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THE EFFECTS OF MORTALITY SALIENCE AND AUTONOMY PRIMING ON
WORLDVIEW DEFENSIVENESS

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ABSTRACT

Terror Management Theory posits that people are motivated to defend against death awareness by maintaining cultural beliefs and behaviors that transcend mortality—sometimes motivating hostile, even militaristic, defenses of one’s culture. In contrast, self-determination theory suggests that autonomous regulation (self-determination) serves as a platform for personal growth and well-being. However, the present thesis suggests that, in addition to fueling growth, self-determination may also help buffer against the awareness of mortality, thus mitigating the impact of death awareness on hostile cultural worldview defense. To test this hypothesis, American participants were randomly assigned to be reminded of mortality or a control topic, then randomly assigned to be reminded of feelings of autonomy or being controlled, and then lastly completed a measure of one possible form of worldview defense: support for militaristic defense of American foreign policy interests in Syria. The present analysis found that death reminders increased that form of worldview defense, unless participants were first prompted to recall self-determination experiences.

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CHAPTER I

INTRODUCTION

Imagine the following: Jim and Kyle live in the rural Midwest and have grown up separate from each other. Kyle has lived his life being pushed along and told what to do and what to care about by his parents, teachers, coaches, and others. While Jim has had some similar life experiences, he has also developed his own voice and interests—he loves to write comic books and illustrate them; it is a place for him to be authentic and autonomously express himself. Now adults, they both now have careers, families, and other responsibilities. One morning, they turn on the television to see that two planes have crashed into the World Trade Center. It's September 11, 2001, and an unexpectedly grim reminder of our mortality. Kyle responds to the awareness of death with hostility and lashes out at people he perceives to be traitors to America and gives his support to leaders who call for military action against Iraq. However, Jim finds that his experiences with comics and art—where he can be his authentic self and explore the world on his own terms—offers him peace in the face of existential concerns, and he does not become aggressive, xenophobic, or oriented towards military action. This fictional anecdote illustrates the possibility that existential defensiveness may be influenced by the extent to which people are able to feel more self-determined and authentic. The present research

sought to explore this idea by building on Terror Management Theory's concept of mortality salience and worldview defenses, Self-Determination Theory's concept of self-determination, and the experimental method.

1.1 Terror Management Theory

Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) posits that death awareness can be a potent source of anxiety in one's life. TMT suggests that this potential anxiety is managed through investment in cultural worldviews and the attainment of self-esteem within those systems. Cultural worldviews are systems of beliefs and behaviors that offer a sense of either literal or symbolic permanence through secular means (e.g. national identity, art, science, etc.) or religious concepts of eternity (e.g. Heaven, reincarnation, etc.). Self-esteem then becomes an indicator of how well one is doing at living up to their cultural standards and qualifies them for permanence within their worldview.

One guiding idea derived from TMT is the mortality salience hypothesis (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989) which postulates that if culture and self-esteem do help negate the potential threat of anxiety about death, then increasing mortality salience (MS) should motivate people to defend and affirm these beliefs and strive for self-esteem. The mortality salience hypothesis has been empirically tested and supported in hundreds of studies conducted in over 20 countries (Routledge & Vess, 2018; Burke, Martens, & Faucher, 2010).

Terror management has shown relevance in political domains and has been demonstrated in people more closely adhering to left- or right-wing ideologies in the face

of MS (Greenberg & Jonas, 2003). This is because adherence to political worldviews, regardless of political orientation, has been shown to be protective from MS and increase self-esteem (e.g. Weise et al., 2008). As such, TMT research has found that MS can often spur hostile worldview defense outcomes in response to worldview threat, such as, harsher judgements of moral transgressors (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989), derogation of those with opposing religious beliefs (Greenberg et al., 1990), aggression towards those who are critical of your worldview (McGregor et al., 1998), and comfort in the annihilation of individuals with different beliefs (Hayes, Schimel, & Williams, 2008). Furthermore, MS can inspire nationalistic worldview defense. For example, American participants exposed to MS had increased liking of other pro-U.S. participants but derogated those with anti-U.S. attitudes (Gailliot, 2012; Greenberg et al., 1990, 2003), motivated Canadian participants to endorse civil rights restrictions for people with anti-Western/pro-Islamic beliefs (Norenzayan, Dar-Nimrod, Hansen, & Proulx, 2009), and even promoted antagonistic attitudes towards immigrants (Motyl et al., 2011).

While much of TMT research emphasizes the more defensive and aggressive outcomes, MS can also lead to more prosocial and positive outcomes. When people become aware of mortality, myriad studies have found positive outcomes such as increased adherence to salient norms of helping (Gailliot, Stillman, Schmeichel, Maner, & Plant, 2008), increased tolerance (Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992), increased empathy (Schimel, Wohl, & Williams, 2006), increased compassion (Vail, Arndt, Motyl, & Pyszczynski, 2009), and pacifism (Jonas et al., 2008). Furthermore, MS has been shown to motivate those with liberal views to reject

conservative and authoritarian policies while also defending liberal ideas (Castano et al., 2011) as well as increase hope for moral progress (Rutjens, van der Pligt, & van Harrenveld, 2009).

1.2 Self-Determination Theory

While TMT research has shown that MS can drive a host of worldview defenses, it is possible that the fulfillment of certain conditions may reduce existential threat and even the necessity of defensiveness. Self-determination theory (SDT; Deci & Ryan, 1985) emphasizes the conditions required for personal growth and well-being. SDT posits that three basic psychological needs facilitate well-being and personal authenticity: competence, relatedness, and autonomy. Competence is the ability to successfully engage in a task (Valenzuela, Codina, & Pestana, 2018); relatedness is described as feelings of connectedness with others (Butz & Stupnisky, 2017); and autonomy (self-determination) is the degree to which someone feels their actions are their own (Deci & Ryan, 2008).

