

THE EVOLUTION OF RELIGION: MODERN ANTHROPOLOGICAL THEORY

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Introduction

In recent years evolutionary psychology and scientific cultural anthropology have been incorporating neo-Darwinist models of human behavior into their thinking. Nowhere has this been more interesting than in the field of religion. Prior to this point in intellectual history, the anthropological study of religion was rather disorganized in its presentation and testing of evolutionary models of religious behavior. It often focused on what were called “origins,” a hypothetical primeval state that preceded modern forms of culture. Later it relied somewhat on the sociology of Weber (1963) and Durkheim (1915) to generate ideas and often referred back to the ideas of Tylor (1874), who seemed just as up-to-date as anyone, although he was 19th century anthropologist.

The 19th century ideas of the evolution of religious behavior and its structure were more about the evolution of a cultural form rather than about a behavior driven by the underlying capacities of the evolving human brain. Religion to anthropologists was conceived of as a set of myths and rituals, most of which were completely alien to the European mind and, therefore were put low on the line of cultural evolution leading from savagery to civilization.¹ Religion was conceived of as a thing by itself, and no one thought of it as a behavioral capacity that had previously come into existence because of some success it had for survival and reproduction. The big issue addressed by David Bidney in 1950 in an article in the *American Anthropologist* was whether or not the myths of modern natives represented “primitive” thinking or were just imaginative thinking with different data than the data available to modern scientists. He concluded that mythology was universal and differed only in the spread of its domain in preliterate and modern cultures. In the preliterate cultures myth enjoyed a wider domain of explanation; however Bidney did not mention the neurophysiology of the brain. Finally, the psychiatrist Eugene d'Aquili (1985) in 1985 suggested that the brain was involved in religion and that it had evolved in such a way as to promote group solidarity through rhythmic auditory, visual, or tactile stimuli. He and others began to move theorizing about religion toward paradigms that included biology.

The difference between the early and the modern evolutionary theories of religion is that the early theories were blank-slate theories in which the biology of the brain was not involved (Pinker 2002). They assumed that culture was progressing, at least in technological terms, from a state of savagery to one of civilization. It was believed, or at least hoped, that science would

¹One has to give some credit to Tylor (1871:73) who in his “doctrine of souls” saw a thread of rationality wending its way from the religions of hunter gatherers through to the beliefs of the civilized nations.

replace superstition as culture progressed, so the superstitious side of religion would eventually evaporate; however, the facts hardly supported this optimistic conclusion. Now we recognize that human beings usually replace non-empirical religious beliefs with new non-empirical religious beliefs as fast as the old ones are discarded. Religion is not disappearing. It is now recognized that religious behavior is most likely encoded in the human brain (Boyer 2001) and that it is the product of biological evolution (Atran 2002).

At the moment there are a number of interesting anthropological theories about the evolution of religion based not on the earlier idea of myths being written on blank slates but on the biological evolution of the human central nervous system. I would like to look at some of these from an adaptationist point of view, a view that looks at the function of religion for human survival and reproduction in groups. Several of these theories are quite new.

The Evolutionary Process

Religion is a communication of a world view, or a created reality, that people develop as a group. Such realities have to start out in the mind of one person. Then they spread to others. How and why have human beings developed the ability to create these internal realities and then communicate them? Let us move back in evolutionary time to our mammalian origins. The central nervous system evolved, at least in mammals, to facilitate survival and reproduction by relating input from sensory organs to an output of behavior. It has evolved so as to make this neural data processing adaptive in the sense of promoting survival and reproduction. In order to do this it creates internal models of external realities. In fact there is no absolute external reality, only models of it that are created by the CNS. Thus, we can think of the central nervous system as a data processing machine. Its inputs are the senses. Its internal memory is a neural network. Its central processing unit is a complex neural processor that is soft-wired to increase the probability of certain connections and decrease the probability of others, and its output is behavior and emotions. Dangerous feedback loops such as drug addiction are possible. Behavioral aberrations due to faulty internal construction are always possible, as in any living system, but, by a large, it is an incredible mechanism that we hardly have begun to understand.

Somewhere around 60,000 years ago humans evolved a capacity for symbolic communication (Mithen 1999). This allowed them to share through symbolic communication these internal models with each other. Thus, a cultural storehouse of shared knowledge developed. Many different models, all of them with adaptive possibilities, were communicated to others with symbols. The most popular of these cultural models became religions. Thus we can also look at religion as a type of survival intelligence that is shared by a group. It is a result of the obligation of the central nervous system to lead human beings toward adaptive and reproductive behavior. Although it is shared by a group, it is a product of the human brain, or mind if you like that way of talking, and it carries with it the imprint of the mammalian brain that preceded it and which contains it.

