

Chapter 11



Faith and Finitude: Exhuming the Death-Denying Function of Religious Belief

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From the earliest evidence of human activity, religion has emerged as a cultural centerpiece. The present chapter contends, from the perspective of terror management theory (TMT), that to sufficiently understand religion, we must consider its role in dealing with the pervasive human awareness that life must ultimately end. Rather than being an epiphenomenal outgrowth of other pressures, TMT argues that a major reason religious beliefs systems have been so persistently appealing is because they directly address the problem of death through the promise of literal immortality. The awareness of death has been shown to enhance the appeal of religious notions of eternal spiritual realms, including myths about divine creation and afterlife, spiritual intermediaries, and supernatural agency. Research also shows that when people become aware of mortality, a cascade of neurophysiological cognitive and behavioral processes helps implement religious strivings for eternal life. In addition to the major functions and themes common to the world's religions, the present chapter also examines individual differences in the ways religious faith is used as a terror management strategy, as well as how those strategies can influence personal and social benefits and/or costs. In sum, a large body of research suggests that the consistent motivator behind a vast majority of religious phenomena is the awareness of mortality.

**FAITH AND FINITUDE: EXHUMING THE
DEATH-DENYING FUNCTION OF RELIGIOUS BELIEF**

Around 7000 BCE, approximately 10,000 people lived in a small Neolithic settlement at Catalhoyuk, Turkey. Though dispersed populations in small settlements would have more efficiently exploited the resources in this rich wetland locale, the people there chose to pack together like sardines in the village. Why? Most likely not for material purposes; the region was settled approximately 1,000 years before the first evidence of domestic agriculture in that area. Rather, the answer appears to revolve around the spiritual needs of the settlers and specifically the need for some collective symbolic agency against death. Archaeological excavations revealed large numbers of spectacular artworks of which the most famous is a seated woman, believed to represent a Mother Goddess, with her hands on the heads of two leopards. Murals composed in time with the earliest burials of children featured wild animals and hunting scenes and adorned the walls around a single raised platform covering a concentration of burials. It has been suggested that the art “represented a ritualistic attempt to assuage . . . spirits that had taken the lives of the community’s young people, or perhaps an effort to protect the living from the spirits of the dead” (Blater, 1998, p. 1445).

Similar findings at Göbekli Tepe (Curry, 2008), as well 140 sites in the Balkans and the Middle East (Wilford, 2001), indicate the emergence of coordinated, ritualistic, symbolic activities coincided with humans’ transition from small bands of seminomadic hunter-gatherers to agrarian collectives. Around 40,000 years ago (well after our ancestors made the leap to *Homo sapiens*, cf. 100,000–150,000 ya), the advent of the Upper Paleolithic Revolution known as the “Creative Explosion” brought about a synergistic combination of sociability, symbolizing, language, and self-consciousness, culminating in the emergence of religion as a centerpiece in the evolution of culture (Burkert, 1996; Donald, 1991; Langer, 1984; Mithen, 1996). To this day, religious beliefs have continued to play a central role in the processes by which humans regulate their social behavior.

Why have religious beliefs systems been so persistently appealing? The example of Catalhoyuk, and the general tendency of people to seek solace in religion in the face of threat and despair, suggest that one of religion’s essential functions—in fact, as we will contend—its primary adaptive function—is to ease existential pangs, particularly those stemming from the awareness of mortality (Becker, 1973). In contrast to evolutionary psychological perspectives that identify religion as a byproduct of fitness-enhancing cognitive adaptations (e.g., Sosis, 2009), we will argue in this

chapter that religious beliefs are not epiphenomenal. Specifically, we will review behavioral, cognitive, and neurophysiological research consistent with the idea that religious conceptions of immortality function to protect adherents from potential death-related anxiety.

TERROR MANAGEMENT THEORY AND RELIGIOUS FAITH

Man is the only being that knows death; all other animals become old, but with a consciousness limited to the moment. . . . Only fully-awakened man . . . whose understanding has been emancipated by the habit of language from dependence on sight, comes to possess the notion of transience . . . Every religion, every scientific investigation, every philosophy proceeds from it.

—Oswald Spengler (1926, p. 166)

Like glucose-approaching amoebae or bear-avoiding salmon, humans are oriented toward self-preservation and reproduction. Variegated functional, structural, and psychological adaptations are observable across species (Tooby & Cosmides, 1992), and creatures like vervet monkeys and honeybees have highly complex communicative skills that enable coordinated avoidance of predators and approach of food and mates. Yet humans alone naturally developed a capacity for symbolic representation: the cognitive ability to interpret arbitrary token-based associations with no contiguous referents in space or time. While other creatures' representational abilities are tied directly to encountered stimuli, only humans can sit on a beach in Kokomo and concatenate words into sentences representing abstract visions of what it would have been like in the Neolithic era and what it will be like 500 years in the future. This is due in large part to the encephalization of the human prefrontal cortex (PFC). As neurobiologist Deacon (1997) notes: "the critical role of the prefrontal cortex is primarily in the *construction* of the distributed mnemonic architecture that supports symbolic reference" (p. 266). No wonder people are such impressive symbol wielders: the human PFC is roughly 202 percent larger than the brain-body proportion expected of a human-sized primate.

Humans therefore have the neural preparedness to construct a metaphorical "self" that can represent objects and events over the course of a mentally fabricated timeline (Jaynes, 1976). Though adaptive in facilitating elaborate autobiographical memory and extrapolative abilities, the capacity to mentally project the self through time enables humans to stumble upon the harrowing realization that death is inevitable—to become Spengler's "fully-awakened man." At each moment, we each thus

live with the knowledge that, like any dung beetle or beetle dung, we each will end up an inert pile of dust, absent emotion and efficacy—absent potential to be anything more than dust.

Juxtaposed with our evolutionarily engrained motives to stay alive and reproduce, the symbolic awareness of death has the potential to elicit tremendous anxiety that might burgeon into paralyzing terror. Yet, humans have avoided behavioral paralysis and emerged as the dominant species on the planet. How? The answer lies in the work of cultural anthropologist Ernest Becker (1973; c.f., Rank, 1936/1950). Becker argued that culture is a death-denying fabrication; that, by inventing shared cosmological systems of belief, humans create a defensive psychological shield against the knowledge of death.

Terror management theory (Greenberg, et al., 1990; Solomon, Greenberg, & Pyszczynski, in press) represents an integration of Becker's ideas into a parsimonious and empirically testable framework. TMT states that humans manage the potential anxiety stemming from the symbolic awareness of death by constructing and maintaining a dual-component anxiety buffer. This consists firstly of *faith in a cultural worldview*: a shared set of beliefs about the nature of reality that prescribes standards of valued conduct and makes the natural and social worlds seem orderly and significant. Worldviews come in many shapes and sizes (e.g., as religious, nationalistic, political, and scientific outlooks, just to name a few) and ultimately are internalized uniquely by each enculturated individual; but all worldviews explain the way things are and how they should be. Secondly, people *seek self-esteem* within their cultural milieus: the perception that they meet or exceed standards of value espoused by their worldview. Standards of personal value are of course culturally relative, yet across cultures individuals strive to feel like valued members rather than inconsequential animals destined for oblivion.

Over the past 25 years, a simple formula known as the *mortality salience hypothesis* (MS hypothesis) has generated considerable empirical evidence for TMT. This hypothesis states that if faith in cultural worldviews and self-esteem strivings function to mitigate concerns with mortality, then a heightened awareness of death should intensify psychological reliance on them. Tests of the MS hypothesis typically entail randomly assigning individuals to receive either a death-related or a non-death-related stimulus, and then observing the effect of that manipulation on culturally relevant opinions or behaviors, or on efforts to bolster self-esteem. Using numerous methodologies, over 400 experiments have shown that reminders of death (mortality salience) enhance efforts to maintain faith in one's cultural beliefs and procure a sense of personal value. Such effects have been

demonstrated among children, adolescents, middle-aged and elderly individuals, across populations diverse socioeconomically and culturally, and in over 15 countries on five continents.

MS has been experimentally induced via open-ended questions about death, exposure to gory accident footage, exposure to corpse-like androids, proximity to funeral homes, and even subliminal presentations of the word "DEATH" during computer tasks. Comparison stimuli are sometimes neutral in nature, but more often use negative content to demonstrate that worldview defense and self-esteem striving are caused by death-related cognitions specifically, and not generalized responses to negative topics. Indeed, MS produces unique, reliable effects relative to control conditions in which participants consider physical threats (e.g., pain), self-relevant threats (e.g., failure), relational threats (e.g., ostracism), anxiety-inducing topics (e.g., worrisome thoughts, upcoming exam), and other existential concerns (e.g., meaninglessness, uncertainty, temporal discontinuity).