Research has demonstrated how the fulfillment of these needs can lead to emotional well-being in myriad contexts. For instance, multiple studies have found that psychological need-satisfaction prompts greater feelings of purpose in one's life (Ryff, 1989; DeWitz, Woolsey, & Walsh, 2009) as well as improved motivation and well-being (Niemic, Ryan, Deci, & Williams, 2009; Fortier, Sweet, O'Sullivan, & Williams, 2007) while need-denial has shown to predict increases in depression and anxiety (Ng et al., 2012). In addition, need-satisfaction is expected to bring about positive outcomes such as life satisfaction, job satisfaction, and volunteering (e.g. Ryan & Deci, 2000; Gagné et al., 2010; Güntert, Strubel, Kals, & Wehner, 2016). Multiple international studies have found that the fulfillment of competence, relatedness, and autonomy is a cross-cultural

component in facilitating psychological well-being (e.g. Church et al. 2012; Chirkov, Ryan, Kim, & Kaplan, 2003; Wu, Lei, & Ku, 2013).

This psychological need-satisfaction doesn't just enhance emotional well-being, but also one's quality of performance. For example, when participants felt self-determined, they exhibited improved task performance, decreased self-serving bias, and less defensiveness (Hodgins, Yacko, and Gottlieb, 2006). Moreover, self-determined and autonomous individuals tend to have more positive attitudes towards challenges and higher performance quality in both employment (Lynch, Plant, & Ryan, 2005; Quested et al., 2011) and athletic settings (Ntoumanis & Mallett, 2014). Additionally, perceived need-satisfaction has been shown to predict academic performance, willingness to practice, motivation to succeed, and feelings of preparedness (Grolnick, Ryan, & Deci, 1991; de Araujo Guerra Grangeia et al., 2016).

1.3 Intersection between TMT and SDT

Whereas TMT focuses on defensive buffering against death awareness, SDT focuses on personal growth and well-being. However, these orientations may not be mutually exclusive. Growth orientation may, at least under certain circumstances, involve at least some basic levels of psychological security—which would suggest that the presence of the three basic psychological needs could facilitate the pursuit of personal growth by mitigating existential concerns. Thus, we next consider prior work regarding competence and relatedness, followed by similar consideration of autonomy.

First, within the context of the TMT literature, self-esteem may be obtained through either self-deceptive methods or the genuine development of competence.

Following MS, one may engage in self-serving bias to disingenuously increase perceived competence by taking credit for successes and denying failure (Mikulincer & Florian, 2002). However, death awareness can also prompt efforts to build genuine competence within self-relevant domains. Among participants who based their self-worth on their basketball performance, death reminders improved their genuine competence strivings in the form of better performance during one-on-one games and higher points scored in a shootout task (Zestcott, Lifshin, Helm, & Greenberg, 2016). Similarly, MS motivated an increase in strength output (on a force dynamometer) among participants who based their self-esteem on strength and fitness (Peters, Greenberg, Williams, & Schneider, 2005). Additionally, Landau, Greenberg, and Rothschild (2009) found that including questions that are relevant to one's culture on an academic test motivates people to demonstrate how competent they are with cultural knowledge. In sum, MS can motivate a variety of behaviors allowing people to build genuine competence within worldview-relevant domains.

Second, TMT research has made similar observations regarding relatedness and suggests that the presence of close relationships allows one to gain a sense of permanence through the concept that they will live on through others (Mikulincer & Florian, 2000). For instance, creating a family and living on through them, living on through contributions made in one's community, and feelings of love with someone who bolsters one's self-esteem (Mikulincer, Florian, & Hirschberger, 2003). Research has found that activating thoughts of one's family, when one is securely attached to them, reduces the need for worldview defensiveness (Cox et al., 2008). Similarly, when one's romantic partner serves as a source of positive regard, prompting those thoughts pertaining to this

regard reduces death-thought accessibility and increase relationship commitment (Cox & Arndt, 2012). Likewise, when close relationships are threatened, participants show increased death-related cognition (Mikulincer, Florian, Birnbaum, & Malishkevich, 2002; Florian, Mikulincer, & Hirschberger, 2002). MS has also been shown to motivate strivings for affiliation with others (Wisman & Koole, 2003) and even relationship formation regardless if mate selection has been compromised (Hirschberger, Florian, & Mikulincer, 2002). The results of these studies firmly support that relatedness and close relationships serve a protective function from MS.

Third, while recent TMT literature has documented the buffering qualities of both competence and relatedness, the extent to which autonomy can mitigate MS has yet to be examined. However, while autonomy has not been specifically studied within the TMT literature, some findings are consistent with the concept that it may play a role in mitigating defensiveness. For instance, research suggests self-esteem can best be accumulated by successfully living up to the standards of one's internalized worldview (Pyszczynski, Greenberg, & Goldenberg, 2003). In other words, one can best obtain self-esteem within a worldview system that they autonomously believe in (as opposed to actions one is forced to make by external pressures). TMT research has found that participants become defensive when exposed to a worldview-relevant threat but not a worldview-irrelevant one (Arndt & Greenberg, 1999). Furthermore, people generally desire to demonstrate their competence, but only within domains they have internalized—that they have autonomously placed self-worth in (e.g. Zestcott, Lifshin, Helm, & Greenberg, 2016; Peters et al., 2005).

Within a similar vein, the presence of control seems to buffer against the impact of death awareness. For example, mortality salient participants have shown increased levels of death anxiety when they were primed with low (vs. high) self-regulatory control (Gailliot, Schmeichel, & Baumeister, 2006); participants with an internal (rather than external) locus of control engaged in fewer risk-taking behaviors after MS (Miller & Mulligan, 2002); and participants who experienced a threat to their control are motivated to engage in defensive behavior (Shepherd, Kay, Landau, & Keefer, 2011). It is important to note here that control is not the same as autonomy, but their possible similarity is perhaps suggestive of autonomy's role in buffering from MS.

