

CULTURAL COGNITION:
THE EPISTEMIC FUNCTION OF WORLDVIEWS

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THE EPISTEMIC FUNCTION OF WORLDVIEWS

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TABLE OF CONTENTS

Acknowledgements	iii
List of Tables	v
Abstract	vi
Introduction	7
Terror Management Theory	8
Cultural Worldviews	9
Terror Management & Cognitive Activity	12
Present Studies	14
Pilot Study	15
Study 1	21
Methods	21
Results	23
Discussion	26
Conclusion	30
References	32
Appendix	44

List of Tables and Figures

iv

Tables	Page
1. Sample descriptive characteristics	40
2. Bivariate correlations among study variables	40
Figures	
1. The effect of threat and dogmatism on death-thought accessibility	41
2. The effects of mortality salience and worldview information on need for cognition	42
3. The effects of mortality salience and dogmatism on need for cognition	43

THE EPISTEMIC FUNCTION OF WORLDVIEWS

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ABSTRACT

Cultural worldviews – shared, symbolic systems of meaning that render life interpretable – provide a great deal of knowledge about the world. Thus, the validity of one’s worldview may affect the need to think. The present study ($n = 431$) used a 2(mortality salience vs. control) x 3(worldview threat vs. worldview affirmation vs. control) design to examine the tendency to engage in critical thinking from a terror management perspective. It specifically addressed whether, when reminded of mortality or not, threatening and affirming cultural worldviews would affect need for cognition. The result provided partial support for the hypotheses. In contrast to predictions, when death was made salient, whether one’s worldview was affirmed or threatened had no effect on need for cognition. Conversely, when death was not made salient, a worldview threat led to higher need for cognition than both a worldview affirmation and neutral stimuli. Though limited, the present study contributes to our knowledge on the epistemic function of worldviews.

Cultural Cognition: The Epistemic Function of Worldviews

“We think, therefore we know we are alive and will one day die; so we had better stop thinking” – Thomas Ligotti

In an open letter published in August 2017, fifteen Ivy League professors urged new college students to “think for [themselves]” in a time when it is “all-too-easy” to submit to “conformism” and “groupthink” (Bloom et al., 2017). Underlying the letter’s thesis seems to be the recognition that people often avoid engaging in thinking. In colloquial terms, people often run on auto-pilot. What are the motivational forces that underlie such tendencies? Advanced cognitive capability is one of humanity’s distinguishing characteristics; why would we need to be reminded to think?

There are diverse areas of research that inform the present question. A large body of work (e.g. Kahneman & Tversky, 1972) shows that heuristics – inferential shortcuts that reduce ambiguity by allowing for quick answers to potentially complex questions (Nisbett, Krantz, Jepson, & Kunda, 1983; Landau et al., 2004) – are used to conserve cognitive resources. These mechanisms reduce cognitive effort, which facilitates efficient functioning in a world of seemingly infinite complexity.

While heuristics research shows the cognitive mechanisms that reduce thinking, other lines of research inform the motivational forces underlying this phenomenon. As a few examples, conformity research (e.g. Asch, 1956) suggests that pressures to fit in with a group lead people to rely on group, rather than personal, judgements when making decisions. Janis’ groupthink research also suggests that people often forgo critical thinking in order to bolster group cohesion (1971). Lay epistemic theory (Kruglanski, 1989; Kruglanski, Orehek, Dechesne, & Pierro, 2010) claims that since knowledge

formation is an inherently indefinite process, a need for cognitive closure allows for efficient judgements that conserve cognitive effort. Although these and other perspectives have generated considerable insight into why people may avoid thinking, for the most part these perspectives do not directly consider how existential concerns can lead to the avoidance of thinking. An existential perspective may offer clarifying insights on the motivational forces that underlie thinking and not thinking. Indeed, existential concerns and cognition go hand in hand; humans are only vulnerable to existential concerns because of the cognitive capacities (e.g. self-awareness) that render the realization that death is inevitable. Informed by terror management theory, the present study examined the potential role of underlying existential psychodynamics in the avoidance of thoughts; specifically, whether people's awareness of death motivates the adoption and affirmation of cultural beliefs that can discourage cognitive activity.

Terror management theory

The fear of death, wrote cultural anthropologist Ernest Becker, "haunts the human animal like nothing else; it is a mainspring of human activity" (1973). Inspired by his ideas on how people manage this fear, terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) builds from the recognition that humans are aware of death's inevitability. The tension between this awareness, and the evolutionarily advantageous predilection for life, can create existential terror. To manage this terror, people construct and engage in cultural worldviews, defined as systems of shared, symbolic beliefs about how the world is and how it ought to be. These make reality seem coherent, stable, and meaningful (Hayes, Schimel, Arndt, & Faucher, 2010), which allows people to effectively maneuver in and manipulate their environment in order to

achieve desired outcomes. Cultural worldviews (henceforth, simply worldviews) also prescribe avenues for the attainment of self-esteem. Together, worldviews and self-esteem manage existential terror by convincing the individual of their worth as valuable members of a coherent, purposeful, and enduring world (Greenberg et al., 1992).

A wide body of empirical research supports this claim. First, hundreds of studies conducted in a variety of countries have found that after thinking about death (mortality salience; MS), people defend more resolutely their worldview (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989; for a review see Pyszczynski, Solomon, & Greenberg, 2015). For example, after writing about their own death, judges became more punitive towards an alleged prostitute (Rosenblatt et al., 1999) and Christians became more negative towards Jews (Greenberg et al., 1990). Second, a number of studies demonstrate that affirming one's worldview reduces defensiveness following MS. In one example of this, Jonas and Fischer (2006) found that those who previously affirmed their religious beliefs did not display heightened worldview defense following MS. Third, threatening one's cultural values increased the extent to which thoughts related to death are activated or accessible, i.e. death-thought accessibility (DTA; Schimel, Hayes, Williams, & Jahrig, 2007). These three lines of research converge on the idea that worldviews mitigate thoughts of death, and when threatened, leave the individual vulnerable to existential concerns.

Cultural worldviews

While most terror management research on worldviews has focused on their prescriptive features – that is, morals and norms – less explicit attention has been paid to their descriptive elements, which may have implications for understanding people's

propensity to think. Worldviews provide ontological, epistemological, social, and existential knowledge. As elucidated by Alfonso Ortiz, worldviews “tell me who I am, where I came from, the boundaries of my world, what kind of order exists within it...and what is likely to happen to me when I die” (1991, p. 7).

Is reality solely physical or do immaterial objects exist? How one answers this ontological question forms the basis of one’s worldview (Koltko-Rivera, 2004). While religious worldviews typically accept the existence of immaterial entities (e.g. god, angels, spirits, etc.), secular worldviews usually do not (Stoljar, 2017). In this way, we can see how worldviews, which contain ontological beliefs, answer deep questions about the nature of being.

