



## The aftermath of destruction: Images of destroyed buildings increase support for war, dogmatism, and death thought accessibility

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### ABSTRACT

Building on terror management theory, we hypothesized that viewing destroyed buildings would increase death thought accessibility and thereby elicit dogmatic belief and hostile worldview defenses. In Study 1, images of destroyed buildings and deadly terrorist attacks elicited greater death-thought accessibility than images of construction sites or intact buildings. Images of destruction also enhanced dogmatic belief (Study 2) and support for military action against Iran (Study 3). Study 4 found that heightened death thought accessibility, but not the accessibility of thoughts of war or national identity, statistically mediated the relationship between visible destruction and worldview defense. Further, although destruction images increased dogmatism, political orientation was not affected by the destruction manipulation nor was political orientation related to death-thought accessibility. Overall, these findings suggest that visibly destroyed infrastructure can motivate increased certainty of beliefs and support for military aggression (e.g., war and/or terrorism) against groups perceived to be threatening to one's worldview.

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As I looked at those demolished towers in Lebanon, it entered my mind that we should punish the oppressor in kind and that we should destroy towers in America... So with these images and their like as their background, the events of September 11th came as a reply to those great wrongs... Just as you lay waste to our nation, so shall we lay waste to yours. *Osama bin Laden, Address to the American People (2004)*

### Introduction

Remnants of buildings destroyed by human actions and natural disaster are a common feature of the landscape in many parts of the world. When the pillars of the visible world come crumbling down, does this provoke peoples' awareness that they too will also ultimately succumb, and if so, where do they turn for solace? One possibility, suggested in the above epigraph, is that visible destruction is closely associated with death, the awareness of which prompts investment in enduring cultural beliefs and values that seemingly defy the test of time. In a sense then, trenchant faith in one's cultural beliefs, and even violent

defense of those beliefs, may help dampen the existential echoes of the visible destruction of one's surroundings.

Importantly, some have speculated that exposure to destruction may indeed conjure up existential fear and promote aggressive and militaristic responses. For example, *Baumgarten (1949)* suggested that visible destruction, such as that endured by Warsaw, Poland, during WWII, carries existential implications that emerge indirectly in other activities, such as the production of destruction themes in artistic and political expressions, and that the destroyed buildings and infrastructure left behind by the war provided a lasting reminder of those deadly implications. Similarly, in a study conducted in Israeli settlements a year and half after the cessation of artillery shelling in the 1967 Arab-Israeli war (*Ziv, Kruglanski, & Shulman, 1974*), people living in shelled areas expressed more patriotism, covert aggression, and signs of courage than did those living in non-shelled areas.

To our knowledge, the present work is the first experimental research to consider the social psychological repercussions of exposure to signs of destruction, offering a novel opportunity to expand understanding of the naturalistic catalysts of existential insecurity and how people react to such situations. The present research builds from terror management theory (TMT; *Greenberg, Pyszczynski, & Solomon, 1986; Greenberg, Solomon, & Arndt, 2008*) to examine the possibility that viewing destroyed infrastructure heightens awareness of death which, in turn, increases dogmatic certainty about one's cultural beliefs as well as support for violent and aggressive defense of one's cultural worldview.

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## Terror management theory

TMT contends that human awareness of the inevitability of death creates the potential for existential terror that would undermine adaptive behavior unless effectively managed. One major way people control this anxiety is through the creation and maintenance of cultural worldviews that alleviate their awareness of death. The hope of transcending death literally, through admission to heaven, reincarnation, or some other ethereal existence, is provided by the religious belief systems contained in virtually all cultures. Similarly, people can attain symbolic immortality by weaving themselves into the everlasting fabric of their culture, affecting the lives of others, performing great works, or leaving other marks on the world. Cultural worldviews prescribe the beliefs and values that serve as the criteria for personal value (i.e., self-esteem) and, consequently, whether one qualifies for either type of immortality.

One important implication of this analysis is that people must maintain certainty regarding their worldview beliefs in order to effectively protect themselves against the awareness of death. Yet research has not directly examined the strength of one's beliefs in response to reminders of mortality. Rather, studies have focused on a variety of changes in attitudes and actions designed presumably to protect those convictions from threats. TMT posits that because worldviews are inherently fragile social constructions, individuals must protect those beliefs against threatening others and must seek social validation in order to maintain their effectiveness at calming existential fears (Berger & Luckmann, 1967). The mere existence of worldviews different from one's own threatens one's own beliefs and thus the capacity of those beliefs to buffer existential fear.

Therefore, if the effectiveness of one's worldview in providing equanimity in the face of death-related thought depends on social validation, then when reminded of mortality (mortality salience) people should be especially favorable toward those who uphold one's worldview and unfavorable toward those who threaten it, a protective response tendency known as worldview defense (e.g., Greenberg et al., 1990). Considerable research has supported this hypothesis, showing that reminders of death affect social allegiances and intergroup hostilities based on cultural demarcations such as race (Greenberg, Schimel, Martens, Solomon, & Pyszczynski, 2001), ethnicity (see Castano, 2004; Motyl et al., 2011), religion (see Vail et al., 2010), political affiliation (e.g., McGregor et al., 1998), and nationality (e.g., Jonas, Fritzsche, & Greenberg, 2005). Such responses can take the form of harsher evaluations of those who challenge one's worldview and more positive evaluations of those who support it (e.g., Greenberg et al., 1990), increased estimates of social consensus for one's worldview (e.g., Pyszczynski et al., 1996), derogation and physical aggression against those who criticize one's worldview (e.g., Hayes, Schimel, & Williams, 2008; McGregor et al., 1998), and various other responses that undermine the impact of threats to and increase the impact of support of one's worldview.

## Physical destruction as a catalyst for existential motivation

In recent years, research has shown how the salience of war, terrorism, or other forms of lethal human conflict can activate terror management processes. For example, subliminally priming the terrorist attacks of September 11th 2001 via the letters "WTC" (i.e., World Trade Center) or the numbers "911" (i.e., September 11th) elicited greater death thought accessibility than did a set of neutral stimuli (i.e., "573"; Landau et al., 2004). Similarly, thinking about, or reading news articles about, terrorism can increase both death thought accessibility and worldview defense (Das, Bushman, Bezemer, Kerkhof, & Cermeulen, 2009; Landau et al., 2004).

Of course, intimations of mortality are not limited to reminders of terrorism. Throughout the world, people frequently encounter environments saddled with reminders of death, such as hospitals, cemeteries, and funeral homes. The Varanasi burial grounds of India, where some 250 public cremations take place each day, are one particularly vivid

example. People living near these grounds display chronic worldview defense compared to those living in other regions (Fernandez, Castano, & Singh, 2010). On a more mundane level, passing by funeral homes and cemeteries remind people of death and trigger worldview defenses (Gailliot, Sillman, Schmeichel, Maner, & Plant, 2008; Jonas, Schimel, Greenberg, & Pyszczynski, 2002; Pyszczynski et al., 1996). These studies demonstrate that mere exposure to sites with a connection to death is capable of instigating terror management processes.

Broken windows theory (BWT; Wilson & Kelling, 1982), a prominent criminological perspective, has pointed out that visible signals of deterioration or destruction, such as graffiti, litter, or broken windows on a building or storefront, signal a disorderly descriptive norm (see Cialdini, Kallgren, & Kallgren, 1991; Cialdini, Kallgren, & Kallgren, 1990) and thus facilitate the spread of criminal disorder in the area. Indeed, compared to clean and orderly environments, introducing even minor visible displays of disorder (e.g., graffiti, illegally locked bicycles, litter) led to increases in a range of other disorderly and criminal behaviors, such as littering, trespassing, and stealing money out of a post office box (Keizer, Lindenberg, & Steg, 2008). BWT thus highlights important issues about the link between visible infrastructure damage and caustic behavior that TMT may also be able to help inform. The rubble of destroyed buildings and neighborhoods in the wake of natural disasters, war, and terrorism, may serve as reminders of the fleeting and fragile nature of life (Pyszczynski, Solomon, & Greenberg, 2003). Lifton (2003) noted that almost immediately following 9/11, the pile of rubble that was formerly the World Trade Center became referred to as "ground zero," a phrase previously reserved for the hypocenter of a nuclear explosion or earthquake. He argued that the symbolism of such language reflects the apocalyptic meaning inherent in such devastation and the shocking realization that humans are vulnerable to sudden destruction. In fact, in earlier writings, Lifton (1976, 1979) suggested that such tangible destruction constitutes "imagery of extinction" and undermines the illusion that one is invulnerable to similar environmental hazards – it is more difficult to believe that one will withstand the test of time when one sees his or her infrastructure or environments ravaged by nature and war.

