

Scaring the bejesus into people:

The role of religious belief in managing implicit and explicit anxiety

Jamin Halberstadt

Department of Psychology, University of Otago

Jonathan Jong

Center for Anthropology and Mind, University of Oxford

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Humans are anxious creatures. For a species at the top of the food chain, we have delicate sensibilities, with over 500 documented phobias (including aulophobia, the fear of flutes). We may have cornered the market on deadly force, yet we easily become anxious when left out of a ball tossing game, and downright terrified at the prospect of singing in public. Consequently, much of our behavioral, cognitive and emotional efforts go into avoiding and, in some heroic cases, overcoming anxieties.

Yet there is one source of anxiety that no behavior modification can avoid, and no cognitive work can rationalize away: our own death. Unlike flutes, our demise is unavoidable and, naturally, upsetting, and coping with death's inevitability requires more than therapy: it requires a belief system optimistic and robust enough to buttress us in the face of constant reminders that life is fragile and fleeting, and that there is no evidence that anything awaits us afterwards.

Religious belief, many philosophers (and some psychologists) have noted, could provide just such a system. It is optimistic, in the sense that most religious belief systems include supernatural entities whose very existence documents the possibility of eternal life, and who in many cases have the power to extend that privilege to mortals as well. And it is robust in the sense that, as has long been noted by anthropologists, there is no known culture, past or present, completely devoid of supernatural agent concepts, most commonly related to life after death (souls, spirits, etc; Barrett, 2004; Boyer, 2001); indeed, ancestral worship seems to date back at least 60,000 years (Rossano, 2006). Furthermore, all attempts to argue or legislate religion away—from first century BCE Epicureans (e.g., Lucretius), to large-scale experiments with state atheism in the Soviet Union, Maoist China, and Socialist Albania, to the current wave of “New Atheists” (e.g., Dawkins, 2006; Hitchens, 2007)—have ultimately failed.

Indeed, the durability of religious belief is, upon inspection, something of a psychological and evolutionary conundrum, since supernatural religious agents, while providing a solution to the problem of death, are invariably inconvenient and costly things in which to believe. The world over, the belief in gods comes almost inevitably with self-denial and sacrifice, and often with divinely-mandated participation in demanding pilgrimages and dysphoric rituals (Whitehouse, 1996, 2004). Hindus' pilgrimage to Prayag, Muslims' to Mecca, and Christians' to Jerusalem, are examples of economically and medically risky endeavors; the Ganges river is infamously polluted with human and industrial waste, and the banks of the Jordan with landmines. Additional religious requirements like tithing and proscriptions on sex make little sense from an evolutionary perspective unless they are offset by proportionally greater benefits, such as the relief of existential anxiety. Thus, while religion potentially answers the question of how people manage their death anxiety, the management of death anxiety may conversely answer the question of why people invest so much effort in religious beliefs and rituals with little tangible reward.

The history of ideas is replete with theories of religion, many of which speculate about the causal role of existential anxiety. Hume (1757/2008) includes "the terrors of death" among the phenomena that "men scrutinize, with a trembling curiosity" that leads them, still baffled, to see the first obscure traces of divinity". Similarly, Feuerbach (1851/1967) argued that religious beliefs are projections of psychological needs, particularly the need to assuage the otherwise crippling fear of loneliness, meaninglessness, and death. Thus, he boldly concludes his *Lectures on the Essence of Religion* with the claim that "the meaning and purpose of God are immortality" (Feuerbach, 1851/1967, p. 276). More (in)famously, Freud (1927/1961) supposed that religious beliefs were paradigmatic examples of wish-fulfillment, driven by "the oldest, strongest, and most urgent wishes of mankind" (p. 38), the desire for a powerful father who can protect us from the dangers of life and the finality of death. And so, gods "exorcise the terrors of nature, [and] must reconcile men to the

cruelty of Fate, particularly as it is shown in death”. More recently, anthropologists like Malinowski (1948) and Becker (1971, 1973) have put even more acute emphasis on the function of religion as a strategy to assuage the fear of death. Malinowski’s (1948) ethnographic work led him to conclude that “Of all sources of religion, the supreme and final crisis of life—death—is of the greatest importance”, while Becker (1973), strongly influenced by the psychoanalytic and existential traditions, argued that not just religion, but much of human culture, is motivated by a fear of death and the concomitant desire for immortality.

In modern psychology the best example of this line of thought is Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986; Vail, Rothschild, Weise, Solomon, Pyszczynski, & Greenberg, 2010). TMT, drawing heavily on Becker’s (1973) work, begins with the observation that human beings are, perhaps uniquely, aware of their mortality. This cognizance of our inevitable deaths elicits crippling existential anxiety, which must be dealt with if we are to function in the world. We are therefore motivated to accept and embed ourselves in cultural worldviews that allow for immortality, either literally (via afterlife provisions) or symbolically (via memberships in groups that are larger and more enduring than any particular member). In this view, religious worldviews are particularly effective at relieving existential anxiety by providing both literal *and* symbolic immortality; Greenberg, Landau, Solomon, & Pyszczynski (in press) have even recently argued that the relief of existential anxiety is in fact the ultimate (i.e., evolutionary) function of religious belief.

However, there are reasons to doubt that religious belief is an evolved (and presumably effective) mechanism for managing existential anxiety. An obvious problem is that, when one examines the specifics of religious afterlife beliefs, one finds them hardly comforting, and arguably more terrifying than death itself. Not all religious belief systems come with afterlife beliefs (e.g., Baka Pygmies; Woodburn, 1982), and many that do posit gloomy graves or horrific hells. Mythical

worlds are populated by benevolent deities, but also with malevolent ones who are often ambivalent or capricious in their dealings with human beings (Lambert, Triandis, & Wolf, 1959). According to their own religious texts, Homeric Greeks (cf. *Iliad*) all descended into a dreary Hades regardless of merit, while ancient Mesopotamians were infamously cast into a terrifying netherworld populated by monsters (cf. *The Netherworld Vision of an Assyrian Crown Prince*) or a despairing one in which “dust is their food, clay their bread” and “they see no light, they dwell in darkness...over the door and the bolt, dust has settled” (cf. *The Descent of Ishtar to the Netherworld*; Dalley, 1998, p. 155). Lucretius’ Epicurean analysis, perhaps the earliest explicit attempt to provide a genealogy of religion, lays out the implications of such visions of the afterlife:

Fear holds dominion over mortality  
Only because, seeing in land and sky  
So much the cause whereof no wise they know,  
Men think Divinities are working there.