Ecological Regulation Theory

The first modern evolutionary theory of religion was the ecological regulation theory most often associated with the anthropologist Roy Rappaport (1984). This theory proposes that religion has evolved to send control signals to a group telling it about the state of its interaction with the natural environment. There are several critical assumptions in this theory: (1) that religion alone has the emotional power to alter group behavior whereas other symbolic signals

lack the authority and emotional impact to get the job done, (2) that religion responds to changes in the group's relationship to the natural environment, and (3) that the group is a significant unit of natural selection. Before Rappaport, the cultural anthropologist Marvin Harris (1974) had suggested a similar idea in his materialistic view of religion. Harris' theory was more firmly tied to the idea of group selection and left no room for biologically evolved psychology in the individual. The main problem with ecological regulation theories is that the process of group selection has yet to be clearly defined. The idea of people working to promote group survival is a common theme in cultural ideology; however many evolutionists have suggested that this ideology is a product of kin altruism or reciprocal altruism and that the notion of sacrifice for the benefit of the group benefits the individual more than the group. Rappaport (1974) provided ample evidence that the Tsembaga, a New Guinea tribe, regulated their interaction with the natural and political environment with a system of rituals, but he did not show how the system had evolved. Possibly the ecological regulation process was a side effect of a larger psychological awareness of the the natural environment found in many religions.

Commitment theory

A more recent evolutionary theory is commitment theory. This is mostly associated with the economist Robert Frank (1988) and the anthropologists William Irons (2001) and Richard Sosis (2004). Commitment theory starts with the paradox that religion is simultaneously rational and irrational. It is rational in that it leads people to successful cooperation within a group, but it is irrational in that it requires a belief in unverifiable superhuman entities and forces. By making an irrational commitment to an unverifiable truth, people signal other members of the group that they can be trusted. Trust is always a problem in human groups, because the mimetic, visual, and linguistic symbolic communication that creates culture also creates the potential for deception. How do people assure themselves that their leaders are not deceiving them? Irons (2001) proposes that a costly signal that can't be faked shows that the signaler can be trusted. Therefore, when an individual abandons all self-interested logic and commits himself or herself to an irrational belief, other persons are inclined to trust him or her. This can be compared to costly signaling in the animal world, but the selection process is different. In the animal world it is often an advertisement of reproductive fitness and the advantage is being selected as a mate. Among humans the advertisement is for trustworthiness and the advantage is in better cooperation, which benefits the group as much as the individual. Unfortunately this pushes the selection process back on to the difficult-to-analyze process of group selection. Good theoretical models of group selection operating under costly signaling are needed, but the theory receives strong empirical support in observations that religiously organized groups have better internal cooperation and better success competing with non-religiously organized groups (Sosis and Bresler 2003).

A parallel to commitment theory has been developed by the economic sociologist Lawrence Iannaccone (1992). He looks at religion from the point of view of utility . Since the main psychological benefits of belonging to a religious group come from being in a close-knit enveloping society, the groups will try to maintain that closeness. Small cult-like religious groups in which the closeness rewards are the greatest will often keep their members dedicated by imposing taboos that prevent involvement with the larger society. A religious group will reject casually committed members because they dilute the intensity of the feeling of group solidarity, the fundamental store of utility that the group holds. Thus, religious groups will exact irrational acts of commitment in order to keep free riders out and to prevent the dilution of the

ideological intensity that they offer their members. Iannaccone points out that the demands for “irrational” acts of commitment are really rational when seen as the protection of group benefits. One has to judge rationality in this case from the point of view of the believer who values his or her support system and not from the point of view of the outsider (Stark and Finke 2000). One advantage of the economic rationality perspective is that it has the potential to predict religious change, whereas the commitment perspective does not clearly have this potential. An individual drops out or backslides when the utility of membership changes because of the increased costs and/or market competition for the same religious services.

Thus, commitment theories see religion evolving to maintain the advantages of group cooperation by means of an unselfish attachment to an empirically arbitrary system of belief. The irrational beliefs lead to behavior that optimizes group cooperation, a type of rationality. From an evolutionary perspective the individual is protected from autopredatory exploitation that makes use of complex symbolic deception, at least in the context of a simple paleolithic society. Whether or not individual fitness is also enhanced in a modern culture with mass communication and sophisticated methods of symbolic deception is not clear. A number of studies show that religiosity is still associated with longevity and health in modern complex societies (Levin 1994). Much of this association is linked to social participation (Hummer, Rogers, Nam, and Ellison 1999), so more empirical data is needed to show that there still exists a real benefit to the individual in creating trust while responding to costly signals in complex cultures. With the advent of mass communication the benefits may only go to the signalers who are activating autopredatory defense mechanisms that are no longer useful to the responders.

