

No Atheists in Foxholes:
Motivated Reasoning and Religious Belief*

Robb Willer
University of California, Berkeley

*Contact Robb Willer at Department of Sociology, University of California, Berkeley, CA 94720. E-Mail: Willer@berkeley.edu. I would like to thank David Dunning, Joyce Ehrlinger, Thomas Gilovich, John Jost, and Dennis Regan for helpful suggestions.

ABSTRACT

Recent research has focused on motivational bases of political ideology. It is plausible that similar factors may drive the formation of religious ideology. Though explanations of the existence of religious beliefs in terms of their satisfaction of psychological needs date back centuries, limited empirical research exists linking motivated reasoning to religious belief. I thoroughly review existing research on the role of motivation in the formation of religious belief systems, specifically research related to the relationship between fear of death and afterlife belief. Then I present the results of two original, experimental studies investigating the hypothesis that fear of death leads to greater religious belief. In Study 1, participants who were asked to write short essays about death reported greater belief in an afterlife than did participants who wrote essays on a neutral topic. Study 2 replicated this finding and also showed that increased fear of death leads to greater belief in God. The results of the studies suggest that a more parsimonious motivated reasoning account may explain the relationship between fear of death and afterlife belief better than one based on Terror Management Theory. Taken together, findings support the notion that some religious beliefs can be usefully explained in motivational terms.

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“If God did not exist, it would be necessary to invent Him.”

– Voltaire

Discovering the factors driving religious belief is of central importance to social scientists (Batson & Ventis, 1982; Christiano, Swatos, & Kivisto, 2002; Sherkat & Ellison, 1999).

Evidence exists that religion is nearly as old as human society, with religious beliefs common among hunter-gatherer societies of the past and present. Evidence is also suggests that religious beliefs are likely to persist in the future even as societies modernize (Stark, 1999). Contrary to the so-called “secularization thesis,” religious belief remains high in most industrialized societies, including the contemporary U.S. (Hout & Greeley, 1987; Stark, 1999; Hout & Fischer, 2002).

The ubiquity of religious belief across cultures and history is intriguing in light of the lack of direct evidence cited for many religious claims. Religion is often associated with *faith*, reasoning based on trust and belief, rather than formal logic and empirical evidence. In fact, religious beliefs are sometimes defined in terms of their basis in faith. In this respect, religious thinking is challenging to sociology and psychology, for its epistemological basis is usually thought of as different from that of other belief systems. If religious belief is not typically based on direct empirical evidence, why are religious beliefs so strong and so widespread? Can mechanisms used for understanding other aspects of human nature be useful in understanding religious belief?

It is very likely that religious beliefs are multiply determined, having bases in many social and psychological mechanisms. Sociological scholars of religion have focused on the social functions of shared religious beliefs in promoting community and

solidarity (Durkheim, 1995 [1912]). Indeed, religion has historically rivaled, if not bested, all other bases of group identity and membership in strength and influence (Christiano et al., 2002). Psychological researchers have also posited several factors that may drive various religious beliefs (e.g., Batson & Ventis, 1982; Gilbert et al., 2000; James, 1902). More recently evolutionary theorists have joined the fray, offering explanations of the possible biological evolution of predispositions towards religious thinking (e.g. Atran & Norenzayan, 2004; Boyer, 2001; Dennett 2006; Sapolsky, 1997; Wilson, 2003).

Consistent with Voltaire's famous claim, religious beliefs may be to a large extent the products of motivational factors. In this article I argue that religious beliefs can be understood in part as a motivated psychological response to fear of death. Specifically, I argue that fear of death increases belief in an afterlife, and religion in general, as a result of a motivated psychological process. In turn, increased afterlife belief should serve to mollify mortality concerns. In the sections that follow I first present two competing theoretical accounts of this relationship. Then I review past correlational and experimental research on the theorized bidirectional relationship between fear of death and afterlife belief. Then I present the results of two studies investigating the effects of fear of death on afterlife belief. Finally, I conclude with a discussion of these results, their implications, and limitations.

THEORY

Motivated Bases of Religious Belief

Recent research on political ideology has primarily explained the formation of political attitudes in motivational terms (e.g., Jost, Banaji, & Nosek, 2004; Jost et al., 2007). For example, politically conservative attitudes have been recently explained via a variety of individual psychological motivations, such as needs for certainty, cognitive closure, unambiguous and just worldviews, and the need to manage mortality concerns (Jost et al., 2003). While this approach has increasingly come to dominate explanation of political belief, comparatively less research has used the same approach to explain religious belief. Nonetheless, such an approach seems potentially very fruitful, and is presaged by the speculations of scholars for centuries. To address this gap, here I present and test a theoretical explanation of afterlife belief based on individuals' motivations to address their fear of death.

Humans are unusual among animals in that their self-consciousness allows them awareness of the inevitability of their own death. Research and theory suggest that thoughts related to one's mortality are a significant source of anxiety (Becker, 1973; Wahl, 1959). If death awareness tends to promote fear and anxiety, then individuals will have strong motivations to adopt beliefs which serve to neutralize or moderate these responses, such as belief in life after death.