## The present research

From a TMT perspective, the destruction of civilized human infrastructure is a "broken window" that may serve as a daunting memento of the fragility of human life. Following from this analysis, the purpose of the present research was to determine whether viewing destroyed infrastructure can lead to heightened accessibility of death-related thought, and consequently, heightened dogmatic belief certainty and violent worldview defensive attitudes. In Study 1 we tested whether exposure to images of destroyed buildings would increase death thought accessibility. If this were the case, TMT suggests that viewing such scenes of destruction should increase the certainty with which people hold their worldview beliefs (Study 2) and increase hostile worldview defense, such as support for violent military campaigns against those with threatening worldviews (Studies 3 and 4). Study 4 also assessed the role of death-related thoughts in mediating the link between viewing images of destroyed buildings and subsequent worldview defense.

## Study 1

Our initial study assessed whether viewing images of destruction could lead to an increase in death thought accessibility. The target condition exposed participants to a series of images depicting buildings that were damaged or destroyed, as well as three comparison conditions. The first comparison condition depicted images of completely intact buildings, representing a neutral baseline condition. The second comparison condition depicted a construction site, with buildings not fully intact yet clearly not destroyed. The third comparison condition depicted buildings in the process of being destroyed by terrorist/military

action. Given previous research showing that terrorism-related stimuli increase death thought accessibility (Das et al., 2009; Landau et al., 2004), this condition allowed us to see how the effect of the destroyed buildings' images compare with images that directly implicate killing and death. Stimuli in each of these four conditions (destruction, terrorism, construction, intact) depicted various buildings and architecture in both urban and suburban settings. After viewing these images, participants completed a word-stem completion task designed to assess the accessibility of death-related cognition.

Based on TMT, we were able to make several predictions. First, that the destroyed building condition would yield higher levels of death thought accessibility than the intact condition and the construction condition. Second, the construction condition would not increase death thought accessibility compared to the intact building condition because the construction site buildings were clearly not destroyed. And finally, the terrorist/military action condition was also expected to produce greater death thought accessibility than the intact condition and construction condition, and that these levels of death thought accessibility would be either the same as or higher than the destroyed building condition. In comparison to viewing images of construction or intact buildings, exposure to images of destroyed buildings was expected to increase death thought accessibility just as would viewing images of military/terrorist action.

Study 1 also provided an opportunity to test the uncertainty–threat model of political conservatism (Jost, Glaser, Kruglanski, & Sulloway, 2003). According to this model, death-related stimuli and other existential threats would be expected to produce a shift toward conservative political ideology. Thus, we tested whether the destruction condition would influence political ideology and, similarly, whether death thought accessibility would be associated with political conservatism.

## Method

### Participants

Participants were 50 undergraduate psychology students (11 male) at the University of Colorado at Colorado Springs (UCCS) with a mean age of 22.84 ( $SD = 5.13$ ) years. Participants in this and all subsequent studies were recruited via an online study sign-up system for either extra course credit or as part of a research participation component of a course.

### Materials and procedure

Upon arrival, participants were told that the study was investigating the relationship between visual and linguistic structural formations. After obtaining informed consent, the experimenter then seated each participant at a computer in a private cubicle and explained how to navigate the computer program and testing packet.

Once familiarized, participants were randomly assigned to guide themselves through one of four "Structural evaluation tasks" whereby they were asked to judge the structural appearance of a total of 25 images of buildings in various states of duress. Fifteen images in the 'destruction' condition included 15 images of destroyed buildings. The 'intact-building' condition included 15 images of normal, intact buildings. The 'construction' condition included 15 images of incomplete or dismantled buildings, but organized and with earthmovers, cranes, scaffolding, and other evidence of active construction around the site. And finally, the 'military/terrorism' condition depicted buildings being blown up by bombs or crashed into by planes. The remaining 10 images in each condition were evenly spaced throughout the presentation and depicted intact buildings.

Images for each building type condition (i.e., destruction, intact, construction, terrorism) were selected from the following locations: New York, NY; Arlington, VA; New Orleans, LA; and the Gulf Coast; and the countries of Israel and Lebanon. No humans or animals were visible in any of the stimuli images. Images in the destruction condition specifically depicted the aftermath of damage incurred at these locations

following bombs, fires, earthquakes, hurricanes, and/or structural collapse; further, care was also taken to make sure that none of the destruction condition stimuli included any overt cues of death (i.e., no bloodstains, gore, etc.) to humans or animals. Sample images are presented in the Appendix.

After the computerized portion of the study, participants completed a 20-item mood inventory (PANAS; Watson, Clark, & Tellegen, 1988) and a word search distraction task to provide the delay typically needed to find increased death thought accessibility after priming with death-related stimuli (see Pyszczynski, Greenberg, & Solomon, 1999). As in previous research (e.g., Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994; Schimel, Hayes, Williams, & Jahrig, 2007), the accessibility of death-related cognition was assessed using a word-stem completion task.<sup>1</sup> This task presented 25 incomplete word-stems, of which 6 could be completed with either a neutral or a death-related word. For example, GRA\_ \_ could be completed as GRANT or GRAVE, and SK\_ \_L could be either SKILL or SKULL.

A single-item Likert-type measure of political orientation (1 = Conservative, 10 = Liberal) was also included to test whether the image manipulation would influence the content of participants' beliefs and values. Similar single-item liberal-conservative assessments have been widely used in social psychological research to assess and predict socio/political attitudes and outcomes (e.g., Amodio, Jost, Master, & Yee, 2007; Landau et al., 2004; Nail, Harton, & Decker, 2003; Nail & McGregor, 2009), and recent studies have demonstrated the single-item measure of political orientation is sensitive to various types of threat (e.g., Bonanno & Jost, 2006; Jost et al., 2007).

This and all subsequent studies concluded with a demographic questionnaire which collected information such as age, sex, and education level.

## Results

### Death thought accessibility

A one-way ANOVA revealed significant differences between conditions on death thought accessibility,  $F(3, 46) = 4.38$ ,  $\eta^2 = .22$ ,  $p < .01$ . Pairwise comparisons revealed that the terrorism ( $M = 2.09$ ,  $SE = .30$ ) and destruction ( $M = 2.33$ ,  $SE = .28$ ) conditions did not differ from each other,  $t(22) = .59$ ,  $d = .25$ ,  $p = .56$ . However, as hypothesized, each of these conditions elicited greater death thought accessibility than the construction ( $M = 1.23$ ,  $SE = .27$ ) and intact building ( $M = 1.21$ ,  $SE = .26$ ) conditions, all  $|t|'s > 2.11$ ,  $d's > .89$ ,  $p's < .03$ . Death thought accessibility did not differ between the construction and intact-building conditions,  $t(26) = .04$ ,  $d = .02$ ,  $p = .97$ .