Other research further suggests autonomy's role in buffering against death awareness. For instance, internally- and growth-related orientations have been shown to reduce strivings toward external sources of value (Cozzolino, Staples, Meyers, & Samboceti, 2004) such as wealth (Arndt, Solomon, Kasser, & Sheldon, 2004), fame (Greenberg, Kosloff, Solomon, Cohen, & Landau, 2010), and physical attractiveness (Cox et al., 2009). Similarly, although MS can motivate self-deceptive methods of self-esteem striving in the form of self-serving bias (Mikulincer, & Florian, 2002), orientation towards personal growth can reduce the need for self-serving bias (Park, Bauer, & Arbuckle, 2009). Furthermore, extrinsic esteem orientations have been shown to motivate defensively distancing oneself from a worldview violating other (Williams, Schimel, & Martens, 2009) while orientation toward intrinsic goals has been associated with death acceptance, greater well-being, and decreased death anxiety (Van Hiel & Vansteenkiste, 2009).

While autonomous self-determination is a key attribute of personal growth and well-being, a broad array of TMT and SDT literature would also suggest that autonomy may serve a protective function in mitigating the impact of worldview threat. Thus, together there is support for the idea that autonomous regulation (self-determination) is valuable in mitigating existential concerns—and thus mitigating the need for subsequent worldview defenses.

1.4 The Present Research

Overall, the present analysis suggests that autonomy can mitigate the need for worldview defensiveness. The goal of the present thesis was to investigate the previously untested hypothesis that MS may motivate hostile worldview defense, as seen in prior TMT studies, unless participants are primed to recall self-determined experiences. To test that hypothesis, I first manipulated both MS (vs. neutral topic) and self-determination salience (vs. control topic). Following the random assignment to conditions, participants were given a worldview defense measure, previously validated by Rothschild (2008) and Pyszczynski et al. (2012), which measured participants' support for American military interests in Syria. I hypothesized that MS would increase worldview defense in the form of increased support for aggressive defense of American foreign policy in Syria in the control condition, but not in the self-determination prime condition.

CHAPTER II

METHODS AND MATERIALS

2.1 Target Sample Size

Meta-analyses of mortality salience effect sizes were consulted to anticipate the sample sizes necessary to achieve a sufficient level of power (.80) to detect MS effects should such effects be present. Burke, Martens, and Faucher (2010) found an overall MS effect size of $r = .35$ ($d = .75$) on a broad range of studies using various worldview-defense outcomes (e.g., defense of national identity, sports team affiliations, physical aggression). Based on these prior effect sizes, an a-priori power analysis (G*Power; Faul, Erdfelder, Buchner, & Lang, 2009) was conducted and recommended a minimum total sample size of 29 participants per condition for a total of 116 participants overall.

2.2 Participants

A total of 157 undergraduate participants were recruited via research exposure program (SonaSystems) for participation in exchange for partial course credit toward a departmental research participation requirement. One participant failed to complete all the materials within the allotted time and was excluded from the dataset listwise. The

remaining 156 participants, depicted in *Table I*, were mostly Christian, White, Non-Hispanic, college-age women. Participants' political orientation was also sampled and found to be normally distributed.

2.2 Materials and Procedure

Materials were printed and compiled into a packet, and participants completed the measures in individual cubicles during a single session (See Appendix for full materials). A brief introduction to the study was provided. Following these brief instructions and after obtaining informed consent, participants completed the tasks below in the following order:

Filler measure. As part of a cover story, a “personality assessment” was administered at the start of the study (see Appendix A). The assessment was a 15-item measure of mindfulness (Brown & Ryan, 2003), was unrelated to the current hypotheses, and will not be discussed further.

Mortality salience. Following previous research (e.g., Rosenblatt et al., 1989; Greenberg et al., 1990), participants were randomly assigned to one of two conditions of a projective life attitude assessment: a MS induction or control topic (see Appendix B). In the MS condition, participants responded to two open-ended questions: “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 physically as you die and once you are physically dead.” The control condition consisted of parallel questions regarding dental pain.

Delay and distraction tasks. Participants completed the Positive and Negative Affect Schedule-Expanded Form (PANAS-X; Watson & Clark, 1999; see Appendix C)

as well as two other tasks: a brief reading and verbal cues task (an excerpt from “The Growing Stone,” a short story from *Exile and the Kingdom* by Albert Camus, 1958; see Appendix D) and a word search task (see Appendix E). These items served as a task-switching activity to remove death thoughts from conscious awareness, allowing death-thought to enter non-conscious awareness where death-anxieties may emerge (see Pyszczynski, Greenberg, & Solomon, 1999).

Autonomy manipulation. Participants were randomly assigned to one of two conditions: an autonomy prime or a control prime condition. In both conditions, participants were presented with 30 sets of 5 words; each set includes a four-word sentence and a fifth unrelated word, in scrambled order (Bargh, Chen, & Burrows, 1996; Hodgins, Brown, & Carver, 2007; see Appendix F). Participants were asked to identify the unneeded word, unscramble the remaining four words to create a sentence, and then write the completed sentence on a line below the word set. Fifteen of these sentences were neutral sentences and common to both the target and control conditions, including sentences such as the following: “sale for by sweatshirts are” (sweatshirts are for sale) and “is the now desk wooden” (the desk is wooden). In the autonomy prime condition, the remaining 15 sentences expressed autonomous statements, such as “actions and my are independent” (my actions are independent). In the control condition, the remaining 15 sentences expressed non-autonomous actions, such as “forced by to study I’m” (I’m forced to study).