A multitude of scholars have cited fear of death as central to the existence of religious belief. For example, Malinowski (1965 [1935]) proposed, "Death, which of all human events is the most upsetting and disorganizing to man's calculations, is perhaps the main source of religious belief." William Durant (1954) reported that Schopenhauer described death anxiety as the "beginning of philosophy and the cause of religion." Gordon Allport (1950) described religious belief as functioning to reduce the concerns

brought about from anxiety over the knowledge of one's own death. Lucretius (1947 [50 B.C.E.]) put it simply, "fear begets Gods." Perhaps this function is why afterlife beliefs are so fundamental to religions, so much so as to become even part of the definition: "most religions have taught in one form or another that the 'soul' or 'spirit' of the individual does not perish when his body dies, but goes on living in another world" (Ducasse, 1961, p. 14).

Here I present two theoretical accounts of the relationship between fear of death and afterlife belief. While both accounts rely on psychological motivations to explain afterlife belief, they are based on distinct theoretical rationales. One account is based on a relatively simple and parsimonious application of motivated reasoning, the other on Terror Management Theory. While the simpler motivated reasoning account argues that fear of death promotes afterlife belief directly (because afterlife belief neutralizes the finality of death), Terror Management Theory offers a more nuanced theoretical logic for the same prediction based on "cultural worldview defense."

Motivated reasoning describes the tendency of individuals to come to conclusions that are desirable to them (Kunda, 1990). Motivational influences on human reasoning have been observed in a variety of forms including motivated self-characterization (Dunning et al., 1995), motivated group affiliation (Cialdini et al., 1976), motivated recall (McFarland & Buehler, 1997), motivated stereotyping (Sinclair & Kunda, 1999), and motivated political reasoning (Westen et al., 2006). Despite these and other examples of judgments being biased by preferences, it is also worth noting that the effects of motivation have limits. People prefer plausible, justifiable conclusions and are often motivated towards judgmental accuracy.

The logic of the parsimonious motivated reasoning account is as follows: Fear of death creates significant anxiety in individuals. Individuals are motivated to come to conclusions that avoid negative arousal states. Therefore, greater fear of death should lead to greater belief in ideas that offer an escape from death anxiety, such as belief in an afterlife. Further, afterlife belief should reduce fear of death. This reciprocal relationship between fear of death and afterlife belief is portrayed in Figure 1.

[Figure 1 about here]

But would motivated reasoning predict that fear of death is related to other religious beliefs, such as belief in God? Here I see little in the way of a direct motivational relationship between mortality concerns and other religious beliefs (but see also Norenzayan & Hansen, 2006). However, belief in an afterlife is itself strongly associated with other religious beliefs, such as belief in God or other supernatural agents. As a result of cognitive consistency mechanisms (Festinger, 1954) individuals should generally hold associated religious beliefs at comparable levels. Thus, my application of motivated reasoning predicts that fear of death leads not only to greater afterlife belief, but also in turn to greater religious beliefs in general (e.g., belief in God). These relationships are also given in Figure 1.

An alternate theory that also predicts fear of death leads to greater afterlife belief, though for different reasons, is Terror Management Theory (hereafter TMT: Greenberg et al., 1990, Greenberg, Solomon, & Pyszczynski, 1997; Pyszczynski, Greenberg & Solomon, 1999; Rosenblatt et al., 1989). Briefly, TMT asserts that humans are strongly

motivated towards self-preservation. As a result, thoughts of death produce mortal terror. However, a person's "individualized version of the cultural worldview" and self-esteem help to buffer against this anxiety by providing individuals a sense of value, order, and symbolic immortality (Greenberg et al., 1994). Because one's cultural worldview provides an anxiety buffer against mortality concerns, the salience of mortal thoughts tends to lead to worldview defense (Rosenblatt et al., 1989). Examples include, the tendency of individuals for whom thoughts of their own death have been made salient to exhibit increased in-group affiliation and biases (Harmon-Jones et al., 1996), hostility and aggression towards out-group members (McGregor et al., 1998), system-justifying stereotypes (Schimel et al., 1999), and increased liking of fellow in-group members who conform to cultural expectations (Greenberg et al., 1990).

Thus, TMT would also predict that fear of death leads to increased belief in an afterlife. To the extent that afterlife belief is part of an individual's cultural worldview, belief should be strengthened following mortality salience because an individual's cultural worldview serves as a buffer against death anxiety. The theory's argument for the relationship between fear of death and afterlife belief is also based on individuals' psychological motivations to reduce fear of death. But the theoretical argument is different because of the theorized mediating role of worldview defense.

PREVIOUS RESEARCH

Correlational

Perhaps due to the limitations of studying reciprocal relationships with cross-sectional research designs, correlational studies of the relationship between fear of death and

afterlife belief are mixed in their results, variously suggesting a positive, negative, curvilinear, or no relationship between these variables. Several studies have shown that lower fear of death or death anxiety is correlated with religious belief or attendance (Alexander & Alderstein, 1960; Jeffers et al., 1961; Swenson, 1961; Martin & Wrightsman, 1965; Richardson et al., 1983). In a meta-analysis, Spilka et al. (1985) found that in 24 of 36 studies fear of death was lower among religious individuals.

