

## Death Goes to the Polls: A Meta-Analysis of Mortality Salience Effects on Political Attitudes\*

**Brian L. Burke**  
*Fort Lewis College*

**Spee Kosloff**  
*California State University, Fresno*

**Mark J. Landau**  
*University of Kansas*

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*Terror management theory posits that people are motivated to affirm cultural meaning systems, including political ideologies, to avoid the awareness of mortality. Accordingly, studies show that increasing mortality salience (MS) intensifies people's attitudes toward political issues and figures. However, whereas in some studies MS increases affirmation of preexisting political ideologies, be they liberal or conservative (supporting a "worldview-defense hypothesis"), in other studies MS elicits a general shift toward conservatism, regardless of preexisting ideology (supporting a "conservative-shift hypothesis"). The current study used meta-analysis to assess the overall magnitude of MS effects on explicitly political attitudes and to clarify the nature of these effects by comparing effect sizes for these competing hypotheses. The overall effect of MS on political attitudes was large ( $r = .50$ ). The effects of MS-induced worldview defense ( $r = .35$ ) and conservative shifting ( $r = .22$ ) were significant and statistically equivalent. We discuss the conditions (e.g., contextual salience of political values) under which conservative shifting or worldview defense occurs.*

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Psychologists have historically noted that social and cognitive factors influence people's attitudes toward political issues as well as their broader political ideology (e.g., Converse, 1964; Rokeach, 1960; Tomkins, 1963). Following in this tradition and the study of motivated social cognition, contemporary research has investigated how psychological motives influence people's attitudes toward issues, events, and figures within the political realm (Jost, Glaser, Kruglanski, & Sulloway, 2003a; Westen, 2007). One prominent theoretical perspective on motivated political attitudes comes from terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986), which proposes that people are motivated to avoid the threatening awareness of their own mortality by affirming culturally

\* Correction added after online publication 24 Jan 2013: Due to a software glitch in the author's statistics analysis package, the related statistics in the article, as well as the last column in table 1, are incorrect. The fundamental conclusions of the research remain unchanged; the error simply adjusts some of the effect sizes and related statistics up or down by .05 or so, and has been corrected in this version of the article.

derived systems of meaning. Given these theoretical foci, TMT stands out as a particularly suitable framework to guide empirical investigation of motivated political attitudes. Politically relevant issues often relate directly or indirectly to death (e.g., terrorism, abortion, health care, capital punishment), and political ideologies constitute some of humankind's most accessible and reinforced systems of meaning. Indeed, an extensive TMT-based political research literature has emerged over the past two decades, demonstrating experimentally that reminders of death (mortality salience, or MS) strengthen or alter political attitudes (Anson, Pyszczynski, Solomon, & Greenberg, 2009).

But how strong is the effect of MS on political attitudes, and what is the precise nature of that effect? To date, there has been no systematic overview of the magnitude and nature of MS effects on political attitudes. The current article attempts to fill that gap in the hopes of reconciling apparently conflicting empirical findings and guiding future research on the role of terror management processes in political attitudes and behavior.

### *Terror Management Theory and Research on Political Attitudes*

Inspired by the writings of Ernest Becker (1962, 1973, 1975), TMT begins with the evolutionary proposition that humans share with other living organisms a set of basic, biologically determined instincts for survival. Yet humans have developed a unique cognitive capacity for symbolic reference (e.g., Deacon, 1997) that facilitates self-awareness and sophisticated representation of the passage of time. The ability to flexibly think about the self's potentialities over time is highly adaptive, but it also enables individuals to realize that inevitably they will die. The juxtaposition of the abstract awareness of death with basic survival motivations engenders a potential for great anxiety that humans must reduce or control.

According to TMT, humans mitigate such death-related concerns by maintaining a dual-component anxiety buffer (Greenberg, Solomon, & Arndt, 2008). The first component of this symbolic buffer is faith in a *cultural worldview*, a socially shared set of beliefs about the nature of reality that prescribes norms of proper conduct and standards for pursuing personal value. The second component is *self-esteem*, the perception that one is meeting or exceeding the value standards set forth by one's cultural worldview. By maintaining these psychological structures, individuals can hope that some valued aspect of themselves will transcend the limitations of their finite, physical body via belief either in literal immortality (e.g., a soul's continuance in heaven) or symbolic immortality (e.g., remembrance of one's children, achievements, political party, or research articles; Lifton, 1968). Thus, as Becker (1973) described, a cultural worldview "is more than merely an outlook on life: it is an immortality formula" (p. 255).

Over 400 published empirical studies have examined hypotheses derived from TMT (for a review, see Burke, Martens, & Faucher, 2010; Greenberg, Solomon, & Arndt, 2008). The majority of this work tests variants on the MS hypothesis, which states that if cultural worldviews and self-esteem buffer against death-related concerns, then reminders of death will intensify efforts to maintain those psychological structures. Tests of this hypothesis have operationalized MS in a variety of ways, such as subliminal primes of death-related words, open-ended questions about personal mortality, and exposure to gory accident footage. Convergent across operationalizations, MS reliably causes individuals to uphold or defend aspects of their cultural worldview, including their nationality, religion, preferred sports team, and university (Burke et al., 2010). For example, Greenberg et al. (1990) showed that MS increased Christians' positivity toward fellow Christians and negativity toward Jews. Such worldview defense effects, which have been replicated cross-culturally and across age groups, occur when comparing death reminders to control conditions in which either neutral topics or aversive topics other than death are made salient (e.g., pain, social exclusion, uncertain future events; Burke et al., 2010).