Worldviews also inform epistemological questions. For example, while Western epistemology typically assumes that knowledge must be obtained through direct sensory experience or logical deduction, Indigenous epistemologies generally accept that knowledge can be acquired through historical and cultural memory (e.g. Carroll, 2014). Thus, worldviews influence knowledge formation and reasoning. They also inform which types of knowledge are valued. For example, while medieval scholastics may have pondered the number of angels that can dance on the head of a pin¹, this would be of no use to those who hold a different worldview. Therefore, worldviews inform *how* to acquire knowledge and *what* type of knowledge is acquired.

Worldviews also provide information on how to act in social situations. Perhaps the most widely studied cultural difference in social behavior is whether one has a collectivistic or individualistic worldview (Markus & Kitayama, 1991; Koltko-Rivera,

¹ Mentioned, perhaps rhetorically, by Thomas Aquinas

2004). Compared to individualists, collectivists typically cooperate at higher rates in social dilemmas (Parks & Vu, 1994) and display less antisocial reactions to social exclusion (Pfundmair, Graupmann, Frey, & Aydin, 2015). Information on how to behave in various social situations is afforded by one's worldview.

Finally, as mentioned above, worldviews provide information on where we came from and what happens after we die. Nearly all religions have creation myths (Johnston, 2009). Secular worldviews can also have their own mythology; many scholars have examined how American creation myths continue to shape national discourse (e.g. Paul, 2014). The creation myths contained within worldviews inform present life; people understand their place in the world by where they came from. Worldviews also provide information on what to expect after death: either literal or symbolic immortality (Dechesne et al., 2003; Florian & Mikulincer, 1998; Lifton, 1979). In the words of Ernest Becker, echoing others in the existential psychoanalytic tradition such as Otto Rank and Norman O. Brown, worldviews are “immortality formula[s]” (1973, p. 255) by which is secured continued existence beyond the grave.

Taken together, worldviews provide answers to important and challenging questions – from what exists to what is true to what happens after we die. Much like schemas and heuristics, worldviews guide people's interpretation, action, and, indeed, thinking (see Koltko-Rivera (2004) for an elaboration on the idea of worldviews as schemas). Critically, this suggests that if worldviews are providing information, or “thinking”, for people, then it follows that threatening a person's worldview might increase the need to think for oneself whereas affirming the worldview might decrease such needs. This proposed study will examine these possibilities.

Terror management and cognitive activity

The first part of the analysis suggests that reminders of death will increase the motivation to achieve epistemic certainty. Because people often increase epistemic certainty through the use of heuristics, reminders of death should increase reliance on heuristics. Prior research is consistent with this idea. Reminders of death have been found to increase reliance on the representative heuristic (Landau et al., 2004), stereotyping (Schimel et al., 1999), and just world beliefs (Hirschberger, 2006). These mechanisms lend themselves to the maintenance of simple, coherent, and meaningful knowledge, which can alleviate existential concerns, but critically, might also reduce the need to engage in further cognitive activity.

Bridging the link between existential concerns and cognitive activity, heuristics are associated with reduced cognition in a number of ways. First, on a conceptual level, heuristics conserve cognitive activity by reducing complexity. They allow for quick judgements that, while prone to systematic error, are often useful (Tversky & Kahneman, 1974). It follows then that people use heuristics more often when under cognitive load (e.g. Roch, Lane, Samuelson, Allison, & Dent, 2000). Taken together, these findings are consistent with the idea that existential concerns increase reliance on cognitive structures, of which worldviews are one example, which in turn decreases cognitive engagement.

While the aforementioned research does not directly measure desire for cognitive activity, in the most direct assessment, Jimenez and Arndt (in preparation) randomly assigned participants to either write about death or a control topic and, after a brief delay, measured need for cognition. Need for cognition (Cacioppo, Petty, & Kao, 1984) refers to the tendency to enjoy and engage in thinking. Participants reminded of mortality

reported significantly less need for cognition than those in the control condition. There are a number of potential explanations for this effect. For example, it may be that, consistent with this paper's epigraph, reminders of mortality motivated an effort to escape cognition more generally because the thought of death was disturbing. It may also be that when reminded of mortality, many participants intuitively turned to or activated their worldviews (Arndt, Greenberg, & Cook, 2002), which in turn might, as previously explained, have led to reduced interest in thinking. If this possibility is correct, one might expect to see such reduced desire for cognitive activity primarily among those who have an informative and available worldview to which they could turn.

This possibility is informed by recent findings from Vail and colleagues. Vail et al. (in preparation) ran a series of studies examining the connection between death reminders, religious worldviews, and critical thinking. First, they found that MS reduced need for cognition only among religious participants. Interestingly, non-religious participants exhibited the opposite effect; following MS they indicated higher need for cognition. Perhaps reminders of death called into question epistemic certainty, which would lead to the activation of the worldview-relevant cognitions that provide a veritable treasure trove of information that can serve, in part, to regain epistemic certainty. To the extent that religion provides an informative and available worldview, it is expected that those who turned to a religious worldview to be more epistemically satisfied, which would reduce the need to think independently. Conversely, those who did not have an (as readily) available and informative worldview (i.e. religion) would have increased their desire for cognitive activity as a way to recover epistemic security. Consistent with this interpretation, Vail and colleagues also found that MS led to increased religious faith

among Christian participants. However, MS did not increase religious faith when Christians were primed with analytic thinking. Participants not instructed to think critically may have looked to their religious worldview to do the “thinking” for them, resulting in increased faith. However, priming participants with analytic thinking may have disrupted epistemic reliance on religion.

Present Studies

Taken together, the findings from Jimenez and Arndt, and Vail and colleagues, suggest that mortality reminders can reduce desire for cognitive activity, and this may be especially the case for those who have a particularly available belief system such as religion. Although the literature could be viewed as consistent with the idea that affirming worldviews in response to reminders of mortality reduces the desire to think, this hypothesis has yet to be tested directly. Such is the purpose of the present study. Specifically, if mortality concerns cause engagement with worldviews that minimize the tendency to engage in cognitive activity, then affirming one’s worldview should decrease need for cognition. As argued throughout this paper, worldviews provide information about many aspects of life. As such, an affirmation of one’s worldview should reinforce the vast knowledge that it provides. This would secure epistemic certainty, and thus reduce the need to think for oneself. Conversely, threatening one’s worldview, particularly when mortality is salient, should question the validity of its information. When the validity of one’s worldview is threatened, people should feel epistemically insecure. In order to regain this security, people should show increased desire for cognitive activity.

To test these hypotheses, this study examined how reminders of death interacted with worldview-affirming and worldview-threatening information to influence desire for cognitive activity. With this goal, it was first necessary to identify a manipulation that could be used to threaten and affirm participants' (religious) worldview.