Worldview defense measure. Following prior research (Rothschild, 2008; Pyszczynski et al., 2012), worldview defense was measured by assessing participant’s support for the USA’s militaristic defense of foreign policy interests in Syria. In 2011,

Arab Spring protestors in Syria called for removal of the Assad regime, which they panned as oppressive; armed conflict erupted after those protests were violently suppressed (Slackman, 2011). In the chaotic years that followed, the USA and its Western allies joined the conflict aligned with Syrian opposition/rebel forces, against the Iran- and Russia-supported Assad regime as well as against Al-Qaeda and the Islamic State of Iraq and the Levant (ISIL) that had opportunistically entered the fray. The stated American interest was to advance Western values and democracy, protect civilians from conventional and chemical attacks, and stymie regional power grabs by Russia, Islamic militants, and other opportunistic terrorist groups. As US President Obama put it (“Obama Syria speech,” 2013), “Our ideals and principles, as well as our national security, are at stake in Syria, along with our leadership of a world where we seek to ensure that the worst weapons will never be used.” In that context, over the subsequent years, as many as 3-in-4 Americans supported the U.S. military campaign in Syria (Pew Research Center, 2014; Smeltz, Kafura, & Martin, 2016).

Thus, support for militaristic defense of American interests against Syria served as the target dependent variable. Participants were asked to engage in role play as follows: “Imagine that you are Commander-in-Chief of the Armed Forces. It is your job to decide when to use your armed forces knowing that, as a result, some innocent civilians are likely to be killed.” Participants then responded to a series of scenarios and rated their support for American military action against Syria on a 10-point Likert scale (see Appendix G). The measure began with a sentence stem “I would support using our armed forces against Syria...” and the scenario items included statements such as, “...if Syria blatantly disregards the international community” and “...if Syrian soldiers or

militants attack American soldiers.” Prior research has indicated this measure is sensitive to MS manipulations and converges with other measures of worldview defense.

Demographics. Following the worldview defensiveness measure, participants filled out a brief questionnaire that recorded age, sex, race, ethnicity, religious affiliation, and political orientation (see Appendix H). Following its completion, participants were debriefed.

CHAPTER III

RESULTS

3.1 Worldview Defense

A 2 (MS: prime vs. control) x 2 (autonomy: prime vs. control) ANOVA was conducted. There was no significant main effect of MS ($F(1, 152) = 3.265, \eta_p^2 = .02, p = .07$) nor autonomy ($F(1, 152) = 1.651, \eta_p^2 = .01, p = .20$); however, there was a significant interaction between the two ($F(1, 152) = 4.440, \eta_p^2 = .028, p = .037$). The interaction was examined using pairwise comparisons and estimated mean worldview defensiveness scores can be found in *Table II*. In the controlled prime condition, worldview defense was higher in the MS condition than in the dental pain condition ($t(66) = 2.93, p = .004, d = .67$ [95%CI = .22, 1.10]). However, in the autonomy prime condition, worldview defense was not significantly different between the MS and dental pain conditions ($t(86) = -.20, p = .84, d = -.05$ [95%CI = -.53, .43]). Moreover, when primed with dental pain, worldview defense was not significantly different between the autonomy and control prime conditions ($t(90) = .64, p = .53, d = -.12$ [95%CI = -.54, .29]). Yet when reminded of death, worldview defense was far higher in the controlled condition than the autonomy condition ($t(60) = 2.22, p = .03, d = .67$ [95%CI = .15, 1.16])—see *Figure 1*.

3.2 Exploratory Analyses

To check whether affect was influenced, MANOVA methods were employed to examine the interaction between MS (vs. dental pain) and autonomy (vs. controlled) on the PANAS subscales. Analyses detected no significant main effects or interactions (see *Table III*).

Further analyses were conducted to observe the interaction between MS (vs. dental pain) and autonomy (vs. controlled) on political orientation. ANOVA methods determined there was no main effect of MS ($F(1,151) = .468, \eta_p^2 = .003, p = .495$) nor autonomy ($F(1, 151) = 1.372, \eta_p^2 = .009, p = 2.43$), nor an interaction ($F(1, 151) = .042, \eta_p^2 < .001, p = .837$).

CHAPTER IV

DISCUSSION

The present research tested the hypothesis that although MS typically motivates worldview defensiveness, priming an autonomy orientation should eliminate that effect. Results supported that hypothesis. In the controlled-orientation condition, American participants reminded of death (vs. control topic) increased worldview defense in the form of support for militaristic defense of American interests against Syria. However, that defensive response to MS was eliminated among participants in the autonomy-orientation prime condition. These findings offer several novel contributions to the growing body of research on the existential dynamics of defense and growth.

4.1 TMT, SDT, and Existential Motivational Trajectories

First, the present findings converge with and expand upon a large body of research finding that death awareness can motivate both hostile and prosocial worldview defenses. MS has been shown to increase Americans' support for those with pro-USA attitudes and dislike of those with anti-USA attitudes (Gailliot, 2012; Greenberg et al., 2003, 1990); increase Canadians' support for placing civil rights restrictions on people with anti-Western/pro-Islamic beliefs (Norenzayan et al., 2009); and increase American, Israeli, and Iranian participants' support for military aggression against their respective

“enemies” (Hirschberger et al., 2009; Pyszczynski et al., 2006; Pyszczynski, Motyl, et al., 2012). This study converges with those prior findings. The US military had become involved in the Syrian civil war following the 2011 Arab Spring protests, with American leaders portraying that involvement as the defense of American values and regional interests against Iran, Russia, Al-Qaeda, and ISIL. Thus, in the controlled-orientation prime condition, this study found that MS increased American support for US militarism in Syria. This finding further supports the TMT idea that that death awareness can motivate people to more fervently defend their worldviews, including militaristic defense of national interests.