By maintaining this buffering system—feeling valued by one's socially constructed reality—individuals can psychologically transcend the limits of their mortality. On one hand, people may garner a sense of *symbolic immortality*: the belief that one's secular works/achievements will leave a lasting mark on the world even after one is physically gone. By having children, composing an indelible sonata, or building a community center, individuals can hope to generate some index of their life's potency, such that all future generations can see and revere. Yet not everyone can be famous presidents, architects, or rock stars; and merely symbolic incarnations of one's worth will eventually disintegrate anyway. More potent, then, is *literal immortality*: the belief in spiritual afterlife, inherently unbounded by the constraints of time and space. How grand to stand atop death once and for all, to know that on the "other side" there is a heaven, paradise, or nirvana!

History is replete with examples of death-denying quests for literal immortality. The *Epic of Gilgamesh*, the oldest known piece of literature (cf. 3000 BCE), tells of an ancient Sumerian king who, overwhelmed by the death of a close friend, sets out on an all-consuming search for the secret of immortality. Qin Shi Huangdi (c. 210 BCE), China's first emperor, solicited the aid of alchemists to derive an immortality-conferring potion that would allow him to live and rule forever (unfortunately, the concoction consisted mainly of mercury, which poisoned the emperor; he remains buried in underground catacombs, commanding a life-sized army of terracotta soldiers from beyond the grave). Similar stories can be told about Mesopotamians, Egyptians, early Hebrews, and many other cultures.

This longing for eternal life continues today. Religions provide individuals with arguably the most direct route to death transcendence via literal immortality. Recent polls show overwhelming portions of the world's population believe in afterlife (Ipsos/Reuters, 2011). For Muslims it is the *Jannat Al-Na'im* (gardens of delight); for Hindus, *Moksha* (salvation); for Christians, heaven; and for some Buddhists, it is *Ching* (the pure land). Whatever the name, religions offer the notion that a supernatural realm or state exists and can be reached by abiding by religious dictates. As we will see in the sections that follow, by offering links to an immortal spiritual realm, religions provide individuals with powerful means to deal with the knowledge that they are crawling slowly toward their ultimate demise.

Immortalizing Expressions and Supernatural Agency

People are surrounded by countless messages expressing the potential for immortality and supernatural existence. Just flip on the television, and a few minutes of channel surfing will guide you to hosts of religious and/or televangelist programming, or sci-fi and fantasy shows depicting superheroes capable of overcoming the limits of time and space. Take a drive around your local community and notice the various churches, temples, mosques, or ashrams—each with a congregation ready to convey to you their special bond with the eternal. Health science and technology are also continually pursuing and revealing innovative new medicines, herbal supplements, and ointments that promise to stave off (or at least conceal) the deteriorative aging process; and the prospects of cryogenic freezing and genetic manipulation sow the hope of conquering the physical ailments of the human condition.

It thus seems as if death transcendence is always at our fingertips; and, in our aching need to believe, culturally prevalent intimations of immortality might provide a great deal of psychological security. In experiments by Dechesne et al. (2003), half of participants were presented with ostensible scientific evidence of an afterlife. They were told (falsely) that a Harvard scientist had found that, among 600 people who were revived after being declared clinically dead, 98 percent reported having an out-of-body experience in which they floated above medical personnel attempting to revive them, moved through a tunnel of bright light toward an even greater source of bright light, felt an absolute feeling of comfort and absence of pain, and were able to contact previously departed loved ones. The other half of participants received information that described such experiences as medically improbable and false. Among these latter,

non-immortality-salient participants, MS increased worldview defense and self-esteem striving. Yet this effect was eliminated among participants who had read that immortality is scientifically valid. So it seems people are less defensive in the face of mortality when some external source bolsters their sense that there is life beyond death.

But as Irvin Yalom (2008) aptly noted, “our existence is but a brief crack of light between two eternities of darkness” (p.81). Accordingly, in addition to afterlife beliefs, religious creation stories help deal with the specter of nonexistence by imbuing oneself, as well as one’s cultural surroundings and activities, with a spiritual cosmogony. Creation stories (and other supernatural myths) generally recount the spiritual history of one’s way of life in spellbinding fantasy, ranging from God’s telekinetic fiat, to drops of milk landing on tortoise shells, to divine lovemaking (Leeming & Leeming, 1994). From the perspective of TMT, it is important to recognize that, like other notions of the great beyond, creation myths convey the promise of existence beyond the boundaries of physical human limitations, and connect the self to a spiritual realm that stretches indefinitely backward and forward in time.

In addition to supporting the foundation of the religious worldview—divine existence—viewing oneself and one’s surroundings as the focus of divine attention serves an esteem function: it construes one’s ensuing spiritual drama as part of the purpose for which the universe was created. As Bertrand Russel (1930/1991, p. 42) explained, “if [religion] is true, mankind are not such pitiful worms as they seem to be; they are of interest to the Creator of the universe, who takes the trouble to be pleased with them when they behave well and displeased when they behave badly. This is a great compliment.”

To explore the function of creation myths, Schimel, Hayes, Williams, and Jahrig (2007) built on the *death-thought accessibility hypothesis*, which states that if self-esteem or faith in one’s cultural worldview functions to keep nonconscious thoughts of death low, then threatening that buffer should cause death-related thoughts to leak into one’s unconscious mind—much like poking a hole in a dam would cause water to leak through. Increases in death-thought accessibility (DTA) can be observed when individuals become particularly likely to complete word fragments like DE_ _ as “DEAD” or become quicker to identify death-related words like GRAVE or KILLED as they flash on a computer screen. In Schimel et al.’s (2007) research, Creationists displayed increased in DTA when asked to read an article presenting evolutionary evidence against divine creationism, whereas those who read a neutral article did not. Similar work has demonstrated that death reminders sometimes heighten acceptance of

intelligent design and reduced acceptance of evolutionary theory (Tracey, et al., in press).

Another basic way of investigating the existentially protective function of religion is to test whether MS increases expressions of faith in God. Research by Norenzayan and Hansen (2006) did so in several ways. They showed that MS increased peoples' ratings on the questions "How religious are you?" and "How strongly do you believe in God,?" strengthened the perceived efficacy of prayer and intensified belief in various supernatural agents (e.g., Buddhist prayer, clairvoyant shamans consulting their ancestral spirits, and unfamiliar spirits). Such findings suggest that belief in an unbounded spiritual realm inhabited by supernatural agents can provide psychological equanimity in the face of death.

Other research further illustrates that such effects are dependent on individuals' pre-standing religious orientations. For instance, MS increased confidence in life after death, but only among individuals with preexisting afterlife beliefs (Osarchuk & Tatz, 1973; Schoenrade, 1989). Moreover, Vail, Arndt, and Abdollahi (2011) found that MS increased American Christians' faith in the Christian God and Iranian Muslims' faith in Allah, and also reduced Christians' faith in Allah and Buddha as well as Muslims' faith in God and Buddha. That is, when reminded of death, both religious groups boosted faith in worldview-consistent deities but denied faith in competing deities.

In sum, evidence supports the idea that expressions of immortality and faith in supernatural agents function to protect people from thoughts of their own finitude. These findings seem incompatible with some perspectives suggesting that religion is a byproduct of fitness-enhancing abilities for enhanced reproduction and physical resource attainment (e.g., Navarrete & Fessler, 2005). If immortality beliefs and spiritual or supernatural entities are just epiphenomena, why has so much effort gone into constructing, maintaining and elaborating upon them throughout human history and continuing to this day? Moreover, perspectives suggesting that worldviews serve a coalition-binding rather than an existential function (Navarrete & Fessler, 2005) have a difficult time explaining why groups need a supernatural dimension. Rambling about bizarre supernatural forces irreconcilable with physical experience, rather than clearly communicating information about the world, runs the risk of breeding social confusion—not cohesion. Yet humans have done so for millennia. Such furious attention to "the beyond" is perfectly explicable from the perspective of TMT, and it is consistent with contemporary evolutionary theory to suggest that religious worldviews serve an important role in denying the abstract awareness of vulnerability to death.

Religion and the Social Maintenance of Cultural Worldviews

Maintaining faith in gods, spirits, and the supernatural realm involves accepting and attaching great value to things that can neither be seen nor verified directly. The validity of religions, like all other cultural phenomena, relies heavily on consensual validation from others (Berger & Luckmann, 1967). On one hand, others can help verify our symbolic inroads to literal immortality as ultimately right and righteous. Yet, on the other hand, encountering followers of alternate religions introduces the existence of a competing worldview and raises the possibility that one's own way of life might not be the best path to immortality. Consequently, people employ an array of compensatory psychological defenses to support their death-denying religious ideologies and reduce the threat posed by adherents of competing religious belief systems. Two such defenses are the twin processes of *bolstering* and *derogation*, which, respectively, refer to attitudinal positivity toward people and information supporting one's own worldview and attitudinal negativity toward people and information supporting a competing way of life.