Focusing on the political realm, TMT posits that people's political attitudes and ideologies are shaped by, and gain their motivational force from, the underlying need to hold the anxiety-provoking

awareness of mortality at bay. Political ideologies are broad, culturally transmitted systems of belief that sanction the value of specific social roles, attitudes, statuses, and group affiliations, while at the same time shunning alternative belief systems. Political ideologies thereby provide individuals with the perception that the world is a structured place in which they can confidently establish the significance of their life in a way that will outlast their physical death. Support for this claim is provided by a large body of experimental research showing that MS instigates diverse efforts to adhere to one's political ideology and to uphold that ideology in the face of potential threats to its validity (Pyszczynski, Solomon, & Greenberg, 2003). An illustrative study by McGregor and colleagues (1998) showed that MS led participants to derogate and even physically aggress against targets who opposed their political ideologies. Specifically, following MS, liberals allocated more of a vile hot sauce to be ingested by a person who expressed antiliberal sentiments, while conservatives allocated larger amounts of the vile hot sauce to individuals who expressed anticonservative views. This and other findings (reviewed below) converge to support what we label as the "worldview-defense hypothesis," which states that MS will cause individuals to display intensified fervor or defensiveness on behalf of their preexisting political ideology, be it liberal or conservative (e.g., Kosloff, Greenberg, Weise, & Solomon, 2010a).

However, findings from other studies suggest that MS may not always heighten liberals' investment in their existing political beliefs; rather, it may lead both liberal and conservative individuals to endorse more conservative political attitudes. This has been labeled the "conservative-shift hypothesis" (Jost et al., 2003a; Jost, Fitzsimons, & Kay, 2004; see also Paulhus & Trapnell, 1997). In developing this position, Jost and colleagues have argued that conservative political ideologies afford an unambiguous, stable conception of the world that functions well to manage mortality concerns (and other existential threats), whereas liberal ideologies are more open to change and thus less likely to provide a secure source of meaning and self-esteem in response to threat.

Indirect support for the conservative-shift hypothesis derives from correlational evidence that, cross-culturally, political conservatism is positively associated with various indices of the motivation to attain confident knowledge and psychological security, among which fear of death is the strongest covariant (Jost et al., 2003a). For example, Wilson (1973) found a correlation of  $r = .54$  between scores on a Fear of Death Scale and scores on a Conservatism Scale. Jost et al. (2003a) claim that more causal evidence comes from seven MS studies reported in Florian, Mikulincer, and Hirschberger (2001) and Rosenblatt, Greenberg, Solomon, Pyszczynski, and Lyon (1989), which examined outcomes related to political conservatism, such as punitive responses toward prostitutes and other individuals who violated social norms. The combined effect size for MS on desire to punish such individuals was significant and large ( $r(7) = .50, p < .01$ ). Notably though, outcomes assessed by Jost et al. (2003a) only indexed investment in conservatism indirectly, using punishment of moral transgression as a proxy for investment in conservatism. Furthermore, this form of conservative shifting did not occur among all participants. MS only increased morally based punitiveness among individuals low in self-reported hardiness (Florian et al., 2001) or high in moral opposition to the evaluated target's transgressive behavior (Rosenblatt et al., 1989), variables which may be confounded with preexisting political orientation. Nevertheless, it remains possible that conservative shifts did occur among a subset of participants included in the studies assessed by Jost et al. (2003a).

Yet other support for the conservative-shift hypothesis comes from experiments showing that, among both liberal and conservative individuals, MS increases support for conservative-leaning political figures. Landau and colleagues (2004a) found that, prior to the 2004 U.S. Presidential election, MS increased both liberals' and conservatives' support for incumbent Republican candidate President George W. Bush, as well as for Bush's antiterrorism policies (this effect has been replicated by Cohen, Ogilvie, Solomon, Greenberg, & Pyszczynski, 2005, and Cuillier, 2009). Furthermore, MS generally decreased participants' support for the liberal challenger, Senator John Kerry. Although Landau et al. (2004a) found that MS did *not* influence participants' self-reported political orientation,

their results are consistent with the idea that MS induces an overall conservative shift. Notably though, Bush was a multidimensional stimulus who, in addition to being politically conservative, was the sitting American President and a charismatic spokesperson for America's prospects in the wake of the 9/11 terrorist attacks against the United States. Any or all of those factors could explain why MS enhanced Americans' support for Bush and his policies (Kosloff et al., 2010a; Landau et al., 2004a). Yet Landau et al.'s (2004a) data are frequently upheld as direct support for Jost's conservative-shift hypothesis of MS effects in the political domain (e.g., Franken, 2005; Westen, 2007).

These lines of research have sparked considerable debate between proponents of the worldview-defense hypothesis (e.g., Greenberg & Jonas, 2003) and proponents of the conservative-shift hypothesis (Jost et al., 2003a; see also, Jost, Glaser, Kruglanski, Sulloway, 2003b). Although empirical evidence continues to mount for both sides of this debate (e.g., Anson et al., 2009; Kosloff, Greenberg, Schmader, Dechesne, & Weise, 2010b; Nail, McGregor, Drinkwater, Steele, & Thompson, 2009), to date there has been no systematic overview of the experimental support for these competing hypotheses, nor, more generally, of the overall magnitude of MS effects on political attitudes.

To fill this gap in the literature, the present study employed meta-analysis to assess the overall magnitude of MS effects on political attitudes and to clarify the nature of these effects by comparing the overall effect size for MS-induced worldview defense and MS-induced conservative shifting. In order to gain a clearer picture of the empirical support for these competing hypotheses, we included in our meta-analysis only those studies that *directly* measured attitudes toward politically charged issues (e.g., war, capital punishment, gay rights) or political leaders (e.g., ratings of support or voting preferences).

## Method

We searched through the reference sections of prior reviews and the TMT website ([www.tmt.missouri.edu](http://www.tmt.missouri.edu)) which lists all known TMT studies. We also conducted a database search (PsycINFO) using "terror management," "mortality salience," or "political attitudes" as a key phrase. Finally, we sent out an electronic message to several TMT and political researchers asking for any unpublished studies relevant to our purposes.

As stated above, in conducting the present meta-analysis, we were primarily interested in evaluating the magnitude of the effect of MS on political attitudes and voting behavior. For this reason, to be included in this review, studies had to: (1) directly test the MS hypothesis; (2) constitute a true experiment with random assignment to groups and double-blind procedures; (3) include at least one dependent variable that directly assessed political attitudes or support for (i.e., rating of, intentions to vote for) specific candidates for public office. This resulted in a total of 31 experiments. The prototypical experiment involved 102 participants (68% female) who were college students (93% of studies) with an average age of 22.9 years ( $SD = 4.30$ ). The MS manipulation (described below) followed one or two filler questionnaires, typically included for the purposes of supporting the cover story and distracting participants from the centrality of the MS manipulation. After a short delay during which participants completed another filler measure, worldview defense was measured in ways that directly addressed political attitudes. A summary of the salient features of the studies, including individual effect sizes, is shown in Table 1.