Further, whereas prior TMT research has typically revealed the darker, defensive, and aggressive reactions to the awareness of existential concerns, more recent work suggests certain conditions may mitigate those aggressive reactions and that (under certain conditions) MS may even motivate more positive, growth-oriented strivings. For example, MS has been shown to increase worldview defense—unless participants took part in a creative design task (Routledge et al., 2004); had increased feelings of curiosity and openness (Boyd, Morris, & Goldenberg, 2017); or had higher intrinsic, as opposed to extrinsic, goal orientation (Vail & Horner, 2018).

Likewise, it is possible that self-determination, including the three basic psychological needs for competence, relatedness, and autonomy, may serve a similar protective function in addition to its known growth-oriented functions. MS can prompt efforts to build genuine competence within worldview-relevant domains, such as among participants who based their self-worth on their basketball performance (Zestcott, Lifshin, Helm, & Greenberg, 2016) or strength and fitness (Peters, Greenberg, Williams, &

Schneider, 2005). Similar observations suggest relatedness also serves that existential protective function (Cox et al., 2008; Mikulincer & Florian, 2000; Mikulincer, Florian, & Hirschberger, 2003). However, the extent to which autonomy can mitigate MS has yet to be examined. Thus, the present work is the first to address the previously-untested hypothesis that priming autonomy orientation would eliminate MS-induced defensiveness. Indeed, MS motivated worldview defensive responses, yet that effect was eliminated among participants in the autonomy-orientation prime conditions.

The present findings point to at least three theoretical perspectives about how people might be able to manage the awareness of death by engaging life as the self-determined author of their own actions. First, Becker (1973) argued that as people mature, they internalize and integrate surrounding sociocultural beliefs, such that a self-determined orientation will naturally orient people to affirm and abide by their death-denying cultural systems of meaning and self-worth. From this view, although MS may motivate worldview defensiveness, activating an autonomy orientation would potentially affirm those internalized defensive buffers and eliminate the need for additional worldview defensiveness. And whereas a variety of other studies have found, for example, that MS increases death-thought and worldview defensiveness unless participants affirmed their worldview belief systems (Schmeichel & Martens, 2005; Vail et al., 2018), the present work goes further to find that simply priming the concept of autonomy orientation can likewise eliminate existential defensiveness.

Second, some have argued that death awareness represents an existential threat because it threatens active being, in the sense that one will cease to be a living, vital, self-aware, freely-acting agent in the world (Choron, 1964; Yalom, 1980). Thus, an autonomy

orientation may mitigate the impact of death awareness because self-determination represents full-fledged, vital, self-aware, freely-acting engagement of life (Ryan & Deci, 2004). Prior work has found that autonomy orientations are associated with greater vitality (Ryan & Frederick, 1997) and mindfulness (K. W. Brown & Ryan, 2003; K. W. Brown et al., 2007) and promote fully-functional optimal *being* in the world (Niemiec & Ryan, 2013). Also, although MS typically motivates worldview defensiveness, that effect is eliminated among those high in mindfulness and those prompted to consider having personal control (Fritsche et al., 2008; Niemiec et al., 2010).

Third, and relatedly, SDT research suggests that autonomy orientations are more growth-oriented—better able to cope with stressors, less defensive, and more open (Vansteenkiste & Ryan, 2013). Indeed, a self-determined orientation: reduces anxiety and threat responses during stressful experiences (Quested et al., 2011); promotes openness with other people and openness to exploring uncomfortable information (Hodgins et al., 1996; Soenens et al., 2005); and reduces defensive hostility, suppression of negative information, attributional bias, and self-handicapping (Hodgins et al., 2006; Weinstein, Deci, et al., 2011; Weinstein, Hodgins, et al., 2011). Prior work also shows that people who value personal growth-oriented goals rather than externally-introjected goals (which tends to be associated with autonomy-orientations, Kasser & Ryan, 1996) experience reduced death anxiety and greater death acceptance (Van Hiel & Vansteenkiste, 2009) and do not respond to MS with financial greed or nationalistic worldview defensiveness (Cozzolino et al., 2004; Vail, Horner, et al., 2019). The present work converges with each of the above prior studies and yet goes further by finding that priming autonomy eliminates MS-induced defensiveness.

While research has already been advancing in this direction by interfacing TMT with SDT, the effects of priming specifically autonomy, one of SDT's basic psychological needs, have not been previously observed. Results from this study support our hypothesis that MS motivates people to defend their worldviews unless they are also primed with feelings of autonomy. Participants who received the MS prime demonstrated increased nationalistic worldview defense of American interests by supporting military action against Syria. However, when participants received an additional autonomy prime, support for military action was not significantly different than participants who were in the dental pain prime condition. These results not only fill the gap in the literature regarding autonomy's role in terror management, but also points to some interesting implications to TMT and SDT.

4.2 Limitations and Future Directions

While these novel findings supported our hypothesis, the experiment is not without its shortcomings. First, there is an alternative interpretation of the present results that is worth noting. The worldview defense measure used in this study may have confounded hostility with worldview defense. As such, it is possible that, instead of broadly reducing defensiveness, autonomy instead simply reduced hostility. In that regard, it is important to note that although worldview defense may sometimes involve aggressive defense of one's national interests, it also often involves the defense of prosocial values such as tolerance and compassion (Vail et al., 2012). Prior work has found that MS motivated people to increase helpfulness when the value of helping was salient (Gailliot et al., 2008), increase pacifism when the value of peacefulness was salient (Jonas et al., 2008), and increase forgiveness among people with high empathy

(Schimel et al., 2006). Also, when the value of tolerance was salient, MS increased Americans' political tolerance and acceptance of culturally-dissimilar others (Greenberg et al., 1992; Vail, Courtney, et al., 2019). Thus, future research should explore whether autonomy orientation simply eliminates hostility, or more broadly eliminates both hostile *and prosocial* existential defensiveness. The present analysis points to the latter.