Prototypical derogation of competing religious adherents can easily be seen in the comments of many pundits, clerics, and military leaders. Take, for example, conservative Christian political pundit Ann Coulter's (2006) statement about the prospect of bombing Muslims in the Middle East, "As I believe our motto should be after 9/11: Jihad monkey talks tough; jihad monkey takes the consequences. Sorry, I realize that's offensive. How about 'camel jockey'?" (para. 8). Similarly, the massacre of 29 Arabs in Hebron by Dr. Baruch Goldstein was excused by Rabbi Yitzhak Ginsburgh, arguing that Gentile blood is dirty and worth less than Jewish blood (Juergensmeyer, 2000). According to TMT, such sentiments reflect efforts to mitigate death-related concerns by hailing followers of one's own path to immortality and condemning alternative immortality ideologies as inhuman hogwash. And indeed, MS intensifies bolstering and derogation in religious contexts. Greenberg et al. (1990) found that Christian participants responded to MS with more positive judgments of a fellow Christian and more harsh and stereotypical assessments of a Jewish person. Kosloff, Greenberg, Sullivan, and Weise (2010) found that MS increased positive feelings about a potential long-term relationship partner only if s/he shared the participant's religion. Furthermore, among Islamic fundamentalists, MS intensified violent antipathy toward Christian nations (Rothschild, Abdollahi, & Pyszczynski, 2009).

But even if one can disparage adherents of alternative religious worldviews, their continued existence persists as a reminder that one's path to

literal immortality might not ultimately be the right one. In addition to bolstering and derogation, then, is *assimilation*: the integration of differing others into one's own religious worldview. History is littered with examples of people trying to convert and assimilate others; from the Dharma Bhanaks who missioned Buddhism throughout most of the Eastern world under order of Indian Emperor Ashoka the Great (c. 250 BCE), to British missionaries who endeavored to saturate India with Christianity in the 18th century, to current-day televangelists like Pat Robertson.

Recent research by Kosloff, Cesario, and Martens (2011) suggests that such efforts are motivated by assimilators' own existential insecurity. In one experiment, Christian participants were reminded of death (or control topic) and then had the opportunity to either give "advice" to, or derogate, an atheist target. If the atheist target showed some potential openness to religion, then MS motivated the Christians to engage in more fervent efforts to get them to give Christianity a try, advising them to go to church and read the Bible. If the target was a staunch atheist who was entirely unreceptive to religious ideas, MS instead motivated the Christian participants to derogate him/her. These findings suggest that, if one can see a viable way to convert the followers of threatening beliefs, derogation gives way to the temptation for consensual validation provided by assimilation.

But it seems as long as humankind exists so too will a myriad of religious ideologies. When derogation and assimilation of competing followers become insufficient defenses, aggressive actions emerge. From fistfights to armed conflicts, and even genocide, aggression can reflect the desperate efforts to *annihilate* threatening religious adherents and thereby demonstrate definitively that one's view was ultimately right after all. From current conflicts in the Middle East, Central Asia, and elsewhere, back through the Crusades and Inquisitions of the Middle Ages and earlier still to tribal wars, religious disputes have resulted in much killing and violence. In the words of Ernest Becker (1975, p. 150), "The hero is, then, the one who accrues power by his acts, and who placates invisible powers by his expiations. He kills those who threaten his group, he incorporates their powers to further protect his group, he sacrifices others to gain immunity for his group. In a word, he becomes a savior through blood."

Public policy specialist Monica Toft (2007) noted that, historically, religious wars are more common than secular wars, more brutal, and more likely to recur. Recent research illustrates that existential concerns with death play a central motivational role in violent conflict across religious lines. In one study (Pyszczynski et al., 2006), Iranian students were reminded of either death or a control topic and later asked to evaluate two fellow students. One student advocated helping the world

to understand that Islam is peaceful, and the other advocated Islamic martyrdom missions against the United States. In the control condition, participants strongly preferred the peaceful student; however, after MS participants strongly preferred the student who advocated martyrdom missions and even indicated greater willingness to join the martyr's cause: destroying Americans in defense of Islam. Such findings might help inform the recent spike in Islamic terrorism, as well as the fierce bloodlusts against the Jews during WWII, Muslims in Palestine, and Hindus in Tamil Eelam, among others.

The annihilation strategy was most compellingly illustrated by an experiment (Hayes, Schimel, & Williams, 2008) in which Christian participants were presented with an article that discussed either a neutral topic (control condition) or argued that the holy city of Nazareth (Jesus's hometown) is being taken over by Muslims ("Islamified"). When reading about the Islamization of Nazareth, the Christians demonstrated increased DTA. However, this effect was eliminated if they were also presented with evidence that a plane full of Muslims had been killed in a crash. That is to say, threats to individuals' religious worldviews produced increases in DTA, but perceiving the annihilation of members of that threatening religious out-group functioned to quell personal mortality concerns.

The Spirit within the Shell: Transcending the Physical Body

The unholy trinity of compensatory processes just outlined—derogation, assimilation, and annihilation—can help buffer, but they do nothing to change the fact that we are each simply walking, talking bags of meat: no more significant or enduring than a hair fiber or a flake of corn cereal. At the end of the day, aspirations of spiritual or supernatural superiority are met with the unflappable reminder that one persists in a blood-pumping, oxygen-gasping body. Like any other animal, the human eats, secretes fluids and waste, copulates, and will eventually bend, break, bleed, wrinkle, become ill, and ultimately die. Our physical, or "creaturely," nature serves a persistent reminder of finitude, one not soon solved by advents of medical science any more than sewing one's asshole shut will make the excretory system disappear. No wonder, then, that exposure to the creaturely characteristics of human nature, such as susceptibility to disease, and basic bodily functions like sex, peeing, and pooping, increase DTA (Cox, Goldenberg, Pyszczynski, & Weise, 2007; Goldberg, Cox, Pyszczynski, Greenberg, & Solomon, 2002).

The denial of human creatureliness illustrates the insatiable urge to forge an immortalizing path through the thickets of natural existence. Religion

is a natural outgrowth of such efforts, sheltering us from the storm of creatureliness with stories and rituals that negate the body's ultimate fragility. In the Hebrew Bible, the evocative Song of Songs reads enigmatically as a poetic dance between faith and sexuality, an amorous dialogue between a Shulamite and King Solomon, in which lustful passions strive to meet an untouchable ideal and find realization only symbolically, in the perceived consummation of spiritual and carnal aims (Kristeva, 1987). The story of Adam and Eve is perhaps more heavy handed in its treatment of the subject: upon eating the forbidden fruit of knowledge, the two become aware, via nudity, of their base creaturely nature and feel morally compelled to clothe themselves. Similar efforts to symbolically veil the biological show up in beatification rites, hair removal, piercing, tattooing, and other forms of body alteration that serve part-and-parcel in spiritually motivated efforts to denude creatureliness in hosts of cultures. Such practices also appear in ritualistic cleansings, like baptism and circumcision.

Simply stated, the purification of the body is the purification of the soul: readying people to be more than just material organisms, to be carriers of immortalizing potentialities that transcend the physical in accord with religious aspirations to divine unification. Empirical findings support the idea that such metaphysical strivings are death denying in nature. MS increases preference for information elevating humanity above other animals (Goldenberg, et al., 2001), and motivates spiritual people and religious fundamentalists to report feeling a greater sense of disconnection of the self from the body and the natural world (Goldenberg & Hart, 2009; Vess, Arndt, & Cox, 2011).

And similarly, people seem to have a fascination with the supernatural. From Superman to Jesus, children and adults revel in the possibility that there are ways to transcend physical constraints. Seeing and believing such things would bespeak the possibility that there is another realm beyond this one where the "rules" are different and experience is unbounded. Perhaps that is why epic poems and religious scriptures tell of Gods doing things that humans physically cannot, and why historically people have flocked to the altars of shamans, medicine men, and oracles: divine incarnates seen as physical connections to a spiritually unbounded world. This tendency was inadvertently suggested by Gottfried Leibniz (1686/1991), an influential metaphysics philosopher, in his observation that "the more enlightened and informed we are about God's works, the more we will be disposed to find them excellent and in complete conformity with what we might have desired" (p. 1).

Research by Cohen, Sullivan, Solomon, Greenberg, and Ogilvie (2011) supports the idea that belief in supernatural forces serves a death-denying

function. They found that following MS, individuals reported having more fantasies about flying. Fantasizing about flying also prevented MS from increasing worldview defense and DTA. Interestingly, flying is a unique upward supernatural motion, conveying a dualistic sense of departure from lower physicality; accordingly, supernatural abilities other than flying (i.e., reading minds, walking through matter) did not have similar effects. Indeed, participants' heightened perceptions that flying freed them "from the limits of the human body" (p. 97) statistically explained (mediated) why flight fantasies, but not mind reading or running through walls, eliminated defensive responses to MS.

