

I have no problem with Atran & Norenzayan's (A&N's) fundamental proposition that religion is a by-product of interacting, evolved psychological adaptations. I also agree that altruistic behavior in non-kin contexts is a ubiquitous characteristic of religion and central to its understanding. However, A&N's argument that exploitation of psychological adaptations related to indirect reciprocity and costly signals of commitment (hereafter *commitment theory*) helps explain non-kin altruism in religious contexts is, in my view, unpersuasive and problematic for several reasons.

First, the manner in which A&N characterize the universality of sacrificial behavior (as "hard-to-fake expressions of material sacrifice"; sect. 1.2, para. 3) prematurely steers interpretation in the direction of commitment theory. Religious institutions do often make demands of goods, property, energy, time, reproduction, or even life of their members in non-kin contexts. This is easily supported by a look at Christian, Buddhist, and Hindu monastic orders. However, establishing that the demands these institutions make on members and recruits – demands that include labor, forfeiture of wealth, and lifelong vows of celibacy – are hard-to-fake expressions of commitment is much more difficult. It is easy to imagine sacrifice occurring in private or anonymous contexts where signaling motivation, as well as institutional manipulation, is unlikely to be relevant. One example is the early Christian semi-anchorite, who lived alone yet sacrificed resources and labor (Timko 1990, pp. 110–11). More generally, consider the myriad individuals who anonymously fill congregation plates and church coffers every day.

Further, A&N do not discuss several distinctions that are potentially critical to evaluating the relevance of commitment theory to religious behavior. The most important is that between a religious specialist, such as a monk or nun, and a lay believer. Is commitment theory equally relevant to these fundamentally different roles? Probably not. In many cases believers are not sacrificing at all, but simply (and rationally) exchanging goods or labor for desired services. In some cases these are relatively mundane services, such as children's schooling or officiating at marriages and funerals. In others, they are what might be called future considerations, like blessings or salvation. But they are viewed as essential all the same; and although the costs may sometimes be severe, as in central Thailand, where a son's ordination can keep a family in debt for many years (Sharp & Hanks 1978), the benefits are perceived to far outweigh them: in both Hinduism and Buddhism, merit earned in this manner promises salvation for not only individual contributors but also generations of their ancestors and descendants (Oman 1973). Additionally, because in many cases believer and specialist relations occur in kin contexts, inclusive fitness theory may well directly apply. Researchers in many settings, including in Tibet (Durham 1991), Ireland (Messenger 1993), and medieval Europe (Hager 1992), have established the long-term benefits to families that place or cloister members in religious institutions. There is more to the story of believer sacrifice than this, of course – Barrett et al. (2001, vol. 1, p. 5) estimate that 70 million Christians alone have been killed because of their religious beliefs – but to call this typically unwilling martyrdom a signal of commitment is also problematic.

Religious specialists, on the other hand, typically make much greater and consistent sacrifices of time, energy, material resources, even reproduction and life, for the benefit of the institutions to which they belong. (Although there are also material, status, and fitness benefits associated with their religious affiliation, these tend to accrue primarily to the highest-ranking members, who are often political appointees from outside the institutions; see, e.g., Betzig 1995.) It may be that A&N have specialists in mind when they say that religion "passionately rouses hearts and minds to break out of this viciously rational cycle of self-interest" (sect. 6, para. 8). Commitment theory seems more relevant here, but only to a point. Where the sacrifice is terminal, involving the loss of reproduction or life, the cost seems too high: There will be no subsequent opportunity for signalers to gain the fitness benefits upon which commitment theory is predicated. Other models

more easily overcome this objection. More plausible than the exploitation of adaptive mechanisms associated with indirect reciprocity is that of those associated with inclusive fitness, as only kin contexts should engender such dramatic sacrifice. One possibility, suggested by the work of Gary Johnson (1986) and explored in the context of institutionalized celibacy (Qirko 2002; 2004), is that manipulation of kin-recognition cues via institutional practices can reinforce altruistic behavior in non-kin contexts. These practices include the separation of young recruits from kin, the institutional replication of kin roles and terms, and the promotion of phenotypic similarity via uniforms and the like. They are consistently present in religious, military, terrorist, and other organizations that demand terminal altruism from members. While A&N do make mention of fictive kinship, they do not discuss specific adaptive mechanisms that might be involved in kin (mis)identification.