Second, the worldview defense measure may be observing a particularly personal style of defensiveness. In the present study, the measure was intended to gauge a motivational influence on American participants' support for US military intervention abroad. However, rather than asking them to express the degree of their support or opposition for the current US administration's military actions in Syria, from their actual third-person perspective, in the present study participants were instead instructed to roleplay as the commander in chief of the American armed forces (first-person perspective) and given the opportunity to defend against a salient threat to American security. Thus, participants may have been much more likely to defend American interests when imagining their first-person response as commander-in-chief, rather than when asked to report from a more removed perspective (in the third-person) their support for an actual Presidential administration's intervention actions. With these concerns in mind, future researchers would be wise to further triangulate on existential defensiveness by using a variety of other, different measures of worldview defense.

4.3 Conclusion

To summarize, this study makes several important contributions. First, the results coincide with previous terror management research that the awareness of death leads to worldview defense. Second, our findings overlap with SDT perspectives that suggest

self-determination is capable of mitigating that defensiveness. Indeed, participants increased worldview defense scores when primed with MS, but not when they were also exposed to the autonomy prime. In interfacing these two theoretical perspectives, this study further offers the novel idea that consistent with the idea that the concept of autonomy/self-determined orientation might serve a protective function (mitigating existential defensiveness) in addition to its well-known growth-oriented functions.

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APPENDIX A

Table I
 Descriptive and Frequency Statistics of Participants

Demographics	
Mean Age	20.07 (4.35)
Did not report	9
Sex	
Male	31
Female	125
Did not report	0
Ethnicity	
Hispanic or Latino	5
Non-Hispanic or Latino	142
Did not report	9
Race	
Caucasian	100
African American	33
Native American/Native Alaskan	1
Asian	9
Native Hawaiian/Pacific Islander	0
Other	11
Did not report	2
Religion	
Christian	108
Muslim	6
Jewish	0

Buddhist	0
Hindu	0
Atheist	13
Spiritual	N/A
Agnostic	15
Other	12
Did not report	2
Political orientation	5.17 (1.94)
(1 = progressive, 10 = conservative)	
Did not report	1
Years of education	12.88 (1.60)

Table II. Worldview defense (support for American military interests in Syria) mean, standard deviation, and n, in each condition

	Controlled salience			Autonomy salience		
	M	SD	n	M	SD	n
Mortality salience	7.63	1.46	34	6.44	2.09	30
Dental pain salience	6.26	2.34	54	6.54	2.34	38

Table III

Results of the MS x Autonomy MANOVA model on the PANAS subscales

MS main effects	df	<i>F</i>	<i>p</i>	η_p^2
Positive mood	1, 152	.05	.82	< .001
Negative mood	1, 152	2.39	.12	.02
Fear	1, 152	3.69	.06	.02
Hostility	1, 152	.18	.67	.001
Guilt	1, 152	1.12	.29	.007
Sadness	1, 152	3.50	.06	.02
Happiness	1, 152	.64	.43	.004
Self-assuredness	1, 152	.002	.97	< .001
Attentiveness	1, 152	2.39	.12	.02
Serenity	1, 152	.09	.77	.001
Surprise	1, 152	2.85	.09	.02
Fatigue	1, 152	1.46	.23	.009
Shyness	1, 152	.47	.49	.003
Autonomy main effects	df	<i>F</i>	<i>p</i>	η_p^2
Positive mood	1, 152	< .001	.99	< .001
Negative mood	1, 152	< .001	.99	< .001
Fear	1, 152	.76	.38	.005
Hostility	1, 152	.16	.69	.001
Guilt	1, 152	3.05	.08	.02
Sadness	1, 152	1.64	.20	.01
Happiness	1, 152	.006	.94	< .001
Self-assuredness	1, 152	.12	.73	< .001
Attentiveness	1, 152	< .001	> .99	< .001
Serenity	1, 152	.10	.76	.001

Surprise	1, 152	1.03	.31	.007
Fatigue	1, 152	.001	.98	< .001
Shyness	1, 152	1.87	.17	.01
<hr/>				
Interaction effects	df	<i>F</i>	<i>p</i>	η_p^2
Positive mood	1, 152	1.28	.26	.008
Negative mood	1, 152	.74	.39	.005
Fear	1, 152	2.38	.13	.02
Hostility	1, 152	.44	.51	.003
Guilt	1, 152	.02	.90	< .001
Sadness	1, 152	.008	.93	< .001
Happiness	1, 152	.15	.70	.001
Self-assuredness	1, 152	.75	.39	.005
Attentiveness	1, 152	1.36	.25	.009
Serenity	1, 152	.12	.73	.001
Surprise	1, 152	.51	.48	.003
Fatigue	1, 152	< .001	.99	< .001
Shyness	1, 152	2.90	.09	.02

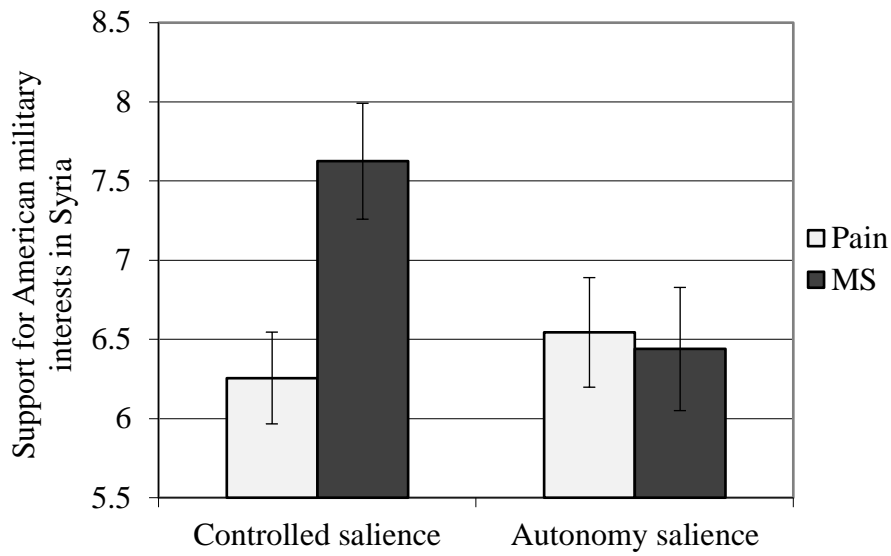


Figure 1. MS increased worldview defensiveness in the form of increased support for American military interests in Syria in the controlled prime condition, but not in the autonomy prime condition.

