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THE EFFECT OF AUTONOMY ON PROSOCIAL WORLDVIEW DEFENSE

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ABSTRACT

The present research explores an intersection between terror management theory and self-determination theory. Depending on what values are salient, terror management theory research has found that mortality salience can lead to both hostile and/or prosocial worldview defense behaviors in order to mitigate death anxiety. Self-determination theory holds that people are naturally oriented toward growth and well-being, with autonomy serving as an important component of healthy psychological functioning. Recent findings have indicated evidence of the buffering ability of autonomous-orientation on death anxiety, but it has only been evidenced with eliminating hostile worldview defense behaviors. It was predicted that reminding participants of their mortality would increase their defense of a salient prosocial worldview, but priming autonomy would eliminate the effect. Participants were randomly assigned to a mortality salience vs. neutral condition and an autonomy vs. controlled-orientation condition, and then asked to indicate their support for the expanding of immigration policies. Results indicated that priming mortality (vs. neutral) led participants to uphold tolerant immigration attitudes by indicating greater support for the expansion of immigration, but priming autonomy (vs. controlled-orientation) attenuated that support, providing evidence for the general buffering effect of autonomy.

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CHAPTER I

INTRODUCTION

The political sphere is one that is characterized by a multitude of existential concerns; topics such as gun regulation, abortion, healthcare, and foreign policy have inherent implications to the safety and survival of a nation's citizens. Policy and voting decisions related to these issues can vary in their expression. Some policymakers and voters might uphold aggressive or hostile worldviews while preparing and voting on legislation (e.g., advocating for restrictive immigration policies and less acceptance of immigrants), while others might instead maintain prosocial worldviews and choose to endorse more tolerant legislation (e.g., constructive and welcoming immigration policies). Utilizing an intersection of terror management theory (TMT; Greenberg et al., 1990) and self-determination theory (SDT; Ryan & Deci, 2000) the proposed research intends to examine when existential threat will lead to the upholding and defense of salient positive worldviews and whether such prosocial attitudes will be eliminated with feelings of self-determination.

Terror Management Theory

Based on the work of Ernest Becker (1973), terror management theory posits that human beings are uniquely aware of their own mortality; unlike other animals, humans know and understand that one day they will cease to exist. This knowledge, juxtaposed with the innate drive to survive, has instilled the potential for existential anxiety (terror) that must be managed in order to maintain healthy cognitive functioning. In order to manage such anxiety, people seek out avenues of permanence by adopting and investing in sociocultural worldviews, which are cultural ideas, systems, and norms that offer significance and meaning. Depending on which worldviews are adopted, the permanence provided can be literal, (i.e.: a religious afterlife in which one will continue to exist after death), or symbolic (such as leaving a surviving legacy through children, professional accomplishments, artwork, etc.), all of which help assuage death anxiety. TMT argues that self-esteem—the way one views oneself as living in the cultural meaning system—is then derived from a person's ability to live up to the standards of one's adopted cultural worldview and assists with buffering death anxiety (Greenberg et al., 1990; Routledge & Vess, 2019).

One of the most widely-tested hypotheses of TMT is the *worldview defense hypothesis*, which predicts that: if cultural worldviews offer people a means of attaining a sense of permanence, then reminding people of their mortality (mortality salience; MS) should cause them to uphold or defend their worldview in some way (Greenberg et al., 1990; Rosenblatt et al., 1989). This hypothesis has found a wide array of support over several decades, with worldview defense (WVD) behaviors taking on a variety of manifestations (Burke et al., 2010; Routledge & Vess, 2019). Many studies have shown

antagonistic WVD behaviors against those who violate the cultural worldview, such as harsher sentences from judges for moral transgressors (Jonas et al., 2008; Rosenblatt et al., 1989) and increased derogation and prejudiced attitudes towards religious outgroup members (Das et al., 2009; Greenberg et al., 1990). There has also been evidence of defense of national and political worldviews, such as: acts of aggression towards a member of a political outgroup (McGregor et al., 1998); harsher punishment for transgressions by a corporation from a different nation (Nelson et al., 1997); and increased interest in political and military intervention for the sake of one's own nation (Gebauer et al., 2017; Landau et al., 2004).

While MS can motivate people to utilize hostile or antagonistic methods of worldview defense, there has also been a large amount of evidence showing that positive and prosocial behaviors can also act effectively to mitigate death anxiety when such norms and values are salient (Gailliot et al., 2008; Vail et al., 2012). For instance, after reminding participants of their mortality, Jonas et al. (2008) found that they endorsed more peaceful views when pacifism was salient, and were also more willing to exhibit helping behavior when the value of helping was salient (after witnessing a confederate assist the experimenter with spilled writing utensils). Additionally, after MS, Greenberg, Simon, Pyszczynski, Solomon, and Chatel (1992) found that participants were more accepting of those with differing political views and of those who were critical of the US when tolerance was salient. Prosocial effects such as these lend evidence to the idea that existential defenses may also serve to orient people towards positive outcomes and psychological well-being when the right conditions are met—an alignment that self-determination theory holds is the natural orientation for humans.

Self-determination Theory

Self-determination theory maintains that humans are naturally oriented towards growth and well-being—objectives which are either helped or hindered by the levels of three components: competence, relatedness, and autonomy. Competence is achieved when one feels as though they are enacting their behavior effectively (Niemic & Ryan, 2009; R. M. Ryan & Deci, 2000). One can maintain a feeling of relatedness by feeling connected and belonging to the group or community around them (Baumeister & Leary, 1995; Ryan & Deci, 2000). Feelings of autonomy, the most central component of the SDT triad, are achieved when a person feels they are acting according to their own internalized beliefs and values, and upon their own volition (Ryan & Deci, 2000, 2006). Conversely, a person would be considered to hold a controlled orientation when they feel as though they are acting upon the will of outside forces or regulations, and not according to their own volition (Deci & Ryan, 1987).

Behaviors in a given situation can be construed as either autonomy-supportive or externally controlled based on the functional significance assigned to it by the individual acting in the scenario (Deci & Ryan, 1987; Ryan & Deci, 2000). For example, a child practicing a piano piece for an upcoming piano lesson might find the task to be inherently enjoyable, rewarding, and fully appreciate the purpose of the rehearsal. Thus, this child would wholeheartedly endorse the repetitive and sometimes tedious practice, imbuing the scenario with feelings of autonomy. On the other hand, another child might be practicing the same piano piece for the same upcoming piano lesson, but feel as though they are only doing so because they must be prepared for the instructor to judge their ability and to avoid poor marks, in which case such a behavior would be considered less volitional

and more controlled. While both children understand that there is an external evaluation to be had based on their extent of practice, only one has engaged it autonomously—having endorsed the behavior and found the inherent enjoyment and value in the action (Ryan & Deci, 2006).

As a key component to SDT, autonomy is considered one of the psychological nutrients needed for people to achieve and maintain their well-being (Sheldon et al., 1996), much like a plant needs water, soil, and sunlight to grow. The effects of feelings of autonomy have been studied in a variety of settings, including places of work and volunteering (Gagné, 2003; Slemp et al., 2018), education (Furtak & Kunter, 2012; Grolnick et al., 1991; Vallerand et al., 1997), and the medical field (Lee et al., 2019; Milne et al., 2008). Previous research has evidenced that environments and interpersonal relationships which facilitate feelings of autonomy have been related to a variety of positive outcomes, including: less relational defensiveness (Knee et al., 2005); increased motor learning (Lewthwaite et al., 2015), prosocial volunteering behavior (Gagné, 2003), and greater overall well-being (Reis et al., 2000). The inherent self-orienting nature of autonomy has the potential to act in other non-defensive and bolstering ways, some of which are already starting to be empirically investigated.