#### De Rerum Natura

In other words, Lucretius suggests that although religion is driven by an attempt to make sense of the unpredictable perils of nature, the ensuing notion of angry gods only exacerbates the anxiety (see also Colman, 2009).

Even in the more familiar Judeo-Christian traditions, with their emphasis on divine omnibenevolence, the God portrayed in the Bible is anything but straightforwardly good (Dawkins, 2006; Matthews & Gibson, 2005; Penchansky, 1999), and the afterlife anything but straightforwardly positive, with eternal torment in Hell a subjectively real possibility for (literally) God-fearing Christians. Some Calvinists, for example, experience “salvation anxiety” so entrenched that many ex-fundamentalists still report experiencing intense fear of divine punishment even after

they have abandoned such beliefs (Hartz & Everett, 1989). Even in Roman Catholic theology, it is possible that unrepented mortal sin can cause a believer to lose her salvation; certainly the more common, venial, variety of sin necessitates a period of purgatorial suffering before the believer may enter Paradise (Catechism of the Catholic Church, nos. 1854—1864). This uncertainty regarding one's post-mortem fate is reflected in various religious practices, such as the sacrament of reconciliation (i.e., the practice of confession), prayers for the dead, and indulgences (Catechism of the Catholic Church, nos. 1422—1498). Thus, the horrific possibility of eternal post-mortem suffering, and the institutionalized doubt about who it will befall, ought to temper the effectiveness of religiosity for relieving existential anxiety: in comparison to some accounts of the afterlife, not existing at all is the less anxiety-inducing outcome.

However, even if the mere possibility of a positive afterlife (when on offer) were sufficient to assuage existential anxiety, the existence of nonbelievers suggests that it is not necessary. Although religious belief, as noted, is a durable feature of human culture, so is atheism, and it is unclear that atheists are any more anxious about their own death than any religious group. Furthermore, because atheism is itself a worldview capable in principle of relieving existential anxiety, thoughts about the afterlife should challenge that worldview and therefore create rather than relieve such anxiety.

Indeed, previous empirical research demonstrates that mortality salience (i.e., increased accessibility of death-related cognitions) leads to the bolstering of ingroups and the derogation of outgroups, even when the groups in question are minimally-defined and arbitrarily-assigned (Harmon-Jones, Greenberg, Solomon, & Simon, 1996; see also Burke, Martens, & Faucher, 2010 for review). If so, then death anxiety should motivate religious belief only among religious believers, in which case it provides little insight into how religious believers came to hold their beliefs in the first place. At the very least TMT's account of religion as a uniquely powerful buffer against existential anxiety is in tension with its account of worldview defense, and requires a means of regulating these two mechanisms of anxiety reduction when they conflict.

### Fear of death and religious belief: Empirical evidence

Does religious belief assuage existential anxiety? If so, for whom, and why? Although researchers have only recently begun to ask these questions experimentally, the related question of whether religious *people* are less death-anxious has enjoyed more scholarly attention. The results have been equivocal, though weakly supportive of the claim that the religious people suffer less anxiety about death. Spilka, Hood, and Gorsuch (1985), for example, found that, of the 36 studies they reviewed, 24 showed that religious people were less anxious about death, three showed that they were *more* anxious about death, and nine showed mixed or inconclusive results. Donovan (1994), reviewing 137 studies conducted between 1897 and 1992, found similar numbers: religious people were less anxious in 57% of studies, more anxious in 9%, and results were inconclusive in 33%.

However, even this weak consensus is suspect due to several methodological issues. As Hood, Hill, and Spilka (2009) observed, the vast majority of the research in this area has been conducted with religious samples (e.g., American college students, who are predominantly religious); we therefore have relatively little information about non-religious individuals, the very ones, as argued above, who might be expected to demonstrate an increase in anxiety with stronger religious belief (which challenges their prevailing worldview). Furthermore, a closer look at the individual studies under review also reveals the diversity in the measurements used, and the imprecision with which “religiosity”—a multidimensional concept with a variety of affective, cognitive, and behavioral components—is often operationalized. Death anxiety may well be correlated with some aspects of religiosity, but not others, or with different aspects of religiosity in different directions. For example, Harding, Flannelly, Weaver, and Costa (2005) found that both belief in God and an afterlife were negatively correlated with death anxiety, whereas Dezutter, Luyckx, and Hutsebaut (2009) found that literal religious interpretation was positively correlated with death anxiety. Alvarado, Templer, Bresler, and Thomas-Dobson (1995) found no relation between death anxiety

and absolute levels of religious conviction, but a negative relation when they examined relative religious conviction (i.e., compared to other people's conviction). Cohen, Pierce, Chambers, Meade, Gorvine, and Koenig (2005) found that fear of death was negatively related to intrinsic religiosity (i.e., internalized religious belief and practice) but positively related to extrinsic religiosity (i.e., religious practice as a means to other ends).

In order to draw a more definitive conclusion about the relation between religiosity and death anxiety, we focused our own research on just one aspect of religiosity, the belief in supernatural agents, places and events (Boyer, 2011). This approach not only put us in line with recent research on religious cognition (e.g., Atran, 2002; Barrett, 2004; Bering, 2011; Boyer 2001; Pyysiäinen, 2009; Tremlin, 2006; Whitehouse, 2004; Wilson, 2002), which considers belief to be a core component of religiosity, but also permits the operationalization of religiosity in both explicit and implicit terms.

Unfortunately, and surprisingly, we found no straightforward, generalizable measure of religious belief, but rather what Gorsuch (1984, p. 234) called a "hodgepodge" of religiosity scales that conflate religious beliefs, values, experiences, and behaviours (see Hill & Hood, 1999, for review). Among the few belief scales that did exist, most were tailored to specific (usually Christian, if not specifically evangelical) audiences and therefore refer to very specific theological beliefs (e.g., Loving and Controlling God Scale, Benson & Spilka, 1973; Christian Orthodoxy Scale, Fullerton & Hunsberger, 1982; Love and Guilt Oriented Dimensions of Christian Belief, McConahay & Hough, 1973). Given this methodological gap, our first task became the development and evaluation of a measurement instrument for our variable of interest. Drawing on recent anthropological and psychological research, we identified a set of cross-culturally recurring religious supernatural themes (e.g., an omnipotent being; a benevolent afterlife; prophecies) and created questionnaire items to assess belief in each. The result was the 10-item Supernatural Belief Scale (SBS; Jong,

Bluemke & Halberstadt, in press). An exploratory factor analysis and two confirmatory factor analyses across three samples determined that the scale was essentially unidimensional, and that the aggregate score reliably measured religious supernatural belief, as well as predicted self-reported religious identity and behavior.

