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**Death anxiety and religious belief:
Responses to commentaries**

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The contributions to this symposium about *Death Anxiety and Religious Belief* (DARB; Jong & Halberstadt, 2016) have been stimulating and kind; we are grateful to our colleagues for taking the time to pen such thoughtful reactions to our book, and to the editors at *Religion, Brain & Behavior*, for providing a forum for such a useful exchange of ideas. On the whole, we find ourselves in agreement with much of the commentary, and motivated anew to pursue further research on the mechanisms involved in the relationships—such as they are—between death anxiety and religious belief. And indeed, if there is a common theme to the commentaries – and DARB itself – it is that further research is needed.

We are also grateful to our colleagues for challenging us to defend the assumptions, definitions, and methods underlying our work. Rather than address each point of each commentary, we have read the set of them as a whole and extracted the most consistent and, in our view, significant themes that emerged. We begin with a review of what DARB was intended—and not intended—to accomplish, before turning to these themes: the importance of definitions; issues of measurement; the reality and theoretical significance of death anxiety; the validity and explanatory power of “atheism”; and alternative motivations for religion, now and in the future. (We also report our thoughts and data on the role of near death experiences in death anxiety, which the commentaries have motivated us to explore.) We cover them in turn, below, with the hope that, in conjunction with the commentaries, we have added clarity and value to the original work.

The aims of DARB

As Kavanagh observes in his commentary, DARB was a doctoral dissertation before it was a book. But before it was a doctoral dissertation, it was an item on a list, scrawled in a notebook: “death anxiety” was one potential causal factor among others, such as “perceived control,” “loneliness,” “meaning,” and “identity”. Suspicious of monocausal theories of human behaviour, we never assumed that any of these would emerge as *the* or even *the main* cause of religiosity, as several commentaries have pointed out (see, especially, van Bruggen’s, as well as DARB, pp. 173-175). Thus, death anxiety was explored not because it was an *a priori* more substantial or plausible account of religious belief, but rather because folk and scholarly theories of religion believe it to

be. Indeed, in an online survey conducted early in the project (208 Mechanical Turk participants, $M_{age} = 34.85$, $SD = 11.65$; 54.3% female), over a quarter of respondents ranked the fear of death as the most “important (or true) explanation of religion”, beating out other options like social influence from family and friends (16.3%) and the desire to explain natural (6.3%) and seemingly miraculous (2.9%) phenomena (see Figure 1).

People are religious because...

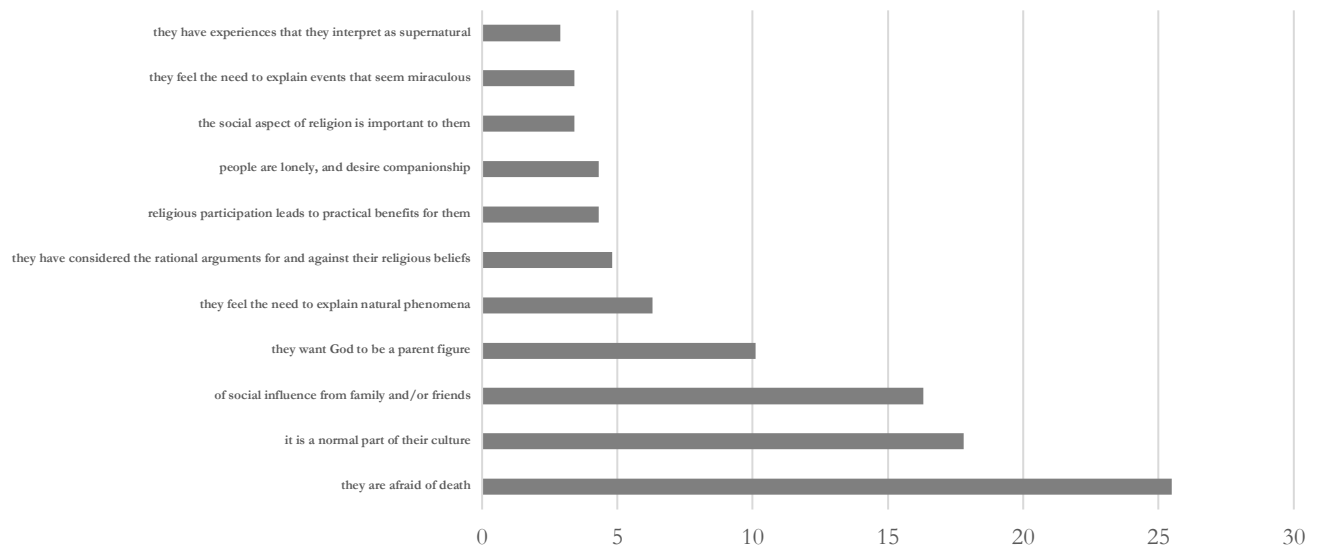


Figure 1. Percent of participants who ranked each cause of religion as most important.