The Role of Autonomy and Prosocial Worldview Defense

Thirty years of TMT research has evidenced that when mortality is salient, people utilize worldviews to mitigate unconscious death anxiety. However, there has also been research showing that these defensive behaviors do not always manifest. The *buffer hypothesis* of TMT posits that if some trait or construct has the ability to serve as a buffering agent, then bolstering or relying upon that construct will eliminate the need for

existential defensive behaviors (Greenberg et al., 1992; Routledge & Vess, 2019). For example, participants did not exhibit WVD when they were allowed to bolster an internalized buffer before MS, such as when their self-esteem was artificially boosted (Harmon-Jones et al., 1997) or when they had the opportunity to reaffirm their existing worldviews (Schmeichel & Martens, 2005).

Two of the three components of SDT, relatedness and competence, have already been shown to offer existential buffering properties. Mikulincer, Florian, and Hirschberger (2003) described close relationships as offering “symbolic promise of continuity, lastingness, and death transcendence,” (p. 24), an avenue of perceived permanence which can serve a buffering function against existential terror. This claim has been supported by several empirical studies showing that the distal effects of mortality salience can be buffered by making romantic commitments salient (Florian et al., 2002), reminding participants of their friends and parents (Cox et al., 2008), and even instances of physical interpersonal contact (Koole et al., 2014).

Similarly, feelings of competence in areas that are relevant to a person can act as buffers against death anxiety via boosts of self-esteem. Peters et al. (2005) found that priming MS led participants who were invested in strength to increase their strength output via hand dynamometer compared to their strength output before MS, indicating a form of competence-striving. Relatedly, Taubman Ben-Ari et al. (1999) found that, for those who found driving relevant to their sense of self, priming MS led them to drive faster in a car simulator, but this effect was eliminated upon the receipt of positive driving feedback, indicating that a reassurance of driving competence eliminated the need for bolstering their driving ability.

Although there is ample evidence for the buffering abilities of competence and relatedness, the role of autonomy in worldview defense has been relatively unexplored until recently. Conti (2019) found support for the possible buffering effects of autonomy in a seminal study examining the role of autonomy in the defense of hostile interaction with a foreign nation. Participants were primed with thoughts of their own death or a neutral topic (dental pain) and then primed with either autonomy-orientation or controlled-orientation. They were then asked to rate their support for militaristic defense of American interests in Syria, a contemporaneous political topic. In the controlled-orientation (vs. autonomy) condition, participants who were primed with mortality (vs. dental pain topic) exhibited the classic TMT effect: they more strongly defended American national interests by indicating higher support for militaristic interventions in Syria. However, in the autonomy-orientation prime condition, MS did not increase support for militaristic intervention to pursue American interests. In other words, WVD defense behavior occurred for those in the MS (vs. dental pain) condition, unless they were primed with autonomy, in which case the effect was eliminated.

The aforementioned study is an intriguing first step towards fully understanding the role of autonomy in existential defensiveness; however, it does not eliminate all alternative explanations for the observed effect. Ryan and Deci (2000) assert that when psychological needs are met, people are motivated to pursue personal well-being and constructive social engagement, and subsequent research has provided evidence for the positive benefits held by those who are autonomously-oriented, including non-defensiveness (Hodgins et al., 2006) and even prosocial behavior (Gagné, 2003). It could be the case, therefore, that the effect observed by Conti (2019) was not an elimination of

the need for general WVD to manage death awareness, per se, but simply an attenuation of the use of *hostile* behaviors in general. Because MS can also be buffered by embracing and upholding salient prosocial worldviews (e.g., helping, pacifism, and tolerance), it may be that, due to its self-orienting and defense-reducing nature, autonomy could function as a more general buffer against existential threat. If so, then activating autonomy-orientation when managing death awareness should eliminate the need for all WVD—regardless of whether the worldview is hostile or prosocial. In order to be certain that autonomy is able to serve as a general buffer against death anxiety, it must be empirically shown that even non-hostile, prosocial worldview defensive behaviors will be eliminated when autonomous-orientation is activated.

In recent years, the long held American worldview of acceptance and tolerant immigration attitudes has become one of the most salient issues in the current political field. A pilot study indicated that tolerance towards immigrants was indeed particularly salient among the research participant pool at the university where this study took place. With that knowledge in hand, according to TMT, inducing MS among this population should lead to increased tolerance and acceptance of immigrants; however, if autonomy acts as a general buffer against existential threat, even this prosocial MS effect should be eliminated if autonomy-orientation is primed.

The Present Research

"Keep, ancient lands, your storied pomp!" cries she
With silent lips. "Give me your tired, your poor,
Your huddled masses yearning to breathe free,
The wretched refuse of your teeming shore.

Send these, the homeless, tempest-tost to me,
I lift my lamp beside the golden door!"

—Emma Lazarus, *The New Colossus*, 1883

The story of America's creation is one well-known to its citizens and non-citizens alike—built upon the tenacity and perseverance of immigrant colonies, the USA was founded and developed by people who were not native to the continent. Indeed, throughout most of America's history, the American "melting pot" culture has been viewed as vital to the American spirit by both the greater populace and leaders from both sides of the political aisle. In 1958, then-senator John F. Kennedy acknowledged that contributions made by immigrants traveling to America "... can be seen in every aspect of our national life," (Kennedy, 1958) and Republican President George H. W. Bush later referred to immigration as "... not just a link to America's past; it's also a bridge to America's future" (*Immigration Act Signing Ceremony*, 1990). It was not until after the 2016 presidential election that those in the highest political office began to challenge the country's "Nation of Immigrants" narrative (Gonzales, 2018).

Donald Trump has often proclaimed his anti-immigrant attitudes and his favor of restrictive immigration policies since the beginning of his campaign (i.e., building a wall along the Mexico-U.S. border), which have since manifested as several executive actions during his presidency, including: restricting immigration from majority-Muslim nations (Diamond, 2017); ending the Obama-era Deferred Action for Childhood Arrivals (DACA) executive order (Romo et al., 2017); and adopting a zero-tolerance policy on all individuals who cross the US-Mexico border (Horwitz & Sacchetti, 2018). However, such rhetoric did not seem to deter the American people from holding on to their

welcoming attitudes, even drawing increased attention to the traditional American worldview that immigration is fundamental to the identity of America and overall positive for the country (Brenan, 2018; Hartig, 2018; *Shifting Public Views on Legal Immigration Into the U.S.*, 2018).

The stark anti-immigrant views of President Trump offered a unique opportunity for the long-held American value of tolerance towards immigrants to become salient among American citizens. A pilot study [See Appendix for methods and results] surveyed participants in the Cleveland State University Psychology Department research pool (Sona) to examine participants' views on the topic and to test whether tolerant immigration attitudes were indeed particularly salient. The pilot study found that the participant pool overwhelmingly viewed President Trump as anti-immigrant and strongly intolerant of different others; additionally, and more importantly, the pool sample indicated that they perceived strong public and personal attention to diversity and tolerance—*tolerance was a salient value to themselves and the public, and they themselves were interested in being more tolerant and accepting of immigrants*. The results indicated the long-held, prosocial American worldview of tolerance towards immigrants was overwhelmingly salient among respondents in the CSU research pool. Because tolerance towards immigrants is a salient, prosocial worldview, the results of the pilot study would indicate that priming thoughts of mortality would cause participants from this research pool to defend and uphold tolerant immigration attitudes, unless also primed with feelings of autonomy.