In addition to supernatural forces, religions and spiritual traditions often describe physical, earthbound beings who magically maintain connections with spiritual worlds. According to Plutarch, the Delphic Oracle of ancient Greece (really just a series of rural females taking psychedelics) bathed and drank from a sacred brook, inhaled smoke from burnt laurel leaves, and supposedly channeled coded messages from Apollo via "her frenzied mouth and with various contortions of her body" (Jaynes, 1976, p. 322). Other corporeal beacons signaling connections with alternative existential planes pervade human history: from the songs of seers, the words of prophets, to the channeling gyrations of shamans. Religious characters like Buddha, Mohammed, and Jesus, among many others, have even been credited with spectacular supernatural activities, including ascensions to heaven, telekinetic healings, transfigurations, and occasionally, with divinity itself.

If incarnations of the spiritual are existentially comforting, one might expect religious followers to be bothered by the prospect of their revered religious characters being subject to the vicissitudes of corporeal processes—that God gets diarrhea too. The notion that divine figures are ultimately subject to the same bodily vulnerabilities as the rest of us, or the rest of the animal kingdom, undermines confidence in the very concept of eternal spirit. Indeed, Muslims refrain even from creating any physical likeness of Muhammad or Allah, emblematic of a general prospect made especially abhorrent when people face their own existential insecurities. In correlational work by Beck (2008), participants read about several body issues Jesus may have had, including bad breath, bad teeth, and diarrhea during illness, and then rated whether those issues made them feel uncomfortable. Participants reporting greater death anxiety also reported greater aversion toward Jesus's bodily characteristics and processes. More recent experiments clarify that death thoughts exacerbate such aversions. Cox et al. (2011) found that MS actually *reduced* faith in God, religion, and literal afterlife among fundamentalist

Christians if they had first been reminded that Jesus likely sometimes vomited, smelled bad, or got thirsty, among other physical ailments.

The transcendent spiritual power showcased by so many religious intermediaries is alluring in part because it demonstrates a capacity to extend beyond our mortal bodies. Yet, we humans each remain encased in physical forms. Terror management processes themselves must therefore operate via some hard-and-fast neurophysiological mechanisms. Exactly how, then, do human brains implement the mental gymnastics that make death-denying religious faith possible? To date, science has made some initial headway, but is still far from providing a sufficient answer to this question. In the following section, we attempt some informed speculation.

BRAIN AND BEAST: HOW NEURAL PROCESSES MAY IMPLEMENT RELIGIOUS TERROR MANAGEMENT

Despite the theory's name, research on TMT has time and again shown that MS does not induce a physiological state of anxiety or terror. Of course, humans and reptiles possess basically the same limbic system to manage fight-or-flight responses, but evidence suggests that MS does not activate this system directly. Null effects on self-reported affect have been observed in over 200 studies and psychophysiological indices of autonomic and cardiac reactivity—including skin conductance/resistance, pulse rate, blood pulse volume—are largely nonresponsive to these manipulations. How is it, then, that MS can play such a profound causal role in human thought and behavior without producing a direct experience of anxious arousal? Surely *something* must be happening in the brain and body for existential concerns to motivate such fervent religious faith!

Indeed, a lot is happening; but to understand what, exactly, requires nuanced consideration of the difference between experiencing *actual* anxiety and mentally representing one's *potential* for anxiety. Actual anxiety is a typical, often adaptive response to overt stressors. It is normal for the palms to sweat during an exam and for the heart to race when a knife is at one's throat. Yet such experiences are quite distinct from having the thought pass through one's mind that an anxiety-provoking event could occur. One might sit quite comfortably, absent any measureable jumpiness, and reflect on the fact that one may take an exam next semester; that one could at some point be mugged; or that one will someday die. Though abstract consideration of such things does not pose the immediate threat of a chasing lion, it is not without consequence.

As illustrated by Greenberg et al. (2003), it is precisely the representation of *potential* anxiety that fuels MS effects. They found that MS produced a

typical worldview defense effect (pro-U.S. bias among Americans) under normal conditions but not when participants had first drunk a placebo tea purported by the researchers to fully prevent the onset of anxiety. Heightened abstract concern with potential death-related anxiety thus appears to be a cognitive-emotional mechanism by which MS has its dynamic influences. When the *potential* for death-related anxiety is eliminated, so is the need for defensive responses.

Rather than directly influencing *explicit* subjective affective experiences, death thoughts are immediately recognized as aversive and produce implicit coping efforts. Supporting this idea, Arndt, Allen, and Greenberg (2001) recorded online facial electromyographical (EMG) indices of *implicit* affect during subliminal presentations of death words (compared to neutral words, nonwords, and aversive words). The death primes increased EMG activity on the corrugator supercillii muscle region (brow), an area associated with implicit negative affect. Importantly, however, corrugator activity was observed only during the period of direct exposure to the death primes, fading away immediately afterward. One interpretation of this research is that the aversive awareness of death motivates an immediate neurophysiological regulatory process in which people implicitly recognize and suppress the potential negative affective consequences of mortality awareness.

Given that TMT involves cold-cognitive (e.g., DTA) rather than hot-affective (e.g., anxiety) processes, how can this potential anxiety be measured in the brain? Kosloff, Greenberg, Martens, and Allen (2001b) reasoned that if MS heightens concern with regulating potential anxiety, then it should produce neural activations associated with regulating responses to stimuli individuals want to avoid. One such index is anterior electroencephalographic (EEG) hemispheric asymmetry. Research on this phenomenon shows that greater relative activity in the right (vs. left) frontal brain hemisphere is associated with a readiness for withdrawal. For instance, spontaneous or directed facial expressions of withdrawal-oriented emotions (e.g., fear) cause increased relative EEG activity in right frontal brain areas—and as with MS, such effects can take place independent of change in self-reported affect (Coan, Allen, & Harmon-Jones, 2001).

Kosloff et al. (2001b) found that, after MS (vs. control), participants showed an increase from baseline in right anterior asymmetric activity at lateral frontal (F8-F7) and fronto-polar (FP2-FP1) EEG site comparisons. After measuring the effect of MS on frontal EEG, the researchers assessed participants' *eyeblink startle responses*: amygdala modulated reactivity at the orbicularis oculi (the muscle that contracts the eye to blink; Lang, 1995). Among those reminded of death, startle responses triggered by blasts of white noise were greater during the presentation of

worldview-threatening images (which did not generalize to negative yet worldview-irrelevant images). And just as potential anxiety mediates MS-induced worldview defense (Greenberg et al., 2003), Kosloff et al. found that heightened startle potentiation during worldview-threatening pictures correlated with the extent to which MS had induced relative right frontal EEG asymmetry.

So as thoughts of death percolate through subjects' minds, the brain orients defensively. It is possible that this motivational withdrawal contributes to the compensatory defenses of religious worldviews mentioned earlier, though direct associations between neural and behavioral outcomes of MS have not yet been tested. It does seem clear, though, that thoughts of death influence hemispheric asymmetry differently than other self-threatening topics. Uncertainty, for instance, has been found to increase relative left frontal EEG asymmetry, indicating heightened approach motivation (McGregor, Nash, & Inzlicht, 2009). While proactive, approach-oriented behaviors might directly eliminate sources of uncertainty, meaninglessness, social exclusion, etc., death, on the other hand, can only be transcended symbolically: by looking beyond the worldly here and now and believing in some other mode of existential permanence. Continued study of the influence of MS on hemispheric asymmetry may thus help reveal why death reminders so often enhance religious faith, whereas thoughts of non-death-related threats generally do not.

Other research has utilized more temporally precise neural measures to explore effects of MS on biased processing of worldview-relevant stimuli. Henry, Bartholow, and Arndt (2010) examined the effect of MS on *event-related potentials* (ERPs): patterned voltage changes embedded in ongoing EEG activity that index psychological processes time locked in response to a particular event. After manipulating MS, Henry et al. (2010) used ERPs to track online attentional and evaluative processes as participants categorized in-group and out-group faces according to expression (happy vs. angry). Across coronal scalp loci (but most pronounced at frontal and fronto-central sites), MS participants exhibited heightened amplitude of the N2 as they viewed angry in-group faces. The N2 is sensitive to cues of in-group conflict (Dickter & Bartholow, 2010), so this effect may indicate increased attention to worldview-threatening images. Attentional allocation, then, may be a crucial cognitive mechanism by which MS induces defensive outcomes.