Cognitive theory

The cognitive theorists in anthropology are asking what makes religious models so popular and widely accepted. Instinctive non-rational popularity implies that there was a strong selective process in the past that genetically imprinted the behavior on the human brain because it was successful at survival and reproduction. Atran (2002) has hit on a number of things that makes religious beliefs attractive ways of thinking: (1) they make use of a fundamental quest to find agents that make things happen; (2) they provide easily remembered stories for learning important cultural ideas; (3) they evoke meaningful and therapeutic states in the brain; and (4) they produce pleasant rhythms and sounds. The attractive and common features of religion point to evolved cognitive capacities in the brain, modules if you think in terms of the modular brain (Barkow, Cosmides, and Tooby 1992). A central problem in cognitive theory is to separate those modules that evolved to solve other problems from those modules that evolved in the context of religion as an adaptive complex itself. This problem has caused a division in the cognitive approaches to understanding religion. Most anthropologists immersed in comparative studies of religions tend to see religion as a complete complex of its own evolving culturally in different directions but with a single overall adaptive pattern. However the cognitive anthropologists such as Atran (2002) and Boyer (2001), who look at cognitive structures in general, tend to see religion as composed of modules that evolved to solve different non-religious problems, for example awareness of predators or the detection of cheaters.

Atran and Norenzayan (2004) write

Religion is not an evolutionary adaptation, but a recurring by-product of the complex evolutionary landscape that sets cognitive, emotional and material conditions for ordinary human interactions. The conceptual foundations of religion

are intuitively given by task-specific panhuman cognitive domains, including folkmechanics, folkbiology, folkpsychology...This enables people to imagine minimally impossible supernatural worlds that solve existential problems, including death and deception. Because religious beliefs cannot be deductively or inductively validated, validation occurs only by ritually addressing the very emotions motivating religion.

This concept rules out commitment theory as adequate. Atran (2002) writes of the previously mentioned commitment theories as follows:

They do not account for the cognitive peculiarity of the culturally universal belief in beings who are imperceptible in principle, and who change the world via causes that are materially and logically inscrutable in principle. They cannot distinguish Marxism from Monotheism, secular ideologies from religious belief.

Cognitive theory is an evolutionary by-product theory. By-product theories pop up in many areas of evolutionary psychology. For example, Margo Wilson has pointed out that killing one's sexual partner hardly is a good way to increase one's reproduction, but it occurs from time to time with great passion. She sees it as a by product of mate-guarding that, by and large, increases the reproduction of those emotional genes. It only appears bizarre and irrational when it goes overboard.

Cognitive theory proposes that religion is an overboard manifestation of some very adaptive behavior that should be seen apart from this complex. Religion is a culturally constructed complex of behavior that captures a number of adaptively unrelated behavioral modules. One problem in utilizing cognitive theory is that some of the modules are pre-human and we need input from animal as well as human studies. Scholars of religion have avoided this by insisting that religion is a purely human phenomenon. The only anthropologist that I can think of at the moment who has not fallen into this trap is Anthony Wallace (1966), whose theories of religion seem to have been ahead of his time.

Let us speculate for a moment. Religion creates powerful convictions of the existence of an unseen world of beings and forces and communicates these convictions to a group (Geertz 1966). If we take the human-to-human species-specific communication out of religion, then how do we know that other mammals do not have convictions of the existence of an unseen world of beings and forces? Perhaps they have something like religious convictions developed by their central nervous system from their experience. Basically, religion is an internal model of an external reality. Humans communicate this reality with their capacity for symbolic communication, but animals may have it without communicating it.