The goal of the present study was to extend the previous findings of the possible existential buffering qualities of autonomy into the area of prosocial worldview defensive

behavior by examining the defense of tolerant immigration attitudes during a time when immigration is one of the most salient political topics in America. It was predicted that participants will uphold and defend the prosocial worldview of tolerant immigration attitudes when primed with MS, except for those who are primed with feelings of autonomy.

CHAPTER II

METHODS AND MATERIALS

Target Sample Size

A priori power analysis (G*Power; Faul, Erdfelder, Lang, & Buchner, 2007) was used to determine minimum required sample size. Using the F-family tests (ANOVA: Fixed effects, special, main effects, and interactions) with power set to .80 to detect an effect size of at least .25 at $p = .05$, with numerator $df = 1$ and 4 groups, G*power analysis indicated a minimum sample size of 128 participants.

Participants

A total of 208 participants were recruited via a research exposure program at Cleveland State University. One participant discontinued the study immediately after signing the informed consent, and two did not complete the dependent measure, and so those three were excluded listwise. As seen in Table I (Appendix) the remaining sample of 205 participants tended to be Christian, White, Non-Hispanic, college-aged, and female. Political orientation was normally distributed, and left leaning ($M = 4.81$, $SD = 1.93$; test value = 5.5; $t(202) = -5.07$, $p < .001$, $d = -.36$).

Methods and Materials

Study was administered in person, with materials completed in one sitting and in the following order [See Appendix for materials].

Mortality Salience

As in previous TMT research, participants were randomly assigned to either a mortality salience or neutral condition. Participants were asked to complete a “Policy Importance” measure, in which they rated the importance of listed policies on a scale of 1 to 6. In the MS condition, participants rated the importance of policies related to and prime the concept of death, including: terrorism, war/military intervention, abortion, gun control, capital punishment, and healthcare. In the neutral condition, participants rated government policies related to other, non-death related national topics, including: trade regulation, tax reform, the national budget and economy, energy and oil, education, and technology and infrastructure. This manipulation has previously been validated (Vail & Horner, 2019)—those in the MS condition, after a distraction task, showed increased death-thought accessibility (via word-stem completion task) whereas those in the neutral condition did not show an increase.

Autonomy Salience

Previous SDT research has shown success with manipulating autonomy through priming methods, including: sentence unscrambling tasks (Hodgins et al., 2007); unattended-channel audio primes (Radel et al., 2013); and simply instructing participants to recall autonomous people from their life (Milyavskaya et al., 2012). To prime autonomous-orientation in the current study, an adaptation of the “Projection of Life

Attitudes Assessment” from previous TMT research was utilized (Greenberg et al., 1990; Routledge & Vess, 2019). In the autonomy salience condition, participants were asked to recall and write about “...a time when you felt ‘self-determined,’ meaning a time in which you felt you were doing things or acting a certain way simply because you wanted to; not because of any outside pressure.” The control salience condition used a similar prompt in which participants were asked to recall and write about “...a time when you felt ‘controlled,’ meaning a time in which you felt you were doing things or acting a certain way simply because of some outside pressure; not because you wanted to.” Asking the participant to introspect on their own experiences with felt autonomy also controls for any individual differences in functional significance of events that may be encountered (Deci & Ryan, 1987; Ryan & Deci, 2000).

Delay and Distraction Task

When reminded of death, participants typically immediately respond (when death-related thoughts are in conscious attention) by either taking steps to protect their health or by pushing the thoughts out of mind, whereas more symbolic efforts to maintain a sense of permanence via self-relevant cultural-level worldview defense do not manifest until thoughts of death are outside of conscious awareness (Greenberg et al., 2000; Pyszczynski et al., 1999). In order to ensure that thoughts of death were removed from focal attention, participants completed the Positive and Negative Affect Scale (Watson & Clark, 1992) in order to fulfill the necessary task-switching distraction required to observe the consequences of non-conscious death awareness.

Dependent Measure

Participants then completed the dependent measure: an 18-item Likert-type scale assessing Immigration attitudes. All items equally evaluated the participants' views on the expansion vs. restriction of immigration as related to potential economic, cultural, and security-related consequences. Nine items focused on the expansion of immigration included items such as: "The US should expand immigration because... immigrants help our economy by consuming American goods and services; immigrants bring diverse cultural beliefs, perspectives, and identities to our country; increased diversity can promote safety through understanding, tolerance, and peacefulness between groups (e.g., race, religion, ethnicity)." Nine items focused on the restriction of immigration included such items as: "The US should restrict immigration because... immigrants take jobs from American citizens; we risk losing our uniquely American national, cultural, and religious identity; immigrants are a potential risk to our national security."

The nine items measuring support for restriction formed a reliable composite ($\alpha = .88$) as did the nine items measuring support for expansion ($\alpha = .91$). Converging with the pilot survey, mean scores suggested that on average participants tended to agree with reasons to expand immigration ($M = 6.69$, $SD = 1.94$) but disagree with reasons to restrict it ($M = 3.06$, $SD = 1.57$). The expansion and restriction subscale composites were negatively correlated ($r = -.46$, $p < .001$), therefore an overall score was computed by subtracting the restriction subscale mean from the expansion subscale mean, such that higher positive scores reflected stronger overall support for expanding (vs. restricting) immigration ($M = 3.63$, $SD = 3.00$; normally distributed, Skew (SE) = $-.35$ (.17), Kurtosis (SE) = $-.58$ (.34)).

Demographics

Finally, participants completed a demographics questionnaire which recorded their sex, age, education level, political orientation, etc.

CHAPTER III

RESULTS

ANOVA methods were used to examine the 2 (MS vs. neutral) x 2 (salience: autonomy vs. controlled) interaction on immigration attitudes. There was no main effect of MS ($F(1, 201) = 1.31, \eta_p^2 = .006, p = .25$) nor autonomy prime ($F(1, 201) = 1.11, \eta_p^2 = .005, p = .29$). However, there was a significant interaction, $F(1, 201) = 4.52, \eta_p^2 = .02, p = .035$.

The nature of the interaction was examined using pairwise comparisons via independent-samples t-tests; estimated mean immigration attitude scores are reported in Table II (Appendix). In the controlled prime condition, affirmation of liberal immigration attitudes was higher in the MS condition than the pain condition ($t(95) = 2.25, p = .025, d = .45$ [95%CI = .04, .85]). In the autonomy prime condition, worldview defense did not statistically differ between the MS and pain condition ($t(106) = -.71, p = .57, d = -.14$ [95%CI = -.52, .24]). From another perspective: when reminded of neutral topics, worldview defense did not statistically differ between the controlled and autonomy condition ($t(101) = .76, p = .59, d = -.14$ [95%CI = -.53, .25]). But when reminded of death, worldview defense was higher in the controlled condition than the autonomy

condition ($t(100) = 2.24, p = .026, d = .49$ [95%CI = .09, .88]) (see Figure 1).