Despite this, a variety of correlational studies are suggestive of a *positive* relationship between mortal fear and afterlife belief. For instance, research shows that those with greater “death experience” (defined as the number and recency of deceased loved ones) exhibit greater levels of religious behavior and stronger religious views (Peterson & Greil, 1990). Also, a study of gay men with and without AIDS showed that among the men with AIDS, greater death anxiety was correlated with greater church attendance (Franks et al., 1990). Studies of people reporting near-death experiences show that the individuals afterward tend to report greater belief in God, the afterlife, and reduced fear of death, though this research is based on small samples (Wulff, 1991). Research on Israeli soldiers in the 1982 Lebanon War shows that nonreligious soldiers reported greater fear of death, and greater responsiveness to higher death-risk experiences in war, than nonreligious soldiers (Florian & Mikulincer, 1993). Anecdotal reports suggest greater religious observance and rates of baptism among U.S. soldiers awaiting deployment to Iraq (Finer & Baker, 2003).

Results of some studies are ambiguous in the direction of the observed effect or find no effect. In a cross-sectional survey study, Hoelter and Epley found that 7 of 8 dimensions of fear of death employed correlated with at least one religiosity measure, but

that the correlation was at times positive and other times negative (1979). Other cross-sectional research has failed to find any correlation between religious belief and death anxiety (Aday, 1984; Christ, 1961; Lester, 1970). Also, while it is generally assumed that religious beliefs increase with age, a relationship possibly attributable to greater fear of death among the elderly, evidence also exists that age and afterlife belief are unrelated (Harley & Firebaugh, 1993).

Still other research has shown a more complex relationship moderated by the nature of individuals' religious beliefs. Spilka et al. found that the intrinsically religious tended towards a benevolent view of the afterlife while the extrinsically religious had a more negative view (1977). Others have found a similar pattern, including research showing that the intrinsically religious report less death concern (Kahoe & Dunn, 1975; Wulff, 1997), and greater fear of death has been reported among the extrinsically religious (Wulff, 1997). Leming (1980) found a curvilinear relationship between fear of death and religious belief, concluding that "religiosity may serve the dual function of afflicting the comforted and comforting the afflicted."

One way to understand these diverse and apparently contradictory findings is to look closer at the characteristics of the studies. Based on the model presented in Figure 1, we would expect individuals high in fear of death to adopt greater afterlife beliefs, and then subsequently fear death less. This model would predict that longitudinal and experimental research will find a positive relationship (as fear of death leads to afterlife belief), while cross-sectional studies should find a negative relationship (as adopted afterlife beliefs leave the individual less afraid of death).

This model is generally consistent with the past research presented here. The Spilka et al. (1985) meta-analysis indicates that cross-sectional research tends to find a negative relationship between religiosity and fear of death. Meanwhile, several of the studies that have found a positive relationship involve quasi-longitudinal designs in which individuals who should be higher in fear of death due to some shared, common factor are surveyed with respect to their afterlife or general religious beliefs.¹ Research cited above studying the attitudes of servicemen anticipating deployment, gay men with AIDS, and people with recently deceased loved ones have found that members of these groups report greater afterlife belief than comparison groups. However, because these designs are non-experimental, significant alternative explanations are possible for the findings. Thus, I next review relevant experimental research on this relationship.

Experimental

The research reviewed in the prior section was non-experimental and therefore is limited in its ability to speak to the causal relationship(s) between individuals' fear of death and belief in an afterlife. Due to the possibly bidirectional relationship between religious belief and fear of death, experimental approaches offer more promise for understanding how these concepts are related. Researchers have employed experimental designs to study both sides of the theorized reciprocal relationship between fear of death and afterlife belief portrayed in Figure 1.

¹ Note however that not all research finding a positive correlation involves quasi-longitudinal designs (e.g. Berman & Hays, 1973). Kurlychek found that afterlife belief was greater among those with greater fear of death of others, but not fear of one's own death (1976). A classic interview study found greater reported fear of death among religious individuals (Faunce & Fulton, 1958).

Most applicable to the current investigation is experimental research on the effects of fear of death on afterlife belief. In a seminal study, Osarchuk & Tatz (1973) first classified participants as high or low in afterlife belief based on responses to one of two forms of an afterlife belief survey. Participants were then assigned to one of three conditions: (1) a Death treatment condition wherein participants watched a presentation of death-related imagery (e.g. photos of corpses and auto wrecks) while a tape played an exaggerated presentation on the high likelihood of death for individuals age 18-22 set to dirgelike music, (2) a Shock threat treatment condition designed to increase fear, but not mortal fear, wherein participants spent a comparable amount of time anticipating participation in a study involving electric shocks, or (3) a Control condition in which participants played with a child's toy for a comparable amount of time. Following the manipulation all participants completed the other form of the afterlife belief survey.

Osarchuk and Tatz found the greatest change in afterlife belief among participants initially high in afterlife belief who were exposed to the Death threat condition. No other conditions of the study produced notable results. This is the only known experimental study to show an effect of fear of death on afterlife belief. However, Osarchuck and Tatz's finding has not yet been replicated. In one subsequent study, Ochsmann (1984) had groups of theology students and students of other subjects fill out a questionnaire on death and dying (or not). Following this manipulation, all participants filled out a belief in afterlife scale. Participants did not show increased afterlife belief as a result of the mortality salience manipulation.