_____ 14. I find myself doing things without paying attention.

_____ 15. I snack without being aware that I'm eating.

APPENDIX C

The Projective Life Attitudes Assessment—Mortality Salience Prime

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual's personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality. Your honest responses to the following questions will be appreciated.

1. PLEASE BRIEFLY DESCRIBE THE EMOTIONS THAT THE THOUGHT OF YOUR OWN DEATH AROUSES IN YOU.

2. JOT DOWN, AS SPECIFICALLY AS YOU CAN, WHAT YOU THINK HAPPENS TO YOU AS YOU PHYSICALLY DIE AND ONCE YOU ARE PHYSICALLY DEAD.

The Projective Life Attitudes Assessment—Dental Pain Prime

This assessment is a recently developed, innovative personality assessment. Recent research suggests that feelings and attitudes about significant aspects of life tell us a considerable amount about the individual's personality. Your responses to this survey will be content-analyzed in order to assess certain dimensions of your personality. Your honest responses to the following questions will be appreciated.

1. PLEASE BRIEFLY DESCRIBE THE EMOTIONS THAT THE THOUGHT OF DENTAL PAIN AROUSES IN YOU.

2. JOT DOWN, AS SPECIFICALLY AS YOU CAN, WHAT YOU THINK HAPPENS TO YOU AS YOU PHYSICALLY EXPERIENCE DENTAL PAIN.

APPENDIX D

PANAS

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now. Use the following scale to record your answers.

1	2	3	4	5
Very slightly or not at all	a little	moderately	quite a bit	extremely
___ cheerful	___ sad	___ active	___ angry at self	
___ disgusted	___ calm	___ guilty	___ enthusiastic	
___ attentive	___ afraid	___ joyful	___ downhearted	
___ bashful	___ tired	___ nervous	___ sheepish	
___ sluggish	___ amazed	___ lonely	___ distressed	
___ daring	___ shaky	___ sleepy	___ blameworthy	
___ surprised	___ happy	___ excited	___ determined	
___ strong	___ timid	___ hostile	___ frightened	
___ scornful	___ alone	___ proud	___ astonished	
___ relaxed	___ alert	___ jittery	___ interested	
___ irritable	___ upset	___ lively	___ loathing	
___ delighted	___ angry	___ ashamed	___ confident	
___ inspired	___ bold	___ at ease	___ energetic	
___ fearless	___ blue	___ scared	___ concentrating	
___ disgusted with self	___ shy	___ drowsy	___ dissatisfied with self	

APPENDIX E

Verbal Cues Questionnaire: Literature

Please read the following short passage and answer the questions below it.

The automobile swung clumsily around the curve in the red sandstone trail, now a mass of mud. The headlights suddenly picked out in the night—first on one side of the road, then on the other—two wooden huts with sheet metal roofs. On the right near the second one, a tower of course beams could be made out in the light fog. From the top of the tower a metal cable, invisible at its starting-point, shone as it sloped down into the light from the car before disappearing behind the embankment that blocked the road. The car slowed down and stopped a few yards from the huts.

The man who emerged from the seat to the right of the driver labored to extricate himself from the car. As he stood up, his huge, broad frame lurched a little. In the shadow beside the car, solidly planted on the ground and weighed down by fatigue, he seemed to be listening to the idling motor. Then he walked in the direction of the embankment and entered the cone of light from the headlights. He stopped at the top of the slope, his broad back outlined against the darkness. After a moment he turned around. In the light from the dashboard he could see the chauffeur's face, smiling. The man signaled and the chauffeur turned off the motor. At once a vast cool silence fell over the trail and the forest. Then the sound of the water could be heard.

The man looked at the river below him, visible solely as a broad dark motion flecked with occasional shimmers. A denser motionless darkness, far beyond, must be the other bank. By looking fixedly, however, one could see on that still bank a yellowish light like an oil lamp in the distance. He turned back toward the car and nodded. The chauffeur switched off the lights, turned them on again, then blinked them regularly. In the blinking lights on the embankment the man appeared and disappeared, taller and more massive each time he came back to life. Suddenly, on the other bank of the river, a lantern held up by an invisible arm swung back and forth several times. At that final signal from the lookout, the man disappeared into the night. With the lights out, the river was shining intermittently. On each side of the road, the dark masses of forest foliage stood out against the sky and seemed very near. The fine rain that had soaked the trail an hour earlier was still hovering in the warm air, intensifying the silence and immobility of this broad clearing in the forest. In the black sky misty stars flickered.

1. Do you think the author of this passage is male or female?
_____ male _____ female
2. Do you think the narrator is a character in the story, or a third-person voice?
_____ A story character _____ A third-person voice
3. What age might the author have been at the time this passage was written?
_____ 15-20 years old _____ 41-50 years old
_____ 21-30 years old _____ 51-60 years old
_____ 31-40 years old _____ 61-70 years old
4. How do you feel about the overall descriptive quality of the passage?
1 2 3 4 5 6 7 8 9
not at all somewhat very
descriptive descriptive descriptive

APPENDIX F

Word Search

Circle as many words as you can in the puzzle below. Words may be forward, backward, or diagonal.