More importantly, the perceived significance of death anxiety among other factors has been promoted by the field’s most influential and enduring thinkers. As we show in the book, the idea gained traction among theorists in the 19th and 20th centuries, championed in particular by the philosopher Ludwig Feuerbach (1804-1872), the psychologist Sigmund Freud (1856-1939), the social anthropologist Bronislaw Malinowski (1884-1942), and the cultural anthropologist Ernest Becker (1924-1974; see also Jong, 2014). Becker’s work—in which death anxiety and death denial were posited to explain far more than religious belief *per se*—then inspired Terror Management Theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) in social psychology, which is DARB’s main theoretical interlocutor.

Now, as van Bruggen explains in his commentary and we elaborate in DARB, TMT's explanation of religion is part of a much broader theoretical framework, in which a panoply of human activities and achievements are driven by our knowledge of our own mortality and the existential terror that this knowledge threatens to evince. However, the unique place of religion in TMT—and especially in Becker's work, TMT's intellectual predecessor—cannot be denied. In *The Denial of Death* (Becker, 1973), religion is the paradigmatic immortality project, upon which secular varieties are derivative, or even parasitic. TMT's distinction between literal and symbolic immortality also at least implicitly prioritizes the former, and despite emerging scientific alternatives (see below), religious supernatural mechanisms are generally seen, for now, as the only option for achieving it.

Furthermore, TMT theorists have proposed specific narratives about the evolutionary origins of religion. For example, in their recent book length treatment of TMT, *The Worm at the Core*, Solomon, Greenberg, and Pyszczynski's (2015) claim that early humans “created a supernatural world, one in which death was not inevitable or irrevocable,” and that those who managed to most effectively assuage their mortal terror in this way “would have been the most capable of functioning effectively in their environment and thereby most likely to perpetuate their genes into future generations.” Others have taken a cultural evolutionary rather than a biological evolutionary perspective, arguing “religious memes spread so rapidly and effectively [because of] the protection from existential fear that they afforded to those who possessed them”(Vail et al. 2010, p. 90-91; see also Atran, 2002).

Setting aside the speculation required for them, such accounts clearly portray existential dread as an adaptive problem religion emerged to solve, and even if, as van Bruggen suggests in his commentary (and we in DARB), social science is ultimately incapable of testing for psychological adaptations in our evolutionary past, those adaptations have implications for theory and research in the present. For example, suppose one believes that religion's function was to defend against death anxiety, but is no longer, due to science's perceived promise of literal immortality. In that case, one might predict that religion's importance will vary with the perceived plausibility or time frame of the supposed scientific breakthroughs. Indeed, Lifshin, Greenberg, Soenke, Darrell and Pyszczynski (2017) tested this very hypothesis, showing that less

religious participants decreased their belief in the afterlife after reading about the plausibility of indefinite life extension through medical science. In any case, TMT itself does not view death anxiety (or, presumably, religious belief) as a relic of our evolutionary past, but as a very real phenomenon in the present, with very real potential to produce crippling psychological paralysis and or other lethal dysfunction.

In short, the intention of the book was neither to propose a new theory of religion, nor was it to defend an old one. We simply took note of the widespread hypothesis—most extensively elaborated in modern psychology by TMT—that the fear of death motivates religious belief at least in part through the buffer it ostensibly provides, and wanted to test it against empirical evidence. In our investigations, we found a great deal of existing research on the topic, which DARB collects in one place. However, we also saw gaps in the literature that we were able to fill: we are pleased that other researchers are joining us in identifying still more promising future lines of research in this area.