Pilot Study

Before testing the effects of worldview threats and affirmations on need for cognition, viable manipulations had to be determined. Initially, four threat-affirmation pairs (described below) were created and tested for their potential influence on the strength of one's religious faith and death-thought accessibility. For this pilot study, 211 Christian participants were recruited from Mturk to complete a brief survey in exchange for \$0.30. Using a feature of TurkPrime (Litman, Robinson, & Abberbock, 2017), the study was only made available for those who answered "Christianity" to the question "Which religion best describes your religious beliefs/practices?" on their Mturk account. After reading and agreeing to the informed consent form, participants completed a series of individual difference measurements intended to distract from the purpose of the study or potentially moderate the effect of condition. Next, participants were randomly assigned to complete a brief task intended to either threaten or affirm their religious beliefs (described below). Following this manipulation, they answered a number of face-valid questions about the strength of their religious faith, as well as a measure of a consequence of worldview threat (i.e. death-thought accessibility). Finally, they completed demographic questions and were debriefed.

Materials

Social desirability. The tendency to respond on surveys in socially desirable ways was measured using an 11-item short form of the Marlowe-Crowne Social Desirability Scale ($\alpha = .77$) (Reynolds, 1982; Strahan & Gerbasi, 1972). This was primarily included to distract participants from the primary purpose of the study. However, due to the potentially socially desirable nature of the outcome measurement, it was also included as a covariate in the analyses.

Religious fundamentalism. Belief in the absolute truth of Christianity was measured using the 12-item Revised Religious Fundamentalism Scale ($\alpha = .96$; Altemeyer & Hunsberger, 2004). Scored on a scale of 1 (*completely disagree*) to 9 (*completely agree*), sample items include “To lead the best, most meaningful life, one must belong to the one, true religion” and “The basic cause of evil in the world is Satan, who is still constantly and ferociously fighting against God”.

Dogmatism. Commitment to one’s beliefs, even in the face of contradictory evidence, was measured with 10 items scored on a scale of 1 (*completely disagree*) to 9 (*completely agree*). Sample items include “I am so sure I am right about the important things in life, there is no evidence that could convince me otherwise” and “People who disagree with me are just plain wrong and often evil as well” ($\alpha = .89$; Altemeyer, 2002).

Worldview-affirmation and threat – Possibility 1. The first threat-affirmation pair consisted of a brief passage that participants were asked to read and respond to. The threat passage described the theology of Paul Tillich, a well-known Christian existentialist philosopher. Tillich’s unconventional Protestantism opposed religious literalism, instead maintaining the spirituality must be understood symbolically. The passage argued that “any serious person will understand” that “God, Jesus, heaven, and

miracles do not exist”. The affirmation passage, of similar length, format, and tone, conversely argued that these religious concepts “are not only true, but help people live better, happier lives”.

Worldview-affirmation and threat – Possibility 2. The second threat-affirmation pair consisted of adapted versions of widely used essays (e.g. Goldenberg et al., 2001) that compare humans and other animals. The threat essay emphasized the similarities between humans and other animals, arguing that “human beings are just another species of animals, maybe a little more intelligent than others, but not different in any really important or meaningful way”. The affirmation essay focused instead on the differences between humans and other animals, contending that “although we certainly have some things in common with simple animals, we humans are truly special and unique”. Inducing the feeling that people are animal-like (i.e. creaturely) was expected to threaten Christian beliefs, given that, particularly fundamentalist, religious beliefs are a strong predictor of rejecting that humans evolved from other animals (e.g. Mazur, 2005).

Worldview-affirmation and threat – Possibility 3. The amount of effort required to recall information qualifies its implications. For example, if recalling an example of a past time in which one acted assertively is judged to be difficult, this implies that one must not be so assertive after all. After all, if someone was assertive it would surely be easy to recall times in which they acted as such. This seemingly straightforward claim leads to the perhaps counterintuitive finding that the degree to which a person perceives themselves of having a personality trait is inversely related to the number of instances they are asked to recall in which this trait is displayed. Schwarz et al. (1991) found that participants who recalled 12 examples of times in which they

acted assertively perceived themselves as less assertive than those who recalled only 6 examples. Apparently, recalling 12 examples was more difficult than recalling 6, which led people to conclude that they must be relatively unassertive. Consistent with this explanation, difficulty of the task was negatively correlated with self-perceived assertiveness.

Adaptations of this task have been shown to influence perceptions of memory (Winkielman, Schwarz, & Belli, 1998), health risk assessments (Rothman & Schwarz, 1998), and, more germane to the present purpose, certainty of beliefs. In the latter example, Haddock, Rothman, Reber, & Schwarz (1999) found that, when generating arguments against their beliefs about physician-assisted suicide, people maintained their beliefs with more certainty when asked to list 7, rather than 3, examples. Recalling few counterarguments with relative ease led people to perceive their beliefs as less secure than those struggling to generate more counterarguments. This was particularly the case for those with moderate attitudes; the recall task did not affect the certainty of those with more extreme views.

Adapting this task to worldview-affirmation and threat, participants, all of whom were religious, were asked to recall, either 8 or 2 instances, respectively, in which their religious beliefs were threatened. It was expected that the difficulty experienced in generating these instances would be related to certainty of religious belief. Presumably, recalling 8 examples of times in which one's religious beliefs were threatened would be more difficult than recalling 2 examples, which informs the individual that their religious beliefs are (relatively) more secure. Although recall tasks have not been used previously to threaten or affirm worldviews, religious or otherwise, they have been used to

manipulate existential processes such as the perception that one is living up to cultural standards (Rogers, Vess, Routledge, & Juhl, 2015).

Worldview-affirmation and threat – Possibility 4. The final threat-affirmation pair consisted of a brief task in which the participant read a description of an individual with lung disease. In the affirmation condition, the individual refused medical care on faith-based grounds; “I know that my prayers are the best medicine available to me”. In the threat condition, the individual opted for surgery, acknowledging that “faith will simply not be enough to carry me through”. To improve the chances that participants would identify with the individual in their respective passages, they were asked to write a couple of sentences from the perspective of the individual in the passage.

Religious faith. Five face-valid questions were included to gauge the intensity of religious faith. These included items such as “To what extent did the previous task make you question your faith?” and “At the moment, how strong is your faith?”. These were answered on a scale of 1 (*not at all*) to 7 (*completely*).

Death-thought accessibility. The ease at which death-related thoughts were accessible was assessed using the paradigmatic word completion task (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994; Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997; see also Hayes, Schimel, Arndt, & Faucher, 2010 and Steinman & Updegraff, 2015 for a review) . Participants are presented with a series of word fragments, six of which can be completed with either a death-related or more benign word and asked to complete the fragment with the first word that comes to mind. For example, D E _ _ could be completed as DEAD or DEAR. Death-thought accessibility is

computed by summing the number of these six fragments that were completed with death-related words.