Book	Computer	Grass
Desk	Phone	Beer
Movie	Train	Music
Paper	School	Actor

S R E T U P M O C O
 W P H O N E R E E B
 A M U S I C P Z S N
 B T N R O T C A P K
 B M R K S E D G A O
 R F O A G O L R R O
 E A G V I Z B A G B
 P W N U I N E S W Q
 A N T A B E T S D O
 P S C H O O L N I T

APPENDIX G

Word Unscrambling Task—High Autonomy Prime

This task will assess your ability to comprehend, and unscramble, a scrambled thought.

Many people find this task enjoyable and interesting, and we are asking you to complete the task to help establish the norm for the task. So please feel free to complete it at a comfortable pace.

Instructions:

- Each item contains one scrambled sentence; one word should be discarded and the remaining four words can be rearranged to create the sentence.
- To complete this task, please identify the words that make up the sentence, unscramble them, and write the correct sentence on the line provided.

1. options have I two and _____
2. book we the read top _____
3. sale for by sweatshirts are _____
4. feel are choiceful I usually _____
5. is to this opportunity my _____
6. dollars salad on costs two _____
7. I to are choose live _____
8. often soda but drink I _____
9. on bookmark used the she _____
10. enjoy I freedom my he _____
11. in we autonomous often are _____
12. tablecloth and blue the is _____
13. have by preference a we _____
14. bright is the yes lamp _____
15. is to here served lunch _____

Verbal comprehension task (cont'd)

This task will assess your ability to comprehend, and unscramble, a scrambled thought.

Many people find this task enjoyable and interesting, and we are asking you to complete the task to help establish the norm for the task. So please feel free to complete it at a comfortable pace.

Instructions:

- Each item contains one scrambled sentence; one word should be discarded and the remaining four words can be rearranged to create the sentence.
- To complete this task, please identify the words that make up the sentence, unscramble them, and write the correct sentence on the line provided.

- 16. to go and I decided _____
- 17. to our we classes selected _____
- 18. is the now desk wooden _____
- 19. on choice we a have _____
- 20. apple was to the delicious _____
- 21. here the by telephone is _____
- 22. we today unconstrained were our _____
- 23. can self-regulate to usually I _____
- 24. the her to fits shoe _____
- 25. actions and my are independent _____
- 26. you coffee the is hot _____
- 27. tell the computer new is _____
- 28. now to I unrestricted am _____
- 29. am I still for self-determined _____
- 30. he now are wears glasses _____

Word Unscrambling Task—Low Autonomy Prime

This task will assess your ability to comprehend, and unscramble, a scrambled thought.

The task correlates with verbal intelligence in adults. Most high school and college-age students are expected to be able to complete it quickly and with ease.

Instructions:

- Each item contains one scrambled sentence; one word should be discarded and the remaining four words can be rearranged to create the sentence.
- To complete this task, you **MUST** identify the words that make up the sentence, unscramble them, and write the correct sentence on the line provided. **Do this as quickly and accurately as you can.**

1. do we to this must _____
2. book we the read top _____
3. sale for by sweatshirts are _____
4. do I should to homework _____
5. to I smile ought desk _____
6. dollars salad on costs two _____
7. for required to I'm study _____
8. often soda but drink I _____
9. on bookmark used the she _____
10. work to with obligated I'm _____
11. meet we on deadlines must _____
12. tablecloth and blue the is _____
13. for boss coerced my me _____
14. bright is the yes lamp _____
15. is to here served lunch _____

Verbal comprehension task (cont'd)

This task will assess your ability to comprehend, and unscramble, a scrambled thought.

The task correlates with verbal intelligence in adults. Most high school and college-age students are expected to be able to complete it quickly and with ease.

Instructions:

- Each item contains one scrambled sentence; one word should be discarded and the remaining four words can be rearranged to create the sentence.
- To complete this task, you **MUST** identify the words that make up the sentence, unscramble them, and write the correct sentence on the line provided. **Do this as quickly and accurately as you can.**

16. was obey we're compelled to _____
17. compulsory to attendance is our _____
18. is the now desk wooden _____
19. giving in to necessary is _____
20. apple was to the delicious _____
21. here the by telephone is _____
22. manipulates my to me boss _____
23. so behavior my they restrict _____
24. the her to fits shoe _____
25. forced by to study I'm _____
26. you coffee the is hot _____
27. tell the computer new is _____
28. the by limits restrained us _____
29. very are we pressured that _____
30. he now are wears glasses _____

APPENDIX I
Demographics Measure

Demographic

1.) What is your sex? _____Male _____Female 2.) Age? _____

3.) What is your ethnicity?

_____Hispanic or Latino

_____Not Hispanic or Latino

4.) What is your race?

_____1. Caucasian/White

_____4. Asian

_____2. African American/Black

_____5. Native Hawaiian/Pacific Islander

_____3. American Indian/Native Alaskan

_____6. Other (specify): _____

5.) How strongly do you identify as a CSU student?

1 2 3 4 5 6 7 8 9 10

Very Weak

Moderate

Very Strong

6.) How much of your self-worth is based on your academic activity/ability?

1 2 3 4 5 6 7 8 9 10

Very little

Moderate

A lot

7.) Please rate your political orientation:

1 2 3 4 5 6 7 8 9 10

Progressive

Moderate

Conservative

8.) How strongly do you identify with your political orientation, indicated in #7 above?

1 2 3 4 5 6 7 8 9 10

Very Weak

Moderate

Very Strong

9.) Please indicate your religious affiliation, if any:

1. Christian

5. Jewish

2. Hindu

6. Atheist

3. Buddhist

7. Agnostic

4. Muslim

8. Other: _____

10.) Please indicate the strength of your religious/philosophical belief indicated in #9 above:

1 2 3 4 5 6 7 8 9 10

Very Weak

Moderate

Very Strong

11.) Please indicate the total number of years of education you have completed: _____

(for example: high school graduation is 12yrs., so two years of college is 14yrs.)