

over, the one horror film routinely mentioned as perhaps the most frightening movie of all time (*The Exorcist*) depicts a religious agent summoning supernatural powers to aid a young girl who is transformed into a monster via demonic possession. In this light, it is not inconceivable that the evolved inferential machinery underlying beliefs in supernatural agents could give rise to a fertile, culturally constructed imaginary world populated by predatory monsters and supernatural religious instruments that function to protect us from these dangerous agents. Although this hypothesized link between religion and predators in popular horror movies (suggested by A&N's model) is based largely on anecdotal evidence, these claims easily lend themselves to more rigorous scientific investigation such as content analysis of popular media (see Ketelaar 2004; Weaver & Tamoborini 1996).

## The evolutionary social psychology of religious beliefs

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**Abstract:** Atran & Norenzayan (A&N) are correct that religion is an evolutionary by-product, not an adaptation, but they do not go far enough. Once supernatural beliefs are enabled by processes they describe, numerous social-cognitive mechanisms related to attachment, social exchange, coalitional psychology, status and dominance, and kinship are crucial for explaining the specific forms religion takes and individual and cultural differences therein.

It has long been speculated – sometimes explicitly but more often implicitly – that humans possess some kind of religious instinct that explains observations such as the apparent universality across human societies, the genetic heritability of religiousness, neurological evidence of a “God module” in the brain, and ethological observations of proto-religious behavior in other species. As I have argued elsewhere (Kirkpatrick 1999b), none of these observations constitutes convincing evidence for a religion as an adaptation, and moreover, such arguments invariably (1) err in identifying the proposed mechanism's adaptive function (e.g., by falling into traps such as naive group selectionism, confusing psychological benefits with reproductive success, or failing to acknowledge adaptive costs); (2) fail to specify the mechanism's design (e.g., by clearly describing what exactly it does, the conditions that activate or deactivate it, etc.); and (3) fail to demonstrate that the mechanism meets the defining criteria of an adaptation, such as economy, efficiency, reliability, and precision.

The central insight that religion is not an adaptation, but rather a reliably produced collection of *by-products* of human evolved psychology, neatly explains those observations that render an adaptationist hypothesis tempting while avoiding the pitfalls. Religious beliefs and behaviors are produced and shaped by a host of evolved psychological mechanisms and systems that were designed for other (mundane) purposes. This insight changes the form of evolutionary explanation from one of identifying design and function to identifying which psychological mechanisms are involved, and explaining how and why these reliably produce the by-product (Buss et al. 1998).

Building on work by Boyer (1994; 2001), Sperber (1996), Guthrie (1993), and others, Atran & Norenzayan (A&N) identify one such crucial set of psychological mechanisms as those designed for understanding and predicting the natural world – those related to so-called folk (or *naive*, or *commonsense*) physics, biology, and psychology – which often misattribute agency and human characteristics to inanimate objects or events and thereby give rise to psychological *animism* and *anthropomorphism*. This set of evolved mechanisms represents the first crucial step in the religion-as-by-product argument and, as A&N demonstrate, explains

why beliefs about supernatural forces and gods are so widespread. However, this is only the first step toward the much larger theory required to explain religion.

I have argued (Kirkpatrick 1999b; 2005) that once beliefs about supernatural agents are enabled by the processes described by A&N and others, the door is opened for a plethora of evolved social-cognitive mechanisms to whirl into action, producing and shaping specific beliefs about these supernatural agents and our relationships with them. For example, the *attachment system* appears central to the psychology of many belief systems, wherein God or other divine figures (e.g., Mary or Jesus in various forms of Christianity) function as attachment figures. In other cases, gods are perceived as *social-exchange* partners who, per reciprocal-altruism principles, provide various benefits to people in exchange for the performance of requisite sacrifices or rituals or observance of specified codes of behavior. In still other cases, gods are processed psychologically by mechanisms designed to negotiate *status or dominance hierarchies*, with high-status or dominant gods demanding submission and surrender from human subordinates (and sometimes each other). The operation of psychological systems related to *kinship* and *kin-based altruism* is evident in such beliefs as God-as-Father and the widespread practice of ancestor worship. Mechanisms of *coalitional psychology* construe gods as members or leaders of local groups or tribes in competition with other groups or tribes (and their gods).

In addition to giving detailed form to beliefs about supernatural agents, these same psychological systems underlie other aspects of religious thinking, including the nature of interpersonal (human) relations. For example, human religious leaders, like gods, may be perceived alternatively as attachment figures, high-status individuals, or coalition leaders; fellow worshippers may be perceived as kin (e.g., “we are all children of God”) or social-exchange partners. Religion-based morality variously reflects the role of social-exchange thinking (“an eye for an eye”), kinship (fellow worshippers as “brothers and sisters”), and coalitional psychology (“love thy neighbor” applies only to the in-group).

Moving to this social-psychological level of analysis is also essential for addressing the crucial issues, explicitly skirted by A&N, of individual and cross-cultural differences in religion. Such questions can be tackled at (at least) two levels of analysis within this framework. First, religious differences reflect varying combinations of the particular social-cognitive mechanisms that underlie them. Certain forms of Christianity, for example, seem particularly attachment-based, whereas other belief systems more strongly reflect coalitional psychology or social-exchange thinking. Within a given belief system, individual differences can emerge as a consequence of differential activation of these various mechanisms. Second, each of these psychological systems is associated with dimensions of individual differences within its particular domain. For example, the attachment system reliably gives rise to well-documented individual differences in attachment patterns or styles – *secure*, *insecure-avoidant*, and the like – which empirical research shows to be predictive of individual differences in religious conversion and other measures of religiosity (see Kirkpatrick 1999a; 2005, for reviews). The extraordinary success of religion around the world may owe largely to the fact that, because it draws upon so many different psychological systems and different forms or dimensions of those mechanisms, it offers “something for everybody.”

In recognizing that religiousness does not itself have an adaptive function, but rather reflects a motley collection of evolutionary by-products, we now have a tiger by the tail. A&N have described some crucial components of that tiger – perhaps the powerful rear legs (i.e., the role of folk-physics, etc.) and a couple of other assorted parts (e.g., related to religious commitment and ritual). In my own work I have tried to sketch the outline of what I believe to be the main body of the animal. Much remains to be done, but progress should be swift once we replace the misguided religion-as-adaptation notion with a comprehensive evolutionary psychology of religion-as-by-product.