Other research suggests that fear of death may lead to greater religious beliefs besides afterlife belief, consistent with the motivated reasoning account given in Figure 1.

Norenzayan & Hansen (2006) found that a mortality salience manipulation led to greater general religiosity and belief in God. Follow-up studies showed that study participants expressed greater belief in supernatural agents that were outside of their cultural worldview (e.g. Buddha, Shamanic spirits), apparently contrary to the predictions of TMT.

Additionally, Greenberg et al. (1995) showed that participants who wrote short essays about their death were more reluctant to make inappropriate use of a crucifix (for hammering) on a task, an effect suggestive of greater religiosity. Greenberg et al. interpret their results as supportive of TMT since mortality salience led to apparently more respectful treatment of culturally significant objects in general, but this result could also be interpreted as consistent with the parsimonious motivated reasoning account presented here.²

Experimental research has also investigated other aspects of the motivated reasoning account of the relationship between fear of death and afterlife belief, specifically the possibility that afterlife belief serves to decrease fear of death. Friedman and Rholes (2007) tested the idea that religious belief functions to suppress thoughts of death among believers. They presented evidence of inconsistencies in the Bible to both fundamentalist and non-fundamentalist Christians. They then measured post-treatment accessibility of death-related thoughts via a word-stem completion task. Fundamentalist Christians presented with evidence of Biblical inconsistency showed greater death thought accessibility, but non-fundamentalist Christians were unaffected by the

² Still other research has failed to find an effect of experimentally manipulating mortality salience on reported religious belief (Burling, 1993).

manipulation. The findings suggest that fundamentalist Christianity's teachings function to keep death related thinking out of consciousness.

Working in the Terror Management Theory tradition, Dechesne et al. (2003) conducted a series of studies in which they successfully manipulated participants' belief in an afterlife via an essay arguing that scientific research on near-death experiences supports (or contradicts) the existence of life after death. The result of the manipulation was to nullify the previously discovered link between mortality salience and self-esteem striving. Participants tended to positively distort negative personality feedback under mortality salience, but not if they had previously been assured that scientific research supports the existence of an afterlife. This research shows how belief in an afterlife can suppress effects of thoughts of death.

Taken together, experimental research relating fear of death and religious beliefs has produced results generally consistent with the parsimonious motivated reasoning account, though with some exceptions and ambiguities. Research has shown a positive effect of fear of death on afterlife belief (Osarchuk & Tatz, 1973) as well as belief in God and general religiosity (Norenzayan & Hansen, 2006), yet many questions remain unanswered. In particular, Osarchuk & Tatz's effects were only observed among participants initially high in afterlife belief, and alternative explanations of their findings based on the accessibility of religious thoughts in the Death threat condition are possible. Most problematic, Osarchuk and Tatz's findings have not been replicated and have even been contradicted by subsequent research (Ochsmann, 1984). Thus, further, controlled experimental research is called for to more carefully assess the validity of the claim that fear of death increase afterlife belief.

Additionally, the theoretical explanation of the relationship between fear of death and religious belief remains ambiguous. For example, Norenzayan & Hansen found increased belief in culturally foreign supernatural agents, a contradiction of TMT's predictions. On the other hand, Osarchuck & Tatz's finding that only those initially high in belief in an afterlife responded to mortality salience with increased afterlife belief is consistent with TMT's prediction of cultural worldview defense in reaction to mortality salience. The present studies are intended to address these ambiguities and extend research on the effects of fear of death on religious beliefs, especially belief in an afterlife, while testing a motivated reasoning account of the relationship against one based on TMT.

STUDY 1

Overview

The purpose of Study 1 was to test the prediction that greater fear of death leads to greater belief in an afterlife. I also wanted to study whether this effect would be greater for individuals with more or less initial religiosity since motivated reasoning and TMT accounts diverge in their predictions for these groups. TMT would predict that the effects of fear of death on belief in an afterlife would be greatest for those who consider the afterlife part of their cultural worldview (i.e. initially religious people). On the other hand, the more parsimonious motivated reasoning account presented here would predict the effect to be greatest among those low in religious belief since those without substantial prior belief in an afterlife should be most threatened by the salience of death-

related thoughts, while those high in prior afterlife belief should be buffered from the effects of mortality salience.

In the study I used a mortality salience induction used in several prior studies (e.g. Greenberg et al., 1990; Greenberg et al., 1994) in order to manipulate the salience of participants' fear of death. The mortality salience induction involves asking participants to write two short essays about their death. Following the mortality salience induction, participants were asked to respond to several survey questions regarding, among other things, their belief in an afterlife. By manipulating the salience of participants' mortal thoughts I was able to test my predictions about the effects of fear of death on afterlife belief.

Methods

Participants

Forty-four undergraduates (23 women, 21 men) at Cornell University participated in the study in return for \$8.³

Design

The study featured a 2 condition (Participant wrote Death/Television essays) between-subject design.

Procedure

³ There was no effect of gender nor age ($M = 19.5$ years) of participants, nor did these variables interact with any of the results presented and are thus not discussed further.