Armed with a reliable and valid measure of one core aspect of religiosity—belief in supernatural agents, entities, and events—we then examined the statistical relationship between religious belief (via the SBS) and death anxiety (via the Death Anxiety Questionnaire; Conte, Weiner, & Plutchik, 1982). In contrast to the weak and variable associations reported in previous research, we have repeatedly found a curvilinear relationship between religious belief and death anxiety. In one representative study, depicted in Figure 1, participants who expressed relatively strong belief in religious supernatural entities (hereafter “believers”) *and* those who expressed relatively strong *disbelief* in such entities (“nonbelievers”) expressed less fear of death than those with relatively neutral or ambivalent beliefs. The same relationship was also found when participants were dichotomized in terms of their religious self-identification: Among “Christian” participants, stronger belief was associated with less fear of death; among nonreligious participants (including self-described agnostics), stronger belief was associated with *greater* fear of death. Equally important, belief was uniquely associated with death anxiety; neither linear nor quadratic relationships were obtained for other measures of high-arousal negative affect, including any dimension of the Depression Anxiety Stress Scale (Henry & Crawford, 2005) or relevant items on the Positive and Negative Affect Schedule (PANAS; Watson & Clark, 1994).

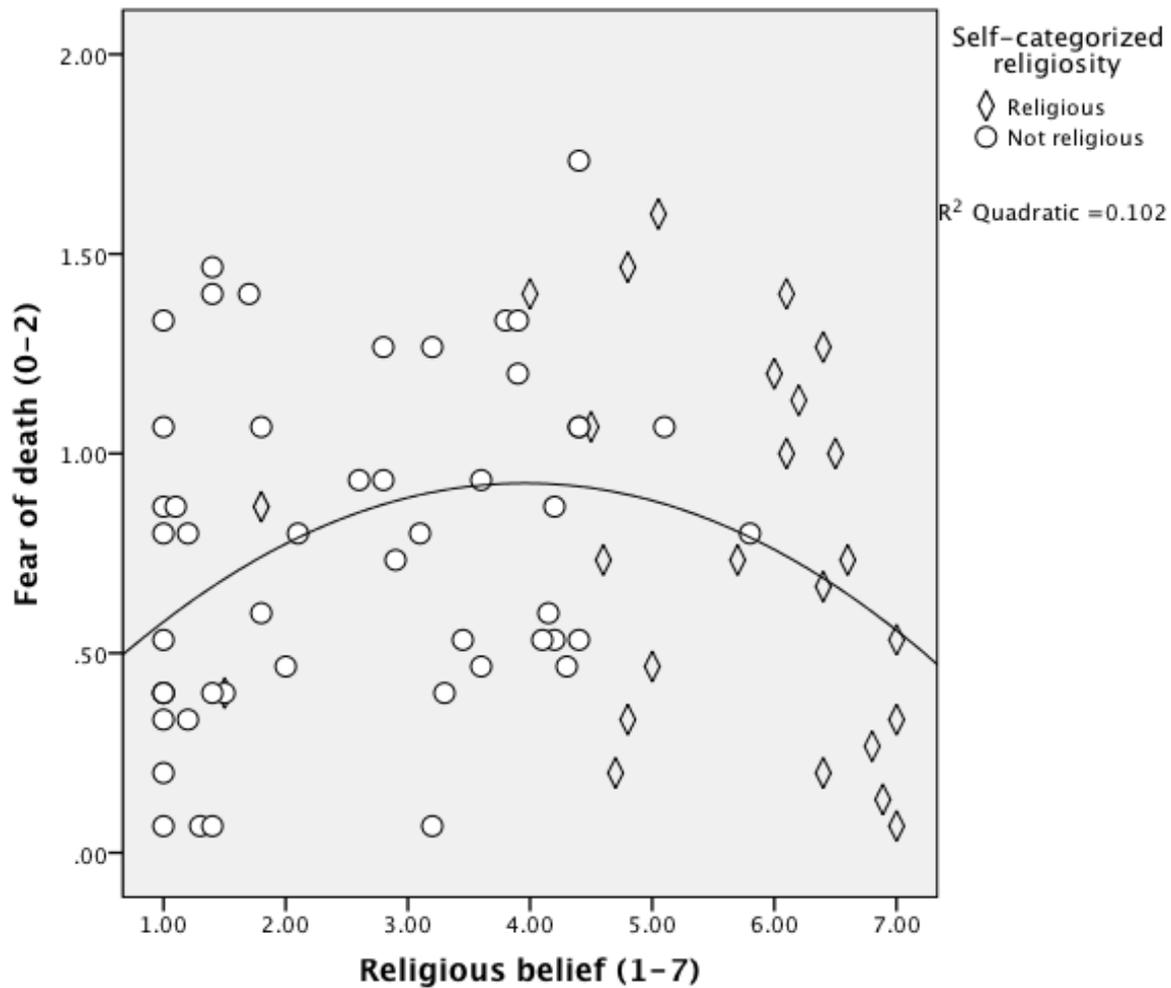


Figure 1: Quadratic relation between religious belief and fear of death.

These correlational data are consistent with the “worldview defense” account of religious belief, in which individuals are buffered against death anxiety to the extent they strongly hold their ingroup beliefs, and not by virtue of strong religious belief per se. Indeed, religious belief was only associated with decreased anxiety among those who described themselves as religious; among nonreligious individuals, greater belief was associated with *greater* anxiety, possibly because such belief was at odds with their prevailing worldview.

Another interpretation, however, is that the positive relation between religiosity and fear of death reflects not a challenge to nonreligious individuals' worldviews, but rather their motivation to assuage that fear. Similarly, one might argue that, on the "believing" half of Figure 1, rather than strong belief reducing death anxiety, it is low anxiety that drives or facilitates strong beliefs (or that high anxiety calls one's religious beliefs into question), supporting precisely the opposite conclusion. The interpretational ambiguity follows directly from the causal ambiguity: it is not clear whether participants' religious beliefs are a cause or a product of their fear of death.

Therefore, to examine the causal relation of anxiety and religious belief, particularly among nonbelievers, we adopted TMT's mortality salience paradigm, in which participants are asked to think and write about their thoughts and feelings they expect to experience at the moment of their death (or, in a control, the thoughts and feelings they expect to experience while watching television). After this priming task, they completed the SBS. Consistent with TMT's worldview defense hypothesis, but inconsistent with a unique role of religious belief, we found an interaction between priming condition and participants' prior religious affiliation (see Figure 2): Participants who described themselves as "Christians" reported stronger beliefs on the SBS, whereas non-religious participants reported stronger *disbelief* when primed with death, than in the control condition (Jong, Halberstadt, and Bluemke, 2012, Study 1).