### Political orientation

The single-item measure of political orientation ranged from 1 to 10 (1 = Conservative, 10 = Liberal), with  $M = 5.02$ ,  $SD = 2.29$ , meaning the

<sup>1</sup> The word fragment measure of death thought accessibility is based on other similar approaches to measuring construct accessibility (e.g., Higgins & King, 1981; Tulving, Schacter, & Stark, 1982). Extant research indicates that death thought accessibility is increased by reminders of mortality, other death associated stimuli, and challenges to terror management buffers (such as threats to the worldview, self-esteem, and close attachments), and is decreased following reminders of mortality and the opportunity to defend these buffers, and further, predicts a number of theoretically specified outcomes (see Hayes, Schimel, Arndt, & Faucher, 2010). Evidence of discriminant validity is provided by studies showing that theoretically specified conditions (e.g., threats to the worldview) increase death thought accessibility but not the accessibility of other negative cognitions (e.g., Schimel et al., 2007). Moreover, as Hayes et al. recently reviewed, a number of studies have shown convergent validity in finding parallel effects with either a word fragment or lexical decision task measure of death thought accessibility. Such an approach was also used in here with Studies 1 and 4. It may also be worth noting that the effects of mortality thought on worldview defense outcomes are stronger when people think about their own death, as opposed to the death of others (Greenberg et al., 1994; Nelson, Moore, Olivetti, & Scott, 1997). This points to the critical role of self-relevant death thought accessibility.



sample had opportunity to shift roughly 2 SD in either the conservative or liberal direction. However, a one-way ANOVA<sup>2</sup> found no effect of condition on political orientation,  $F(3, 45) = 2.09$ ,  $\eta^2 = .12$ ,  $p = .12$ . Given this lack of condition effect on political orientation, it was also reasonable to check for a Condition  $\times$  Political Orientation interaction on death thought accessibility. Following methods prescribed by Aiken and West (1991), condition was dummy coded, political orientation was centered on the mean, and interaction terms were computed; each main effect was entered into the first step and the interaction terms were entered into the second step. No interaction was found ( $F[1, 41] = 1.72$ ,  $\Delta R^2 = .08$ ,  $p = .18$ ), neither was there a main effect of political orientation ( $\beta = .21$ ,  $t[45] = 1.50$ ,  $p = .14$ ) or even a zero-order correlation between political orientation and death thought accessibility ( $r[48] = .15$ ,  $p = .29$ ). Yet, while controlling for political orientation, the condition main effects remained as reported above.

### Affect

A one-way ANOVA revealed no significant effects on positive affect ( $\alpha = .86$ ),  $F(3, 46) = .51$ ,  $\eta^2 = .03$ ,  $p = .68$ , or negative affect ( $\alpha = .81$ ),  $F(3, 46) = 1.28$ ,  $\eta^2 = .08$ ,  $p = .29$ .

### Brief discussion

In Study 1, viewing images of damaged buildings increased the accessibility of death-related thought compared to both the intact condition and the construction condition. Further, the level of death thought accessibility elicited by the damage condition was no different from that elicited by viewing incidents of deadly terrorist attacks and bombings. Thus, in line with expectations, exposure to destruction appeared to signal a similar type of existential threat – at least as manifested in death thought accessibility – as that signaled by terrorist activity<sup>3</sup>. Additionally, death thought accessibility in the construction condition, which depicted buildings that were not intact yet were undamaged, did not differ from that observed in the intact building condition.

There was also no effect of exposure condition on political orientation, nor was political orientation associated with death thought accessibility. These findings run counter to claims that thoughts of death produce a shift toward conservative ideology (Jost et al., 2003), a point we will return to in greater depth in the General Discussion section.

### Study 2

Given that exposure to images of destruction produced a clear increase in DTA in Study 1, TMT suggests that such images should increase people's need for certainty regarding their cultural worldviews. As discussed earlier, a substantial amount of research shows that the awareness of death plays an important role in fueling responses designed to protect the worldview from threats, such as intergroup conflict, hostility, and violence. A major assumption in that prior research has been that individuals expressing such worldview defenses do so because they have become more certain about the veracity of those worldview beliefs. But, although prior research shows that death awareness can motivate responses designed to protect individuals' worldviews from threat, research has yet to directly assess whether death awareness motivates people to increase their certainty regarding their beliefs.

On that point, it is important to note that individuals' worldviews are drawn from the prevailing cultural landscape, and that each individual develops his or her own individualized set of worldview beliefs

(via unique socialization experiences, etc.) to help them manage death-related cognition (Solomon, Greenberg, & Pyszczynski, 1991). Accordingly, a considerable literature shows that the effects of mortality salience on worldview defense outcomes are dependent on the relevance of the worldview domain, or belief, to the individual. For example, in the first empirical report of mortality salience effects, Rosenblatt, Greenberg, Solomon, Pyszczynski, and Lyon (1989, Study 2) found that reminders of death motivated people to become more punitive toward alleged prostitutes, but only if prostitution violated participant's worldview beliefs; it did not motivate such anti-prostitution attitudes if prostitution did not violate the individuals' personal worldview. Many subsequent studies have similarly demonstrated the importance of the relevance of the person's individualized version of the cultural worldview in terror management processes (e.g., Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992; Rothschild, Abdollahi, & Pyszczynski, 2009; Schimel, Wohl, & Williams, 2006). Thus, acknowledging that each individual holds a unique set of worldview beliefs, TMT predicts that death-related stimuli will increase one's certainty about his or her death-denying worldview beliefs, whatever they may be.

Study 2 provided an opportunity to examine this basic but previously untested assumption of TMT. Given that images of destruction increase death thought accessibility, TMT predicts that these images would lead to increased desire for certainty regarding one's beliefs. Importantly, such increased certainty was expected to emerge regardless of the particular content of their worldviews. Therefore, we used the 'content-free' dogmatism scale, which uses ideologically neutral items, as a measure of participants' certainty about their worldview beliefs (Altemeyer, 1996, 2002). The degree of dogmatism captured by this measure ranges from relatively weak and open-minded/undogmatic beliefs at the low end, to absolute certainty about one's beliefs with "conviction beyond the reach of evidence to the contrary" at the high end (Altemeyer, 1996, p. 201).

Study 2 also further tested the uncertainty–threat model of political conservatism. Whereas TMT would predict that existential threat would motivate dogmatic certainty about one's beliefs, rather than a shift in belief content, the uncertainty–threat model of political ideology would predict that individuals would become more politically conservative. Alternatively, if the death-thought inducing destruction condition does not produce a conservative shift (as was suggested in Study 1), the model might instead predict an interaction such that conservatives increased dogmatic certainty about their beliefs and liberals reduce dogmatism about their beliefs.

### Method

#### Participants

The sample consisted of 49 undergraduate psychology students (14 male) at UCCS, with a mean age of 23.31 ( $SD = 7.56$ ) years.

#### Materials & procedure

The procedure for Study 2 was identical to Study 1, with the following exceptions. Participants were randomly assigned to the destruction, intact building, or construction site image conditions; the 'military/terrorism' image condition was not included in this or subsequent studies because Study 1 established that the focal 'destruction' condition indeed produced similarly high levels of death-thought accessibility. After the image manipulation and PANAS, participants completed Altemeyer's (1996, 2002) 22-item Dogmatism scale ( $\alpha = .91$ ) to assess the extent to which they view their beliefs as absolutely correct (independent of the content of their beliefs). This 9-point Likert-type scale (1 = very strongly disagree, 9 = very strongly agree) included items such as "The things I believe in are so completely true, I could never doubt them" and "My beliefs are right and will stand the test of time."

As in Study 1, a single-item Likert-type measure of political orientation (1 = Conservative, 6 = Liberal) was included to test whether

<sup>2</sup> The degree of freedom for this analysis is reduced because one participant declined to report political orientation.

<sup>3</sup> This should not be taken to imply that terrorism and destruction always or even often constitute similar levels of death-related or existential threat. Certainly the levels of both can vary depending on the intensity of the particular encounter. The important point for present purposes is that both the destruction and terrorism images used here significantly increased the accessibility of death-related cognition above that observed in the control conditions.

the image manipulation would influence the content of participants' beliefs and values.

## Results

### Dogmatism

A one-way ANOVA revealed significant differences among conditions on dogmatism,  $F(2, 46) = 3.92$ ,  $\eta^2 = .15$ ,  $p < .03$ . Pairwise comparisons revealed that the destruction ( $M = 4.15$ ,  $SE = .29$ ) condition elicited greater dogmatic faith in participants' beliefs than either the construction ( $M = 3.19$ ,  $SE = .31$ ) or intact building ( $M = 3.12$ ,  $SE = .29$ ) conditions, both  $|t|'s > 2.28$ ,  $d's > .82$ ,  $p's < .03$ . Dogmatism did not differ between the construction and intact building conditions,  $t(31) = .17$ ,  $d = .06$ ,  $p = .87$ .