Ancillary analyses revealed that the MS \times Autonomy interaction was primarily due to shifts on the composite subscale of support for expanding immigration rather than the subscale for restricting immigration; further analyses examined each of the three-item measures of agreement with economic, cultural, and security reasons for expanding immigration, and in each case found interaction patterns similar to those reported above. Full statistical details of those ancillary analyses can be found in the Appendix.

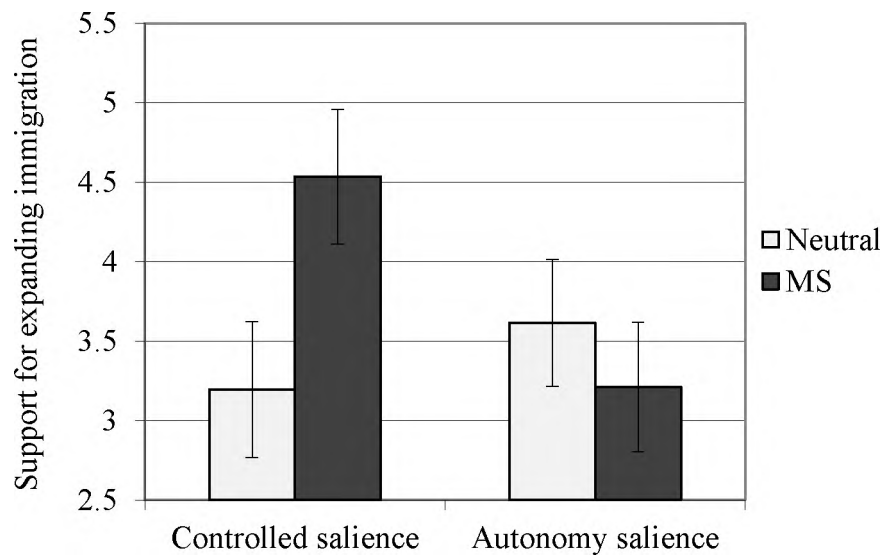


Figure 1. Results. MS increased support for expanding immigration in the controlled prime condition, but not in the autonomy prime condition.

CHAPTER IV

DISCUSSION

The present research further explored the existential buffering effects of autonomy. Although mortality salience usually leads to worldview defense behaviors, it was predicted that priming thoughts of autonomy would attenuate that effect. The results indicated support for this hypothesis. When reminded of death, participants in the controlled-orientation condition exhibited the typical MS response by endorsing a salient prosocial worldview (tolerant immigration attitudes); however, reminding participants of their autonomy attenuated that effect.

Existential Threat and Worldview Defense

The present findings conceptually replicate and expand upon previous TMT research finding that MS motivates defense of both hostile and prosocial worldviews. In response to MS, previous studies have shown a range of hostile and prejudicial defensive behaviors, such as young adults showing increased distaste for the elderly (Martens, Greenberg, & Schimel, 2004) and Italians exhibiting greater dislike towards German people (Castano, Yzerbet, Paladino, & Sacchi, 2002). Indeed, the antecedent study to the

present research showed similar hostile WVD—increased support for military intervention in Syria (Conti, 2019).

More recent research has indicated that WVD can occur as prosocial behaviors; positive defensive responses such as increased tolerance and helpfulness can manifest in response to MS when those cultural values are made salient (Jonas et al., 2002; Greenberg et al., 1992; Gailliot et al., 2008). It can be seen that the results of the present research converge with these findings by examining the pattern of results in the controlled-orientation condition (Figure 1). America has a long history of tolerance and acceptance of immigrants, and this worldview has only strengthened among Americans following the election of Donald Trump (Brenan, 2018; *Shifting Public Views on Legal Immigration Into the U.S.*, 2018). A pilot study preceding data collection for the primary study found similar attitudes of striving for tolerance and acceptance of immigrants among the utilized participant pool. The present findings indicated that in the controlled-orientation condition, participants primed with MS increased defense of the salient cultural values of tolerance and acceptance in the form of support for expanding (vs. restricting) immigration.

Autonomy as a General Death-anxiety Buffer

Self-determination theory holds that there are three basic psychological needs that foster psychological growth and well-being what satisfied: competence, relatedness, and autonomy. While competence and relatedness had been previously found to have existential buffering properties (Florian et al., 2002; Peters et al., 2005; Taubman Ben-Ari et al., 1999), Conti (2019) was the first to explore the role of autonomy. That study examined if autonomy would play a similar buffering role and found support—

participants who were reminded of their autonomy after MS did not exhibit increased endorsement of military intervention in Syria, while those who were primed with controlled orientation showed increased support for military intervention. However, because autonomy leads people to pursue personal well-being and reduce defensiveness (Ryan & Deci, 2000), that study confounded WVD reduction with hostility reduction, which made it impossible to determine whether autonomy had the ability to serve as a general anxiety buffer.

The current research converges with and expands upon Conti's initial examination of autonomy's role in existential nondefensiveness by utilizing a salient *prosocial* worldview as the target of interest. Because the defense of the salient prosocial worldview was attenuated among participants who were reminded of death and autonomy, the present findings provide evidence of the general buffering effect of autonomy in response to existential threat. These converging findings support the claim that, in addition to their growth-oriented function, self-determination (as comprised of the components of autonomy, competence, and relatedness) appears to play a role in defense-oriented behaviors.

The results of this study shed intriguing light on the possible dual motivational functions that self-determination may play in both defense and growth-orientation. While existential defense and growth are most often thought of as opposing forces, it is possible that they could act as complementary dynamics. Acting as opposing forces, existential anxiety would sometimes motivate defensive functioning, in which case growth-oriented open-mindedness would not so readily occur; growth-orientation, then, may sometimes challenge the familiar defenses that one utilizes to mitigate the dread of death. On the

other hand, the two forces acting in tandem may allow some defensive protections to provide the needed defense function that mitigates the threat of existential anxiety, while simultaneously providing one with the security needed to eliminate the need for additional defensiveness. Self-determination serving both a defense and growth-oriented function may then allow one to experience reduced anxiety and greater well-being after a threat, thus leading to personal growth by allowing for one to venture out and authentically face challenges and new experiences.

These findings also challenge the common and often-tacit appraisal that MS-induced defensiveness is “bad” while self-determination is “good.” While true that WVD can lead to hostile defense behaviors (Greenberg et al., 1990; McGregor et al., 1998; Nelson et al., 1997), MS can also motivate defense of salient prosocial values. Similar to past research (Vail et al., 2012), in the current findings reminding participants of their mortality in the controlled-orientation condition led them to endorse the salient tolerant immigration attitudes. And while self-determination is most often associated with more prosocial behavior and greater well-being (Gagné, 2003; Ryan & Deci, 2000), the results of the present study also show an opposite result—priming the most fundamental component of self-determination seemed to attenuate a MS-induced motivational increase toward tolerant and prosocial attitudes and prevent the support of the expanding immigration policies. These tangible results of the study point to a more complex relationship between growth and defense-oriented functioning.