On definition

Before evaluating the relationship between religion and death anxiety, we had to lay some conceptual and methodological foundations and, in the process, make choices that were the subject of legitimate scepticism by commentators. Our first port of call was the seemingly obvious, but so frequently ignored matter of defining what “religion” and “death anxiety” mean—and do not mean. If there is one thing on which researchers agree, it is that both religion and death anxiety are complex, multifaceted phenomena. For example, an individual or group may hold religious beliefs, engage in religious practices, and experience religious emotions. Equally, there are many aspects of death about which one might be fearful, including prolonged suffering, loneliness, and nonexistence. As widely accepted as the multidimensionalities of these phenomena are, we argue that researchers have largely failed to take seriously an obvious implication of them: one cannot assume that any particular aspect of “religion” (or death anxiety) has the same etiology or consequences as another. Scientific progress, at least at this early stage, is more likely if we isolate and cleanly operationalize the aspect(s) we care about, and have a good understanding of why we do.

Thus, we focused our inquiry in DARB on just one aspect of religion: the *belief in supernatural entities and events*; that is, the belief in the existence of such things as gods and ghosts, heavens and hells, blessings and curses, prophecies and miracles. Perhaps unsurprisingly, the narrowness of our definition has courted some criticism. Wilson is quite right when he urges us in his commentary not to assume that “religious” automatically means “supernatural” As we hope the previous paragraph makes clear, we would be the last to make this assumption. Indeed, if the history of attempts to define “religion” are any indication, the term cannot mean *any* one thing, automatically or otherwise, and is better characterized as a shorthand for whatever phenomenon any given scholar of religion is interested in, within conventional limits.

On the other hand, our focus on belief in the supernatural¹ is hardly arbitrary. Like the relationship between religion and death anxiety itself, it is a response to widespread interest among scholars. This is the aspect of religion that has most occupied the research tradition we inhabit, from David Hume to E. B. Tylor² to our more recent thanatocentric theorists of religion. Although we happen to agree with this historical emphasis—the belief in supernatural agents *is* the most distinctive and significant aspect of “religion”—we acknowledge that it is not the only one: other beliefs to which the commentators allude (see especially Vess, and Wilson), such as in extraterrestrials, terrestrial cryptids, or an inchoate oneness-with-the-universe, are interesting in their own right. Indeed, they may, when all is said and done, turn out to overlap with or encompass belief in the supernatural itself. But they simply lay outside our immediate sphere of concern. Analogous things may be said (and were; see Wilson) regarding “death anxiety.” While there are many flavors thereof—fear of a painful or lonely dying, fear for one’s family, fear of premature burial, and so forth—we were primarily interested in the one that we found most prominently featured in the theoretical literature: the anxiety over ceasing to exist.

In sum, our narrowing religion and death anxiety to supernatural belief and existential fear is a deliberate and considered move on scientific grounds. It

¹ *Pace* Wilson, we define “supernatural” on p. 4; see also Vess’s commentary. On our definition, neither extraterrestrial aliens and the Loch Ness monster necessarily count as “supernatural”, unless they possess traits that violate our intuitive category-based expectations.

² See, for example, Jong’s (2017) recent essay on E. B. Tylor and the cognitive science of religion.

enables us to engage directly with the research tradition as we have received it, to review the empirical literature in a systematic and targeted way, and to design studies—and measures—well-suited to our specific theoretical interests. It is certainly possible that we have misread our sources or failed in our reconstructions or operationalizations of their ideas, but those criticisms have not yet been made.

On measurement

The same preference for targeted-but-clear over inclusive-but-uncertain progress also motivated our approach to measuring religiosity and death anxiety. The existing measurement options were both voluminous and wanting, either too narrow (and often meaningful only to Christians) or too multifaceted for our purposes. The former tend to assume the beliefs they are meant to measure, and take for granted constructs that may be irrelevant outside of (or even within) the targeted population. The latter more fully capture the multiple dimensions of “religion,” but at the cost missing crucial differences among them (they are often treated as unidimensional measures, for example of what Cox and Arrowood call “religiosity in general”) or of a combinatorial explosion of possible statistical analyses.

The Supernatural Belief Scale, which measures an individual’s tendency to believe in supernatural entities and events, was designed to fill this gap. The construct is narrow but, according to cognitive scientists and religious scholars, pancultural and therefore amenable in principle to cross-cultural measurement, even if its first instantiation of the SBS was most appropriate for those familiar with Abrahamic faiths. (A second, six-item iteration has been constructed to increase the generalizability of the instrument; we have now tested it successfully in South and East Asian contexts such as India, China, and Japan.) Similarly, the Existential Death Anxiety Scale (EDAS) was also an attempt to measure a specific construct—anxiety about the extinction of the self—that represents, in our view, the theoretical concerns of the thanatocentric theorists we reviewed in DARB.³

³ We say “an attempt” because our psychometric analyses produced a second, correlated factor, which we termed “the cessation of life”. See DARB, pp. 73-74.