### Political orientation

The single-item measure of political orientation ranged from 1 to 6 (1 = Conservative, 6 = Liberal), with  $M = 3.69$ ,  $SD = 1.09$ . A one-way ANOVA<sup>4</sup> revealed a null effect of condition on political orientation,  $F(2, 45) < 1$ . Given this lack of condition effect on political orientation, we followed Aiken and West (1991) to test for a Condition  $\times$  Political Orientation interaction on dogmatism. No interaction was found ( $F[2, 42] < 1$ ), but a main effect ( $\beta = -.48$ ,  $t[47] = -3.95$ ,  $p < .001$ ) and zero-order correlation ( $r[47] = -.50$ ,  $p < .001$ ) showed political orientation was negatively related to dogmatism and the condition main effect remained as reported above.

### Affect

There were no differences on negative affect ( $\alpha = .77$ ),  $F(2, 46) = 1.29$ ,  $\eta^2 = .05$ ,  $p = .28$ . A one-way ANOVA revealed significant differences on positive affect ( $\alpha = .89$ ),  $F(2, 46) = 9.61$ ,  $\eta^2 = .30$ ,  $p < .001$ . The intact building condition ( $M = 3.23$ ,  $SE = .19$ ) elicited greater positive affect than the destruction ( $M = 2.54$ ,  $SE = .19$ ) or the construction ( $M = 2.03$ ,  $SE = .20$ ) conditions, both  $|t|'s > 2.59$ ,  $d's > .93$ ,  $p's < .01$ . Positive affect was also somewhat greater in the destruction condition than the construction condition,  $t(31) = 1.85$ ,  $d = .66$ ,  $p = .07$ .

Because of this unexpected effect on positive affect, the analysis on dogmatism was repeated with positive affect as a covariate. Both the ANCOVA and adjusted pairwise comparisons showed the same significant effects described above, all  $ps < .05$ . This suggests that the dogmatism effects were not due to changes in affect.

### Brief discussion

As hypothesized, the destruction condition triggered an increase in dogmatic certainty about one's beliefs compared to images depicting intact buildings and construction sites<sup>5</sup>. These findings not only provide some of the first empirical evidence regarding this basic TMT assumption, but they also speak to the terror management consequences of exposure to destruction images. In contrast to studies examining the social

implications of terror management worldview defenses (e.g., Gailliot et al., 2008; Greenberg et al., 1990), Study 2 demonstrated that environmental reminders of death increase the dogmatic strength and tenacity with which the worldview beliefs themselves are held.

Additionally, the effect of exposure condition on increased belief certainty was not explained by a shift in political ideology. And although conservatives were more dogmatic than liberals, the destruction condition increased dogmatism regardless of political ideology. We consider the implications of this finding in greater depth in the General Discussion section.

## Study 3

According to TMT, individual's beliefs, ideas, and values are an inherently fragile foundation from which to derive existential security, therefore requiring continual social validation from others (see also, Berger & Luckmann, 1967). Consequently, people and cultures that challenge one's way of life have the potential to undermine that security, and thus people respond defensively to such challenges. One of the more dramatic forms of worldview defense is to support the annihilation of those who pose the worldview threat. As Berger and Luckmann pointed out, such a response serves to both negate the threat and demonstrate the "superiority" of one's cultural system. A number of recent findings support this analysis (Hayes et al., 2008; see also, Niesta, Fritsche, & Jonas, 2008; Pyszczynski et al., 2003). For example, research has shown that mortality awareness can increase support for the use of lethal military force among Americans and support for martyrdom (terrorist) attacks against the West among Iranian students (Pyszczynski et al., 2006), for self-sacrifice for England among English students (Routledge & Arndt, 2008), as well as for violent political resistance among conservative Israeli's (Hirschberger & Ein-Dor, 2006).

Building on these findings, Study 3 explored whether exposure to images of destroyed infrastructure would increase support for violence against a perceived cultural and military enemy. Given the widely publicized concerns over Iranian nuclear and foreign policies during the months prior to Study 3, we operationalized worldview defense as support for aggressive American foreign policy regarding Iran. Given the findings of Study 1, that images of destroyed buildings increased death thought accessibility, exposure to such images was expected to increase worldview defense in the form of support for aggressive policies toward Iran.

Study 3 again tested whether individuals would become more politically conservative in the destruction condition. But we should note that increased support for military action against Iran would be predicted by both TMT (protecting the American cultural worldview against Iran) and by the uncertainty–threat model of ideology (as a shift toward conservative foreign policy; Nail & McGregor, 2009).

## Method

### Participants

The sample consisted of 61 undergraduate psychology students (35 male) at University of Missouri-Columbia (MU), with a mean age of 18.84 ( $SD = 1.04$ ) years.

### Materials and procedure

The procedure was identical to that of Study 2 with the following exceptions. Rather than assessing dogmatism, worldview defense was measured using the Commander-in-Chief task developed by Rothschild (2008; see also, Motyl, Pyszczynski, & Hart, 2010). This measure first instructed participants to: "Imagine that you are Commander-in-Chief of the Armed Forces. It is your job to decide when to use your national armed forces (army, navy, and air force) knowing that as a result some innocent civilians are likely to be killed." Participants then used a 10-point Likert-type scale to respond

<sup>4</sup> The degree of freedom for this analysis is reduced because one participant declined to report political orientation.

<sup>5</sup> It is useful here to reiterate that the dogmatism scale was made up of ideologically neutral items and did not assess belief in any particular ideological stance. Further, although political conservatives have been found to be more dogmatic, such findings do not support the conclusion that dogmatic belief style is simply a reflection of conservative belief content. And finally, Study 2 demonstrated that although dogmatism scores shifted, political ideology/beliefs did not shift as a result of the destruction images. Thus, we do not see empirical support for the possibility that expressing more dogmatic certainty about one's beliefs could be described as shift toward conservative ideology. It is possible that the destruction exposure condition did not affect political ideology because political ideology was measured after the dogmatism scale, and thus the effects of that condition may either have dissipated by the time participants completed the ideology item, or affirming the veracity of one's belief may have attenuated the need for further defense. However, the same item was included in Study 1, but with no preceding opportunity for belief affirmation; there was still no effect on political orientation.

to each of 11 items ( $\alpha = .92$ ) that began with the sentence stem, “I would support using our armed forces against Iran if...” and concluded with such statements as, “an American is killed by an Iranian soldier,” and “Iran threatens to attack the United States” (1 = definitely not, 10 = definitely yes).

A single-item Likert-type measure of political orientation (1 = Conservative, 10 = Liberal) was again included.

## Results

### Military action against Iran

A one-way ANOVA revealed significant differences among conditions on support for military action,  $F(2, 58) = 3.32$ ,  $\eta^2 = .10$ ,  $p < .05$ . Pairwise comparisons revealed that the destruction ( $M = 7.55$ ,  $SE = .37$ ) condition elicited greater support for war against Iran than either the construction ( $M = 6.35$ ,  $SE = .35$ ) or the intact building ( $M = 6.45$ ,  $SE = .38$ ) conditions, both  $|t|'s > 2.08$ ,  $d's > .66$ ,  $p's < .05$ . Militaristic attitudes did not differ between the construction and intact building conditions,  $t(40) = .20$ ,  $d = .06$ ,  $p = .84$ .

### Political orientation

The single-item measure of political orientation ranged from 1 to 10 (1 = Conservative, 10 = Liberal), with  $M = 5.89$ ,  $SD = 2.14$ . A one-way ANOVA found no effect of condition on political orientation,  $F(2, 58) < 1$ . Following methods prescribed by Aiken and West (1991), we checked for a Condition  $\times$  Political Orientation interaction on support for military action. No interaction was found ( $F[2, 55] < 1$ ), but a main effect ( $\beta = -.36$ ,  $t[60] = -3.06$ ,  $p < .01$ ) and zero-order correlation ( $r[60] = -.36$ ,  $p < .01$ ) showed political orientation was negatively related to support for military action against Iran and the condition main effect remained as reported above.