To induce MS, 87% of these studies used a standard induction (Rosenblatt et al., 1989), which is purported to be a projective personality assessment. Participants were given two prompts and instructed to write short paragraphs in response to each: "Please briefly describe the emotions that the thought of your own death arouses in you" and "Jot down, as specifically as you can, what you think will happen to you as you physically die and once you are physically dead." The remaining four studies (13%) used the Death Anxiety Scale (DAS; Templer, 1970), a 15-item true/false survey with items such as "I often think about how short life really is."

**Table 1.** Study Characteristics and Mortality Salience (MS) Effect Sizes for Terror Management Studies Involving Political Dependent Variables

Study (first author/date)	Total N	Mean Age	Location	Control Group	Second IV	Delay Tasks	DV	Hypothesis	Effect Size, <i>r</i> (95% CI)
Anson11-study2	103		US	TV	NONE	1	Implicit Association Test for politics (Mitchell et al., 2003)	WD	<b>.24 (.03, .43)</b>
Castano11-study3 <sup>s</sup>	31		US	TV <sup>s</sup>	NONE (liberals only)	1	Support for 3 conservative policies	WD	<b>.37 (.02, .64)</b>
Castano11-study4	8		US	DP	Liberal Conservative	1	Rating of pro-evolution essay	WD	.43 (-.43, .88) -.29 (-.53, .83)
Cohen04	190	21.8	US	exam	NONE	2	Voting for charismatic leader	N	<b>.34 (.20, .46)</b>
Cohen05	184	21.0	US	TV	NONE	2	Voting for G.W. Bush	CS	<b>.51 (.30, .67)</b>
Cuillier09	58	38.0	US	DP	NONE	1	Support for G.W. Bush	CS	.15 (-.11, .55)
Francis10 <sup>s</sup>	46	21.4	US	DP <sup>s</sup>	Ethnicity: CAUCASIAN NON	1	Support for Obama (inverse)	CS	.28 (-.05, .55) -.51 (-.82, .05)
Gailliot06-study5	88			No task	Self-Control: LOW HIGH	2	Voting for G.W. Bush	CS	<b>.53 (.01, .83)</b> -.13 (-.61, .43)
Hirshberger09-study1	80	24.0	Israel	pain	Iranian leaders: Support violence NOT	1	Support for Israeli violence against Iran	CS	<b>.46 (.16, .68)</b> <b>-.35 (-.60, -.03)</b>
Hirshberger09-study2	308	24.0	Israel	pain	Personal vulnerability: LOW HIGH	1	Support for Israeli violence against Iran	CS	<b>.17 (.07, .32)</b> <b>-.16 (-.31, -.01)</b>
Hoyt09-study1	68		US	exam	Female Male	2	Voting for female candidate	N	<b>.37 (.01, .64)</b> -.10 (-.42, .25)
Kosloff10a	146		US	pain	Liberal Conservative	2	Rating of like charismatic politician	WD	<b>.42 (.08, .64)</b> .25 (-.06, .52)
Landau04a-study1	97		US	TV	NONE	2	Support for G.W. Bush	CS	<b>.74 (.63, .82)</b>
Landau04a-study3	74		US	exam	NONE	2	Support for G.W. Bush	CS	<b>.74 (.62, .83)</b>
Landau04a-study4	157		US	pain	NONE	2	Support for G.W. Bush	CS	<b>.68 (.53, .78)</b>
Lavine05	145		US	No task	Authoritarianism (RWA): HIGH LOW	1	Preference for attitude-congruent capital punishment article	WD	<b>.30 (.01, .55)</b> .15 (-.44, .18)
Moty110	136	23.0	US	DP	Authoritarianism (RWA): HIGH LOW	1	Support for use of military force when human violence was compared to animals (inverse)	WD	<b>.62 (.26, .82)</b> .00 (-.45, .45)
Nairi09-study2	58	22.0	Canada	TV	Preference for consistency (PC): LOW	1	Psychological conservatism (pro-capital punishment and anti-abortion survey conviction)	CS	<b>.73 (.13, .94)</b>
Nairi09-study3	35	24.3	Canada	TV	Preference for consistency (PC): LOW HIGH	1	Anti-gay sentiment (non-support for gay partner benefits in vignette)	CS	.00 (-.81, .81) .74 (-.18, .97)
Nikkah08-study 1 <sup>s</sup>	25		US	TV <sup>s</sup>	NONE (liberals only)	4	Authoritarianism via RWA scale (INVERSE)	WD	.00 (-.81, .81) <b>.45 (.01, .74)</b>

Table 1. (cont.)

Study (first author/date)	Total N	Mean Age	Location	Control Group	Second IV	Delay Tasks	DV	Hypothesis	Effect Size, <i>r</i> (95% CI)
Nikkah08-study2 <sup>s</sup>	37		US	TV <sup>s</sup>	NONE (liberals only)	15	Support for 8 conservative policies (INVERSE)	WD	<b>.34 (.01, .61)</b>
Ogilvie08-study1	234		US	Undesired self	NONE	2	Support for G.W. Bush	CS	.16 (-.02, .33)
Pyszczynski-study1	40	22.0	Iran	DP	NONE	1	Ratings of pro-martyrdom target	N	<b>.87 (.76, .93)</b>
Rothschild09-study1	151	22.6	US	pain	Religious Fundamentalism (RF): HIGH	1	Support for military force when compassionate Biblical values primed (inverse)	WD	<b>.43 (.04, .71)</b>
Rothschild09-study2	121	22.1	US	pain	LOW	1	Support for military force when compassionate Biblical values primed (inverse)	WD	-.32 (-.64, .09)
Rothschild09-study3	120	21.7	Iran	DP	Religious Fundamentalism (RF): HIGH	2	Anti-Western attitudes (e.g., support for violence against US)	N	<b>.56 (.15, .80)</b>
Simon96-study2	61		US	TV	LOW	1	Rating of essay on U.S. flag burning that supported worldview	WD	-.34 (-.68, .12)
Vail09	91	18.3	US	uncertainty	Compassionate values primed: SECULAR KORAN-BASED	2	Support for McCain (vs. Obama)	CS	<b>.66 (.48, .78)</b>
Vail11	72		US	fail exam	NONE	2	Support for health care reforms (9 items)	N	-.37 (-.57, -.12)
Weise08-study1	40	18.6	US	DP	Attachment Security (RSQ): LOW	2	Support for G.W. Bush (vs. J. Kerry)	CS	<b>.60 (.40, .74)</b>
Weise08-study2	160	22.2	US	DP	Relationship Prime: SECURE NEUTRAL	1	Support for extreme military force (inverse)	CS	<b>.83 (.64, .92)</b>