As useful as the SBS has been in our and others' research (e.g., Lindeman, Svedholm-Häkkinen, & Lipsanen, 2015; van Elk, Rutjens, & van Harreveld, 2017), conscious endorsement of propositional knowledge is not the only way in which one can "believe" in the supernatural. Furthermore, it is a way that is vulnerable to well-known criticisms, which we review in DARB, such as doubts over whether individuals can or will accurately report their endorsements. In response to these concerns, we also developed an implicit measure of religious belief (a supernatural belief single-target implicit association test; IAT) to capture the automatic associations between supernatural entities/events and existence. Because the distinction between explicit and implicit beliefs plays a key role in the arguments and conclusions in DARB, we address their critique in some detail.

Cox and Arrowood observe that the IAT has been criticized because of "issues with reliability and validity." Though they do not elaborate on these, the articles they cite imply that they oppose the use of the IAT as a *diagnostic* tool. There is indeed a litany of concerns with the IAT as a reliable measure of stable individual differences: test-retest reliability is low; performance varies with the particular stimuli used; claims of unfakeability may be exaggerated; absolute scores may reflect participants' knowledge of social norms rather than their "true" attitudes; and so forth. We are familiar with the limitations of this use of the IAT, not least because Bluemke, a co-constructor of our SBS and IAT, has made similar criticisms (Fiedler & Bluemke, 2005; Fiedler, Messner, & Bluemke, 2006; see also Jong, Zahl, & Sharp, 2017).

However, the studies in DARB do not use the IAT as an indicator of stable individual differences, but as an indicator of group differences as a function of experimental manipulations. The psychometric assumptions required for the two purposes differ. It is still important, for example, for the IAT to demonstrate convergent and divergent validity (on which see, e.g., Cunningham, Preacher, & Banaji, 2001; de Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009; Dovidio, Kawakami, & Gaertner, 2002; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Gawronski, 2002; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Nosek & Smyth, 2007). However, the IAT need not enjoy high test-retest reliability, or explain unique variance in behaviour (though see Greenwald, Poehlman, Uhlmann, & Banaji, 2009 for meta-analyses of the predictive validity of the IAT compared to

explicit measures), or even be immune to faking and bias, so long as such vulnerabilities are constant across experimental conditions. For example, a common criticism of the IAT's validity is that it reflects attitudes respondents know about, rather than attitudes they actually hold themselves. However, for this hypothesis to be plausible in experimental contexts would require an account of how the experimental manipulation could affect such knowledge or the salience thereof.

We do, of course, assume that the IAT assesses *belief*, but this is something the measure is well (arguably, uniquely well) designed to assess. Contrary to Cox and Arrowood's contention that the IAT measures not beliefs but "attitude associations," we argue (along with Fazio, 2007, whom Cox and Arrowood cite), that beliefs *are* associations—in particular, cognitive associations between supernatural concepts and existential ones—regardless of whether they are measured implicitly or explicitly. It is true that explicit and implicit measures of these associations may not always coincide, but it would be a mistake to conclude that they therefore measure orthogonal constructs. As we argue in DARB, implicit and explicit beliefs are better thought of as distinct but related products of the same psychological phenomenon (cf. Gawronski & Bodenhausen, 2006; Petty, Briñol, & DeMarree, 2007), both of which are required for a complete picture of religiosity and its precursors and consequents. From our perspective, therefore, it is fortuitous indeed that our theoretical focus emphasizes belief, which, unlike more ambiguous aspects of religiosity, affords measurement in terms of IATs.

None of the above is to say that our use of implicit measures is unassailable. For example, while we stand by the soundness of our supernatural belief IAT, we are less certain of our death anxiety IAT. IATs are intended to measure associations between *concepts*. As we argue in the book, this is a good way to operationalize beliefs, but it is much less obvious that it is a good way to operationalize emotional states. Someone who scores high on our death anxiety IAT strongly associates death with anxiety, but this is at least one step removed from the claim that she *feels* anxious about death. We therefore agree with Cox and Arrowood that there are better methods of measuring death anxiety without relying on self-report, albeit for different reasons and with different recommendations for the future.

