

in an accident, both textbook examples of the conditions under which individuals make supernatural attributions, be offset by facial-recognition and body-movement recognition schemata? Rather, these are event types that bear no direct perceptual features capable of breaking the “hair trigger” of the authors’ proposed sensory driven hyperactive agency detector. A&N thus overlook *the* most critical “c” in their account of religion – *communication*.

Specifically, we hypothesize an evolved psychological mechanism that may have motivated ancestral humans to believe that certain categories of natural events were *about* some abstract intentional agency’s desire to purposefully share information with them. This does not involve simply detecting agency in the environment, but more important, it has to do with unraveling a supernatural agent’s intentions or reasons for causing events. More often than not, the interpretation of natural events as “messages” or “signs” engenders a change in the epistemic content of believers such that these new beliefs are responsible for behavioral change. If such behavioral change tended over long periods of time to increase individual’s genetic fitness, then the psychological processes enabling humans to interpret certain natural events, under certain conditions, as symbolic of supernatural agents’ intentions may have been subjected to selective pressures (see Bering in press; Bering & Johnson, in press).

In a recent series of experiments, one of us (Bering) has begun to explore the developmental emergence of the capacity to find *meaning* in natural events in response to supernatural agent priming. Supernatural agent concepts may only be endorsed if there is empirical evidence of their *behaviors* in the natural environment. The ability to translate this information into communicative messages is likely dependent on advances in cognitive development. In one experiment, 3- to 7-year-olds were asked to play a guessing game by placing their hand on one of two boxes that contained a hidden ball (Bering 2003). After an initial training trial, the children were then told a story about an invisible agent (“Princess Alice”) in the room with them who would “tell them, somehow, when they pick the wrong box.” Following this, on two of four counter-balanced trials, a random event was simulated in the room (i.e., a light flashing on and off, a picture falling) at the moment a child’s hand first made contact with a box. Only the 7-year-olds reliably moved their hands to the opposite box after these “random” events and gave verbal judgments indicating their belief that Princess Alice was trying to share with them information about the hidden object.

Findings from an ongoing study, however, suggest that even preschoolers interpret seemingly random events as admonitions when they are caught in an act of cheating (Bering 2003). When left alone in a room with a so-called forbidden box that they are told contains something very special, many children will attempt to open the box. However, when told that Princess Alice is in the room with them, and when a light flashes on and off at the moment of their indiscretion, even 3-year-olds will inhibit their cheating response and cease looking inside. Supernatural agent concepts may have led to adaptive decision making under conditions where the self underestimated the likelihood of “real” social detection by other group members. Although clearly much work remains to be done in this area, we feel it is empirically premature to claim that religious beliefs served no independent evolutionary function.

Future research in cognitive science and religion

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Abstract: From a religious studies perspective, Atran & Norenzayan (A&N) succeed in arguing for the influence of evolved cognitive functions in religious phenomena. To develop their argument further, four suggestions are offered: (1) Look beyond the ordinary to the extraordinary; (2) culture matters more than ever; (3) theists need not despair, atheists ought not celebrate; and (4) dreaming is a primal wellspring of religion.

Atran & Norenzayan’s (A&N’s) application of cognitive science to the study of religion is commendable for its measured tone and thought-provoking claims. Without pushing their argument farther than the evidence allows, A&N make a compelling case for the involvement of basic cognitive operations in human religiosity. As a religious studies scholar who is trying to persuade my colleagues to pay greater attention to the findings of contemporary brain–mind science, I welcome such efforts. With an eye toward the future expansion of this area of research, I offer the following four prospective suggestions.

Look beyond the ordinary to the extraordinary. The research program of A&N concentrates on identifying the psychological roots of religious behavior in the ordinary operation of our evolved cognitive capacities (e.g., folkpsychology, folkbiology, folkmechanics). This approach echoes that of Sigmund Freud in *Civilization and its Discontents* when he uses psychoanalysis to investigate “the common man and his religion – the only religion which ought to bear that name” (Freud 1930/1961). Aiming at the average and the common, Freud dismisses the possibility that studying the idiosyncratic experiences of the “uncommon man” (or woman) might reveal new dimensions of religious phenomenology, with unfortunate results for his theory of religion. To avoid a similar fate I suggest Atran, Norenzayan, and other like-minded researchers consider expanding their focus and examining more carefully the rare, unusual, and extraordinary dimensions of religious experience – *not* as the best or only way to study religion (as William James proposes in *The Varieties of Religious Experience*; James 1958), but rather as a necessary complement to current research on so-called ordinary religion.