Note. All studies above used two open-ended questions about death (Rosenblatt et al., 1989) as the mortality salience (MS) manipulation except for four studies indicated with an <sup>s</sup> that used the Death Anxiety Scale (Templer, 1970); abbreviations are listed in alphabetical order under the relevant column title; Blank spaces mean that the information was not available in the original study; Heading Abbreviations: CI = confidence intervals; DV = dependent variable; IV = independent variable; Control Group Abbreviations: <sup>s</sup> = Death Anxiety Scale (Templer, 1970) used as MS prime with parallel scale on DP (dental pain) or TV used as the control; DP = two essay questions about dental pain; TV = two essay questions about watching television; Second IV Abbreviations: PC = preference for consistency (Cialdini, Trost, & Newsom, 1995); RF = Religious Fundamentalism Scale (Altemeyer & Hunsberger, 1992); RSQ = Relationship Scales Questionnaire (a measure of attachment style; Griffin & Bartholomew, 1994); RWA = Right-wing Authoritarianism (Altemeyer & Hunsberger, 1992); Delay Tasks: number of delay tasks between MS manipulation and measurement of the political dependent variable; Hypothesis: CS = conservative shift; WD = worldview defense; N = neither; Effect sizes in bold are significant at  $p < .05$ .

In 65% of these studies, participants assigned to control conditions responded to parallel open-ended prompts about aversive topics other than death (e.g., pain) or, in one study that used the DAS, a parallel survey about dental pain with items such as “The thought of an injection of Novocain is very disturbing.” In the other 35% of studies, participants in control conditions responded to either open-ended or survey prompts about neutral topics (e.g., watching TV) or, in two studies, they did not respond to any open-ended prompts.

The effects of explicit reminders of death on worldview defense typically emerge only after a delay between MS and the dependent-variable assessment, after which death-related ideation is shown to be cognitively accessible but outside of focal attention; in fact, delays of 7–20 minutes produce significantly larger effects overall than a delay of less than 7 minutes or no delay (Burke et al., 2010). According to TMT’s dual-defense model (Pyszczynski, Greenberg, & Solomon, 1999), the problem of death resides beneath consciousness and, from there, triggers *distal* defenses—worldview defense and self-esteem striving. The conscious contemplation of death is instead managed by *proximal* defenses, which occur immediately after explicit MS and function, in a pseudo-rational manner, to deny vulnerability to physical death or push it into the distant future.

As the present investigation concerned the effect of MS on distal defense of political worldviews, studies included in this meta-analysis interposed one or more delay tasks between MS and dependent measures of interest. Specifically, the experiments included in the current analysis used either one (52%), two (42%), or several (6%) tasks designed to create a delay and distraction period between the MS manipulation and the administration of the political dependent measure. The most common delay task (68%) was the Positive and Negative Affective Schedule (PANAS; Watson, Clark, & Tellegen, 1988) or its expanded form (PANAS-X; Watson & Clark, 1992), which asked participants to indicate on 5-point scales their present mood across 10 (PANAS) or 30 (PANAS-X) positive-affect items (e.g., happy, enthusiastic) and 10 (PANAS) or 30 (PANAS-X) negative-affect items (e.g., distressed, upset). Other examples of delay tasks included completing a word-search puzzle, completing filler personality questionnaires, or reading a neutral passage or essay.

Eighty-one percent of these experiments were conducted in the United States, with 13% conducted in the Middle East (two studies each in Israel and Iran) and two studies in Canada. The majority of experiments (58%) included a second independent variable other than MS that served as a potential moderator. In most cases (78% of the subtotal), this additional variable was a grouping variable that categorized participants based on their levels of an individual-difference variable, often a personality characteristic with political implications such as self-reported political orientation, preference for consistency (Cialdini, Trost, & Newsom, 1995), right-wing authoritarianism (RWA; Altemeyer & Hunsberger, 1992), religious fundamentalism (RF; also in Altemeyer & Hunsberger, 1992), or attachment style (Griffin & Bartholomew, 1994). Four studies (22% of the subtotal) created a second independent variable by way of an experimental prompt, most commonly a compassion manipulation whereby participants were primed with either religious bases of compassion, secular bases of compassion, or no compassion induction. Because experiments with multiple independent variables yielded more than one effect size for MS, there were a total of 49 effect sizes included in our meta-analysis: 31 primary/hypothesized effects and 18 that were secondary to the study or hypothesized in the null or inverse direction (i.e., the original researchers predicted that the effect size for MS would be zero or negative for that subset of participants). Only the primary effects were included in the overall effect-size calculation for the effect of MS on political opinions, whereas all relevant effects were included for the comparison of experimental support for the worldview defense and conservative-shift hypotheses.

The studies under consideration employed two types of measures of political attitudes. Forty-five percent of these studies measured participants’ evaluation of a political figure or their intentions to vote in favor of that individual’s campaign for public office. For instance, four of these

experiments employed the Presidential Support Scale first used in Landau et al. (2004a), which asked respondents three questions on a 5-point Likert scale to yield an overall support score for how much they agreed with a paragraph containing favorable statements about George W. Bush's actions in the wake of the 9/11 terrorist attacks against the United States: "To what extent do you endorse the statement (above)?" "I share many of the attitudes expressed in the above statement"; and "Personally, I feel secure knowing that the President is doing everything possible to guard against any further attacks against the United States." One study (Vail, Arndt, Motyl, & Pyszczynski, 2009) asked participants to evaluate the likelihood that the two major presidential candidates in the 2008 U.S. Presidential election (Barack Obama or John McCain) would antagonize unfriendly nations, be a competent President, use government to contribute to society, keep America safe, and improve America's status around the world.