For example, in *The Denial of Death*, Becker (1973) mentions physiological tests—specifically, of galvanic skin responses (GSR)—as a means of measuring repressed death anxiety, and in DARB we suggest additional psychophysiological measures like facial electromyography (EMG) and salivary cortisol. The limitation of such methods is that they currently lack emotional specificity: multiple emotions increase GSR and heart rate and EMG responses, and not enough is yet known about the relationship between specific emotions and specific psychophysiological configurations. Indeed, on some theories of emotion, such correspondences simply do not exist (e.g., Barrett, 2017; Barrett & Russell, 2014). Fortunately, nonspecific measurement is not necessarily failed measurement: inferences about the causes and effects of anxiety may still be made under rigorous experimental conditions, even with equivocal measures.

Cox and Arrowood’s own suggestion is the trendier preference for neuroimaging techniques, which seem to promise more emotion specificity than do psychophysiological approaches. Unfortunately, that promise has gone largely unfulfilled. Cox and Arrowood, for example, cite Quirin et al.’s (2011) paper approvingly as evidence that mortality salience (MS) is associated with “activation of emotional areas of the brain”. However, other neuroimaging research reveals inconsistencies regarding *which* “emotional areas of the brain” are activated or deactivated by reminders of death (e.g., Han, Qin, & Ma, 2010; Klackl, Jonas, & Kronbichler, 2013; Shi & Han, 2013). Indeed, every brain region Cox and Arrowood cite from Quirin et al.’s study has been disconfirmed in subsequently published studies. It is therefore unclear what a neuroimaging measure of death anxiety would consist in, short of a scattershot approach in which multiple potential brain regions are monitored. Without wanting to be too pessimistic about neuroimaging research in general, we maintain our scepticism that neuroimaging holds the key to measuring death anxiety. Certainly, arguments for the usefulness of neuroimaging should not be predicated on any single finding (Lieberman & Cunningham, 2009).

On the fear of death

Of the three questions DARB addresses—are people afraid of death, does death anxiety motivate religious belief, and does religious belief assuage death anxiety—the first, and particularly our conclusion that death anxiety is

generally weak, tends to elicit the most discussion in public presentations, usually along partisan lines. Critics of Terror Management Theory feel vindicated, grateful that someone has given voice to their private misgivings about the theory's hegemony, while proponents take issue with the methods used to assess death anxiety.

Chapter 4 of DARB thoroughly reviews the evidence for death anxiety before coming to its rather tepid conclusion. Since there are no large-scale studies that use psychophysiological measures, population levels of trait death anxiety must generally be inferred from research using interview or questionnaire methods, and these indicate that trait death anxiety is generally low.

Furthermore, proximity to death does not appear to increase self-reported anxiety about it. Indeed, death anxiety declines as a function of age, at least in the United States (cf. Russac, Gatliff, Reece, & Spottswood, 2007; DARB, pp. 100-103), and the terminally ill report, if anything, less fear of death than healthy controls (Feifel, 1974). Since DARB was published, Goranson, Ritter, Waytz, Norton, and Gray (2017) have also found, using semantic text analysis, that patients near death, as well as death row inmates, talk about death in much more positive terms than control participants expect, and in fact in more positive terms as death approaches.

Other research on people who have had close encounters with death suggest that such life-threatening experiences have little effect on their fear of death, except in special circumstances. For example, van Lommel, van Wees, Meyers, and Elfferich's (2001) longitudinal study compared two groups of patients who had undergone resuscitation after cardiac arrest: those who had had a near death experience (NDE; e.g., out of body experiences) and those who had not. Two years after the event, patients who had experienced NDEs reported decreased fear of death compared to those who had not; by eight years post-event both groups showed decreased death anxiety, but this may be a reflection of the aging effect mentioned above. Our own cross-sectional multinational study found no differences in EDAS scores between people who had almost died themselves and those who did not, except in the South Korean sample, where having life-threatening experiences was associated with

increased death anxiety ($M_{\text{difference}} = -.75, SE = .32, p < .05$).⁴ Finally, in the vast majority of published studies—and as Cox and Arrowood have also found—even when people are acutely reminded of their mortality using TMT’s standard mortality salience paradigm, they exhibit no measurable emotional change (cf. DARB, p. 113).