Results

Each of the threat-affirmation pairs were compared for their possible differences on religious faith and death-thought accessibility. Although there were no main effects of any pairs, or interactions with individual differences, in religious faith (all $ps > .53$), the third threat-affirmation pair interacted with dogmatism to affect death-thought accessibility ($b = .24$, $SE(b) = .10$, $t(201) = 2.51$, $p = .01$, $(CI) = [.05, .43]$). When looking at the predicted means (Figure 1), those high (+1 SD) in dogmatism displayed higher death-thought accessibility after recalling 2, as compared to 8, instances which threatened their religious faith. Interestingly, those low (-1 SD) in dogmatism showed the opposite, albeit only marginally significant pattern; death-thought accessibility was *lower* in the threat condition (i.e. recall 2 examples) than in the affirm condition (i.e. recall 8 examples).

The results of the pilot study indicate that, for those who strongly endorse religious dogmatism, recalling 2 (as compared to 8) instances which threatened their religious beliefs led them to report heightened death-thought accessibility. It is worth noting that no effects were found for self-reported strength of religious faith. This could indicate that the manipulations did not have their intended effects. However, given that effects on death-thought accessibility were found, it seems reasonable to conclude that the manipulations affected, perhaps on a non-conscious level, the perceived validity of their religious beliefs. For this reason, the third threat-affirmation pair was chosen for use in the main study.

Study 1

Method

Sample²

A power analysis conducted on G*Power, with input parameters of effect size = 0.2, alpha = 0.05, power = 0.8, numerator df = 11, and groups = 6 revealed a requisite sample size of 430. The effect size used in the power analysis was derived from a conservative estimate of the mean effect size found in terror management studies which utilize non-college samples (Burke, Martens, & Faucher, 2010). Consistent with broader Mturk demographics, the sample was majority White (79%) and female (64%), with an average age of 44.89 ($SD = 13.17$).

Procedure

After enrolling in the study and providing informed consent, participants completed a series of individual difference measures intended to distract from the purpose of this study as well as measure potential moderating variables. Following this, they were randomly assigned to one of six conditions in a 2 (mortality salience vs. control) X 3 (worldview-affirmation vs. worldview-threat vs. control) between-subjects design. Finally, they completed a measure of need for cognition, demographics, and were given debriefing information.

Study Materials

Complete study materials are included in the Appendix. Measures of religious fundamentalism and dogmatism were included using the same materials as in the pilot study.

² While an ideal study would recruit participants of any religious affiliation and include religion as a factor, due to limited resources only Christians were recruited.

Belief in hell. The extent to which one believes in Hell was assessed using the Single Item Hell Scale (SIHS; Bushman, Lueke, Lueke, & Ferguson, 2018), which asks “What percentage of the world’s population do you think will be damned to hell?”. Disbelief in Hell can be indicated by either choosing 0% or by choosing the response option “N/A: I don’t believe in hell”. The raw percentage of humanity believed to be destined for everlasting punishment is correlated with general religiosity, frequency of church attendance, political conservatism, and authoritarianism.

Mortality salience. Participants were randomly assigned to either mortality salience or control conditions. Mortality salience was induced using the paradigmatic manipulation in which participants respond to two open-ended questions about their own death: “briefly describe the emotions that the thought of your own death arouses in you” and “write down, as specifically as you can, what you think happens to you when you physically die and once you are physically dead” (Rosenblatt et al., 1989). Those in the control condition received similar questions about dental pain rather than death. While some researchers have suggested using neutral control topics for purposes of examining affective implications of the manipulation (Lambert et al., 2014), an aversive topic is used for the control condition to determine if potential effects are due to thoughts of death or unpleasant cognitions more generally.

Worldview information. As explained in the pilot study, worldview-threat and -affirmation was manipulated by asking participants to recall, either 2 or 8 instances, respectively, in which their religious faith was threatened. A neutral task was also included so as to be able to determine the direction of the effect of the manipulation on

need for cognition. The neutral task asked participants to recall a small number of memorable experiences from the past month.

Need for cognition. The tendency to engage in and enjoy thinking was assessed using the 18-item abbreviated Need for Cognition scale (Cacioppo, Petty, & Kao, 1984). Items included “I would prefer complex to simple problems” and “I find satisfaction in deliberating hard and for long hours” (1 = *strongly disagree*, 9 = *strongly agree*) ($\alpha = .95$). As this scale is intended to capture trait, as opposed to state, levels of need for cognition, modified language instructed participants to respond to these questions based on their feelings at the present moment.

Demographics. Participants answered a number of demographic questions pertaining to age, gender, race, income, political orientation, and religion. There were no specific predictions for any of these demographic variables (see Table 1 for descriptive statistics on demographic variables).

Results

Preliminary analyses.

Before the analyses were conducted, the data were cleaned and inspected. First, the distribution of fundamentalism and dogmatism was checked for normality using Kolmogorov-Smirnov tests. Although dogmatism adhered to a normal distribution, fundamentalism did not and was subsequently transformed. The following analyses were conducted using the transformed fundamentalism variable. Finally, the reliabilities of all measurements were tested and found to be satisfactory (all α s > .77). The bivariate correlations between all study variables are presented in Table 2.

Main analyses.

To test the potential interactive effects of mortality salience and worldview threat on need for cognition, a 2 (mortality salience vs. control) X 3 (worldview-affirmation vs. worldview-threat vs. control) ANOVA was conducted. This returned a marginally significant interaction $F(2, 425) = 4.83, p = .051, \eta^2 = .014$ (see Figure 2), with no main effects (both $ps > .18$). A Breusch-Pagan test confirmed a homoscedastic distribution of error terms.

To further examine this interaction, one-way ANOVAs were conducted for the effect of worldview threat on need for cognition within both the mortality salience and control conditions. When mortality was made salient, there was no difference in need for cognition between the three worldview-relevant conditions $F(2, 214) = .86, p = .43, \eta^2 = .01$. However, a marginally significant effect emerged when mortality was not made salient $F(2, 211) = 2.45, p = .09, \eta^2 = .02$. Specifically, need for cognition was higher in the worldview-threat ($M = 4.91, SD = 1.30, (CI) = [4.60, 5.22]$) condition than both the worldview-affirmation ($M = 4.50, SD = 1.24, (CI) = [4.22, 4.78], p = .053$) and control ($M = 4.49, SD = 1.27, (CI) = [4.19, 4.79], p = .055$) conditions, which did not differ from each other ($p = .97$).

Exploratory Covariate Analyses

Given the potentially socially desirable nature of the dependent variable (i.e. propensity to think), an ANCOVA analysis probed whether controlling for social desirability would minimize the above effect. Including social desirability in the model led to little substantive change in the interaction between mortality salience and worldview information on need for cognition $F(2, 424) = 2.67, p = .07, \eta^2 = .01$.