The remaining 55% of the studies measured participants' attitudes toward a specific political issue. For example, one study assessed participants' support for same-sex partner benefits (Nail et al., 2009), one used nine items assessing level of support for the 2009 proposed health care reforms (Vail, Arndt, & Pope, 2011), and another measured support for national military force by having participants rate support for nine Likert-type items such as "In order to improve security within the United States, the United States must use its superior military might to destroy terrorists throughout the world" (Weise et al., 2008). Three studies measured participants' evaluation of an essay or essay writer that took a specific political position on an issue such as evolution (Castano et al., 2011), burning the U.S. flag (Simon, Greenberg, Harmon-Jones, Solomon, & Pyszczynski, 1996), or capital punishment (Lavine, Lodge, & Freitas, 2005).

In most cases, we generated effect sizes for MS using data from the original studies and provided by the study authors. When authors merely reported a nonsignificant finding with no other data, we estimated the MS effect size to be zero for that particular political variable. The combined effect size for all included studies was computed by weighting each individual effect size according to the inverse of its variance. In this review, effect size ( $r$ ) is the magnitude of the correlation between the independent variable (MS) and the dependent variable (political attitudes/decisions). The coefficient of determination,  $r^2$ , indicates the percentage of variance of the political opinion that can be explained by the MS manipulation (for a more detailed explanation of the effect-size calculation formulae, see Burke et al., 2010). In accordance with recent developments in meta-analysis (e.g., Kisamore & Brannick, 2008; Schmidt & Hunter, 2003; Schulze, 2007), we employed random effects models for our analyses because the assumptions underlying the use of such models are better suited to behavioral science and generally produce more conservative results.

Effect sizes for MS were then further coded into one of two categories based on the hypothesis that they tested: (1) worldview defense, for effect sizes that measured overall increases in adherence to one's preexisting worldview (e.g., positively rating a gubernatorial candidate who shared the participants' political orientation, preferring an attitude-congruent capital punishment essay, or liberals decreasing their preference for conservative policies); or (2) conservative shift, for effect sizes that measured overall increases in conservative values or attitudes (e.g., voting for George W. Bush or John McCain, support for national military aggression or anti-abortion or anti-gay policies). Note that some of these studies produced more than one effect size for a given hypothesis; for instance, support for conservative George W. Bush for those both high and low in self-control were considered two tests of the conservative-shift hypothesis. In total, there were 21 experimental tests of the conservative-shift hypothesis and 15 tests of the worldview-defense hypothesis included in this meta-analysis.

We did not include in the meta-analytic comparison of the worldview defense versus conservative-shift hypotheses those findings for which the dependent variables were not clearly related to political attitudes or ideology. For example, we excluded studies that tested the effect of MS on voting for a same-gender candidate (Hoyt, Simon, & Reid, 2009) or a charismatic candidate of unspecified political ideology (Cohen, Solomon, Maxfield, Pyszczynski, & Greenberg, 2004). We



also excluded studies (Pyszczynski et al., 2006) looking at support for martyrdom. This decision may appear controversial, because we did include Weise et al.'s (2008) finding that MS increased support for national military force. We are treating support for military force—but not martyrdom—as an aspect of conservative ideology, because we have strong reason to believe that, in the United States, support for national military force is positively associated with political conservatism. This is evidenced by the voting record for U.S. military action over the past few decades (e.g., Grote, Frieze, & Schmidt, 1997). Also, we conducted a pilot study in which 126 American undergraduates (64 women, 62 men) indicated their political orientation on a 9-point scale (1 = *very conservative*, 9 = *very liberal*;  $M_{grand} = 5.80$ ) and a single item assessed their support for the United States' use of military force ("I support my country's use of military force against other countries" rated from 1 = *strongly disagree*, 7 = *strongly agree*). As expected, responses on these items were significantly correlated ( $r = -.45$ ,  $p < .01$ ). However, we are not as confident that support for martyrdom among Iranian participants (as measured in Pyszczynski et al., 2006) clearly reflects an aspect of political conservatism. In the absence of conclusive evidence about the ideological significance of martyrdom beliefs, we did not include it in the analysis herein comparing relative support for MS-induced worldview defense and conservative shifting.

To calculate effect sizes of MS for both conservative shift and worldview defense, we generated a Q statistic corresponding to each hypothesis using a random effects SPSS macro for categorically grouped data (Lipsey & Wilson, 2001, pp. 138, 216). The Q statistic is the meta-analytic analog to the F statistic in ANOVA for primary data sets. This analysis thus provides easily interpretable results, as a significant Q indicates that there is a significant difference between the mean effect sizes in the group comparison. Finally, we examined the experiments bearing on the worldview defense and conservative shift hypotheses qualitatively by exploring their specific results in narrative (rather than statistical) format below, including a brief review of relevant studies that met some but not all of our inclusion criteria for this meta-analysis.

## Results

The first goal of the current analysis was to compute the overall effect size for the effect of MS on political outcomes (political attitudes and/or voting behavior) across the 31 experiments under consideration. Of the 31 hypothesized/principal effect sizes in these studies, 24 (77%) were both positive and statistically significant (nonzero) in favor of the general MS hypothesis. Effect sizes ranged from .15 to .87 with a standard deviation of .21 and an arithmetic mean of .49. The overall weighted effect size for all the primary MS manipulations on political outcome measures was  $r(30) = .50$ , 95% confidence interval: .46 to .54,  $p < .0001$ . To put this overall effect size into context, Richard, Bond, and Stokes-Zoota (2003) compiled results from a century of social psychological research—more than 25,000 studies involving eight million participants—and found that the mean effect size was  $r(473) = .21$  ( $SD = .15$ ). Thus, the mean effect size for MS manipulations on political outcome measures is a large effect (Cohen, 1992) that explains 25% of the variance in those outcomes, exceeding the 95<sup>th</sup> percentile (1.93 standard deviations above the mean) for theoretically specified effects in social psychology. Note also that the effect size for MS effects on political outcomes is significantly larger than the overall effect size for MS on worldview defense and self-esteem striving in general ( $r(276) = .35$ ; Burke, Martens, & Faucher, 2010), a point to which we later return.