Henry et al. (2010) also found that MS significantly quickened latency of the P3 during happy in-group face presentation and directionally slowed latency of the P3 during angry in-group face presentation (parieto-central maximum). Latency of P3 indexes the speed at which a stimulus is categorized and its evaluative implications understood, and has been

implicated in the cognitive activation of stereotypes (Bartholow, Dickter, & Sestir, 2006). This suggests that MS participants were quicker to make sense of in-group members who appeared happy (i.e., who were consistent with a stereotypical view of the in-group as good). Viewing the social world in terms of generalized, worldview-consistent categories may be an efficient way of maintaining an existentially meaningful sense of order and coherence. In religious contexts, such concerns may motivate interpretation of the world as consistent with beliefs about fate, cosmological forces, or moral imperatives.

In addition to guiding interpretations of the social world, religions provide moral compasses with which individuals gauge their self-worth. By perceiving oneself as living up to religious standards of value, one can gain security from death, as a significant agent destined for heaven rather than a base, debauched sinner condemned to oblivion. As previously mentioned, TMT research shows that MS intensifies motivation to meet such value standards (self-esteem striving), and recent research by Kosloff, Greenberg, and Allen (2001a) elucidates neural processes that may contribute to such efforts.

Kosloff et al. (2001a) reasoned that because death awareness heightens motivation to pursue a sense of personal value, MS should sensitize people to failures to live up to prescribed behavioral contingencies for self-esteem. To assess this, they examined the effect of MS on neural indices of performance monitoring during a self-esteem relevant task. Specifically, college-aged participants performed a rapid-fire decision-making task and were led to believe that the task was diagnostic of self-esteem relevant attributes like intelligence and career success. The task was difficult and designed to elicit erroneous responses so the researchers could assess neural reactivity to performance errors. Of particular interest was the Error Related Negativity (ERN), an ERP component known to occur time locked to error responses. At about 60–100 milliseconds after participants make an error, the ERN emerges in the averaged waveform, as a negative-going voltage deflection. To examine whether MS would intensify ERN on the self-esteem relevant task, Kosloff et al. (2001a) presented half of the participants with subliminal primes of the word “DEATH” during each trial (vs. control primes “PAIN” and “FIELD”). MS-primed participants showed greater ERN amplitude compared to control participants (fronto-central maximum). Thus, MS triggered neural processes reflecting heightened sensitivity to self-relevant failures—much as religious persons might react to committing sins in the eyes of God.

Kosloff et al. (2001a) further examined behavioral consequences of MS-induced neural conflict monitoring. The ERN is known to be generated

by the dorsal Anterior Cingulate Cortex (dACC), a portion of cortex with connectivity to frontal brain regions implicated in higher-order, executive processes that regulate behavior. Research shows that activity in the dACC (as indexed by ERN amplitude) predicts behavioral adjustments to avoid continued error commission (e.g., Gehring et al., 1993). Accordingly, Kosloff et al. (2001a) found that MS-primed participants tended to slow down on trials following an error (post-error slowing) and to be more accurate on such trials (post-error accuracy), and that heightened ERN statistically explained (mediated) these behavioral outcomes.

Much as a Catholic might recite several Hail Marys to gain absolution from sin, or as a Jain might recite the *Prakrit* phrase “*micchāmi dukkadam*” (roughly meaning: “If I have caused any offence in any way, in thought, word or deed, then I seek forgiveness”), death-primed participants exhibited behavioral efforts to counteract value-relevant failures—as long as the dACC and prefrontal cortex had registered the conflict to begin with. And just as maintaining self-esteem and faith in religious worldviews functions to reduce concerns with death, Kosloff et al. (2001a) found that greater post-error accuracy correlated with reduced DTA among the death-primed participants.

We speculate that similar processes are likely to occur in explicitly religious contexts. Religious contingencies for personal value often emphasize the importance of staying true to the sacred path, especially during hard times. In the book of Job, Satan reportedly subjects Job to a brutal succession of afflictions, yet Job refuses to yield in his piety before God, reflecting deep-seated motivation to maintain his faith. Rituals of penance (e.g., Jain *pratikraman*, Catholic confession) illustrate religious methods of error monitoring in the quest for literal immortality. It thus seems plausible that death-related concerns would heighten religious people’s dACC reactivity to evidence that they have erred in some religious quest. Moreover, religions prescribe hosts of paths to behavioral correction: as just a few examples, Muslims attentively follow the teachings of the Quran to avoid sin, and Buddhists follow the Eightfold Path to transcend clinging and suffering. Heightened neural reactivity to personal sacrilege might thus facilitate corrective behaviors (e.g., prayer, meditation) designed to guide individuals back along their death-denying paths to righteousness.

The evidence reviewed in this section offers an initial glimpse into the neural mechanisms that may implement religious forms of terror management, yet this line of research is still in its infancy. Researchers are just beginning to develop an integrative sense of the cascades of neurophysiological, behavioral, and cognitive processes that make human hopes for immortality possible. Heightened awareness of death triggers

neurophysiological processes that prepare the organism for withdrawal (i.e., relative right anterior hemispheric asymmetry), leading to heightened reactivity to stimuli or events which undermine faith in one's worldview or sense of self-worth. The application of psychophysiological and neuroscientific methods to understand the existential basis of religious faith is ongoing, and it will likely be countless years, if ever, before neural correlates of humans' existential condition are thoroughly revealed.

INDIVIDUAL DIFFERENCES IN RELIGIOUS ORIENTATIONS

In addition to the functions and themes common to the world's religions, there are a number of ways people can utilize religion to help manage death concerns. Some may embark on a more open-minded search for spiritual truth, whereas others might rely on a strict adherence to one particular faith. Some might become involved in religious communities for symbolic immortality, perhaps by making a lasting social impact on the congregation, whereas others might be involved for more personal, belief-oriented reasons. Vast swaths of individuals simply differ in their use of religion. Examining these individual differences has revealed important nuances in the ways religious faith can be used (or not used) as a terror management strategy, as well as the unique benefits and costs associated with these varied approaches to the denial of death.

To Believe or Not to Believe

We begin by considering the starkest of contrasts in the use of religious faith: believing and not believing. Although we have mentioned that the majority of people around the world believe and engage in religious pursuits (Ipsos/Reuters, 2011), that pattern is not universal. Many have simply been raised without religion and others, for one reason or another, have altogether abandoned religious faith in favor of more secular pursuits. And justifiably so: religions involve entities and ideas that do not conform to natural laws and thus cannot be empirically validated, but the secular world is generally based in physical reality, and one's interactions with it are consequently subject to logic and evidence. Further, the number of potential secular cultural endeavors offers much flexibility in the types of communities, beliefs, and behaviors that can support a solid sense of symbolic immortality.

To be sure, regardless of geographic locale, there is generally a cornucopia of cultural undertakings with which a person might become involved, each with potential to bolster self-value. People's specific cultural milieu offers opportunities to invest, or not, in things like religion, as well

as their career, family, nation, or community softball team, just to name a few. One might help develop a product that others will want to buy and use; raise a successful family; take pride in one's country; and/or play solid defense to help catapult that softball team to league championships.

But these paths to symbolical immortality, however, will ultimately fall short in fully addressing the problem of death. Critically, MS elicits a general *desire* for a literal afterlife (Heflick, Goldenberg, Hart, & Kamp, 2011), suggesting that at the very least, existential concerns prompt a basic interest in literal immortality that cannot be sated by secular life. This tendency echoes filmmaker Woody Allen's frustration, "I don't want to achieve immortality through my work; I want to achieve it by not dying." However, doubts about the validity of religious phenomena, such as those held by atheists, preclude belief in God and eternal life. Indeed, atheists refused to express any amount of faith in the existence of the Allah, Buddha, or the Christian God, regardless of whether or not they were reminded of death (Vail et al., 2011). Thus, MS arouses the inclination to pursue literal immortality, yet atheism and other forms of skepticism explicitly deny the existence of God and afterlife—even in the face of death.

So is it possible to effectively manage the awareness of death *without* religion? Perhaps. The greater body of TMT research suggests that successful participation in secular belief systems can serve a similar death-denying function. For instance, presenting Canadians with insults to Canada undermined that source of symbolic immortality and increased DTA (Schimel et al., 2007), just as did confronting devout Christians with errors and contradictions in the Bible (Friedman & Rholes, 2007). And just as MS increased British students' willingness to self-sacrifice to defend England (Routledge & Arndt, 2007), so too did MS increase support for martyrdom attacks to defend Islam among Iranian students (Pyszczynski et al., 2006).

Yet, there is an important reason why atheists and other skeptics are in the minority. As we have elaborated, it is no small matter that religious beliefs *directly* address the problem of death through the promise of literal immortality. In contrast, secular worldviews, on their own, can only do so *indirectly* by offering ways to make a lasting impression on society. It is thus possible that nonreligious terror management strategies are less potent than religious strategies, precisely because religions offer promises of literal immortality that cannot be obtained via secular means.