### Affect

A one-way ANOVA revealed no significant differences on positive affect ( $\alpha = .76$ ) or negative affect ( $\alpha = .66$ ), both  $F's < 1$ ,  $\eta^2 s < .02$ ,  $p's > .54$ .

### Brief discussion

The results of Study 3 provided additional support for the present analysis, showing that participants in the destruction condition were more supportive of war against Iran than participants in either the intact-building condition or the construction condition.

## Study 4

The present analysis suggests why viewing destruction can encourage support for militaristic worldview defenses. The results from Studies 1 and 3 showed that images of destroyed buildings led to greater death thought accessibility and support for war against Iran. But it remains to be determined whether the effect of visible destruction on militaristic worldview defense can in fact be explained by increased accessibility of death thought.

Research on the cognitive architecture of TMT suggests a strong connection between the accessibility of death related cognition and worldview defense (see Hayes et al., 2010, for a review). Across different lines of research, the same conditions that influence death thought accessibility after reminders of death influence worldview defense (e.g., Simon et al., 1997), threats to one's worldview increase death thought accessibility (e.g., Schimel et al., 2007), and defending one's worldview after mortality salience reduces death thought accessibility (e.g., Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997). This work converges in suggesting that worldview defenses are linked to the awareness of death. However, to our knowledge, only one previous study has demonstrated that variations in the accessibility of death-related thought statistically mediates worldview defense. Building on

the idea that insurance brand logos can be subtle reminders of mortality, Fransen, Fennis, Pruyn, and Das (2008) found that participants who viewed an insurance company logo (compared to those who did not view this logo) intended to spend greater amounts of money on luxury goods, an increase mediated by greater death thought accessibility.

Further, although Study 1 demonstrated that destruction imagery increases the accessibility of death-related cognition, those images are clearly multidimensional, making it possible that they could also be triggering other types of thoughts. One possibility is that the destruction images aroused nation-based worldview defense as a result of their resemblance to the destruction commonly seen in war and/or because they might have heightened participants' national identity, reflecting the common association between destruction imagery and patriotic or nationalist imagery, invoking one's nation as either destroyed victim or destructive victor. In this light it is possible that the effects in the prior studies could have stemmed from these types of thoughts (national identity, war) rather than being driven by the activation of death-related thoughts.

Study 4 was therefore designed to assess the role of thoughts of death in mediating the relationship between images of destruction and worldview defense. In addition, we sought to compare the mediational role of death thoughts with that of thoughts of war or national identity, two other types of ideation that these images of destruction might activate that could be plausibly expected to increase worldview defense. We predicted that exposure to destruction and decay would trigger increased death thought accessibility (replicating Study 1) and worldview defense (replicating Study 3). If death-related cognition is indeed a critical catalyst of worldview defense following exposure to destruction images, then death thought accessibility should mediate the relationship between destruction exposure and worldview defense. If, however, thoughts of war or nationalism are the operative agent in these effects, then their accessibility should mediate the relationship between destruction exposure and worldview defense.

Finally, Study 4 again tested whether the destruction condition would influence political ideology and, similarly, whether death thought accessibility would be associated with political conservatism. And as was the case in Study 3, increased support for aggressive anti-terrorism military action was similarly predicted by both the uncertainty-threat model of ideology (as a shift toward conservative anti-terrorism policy; Nail & McGregor, 2009) and by TMT (protecting the American cultural worldview against terrorists).

## Method

### Participants

Twenty-six undergraduate psychology students (10 male) at MU participated.

### Materials and procedure

Because the previous studies consistently demonstrated that both the construction condition and the intact building condition did not differ, Study 4 proceeded with only one of these two controls—the construction condition—and therefore did not include the intact building condition. Participants were randomly assigned to the same destruction or construction image conditions used in Studies 1–3. Then, to enhance the generalizability of our findings, death thought accessibility was assessed in Study 4 with a different method than in Study 1: a lexical decision task measuring response latencies to several types of letter strings.

In the lexical decision task, participants were presented with strings of letters, some of which represented a specific type of thought or concept, and asked to judge whether the letters did or did not make a word. A specific type of thought was inferred to be more accessible if the participants made a correct identification of representative words more quickly than neutral words or other types of words. This method has been validated by several prior studies as predicting terror management



outcomes or arising from challenges to terror management buffers (see e.g., Arndt, Cook, Goldenberg, & Cox, 2007, Study 3; Bassett, 2005; Koole & Van den Berg, 2005, Study 5; Schimel et al., 2007, Study 3), and converges with other approaches in assessing death thought accessibility (see Hayes et al., 2010 for full review of this and other methods of assessing death thought accessibility). Although other research has validated the lexical decision task and word-stem completion task (see Hayes et al., 2010), there is need for more research measuring death thought accessibility with methods other than word-stem completion. Thus, using the lexical decision task provides an important opportunity to conceptually replicate the word-stem completion findings from Study 1.

A brief set of practice trials oriented participants to the task, after which they performed the recorded task. A fixation point of “xxxxx” was presented for 1000 ms, followed by the stimulus letter string and a backward mask of “xxxxx” to cover any remaining traces of the stimulus. A blank screen was presented for a 1000 ms interval between each trial. Word types were evenly distributed in the same randomized order across all trials for all participants.

A total of 70 recorded trials were presented, consisting of 30 non-words ( $\alpha = .91$ ; e.g., *nempt, trotm, frub*), 10 neutral words ( $\alpha = .87$ ), 10 death-related words ( $\alpha = .83$ ), 10 war-related words ( $\alpha = .87$ ), and 10 nation-related words ( $\alpha = .85$ ). Each of the four groups of words were chosen such that each group of words was, on average, roughly comparable on character length and frequency of occurrence (Bargh, Chaiken, Govender, & Pratto, 1992). See Table 1 for the specific words and their frequency. An English language word corpus (British National Corpus, 2007) was used to check the frequency of each word.

Following the lexical decision task, a 5-item Likert-type scale (1 = very strongly disagree, 6 = very strongly agree) developed by Weise et al. (2008) was used to record support for militaristic defense of America from terrorism ( $\alpha = .92$ ). Items included statements such as, “The best way for the United States to address the problem of terrorism involves increasing U.S. military presence in troubled areas around the world (e.g., Middle East),” and “The only chance we have to stop international terrorism is if the United States follows a strict warlike and uncompromising approach to the problem.”

A single-item Likert-type measure of political orientation (1 = Conservative, 7 = Liberal) was again included.

## Results

### Thought accessibility

Following Schimel et al. (2007), all incorrect responses were excluded from the analyses, producing a satisfactory (87.16%) rate of valid word/non-word identifications. None of the corresponding response latencies were greater than 2000 ms or less than 300 ms, and the

**Table 2**

Cell means and standard deviations of reaction times for condition  $\times$  accessibility interaction (Study 4).

Condition	Death words			War words			Nation words		
	M	SE	n	M	SD	n	M	SD	n
Destruction	581.30	8.47	12	605.44	9.15	12	601.77	9.63	12
Construction	616.03	7.84	14	612.08	8.47	14	618.26	8.92	14

Note. Lower means signify quicker response latencies (in ms).

assumptions were met for homogeneity of variance,  $F(1, 24) < 1.20$ ,  $p > .28$ , and sphericity,  $\chi^2[2] = 2.07$ ,  $p > .35$ .