Future Directions

The current research, designed in such a way to utilize both the worldview defense and buffering hypotheses of TMT, offers compelling preliminary evidence for

the role of autonomy in existential nondefensiveness. However, there is room to further prod at the defensive abilities of autonomy by using the third hypothesis of TMT, the *death-thought accessibility hypothesis*. The death-thought accessibility (DTA) hypothesis states that if a worldview or construct serves to shield one from anxiety-invoking thoughts of death, then threatening or undermining that construct should lead to heightened accessibility of death-related thoughts. Previous research has indicated that DTA increases when self-relevant buffering components such as cultural worldviews, self-esteem, or meaning systems are threatened (Routledge & Vess, 2019); because the current study demonstrates that autonomy does seem to act in the same capacity as other general death-anxiety buffers, it is likely that it also serves to manage DTA. Future research would do well to empirically examine the role of autonomy in the accessibility of death-related thoughts.

The current research also opens up avenues of potential applied research regarding autonomy and nondefensiveness. While autonomy-supportive environments have previously been shown to improve performance in the workplace (Gagné & Deci, 2005) and the classroom (Assor et al., 2002; Ryan & Grolnick, 1986), compelling evidence for its benefits in the medical field are abundant; previous research has found evidence that physicians who offer environments that support patient autonomy show associations with smoking cessation (Williams et al., 2002), increases in long-term physical activity (Fortier et al., 2007), and higher self-reported medication-adherence (Umeukeje et al., 2016).

Relatedly, the terror management health model (TMHM) offers insight into how death reminders can affect health motivations (Goldenberg & Arndt, 2008; Greenberg et

al., 2014). When thoughts of death are in focal awareness, health-striving similar to the aforementioned autonomy research is observed, such as increased intentions to use sunscreen (Routledge et al., 2004) and increased intention to engage in physical activity (Arndt et al., 2003). According to the model, these health-striving intentions occur to remove death thoughts from focal awareness and minimize the threat. However, when death-thoughts are outside of focal awareness, more symbolic structures such as self-worth and cultural worldviews can influence health-striving. For example, the same research that found that proximal death thoughts lead to increased exercise intentions found that, when thoughts of death left focal awareness, increased exercise intentions only occurred for those who considered fitness important to their self-esteem (Arndt et al., 2003). Similarly, another study found that among current smokers, after viewing a MS-inducing warning label, smoking intentions increased for those who value smoking as part of their self-image once thoughts of death were outside of focal awareness (Hansen et al., 2010).

The present findings might offer interesting ways to further evaluate health motivations based on the TMHM. Coupled with an autonomy supportive health environment, felt autonomy might help mitigate the potential negative effects of MS-induced self-esteem striving and cultural worldview defense when they pertain to negative health behaviors. For example, for those who value smoking as part of their self-image, yet still desire to quit, autonomy-supportive relationships with physicians may help initiate steps to cease smoking, while long-term feelings of autonomy may mitigate downstream, non-conscious motivators of smoking after fluctuations in existential

anxiety. Future research would do well to further evaluate the possible role of autonomy in health-striving behavior according to the terror management health model.

Limitations

While the current research offers interesting insight into the role of self-determination in existential defensiveness, it is possible that one could interpret the present results in a different light. Because there was not a true neutral condition, one could argue that the present findings may reflect the opposite effect—instead of autonomy buffering the WVD effect, controlled-orientation may have exacerbated it. In addition to reducing the resources and time needed to complete the study, it was decided to forego a true-neutral prime because previous research has indicated that compared to both controlled and neutral primes, priming autonomy increases self-reports of felt autonomy and improved behavioral performance on lab tasks (Levesque & Pelletier, 2003; Radel et al., 2013). In other words, priming autonomy leads to noticeable effects in comparison to both neutral and controlled-orientation primes, indicating that controlled-orientation does not necessarily entail being worse than a neutral prime. Additionally, all previous TMT work has operated under an assumed no-motivation prime. That is, three decades of research have presumably been conducted under a “neutral” motivational prime (no autonomy prime and no controlled-orientation prime), and worldview defense was observed. This study indicates the same results in the controlled-orientation condition—typical WVD—but not in the autonomy condition, indicating that autonomy seems to alter the effect of MS. However, while perhaps not necessary, in no case would a true neutral prime hinder a study, so future research would do well to include a true neutral prime for clarity purposes.

Conclusion

The present study examined an intersection of terror management theory and self-determination theory to further explore the general buffering effect of autonomy on worldview defense. The results indicated that autonomy attenuated the effect of MS on the defense of a salient prosocial worldview, providing evidence for a general buffering effect of autonomy against existential anxiety. Not only did the results converge with and expand previous research on prosocial worldview defense and the role of autonomy in hostile worldview defense, these results offer insight into the likely dual growth and defense-oriented motivational functions of self-determination.

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APPENDICES

APPENDIX A

Pilot Study Materials

[Social values measure]

This scale consists of a number of statements about the awareness of various social issues. Please read each item and then indicate how much you either agree or disagree with the statement.

1 2 3 4 5 6

Strongly disagree

Strongly agree

- _____ 1. The American values of diversity and tolerance are in the public consciousness more than they were before.
- _____ 2. The public is giving more attention to diversity and tolerance than they were before.
- _____ 3. More often than I did before, I think about how we need to be tolerance and accepting of others.
- _____ 4. I'm more aware of the value of being tolerant about race, religion, gender, and so on.
- _____ 5. This item is a disguised attention-check item, please mark the strongly agree response.
- _____ 6. I want to be more tolerant and accepting of others in general.
- _____ 7. I want to be more tolerant and accepting of immigrants and foreigners.
- _____ 8. I want to be more tolerant and accepting of Islam, Muslims, and people from the Middle-East.

- _____ 9. This is another disguised attention-check item, please select the somewhat disagree response.
- _____ 10. I want to be more tolerant and accepting of different races and ethnicities.
- _____ 11. I want to be more tolerant and accepting of women.
- _____ 12. I want to be more tolerant and accepting of gays, lesbians, and transsexual people.

[Impressions of President Trump's social attitudes; PRESENTED IN RANDOM ORDER]

This survey consists of a number of opinions about President Donald Trump. You may agree or disagree with any of these opinions. Please read each and then indicate how much you either agree or disagree with the statement.

1 2 3 4 5 6

Strongly disagree

Strongly agree

- _____ 1. Donald Trump is intolerant of people who are different from him.
- _____ 2. Donald Trump is intolerant of immigrants.
- _____ 3. Donald Trump is racist.
- _____ 4. Donald Trump is prejudiced against Islam, Muslims, and people from the Middle-East.
- _____ 5. Donald Trump is sexist against women.
- _____ 6. Donald Trump is homophobic and trans-phobic.
- _____ 7. Donald Trump is tolerant and accepting of people who are different from him.
- _____ 8. Donald Trump is tolerant of immigrants.
- _____ 9. Donald Trump is racially tolerant.
- _____ 10. Donald Trump is tolerant of Islam, Muslims, and people from the Middle-East.

- _____ 11. Donald Trump is respectful of women and treats women as equals.
- _____ 12. Donald Trump is tolerant toward gays, lesbians, and transsexual people.