The second goal of the current analysis was to assess which competing hypothesis—worldview defense or conservative shift—better accounts for the pattern of MS effect sizes in these experiments. As noted previously, some experiments had secondary MS effect sizes in addition to the primary ones; we used all relevant effect sizes for MS that evaluated one of these two hypotheses, resulting in 36 effect sizes submitted for the Q analysis. There was support for *both* competing explanations, with the worldview-defense hypothesis ( $r(13) = .35$ ,  $p < .01$ ) and the conservative-shift hypothesis

( $r(25) = .22, p < .02$ ) both yielding significant effects. Thus, the worldview-defense hypothesis yielded a medium overall effect size, whereas the average effect size for the conservative shift was in the small range (Cohen, 1992), although the two effect sizes were statistically equivalent ( $Q_B(1, 38) = 0.84, p = .36$ ).

### *What Does a Qualitative Analysis of These and Other Studies Show?*

It is useful to complement our quantitative analysis with a discussion of the relevant studies. In support of the worldview-defense hypothesis, one study (Kosloff et al., 2010a) found that MS increased support for a charismatic candidate of the same political orientation as the participant. Two other studies showed increased support for a Democratic President or presidential candidate (Barack Obama) following MS, but only among non-Caucasians (Francis, Burke, & Kraus, 2010) or when compassionate quotes such as “our #1 responsibility is to love others” were first presented (Vail et al., 2009). Furthermore, after MS, people who scored high on RWA reported increased support for a capital-punishment article containing uniformly proattitudinal arguments rather than a more balanced exposure (Lavine et al., 2005) and reported decreased support for military force when human violence was likened to that of animals (Motyl, Hart, & Pyszczynski, 2010), thereby bolstering the “human specialness” component of their worldview. In addition, two other studies (both in Rothschild, Abdollahi, & Pyszczynski, 2009) showed decreased support for military force following MS among those high on RF, but only when compassionate Biblical values were first primed. In three other studies, MS led liberals, but not conservatives, to become less authoritarian and less favorable toward conservative views such as creationism and conservative policies regarding welfare, abortion, and the pledge of allegiance (Castano et al., 2011; Nikkah, 2008).

In support of the conservative-shift hypothesis, seven studies illustrated that people supported Republican presidential candidates (George W. Bush in six studies and John McCain in the other) more strongly under MS regardless of their preexisting political ideology (Cohen et al., 2005; Cuillier, 2009; three studies in Landau et al., 2004a; Ogilvie, Cohen, & Solomon, 2008; Vail et al., 2009). Two other studies (Gailliot, Schmeichel, & Baumeister, 2006; Weise et al., 2008) showed increased support for President George W. Bush following MS, but only for those low in trait self-control (measured with the Self-Control Scale; Tangney, Baumeister, & Boone, 2004) or Attachment Security (measured with the Relationship Scales Questionnaire; Griffin & Bartholomew, 1994). One study showed that MS decreased support for President Barack Obama and his health care reforms, but only among Caucasians (Francis et al., 2010). Four studies (all in Hirschberger, Pyszczynski, & Ein-Dor, 2009) showed that people increased their support for their national military force following MS. Two studies (both in Nail et al., 2009) revealed that people with low preference for consistency (Cialdini et al., 1995) shifted toward more conservative attitudes such as anti-capital punishment or anti-abortion following MS.

Other relevant tests included in the present meta-analysis suggest that MS sometimes causes individuals to become more progressive when salient political conditions place special value on liberal ideals. Such effects do not support the conservative-shift hypothesis, because they show individuals becoming more liberal. Moreover, such outcomes seem consistent with the worldview-defense hypothesis, in that salient prevailing political ideology determined how psychological security was gained after MS. For instance, one recent study conducted during Democratic President Barack Obama’s first term indicated that, when reminded of death, both self-reported conservatives and liberals reported more liberal attitudes, as measured by a multi-item political opinion survey constructed for the study as well as an implicit association test (Anson & Zahn, 2011). Another study, conducted at the height of the Fall 2009 U.S. Congressional debate on health care reform, found that MS increased support for the extremely progressive bill among both liberals and conservatives, as

long as participants viewed the reforms as creating an “autonomy-supportive” (need-satisfying) environment (Vail, Arndt, & Pope, 2011). Thus, MS is capable of motivating progressive change if progressive norms and values are salient or need-satisfying components of the individuals’ worldview.

Other research more directly illustrates how historic political conditions moderate responses to MS. Prior to the 2008 election of President Barack Obama, Motyl and Pyszczynski (2010) found that inducing MS (by focusing participants on either death, terrorism, or war) led to increased support for war against Middle Eastern countries among Western participants (college students from the United States, Netherlands, and the United Kingdom) and increased support for terrorism against Western countries among Iranian participants. However, following the 2008 U.S. election, participants in countries in both regions became more conciliatory towards countries in the other regions following MS. Therefore, it appears that historical context can determine whether liberal or conservative values facilitate terror management. When prevailing cultural trends favor conservatism, MS often strengthens conservative leanings; yet when prevailing trends are more progressive in nature, MS often strengthens liberal leanings. However, such conclusions must be qualified by the fact that—as the present review shows—many effects in the literature of MS effects on political variables are moderated by additional dispositional and/or situational factors. Thus, historical context likely conditions the influence of MS on political ideology, but it does so synergistically, as one factor interacting with others in complex and theoretically interesting ways (e.g., Kosloff et al., 2010a).