Putting All the Eggs in One Basket: Religious Fundamentalism

On the flip side of this coin, however, are those most intensely invested in their religious beliefs. This is known as the *fundamentalist* approach to

religion. From ancient tribal societies to many modern ones, the direct death-denying power of religion appears to motivate fervent efforts to adhere to prescriptions for righteous behavior. Fundamentalists are those who believe their particular faith “clearly contains the fundamental, basic, intrinsic, essential, inerrant truth about humanity and deity; that this essential truth is fundamentally opposed by forces of evil which must be vigorously fought; that this truth must be followed today according to the fundamental, unchangeable practices of the past; and that those who believe and follow these fundamental teachings have a special relationship with the deity” (Altemeyer & Hunsberger, 1992, p. 118). This approach reflects the view that one’s religion is the one and only “correct” way of life and sets the stage for the pursuit of personal value via efforts to maintain an unflinchingly strict adherence to the attitudes and behaviors prescribed by the faith, often to the exclusion of involvement in secular enterprises.

Research supporting this idea has shown that although those low in religious fundamentalism increase secular worldview defense in response to MS, those high on fundamentalism do not (Friedman & Rholes, 2008). Follow-up analyses showed that when responding to MS, religious fundamentalists displayed less cognitive complexity but more peace, acceptance, and certainty of an afterlife. These markers of a single-minded focus on the hereafter statistically explained (mediated) fundamentalists’ lacking secular worldview defense. Other work shows that fundamentalists tend to prefer their own religious methods of coping with life’s health hazards, as opposed to standard secular or medical methods. Vess et al. (2009) found that when religious fundamentalists were reminded of death, they were more likely to endorse prayer as an effective substitute for medical treatment, and more willing to rely on faith alone to heal. That these effects did not emerge in the absence of death-relevant thought highlights just how sensitive these individuals are to mortality concerns. These findings suggest that fundamentalists tend to look exclusively to religion when dealing with existential concerns and make religiously motivated decisions that they might not otherwise make.

In like manner, fundamentalists might be particularly inclined to rely on literal interpretations of scripture to guide their attitudes and behavior: viewing parables, songs, and verses as illustrating steps necessary to gain entry to heavenly gardens of delight, much as an instruction manual illustrates how to build a car stereo. Even the earliest known religious texts—ancient Egyptian hieroglyphics known as the *Pyramid Texts* (c. 2353 BCE)—essentially served as instruction manuals for rituals designed to secure eternal life.

This strict discipleship has the potential to foster some rather deleterious ways of defending one's religious beliefs during tough times. For example, should their holy Arabian Peninsula be invaded by *kufir* (i.e., unbeliever) forces, fundamentalist Muslims might literally follow the Quran's instructions to "slay them wherever ye find them" (The Holy Quran, 2:191). Likewise, Christian fundamentalists faced with threats to their beliefs about abortion or marriage might interpret justification for violence in Jesus's warning: "do not suppose that I have come to bring peace to the earth. I did not come to bring peace but a sword" (Matt. 10:34, The Bible, New International Version). It is perhaps unsurprising, then, that religious terrorism is more intense and inflicts more civilian fatalities than secular terrorism (Toft, 2007).

But more broadly, because religious fundamentalists put all their existential eggs in one basket, they appear to be particularly hostile when protecting the integrity of their death-denying worldview. Fundamentalists often display defensive aggression and militaristic attitudes, ethnocentrism, and racial prejudice toward those who view the world differently or who violate perceivably sacred attitudes and behaviors (e.g., Altemeyer & Hunsberger, 1992; Henderson-King, Henderson-King, Bolea, Koches, & Kauffman, 2004). So, acknowledging that religion can be a powerful terror management resource, one important issue facing society is to better understand how religion can be used to meet terror management needs without tearing the world to pieces.

Beating Swords into Plowshares

Toward this end, it is important to remember that many religious beliefs were founded upon pro-social values like compassion, tolerance, and kindness. In spite of the caustic aspects of religion, most people are familiar in some way with the Qur'anic teachings of tolerance and compassion such as, "do good to others, as god has done good to you" (The Holy Quran, 28:77), or Jesus's commandment to, "love your neighbor as yourself" (Mark 12:31). In fact, research shows that simply priming these positive principles of religion can encourage behavior consistent with pro-social religious precepts, such as helping and charitable behavior (Pichon, Boccato, & Saroglou, 2007; Shariff & Norenzayan, 2007). One can then easily imagine times when the motivation to live up to these standards and values might conflict with the abovementioned tendency for hostile defense against those posing a threat to one's faith.

Whereas death awareness might otherwise encourage fundamentalists' tenacious aggressive reactions, making the pro-social aspects of

religion particularly salient may be a promising way to promote and maintain peaceful relations with diverse (and potentially worldview-threatening) others. This issue was recently addressed in research (Rothschild, Abdollahi, & Pyszczynski, 2009), in which American Christian fundamentalists were first reminded of death or control topic. Then, some were presented with scriptural passages espousing compassionate values (vs. neutral statements; vs. secular adages of either compassionate or neutral content) and asked to indicate their support for extreme military responses to those who challenge the United States, such as using chemical and nuclear arms and killing thousands of civilians to beat the enemy. Fundamentalists in the control condition were always supportive of such violent worldview defense. However, when those in the MS condition read compassionate religious scripture (but not neutral scripture or secular adages), they significantly reduced their support for violence. A third study replicated this finding among a Shi'a Muslim population in Iran. Thus, because fundamentalists are characterized by strict adherence to their religious texts, making compassionate religious values especially salient encourages peaceful means of managing existential concerns.

In a related vein are those who have internalized the actual values and teachings of their religious beliefs, integrating them into the self as the dominant standards of worth. This is known as *intrinsic religiosity* and is distinguished from extrinsic religiosity or involvement oriented toward building social capital rather than personal interest in the tenets of one's religion. Because of this integrative approach, intrinsic religiosity tends to be associated with high levels of actual adherence to religious values, and thus sets the stage for a relatively peaceful life marked by reduced anxiety, greater life satisfaction, and a clear sense of meaning (Batson, Schoenrade, & Ventis, 1993). Opportunities to rely on religious faith may therefore foster happy, peaceful methods of coping with one's existential concerns.

Indeed, when intrinsically religious participants were reminded of death, affirming their religiosity boosted their sense of self-efficacy in the face of existential fear, which in turn helped sustain a positive mood (Fischer, Greitemeyer, Kastenmuller, Jonas, & Frey, 2006). Extending this finding, Jonas and Fischer (2006) conducted a study in which participants high or low in intrinsic religiosity were first allowed to affirm their religious beliefs or were not. Then, they were reminded of death (or control topic) before having the opportunity to engage in secular worldview defense (vigorous allegiance to their hometown). Whereas MS increased secular defenses when participants were not given the chance to affirm their

religious beliefs, this effect was eliminated among intrinsically religious participants who affirmed their beliefs. Internalizing religious values as dominant life standards thus appears to offer a useful way to harvest the benefits of religion and sustain well-being, while also refraining from typical defensive reactions.

Another approach to religion that is more explorative, and less defensive, is the *quest orientation*. This approach does not treat any one religious tradition as the "correct answer," per se, to life's existential questions but rather treats them all as stepping-stones on the path to spiritual truth. In Gandhi's (1948) words, "I worship God as Truth only. I have not yet found Him, but I am seeking him" (pp. 5–6). And for the past few hundred years, there have even been formalized religious denominations, such as Baha'i Faith or Unitarian Universalism, devoted to the open-minded pursuit of spiritual truth. These groups seek greater connection to God and a more nuanced moral understanding of the world by studying texts and teachings gleaned from a blend of Christian, Muslim, Jewish, Hindu and Buddhist sources, among many others.

Accordingly, correlational work shows quest orientation to be correlated with more accepting attitudes toward unfamiliar (and potentially threatening) people and ideas (Batson & Stocks, 2004). Although quest has not yet been explored in a TMT context, other work suggests the apparently absent need for rigid, dogmatic structure may render questers particularly likely to seek existential meaning by exploring novel religious beliefs and rituals. Vess, Routledge, Landau, and Arndt (2009) found that when open-minded people (i.e., those low in personal need for structure) were reminded of death, they sought meaning in life by engaging in cultural exploration. Because quest orientation promotes openness to all sorts of cultural and spiritual ideas, those with different worldviews may not be viewed as threatening, and may even be perceived as offering valuable lessons.