[Demographics and political orientation]

Demographics

1.) What is your sex? _____ Male _____ Female 2.) Age? _____

3.) What is your ethnicity?
_____ Hispanic or Latino _____ Not Hispanic or Latino

4.) Is English your native language?
_____ Yes _____ No

5.) What is your race?
_____ 1. Caucasian _____ 4. Asian
_____ 2. African American/Black _____ 5. Native Hawaiian/Pacific
Islander
_____ 3. American Indian/Native Alaskan _____ 6. Other (specify):

6.) Please rate your political orientation:
1 2 3 4 5 6
Progressive Moderate Conservative

7.) How important to you is your political orientation?
1 2 3 4 5 6
Not at all Very important

8.) With which political party do you most strongly identify?
Democrat Republican Green Libertarian Constitution Other:

9.) How important to you is your political party?
1 2 3 4 5 6
Not at all Very important

10.) What religion or philosophy are you affiliated with, if any:
1. Christian 5. Hindu
2. Muslim 6. Atheist (I do not believe supernatural beings
exist)
3. Jewish 7. Spiritual (I believe supernatural beings exist,
but I do not follow a specific religion)
4. Buddhist 8. Agnostic (I'm not sure whether, or it's
impossible to know whether, supernatural beings exist)
9. Other: _____

11.) Please indicate the strength of your religious/philosophical belief:

1	2	3	4	5	6
Very Weak		Moderate			Very Strong

12.) 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.)

APPENDIX B

Pilot Study Methods and Results

Pilot survey: Method

Estimation of target sample size

Sample size planning was based on an a-priori power analysis (G*Power; Faul et al., 2009) for bivariate correlations, with power set to .80 for detecting an effect size of $|r| = .3$ (a medium effect size; vs. a null of $r = 0$) at $p = .05$; this analysis recommended a minimum of 84 participants.

Participants

A total of 382 participants were recruited via a research exposure program (Sona Systems). Nine participants discontinued the study immediately after signing the informed consent, and thus did not provide any data. A further 90 participants failed at least one of the two attention-check items included in the first page, indicating they were not attending to the content of the items; their data were thus excluded listwise. As seen in Table I, the remaining sample of 283 participants tended to be Christian, White, Non-Hispanic, college-age females.

Materials and procedure

The pilot survey was conducted with IRB approval. Data were collected online (Qualtrics); participants gave informed consent and then completed three survey pages in the following order.

Tolerance of diversity: Perceived public attention, personal attention, and interest. A composite mean of two items assessing perceived public concern for the values of diversity and tolerance in America ($r = .62, p < .001$) was computed. A

composite of two items assessing personal attention to the value of “being tolerant about race, religion, gender, and so on” ($r = .68, p < .001$) was computed. Six separate items assessed personal interest in being more tolerant and accepting of: others in general; immigrants and foreigners; Islam, Muslims, and people from the Middle-East; different races and ethnicities; women; and sexual minorities. Each item was scored on a 6-point Likert-type scale (1 = Strongly disagree, 6 = Strongly agree).

Impressions of President Donald Trump’s social attitudes. Two items each (one phrased positively, e.g., “...is tolerant of...” and one phrased negatively “...is intolerant of...”) assessed participants’ impressions of President Trump’s social attitudes on the six abovementioned dimensions. The 12 items were scored on a 6-point Likert-type scale (1 = Strongly disagree, 6 = Strongly agree) and presented in random order. Each of the two-item pairs were strongly negatively correlated indicating convergence: others in general ($r = -.60, p < .001$); immigrants and foreigners ($r = -.54, p < .001$); Islam, Muslims, and people from the Middle-East ($r = -.74, p < .001$); different races and ethnicities ($r = -.66, p < .001$); women ($r = -.81, p < .001$); and sexual minorities ($r = -.66, p < .001$). Each positively phrased item was therefore reverse-coded, and six composite measures were computed.

Demographics. Participants then completed a questionnaire recording age, sex, race, ethnicity, religious affiliation, political orientation, etc., and then were debriefed.

Pilot survey: Results

Table II presents the descriptive statistics and correlation matrix for the survey. Political orientation (1 = Progressive to 10 = Conservative) was normally distributed, and one-sample t-tests found that this sample ($M = 4.81, SD = 2.01$) was more progressive

than the political center (test value = 5.5; $t(274) = -5.73, p < .001, d = -.35$).

Participants overwhelmingly viewed President Trump as holding intolerant social attitudes. One-sample t-tests found that, compared to the center scores of 3.5 on each composite measure, participants rated President Trump as: being strongly intolerant of different others ($t(282) = 17.43, p < .001, d = 1.04$); racist ($t(282) = 14.52, p < .001, d = .86$); sexist ($t(282) = 19.64, p < .001, d = 1.17$); anti-Muslim ($t(282) = 21.06, p < .001, d = 1.25$); anti-LGBT ($t(282) = 15.33, p < .001, d = .91$); and anti-immigrant ($t(282) = 19.36, p < .001, d = 1.15$).

Participants also overwhelmingly indicated tolerance was a salient public value, and held those tolerant prosocial values themselves. One-sample t-tests found that, compared to the center scores of 3.5 on each measure, participants indicated they perceived strong public attention to diversity/tolerance ($t(282) = 12.18, p < .001, d = .72$) and strong personal attention to diversity/tolerance ($t(282) = 12.43, p < .001, d = .74$). They also reported strong interest in being more tolerant and accepting of: others in general ($t(282) = 14.83, p < .001, d = .88$); other races/ethnicities ($t(281) = 17.83, p < .001, d = 1.06$); women ($t(282) = 18.87, p < .001, d = 1.12$); Muslims ($t(281) = 15.67, p < .001, d = .93$); sexual minorities ($t(281) = 13.45, p < .001, d = .80$); and immigrants ($t(280) = 16.35, p < .001, d = .98$).

Table I

Demographic	Pilot Study	Primary Study
Age	19.65	19.83 (5.40)
Did not report	23	7
Sex		
Male	63	82
Female	219	123
Did not report	1	0
Ethnicity		
Hispanic or Latino	21	53
Non-Hispanic or Latino	259	150
Did not report	3	2
Race		
Caucasian	184	127
African American	58	51
Native American/Native Alaskan	4	2
Asian	8	5
Native Hawaiian/Pacific Islander	1	1
Other	27	17
Did not report	1	2
Religion		
Christian	165	117
Muslim	13	11
Jewish	1	1
Buddhist	2	1
Hindu	1	1
Atheist	13	13
Spiritual	43	27
Agnostic	35	27
Other	8	5
Did not report	2	2
Political orientation (1 = progressive, 10 = conservative)	4.81 (2.01)	4.81 (1.93)
Did not report	8	2
Years of education	12.74 (1.32)	12.99 (1.44)

Note. Sums and means are presented with standard deviations following means in parentheses.

Table II
Descriptive statistics and correlation matrix for the pilot survey.