Culture matters more than ever. Although A&N’s primary goal is to abstract the “pancultural foundations of religion,” they acknowledge that *actual* human cultures work to stimulate and manipulate our species’ innate psychological dispositions in a huge variety of different ways. Nothing more is said about this in the article, but I hope the cognitive science of religion will in the future move more boldly into the study of cultural variability. More than anything (and as an extension of my first suggestion), I encourage researchers to consider not only the lowest common denominators found in all cultures everywhere, but also to investigate the ways in which each particular culture has developed its own creative synthesis and novel elaboration of those evolved cognitive capacities. Identifying the psychological building blocks of religion and culture is a fine achievement. An even greater achievement would be shedding new light on what humans have created with those building blocks.

Theists need not despair, atheists ought not celebrate. A&N’s article is commendably free of either pro- or anti-religious polemics. Still, their work is a contribution to an ongoing and often rancorous social conversation about the relationship between religion and science, and researchers in this area can benefit from a greater historical familiarity with this conversation (which reaches back at least as far as Darwin, who agonized over the religious implications of his evolutionary theory). To my mind, James’s approach in *The Varieties* remains the most reasonable one to adopt. He says that while scientific psychology can tell us

what is happening on the “hither” side of religious experience (i.e., its psychophysiological rootedness), it can tell us nothing of the “farther” side of such experiences (i.e., their ultimate connection to transcendent powers). Advances in psychological knowledge do not, in James's view, refute religion because most (though not all) religious traditions already recognize that the divine enters our lives *through* our created physical nature.

Dreaming is a primal wellspring of religion. No mention is made in A&N's article of the role of dreaming in religion. However, a sizable literature has developed in recent years regarding the central involvement of dreaming in religious belief, practice, and experience (Bulkeley 1994, 1995, 1999, 2001; Harris 1994; Irwin 1994; Jedrej & Shaw 1992; Kelsey 1991; Mageo 2003; Miller 1994; O'Flaherty 1984; Stephen 1995; Tedlock 1987; Young 1999). At the same time, another sizable literature has arisen on the scientific study of dreaming (Domhoff 1996, 2003; Flanagan 2000; Foulkes 1999; Hartmann 1998; Hobson 1988, 1999; Jouvett 1999; Kahan 2001; Solms 1997), and recently a special issue of *BBS* was devoted to sleep and dreaming (*BBS* 2000, Vol. 23, No. 6). For researchers interested in further developing the insights of A&N, combining these two bodies of scholarship offers intriguing potentials. E. O. Tylor may or may not have been right that dreams are the origin of religion – such propositions are impossible to prove – but the historical and cross-cultural evidence is very clear that dreams are at least *reinforcers* of religious dispositions, providing experiential verification of ideas about the soul, supernatural beings, alternate dimensions of reality, and life after death. Abundant evidence also shows that dreams are frequently the proximate cause of striking religious innovations, prompting the development of new rituals, new conceptions of the divine, and new forms of social relationship. This primal connection between religion and dreaming may now, thanks to the resources of cognitive science, be explored in greater depth than ever before.

Different religions, different emotions

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Abstract: Atran & Norenzayan (A&N) correctly claim that religion reduces emotions related to existential concerns. Our response adds to their argument by focusing on religious differences in the importance of emotion, and on other emotions that may be involved in religion. We believe that the important differences among religions make it difficult to have one theory to account for all religions.

Atran & Norenzayan (A&N) rightly emphasize the human proclivity to assign agency to events, including supernatural agency to otherwise unexplainable events, and we wholeheartedly agree. However, we propose that religions vary in the extent to which the reduction of existential concerns is a salient part of religious dogma, and the ways in which they promote meaning. Religions also differ in the emotions that are involved. Such considerations complement the more pan-religious analysis of A&N.