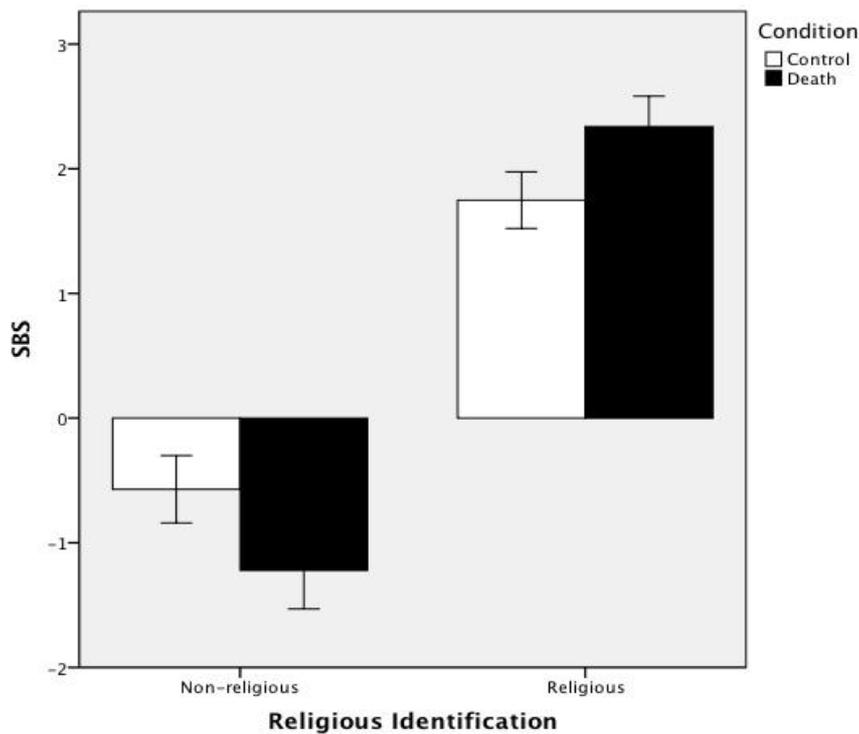


Figure 2: Religious supernatural beliefs as a function of self-identified religiosity and death priming condition.

Clearly, at least in this study, a reminder of their mortality did not universally motivate participants' religious belief. Other researchers employing the same paradigm or variations thereof have also found similar results, albeit with some interesting differences. Norenzayan and Hansen (2006), for example, found that mortality salience increased religious belief among religious individuals, but had no effect on non-religious individuals. Interestingly, there was some indication that death-primed Christians were more willing to endorse *other* groups' gods as well as their own. More recently Vail, Arndt, and Abdollahi (2012) primed Christian, Muslim, and variously non-religious participants with death, and found that under mortality salient conditions, religious participants reported strengthened ingroup religious belief (i.e., Christians reported increased belief in Jesus; Muslims reported increased belief in Allah) and outgroup religious disbelief (i.e., Christians reported reduced belief in Allah and Buddha; Muslims reported reduced belief in Jesus and Buddha). There was no effect among self-described atheists, although, contrary to our results, death priming increased religious belief among self-described agnostics. Given the different ways in

which participants were divided into “religious” and “non-religious” groups and the different dependent measures used, it is difficult to make sense of the differences among our findings, but it is clear that, at the very least, reminders of one’s mortality do not always motivate religious belief; indeed, they may even motivate religious disbelief among non-religious individuals, consistent with a worldview defense interpretation.

### Religious belief as an anxiety-management strategy

Of course, even if thoughts of death change people’s beliefs, it does not mean the change occurs for the purpose of reducing anxiety, much less that it is effective in doing so. Although there is now extensive research on defensive responses to mortality salience, there has been surprisingly little research directly testing whether those responses actually work. The several studies that have examined the issue indirectly suggest, again, a complex situation. For example, Friedman and Rholes (2008) found that participants who scored high on religious fundamentalism engaged in less secular worldview defense after death priming than their counterparts who scored lower on religious fundamentalism (presumably because the former, their anxiety relieved, had no need for worldview defense). Similarly, Norenzayan, da-Nimrod, Hansen, and Proulx (2009) found that while non-religious participants reliably engaged in nationalistic worldview defense after a mortality salience induction, religious participants did not; interestingly, religious and non-religious participants did not differ on either self-esteem level or chronic death thought accessibility. Likewise, Deschene et al. (2003) found that encouraging participants to believe in an afterlife decreased self-esteem striving and defense of values after a mortality salience induction. But, contrary to the worldview defense hypothesis, Heflick and Goldenberg (2012) found that such encouragement to believe in an afterlife mitigated the effects of mortality salience induction among atheists; discouragement from afterlife belief (i.e., the bolstering of their anti-religious worldviews) had no such positive effect.

If it seems odd that none of these studies measures anxiety per se, it is worth noting that Terror Management theorists generally maintain—rather incongruously given TMT’s grand narrative—that it is not consciously experienced affect that drives worldview defense, but rather death thought accessibility itself (e.g., Pyszczynski, Greenberg, & Solomon, 1999; though recall Norenzayan et al.’s. 2009 finding above). To the extent that conscious terror is involved in the process, it is when death is first made salient, at which point individuals respond with “proximal defense” to head off the “ultimate fear of annihilation” (Pyszczynski et al., 1999). Worldview defense, in contrast, is a “distal defense” that is not invoked until thoughts of death leave consciousness (but are still accessible).

Be that as it may, it appears to follow that, if religious belief evolved to manage our existential anxiety, then manipulating religious belief should have measurable effects on it. To test this hypothesis we manipulated religious belief via an indirect persuasive message. Participants, in the context of a “research evaluation task,” were instructed to read and rate the quality of three abstracts of published scientific studies. The first and third were identical for all participants and did not mention religiosity. The second, however, differed by experimental condition (pro versus anti religion): Participants read about a large survey, supposedly published in *Nature*, which revealed that “scientists are getting more religious [atheistic]” because they find that “scientific [religious] explanations are increasingly inadequate to the task of explaining natural phenomena.” Then, participants were primed with death, after which they completed the Death Anxiety Questionnaire described above, the PANAS as a state mood measure, and the SBS, used in this case as a measure of chronic religious supernatural belief. Contrary to the notion that religious belief is a uniquely powerful buffer against death anxiety, pro-religious priming only decreased death anxiety among religious participants (those above the median on the SBS), but *increased* death anxiety among non-religious participants (see Figure 3). The same analysis conducted on general mood, as measured by the PANAS, and on the anxiety-related items on the PANAS, revealed no effects.