Another step on the path to peace and open-mindedness is the establishment of programs encouraging *interfaith outreach and ecumenical fellowship*. In light of our acknowledgment earlier that intense, fundamentalist faith can lead to potentially hostile interactions and that open-minded religious approaches might be more peaceful, it could be useful to consider the popular mantra that people of all faiths are "God's children." Sherif et al.'s (1961) famous Robber's Cave study, in which simple competition between groups deteriorated into violent conflict with blazing speed, also demonstrated the capability of superordinate goals and cooperation between groups to restore peaceful group interaction. Building on this study, as well as the "contact-hypothesis," some suggest fostering a common

identity—like the common identity fostered by interfaith and ecumenical notions of “God’s children”—may help prevent violent intergroup conflict (Gaertner & Dovidio, 2000).

Although this possibility has not yet been studied in the context of religion, research by Motyl et al. (2008) is illustrative. American students were reminded either of death or a control topic, and then asked to relate to stories of common childhood experiences ostensibly written either by other Americans or by people from diverse areas of the world. Following these manipulations, the researchers assessed participants’ explicit prejudice against immigrants. When relating to American childhood experiences, mortality salience increased hostile prejudice against immigrants; however, when relating to those *same* childhood experiences as attributed to a foreign author, this negative effect was completely eliminated.

In this section, we have argued that although it is possible to live a nonreligious life and still manage one’s existential concerns, relying exclusively on secular modes of immortality may not be as effective or potent as the literal immortality promised by religion. For this reason, many rely on their religious beliefs as a fundamental guide to life, strictly adhering to its prescribed thoughts and actions and fervently protecting the integrity of the beliefs against any and all who dare violate them. However, we also noted research suggesting religious investment need not always lead to hostile defensive reactions and in some cases can be an acquisitive, open-minded, and enriching venture.

CONCLUSION

You have all the fears of mortals and all the desires of immortals.

Seneca, *On the Shortness of Life* (49 CE, p. 295)

The central point of this chapter has been that religion cannot be fully understood without considering its role in dealing with the awareness that life must ultimately end. The awareness of death increases the appeal of religious notions of eternal spiritual realms, including myths about divine creation and afterlife, spiritual intermediaries and supernatural agency. Once made aware of mortality, a series of neurophysiological, cognitive, and behavioral processes help implement religious strivings for eternal life. Thus, although variation in the way people use religion to seek literal immortality can alter the costly or beneficial personal and social implications, the consistent motivator behind a vast majority of religious phenomena can be traced to the troublesome awareness of mortality.

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SUGGESTED READING

- Becker, E. (1973). *The denial of death*. New York: Free Press.
- Berger, P., & Luckmann, T. (1967). *The social construction of reality*. New York: Anchor Books.
- Greenberg, J., Koole, S. L., & Pyszczynski, T. (2004). *Handbook of experimental existential psychology*. New York: Guilford Press.

REFERENCES

- Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *The International Journal for the Psychology of Religion*, 2, 113–133.
- Arndt, J., Allen, J.J.B., & Greenberg, J. (2001). Traces of terror: Subliminal death primes and facial electromyographic indices of affect. *Motivation and Emotion*, 25, 253–277.
- Bartholow, B. D., Dickter, C. L., & Sestir, M. A. (2006). Stereotype activation and control of race bias: Cognitive control of inhibition and its impairment by alcohol. *Journal of Personality and Social Psychology*, 90, 272–87.
- Batson, C. D., Schoenrade, P., & Ventis, L. W. (1993). *Religion and the individual: A social psychological perspective*. New York: Oxford University Press.
- Batson, C. D., & Stocks, E. L. (2004). "Religion: Its core psychological function." In J. Greenberg, S. L. Koole, & T. Pyszczynski (Eds.), *Handbook of experimental existential psychology*. New York: Guilford Press.
- Beck, R. (2008). Feeling queasy about the incarnation: Terror management theory, death, and the body of Jesus. *Journal of Psychology and Theology*, 36, 303–313.
- Becker, E. (1973). *The denial of death*. New York: Free Press.
- Becker, E. (1975). *Escape from evil*. New York: Free Press.
- Berger, P., & Luckmann, T. (1967). *The social construction of reality*. New York: Anchor Books.
- Blater, M. (1998). Why settle down? The mystery of communities. *Science*, 282, 1442–1445.
- Burkert, W. (1996). *Creation of the sacred: Tracks of biology in early religions*. Cambridge, MA: Harvard University Press.
- Coan, J. A., Allen, J.J.B., & Harmon-Jones, E. (2001). Voluntary facial expression and hemispheric asymmetry over the frontal cortex. *Psychophysiology*, 38, 912–925.

- Cohen, F., Sullivan, D., Solomon, S., Ogilvie, D. M., Greenberg, J., & Pyszczynski, T. (2009). *Finding everland: Flight fantasies and the desire to transcend mortality*. Unpublished manuscript.
- Coulter, A. (2006). Muslim bites dog. Retrieved April 20, 2008, from http://www.townhall.com/columnists/AnnCoulter/2006/02/15/muslim_bites_dog.
- Cox, C. R., Goldenberg, J. L., Pyszczynski, T., & Weise, D. (2007). Disgust, creatureliness and the accessibility of death-related thoughts. *European Journal of Social Psychology*, *37*, 494–507.
- Cox, C. R., Heflick, N., Goldenberg, J. L., & St. Arnaud, K. (2011). *Fleeing the body of Jesus: Religious beliefs following mortality salience, religious fundamentalism, and human-nature primes*. Unpublished manuscript. Texas Christian University.
- Curry, A. (2008). Gobekli Tepe: The world's first temple? *Smithsonian Magazine online* (Nov.). <http://www.smithsonianmag.com/history-archaeology/gobekli-tepe.html>.
- Deacon, T. (1997). *The symbolic species: The coevolution of language and human brain*. London: Penguin.
- Dechesne, M., Pyszczynski, T., Arndt, J., Ransom, S., Sheldon, K. M., van Knippenberg, A., & Janssen, J. (2003). Literal and symbolic immortality: The effect of evidence of literal immortality on self-esteem striving in response to mortality salience. *Journal of Personality and Social Psychology*, *84*, 722–737.
- Dickter, C. L., & Bartholow, B. D. (2010). Ingroup categorization and response conflict: Interactive effects of target race, flanker compatibility and infrequency on N2 amplitude. *Psychophysiology*, *47*, 596–601.
- Donald, M. (1991). *Origins of the modern mind: Three stages in the evolution of culture and cognition*. Cambridge, MA: Harvard University Press.
- Fischer, P., Greitmeyer, T., Kastenmuller, A., Jonas, E., & Frey, D. (2006). Coping with terrorism: The impact of increased salience of terrorism on mood and self-efficacy of intrinsically religious and nonreligious people. *Personality and Social Psychology Bulletin*, *32*, 365–377.
- Friedman, M., & Rholes, W. S. (2007). Successfully challenging fundamentalists beliefs results in increased death awareness. *Journal of Experimental Social Psychology*, *43*, 794–801.
- Friedman, M., & Rholes, W. S. (2008). Religious fundamentalism and terror management. *International Journal for the Psychology of Religion*, *18*, 36–52.
- Gaertner, S. L., & Dovidio, J. F. (2000). *Reducing intergroup bias: The common ingroup identity model*. New York: Psychology Press.
- Gandhi, M. K. (1948). *Gandhi's autobiography: The story of my experiments with truth (M. Desai, Trans.)*. Washington, DC: Public Affairs Press.
- Gehring, W. J., Goss, B., Coles, M.G.H., Meyer, D. E., & Donchin, E. (1993). A neural system for error detection and compensation. *Psychological Science*, *4*, 385–390.
- Goldenberg, J. L., Cox, C. R., Pyszczynski, T., Greenberg, J., & Solomon, S. (2002). Understanding human ambivalence about sex: The effects of stripping sex of meaning. *Journal of Sex Research*, *39*, 310–320.