Participants were recruited by fliers advertising payment for participation in a “Miscellaneous Surveys Study.” Upon reporting to the lab, a research assistant gave each participant a series of materials to complete. After completing a survey packet for another study, participants filled out a demographic questionnaire. The questionnaire included an item asking participants how religious they were on a 10-point scale ranging from “Extremely Religious” to “Not Religious at all.”⁴

After completing the demographic questionnaire, participants were asked to write short essays in response to two essay prompts on a computer. Half of the participants were randomly assigned to respond to essay prompts regarding death, and half were assigned to respond to essay prompts regarding watching television (Greenberg et al. 1994). The exact wording of the prompts was:

- “Briefly describe the feelings and emotions that the thought of your own death (watching television) arouses in you.”
- “Please describe in as much detail as possible what your thoughts would be as you physically die (watch television).”

After participants finished writing the short essays they were given a survey with miscellaneous questions, including one asking “How likely do you think it is that there is life after death?” Participants responded on a 10-point scale ranging from “Extremely Unlikely” to “Extremely Likely.” The survey also asked participants to answer a series of ten questions regarding characteristics of the afterlife adapted from the General Social

⁴ Random assignment was successful in creating two groups that were roughly equal in their initial levels of religious belief. There was no significant difference in the reported level of religious belief, as measured on the demographic questionnaire prior to the manipulation, among participants assigned to the death essay and those assigned to the TV essay condition ($p > .50$).

Survey, e.g. participants were asked how likely it was that the afterlife would be “A paradise of pleasure and delights.”

Finally, participants were debriefed regarding the true purpose of the study, paid, and thanked for their participation.

Results

Participants who wrote essays regarding death rated the existence of an afterlife as more likely ($M = 7.30$, $SD = 2.53$) than did participants who were assigned to write essays about television ($M = 5.62$, $SD = 3.51$), although this effect was only marginally significant ($t = 1.84$, $p < .08$). I next conducted a regression analysis of the effect of the essay manipulation on reported belief in the afterlife while controlling for participants' pre-manipulation reported religious belief. This analysis showed a highly significant effect of initial religiosity ($B = 0.75$, $p < .001$) and a significant effect of condition ($B = 2.06$, $p = .01$) on participants' stated belief in an afterlife. The results of the regression analysis indicate that participants who wrote essays about death tended to report greater belief in life after death than did participants who wrote essays about TV, net of initial religious belief. This finding supports the prediction that greater fear of death leads to greater belief in the afterlife

To investigate whether this effect varied by participants' initial level of religious belief I performed a median split dividing participants into two groups based on how religious they reported being on the demographic questionnaire. Among participants initially low in religious belief, those assigned to write the death essay reported greater belief in an afterlife ($M = 6.42$, $SD = 2.78$) than did those who wrote the TV essay ($M =$

3.38, $SD = 2.77$)($t = 2.40, p < .03$). But among those initially high in religious belief, those assigned to the Death essay condition did not report significantly greater belief in an afterlife ($M = 8.27, SD = 1.90$) than did those assigned to the TV essay condition ($M = 7.08, SD = 3.40$)($t = 1.02, p > .30$). Though this pattern of means suggests that those low in initial religiosity were most affected by the mortality salience manipulation, the results of a regression analysis of the effects of the essay manipulation, initial religiosity, and their interaction on afterlife belief did not yield a significant interaction effect ($p > .40$).

I found no significant effects of condition on participants' responses to any of the ten survey questions regarding characteristics of the afterlife.

STUDY 2

Overview

Study 2 was designed to address a significant alternative explanation for the results of Study 1 and also to help determine what theoretical mechanism best explains the observed effect. Although the results of Study 1 support the predicted relationship between fear of death and afterlife belief, various alternative explanations could also be advanced. First, it is possible that the effect of the Death essay condition was simply to make afterlife thoughts more accessible to participants due to cultural associations between the concepts of death and afterlife. Later, when participants reported the likelihood of an afterlife they may have answered based on the subjective accessibility of thoughts related to the afterlife, and as a result reported a higher probability in the death essay condition. This alternative account based on semantic associations leading to biased probability estimates could also explain the findings of Osarchuk & Tatz's prior study

(1973). Osarchuk & Tatz played a funeral dirge prior to measuring participant's belief in an afterlife. It is very possible that participants in their study, in thinking about death and funerals, also thought more about religion-related topics (e.g., churches) and then reported greater afterlife belief as an artifact of the salience of these thoughts.

To address this possibility I added an additional control condition to Study 2. In addition to having some participants write short essays about death and television watching, I also had some participants write essays about their thoughts regarding the afterlife. My thinking was that in this condition the salience of thoughts about the possibility of an afterlife would be maximized for participants. Thus, if participants who wrote essays about death reported greater afterlife belief than those who wrote essays about the afterlife, it would offer convincing support for a motivational rather than a semantic association account.

Additionally, Study 2 was designed to further assess which of motivated reasoning or Terror Management Theory better accounts for the relationship between fear of death and afterlife belief. I again measured prior religiosity to see if the effect observed in Study 1 is stronger among those initially high or low in religiosity. Also, I measured other religious beliefs besides belief in an afterlife, specifically belief in God, heaven, and hell.