A 2 (condition: destruction vs. construction)  $\times$  3 (reaction time [RT]: death words vs. war words vs. nation words) mixed ANCOVA, controlling for baseline reaction times to the neutral words, revealed no main effect for RT type,  $F(2, 46) = .28$ ,  $\eta^2 = .01$ ,  $p = .75$ , and a main effect of condition,  $F(2, 23) = 3.45$ ,  $\eta^2 = .13$ ,  $p = .08$ . However, this was qualified by a condition  $\times$  RT type interaction,  $F(2, 46) = 2.96$ ,  $\eta^2 = .11$ ,  $p = .06$ . Pairwise comparisons revealed quicker RTs to death words in the destruction condition compared to the construction condition ( $t[25] = -3.01$ ,  $d = 1.20$ ,  $p = .006$ ); war word and nation word RTs did not differ by condition, both  $|t| < 1.26$ ,  $d < .50$ ,  $p > .22$ . Looked at differently, within the destruction condition, death word RTs were quicker than war and nation word RTs (both  $|t| > 2.75$ ,  $d > 1.10$ ,  $p < .01$ ), and war and nation word RTs did not differ,  $t(25) = .38$ ,  $d = .15$ ,  $p = .71$ . There were no differences between RT for different word types in the construction condition, all  $|t| < .69$ ,  $d < .28$ ,  $p > .50$ . The adjusted cell means and standard errors are reported in Table 2.

### Mediation analyses

Methods similar to those recently used by Fransen et al. (2008) were employed to test whether increased death-related cognition accounts for the relationship between condition and worldview defense beyond any effect of war- or nation-related cognition. In the first step, an independent samples *t*-test replicated Study 3, showing that support for militaristic defense was greater in the destruction condition ( $M = 3.20$ ,  $SD = 1.66$ ) than in the construction condition ( $M = 1.96$ ,  $SD = .98$ ),  $\beta = .44$ ,  $t(25) = 2.37$ ,  $d = .95$ ,  $p = .03$ . The second step, as noted above, showed that death word RTs were faster in the destruction condition than the construction condition, indicating greater accessibility,  $\beta = -.24$ ,  $t(25) = -3.01$ ,  $d = 1.20$ ,  $p = .006$ . Finally, when regressing support for militaristic defense on death word RTs, war word RTs, nation word RTs, and condition, death word RT's emerged as the only significant predictor of worldview defense,  $\beta = -1.27$ ,  $t(25) = -2.03$ ,  $d = .81$ ,  $p = .05$  (condition,  $\beta = .21$ ,  $t[25] = 1.03$ ,  $d = .41$ ,  $p = .31$ ; war word RTs,  $\beta = .50$ ,  $t[25] = 1.02$ ,  $d = .41$ ,  $p = .32$ ; nation word RTs,  $\beta = .53$ ,  $t[25] = .98$ ,  $d = .39$ ,  $p = .34$ ). A Sobel test of the reduction of

**Table 1**

Word frequency (per million) and character length by word type.

Neutral words	Frequency	Length	Death words	Frequency	Length	War words	Frequency	length	Nation words	Frequency	Length
Picture	106.27	7	Death	199.07	5	War	273.44	3	State	186.27	5
Radio	88.80	5	Dead	118.84	4	Attack	92.51	6	National	127.07	8
Phone	76.79	5	Killed	84.57	6	Gun	33.81	3	Law	113.50	3
Chair	73.88	5	Murder	55.86	6	Iraq	31.69	4	President	64.61	9
Tree	61.36	4	Buried	24.10	6	Bomb	29.53	4	America	52.19	7
Express	49.03	7	Grave	20.66	5	Iran	19.84	4	USA	49.63	3
Desk	40.76	4	Coffin	13.65	6	Destroy	19.49	7	Flag	14.88	4
Cloak	6.69	5	Skull	10.05	5	Soldier	17.25	7	Senate	12.97	6
Baseball	4.14	8	Tomb	6.03	4	Combat	15.50	6	Anthem	3.09	6
Magnet	3.19	6	Slay	1.68	4	Torture	8.48	7	Patriot	1.87	7
M	51.09	5.6	M	53.45	5.1	M	54.15	5.1	M	62.61	5.8

Note. All words and non-words were presented in randomized order.

the effect of condition on militaristic defense was significant ( $Z = 1.71$ ,  $p = .04$ ). In a test of reverse mediation, regressing death thought onto condition and support for militaristic defense, condition remained a significant predictor of death word RTs ( $\beta = -.21$ ,  $t(25) = -2.36$ ,  $d = .94$ ,  $p = .03$ ) while militaristic defense did not ( $\beta = -.06$ ,  $t(25) = -.68$ ,  $d = .27$ ,  $p = .50$ ). Taken together, this suggests that death word RTs uniquely mediated the effect of viewing destruction on militaristic worldview defense (see Fig. 1), and not the reverse.

#### Political orientation

The single-item measure of political orientation ranged from 1 to 10 (1 = Conservative, 10 = Liberal), with  $M = 4.27$ ,  $SD = 1.99$ . A one-way ANOVA found no effect of condition on political orientation,  $F(1, 24) = 2.13$ ,  $\eta^2 = .08$ ,  $p = .16$ . Following Aiken and West (1991), we checked for Condition  $\times$  Political Orientation interactions on support for militaristic defense and on each type of thought accessibility. No interaction was found on militaristic defense ( $F[1, 22] = 1.28$ ,  $\Delta R^2 = .02$ ,  $p = .27$ ), though there was a main effect such that political orientation was negatively related to support for militaristic defense ( $\beta = -.63$ ,  $t[24] = -4.35$ ,  $p < .001$ ). There was no main effect of political orientation on death word RTs, war word RTs, or nation word RTs (all  $\beta s < .28$ ,  $t[24] s < 1.41$ ,  $p s > .17$ ), nor was there an interaction on any of these RTs (all  $F[1, 22] s < 1$ ). In all cases, the condition effects remained as reported above.

#### Affect

A one-way ANOVA revealed no significant differences on positive affect ( $\alpha = .81$ ),  $F(1, 25) = 2.13$ ,  $\eta^2 = .08$ ,  $p = .16$ , or negative affect ( $\alpha = .86$ ),  $F(1, 25) = 1.70$ ,  $\eta^2 = .07$ ,  $p = .21$ .

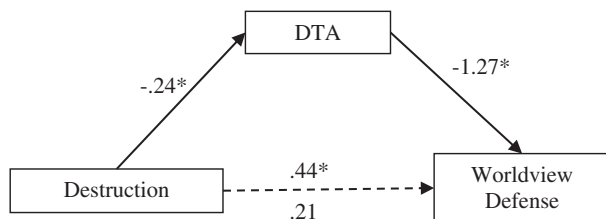
#### Brief discussion

The results of Study 4 support the hypothesis that death thought accessibility mediates the influence of destruction imagery on worldview defense. The destruction condition increased death thought accessibility compared to the construction condition, but did not affect thought of national identity or war. The destruction condition also subsequently increased worldview defense in the form of support for the aggressive military defense of America from terrorism. A mediation analysis showed that differences in death thought accessibility between the destruction and construction conditions uniquely accounted for the influence of condition on worldview defense.

There was also no effect of exposure condition on political orientation, nor was political orientation associated with death thought accessibility.

#### General discussion

The present research hypothesized that viewing destroyed buildings would enhance ideological certainty and violent worldview defensive attitudes because such scenes of destruction serve as a



**Fig. 1.** Heightened death thought accessibility (DTA; shorter reaction times on death-related lexical decision task trials) uniquely mediated the relationship between exposure to destruction and worldview defense in Study 4. Note. Numbers represent standardized beta coefficients. \* $p < .05$ .

reminder of people's existential fragility, thereby triggering terror management efforts to believe more strongly in one's undying worldview beliefs and to aggressively protect those beliefs against threatening others. Four studies converged to support this analysis. Study 1 found that images of visible destruction increased death thought accessibility compared to images of intact buildings and construction sites. Study 2 showed that visible destruction increased the dogmatic certainty with which participants held their worldview beliefs. In Study 3, American students exposed to images of visible destruction were more supportive of military action against Iran. Study 4 conceptually replicated these findings and, importantly, also showed that the increase in death thought accessibility produced by viewing images of destroyed buildings uniquely mediated the increase in support for militarism.

These findings were consistent across two distinct measures of thought accessibility and two separate measures of worldview defense. That the destruction conditions in Studies 1 and 4 affected more frequent completions of death-related word-fragments and led to quicker death word RTs (but not war or nation word RTs), respectively, provides converging evidence that visible destruction does, in fact, increase the accessibility of death-related thought. Second, the measures of anti-Iranian militarism and anti-terrorist militarism used in Studies 3 and 4 converge in showing that exposure to destruction does indeed increase worldview defense, and that this can take the form of increased support for intergroup violence.