Further, religious dogmatism was negatively associated with need for cognition. To minimize the variability associated with individual differences in dogmatism, an ANCOVA was conducted controlling for dogmatism. Including dogmatism in the model strengthened the interaction between mortality salience and worldview information $F(2, 400) = 4.95, p = .01, \eta^2 = .02$, though did not alter the previously described pattern. In the control condition, the worldview condition significantly affected need for cognition $F(2, 195) = 3.43, p = .03, \eta^2 = .03$. Specifically, need for cognition was higher in the threat condition ($M = 4.93, SD = 1.28, (CI) = [4.63, 5.26]$) than in both the affirm ($M = 4.52, SD = 1.23, (CI) = [4.25, 4.80], p = .05$) and neutral conditions ($M = 4.40, SD = 1.27, (CI) = [4.07, 4.68], p = .01$), which did not differ from each other ($p = .49$). Again, in the mortality salience condition, no differences in need for cognition emerged between any of the worldview-relevant conditions $F(2, 204) = 1.64, p = .20, \eta^2 = .02$.

Exploratory Moderation Analyses.

To test for interactions between the independent variables (i.e. mortality salience, worldview threat) and potential (mean-centered) moderating variables, a series of regression analyses were conducted using the PROCESS macro in SPSS (Hayes, 2012). These revealed no three-way interactions involving fundamentalism, dogmatism, nor belief in Hell (all $ps > .26$).

These analyses also revealed that neither fundamentalism ($b = .07, SE(b) = .06, t(412) = 1.20, p = .23, (CI) = [-.05, .19]$) nor belief in Hell ($b = .01, SE(b) = .004, t(428) = 1.50, p = .14, (CI) = [-.002, .02]$) moderated the effect of mortality salience on need for cognition.

However, a marginally significant interaction emerged between mortality salience and dogmatism ($b = .13$, $SE(b) = .08$, $t(407) = 1.59$, $p = .11$, $(CI) = [-.03, .28]$) (Figure 3). Using predicted means to unpack this interaction shows that, in the control condition, those low in dogmatism exhibited higher need for cognition than those high in dogmatism ($p = .002$). This difference did not emerge following mortality salience ($p = .31$). Further, while need for cognition did not differ between the mortality salience and control conditions among those high in dogmatism, a (marginal) difference did emerge between conditions among those low in dogmatism. Specifically, need for cognition was (marginally) lower in the mortality salience (as compared to control) condition ($p = .08$). In addition, further analyses revealed that the effect of worldview threat on need for cognition was not moderated by fundamentalism, dogmatism, nor belief in hell (all $ps > .17$).

Discussion

The present study examined the existential processes that contribute to the desire to engage (or not) in cognitive activity. If, in the process of helping people to manage awareness of mortality, worldviews "think", so to speak, for people, then threatening them may motivate a desire to think, perhaps to regain the previously threatened perception of epistemic security. Conversely, affirming one's worldview should have the opposite effect, reducing the desire to think by bolstering certainty. These were the ideas tested in the present study.

The results were somewhat consistent with the hypotheses, though certainly not without limitation and nuance. Perhaps most surprisingly, effects seemed to emerge in the absence, but not presence, of reminders of mortality. Specifically, when not asked to

reflect on their own mortality, participants who recalled two times in which their religious beliefs were threatened reported higher need for cognition than those who recalled eight examples and those who completed a neutral task. This result is consistent with the guiding hypothesis that threatened worldviews would motivate cognitive engagement.

There are thus two facets of the hypotheses that can be considered further in light of the unpredicted results. The first is the lack of differences between what was intended to be the affirmation condition and control condition. As explained earlier, the affirmation consisted of recalling eight experiences of religious doubt. Recalling eight examples was presumed to be difficult and would thus lead the individual to conclude that their faith was secure. However, it is possible that this did not affirm religious beliefs *per se*, but rather was merely *less* threatening than the “threat” condition. Indeed, those in the affirmation condition still thought about spiritually challenging events, which may be inherently threatening. Thus, it is possible that a stronger affirmation would reduce need for cognition.

The second aspect of the hypotheses that was not supported, and thus warrants further attention, is that the worldview-relevant manipulations showed no effect on need for cognition when mortality was made salient. There are a number of possibilities as to why this was the case. First, it is possible that mortality salience and worldview threat motivate conflicting drives for cognitive engagement. Previous studies have shown that mortality salience can lead to decreased need for cognition (Jimenez & Arndt, in preparation; Vail et al., in preparation). Further, in the present study, in the absence of mortality salience, worldview threat led to increased need for cognition. These two

findings suggest that the existential concerns of death and worldviews can differentially affect cognitive engagement. However, this possibility does not explain why there was no difference in need for cognition between the mortality salience-control condition and the physical pain-control condition, as found in previous studies. In this light, it may be useful to consider the role of consciousness in the management of death-related thoughts. Terror management research tends to find two distinct defensive processes used to manage mortality concerns: proximal and distal (e.g., Pyszczynski, Greenberg, & Solomon, 1999). When death-related thoughts are at the focal point of attention, people utilize proximal defenses which either distract from the thought of or deny one's vulnerability. For example, immediately following a reminder of death, people may respond by planning to improve their health (which pushes death into the future) or convincing themselves that death is not an immediate concern. These defensive strategies, which are logically and/or semantically related to the problem of death, push death-related cognitions out of conscious awareness. When this occurs, distal defenses such as the typical terror management processes of self-esteem and worldview defense, are activated, which manage non-conscious death-related thoughts. These defenses are existentially reassuring because they afford the perception that one is a valuable member of a meaningful world.

As terror management research is typically more focused on distal than proximal defenses (and the current project is no exception), experimentally manipulated reminders of death are typically followed by unrelated tasks intended to move death-related thoughts out of focal awareness, thus activating distal defenses. In the present study, the delay tasks typically used in terror management studies (i.e. measures of affect and a

reading task) were not included. In place of the typical delay tasks, it was thought that the worldview manipulations, which directly followed the mortality salience induction, would sufficiently move death-related thoughts out of conscious awareness and activate distal defenses. However, there are reasons to suspect that the worldview manipulations did not effectively serve this function. First, it is unlikely that the worldview manipulation was long enough to properly distract participants from the death reminder, as a meta-analysis has demonstrated that distal defenses typically emerge approximately 7-10 minutes after the mortality salience induction (Burke et al., 2010). Second, other research has shown that worldview threats and affirmations can affect the accessibility of death-related thoughts (Schimel et al., 2007), and thus would not function as a benign delay task. Indeed, the pilot study showed that the recalling 2 instances of religious doubt could increase death thought accessibility for those high in religious dogmatism.