Atran's idea of religious cognition is that it formulates counterfactual counterintuitive models. What does it mean to say that a model is counterintuitive or counterfactual? Atran and Norenzayan write:

The meanings and inferences associated with the subject (omnipotence = physical power) of a counterintuitive expression contradict those associated with the predicate (insubstantial = lack of physical substance), as in the expressions "the bachelor is married" or "the deceased is alive." (2004)

But this test depends on semantic logic. The semantic structure of language varies from one

culture to another, so something can be counterintuitive in one culture and intuitive in another. If an anthropological theory of religion is to be universal, then it must apply to all cultures. Other people such as Geertz (1966) and Boyer (1994) have noted the inherently factual nature of religion. The counterfactual/counterintuitive characteristic is not recognized by everyone. Whether or not a religious belief is counterfactual or counterintuitive depends on who is looking at it. This approach ignores a virtually obvious feature of religion, that it is *symbolic*. So a good evolutionary theory of religion must allow for varied symbolism. Counterfactuality cannot be measured absolutely but only in the context of other beliefs. A belief is counterfactual only if we have another model of reality that is more “factual,” and, of course, we have to be able to measure factuality in both domains of discourse. Atran and Norenzayan adduce evidence from psychological tests of children that shows that the acceptance of “counterfactual” beliefs increases with age, but this could be interpreted as the result of learning culturally supplied cognitive structures.

One of the most concrete mental modules that Atran has pointed out is the module of agency. It is a modification of Guthrie's (1993) ideas of animism and anthropomorphism. Humans from an early age manufacture theories at a tremendous rate and very rarely test them with rigorous logic and careful observation. One of the most common and universal tendencies is to theorize that something happens because some agent made it happen. The agent need not be another human being; it may be any natural or supernatural creature. Religions, not just the animistic ones, are loaded with beliefs in unseen unverifiable entities, gods, spirits, and the like, who cause things to happen. Possibly this is a pre-human module that developed to detect predators.

The Problem of Change

An important question to be asked of evolutionary theories of religion is why do religions change. Religious change is an important issue for historians, sociologists, as well as cultural anthropologists. It should be included in any evolutionary theory of religion. Including religious change is not difficult when we see evolution as part of the continuing obligation of the central nervous system to promote survival and reproduction. Internal models are likely to exhibit facultative adaptation. Thus religion should help individuals survive and reproduce. They should be expected to change as survival and reproductive opportunities change. At a facultative level, religions that do not promote the individual's well being should be abandoned and a new ones should be substituted. Religions are noted for this quality.

As far as the central nervous system is concerned, there is no absolute test of the adequacy of an internal model of an external reality such as its “factuality” or its ability to work within a scientific-technological tradition. The only thing that the CNS is concerned with is getting rid a model that is not working. Some aspects of the brain, the innate modules and capacities, cannot be changed, but the content of the ideas, the models of external reality, can change. In this sense, religion can be seen as a provisional working model of an external reality. It does not have to fit any other criteria other than creating an aura of well being, as measured by whatever neurological sensors are set up for this activity. For lack of a better term I will call this the *trophic obligation* of religion.

Conclusion

Within a biological evolutionary understanding of religion where can anthropology go

from here? The problem of change needs to be dealt with. Religion is involved in facultative adaptation, and all measures show that it promotes well being and survival. The economic viewpoint sees rationality at work, which should help us understand how this adaptation is working. It could be a starting point; yet it does not capture the insanity of religious conversion. Trophic responses are involved in setting the course for religious change. How does the brain link well being with the acceptance of an internal model of reality? The normal way of thinking about survival problems is to apply rational logic, but religion works at other levels of consciousness. Desire and hunger are part of religion. How does a lack of well being stimulate the creation of new concepts of the supernatural? The largest source of religious symbols seems to be food. Food is a primary survival need for any organism. Food symbolism in religion needs to be studied, because perhaps the trophic obligation involved in religion surfaces in cultural symbolism in this way.

Another problem in advancing the evolutionary approach to religion is that we only are aware of the structure of religious thinking as it is put in symbolic form. Cultural evolution selects from a variety of internal models and retains the ones that have public appeal. One has to be careful not to mix the individual processes of formulating an internal model with the social selection process. Certainly, the social process depends on an appeal to the individual ones, but they are separate from these and obey other evolutionary laws. The long-term biological evolutionary process establishing the organization of the mammalian/human brain is not the same as the process by which cultures select the symbolic systems of religion. The two are related in a co-evolution but they are different parts of a larger overall process. The cognitive theorists propose that only the social process creates what we call religion, but why is it created over and over again in the same way? Why don't we call alternative formulations for the same underlying cognitive capacities such as science, social science, humanism, or a belief in contact by beings from outer space religion as well?

Commitment theory has some particular problems. We need a better understanding of group selection. We also do not understand the evolutionary process by which an emotional commitment to a religious belief increases the fitness of an individual and hence the genes for this capacity. Here active-agent modeling and evolutionary game theory can play a role. The models may be complex, because social interaction is involved.

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