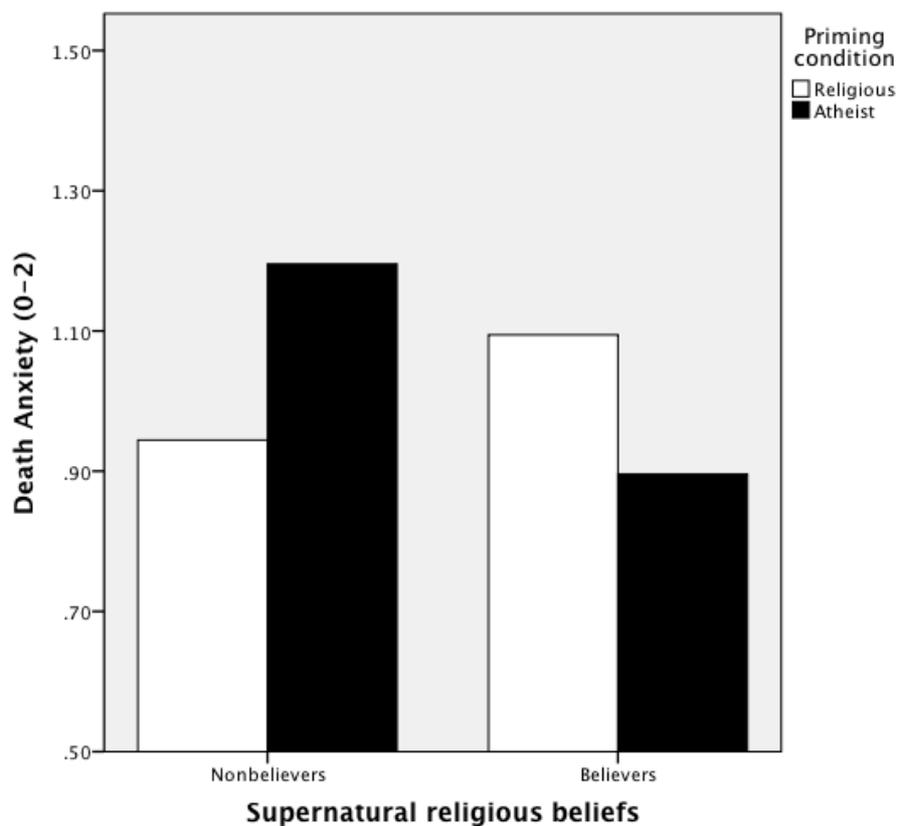


Figure 3: Death anxiety as a function of prior religious belief (SBS score) and religiosity priming

So far then, our experimental investigations spell bad news for the venerable idea that death anxiety motivates, and is quelled by religious belief. Instead, increasing death-related thoughts bolstered individuals' prior beliefs, be they religious or anti-religious; furthermore, encouraging religious belief reduces death anxiety only for those who already believed, while making non-religious participants *more* anxious. The data are more consistent with TMT's worldview defense hypothesis, and with the notion that if participants are seeking immortality, they are doing so symbolically, not literally via an openness to supernatural agents with the power to grant it.

The result, while consistent with TMT, is at odds with much religious and philosophical thought, not to mention the implications of a good deal of empirical research. For example, Vail et al.'s (2012) finding that, when primed with death, agnostics abandon their doubt and move toward

religious belief, are suggestive that religious beliefs are particularly attractive when mortality is salient. Similarly, Norenzayan and Hansen's (2006, Experiment 4) finding, that death-primed Christians became more willing to endorse even outgroup gods, shows that mortality salience enables people to transcend religious worldview defense to become more open to other religious possibilities in the face of death. Furthermore, the research on the moderating effects of religious and afterlife beliefs on people's social and self-esteem responses to mortality salience strongly suggest that such beliefs provide resources that ward off the negative effects of death-related thoughts. How can God's existence be both a threat and a comfort to nonreligious individuals facing death?

#### Implicit belief and anxiety

One possibility is that, while the assertion that "God exists" conflicts with strongly held propositional beliefs to which nonreligious individuals are committed, the concept of God (and religious supernatural beliefs generally) is associated with other, positive concepts. Just as one need not endorse negative attitudes toward African Americans (for example) to be influenced by learned cultural associations with this group, it is conceivable that one might derive some benefits from God without explicitly believing in Him.

Over the last two decades, the notion that our explicit attitudes are dissociable from our implicit attitudes, and indeed, that some attitudes are held or formed automatically and even unconsciously, has established itself as social cognitive orthodoxy. The literature is now replete with dual-process models of cognition, which variously distinguish between the implicit and explicit (e.g., Nosek, 2007), or the automatic and controlled (e.g., Bargh & Chartrand, 1999), or the unconscious and conscious (e.g., Dijksterhuis & Nordgren, 2006), or the heuristic and systematic (e.g., Chen & Chaiken 1999), or the intuitive and reflective (e.g., Sperber, 1997). The conceptual and empirical relationships among these different distinctions are yet to be fully understood, but it is clear at least

that human cognition and emotion are not limited to our conscious, verbalizable experience. Indeed, the distinction between explicit and implicit cognition has been applied to many domains in social psychology. As noted, research on prejudice (see Devine, 2001 for review), for example, has repeatedly demonstrated that implicit prejudice predicts behavior, even when controlling for explicit prejudice (e.g., Knowles, Lowery, & Shauberg, 2010). Furthermore, explicit and implicit measures of prejudice, which putatively measure explicit and implicit prejudice respectively, predict different kinds of prejudiced behaviour (e.g., Dovidio, Kawakami, & Gaertner, 2002).