Religion, meaning, and awe. There is good evidence that humans have difficulty understanding random processes as part of causative accounts. The assignment of agency is perhaps part of a bigger system, a narrative or meaning-making system, that continually ascribes meaning to different life events. We often ask, *Why me?* Agency provides meaning for myriad events, from cloud movements to sudden misfortunes (e.g., the action of sorcerers).

Meaning making, if not unique to humans, surely reaches its heights in this species. It is a natural setup for religion, especially for a species inclined to agentic accounts. Meaning making is emo-

tionally satisfying, and it is probably a general feature of religion. The prevalence and effectiveness of religious coping (Pargament 1997) attests to the power of religion to help make sense of negative life events.

Along with reducing negative emotions related to existential concerns, attributions of meaning might also promote other emotions, such as awe. Awe is intimately involved in religious experiences, evident in the conversion stories related by James (1902/1997), to the story of Arjuna in the Hindu sacred text, the *Bhagavad Gita*. Could the experience of awe in a religious context promote fitness? Keltner and Haidt (2003) proposed that awe prototypically involves experiencing vastness and cognitive accommodation. Vastness often involves realizing patterns of causation, design, and beneficence that transcend the human scale, and such cognitive broadening could have fitness implications.

Some emotions, including awe, could take various forms in the context of religion, and might even detract from fitness. The Hebrew Bible, as well as the Koran, stresses the importance of both loving and fearing God. The Hebrew term for awe (*yirah*) involves a component of fear, as well. Religion can be associated with increased fear of God or fear of transgressing religious requirements (Abramowitz et al. 2002). Such fears can impact health. In one study of medically ill older patients, those patients who exhibited what might be termed *religious struggle* had a significantly greater likelihood of dying over the two-year duration of the prospective study. Religious struggle included, for example, patients wondering whether God had abandoned them or was punishing them (Pargament et al. 2001).

Other religions, other emotions. Although we agree that emotion is an important element of religion, it is interesting to us that emotion plays such a key role in A&N's discussion. Religion and emotion have not always been seen as inexorably linked. With the Renaissance came a vastly increased scientific understanding of the material world. Perhaps faced with a losing battle in understanding the physical universe, theologians began to confine their purview into the realm of subjective experiences. Emotional experiences became the primary criterion for the evaluation of the truth of religion. Certain religions, such as American Protestantism, have been powerfully affected by the turn to emotions (Cohen & Rozin 2001; Cohen et al. 2003; 2005; Lindbeck 1984; MacIntyre 1988; Milbank 1993; Morris 1996; Taylor 1989).

However, some religions have handed down social and ritual sensibilities since long before the Renaissance. Although emotions are also importantly involved in other religions such as Judaism and Hinduism, they may not have the same central role that they do in Protestantism. Rather, social connections and ethnic ties may be seen as of key importance, and different emotions may be involved (Cohen et al. 2005; Morris 1996; 1997). The social elements of such religions are relevant to an evolutionary analysis. Other theorists have proposed that religion is adaptive because of its promotion of social cohesion or conformity (e.g., Wilson 2002).

The social and/or emotional focus of religions suggests that agency itself has many forms, and attributions for emotional states vary (e.g., Liu et al. 1992; Smith & Ellsworth 1985). There are the most common agents in social explanation – other individuals, groups, the self. There are other agents, as well – natural forces like the weather and disease, and broad social and economic forces. Cultures prioritize different kinds of agents in their everyday social explanation (Miller 1984; Morris & Peng 1994). And this is evident in the form agents take in specific religions. For example, for Protestants, religious and moral behavior is expected to follow from altruistic and emotional motivations, such as keen awareness of God (Allport & Ross 1967), compassion, or sympathy. However, for members of certain other religions (such as Judaism, Catholicism, and Hinduism), social and duty-based motivations may be more acceptable (Cohen et al. 2005; Miller & Bersoff 1992, 1994; Miller & Luthar 1989; Miller et al. 1990).

In the same vein, the reduction of existential concerns may be more central, for example, in Christianity and Islam than it is in Hinduism, Buddhism, and Judaism. In the context of Judaism, for