Considering the above, participants in the mortality salience, but not physical pain, conditions may have been consciously aware of death. Thus, the differential effects on need for cognition between these conditions may have occurred, at least in part, as a result of differences between proximal and distal defenses. When death-related thoughts are consciously accessible, it is possible that, consistent with this paper's epigraph, people are motivated to avoid thinking. However, when death-related thoughts are outside of conscious awareness, then their motivation for thinking may be directed by the desire for epistemic certainty, which may or may not be provided by their cultural worldview. The marginal interaction with dogmatism is interesting to consider in this regard. Those low in dogmatism reported less need for cognition in the mortality salience as compared to control condition. This result runs counter to those found by Vail

and colleagues, in which those low in dogmatism report higher need for cognition following reminders of death. Unlike in the present study, Vail et al. may have measured need for cognition after effectively removing death-related thoughts out of conscious focus. Thus, if a longer delay had separated the mortality salience induction from the measurement of need for cognition, then perhaps these low dogmatists would have responded with an increased desire to regain epistemic certainty. Of course, this theoretical speculation necessitates further empirical testing.

Examining this possibility within a non-religious context may also be merited. As alluded to previously, the present ideas were tested within the context of Christianity as it represents a seemingly available (and popular) worldview. That is, although all people hold a worldview, religion offers a particularly salient one with explicit beliefs. Given the negative relationship between religious dogmatism and need for cognition (e.g. Cacioppo & Petty, 1982), it remains unclear whether affirmations and threats of a non-religious worldview would influence the desire for cognitive engagement.

Conclusion

Although limited and somewhat inconsistent with prior predictions, the present study provides an additional step towards understanding the epistemic function of worldviews. This relatively understudied topic has the potential to inform how cognition relates to the dialectical process of existential threat and security. Thinking can be existentially troubling. Indeed, humans' impressive intellectual capabilities – self-reflection, temporal imagination, symbolic reasoning, etc. – provide the necessary scaffolding for the experience of anxiety, or, in the words of Paul Tillich, “the existential awareness of nonbeing” (1952/2000). Thinking, or overthinking, can undermine the sense

that life is meaningful (Heintzelman & King, 2016); rumination is reliably found to relate to depressive symptoms (e.g. Mor & Winquist, 2002); analytic reasoning fosters religious disbelief (Gervais & Norenzayan, 2012). Suffice to say that existential concerns and thinking can go hand in hand. Yet, as presently demonstrated, existential threats (to deeply held beliefs) can motivate an increased interest in cognitive engagement. Further, thinking is used to construct symbolic defenses (e.g. cultural worldviews) against existential concerns. Together, the above suggests that thinking can arouse existential concerns, which are in turn managed by further thinking. Future research might address this existential dialectic of thinking, particularly as to how it relates to both psychological threat and security.

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Table 1. Sample descriptive characteristics

	Mean \pm SD	%
Sex (female)		64
Race/ethnicity		
White		79.4
Black		12.8
Asian		4.2
Other		3.8
Age	44.89 \pm 13.17	
Political Orientation	4.33 \pm 1.77	
Social Desirability	1.51 \pm .26	
Fundamentalism	5.49 \pm 2.11	
Dogmatism	4.37 \pm 1.60	
% Damned to Hell	35.18 \pm 28.31	
Need for Cognition	4.54 \pm 1.28	

Table 2. Bivariate correlations among study variables

Variables	1.	2.	3.	4.	5.
1. Social Desirability	-	.11*	.11*	.01	.26**
2. Fundamentalism		-	.80**	.43**	-.05
3. Dogmatism			-	.37**	-.14**
4. % Damned to Hell				-	-.09
5. Need for Cognition					-

Note. * $p < .05$. ** $p < .01$.

Figure 1. The effect of threat and dogmatism on death-thought accessibility

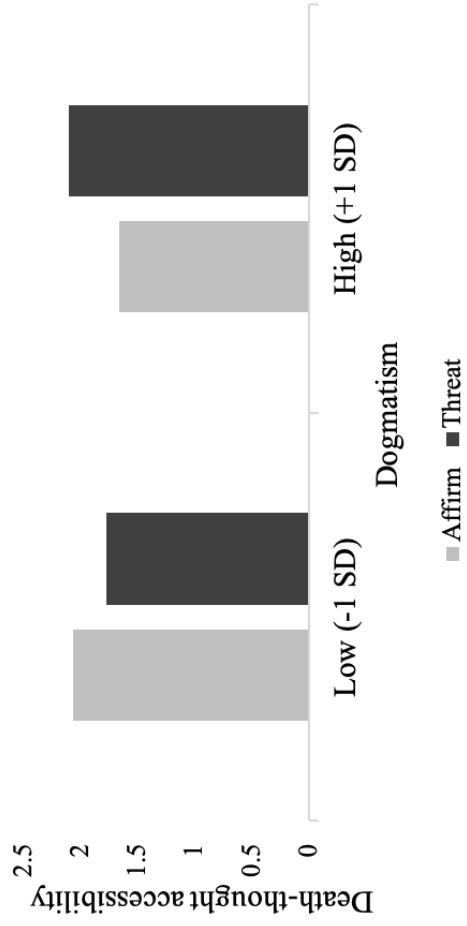


Figure 2. The effects of mortality salience and worldview-information on need for cognition

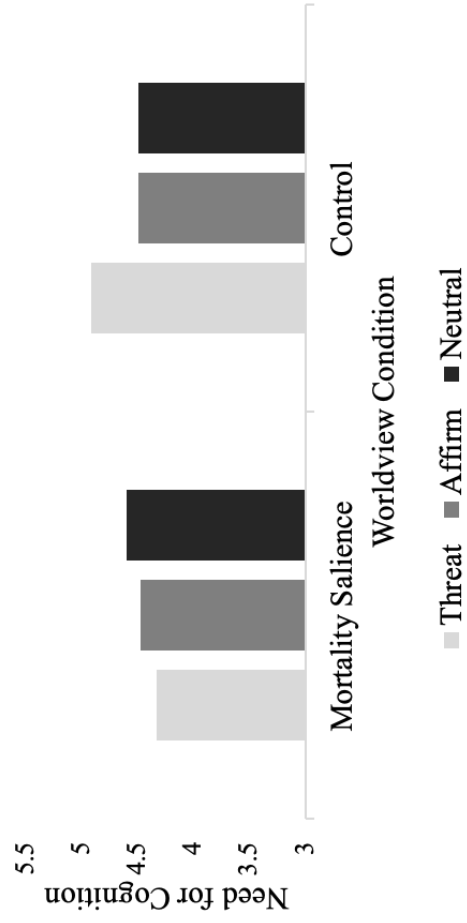
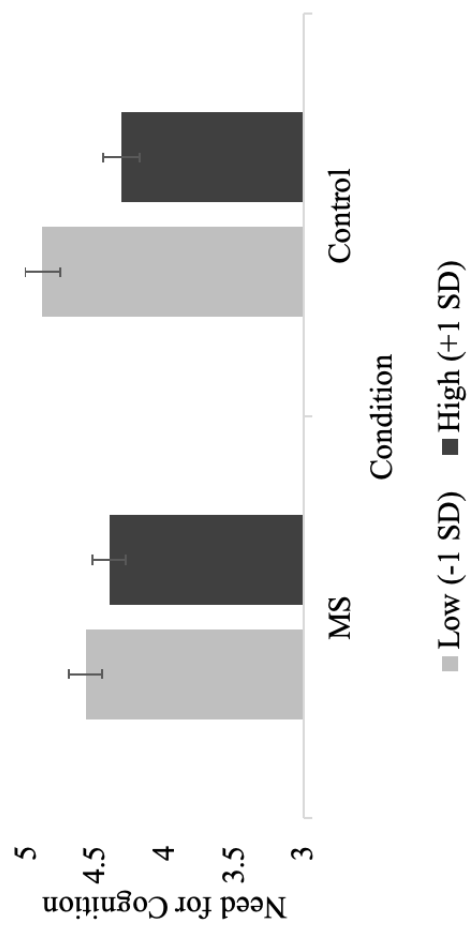