Furthermore, recent research on religious cognition highlights just such a decoupling of reflective, propositional belief from unreflective, implicit beliefs. Barrett and Keil (1996), for example, demonstrated that people often employ theologically incorrect, overly-anthropomorphic assumptions that contradict their explicitly stated religious beliefs, when processing narratives about God in a recall task. There is also increasing evidence that participants who explicitly deny religious belief nevertheless behave like “implicit theists” (Uhlmann, Poehlman, & Bargh, 2008, p. 71). For example, participants who denied belief in the soul nevertheless declined to sell their souls to the experimenter, even though the contract was explicitly marked as bogus (i.e., “not a legal or binding contract, in any way”; Haidt, Björklund, & Murphy, 2000, p. 22). Bering (2002, p. 274) also found that “extinctivists”—people who explicitly affirmed belief that “the self is wholly extinguished at death”—nevertheless implied that certain kinds of psychological functioning persisted after death, when answering a series of questions about a character in a story who had died. While they had little trouble denying the continuation of biological needs and psychobiological experiences (e.g., hunger), even extinctivists often endorsed statements that implied the post-mortem persistence of emotional (e.g., love for family member), desire (e.g., to be alive), and knowledge (e.g., knowledge that they were dead) states. Furthermore, they took significantly longer to deny the persistence of such psychological states than they did the persistence of biological and psychobiological ones. In a related study, Heywood (2010)

interviewed atheists about major events in their lives, and found that they often saw intrinsic meaning or purpose in significant events, as though they occurred in order to teach them something or to convey some important message. These results, Bering (2010) argues, reveal that even trenchant non-believers (e.g., extincivists, atheists) are subject to implicit and incorrigible tendencies toward afterlife beliefs and teleo-functional reasoning, which are important aspects of religious belief.

Besides implicit attitudes and implicit beliefs, there is also increasing evidence for implicit or unconscious emotions. There is, for example, clinical evidence of dissociations between consciously-experienced feelings and psychophysiological responses in anxiety disorders (Barlow, 1988; Rachman, 1990); indeed, this unconscious anxiety is even specially associated with particular patterns of avoidance behaviour, such as substance abuse (Kihlstrom, Mulvaney, Tobias, & Tobis, 2000). Furthermore, combining Zajonc's (e.g., 1980) work on affective priming and Schwarz and Clore's (1994) work on affect misattribution, Winkielman, Zajonc, and Schwarz (1997) provided evidence that affective priming (via happy and angry faces) could alter subsequent judgements about the valence of Chinese ideographs without detectable changes in consciously-experienced affect. Similarly, Winkielman, Berridge, and Wilbarger (2005) exposed thirsty participants to subliminal affective primes, and measured the amount of a novel beverage they drank as well as their evaluations of the beverage. In this case, the unconscious primes affected participants' attitudes and behaviour without affecting consciously-experienced affect; participants primed with happy faces were more willing to drink the beverage and to evaluate it positively.

The research on implicit social cognition, implicit theism, and unconscious emotion open up the intriguing possibility that there may be a dissociation between explicit and implicit religious beliefs in the face of death, as well as a dissociation between effects of religious belief on conscious and unconscious death anxiety. As a preliminary test of this idea, we first ran a correlational study to

examine whether religious beliefs were associated with explicit and implicit death anxiety in different ways. Participants in this study completed the SBS before completing a single-target implicit association test (Wigboldus, Holland, & van Knippenberg, 2006), in which “death” and its synonyms were paired either with words associated with anxiety or (in a different block) with words associated with calmness. Difference in response times between these two blocks reflected implicit death anxiety. Participants also completed the explicit Death Anxiety Questionnaire used previously. Consistent with previous findings on the dissociation between explicit and implicit cognition and emotion, we found that while the relationship between religious belief and explicit death anxiety was curvilinear as before, the relationship between religious belief and *implicit* death anxiety was linear: stronger religious belief was associated with lower implicit death anxiety (see Figure 4).

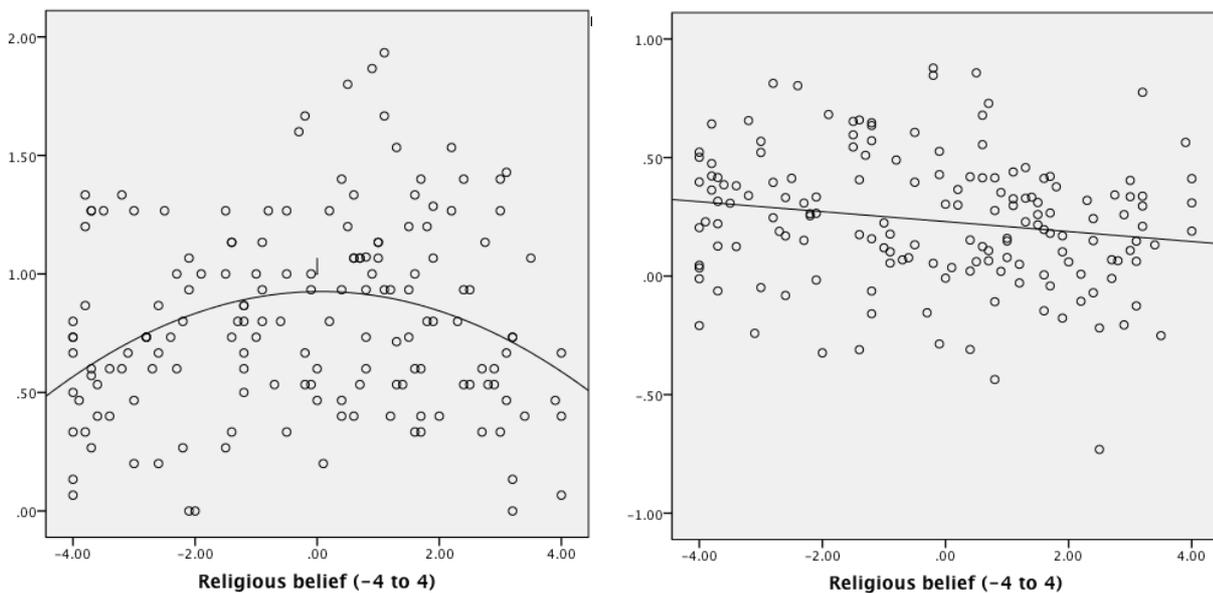


Figure 4: Explicit fear of death (left panel, Death Anxiety Scale, 0-2) and implicit fear of death (standardized ST-IAT score) as a function of supernatural religious belief.

Given the interpretational ambiguity noted above, we replicated this initial result experimentally. This time, rather than relying on an indirect persuasive message, we took advantage of the affect-as-information effect (Clore, Gasper & Garvin, 2001). In the pro-religion condition, participants were

asked to list twelve reasons that “God does not exist” (a task fewer than 1% of pretest participants accomplish spontaneously), noting that “most atheists find it easy to list 12 reasons,” but adding that participants should stop if they themselves cannot think of that many. In the anti-religion condition, participants listed 12 reasons why “God exists,” adding again that most religious people can do so, but that participants need not if they are unable. The expectation (validated in a pretest) was that participants would either fail or find it very difficult to list 12 reasons for either proposition, and consequently attribute this difficulty to their own attitudes. That is, the difficulty of the “God does not exist” task would lead to increased religious belief, whereas the difficulty of the “God exists” task would lead to decreased religious belief. Following the manipulation, all participants completed both implicit and explicit measures of death anxiety. In stark contrast to our previous study on self-reported death anxiety, we found that participants listing—with difficulty—reasons why God does not exist demonstrated less implicit death anxiety than those trying to list why God exists, regardless of their explicit religious beliefs (measured on the SBS; see Figure 5). That is, the manipulation that increased religious disbelief also decreased implicit death anxiety. Participants’ explicit fear of death did not change.