Social values measure		M	SD	Skew (SE)	Kurtosis (SE)	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Perceived public attention to diversity/tolerance	4.45	1.31	-1.05 (.15)	.60 (.29)	.16*	.09	.05	.003	.02	-.002	.02	-.03	-.12	-.10	-.13	-.12	-.15	-.09
2	Personal attention to diversity/tolerance	4.46	1.30	-.80 (.15)	.11 (.29)		.58*	.56*	.58*	.61*	.57*	.58*	.20*	.20*	.21*	.22*	.26*	.22*	-.31*
3	Personal interest: General tolerance	4.68	1.34	-1.00 (.15)	.31 (.29)			.79*	.76*	.83*	.79*	.71*	.36*	.34*	.40*	.42*	.41*	.35*	-.36*
4	Personal interest: Accepting immigrants	4.78	1.31	-1.06 (.15)	.43 (.29)				.87*	.85*	.84*	.74*	.43*	.43*	.47*	.47*	.50*	.43*	-.39*
5	Personal interest: Accepting Islam/Muslims	4.74	1.33	-1.01 (.15)	.31 (.29)					.83*	.80*	.70*	.45*	.46*	.47*	.49*	.51*	.46*	-.42*
6	Personal interest: Accepting races/ethnicities	4.82	1.24	-1.14 (.15)	.88 (.29)						.85*	.75*	.42*	.41*	.44*	.45*	.49*	.42*	-.36*
7	Personal interest: Accepting women	4.91	1.26	-1.25 (.15)	.97 (.29)							.78*	.35*	.39*	.38*	.40*	.41*	.36*	-.37*
8	Personal interest: Accepting sexual minorities	4.67	1.46	-1.05 (.15)	.17 (.29)								.40*	.38*	.39*	.42*	.47*	.39*	-.45*
9	Trump: General Intolerance	4.74	1.20	-.83 (.15)	-.01 (.29)									.65*	.74*	.75*	.75*	.73*	-.53*
10	Trump: Anti-immigrant	4.86	1.18	-.89 (.15)	.12 (.29)										.71*	.75*	.61*	.64*	-.46*
11	Trump: Racist	4.61	1.29	-.74 (.15)	-.36 (.29)											.81*	.80*	.78*	-.47*
12	Trump: Anti-Muslim	4.92	1.13	-.98 (.15)	.23 (.29)												.74*	.73*	-.46*
13	Trump: Sexist	4.92	1.22	-1.16 (.15)	.65 (.29)													.76*	-.48*
14	Trump: Anti-LGBT	4.60	1.21	-.58 (.15)	-.58 (.29)														-.49*
15	Political orientation	4.81	2.01		-.22 (.29)														

Note. * $p < .05$. Items 1-14 scaled 1 = Strongly disagree, 6 = Strongly agree; political orientation 1 = Progressive, 10 = Conservative.

APPENDIX C

Primary Study Materials

[Manipulation #1: MS condition]

Policy Importance

Using the numbers 1-6, please RANK the importance of the following policy issues, in your personal opinion. Use each number only once.

- _____ Terrorism
- _____ War, or military intervention
- _____ Abortion
- _____ Gun control
- _____ Capital punishment
- _____ Illness, healthcare, health insurance

[Manipulation #1: Neutral condition]

Policy Importance

Using the numbers 1-6, please RANK the importance of the following policy issues, in your personal opinion. Use each number only once.

- _____ Trade regulation
- _____ Tax reform
- _____ Budget and economy
- _____ Energy and oil
- _____ Technology and infrastructure
- _____ Education

[Manipulation #2: Self-determination salience]

Projective Life Attitudes Assessment

Please briefly describe a time when you felt “self-determined,” meaning a time in which you felt you were doing things or acting a certain way simply because you wanted to; not because of any outside pressure.

[Manipulation #2: Controlled salience]

Projective Life Attitudes Assessment

Please briefly describe a time when you felt “controlled,” meaning a time in which you felt you were doing things or acting a certain way simply because of some outside pressure; not because you wanted to.

[Distractor task: PANAS]

For each item below, indicate to what extent you feel this way right now. Use the following scale.

1	2	3	4
5			
Very slightly extremely or not at all	a little	moderately	quite a bit
____ Interested Determined	____ Guilty	____ Irritable	____
____ Disinterested	____ Scared	____ Alert	____ Attentive
____ Excited	____ Hostile	____ Ashamed	____ Jittery
____ Upset	____ Enthusiastic	____ Inspired	____ Active
____ Strong	____ Proud	____ Nervous	____ Afraid

This scale consists of common perspectives on immigration. Please read each phrase and indicate the extent to which you agree or disagree with the phrase using the scale below:

Economic impact:

_____ 1. ... immigrants take jobs from American citizens.

_____ 2. ... immigration unfairly increases the labor force and drives down wages.

_____ 3. ... immigrants take advantage of our system (e.g., schools, healthcare, welfare) without paying into it (e.g., taxes).

_____ 1. ... immigrants help our economy by consuming American goods and services.

_____ 2. ... immigrants often start new businesses, creating jobs.

_____ 3. ... immigrants pay into our system (e.g., sales, payroll/income, property taxes) but are ineligible to take advantage of it (e.g., ineligible for welfare, food stamps, unemployment, social security).

_____ 1. ... we risk losing our uniquely American national, cultural, and religious identity.

_____ 2. ... immigrants often don't speak English.

_____ 3. ... immigration makes us vulnerable to incompatible cultural and religious beliefs.

_____ 1. ... immigrants bring diverse cultural beliefs, perspectives, and identities to our country.

_____ 2. ... immigrants often challenge us to rethink our traditional cultural values, perspectives, and beliefs.

_____ 3. ... immigrants often have new ideas about how to best participate in democracy, work hard, and raise families.

- _____ 1. ... immigrants are a potential risk to our national security.
- _____ 2. ... immigrants might bring infectious diseases.
- _____ 3. ... immigrants might increase violent crime rates.

_____ 1. ...immigrants often come to the US because they value safe neighborhoods for their families.

_____ 2. ... immigrants often contribute to national security via military service.

_____ 3. ... increased diversity can promote safety through understanding, tolerance, and peacefulness between groups (e.g., race, religion, ethnicity).

[Demographics and political orientation]

Demographics

1.) What is your sex? _____ Male _____ Female 2.) Age? _____

3.) What is your ethnicity?
 _____ Hispanic or Latino _____ Not Hispanic or Latino

4.) Is English your native language?
 _____ Yes _____ No

5.) What is your race? (check only one)
 _____ 1. Caucasian/White _____ 4. Asian
 _____ 2. African American/Black _____ 5. Native Hawaiian/Pacific
 Islander
 _____ 3. American Indian/Native Alaskan _____ 6. Other (specify):

6.) Please rate your political orientation:
 1 2 3 4 5 6 7 8 9 10
 Progressive Moderate Conservative

7.) How strongly do you identify with your political orientation, indicated in #6 above?
 (circle one)
 1 2 3 4 5 6 7 8 9 10
 Very Weak Moderate Very Strong

8.) With which political party do you most strongly identify? (circle one)
 Democrat Republican Don't know None Other

9.) How strongly do you identify with the political party indicated in #8 above? (circle one)
 1 2 3 4 5 6 7 8 9 10
 N/A
 Very Weak Moderate Very Strong

10.) Please indicate your religious affiliation, if any (please circle one):
 1. Christian 5. Hindu
 2. Muslim 6. Atheist (I do not believe supernatural beings exist)
 3. Jewish 7. Spiritual (I believe supernatural beings exist, but I do not follow a specific religion)
 4. Buddhist 8. Agnostic (I'm not sure whether, or it's impossible to know whether, supernatural beings exist)
 9. Other: _____

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

1	2	3	4	5	6	7	8	9	10
Very Weak				Moderate					Very Strong

12.) 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.)

APPENDIX D

Primary Study Results

Table III. Worldview defense (support for expanding vs. restricting immigration) mean, standard deviation, and n, in each condition of primary study.

	Controlled salience			Autonomy salience		
	M	SD	n	M	SD	n
Mortality salience	4.54	2.79	49	3.21	2.65	53
Neutral topics	3.17	3.29	48	3.62	3.14	55

APPENDIX E

Ancillary analyses: Further exploring effects on the immigration attitude subscales.