The present findings thus suggest that destroyed infrastructure can carry an existential signature, potentially serving as a day-to-day reminder of one's own transience and encouraging hostile worldview defenses. Given the specific worldview defensive attitudes studied here, the present findings can help to explain how exposure to visible destruction in certain geographical areas, such as in cities suffering severe urban deterioration, the sites of terrorist attacks or military strikes, or even natural disasters, might encourage ideological dogmatism and exacerbate harmful intergroup relations, potentially leading to even more violence and destruction. For example, in Jenin, a frequently shelled town known as the "capital of Palestinian martyrdom," an Islamic Jihad spokesperson explained, "Look around and see how we live here, then maybe you will understand why there are always volunteers for martyrdom" (Jacobson, 2001, par. 6). Granting that the "broken windows" that characterize such poor living conditions can arouse a multitude of motivations, the present research points to terror management processes as one motivating force that can play an important role in fuelling hostile and violent intergroup relationships.

#### Death, destruction, and terror management mechanisms

As noted earlier, various studies have linked death thought accessibility to worldview defenses (see Hayes et al., 2010). Yet these lines of work have typically relied on an experimental causal chain strategy (see Spencer, Zanna, & Fong, 2005) of demonstrating in some studies that threats to the worldview increase the accessibility of death-related cognition (e.g., Schimel et al., 2007) and in other studies that defending the worldview after mortality salience reduces this accessibility (e.g., Arndt et al., 1997). Study 4 compliments and extends these approaches by showing that variations in the accessibility of death-related thought statistically mediate worldview defense (see also Fransen et al., 2008). Going further, Study 4 shows that the destruction images affected worldview defense through death thoughts only, and not through thoughts of war or national identity. This extends previous findings that terror management effects are specifically due to death thoughts and are not typically aroused by otherwise worrisome, value-focused, or aversive thoughts (Greenberg et al., 1995; see also, Pyszczynski, Greenberg, Solomon, & Maxfield, 2006).

The present research was designed to determine whether exposure to images of destroyed infrastructure increases death thought accessibility and therefore leads to ideological certainty and worldview



defense, but these studies also raise some generative avenues for future research about the mechanism producing the link between exposure to visibly destroyed environments and death-related thought. We note three possibilities. The first is that scenes of destruction serve as symbolic reminders that one is ultimately vulnerable to existential threat. This entails that destruction, regardless of cause, will elicit death thought accessibility. The second is that visible destruction is a literal reminder of deadly events that may have led to the destruction. The implication of this possibility is that visible destruction would only elicit death thought if the scene is associated with deaths in some way, but would not arouse such cognitions if the scene were not associated with fatal or potentially fatal circumstances (e.g., normal decay of a building over time). The third possibility is that certain buildings can serve as cultural icons, the destruction of which would constitute a clear and direct threat to one's worldview. As individuals' worldviews buffer against death thought accessibility (e.g., Schimel et al., 2007), undermining such buffers via scenes of destroyed iconic buildings would thereby increase the accessibility of death-related thought. Although future research is needed to reveal whether and how each of these potential "trigger mechanisms" might play a role in different environments, the present demonstration of these basic processes has important implications for understanding the catalysts and consequences of existential motivation in everyday life.

#### *Destruction, reconstruction, and the malleability of terror management strategies*

In Studies 3 and 4, images of destruction increased the endorsement of militaristic defense of one's country, which is likely to exacerbate violent intergroup conflict. However, the awareness of mortality need not always produce such conflict escalating outcomes (Vail et al., *in press*). As just a few examples, when reminded of mortality: people reminded of compassionate religious values became less supportive of violence (Rothschild et al., 2009); people reminded of a global threat became more supportive of peaceful coexistence, even among Israeli's and Palestinians during times of heightened conflict (Pyszczynski et al., 2010); people become more charitable toward their fellow citizens (Jonas et al., 2002); and empathetic people become more forgiving of those who aggressed against one's fellow ingroup members (Schimel et al., 2006). This suggests that situationally salient, as well as dispositionally active, features of an individual's value system (e.g., tolerance, Greenberg et al., 1992) may guide terror management responses triggered by exposure to visibly destroyed buildings or other similar environments. Thus, the critical insight here is that the destroyed buildings themselves may merely activate the terror management system, whereas the additional social or environmental cues surrounding the destroyed site may have a strong influence on the form of the emergent terror management responses. Thus, one interesting possibility here is that contextual imagery promoting compassion, shared humanity, or peace at destroyed sites might guide terror management responses toward those prosocial directives, alleviating or even reversing otherwise aggressive responses (see Motyl, Rothschild, & Pyszczynski, 2009).

Another direction that merits further study stems from the "cultural icon" possibility mentioned above, and involves individuals' awareness of the target of destruction. Specifically, future research might examine whether individuals viewing the destruction of their own (or an ally's) infrastructure would elicit the same response as viewing the destruction of an enemies' infrastructure. In this vein, when told about the encroachment of Bethlehem (the birthplace of Jesus) by Muslims, Christian participants reminded of death were buffered from increased death thought accessibility and worldview defense if they were first informed of the deaths of a plane full of Muslims (Hayes et al., 2008). This suggests that viewing the destruction of an enemies' infrastructure may in fact attenuate the need for further terror management by reducing the accessibility of death-related cognition.

Moreover, in all four of the present studies, the construction and intact building conditions did not enhance death thought accessibility, dogmatism, or worldview defense. Future research might therefore explore the extent to which people can be encouraged to "fix the broken windows" – to actively support things like reconstruction efforts or humanitarian relief as a straightforward way to eliminate the death-laden qualities of the site. Indeed, one of the interesting aspects of the unprecedented outpouring of support in the immediate aftermath of the January 2010 earthquake in Haiti ("Haiti earthquake aid", 2010) was that the call for donations was often couched in terms of facilitating the reconstruction and "healing" of the country's infrastructure. From this perspective, support for humanitarian aid and reconstruction efforts could be viewed as an expression of the existential motivation to eliminate the visual cues of material transience by transforming destroyed sites into construction sites and, ultimately, intact infrastructure again.

In this light, the present findings may help expand strategies to curb terrorism based on BWT (e.g., Kelling & Bratton, 2006; Scheider & Chapman, 2003). Such strategies currently emphasize intensified police attention to minor crimes and misdemeanors as an effort to close the gateway to terrorism, catch terrorists engaged in minor infractions before more serious offenses, and make it more difficult to fund terrorism via illicit activities. The present results suggest that an additional strategy would be to repair or reconstruct the destroyed infrastructure in terrorist-producing, or potentially terrorist-producing, regions rather than further destroying them or simply leaving those areas in shambles.

#### *Does existential threat motivate ideological certainty or conservative shift?*

Although extant studies have previously demonstrated the impact of death awareness on efforts to protect and live according to one's worldview beliefs, a major assumption in that prior research has been that individuals expressing such worldview defenses do so because they have become more certain about the veracity of their worldview beliefs. Whereas other prior research has shown that, because fervent belief in one's worldview helps buffer against death awareness, threatening an individual's beliefs or cultural worldviews undermines the buffering quality of those beliefs and allows death thoughts to become accessible (Hayes et al., 2008; Schimel et al., 2007), no research has yet directly tested whether reminders of death can motivate increased certainty of one's worldview beliefs. Thus, Study 2 makes a unique contribution by providing some of the first evidence that death concerns do indeed motivate people to directly increase certainty about those beliefs. This supports the assumption that death awareness can lead to uncompromising and hostile intolerance of alternative beliefs or competing ways of life because mortality salience motivates dogmatic certainty about the existential primacy of one's worldview beliefs.