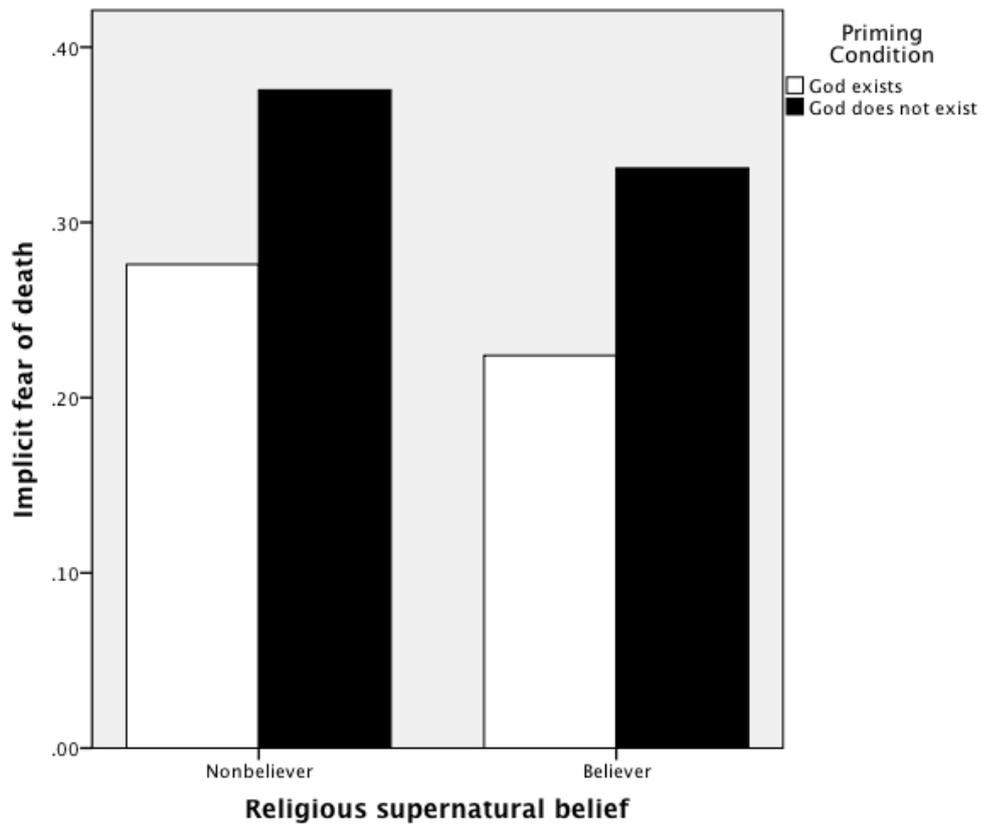


Figure 5: Implicit fear of death (standardized ST-IAT) as a function of the priming of God's existence and preexisting supernatural religious belief.

These findings, in turn, raised the question of the effect of mortality salience on implicit religious beliefs. If religious beliefs mitigate implicit death anxiety, we reasoned, perhaps mortality salience might motivate implicit religious belief while also motivating explicit worldview defense. To address this possibility, we ran two studies, employing two different implicit measures of religious belief. In the first study, religious and non-religious participants (self-categorized) either completed the death or control thought listing task, followed by a supernatural belief ST-IAT. In this case, participants responded to target words that referred to supernatural entities (from the SBS) on the same key as synonyms of “real” or (in a different block) synonyms of “imaginary,” with the difference in response times a measure of the implicit association between supernatural entities and existence. Consistent with our hypothesis, and in contrast with our previous experiment on explicit religious belief, mortality salience increased implicit religious belief—the cognitive association

between supernatural concepts and existential attributes—regardless of participants’ self-reported religious identities (Jong, Halberstadt & Bluemke, 2012, Study 2; see Figure 6).

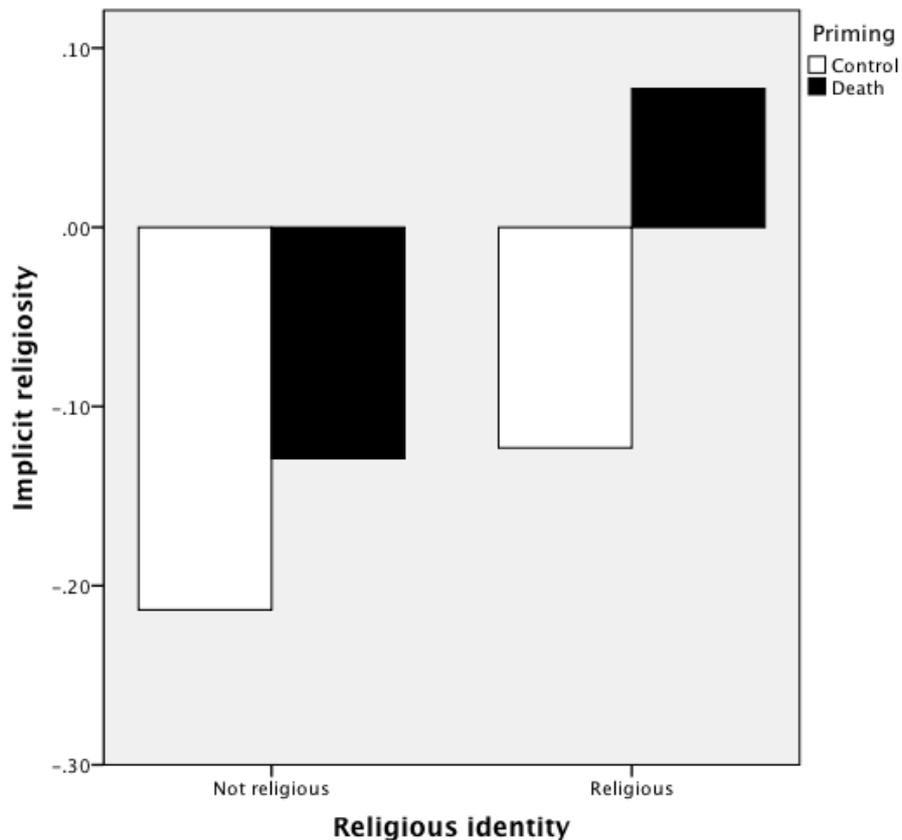


Figure 6: Implicit religiosity (standardized ST-IAT score) as a function of religious identity and priming condition.