Support for restricting immigration. ANOVA methods were used to examine the 2 (MS vs. dental pain) x 2 (salience: autonomy vs. controlled) interaction on the nine-item composite measure of support for restricting immigration. However, there was no main effect of MS ($F(1, 201) = .52, \eta_p^2 = .003, p = .47$) nor autonomy prime ($F(1, 201) = .22, \eta_p^2 = .001, p = .64$), nor interaction, $F(1, 201) = 1.22, \eta_p^2 = .006, p = .27$. Similar analyses were conducted on each 3-item batch of economic, cultural, and security concern items.

Economic concern items. There was no main effect of MS ($F(1, 201) = .07, \eta_p^2 < .001, p = .80$) nor autonomy prime ($F(1, 201) = .69, \eta_p^2 = .003, p = .41$). However, there was a significant interaction, $F(1, 201) = 3.69, \eta_p^2 = .02, p = .056$. The nature of the interaction was examined using pairwise comparisons. In the controlled prime condition, agreement with economic reasons for restricting immigration were not statistically different in the MS condition than the neutral condition ($t(95) = -1.50, p = .14, d = -.29$ [95%CI = $-.68, .12$]). In the autonomy prime condition, agreement scores again did not statistically differ between the MS and neutral condition ($t(106) = 1.21, p = .29, d = .25$ [95%CI = $-.13, .62$]). From another perspective: in the neutral condition, agreement did not statistically differ between the controlled and autonomy condition ($t(101) = .77, p = .44, d = .15$ [95%CI = $-.24, .53$]). But when reminded of death, agreement was lower in the controlled condition than the autonomy condition ($t(100) = -1.94, p = .054, d = -.40$ [95%CI = $-.79, .00$]).

Cultural concern items. There was no main effect of MS ($F(1, 201) = .57, \eta_p^2 = .002, p = .57$) nor autonomy prime ($F(1, 201) = .14, \eta_p^2 = .001, p = .71$), nor interaction, $F(1, 201) = .02, \eta_p^2 < .001, p = .88$.

Security concern items. There was no main effect of MS ($F(1, 201) = .88, \eta_p^2 = .004, p = .35$) nor autonomy prime ($F(1, 201) < .001, \eta_p^2 < .001, p > .99$), nor interaction, $F(1, 201) = .43, \eta_p^2 = .002, p = .51$.

Support for expanding immigration. ANOVA methods were used to examine the 2 (MS vs. dental pain) \times 2 (salience: autonomy vs. controlled) interaction on the nine-item composite measure of support for expanding immigration. There was no main effect of MS ($F(1, 201) = 1.41, \eta_p^2 = .007, p = .24$) nor autonomy prime ($F(1, 201) = 1.57, \eta_p^2 = .008, p = .21$). However, there was a significant interaction, $F(1, 201) = 5.74, \eta_p^2 = .03, p = .018$.

The nature of the interaction was examined using pairwise comparisons. In the controlled prime condition, worldview defense was higher in the MS condition than the neutral condition ($t(95) = 2.47, p = .014, d = .50$ [95%CI = .09, .90]). In the autonomy prime condition, worldview defense did not statistically differ between the MS and neutral condition ($t(106) = -.89, p = .38, d = -.17$ [95%CI = -.55, .21]). From another perspective: when reminded of neutral topics, worldview defense did not statistically differ between the controlled and autonomy condition ($t(101) = .81, p = .42, d = -.15$ [95%CI = -.54, .24]). But when reminded of death, worldview defense was higher in the controlled condition than the autonomy condition ($t(100) = 2.57, p = .011, d = .56$ [95%CI = .16, .95]). We also examined the economic, cultural, and security concern

items.

Economic concern items. There was no main effect of MS ($F(1, 201) = 1.74, \eta_p^2 = .009, p = .19$) nor autonomy prime ($F(1, 201) = 3.37, \eta_p^2 = .02, p = .07$), nor interaction, $F(1, 201) = 2.65, \eta_p^2 = .01, p = .11$. In the controlled prime condition, worldview defense was higher in the MS condition than the neutral condition ($t(95) = 2.02, p = .044, d = .42$ [95%CI = .02, .82]). In the autonomy prime condition, worldview defense did not statistically differ between the MS and neutral condition ($t(106) = -.22, p = .82, d = -.04$ [95%CI = -.42, .34]). From another perspective: when reminded of neutral topics, worldview defense did not statistically differ between the controlled and autonomy condition ($t(101) = .15, p = .88, d = .03$ [95%CI = -.36, .41]). But when reminded of death, worldview defense was higher in the controlled condition than the autonomy condition ($t(100) = 2.45, p = .02, d = .52$ [95%CI = .13, .92]).

Cultural concern items. There was no main effect of MS ($F(1, 201) = .59, \eta_p^2 = .003, p = .44$) nor autonomy prime ($F(1, 201) = .001, \eta_p^2 < .001, p = .98$), nor interaction, $F(1, 201) = 3.34, \eta_p^2 = .02, p = .07$. In the controlled prime condition, worldview defense was higher in the MS condition than the neutral condition ($t(95) = 1.79, p = .075, d = .36$ [95%CI = -.05, .76]). In the autonomy prime condition, worldview defense did not statistically differ between the MS and neutral condition ($t(106) = -.77, p = .44, d = -.15$ [95%CI = -.53, .23]). From another perspective: when reminded of neutral topics, worldview defense did not statistically differ between the controlled and autonomy condition ($t(101) = -1.27, p = .20, d = -.25$ [95%CI = -.64, .14]). But when reminded of death, worldview defense was higher in the controlled condition than the autonomy condition ($t(100) = 1.31, p = .19, d = .26$ [95%CI = -.13, .65]).

Security concern items. There was no main effect of MS ($F(1, 201) = .70, \eta_p^2 = .003, p = .40$) nor autonomy prime ($F(1, 201) = 2.80, \eta_p^2 = .01, p = .10$). However, there was a significant interaction, $F(1, 201) = 7.14, \eta_p^2 = .03, p = .008$. In the controlled prime condition, worldview defense was higher in the MS condition than the neutral condition ($t(95) = 2.41, p = .017, d = .50$ [95%CI = .09, .90]). In the autonomy prime condition, worldview defense did not statistically differ between the MS and neutral condition ($t(106) = -1.33, p = .18, d = -.25$ [95%CI = -.63, .13]). From another perspective: when reminded of neutral topics, worldview defense did not statistically differ between the controlled and autonomy condition ($t(101) = -.70, p = .48, d = -.13$ [95%CI = -.52, .26]). But when reminded of death, worldview defense was higher in the controlled condition than the autonomy condition ($t(100) = 3.07, p = .002, d = .66$ [95%CI = .26, 1.05]).

Table IV

Results of the MS x Autonomy MANOVA model on the PANAS subscales in primary study.

MS main effects	df	<i>F</i>	<i>p</i>	η_p^2
Positive mood	1, 201	.60	.44	.003
Negative mood	1, 201	.01	.92	< .001
Autonomy main effects	df	<i>F</i>	<i>p</i>	η_p^2
Positive mood	1, 201	.24	.62	.001
Negative mood	1, 201	.03	.86	< .001
Interaction effects	df	<i>F</i>	<i>p</i>	η_p^2
Positive mood	1, 201	.02	.89	< .001
Negative mood	1, 201	.04	.84	< .001