Several studies that support the worldview-defense hypothesis were not included in this meta-analysis because the dependent measures did not constitute political attitudes or voting preferences per se. For instance, McGregor et al.’s (1998) studies of hot-sauce allocation illustrated that both conservatives and liberals respond to MS by increasing their aggression toward people of the opposing political orientation, thereby bolstering their own worldview. Furthermore, Vail, Arndt, Motyl, and Pyszczynski (2011) found that MS increased dogmatic belief style regardless of political orientation—i.e., both conservatives and liberals strengthened their beliefs after exposure to death-related stimuli. In addition, McCann (2008) reported that, as statewide homicide rates increase (presumably heightening the salience of mortality), predominantly conservative U.S. states showed higher rates of capital punishment whereas more liberal U.S. states showed *lower* rates of capital punishment. McCann (2009) also found that the degree of national societal threat (including death) preceding congressional elections from 1946 to 1992 was positively associated with the mean state percentage of people voting for Republican representatives in conservative states (with no evidence of that same relationship in liberal states). Moreover, Swiss liberals did not significantly increase their conservative opinions—and, in fact, showed a trend toward becoming more liberal—after the actual death of a close relative (Chatard, Arndt, & Pyszczynski, 2010). *Finally*, a more recent study (Taylor & Burke, 2012) primed U.S. participants with thoughts of their imminent death (i.e., dying in an apartment fire) rather than the abstract idea of death as in typical MS primes; this produced a “liberal shift” in their moral foundations—more concern for individual rights over societal groups and institutions (Graham, Haidt, & Nosek, 2009).

## Discussion

The current article is the first to our knowledge to meta-analytically evaluate the effects of experimentally manipulating the salience of personal mortality (i.e., mortality salience; MS) on political attitudes, in particular attitudes toward politically charged issues and political figures. We had three goals in this review: (1) describe the basic or prototypical characteristics of MS experiments with direct political implications; (2) calculate the combined effects of these MS inductions on

explicitly political outcomes; and (3) test two competing hypotheses regarding the nature of MS effects on political outcomes: the worldview-defense hypothesis, which states that MS leads people to cling to their preexisting worldview, and the conservative-shift hypothesis, which states that MS elicits a general shift toward more conservative attitudes and preferences.

Results indicated that MS exerted a large overall effect on political attitudes ( $r = .50$ ). This effect size reaches the 95<sup>th</sup> percentile for theories in social psychology and exceeds the effect size for MS in general ( $r = .35$ ; Burke et al., 2010). Why might MS effects on political attitudes be stronger than MS effects on other forms of worldview defense and self-esteem striving? One possibility is that politically oriented attitudes may be better defined and thus more reliably measured than other aspects of worldviews that TMT researchers have studied, such as attitudes toward risky behaviors, sports teams, or using sunscreen. However, we can also speculate that people may view political topics, events, and figures as especially important aspects of their broader cultural worldview; therefore, people may respond with particularly vigorous defense of those aspects when mortality is salient. This suggests that one interesting direction for future research is to directly compare, within the context of the same experiment and measurement quality, the effect sizes of MS on defense of political versus nonpolitical aspects of participants' cultural worldview.

Furthermore, both the conservative-shift hypothesis and the worldview-defense hypothesis received empirical support in the current meta-analysis. The effect sizes for the worldview-defense hypothesis ( $r = .35$ ) and the conservative-shift hypothesis ( $r = .22$ ) were both significant and statistically equivalent to one another, yet directionally favored the worldview-defense hypothesis.

A main limitation of this review is that most of the studies presently included as tests of the conservative-shift hypothesis examined the effect of MS on support for President George W. Bush and his antiterrorism policies. As described above, MS-induced support for Bush may not simply index conservative shifting. In addition to being conservative, Bush was a charismatic political leader in the wake of the 9/11 terror attacks, as well as the sitting American President and a staunch advocate of strong security and aggressive military measures at a particular moment in American history when most liberal and conservative leaders had supported the invasion of Iraq and professed pronounced concerns about the prospect of additional acts of terrorism. It is therefore possible that MS-induced increases in positive regard for Bush among both liberals and conservatives reflect the influence of any one or a combination of these factors.

Indeed, the only published study which has attempted to isolate these variables (Kosloff et al., 2010a) showed that charisma and shared liberal or conservative identity seemed to matter more than whether or not the candidate was conservative. Kosloff et al. (2010a) found that MS caused liberal participants to express heightened enthusiasm for a hypothetical gubernatorial candidate who was both liberal and charismatic, but to express lessened support for a noncharismatic liberal and for conservative candidates independent of charisma. Analogously, among conservative participants, MS heightened support for a charismatic conservative candidate, but lessened support for a non-charismatic conservative and for liberal candidates.

Nonetheless, given that Bush was strongly identified with conservatism in American culture, it is possible that MS-induced support for Bush in part reflects a conservative shift. Indeed, this account is further supported by Vail et al.'s (2009) finding that MS heightened support for McCain, a Republican whose conservative pronouncements were less likely confounded with perceived charisma (e.g., Cohen et al., 2004; Ehrhart & Klein, 2001). Accordingly, the key future studies needed to resolve this theoretical debate should focus squarely on conditions that produce the different effects each position predicts: by isolating the political opinions of liberals (e.g., Castano et al., 2011; Nikkah, 2008) and investigating precisely when liberals become more liberal or more conservative following MS.

*When Does Conservative Shifting or Worldview Defense Occur?*

It is clear from the present analyses that individuals do not always respond to MS with heightened conservative attitudes and preferences. In fact, individuals often exhibit strengthening of their liberal or conservative worldview. Furthermore, additional research has demonstrated conditions under which MS increases interest in novelty, cultural exploration, or progressive change, effects which seem to paint a picture at odds with a strict conservative-shift hypothesis. For instance, Vess, Routledge, Landau, and Arndt (2009) found that, among individuals with a low dispositional preference for simple and clear-cut knowledge, MS elicited novelty seeking and, consequently, increased the perception that life is meaningful. Rutjens, van der Pligt, and van Harreveld (2009) even found evidence that progressive change can serve a generalized buffering function: bolstering belief in progress eliminated the typical effect of MS to heighten the cognitive accessibility of death-related ideation and worldview defense.