- Goldenberg, J. L., & Hart, J. (2009). *Distancing from the body as a reaction to death reminders among spiritual people*. Unpublished manuscript. University of South Florida.
- Goldenberg, J. L., Pyszczynski, T., Greenberg, J., Solomon, S., Kluck, B., & Cornwall, R. (2001). I am not an animal: Mortality salience, disgust, and the denial of human creatureliness. *Journal of Experimental Psychology: General*, *130*, 427–435.
- Greenberg, J., Martens, A., Jonas, E., Eisenstadt, D., Pyszczynski, T., & Solomon, S. (2003). Psychological defense in anticipation of anxiety: Eliminating the potential for anxiety eliminates the effects of mortality salience on worldview defense. *Psychological Science*, *14*, 516–519.
- Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990). Evidence for terror management II: The effects of mortality salience on reactions to those who threaten or bolster the cultural worldview. *Journal of Personality and Social Psychology*, *58*, 308–318.
- Hayes, J., Schimel, J., & Williams, T. J. (2008). Fighting death with death: The buffering effects of learning that worldview violators have died. *Psychological Science*, *19*, 501–507.
- Hefliff, N. A., Goldenberg, J. L., Hart, J. J., & Kamp, S. M. (2011). Death awareness and body self dualism: The why and how of afterlife belief. Unpublished manuscript. University of South Florida.
- Henderson-King, D., Henderson-King, E., Bolea, B., Koches, K., & Kauffman, A. (2004). Seeking understanding or sending bombs: Beliefs as predictors of responses to terrorism. *Peace and Conflict: Journal of Peace Psychology*, *10*, 67–84.
- Henry, E. A., Bartholow, B. D., & Arndt, J. (2010). Death on the brain: Effects of mortality salience on the neural correlates of race bias. *Social Cognitive and Affective Neuroscience*, *5*, 77–87.
- Ipsos/Reuters (2011). Supreme being(s), the afterlife and evolution. Retrieved on April 25, 2011, <http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=5217>.
- Jaynes, J. (1976). *The origin of consciousness in the breakdown of the bicameral mind*. New York: Mariner Books.
- Jonas, E., & Fischer, P. (2006). Terror management and religion—Evidence that intrinsic religiousness mitigates worldview defense following mortality salience. *Journal of Personality and Social Psychology*, *91*, 553–567.
- Juergensmeyer, M. (2000). *Terror in the mind of god: The global rise of religious violence*. Berkeley: University of California Press.
- Kosloff, S., Cesario, J., & Martens, A. (2011). Resistance is futile: Mortality salience increases efforts to assimilate differing others into one's own worldview. Unpublished manuscript. East Lansing, MI.
- Kosloff, S., Greenberg, J., & Allen, J.J.B. (2011a). Mortality salience heightens neural indices of conflict monitoring and behavioral compensations during a self-esteem relevant task. Unpublished manuscript. East Lansing, MI.

- Kosloff, S., Greenberg, J., Martens, A., & Allen, J.J.B. (2011b). Mortality salience heightens neural and autonomic indices of withdrawal from symbolic threat. Unpublished manuscript. East Lansing, MI.
- Kosloff, S., Greenberg, J., Sullivan, D., & Weise, D. (2010). Of trophies and pillars: Exploring the terror management functions of short-term and long-term relationship partners. *Personality and Social Psychology Bulletin*, *36*, 1037–1051.
- Kristeva, J. (1987). *Tales of love* (Trans. L. S. Roudiez). New York: Columbia University Press.
- Lang, P. J. (1995). The emotion probe: Studies of motivation and attention. *American Psychologist*, *50*, 372–385.
- Langer, S. K. (1984). *Mind: An essay on human feeling*. London: Johns Hopkins Press.
- Leibniz, G. W. (1686/1991). *Discourse on metaphysics and other essays*. Indianapolis, IN: Hackett Publishing Company.
- Leeming, D. A., & Leeming, M. A. (1994). *Encyclopedia of creation myths*. Santa Barbara, CA: ABC-CLIO.
- McGregor, I., Nash, K. A., & Inzlicht, M. (2009). Threat, high self-esteem, and reactive approach motivation: Electroencephalographic evidence. *Journal of Experimental Social Psychology*, *45*, 1003–1007.
- Mithen, S. (1996). *Evolution of social behaviour patterns in primates and man*. New York: Oxford University Press.
- Motyl, M., Hart, J., Pyszczynski, T., Cox, C., Weise, D., Maxfield, M., & Siedel, A. (under review). Subtle priming of shared human experiences eliminates threat-induced implicit and explicit hostility toward Arabs and immigrants. Manuscript under review.
- Navarrete, D. C., & Fessler, D.M.T. (2005). Normative bias and adaptive challenges: A relational approach to coalitional psychology and a critique of terror management theory. *Evolutionary Psychology*, *3*, 297–325.
- Norenzayan, A., & Hansen, I. G. (2006). Belief in supernatural agents in the face of death. *Personality and Social Psychology Bulletin*, *32*, 174–187.
- Osarchuk, M., & Tatz, S. J. (1973). Effect of induced fear of death on belief in after-life. *Journal of Personality and Social Psychology*, *27*, 256–260.
- Pichon, I., Boccato, G., & Saroglou, V. (2007). Nonconscious influences of religion on prosociality: A priming study. *European Journal of Social Psychology*, *37*, 1032–1045.
- Pyszczynski, T., Abdollahi, A., Solomon, S., Greenberg, J., Cohen, F., & Weise, D. (2006). Mortality salience, martyrdom, and military might: The Great Satan versus the Axis of Evil. *Personality and Social Psychology Bulletin*, *32*, 525–537.
- Rank, O. (1936/1950). *Will therapy and truth and reality*. New York: Alfred A. Knopf.
- Rothschild, Z. K., Abdollahi, A., & Pyszczynski, T. (2009). Does peace have a prayer? The effect of mortality salience, compassionate values, and religious fundamentalism on hostility toward out-groups. *Journal of Experimental Social Psychology*, *45*, 816–827.

- Routledge, C., & Arndt, J. (2007). Self-sacrifice as self-defence: Mortality salience increases efforts to affirm a symbolic immortal self at the expense of the physical self. *European Journal of Social Psychology*, 38, 531–541.
- Russel, B. (1991). "Has religion made useful contributions to civilization?" [originally published in 1930] In P. Edwards (Ed.), *Why I am not a Christian and other essays* (pp. 24–47). New York: Simon & Schuster.
- Schimmel, J., Hayes, J., Williams, T. J., & Jahrig, J. (2007). Is death really the worm at the core? Converging evidence that worldview threat increases death-thought accessibility. *Journal of Personality and Social Psychology*, 92, 789–803.
- Schoenrade, P. A. (1989). When I die. . . . Belief in afterlife as a response to mortality. *Personality and Social Psychology Bulletin*, 15, 91–100.
- Seneca. (49/1951). "On the shortness of life." In *Moral essays*, Vol. 2, (J. W. Basore, trans.). Cambridge, MA: Harvard University Press.
- Shariff, A. F., & Norenzayan, A. (2007). God is watching you: Priming God concepts increases prosocial behavior in an anonymous economic game. *Psychological Science*, 18, 803–809.
- Sherif, M., Harvey, O. J., White, B. J., Hood, W. R., & Sherif, C. W. (1961). *Intergroup conflict and cooperation: The Robber's Cave experiment*. Norman: University of Oklahoma Book Exchange.
- Solomon, S., Greenberg, J., & Pyszczynski, T. (in press). *The worm at the core*. New York: Random House.
- Sosis, R. (2009). The adaptationist-byproduct debate on the evolution of religion: Five misunderstandings of the adaptationist program. *Journal of Cognition and Culture*, 9, 315–332.
- Spengler, O. (1926). *The decline of the west: Form and actuality*. Knopf: New York.
- Taubman Ben-Ari, O., Florian, V., & Mikulincer, M. (1999). The impact of mortality salience on reckless driving—A test of terror management mechanisms. *Journal of Personality and Social Psychology*, 76, 35–45.
- Toft, M. (2007). Getting religion? *International Security*, 31, 97–131.
- Tooby, J., & Cosmides, L. (1992). "The psychological foundations of culture." In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture*. New York: Oxford University Press.
- Tracey, J. L., Hart, J., & Martens, J. P. (in press). Death and science: The existential underpinnings of belief in intelligent design and discomfort with evolution. *PLoS ONE*.
- Vail III, K. E., Arndt, J., & Abdollahi, A. (2011). *The effects of religious belief and mortality salience on faith in worldview-consistent supernatural agents*. Unpublished manuscript. University of Missouri-Columbia.
- Vess, M., Arndt, J., & Cox, C. R. (2011). *Faith and nature: The effect of death-relevant cognitions on the relationship between religious fundamentalism and connectedness to nature*. Unpublished manuscript. Ohio University.

- Vess, M., Arndt, J., Cox, C. R., Routledge, C., & Goldenberg, J. L. (2009). The terror management of medical decisions: The effect of mortality salience and religious fundamentalism on support for faith-based medical intervention. *Journal of Personality and Social Psychology, 97*, 334–350.
- Vess, M., Routledge, C., Landau, M. J., & Arndt, J. (2009). The dynamics of death and meaning: The effects of death-relevant cognitions and personal need for structure on perceptions of meaning in life. *Journal of Personality and Social Psychology, 97*, 728–744.
- Wilford, J. (2001). In dawn of society, dance was center stage. New York Times online (Feb. 27). <http://www.nytimes.com/2001/02/27/science/in-dawn-of-society-dance-was-center-stage.html>.
- Yalom, I. D. (2008). *Staring at the sun: Overcoming the terror of death*. San Francisco: Jossey-Bass.