In a second study, we designed and employed a property verification task for religious belief in which participants simply categorized supernatural entities as being “real” or “imaginary” (Jong, Halberstadt, & Bluemke, 2012, Study 3). This task provides two measures: first, the rate of classification, and second, the speed of classification. As expected, classification rates were highly correlated with self-reported religious belief, as measured via the SBS, regardless of experimental condition: participants who scored high on the SBS also categorized more supernatural entities as real,  $r = .86$ ,  $p < .001$ . On the other hand, classification latencies depended on experimental condition. In the control condition, these latencies were quadratically related to SBS scores: participants who reported strong religious belief *or* strong religious disbelief scores classified

supernatural entities most quickly, whereas more ambivalent participants were slower to respond,  $\beta = .49, t = -4.14, p < .001$ . However, after writing about their own death, believers classified more quickly, while nonbelievers classified more slowly (relative to controls), a cubic function indicating strengthened religious belief and weakened religious disbelief among believers and nonbelievers respectively (see Figure 7). Note that this patterns is inconsistent with the worldview defense hypothesis, which predicts that mortality salience leads to the bolstering of one’s prior beliefs, whether religious or not, and therefore that both religious and non-religious participants would classify supernatural entities more quickly, in worldview-consistent ways.

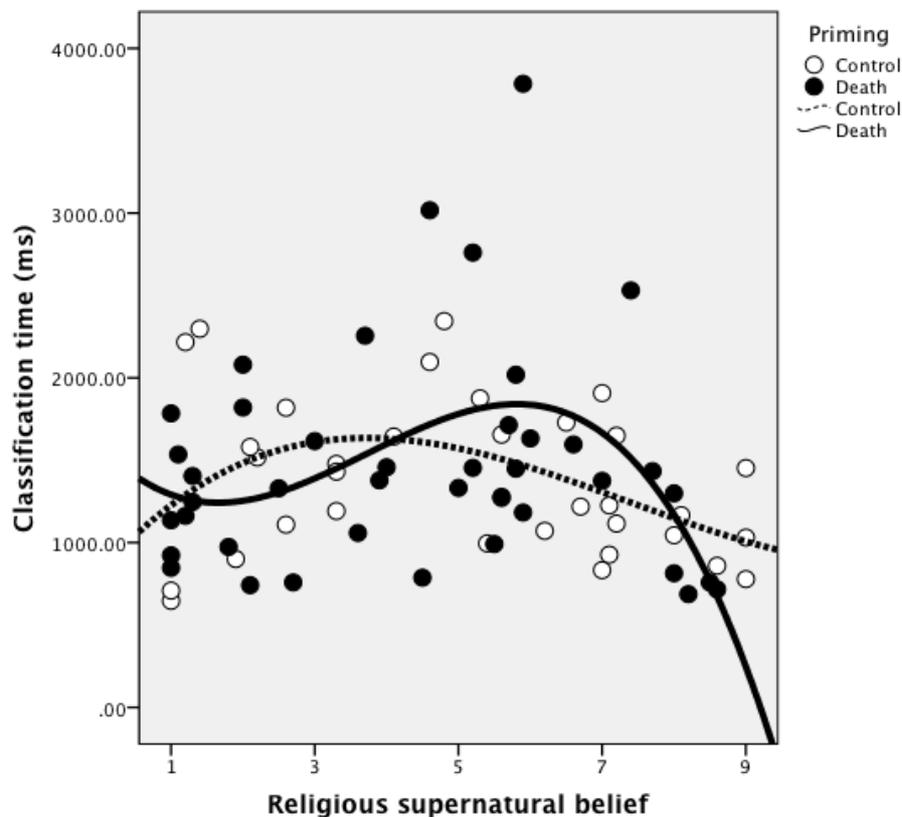


Figure 7: Time to classify religious concepts as “real” as a function of prior religious supernatural belief and priming condition.

These latter four studies—one correlational and three experimental—strongly suggest that religious belief mitigates implicit death anxiety, and that death anxiety motivates implicit religious belief. Taken together with the previous studies on explicit religious belief and death anxiety, the findings

presented here reveal religious belief to be a uniquely powerful buffer of existential anxiety. The dissociation between explicit and implicit religious belief enable people to simultaneously pursue symbolic immortality by engaging in explicit religious (or anti-religious) worldview defense while also pursuing literal immortality via implicit religious belief. Religious belief therefore provides a double-barreled strategy against death anxiety.

### Conclusion

The fact of the inevitability of death is, as William James (1902/1952, p. 138) put it, “the worm at the core of all our usual springs of delight”. We are consequently motivated to keep mortality at bay, and always have been. The desire for a technological solution to ageing and death runs throughout human history from pre-scientific quests for magical potions to more recent forays into cryonics and regenerative medicine to aspirations toward so-called “digital immortality” (Cave, 2012; Gray, 2011; Weiner, 2010). However, regardless of their actual efficacy, such attempts are unconvincing, more likely to attract derision than devotion (Gray, 2011; Weiner, 2010). In contrast, billions of people—the vast majority of us—seem to have little trouble believing that we will, in some way, survive our deaths without any medical intervention. Instead, we will do so by the immortality of our souls or the grace of our gods; to the Lord belongs escape from death, as the Psalmist proclaims. Regardless of the truth of our religious beliefs—as perhaps strengthened by their immunity to falsification—they seem to be, as it were, effective psychological technologies against our fears of annihilation.

The research surveyed here suggests that religious beliefs regulate death anxiety in two ways. First, at an implicit level, religious beliefs reduce death anxiety; conversely, religious believers and nonbelievers alike are implicitly attracted to religious belief when they are reminded of death. On the other hand, worldview defense is still an available option at the explicit level: in the face of death, we defend our own explicitly-held religious or nonreligious propositional beliefs, which helps us to deal with our conscious fears of death. These preliminary findings suggest that

religion may buffer against existential anxiety in two ways—by providing literal and symbolic immortality—at two levels, implicit and explicit. It is still unclear what behavioural, physiological, and other long term effects implicit religious belief and the mitigation of implicit death anxiety might have, but our efforts represent an initial step toward finding out.

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