Finally, A&N interchange the terms cooperation and sacrifice in their discussion of altruism, sometimes in the same sentence. The relationship between these two concepts is, at best, complicated (e.g., Rachlin 2002 and commentaries), so that conflating them risks overlooking important theoretical implications. To whatever extent cooperation entails individual gain (e.g., Tuomela 2000, pp. 17–18), it fundamentally differs from some of the previously mentioned terminal categories of sacrificial behavior found in non-kin, religious contexts, and probably does not require commitment or any other special theory as an explanation.

While there is little doubt that religious behavior involves a strong component of non-kin altruism, or that this must be adequately explained in any robust Darwinian interpretation of religious behavior, it is premature to focus on commitment theory. A&N have made a good start at addressing this problem, but there is a need for more empirical testing of alternative models.

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Religion's evolutionary landscape needs pruning with Ockham's razor

William A. Rottschaefer

Department of Philosophy, Lewis and Clark College, Portland, OR 97219.
 rott@clark.edu <http://www.lclark.edu/%7Eroths/>

Abstract: Atran & Norenzayan (A&N) have not adequately supported the epistemic component of their proposal, namely, that God does not exist. A weaker, more probable hypothesis, not requiring that component – that the benefits of religious belief outweigh those of disbelief, even though we do not know whether or not God exists – is available. I counsel them to use Ockham's razor, eliminate their negative epistemic thesis, and accept the weaker hypothesis.

Why do people continue to believe in God, even though God does not exist? Atran & Norenzayan (A&N) suggest that religion is a by-product of our evolutionarily based emotional, cognitive, and social capacities. Believing in and committing oneself to a supernatural being, even though it does not exist, reduces existential anxiety and promotes social solidarity. Their proposal involves three key elements. First, they offer an unsupported, speculative cost/benefit estimate: The advantages accruing to being religious, despite the falsity of religious belief, outweigh those of being non-religious though possessing true belief. Second, they support the cognitive component of their explanation by experimental findings concerning the ease of learning and remembering such beliefs and their role in alleviating existential anxiety. Third, they argue for their hypothesis that religious beliefs lack epistemic merit. The cognitive component of their proposal – along with their suggestion about the role of ritual in promoting social solidarity – is independent of the cost/benefit component and the epistemic

component. The experimental results stand whether or not the cost/benefit claim or the epistemic claims are correct.

An alternative, weaker but more probable, cost/benefit claim is that religious belief is more worthwhile than unbelief, even though we do not know whether or not God exists. This alternative requires only empirically based assumptions. Since, as I shall maintain, the authors' arguments for the epistemic component are quite problematic, I suggest that they use Ockham's razor to eliminate that component and replace it with the weaker alternative.

According to A&N, religious beliefs concern supernatural beings, immaterial personal agents active in our material world. Maintaining the universality of this version of the transcendent, they brush aside the concern that this interpretation of the transcendent fails to do justice to major religious traditions. Major portions of Hinduism and Buddhism, as well as the mystical branches of all the major religious traditions, either have a nonpersonal conception of the divine or do not distinguish, as do the authors, between the transcendent and finite self. A&N compound this neglect by failing to examine mysticism as a source and justification of religious belief. In addition, the authors lump together without justification the beliefs of all supernaturalistic religious traditions, from primitive to culturally advanced, and make no distinction between folk and disciplined practices of the epistemic assessment of religious beliefs.

Set aside these inadequate characterizations of the *explanandum*. On the authors' view, beliefs about the supernatural have multiple epistemic faults rendering them unjustified and false. They lack truth conditions, are contradictory, cannot be logically or empirically validated, are inconsistent with factual knowledge, and violate the categories of our evolutionarily based cognitive capacities concerning folkmechanics, biology, and psychology.

But these critiques conflict with each other. Expressions that lack truth conditions are incapable of truth or falsity and are cognitively meaningless. As such they are not candidates for A&N's *cognitive* explanatory hypothesis. Nor can they be either contradictory or empirically false, since such expressions can be so only if they have truth conditions that they fail to satisfy.

Accordingly, it seems best to interpret A&N's claims that religious beliefs lack truth conditions, to mean that even though religious beliefs possess truth conditions, they fail to satisfy them. However, the authors suggest two conflicting ways in which cognitively meaningful supernatural beliefs are false; that is, they cannot be logically or empirically verified or falsified. If, as the authors maintain, beliefs about the supernatural are contradictory, then they are logically false and logically falsifiable. However, if religious beliefs are logically false, then they are not subject to empirical verification or falsification.