Nevertheless, there may be some psychological advantages to political conservatism that make that orientation especially useful for managing mortality concerns under some circumstances. Perhaps conservatism provides particularly reliable structure and certainty, as well as an enhanced sense of collective self-esteem (i.e., by the higher levels of nationalism that often go with it). Research shows that MS increases preference for simple structuring of the social world, at least among individuals predisposed to prefer structured knowledge (Landau et al., 2004b), and a wide range of studies shows that MS increases striving for self-esteem as well as nationalistic and other in-group biases (see review by Castano & Dechesne, 2005). Furthermore, it may be that conservative shifting restores psychological equanimity not only by bolstering unambiguous “black-and-white” aspects of one’s cultural worldview but also via a general “system justification” that affirms stable, overarching social order (Rutjens & Loseman, 2010).

Yet much evidence was reviewed showing that various factors can interact with MS to push people toward either liberalism or conservatism, suggesting that conservatism is not inevitably the preferred ideological source of security from death-related concern. For instance, it is probable that broad, historic sociopolitical trends partly determine how people respond on political variables after MS. Conservative shift responses might be more likely during conservative political eras (e.g., the presidencies of Nixon, Regan, and Bush), while left-wing reorientations might be more likely during more progressive eras. Analogously, in the Soviet Union, left-wing communist ideology grew to power and then faded, reflecting that prevailing ideologies and their security value may ebb and flow with time and circumstance.

Ideological bases of security from political worldviews may thus shift with historical context and corresponding changes in salient components of the predominant worldview. Indeed, research shows that MS effects are reliably moderated by salient norms and values (e.g., Jonas et al., 2008). It would seem odd to identify all such changes in the status quo as “conservative shifts,” as some have done (Jost et al., 2003a), given that dominant ideologies sometimes emphasize a progressive mentality (e.g., the Roosevelt and Kennedy presidencies). At issue in the present work, then, is whether and when MS makes people prefer right-wing ideology, primarily as it manifests in evaluative stances on social, moral, and economic issues endemic to self-identified conservatives in the current Western geopolitical climate.

Viewed in this light, it can be argued that, at the historical moment in which the studies in this meta-analysis took place, conservative ideologies had a pronounced safety-oriented tenor in many cultures and so may have served as a particularly strong basis of psychological security in many sociopolitical contexts. After the terrorist attacks on the World Trade Center in the United States on 9/11, which may have served as an international MS prime, world politics shifted decidedly to the right (Kahn, 2002). For instance, the Republican Party in the United States won a Senate majority in the next (2002) election, whereas many other Western countries—including Germany,

Israel, France, Canada, and the United Kingdom—also elected conservative governments in subsequent years. Further, three times as many predominantly liberal survivors of the 9/11 terrorist attacks (38% vs. 13%) reported becoming more conservative rather than more liberal 18 months afterwards (Bonanno & Jost, 2006). Research also uncovered a consistent, positive relationship between terror warnings and presidential approval for George W. Bush (Willer, 2004; though see also Willer & Adams, 2008).

Results of the present meta-analysis conform to this historical account, suggesting that, in the context in which the included studies took place, conservative shifting was a response to existential threat. Conservative shifting appeared likely among liberals and conservatives when the extant political climate legitimized or emphasized conservative ideals (e.g., during the Bush presidency and in the wake of the 9/11 attacks). Such effects seemed most generalized across participants (i.e., occurring regardless of initial self-reported political orientation) when the evaluated stimulus emphasized conservative norms/values but could also afford additional political, psychological, or strategic advantages or security (e.g., a current President and his military initiatives on behalf of the participant's country). Furthermore, such effects were typically most pronounced among individuals *low* on trait variables that might otherwise facilitate deviation from the Western right-wing status quo (e.g., self-control, attachment security).

Yet conservative shift responses appeared quite readily overridden when additional components of a person's worldview were rendered salient. In the currently assessed research, there appeared to be three ways in which additional salient worldview components produced worldview defense effects. The first inhered in the use of additional manipulations designed to activate constructs associated with liberal or conservative norms or values (e.g., Biblical verses, thoughts of human violence as animalistic). Although liberals' and conservatives' worldviews differ in important ways, they share many elements, including the desire for happiness, security, and self-esteem. Consequently, activating norms or values that are inchoate for both liberals and conservatives (e.g., some valuing of compassion or tolerance, or of security) appeared to override simple conservative shifting and result instead in conservative or progressive evaluations in line with the salient ideal. Second, worldview defense effects were likely when researchers took into account individual-difference variables that may make politically relevant norms, values, and identities chronically salient (e.g., minority racial identity, Right-Wing Authoritarianism). Third, in some studies supporting the worldview-defense hypothesis, the evaluated stimulus was an extremely divisive policy issue, the author of a direct slight to one's preexisting liberal or conservative ideology or a charismatic representation of one's ideology in direct competition with an uncharismatic representation of the opposed party. It is possible that such evaluative contexts made participants' liberal or conservative worldview salient, resulting in responses to MS that bolstered that preexisting worldview.

In sum, the present analyses suggest that conservative shifting often gives way to worldview defense when additional components of a participant's worldview are rendered salient in some manner. Future research is needed to understand which political phenomena most strongly moderate MS effects and why. For instance, various aspects of a political climate—such as an economic recession, foreign wars, or immigration issues—could function as MS proxies in the level of threat they present to voters. Whether such events produce conservative shifting or worldview defense may depend on the broad sociopolitical climate, as well as the chronic accessibility or situational salience of worldview components. For example, amidst a high unemployment rate (7.9%), a continuing war in Afghanistan, and a hurricane/superstorm Sandy decimating parts of the East coast, the 2012 U.S. Presidential election was the most racially polarized in U.S. history, with Caucasian voters preferring Mitt Romney almost 60% to 40% but minority voters reelecting President Barack Obama: Over 93% of African Americans voted for Obama in 2012, as well as 73% of Asian Americans and 71% of Latinos. Continued exploration of such political phenomena, both within and outside of experimental

laboratory settings, will yield further insight into the impact of death-related concerns on political attitudes and voting behavior.

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Correspondence concerning this article should be sent to Brian L. Burke, Psychology Department, Fort Lewis College, Durango, CO, 81301. E-mail: burke\_b@fortlewis.edu

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