As we argue in DARB, the lack of direct evidence that people fear death poses a *prima facie* challenge to thanatocentric theories of religion. It at least generates a demand for explanation: how might we reconcile the alleged attitudinal and behavioural effects of death thoughts with participants’ apparently emotional indifference to them? To meet this demand, many researchers effectively assume that the participants *would* have been terrified but for a complex evolved mechanism that keeps death out of consciousness (for review, see Hayes, Schimel, Arndt, & Faucher, 2010; Pyszczynski, Greenberg, & Solomon, 1999). Specifically, when faced with reminders of their mortality, people allegedly suppress unwanted death thoughts, though this has the paradoxical effect of rendering such thoughts more powerful. The process, if inelegant, does enjoy indirect empirical support. For example, as evidence of thought suppression, proponents of TMT point to the greater accessibility of death thoughts under cognitive load, which ostensibly hinders the effortful process of suppressing them. As evidence of hyperaccessibility, they point to stronger effects of mortality salience after delay (i.e., after thought suppression processes are alleged to have kicked in). While these and other findings (e.g., moderating effects of worldview defense) do suggest that people work to keep thoughts of death out of consciousness, there is, so far, little direct evidence that they have much to do with death *anxiety*. An apparent exception is a study by Webber, Schimel, Faucher, Hayes, Zhang, and Martens (2015), cited by Cox and Arrowood, showing that physiological arousal is necessary for worldview threats to increase death thought accessibility and to instigate defensive reactions. But the fact that arousal is needed to produce death thoughts does not entail that death thoughts produce negative affect.

⁴ These data are from the same multinational correlational study as reported in DARB, including samples from the USA, Brazil, Russia, South Korea, Japan, and the Philippines.

The second strategy sometimes taken by TMT proponents is to nuance claims about the fear of death, asserting that human beings all suffer not from death anxiety, but from *potential* death anxiety. In their recent review of the field, Solomon et al. (2015) point out that the fear TMT has in mind is the consequence of “the ever-present knowledge of the inevitability of death rather than immediate threats to continued existence”. Immortality projects—from physical exercise to child-bearing to worldview defense—are intended not to manage incapacitating terror, but the possibility that such terror will be realized. Similarly, Cox and Arrowood also cite research on how “potential for anxiety, rather than an actual experience of fear” explain worldview defensiveness.

This view sidesteps the lack of evidence for any affective component to mortality salience effects and the death thoughts they render hyperaccessible, but it unwittingly creates a new challenge for the TMT enterprise, at least in spirit. If it is truly the case that immortality projects are not attempts to relieve experienced terror, but rather attempts to keep terror from intruding in the first place, TMT need not assume actual terror at all. Mortality salience effects become fully explainable in terms of people’s *beliefs* that their death will terrorize them, beliefs that may or may not be (but are probably not) correct. The reality of death anxiety becomes an entirely separate empirical question (and indeed is treated as such in our book), independent of people’s psychological motivations. Indeed, it could be argued that by promoting a potential for terror that is currently scanty justified by the data, TMT prematurely legitimizes the immortality projects, both positive and negative, people engage in to prevent that potential from being realized. That (1) people have vastly misjudged how terrifying and incapacitating death will be when it intrudes into consciousness, and (2) their consequent efforts to avoid that terror are based on false premises, are ideas we can accept, but ones that scholars steeped in TMT may not.

Atheists in foxholes (re)(re)revisited

There has been some disagreement in the research literature on how nonreligious individuals respond to the MS manipulation on measures of religious belief (Norenzayan & Hansen, 2006; Vail, Arndt, & Abdollahi, 2012), and on what this means from a TMT perspective. In our own studies reported in DARB, these individuals reported stronger (implicit) religious belief when mortality was salient than when it was not, which we argued is at odds with TMT’s worldview defense hypothesis. One objection to this inference, hinted at by Cox and Arrowood, is that “nonreligion” fails to constitute a worldview to be defended. (Atheism might count as a worldview in this sense, but even if so, atheists composed only a minority of our samples.) Cox and Arrowood

therefore interpret our sample not as two groups with distinct worldviews, but as one group with a religious worldview of varying strength. If so, they argue, then all we have shown in our studies using implicit measures is that mortality-primed participants bolster their religious worldview regardless of how strongly it is consciously held. As Cox and Arrowood put it, “it is highly likely that low religious persons are the ones bolstering their belief in supernatural agents.”