Terror Management Theory would predict that fear of death would lead to increased religious beliefs in general to the extent they are associated with an individual's cultural worldview. However, motivated reasoning would predict that fear of death would first lead to increased afterlife belief, and thereafter other religious beliefs as a result of cognitive consistency. Thus, one theory predicts a direct effect of mortality salience on

religious beliefs in general and the other predicts these effects will be mediated by afterlife belief.

Finally, I added an additional essay writing condition in which participants were asked to write essays about the death of a loved one. The inclusion of this condition was exploratory. Past research has shown that writing an essay about a loved one does not have the same impact on participants that writing about one's own death has (Greenberg et al. 1994). Thus, both TMT and motivated reasoning would likely predict that participants writing essays about their own death would report greater afterlife belief than those who wrote essays about the death of a loved one.

Methods

Participants

One hundred and eleven undergraduates (73 women, 38 men) at Cornell University participated in the study in return for \$8. Three participants did not provide answers to questions regarding religious beliefs and were omitted from the following analyses.

Design

The study featured a 4 condition (Participant wrote Death/Television/Afterlife/or Death of a Loved One essays) between-subject design.

Procedure

The procedure was generally identical to Study 1. Participants were again recruited by fliers advertising payment for participation in a "Miscellaneous Surveys study." Upon

reporting to the lab, a research assistant gave each participant a series of materials to complete. After completing a survey packet for another study, participants again filled out a demographic questionnaire measuring their self-reported level of religious belief prior to the manipulation.⁵

After completing the questionnaire, participants were asked to write short essays on one of four randomly assigned topics. Two of the topics were the same as in Study 1 (death, watching television). Two additional topics were added, one on the afterlife and the other on the death of a loved one. The exact wording of the two new essay prompts was:

- “Briefly describe the feelings and emotions that the thought of the afterlife (death of a loved one) arouses in you.”
- “Please describe in as much detail as possible what your thoughts would be if you were to experience the afterlife (as a loved one physically dies.).”

After participants finished writing the short essays they were given a survey including several religious views questions. In addition to the prior question regarding belief in the afterlife, three other questions of interest were added to the survey, specifically participants were asked how likely they thought it was that heaven, hell, and God exist. Participants responded to each on 10-point scales ranging from “Extremely Unlikely” to “Extremely Likely.”

Finally, participants were debriefed regarding the true purpose of the study, paid, and thanked for their participation.

⁵ Random assignment was again successful in creating groups that were roughly equal in their initial levels of religious belief. There were no significant differences in the reported levels of religious belief between any two conditions.

Results

Belief in an Afterlife

Table 1 gives results by condition for the primary dependent variables: reported belief in an afterlife, heaven, hell, and God. Participants who wrote essays regarding death rated the existence of an afterlife as more likely ($M = 7.29, SD = 2.48$) than did participants who were assigned to write essays about television ($M = 5.40, SD = 3.11$) ($t = 2.45, p = .02$), the afterlife ($M = 5.55, SD = 3.19$) ($t = 2.29, p = .03$), and the death of a loved one ($M = 6.00, SD = 2.55$) ($t = 1.93, p = .06$). These results replicate the effect of fear of death on belief in an afterlife found in Study 1.

[Table 1 about here]

Next, I analyzed the effects of condition on participants' reported belief in heaven and hell. Participants who wrote essays regarding death rated the existence of heaven as more likely ($M = 7.75, SD = 2.10$) than did participants who were assigned to write essays about television ($M = 5.48, SD = 2.95$) ($t = 3.26, p < .01$), the afterlife ($M = 5.43, SD = 3.39$) ($t = 3.10, p < .01$), and the death of a loved one ($M = 5.97, SD = 2.85$) ($t = 2.68, p = .01$).

The same results obtained for the effect of condition on reported belief in hell. Participants who wrote essays regarding death rated the existence of hell as more likely ($M = 6.54, SD = 2.60$) than did participants who wrote essays about television ($M = 4.60,$

$SD = 3.07$)($t = 2.48, p = .02$), the afterlife ($M = 4.13, SD = 3.12$)($t = 3.18, p < .01$), and the death of a loved one ($M = 4.17, SD = 2.83$)($t = 3.28, p < .01$).⁶

Also, I found that participants across all conditions reported greater belief in heaven ($M = 6.16, SD = 2.98$) than in hell ($M = 4.85, SD = 3.04$)($t = 6.22, p < .001$). This finding supports a motivated reasoning account of religious belief since participants tended to invest greater belief in the more positive form of the Christian afterlife than the more negative one, though the two are typically communicated as part of the same religious system.

Belief in God

I also analyzed the effects of condition on reported belief in God. Generally, participants who wrote essays regarding death rated the existence of God as more likely ($M = 8.18, SD = 2.11$) than did participants who were assigned to write essays about television ($M = 6.88, SD = 3.17$)($t = 1.77, p = .08$), the afterlife ($M = 6.72, SD = 3.12$)($t = 2.06, p = .04$), and the death of a loved one ($M = 6.83, SD = 3.08$)($t = 1.92, p = .06$). However, two of these effects only approached statistical significance.