Figure 3. The effects of mortality salience and dogmatism on need for cognition



Appendix

Pilot study materials

Social Desirability

Listed below are a number of statements concerning personal attitudes and traits. Read each statement and decide whether it is true or false as it pertains to you personally. If the statement is true as it pertains to you, select the letter **T**; if the statement is false as it pertains to you, select the letter **F**.

	T	F
It is sometimes hard for me to go on with my work if I am not encouraged	<input type="radio"/>	<input type="radio"/>
I sometimes feel resentful when I don't get my way	<input type="radio"/>	<input type="radio"/>
No matter who I'm talking to, I'm always a good listener	<input type="radio"/>	<input type="radio"/>
There have been occasions when I took advantage of someone	<input type="radio"/>	<input type="radio"/>
I'm always willing to admit when I've made a mistake	<input type="radio"/>	<input type="radio"/>
I sometimes try to get even, rather than forgive and forget	<input type="radio"/>	<input type="radio"/>
I'm always courteous, even to people who are disagreeable	<input type="radio"/>	<input type="radio"/>
I have never been irked when people express ideas different from my own	<input type="radio"/>	<input type="radio"/>
There have been times when I was quite jealous of the good fortune of others	<input type="radio"/>	<input type="radio"/>
I have never deliberately said something that hurt someone's feelings	<input type="radio"/>	<input type="radio"/>

Religious Fundamentalism

Please indicate using the scales below how much you agree or disagree with each statement.

Completely disagree	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	Completely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1. God has given mankind a complete, unfailing guide to happiness and salvation, which must be totally followed
2. No single book of religious teachings contains all the intrinsic, fundamental truths about life
3. The basic cause of evil in this world is Satan, who is still constantly and ferociously fighting against God
4. It is more important to be a good person than to believe in God and the right religion
5. There is a particular set of religious teachings in this world that are so true, you can't go any "deeper" because they are the basic, bedrock message that God has given humanity
6. When you get right down to it, there are only two kinds of people in the world: the Righteous, who will be rewarded by God; and the rest, who will not
7. Scriptures may contain general truths, but they should NOT be considered completely, literally true from beginning to end.
8. To lead the best, most meaningful life, one must belong to the one, true religion
9. "Satan" is just the name people give to their own bad impulses. There really is no such thing as a diabolical "Prince of Darkness" who tempts us
10. Whenever science and sacred scripture conflict, science is probably right
11. The fundamentals of God's religion should never be tampered with, or compromised with others' beliefs
12. All of the religions in the world have flaws and wrong teachings. There is no perfectly true, right religion

Neuroticism

Please answer each question by clicking either yes or no. There are no right or wrong answers and no trick questions. Work quickly and do not think too long about the exact meaning of the question.

	No	Yes
Does your mood often go up and down?	<input type="radio"/>	<input type="radio"/>
Do you ever feel "just miserable" for no reason?	<input type="radio"/>	<input type="radio"/>
Do you often worry about things you should not have done or said?	<input type="radio"/>	<input type="radio"/>
Are you an irritable person?	<input type="radio"/>	<input type="radio"/>
Are your feelings easily hurt?	<input type="radio"/>	<input type="radio"/>
Do you often feel fed-up?	<input type="radio"/>	<input type="radio"/>
Are you often troubled about feelings of guilt?	<input type="radio"/>	<input type="radio"/>
Would you call yourself a nervous person?	<input type="radio"/>	<input type="radio"/>
Are you a worrier?	<input type="radio"/>	<input type="radio"/>
Do you worry about awful things that might happen?	<input type="radio"/>	<input type="radio"/>
Would you call yourself tense or "highly strung"?	<input type="radio"/>	<input type="radio"/>
Do you worry about your health?	<input type="radio"/>	<input type="radio"/>
Do you suffer from sleeplessness?	<input type="radio"/>	<input type="radio"/>
Have you ever felt listless and tired for no reason?	<input type="radio"/>	<input type="radio"/>
Do you often feel life is very dull?	<input type="radio"/>	<input type="radio"/>

Do you worry a lot about your looks?	<input type="radio"/>	<input type="radio"/>
Do you worry too long after an embarrassing experience?	<input type="radio"/>	<input type="radio"/>
Do you suffer from “nerves”?	<input type="radio"/>	<input type="radio"/>
Do you often feel lonely?	<input type="radio"/>	<input type="radio"/>
Are you easily hurt when people find fault with you or the work you do?	<input type="radio"/>	<input type="radio"/>
Are you sometimes bubbly with energy and sometimes very sluggish?	<input type="radio"/>	<input type="radio"/>
Are you touchy about some things?	<input type="radio"/>	<input type="radio"/>

Dogmatism

Please use the scale below to answer the following questions.

Completely disagree	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	Completely agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1. Anyone who is honestly and truly seeking the truth will end up believing what I believe
2. There are so many things we have not discovered yet, nobody should be absolutely certain his beliefs are right
3. The things I believe in are so completely true, I could never doubt them
4. I have never discovered a system of beliefs that explains everything to my satisfaction
5. Flexibility is a real virtue in thinking, since you may well be wrong
6. There are no discoveries or facts that could possibly make me change my mind about the things that matter most in life
7. I am so sure I am right about the important things in life, there is no evidence that could convince me otherwise
8. If you are “open-minded” about the most important things in life, you will probably reach the wrong conclusions
9. No one knows all the essential truths about the central issues in life
10. People who disagree with me are just plain wrong and often evil as well

Threat-Affirmation Pair 1

Threat:

Paul Tillich was a well-known and highly respected Christian theologian and pastor. He wrote many books on Christianity and gave sermons at churches across the United States and Europe. In his books and sermons, Tillich regularly stated that “God does not exist. In fact, whether God exists is not an interesting question to ask”. These ideas have been widely praised by many local preachers, as well as the National Christian Foundation and the Harvard Divinity School.

For Tillich, Christianity is a symbolic system that can be used to explain and understand the mysteries of life. According to Tillich, belief in the supernatural is not only naïve, but harmful; worshipping God is akin to worshipping the Golden Calf because both are symbols. This means that, for Tillich and his many followers, the Christian concepts of God, Jesus, heaven, and miracles do not exist, and “any serious person will understand this”.