However, the question of what constitutes a psychologically valid worldview is not one Cox and Arrowood (or we) can answer *a priori*. Just as there are innumerable ways to distinguish different kinds of religious people (e.g., by denomination, religious orientation, belief strength, religious observance), there are multiple varieties of nonreligion (e.g., atheism, agnosticism, antitheism), and while Cox and Arrowood may have their favourite taxonomy, the fact is that we simply do not know enough, as a field, to say what qualifies as a (non)religious worldview. We do know, however, that a worldview need not be venerable or elaborate to inspire defense under MS conditions (see, e.g., Harmon-Jones, Greenberg, Solomon, & Simon, 1996), and that our nonbelievers showed classic worldview defense effects in their explicit responses (i.e., on the SBS) to mortality salience. There is therefore an inconsistency in Cox and Arrowood’s interpretation of our results: it leaves unexplained this finding that, on self-report measure, nonreligious people *do* behave as though “nonreligion” were a worldview to be defended. It is in any case clear that further research is needed to understand what constitutes a “religious worldview” and under what circumstances it is worth defending.

As a starting point, future research might draw a distinction between atheism and “milder” forms of nonreligion (e.g., agnosticism, indifference), on the argument that there may be interesting differences between active and passive rejection of religious belief. Even using this simpler dichotomy, however, researchers will face the challenge of defining and operationalizing “atheism,” which itself comes in multiple varieties (Bullivant & Ruse, 2013). For example, Cook and Arrowood’s criterion that demands the “abandonment of religious faith altogether” seems overly restrictive, and risks conflating atheism with atheistic fundamentalism. Using a measure of religious belief, such as the SBS, which asks participants about the extent to which they believe or—crucially—*disbelieve* in the supernatural, may be a useful alternative to self-reported labels,

given their fluidity and unfamiliarity in public discourse. A continuous scale presents its own challenges—the cut-off points for how strongly individuals disbelieve or how many supernatural entities they reject is bound to be arbitrary—but they may not be insurmountable.

On near-death and life-threatening experiences

Although DARB deliberately avoided the controversial literature on near-death experiences (NDEs), this symposium has given us the opportunity to engage with some of the relevant research under that rubric. We referred to research by van Lommel et al. (2001) earlier, regarding evidence of decreased death anxiety after a close encounter with death. The same study also showed interesting religious differences between patients who had had NDEs and those who had not. Patients who had had NDEs as they were being resuscitated reported increased belief in an afterlife, and by the eighth year after the event, most of the group reported strong belief in an afterlife. In contrast, the patients who had had brushes with death without NDEs remained mostly unbelieving in an afterlife, at both the second and eighth year follow-up. Similarly, in their cross-sectional study Groth-Marnat and Summers (1998) found that participants who had had NDEs reported decreased death anxiety and increased afterlife belief compared to those who experienced similar life-threatening experiences without NDEs. It seems that close encounters with death are only religiously significant if they come with these intense experiences that are amenable to supernaturalistic interpretation. This conclusion is also corroborated by our own nonclinical data, alluded to above. In none of our samples from the USA, Brazil, South Korea, Japan, the Philippines, or Russia did SBS scores differ between those who reported previous life-threatening experiences (“Have you almost died yourself?”) and those who did not; nor were there differences in afterlife belief specifically (see Table 1).

Country	n (Y, N)	Variable	$M_Y (SD); M_N (SD)$	t	df	p
USA	288, 525	SBS-6	.52 (2.70); .36 (2.92)	.79	630.94	.43
		Afterlife	.72 (2.86); .45 (3.06)	1.24	625.27	.22
Brazil	105, 95	SBS-6	2.62 (1.95); 2.68 (1.60)	.27	196.28	.79
		Afterlife	2.35 (2.33); 2.27 (2.47)	-.23	193.14	.82
South Korea	86, 114	SBS-6	.52 (2.00); .27 (2.42)	-.78	196.23	.44

Country	n (Y, N)	Variable	$M_Y (SD); M_N (SD)$	t	df	p
Japan	109, 116	Afterlife	.33 (2.50); .20 (2.70)	-.34	189.98	.74
		SBS-6	-.02 (1.91); -.18 (1.88)	-.65	223	.52
Philippines	77, 123	Afterlife	-.47 (2.35); -.45 (2.20)	.05	222	.96
		SBS-6	2.79 (1.50); 3.00 (1.33)	1.02	147.68	.31
Russia	40, 160	Afterlife	2.34 (2.25); 2.82 (1.90)	1.57	141.36	.12
		SBS-6	1.73 (2.13); 1.77 (1.72)	.09	52.42	.93
		Afterlife	1.53 (2.44); 1.54 (2.19)	.03	55.73	.98

Table 1. *Supernatural beliefs as a function of life-threatening experience.*

These findings provide an important corrective against the overinterpretation of experimental findings, including our own. Overall, real-life brushes with death appear to have no lasting effect on religious belief, except when they coincide with out-of-body or other kinds of unusual experiences. Even under controlled conditions, with very specific and simplified measures of religiosity, experiments on the effects of mortality salience, with effects that rarely account for much more than 10% of the variance in the sample (cf. Jong et al., 2012; Norenzayan & Hansen, 2006). These are, in other words, not dramatic effects. Even though scholars and laypeople alike prioritise death anxiety in their explanations of religion, other causal factors are likely more important in the real world, such as social and political factors. But those are topics for other books.