In a similar vein, Study 2 can also be viewed as offering a novel contribution to research investigating "compensatory conviction" or "ideological zeal" in response to threat (e.g., McGregor, Gailliot, Vasquez, & Nash, 2007; McGregor & Marigold, 2003; McGregor, Zanna, Holmes, & Spencer, 2001). Such research has primarily dealt with responses to threat associated with managing uncertainty, though several studies have employed TMT's traditional mortality salience manipulation to induce "threat." However, as with the vast majority of TMT research, those studies have typically focused on the impact of mortality salience on participants' reactions to others who either praise or criticize their worldview, and on participants' interest in pursuing various personal goals, neither of which directly measure certainty about worldview beliefs. Thus, Study 2 represents an important contribution because it is the first direct demonstration of ideological dogmatism in response to a mortality-related threat, and therefore speaks to a unique and important set of psychological processes.

Further, the present research helps shed some light on the recent debate over the uncertainty–threat model of political ideology (e.g., Jost et al., 2003). Proponents of this model argue that mortality reminders

represent an existential threat that motivates a shift toward conservative political ideology in an effort to protect the status quo. To the contrary, critics have argued that protection from existential threat can be gleaned by believing more fervently in the ultimate veracity of one's constellation of beliefs, regardless of where those beliefs might fall along the political spectrum (Anson, Pyszczynski, Solomon, & Greenberg, 2009; Greeberg & Jonas, 2003).

The destruction condition did not produce a shift toward conservative political orientation in any of the present four studies, nor was death thought accessibility associated with political orientation in Studies 1 and 4. Further, in Study 2, although conservatives were more dogmatic than liberals, the destruction condition enhanced ideological dogmatism regardless of political orientation, meaning that all participants—liberal and conservative—became more certain about the veracity of their beliefs<sup>5</sup>. These findings were inconsistent with the uncertainty–threat model prediction that existential threat would motivate political conservatism, or alternatively, in the case of Study 2, that destruction exposure might have increased dogmatism among politically conservative participants and reduced it among liberal participants (because conservatives would become more dogmatically certain about conservative beliefs and liberals less certain about liberal beliefs). Rather, the findings converged with a recent set of experimental studies (Castano et al., 2011) showing that whereas a death reminder motivated conservatives to increase support for conservative policies, it motivated liberals to reject right-wing authoritarian values, reject conservative policies and rhetoric, and indicate stronger support for liberal social policies and values.

In light of the growing experimental evidence showing that terror management processes lead to ideological certainty, rather than conservative shift, it is perhaps worth taking a closer look at two possible reasons for the theoretical debate. First, research has illustrated a dual set of terror management processes (Pyszczynski et al., 1999), in which conscious death-related thought motivates efforts to reduce one's vulnerability to mortality (e.g., quit smoking) or reduce the perception of vulnerability, whereas non-conscious yet still accessible death-related thought motivates efforts to adhere to and protect one's worldview beliefs. However, the relevant uncertainty–threat model predictions were based, in part, on correlations between conservative political orientation and explicit fears of death (Jost et al., 2003; Wilson, 1973), with some subsequent research on the topic involving non-experimental exposure to traumatic experiences (e.g., Bonanno & Jost, 2006; Nail & McGregor, 2009). As Castano et al. (2011) briefly noted, such circumstances likely involve conscious death-related thought, meaning that they do not necessarily inform reactions to non-conscious death awareness. Indeed, the present Studies 1 and 4 appear to be the first to test the association between political ideology and non-consciously accessible death awareness—there was none.

Second, when dealing with non-conscious death-related thought, TMT and the uncertainty–threat model can sometimes make similar predictions regarding some potentially politically charged outcomes (Burke, Kosloff, & Landau, *in press*). Indeed, Burke et al. (*in press*) noted that most of the studies often offered as supporting conservative shift deal with political issues (e.g., support for President Bush; anti-terrorism policies) that are multi-dimensional and could be viewed as worldview defenses (e.g., supporting incumbent American leadership; defending one's worldview by militarily safeguarding one's nation). Similarly, in the present Studies 3 and 4, the uncertainty–threat model would have presumably predicted that those who viewed destroyed buildings would increase support for military action as a shift toward conservative foreign policy (see Nail & McGregor, 2009 for a similar example of this interpretation). However, although political orientation may be associated with various ideas about the appropriate extent of military spending and operations, the protection of the American worldview against salient threat is a real and relevant concern to most Americans. Thus, TMT often makes the same prediction, but based on the worldview defense hypothesis. These concerns suggest that

worldview defense may sometimes look like conservative shift – and vice versa – and that future research may help understand the circumstances that produce that similarity.

On that point, it is important to note that the TMT worldview defense prediction depends on the salient or dominant set of worldview beliefs, values, and identities. The hypothesis that American participants would increase support for militarily defending America rests on the assumption that individuals will respond to international threats as “Americans,” involving the protection of an overarching set of worldview beliefs, values, and identities relevant to both liberals and conservatives. But if more specific political beliefs, values, or identities were salient or dominant, TMT might predict that existentially motivated participants would adhere to those beliefs (Castano et al., 2011). Thus, future research might benefit from further investigating the possible role of salient or dominant political worldview characteristics, perhaps comparing instances when none are particularly salient to instances when relevant salient beliefs are issue-specific (e.g., environmental protection), related to party or political orientation (e.g., liberal, conservative), or are broadly related to national/international roles (e.g., American).

#### *The functional invisibility of culture?*

Another potentially interesting aspect of this research is that it leads to questions about how people respond to a world where the physical environment—our buildings, roads, and other architectural imprints—might visibly remind us of our capacity to be destroyed. Becker (1971; see also Lifton, 1979) posited that part of the answer might lie in turning toward the intangible character of one's cultural worldview. Because an individual's ideas, beliefs, and values cannot be seen, they may be more immune to the physical perils visible in the natural world. Thus, from this perspective, people, especially those with a heightened awareness of death, may devote themselves more fervently to the relatively invisible, and thereby relatively invulnerable, system of beliefs – including religions as well as secular concepts of nations, science, and the like.

The present studies can be seen as consistent with the idea that the psychological association of visible destruction with death reflects what Lifton (1976, 1979) called the “imagery of extinction.” From this perspective, the visible destruction of one's surroundings represents an apocalyptic symbol of one's ultimate vulnerability—death. Similarly, Sartre (1956) noted that humankind is aware that even the evidence of its own presence is fragile, and the deterioration of human constructions undermines the perceived persistence of humanity itself. In Sartre's words about the psychological implications of this awareness,

“It is man who renders cities destructible, precisely because he posits them as fragile and as precious and because he adopts a system of protective measures with regard to them. It is because of this ensemble of measures that an earthquake or volcanic eruption can destroy these cities or these human constructions. The original meaning and aim of war are contained in the smallest building of man.” (Sartre, 1956, pp. 40)

In other words, people may increase investment in an invisible world, made up of the mental figments, fantasies, and faiths (i.e., cultural beliefs) precisely as a result of being faced with environmental reminders of death and destruction of the visible, tangible world. The present findings of increased certainty about the veracity of one's worldview and willingness to use violence to defend it are consistent with these ideas. The increase in dogmatic belief observed in Study 2, specifically, helps suggest how confidence in an “invisible” set of beliefs might mitigate the death awareness brought on by the visible hazards of physical existence. The worldview defenses observed in Studies 3 and 4 also suggest an increased psychological reliance on the intangible values and beliefs representing one's way of life, and the existential need to defend them. An interesting question raised by the present findings is whether the terror management processes triggered by visible physical destruction would differentially influence people's preference

for visible (e.g., flags) vs. invisible (e.g., “freedom”) cultural icons, values, and symbols.

### Conclusion

In sum, the present research uses TMT to offer a fresh perspective on some of the motivational implications of visibly destroyed physical surroundings. In these studies, exposure to images of destroyed buildings lead to greater death thought accessibility, which in turn strengthened people’s dogmatic certainty about their cultural worldview beliefs. Images of destroyed buildings also boosted their support for violent military aggression against those who might threaten their way of life. These results bear important implications for modern ideological struggles and compromises, as well as for breaking the cycle of violent military and/or insurgent aggression.

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### Appendix A

Sample images per condition

Sample images per condition



Sample destruction condition image



Sample terrorism condition image



Sample construction condition image



Sample intact building condition image

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