“It is important,” claimed Tillich, “for Christians to move beyond the supernatural elements of Christianity. God does not exist, miracles do not occur, and no one is going to judge you for your sins.”

Affirm:

Paul Tillich was a well-known and highly respected Christian theologian and pastor. He wrote many books on Christianity and gave sermons at churches across the United States and Europe. In his books and sermons, Tillich regularly stated that “Faith in God gives us the courage to assert ourselves in the face of danger or uncertainty”. These ideas have been widely praised by many local preachers, as well as the National Christian Foundation and the Harvard Divinity School.

For Tillich, Christianity is a divine system that can be used to explain and understand the mysteries of life. According to Tillich, belief in the supernatural affords a deeper understanding of life; accepting the love of God and the promise of immortality allows people to avoid the despair of a purely physical existence. This means that, for Tillich and his many followers, the Christian concepts of God, Jesus, heaven, and miracles are not only true, but help people live better, happier lives.

“It is important,” claimed Tillich, “for Christians to keep their faith in the face of secularism. God exists, miracles occur, and, only the sacrifice of Jesus Christ saves us from our sins.”

Threat-Affirmation Pair 2

Threat:

The boundary between humans and animals is not as great as most Christians think. Although we like to think that we are special and unique, our bodies work in pretty much the same way as the bodies of all other animals. Whether you're talking about lizards, cows, horses, insects, or humans, we're all made up of skin, blood, organs, and bones. We're all driven by needs for food, water, sex, and comfort. Although some people like to claim that we humans are vastly more intelligent than other animals, this doesn't really seem to be true. What appears to be the results of complex thought and free will is really just the result of our biological programming and simple learning experiences, just like all other animals.

In fact, the “sixth sense” that gives animals control over dangerous situations is the same mechanism that makes people believe in God. Research shows that chimps have the capacity for language, even pigeons are able to solve pretty complex problems, and all animals show caring for and attachment to their offspring. Human beings are just another species of animals, maybe a little more intelligent than others, but not different in any really important or meaningful way. Seeing ourselves as special or different from the cows we eat for lunch or the insects we wash off our windshields is just another example of human vanity and self-delusion.

Affirm:

The one thing that my education has made clear to me is that, although we humans have some things in common with other animals, human beings are truly unique. Although our bodies may be pretty similar to simpler species, the potential of the human mind and spirit go far beyond anything remotely similar to what is found in simple animals. First there are the obvious things: Humans have religious faith. We were purposefully created in God's image to rule over and care for the Earth; “And God said, ‘Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth’” (Genesis, 1:26).

Unlike animals, humans live in a world of ideas and concepts, morals and values. More importantly, humans have the capacity for love, generosity, and kindness --- putting the welfare of others above themselves. We are not simple selfish creatures driven by hunger and lust, but complex individuals with a will of our own, capable of making choices, and creating our own destinies. Although we certainly have some things in common with simple animals, we humans are truly special and unique.

Threat-Affirmation Pair 3

Threat:

In the space provided below, please list 2 times that have made you question your religious faith

Affirm:

In the space provided below, please list 8 times that have made you question your religious faith

Threat-Affirmation Pair 4

Threat:

The following is a quote from a man suffering from lung disease and refusing medical treatment for it.

"My faith is very strong, and I believe that God is always watching over me. I refuse medical treatment because I know that my prayers are the best medicine available to me. My faith in the Lord will be enough to carry me through."

Thinking back to the previous quote, please write a few sentences from the perspective of the man who has refused medical treatment for lung disease.

If it helps, you can finish this sentence.

Medicine won't do anything for me that faith alone can't do. My Lord will...

Affirm:

The following is a quote from a man suffering from lung disease on whether he would ever refuse medical treatment.

"Given the evidence that I've seen, there's little reason to believe that faith alone will help me recover. I absolutely would not refuse medical treatment because I know that professional treatment is the best medicine available to me. Faith will simply not be enough to carry me through."

Thinking back to the previous quote, please write a few sentences from the perspective of the man who claimed he would never refuse medical treatment.

If it helps, you can finish this sentence.

Faith alone won't be enough. Medicine is what I need. My doctors will...

Manipulation Questions

Not at all	Slightly	Somewhat	Moderately	A lot	Almost completely	Completely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1. To what extent did you enjoy the previous reading or writing task?
2. To what extent did the previous passage make you question your faith?
3. To what extent did the previous passage affirm your faith?
4. At this moment, how strong is your faith?

Death-thought Accessibility

You have been randomly assigned to spend a couple of minutes completing a word completion task that has been recently developed. Please complete the following by coming up with letters for the blank spaces that changes each item into an english word and then typing that word in the space provided. Please go with the first correct completion that comes to mind. Only use one letter per blank and note that some words may be plural. Thank you.

1. B U R _ _ D
2. P L A _ _
3. _ _ O K
4. W A T _ _
5. D E _ _
6. M U _ _
7. _ _ N G
8. B _ T _ L E
9. M _ J _ R
10. P _ _ T U R E
11. F L _ W _ R
12. G R A _ _
13. K _ _ G S
14. C H A _ _
15. K I _ _ E D
16. C L _ _ K
17. T A B _ _
18. W _ _ D O W
19. S K _ _ L
20. T R _ _
21. P _ P _ R
22. C O F F _ _
23. _ O _ S E
24. P O S T _ _
25. R _ D I _

Study 1 Materials. The same measures of social desirability, religious fundamentalism, and dogmatism used in the pilot study were used in Study 1. The third threat-affirmation pair from the pilot study was also included.

Belief in Hell

What percentage of the world's population do you think will be damned to hell? _____

The above question does not apply to me because I do not believe in hell

- True
- False

Mortality Salience

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.

MS:

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 will happen to you as you physically die and once you are physically dead

Control:

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 will happen to you as you physically die and once you are physically dead

Need for Cognition

Please indicate your level of agreement *at this moment* with each statement using the scale provided

Strongly disagree 1	2	3	4	5	6	Strongly agree 7
○	○	○	○	○	○	○

1. I would prefer complex to simple problems
2. I like to have the responsibility of handling a situation that requires a lot of thinking
3. Thinking is not my idea of fun
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something
6. I find satisfaction in deliberating hard and for long hours
7. I only think as hard as I have to
8. I prefer to think about small, daily projects to long term ones
9. I like tasks that require little thought once I've learned them
10. The idea of relying on thought to make my way to the top appeals to me
11. I really enjoy a task that involves coming up with new solutions to problems
12. Learning new ways to think doesn't excite me very much
13. I prefer my life to be filled with puzzles that I must solve
14. The notion of thinking abstractly is not appealing to me
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort
17. It's enough for me to know that something gets the job done; I don't care how or why it works
18. I usually end up deliberating about issues even when they do not affect me personally