Beyond death anxiety, beyond religion

Although death receives disproportionate attention in the psychology and philosophy of religion, we agree with van Bruggen that it is not a unique, or even uniquely powerful, psychological threat. Van Bruggen outlines others, including concerns about meaninglessness, guilt, social isolation, and lack of self-knowledge and self-consistency. From a TMT perspective, of course, death anxiety undergirds all of these—it is, for example, the reason we strive for self-esteem, the reason we desire to see meaning in things—but we make no such argument in DARB, in part because it is not clear that arguments about the primacy of one fundamental motivation over others is an empirically tractable one.

Van Tongeren focuses in particular on the connection between death anxiety and the pursuit of meaning, which provides people with a sense of coherence, purpose, and significance. Coherence here refers to the manner in which experiences are organized and interpreted, while purpose refers to normative behavioural guidelines and goals. (Cox and Arrowood similarly acknowledge the capacity for religion to help us make sense of negative experiences, and even to facilitate moral behaviour.) These two components of the meaning making perspective, at least as van Tongeren has described them, are analyzable in terms of religion's ability to provide symbolic immortality. In contrast, according to van Tongeren, significance pertains to the transcendence of impermanence: religion can provide not only meaning, but *lasting* meaning. These ideas suggest a promising research programme, which van Tongeren and colleagues have already begun, on the factors that determine the cultural transmission of different religious ideas. To be sure, there are politically and more broadly historically contingent reasons for the rise and fall and evolution of religious traditions, but van Tongeren's commentary suggests that some religious beliefs do not provide meaning as well as others, and therefore may not fare as well over time.

If death anxiety is not our only source of significant anxiety, religion likewise is not our only source of comfort, especially when broadly construed, as Wilson and Vess have done. Indeed, Vess proposes that religion may be less and less relevant for our pursuit of literal immortality. In Chapter 7 of DARB, we consider the implications for religion of biotechnological and information technological approaches to lifespan extension, but is still an empirically understudied area. It certainly possible that as the development of these technologies will reduce people's need for supernatural belief in much the way that political and economic changes that provide stability and security may well have done (Gill & Lundsgaarde, 2004; Norris & Inglehart, 2004). There is already evidence, cited above, that learning about life-extending technologies reduces afterlife belief among those low in religiosity; will faith in biotechnology—or, for that matter, in the welfare state or in liberal democracy—absorb other characteristics of religious faith? To answer such questions, it may be necessary to challenge the distinction between literal and symbolic immortality. After all, it is already unclear how symbolic immortality is really meant to defeat our death anxiety, given that it is obviously only an ersatz immortality. In what sense do we think that we will live on in our

children or church or country, such that it can assuage death anxiety or serve any other significant motivational function? As technology expands the ways in which it is possible to live forever (e.g., as an uploaded dataset), we may see more clearly just what aspects of immortality are psychologically important to us.

Final remarks

It is a poor workman who blames his tools, but some critical reflection on our research methods can be a much needed prophylactic against hubris on one hand and disappointment on the other. DARB summarizes decades of psychological research on tens of thousands of human participants, and at the end of it, the shortcomings of our field seem more evident to us than the increased understanding it has gained us on our topic. But perhaps this is just typical of the study of human behaviour more generally: no one method is adequate, no one theory exhaustive. The great contribution of the cognitive science of religion and journals like *Religion, Brain & Behavior* is precisely in their rejection of methodological parochialism: archaeologists and anthropologists and psychologists and economists and behavioural neuroscientists, and computer scientists and historians and biblical scholars and literary scholars all have seats at the table. We do not regret writing DARB the way we did, but we cannot help but wish that we were up to the task of writing a book on death anxiety and religious belief that more reflected the multidisciplinary ethos we so admire in these emerging approaches. Perhaps in the next edition.

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