Next I tested the claim, based on motivated reasoning, that the effects of fear of death on belief in God are mediated by belief in the afterlife. In other words, the direct effect of fear of death is on afterlife belief, which in turn leads to greater belief in God's existence. This contrasts with the reasoning of TMT, which would predict that both result

⁶ In addition, I also conducted alternate regression analyses of the effects of each condition on participants' reported belief in an afterlife, heaven, and hell using dummy variables for each condition. Results of these analyses converged with the t -test results presented here. For all three dependent variables, only the participants who wrote essays about their own death reported significantly greater belief in an afterlife. The same analysis of participants' reported belief in God showed that participants who wrote essays about their own death reporting higher afterlife belief, however this result was not significant ($p = .11$).

from cultural worldview defense without one mediating the other. To test this mediational argument I ran a series of regression analyses. I created a dummy variable for whether participants wrote the essay about death or responded to one of the other three essay prompts. Combining the other three conditions into a single reference group was justified since the death essay condition was at least marginally different from all three conditions in both reported belief in an afterlife and God, but there were no significant differences between any of the three.

First, I analyzed the effect of writing the essay about death on reported belief in an afterlife. As the above *t*-test results imply, participants who wrote essays about their death reported significantly greater afterlife belief ($B = 1.62, p = .01$). Further, participants who wrote essays about their death also reported significantly greater belief in God ($B = 1.37, p = .03$). Finally, in a regression analysis on participant's reported belief in God, with both reported belief in an afterlife and whether the participant wrote essays about his/her own death as independent variables, belief in an afterlife predicted belief in God ($B = .613, p < .001$), but the effect of writing the essay about death was insignificant ($B = .377, p > .45$). A Sobel test indicated that this mediation was statistically significant ($p < .02$). These findings suggest that the effect of fear of death on belief in God operated through increased afterlife belief and support a motivated reasoning theoretical account.

Moderating Effects of Worldviews

To investigate whether the effects of the essay writing manipulation on religious beliefs varied by participants' initial levels of religious belief I again performed a median split to

create high and low religiosity groups. I also again combined the three control conditions and compared participants by whether they did, or did not, write essays about their own death.

Among participants initially low in religious belief, those assigned to write the death essay reported greater belief in an afterlife ($M = 6.25$, $SD = 2.42$) than did those who responded to one of the other three essay prompts ($M = 4.60$, $SD = 2.69$) ($t = 1.93$, $p = .06$), though this effect was marginally significant. But among those initially high in religious belief, participants assigned to write says about their death did not report significantly greater belief in an afterlife ($M = 8.06$, $SD = 2.29$) than did the participants in the other conditions ($M = 7.11$, $SD = 2.64$) ($t = 1.24$, $p = .22$).

Though these results are consistent with the idea that individuals low in initial religiosity were more responsive to the mortality salience manipulation, it is important to note that the results might also be the result of ceiling effects for the high religiosity participants. It may simply be the case that all participants were more or less equally affected by the mortality salience manipulation, but those initially high in religious belief did not report significantly higher belief because their counterparts who did not receive the mortality salience manipulation had themselves indicated very high religiosity. Further, the results of a regression analysis of the effects of the essay manipulation, initial religiosity, and their interaction on afterlife belief did not yield a significant interaction effect ($p = .95$).

DISCUSSION

Two experimental studies showed that making thoughts of their own death salient to participants increased reported belief in an afterlife. Participants in Study 2 also reported greater belief in God as a result of writing essays about their own death, and this effect of the essay manipulation was mediated by increased belief in an afterlife. In Study 2, mortality salient participants also reported greater belief in heaven and hell. In both studies, the effects of mortality salience on afterlife belief were greater among those initially low in religiosity, though support for this pattern was mixed and possibly driven by a ceiling effect for high religiosity participants' reported religious beliefs.

The only known experimental demonstration of an effect of fear of death on level of afterlife belief is that of Osarchuk & Tatz (1973). However, that study only showed an effect among participants initially high in religious belief, while the present studies showed main effects of fear of death. The study also replicates Norenzayan & Hansen's (2006) finding that fear of death increases belief in God. The effect of the fear of death on reported belief in God was mediated by reported afterlife belief.

Study 2 helps address a previously presented alternative explanation for Osarchuk & Tatz's findings. It is possible that their use of dirgelike music and imagery related to funerals may have made religious thoughts more accessible to participants, and in turn created higher estimates of the likelihood of religious notions, such as an afterlife. Likewise, my Study 1, by making death thoughts salient to participants may have also led religious thoughts to be salient to people via cultural and other associations between the two. To address the possibility that the salience of thoughts related to religion and an afterlife biased estimates of the probability of an afterlife, Study 2 contrasted a death essay condition with an afterlife essay condition. The afterlife essay condition should

have promoted even greater thinking related to the idea of an afterlife than the death essay condition, but nonetheless participants who wrote death essays rated the afterlife as more probable.

Motivated Reasoning and Terror Management Theory

Results presented here generally support the claim that religious beliefs are driven in part by motivational factors. When participants' fear of death was made salient to them they exhibited greater belief in an afterlife, heaven, hell, and God. However, the evidence is mixed on whether these effects are best understood in terms of Terror Management Theory or a more parsimonious motivated reasoning account.