However, A&N's references to supernaturalistic beliefs as "inconsistent with fact-based knowledge" and "minimally" violating claims formulated in terms of our evolutionarily acquired cognitive capacities, suggest that in their view such claims are empirical and empirically testable. But, if that is so, then such claims can be empirically true or false. And if false, as A&N claim, they are so empirically.

A&N's major argument for the empirical falsity of religious claims is that they violate or minimally exceed the limits of claims formulated in terms of folk mechanical, biological, and psychological categories. They contrast legitimate scientific and illegitimate religious metaphorical extensions of the categories of our folk mechanisms, and claim that in the sciences there is an attempt to get rid of the metaphor and to assimilate the claims to factual and commonsense beliefs. But Newtonian mechanics demonstrates that only accelerated bodies require a force, whereas Aristotelian folk mechanics require a cause for all local motion, accelerated or not. Folkbiology requires that adaptations be designed, but evolutionary biology does not. Arguably, cognitive psychology and cognitive neuroscience are beginning to make do without folkpsychology. Quantum mechanics, relativity theory, electrodynamics, and molecular biology, to name but a few well-grounded scientific theories, depart even further from our evolutionarily

based cognitive capacities. A&N owe us some principled reason why departure from common sense is fatal to religious, but not scientific, claims. Moreover, philosophers of science have shown that the import of theoretical terms cannot be reduced to observational meanings without the loss of significant meaning. The issue for scientists is not to show how metaphorically elaborated theories, for instance, the planetary orbit model of the atom, can be understood in literal (commonsense) terms. Rather, it is to reveal how such theories have, or fail to have, empirical connections with recordings of instruments, themselves built on the basis of theories. If supernaturalistic claims are to be shown to be unjustified empirically because they fail to meet the epistemic standards of the sciences, then the authors need to show us where and why this happens.

A&N have not adequately supported the epistemic component of their proposal. A weaker hypothesis is available to them which does not require their negative assessment of the epistemic status of supernaturalistic beliefs. I counsel them to use Ockham's razor and eliminate it. Both alternatives, however, require that the authors support their cost/benefit estimates about religious belief.

Cognition and communication in culture's evolutionary landscape

Mark Schaller

*Department of Psychology, University of British Columbia, Vancouver, British Columbia, V6T 1Z4, Canada. schaller@psych.ubc.ca
http://www.psych.ubc.ca/~schaller/schaller.htm*

Abstract: Atran & Norenzayan's (A&N's) analysis fits with other perspectives on evoked culture: Cultural beliefs might emerge simply from the fact that people share a common cognitive architecture. But no perspective on culture can be complete without incorporating the unstoppable role of communication. The evolutionary landscape of culture will be most completely mapped by theories that describe specifically how communication translates evolved cognitive canals into cultural beliefs.

There are few systems of belief and behavior so prototypically *cultural* as those that define a religion. Just as religion may be a predictable by-product of a canalizing evolutionary landscape, many other features of human cultures can also be best viewed as accidental by-products of specific psychological dispositions that emerged for very different reasons altogether. As others (e.g., Tooby & Cosmides 1992) have suggested, in order to crack the complicated code we call culture, we would be wise to first figure out the specific cognitive canals carved by our evolutionary past.

Atran & Norenzayan (A&N) apply this approach cleverly; the useful upshot is a penetrating perspective on several paradigmatic elements of religion. Others may take a broader view of religion and wonder whether an evolutionary canalization approach can also explain the kinds of moral injunctions that show up in, say, the Ten Commandments. It can. Krebs and Janicki (2004) describe how specific evolutionary pressures inclined the human mind toward specific kinds of moral norms. These norms may be codified in somewhat different ways in different religious systems, but the norms themselves appear to be universal. More generally, even when moral thinking appears to appeal to specific religious values, it may actually be a by-product of automatically activated emotional responses – such as disgust – that evolved for reasons entirely independent of their cultural consequences (Haidt 2001).

These and other examples suggest that one of the defining features of any culture – its sharedness across a population – can emerge simply from the fact that people share a common cognitive architecture. Widespread cultural beliefs can be evoked by cognition, even in the absence of persuasion, socialization, or other acts of interpersonal information transmission (Tooby & Cosmides 1992). This insight is important, and it surely appeals to our very human preference for parsimony.