On balance, most results supported the parsimonious motivated reasoning explanation given in Figure 1. In both studies, the effects of fear of death on afterlife belief appeared to be strongest among those low in religiosity. However, this pattern did not yield significant interaction effects and could have been driven by ceiling effects for those high in religiosity. It could be argued that TMT would predict only those high in religiosity would respond to mortality salience manipulations with increased religious belief, since only those high in religious belief would see religion as central to their cultural worldview. If one interprets TMT in this way, it clearly does not account well for the pattern of data found here.⁷

Additionally, the effect of fear of death on belief in God, a result first shown experimentally by Norenzayan & Hansen (2006), suggested that this relationship was

⁷ Note that it is unclear whether the meaning of the term "cultural worldview" in TMT refers to the "dominant cultural worldview" or the "individualized cultural worldview," i.e. an individual's beliefs or beliefs held more generally in the culture. Consistent with Popper's falsifiability criterion (1959), vagueness of key terms in theories undermines scientists' efforts to assess their validity in empirical tests. Future theoretical work should clarify the meaning of this central concept of TMT.

mediated by afterlife belief. This causal sequence was predicted by the simple motivated reasoning account, but not TMT. It is also worth noting that participants in Study 2 reported greater belief in heaven than in hell even though these beliefs are typically paired, also consistent with a motivated reasoning explanation of afterlife beliefs. Additionally, Norenzayan & Hansen (2006) showed that the effect of mortality salience on belief in supernatural agents extends to even culturally foreign ones, a finding also at odds with TMT.

Other evidence from the two studies, though, supports TMT. The increased belief in hell among mortality salient participants in Study 2 does not fit well with motivated reasoning. However, it makes sense from the perspective of TMT, which would predict mortality salience to lead to cultural worldview defense, including increased belief of even aversive cultural beliefs. Also, although I found the effects of mortality salience to be driven by those low in religiosity, it is worth noting that Osarchuk & Tatz (1973) found an effect of fear of death on afterlife belief exclusively among individuals initially high in afterlife belief, consistent with TMT.

Future research should extend the present studies and address their limitations. For example, it would be best to more thoroughly classify participants' pre-manipulation religious beliefs, e.g. surveying participants' intrinsic vs. extrinsic religiosity. Another limitation of the current research is its strict reliance on survey measures of religious belief. Self-reported attitudes are often unreliable and poor predictors of behavior (Nisbett & Wilson 1977). Thus, future research could extend the present research by demonstrating effects of fear of death on behaviors related to afterlife belief.⁸ It also

⁸ An initial study attempting to show effects of fear of death on behaviors related to afterlife belief was conducted by the author (Willer, 2007). The experiment failed to show an effect of fear of death on study

would be valuable for future research to explore nonconscious mortality salience inductions both to better understand the role of conscious vs. nonconscious processing in the processes studied here, but also to avoid participants' awareness of the manipulation and the possibility of incumbent demand effects.

Another limitation of the present research is its exclusive focus on one basis of motivational basis of religious beliefs: fear of death. It is likely that other motivations may also lead individuals to adopt religious beliefs. For example, Koole, Greenberg, & Pyszczynski (2006) identify four additional existential concerns – isolation, identity, freedom, and meaninglessness – all of which may contribute to religious belief. Also, the same motivational bases of political conservatism (Jost et al. 2003) may also apply to religiosity as the two are often paired in cultural discourse.

CONCLUSION

Though more than two centuries have passed since Voltaire famously pronounced that belief in God could be attributable to psychological motivations, research has only begun to keep pace with theoretical speculations on the motivated bases of religiosity. While research on political ideology has increasingly come to focus on the role of psychological motivations in the formation of political attitudes (e.g., Jost et al., 2003), the trend is more recent and smaller in social psychological research on religiosity. Taken together, the present studies contribute to a recent emergence of research on the significance of

participants' willingness to sign a statement transferring possession of their soul to the experimenter in return for \$3. It was predicted that participants who had written essays about their death would be less willing to sell their souls (because of greater belief in an afterlife). Though this effect was not observed, willingness to sign the statement was negatively related to reported religious belief.

motivational factors, especially fear of death, in the explanation of religious beliefs (e.g. Dechesne et al. 2003; Friedman & Rholes 2006; Norenzayan & Hansen 2006).

Future research should continue this growing emphasis, as it has so far proven fruitful. Future research also, however, should pay heed to the complexity of human religious beliefs. Past findings are mixed and often contradictory, and such closely held beliefs are quite difficult to change with experimental manipulations.

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Table 1: Mean reported belief in afterlife, heaven, hell, and God by essay condition in Study 2.

	Death Essay Mean (<i>SD</i>)	Television Essay Mean (<i>SD</i>)	Afterlife Essay Mean (<i>SD</i>)	Death of a Loved One Essay Mean (<i>SD</i>)
Belief in an Afterlife	7.29 (2.48)	5.40 (3.11)	5.55 (3.19)	6.00 (2.55)
Belief in Heaven	7.75 (2.10)	5.48 (2.95)	5.49 (3.39)	5.97 (2.85)
Belief in Hell	6.54 (2.60)	4.60 (3.07)	4.13 (3.12)	4.17 (2.83)
Belief in God	8.18 (2.11)	6.88 (3.17)	6.72 (3.12)	6.83 (3.08)

Figure 1: Theoretical, Bidirectional Relationship Between Fear of Death and Belief in an Afterlife Predicted by Basic Motivated Reasoning Account

