

A Creation Story For Our Time: How Evolution Explains Religion

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Why is religion so important to so many people? Opinions differ. Adherents of monotheistic religions typically believe that it's because religion is designed by God so the faithful can live in accordance with God's plan. In contrast, “New Atheists,” like Sam Harris, Dan Dennet, and Richard Dawkins, view religion as a destructive mass delusion arising from defects in our cognitive architecture.¹

There are popular folk explanations of religion as well. In a national survey by Michael Shermer, the most widespread explanation that people gave for *other peoples'* belief in God is that *other people* need the comfort and consolation of a supreme being. However, the most common explanation that believers gave for their *own* belief is that God provides an explanation for the complexity and beauty of the world.²

Social scientists have been producing their own explanations of religion for more than a century. In recent years a consensus has begun to emerge among these scientists about the origin and function of religion.³ The premise of this theory is that since human beings are the product of evolution, either religion itself, or psychological traits that give rise to religion, must have enhanced survival and reproduction at some point in our evolution.

In this talk, I will sketch outline this evolutionary theory of religion, show how the theory explains some of the most puzzling aspects of religion, and discuss what the theory means for theistic and humanist religions.

Let's start by flexing our philosophical muscles with a few puzzles about religion that a satisfactory theory should explain:

1. Why do most religions have at least one belief that nobody but adherents of that particular religion find even remotely believable? Stated differently, could there be a religion based on belief in something *everyone* can agree on, like the importance of sharing or gravity?
2. In monotheistic religions, why is God so preoccupied with sex, as well as with food, rituals, and property rights (as typified by the Ten Commandments)?
3. Why is heresy often worse than murder or rape?
4. Why is so much of the world's violence committed in the name of a loving and

1 Dawkins, R., *The God Delusion*. New York: Houghton Mifflin Company (2006); Harris, S., *The end of faith: religion, terror, and the future of reason*, W.W.Norton (2004).

2 Shermer, M., *How We Believe: The Search for God in an Age of Science*, W.H. Freeman (2001).

3 Norenzayan, A., and Shariff, A., The origin and evolution of religious prosociality, *Science* 322:58-62 (2008).

merciful God?

5. Why do many believers feel that life would be meaningless without God, but meaningful with God?

I hope that you agree that these are hard questions, and that a theory that answered them would give us real insight into religion.

So, let's get started on the work of explaining how religious belief could have evolved by asking why the human species has been so successful. The short answer is that human beings have an unexcelled ability to adapt to new and changing environments because humans transmit behavior *culturally* rather than *genetically*. The rate of adaptation in *other* species is limited to the rate at which beneficial genetic changes can occur. For example, a fox from a temperate climate can't live in the arctic, but over many generations those at the northernmost edge of their range may evolve small ears, white fur in winter, and other adaptations that make life farther north possible. In contrast, a human being can learn everything needed for life in the arctic simply by being born into an Inuit or Lapp family, or by being trained in arctic survival. We can survive in the sweltering rain forest, a space station, an isolated atoll, or a cut-throat law firm just by reading books about those places and talking to people who have been there.

A second factor in human success is the ability to act in cooperation with others toward shared goals. An isolated person is weak and helpless, but in a group we can perform wonders, from curing diseases, to performing symphonies, to creating the World Wide Web.

Many cognitive traits are required for cultural transmission of behavior and cooperative social life, but two seem particularly important. The first is the ability to understand and reason about other peoples' thoughts, feelings, goals, and beliefs. This is sometimes referred to as a "theory of other minds." The second is the ability to subordinate one's individual interests to those of other members of one's social group, in other words, to act cooperatively or altruistically.

The human facility for understanding other minds is one of our most unique attributes. Even 18 month-old toddlers are attracted to things that other people gaze at or gesture towards, and they in turn try to direct the attention of other people to interesting things by pointing to them.⁴ Our closest genetic relative, chimpanzees, completely lack this ability. Alone in the animal kingdom only domestic dogs, who have been domesticated for tens of thousands of years, are able to respond to gestures as well as a toddler.⁵ The vital importance of being able to reason about the minds is dramatized by the existence

4 Bloom, P., *Descartes' Baby: how the science of child development explains what makes us human* (Basic Books) 2004.

5 Hare, B., Brown, M., Williamson, C., and Tomasello, M., The domestication of social cognition in dogs, *Science* 298, pp1634–1636 (2003).

of a disability that consists solely of the absence this ability, namely autism.⁶ Even the most intelligent autistic person suffers from drastically limited ability to communicate and act cooperatively.

Our ability to recognize mental states is so sensitive that we often attribute human thoughts and motives to inanimate things. We see faces in the clouds and on the surface of the moon, we threaten or plead with our car when it won't start and our computer when it won't boot, we see storms as angry and calm seas as friendly. Experimental subjects shown animations consisting of nothing but moving dots perceive them as characters in little stories, helping or hindering one another, or making and protecting friends.⁷ Even scientists have difficulty avoiding anthropomorphic language, describing regularities in nature as “laws,” genes as “selfish,” and cells as “communicating” with each other.

This tendency to see human intentions and goals where there are none appears in the polytheism of hunting-gathering people and many other cultures in which each natural process (i.e., thunder, wind, rivers) has its own deity. The Greek hypopre-Socratic philosopher Xenophones noted 2500 years ago that Gods often seem to be modeled after their believers—they have human goals, desires, and personalities, and even their skin color matches that of believers.⁸ For all people, anthropomorphism is as natural as breathing.

The second key factor in human adaptability, the ability to act cooperatively, presents a unique set of challenges. Every cooperating group must deal with the dilemma that the group does best if everyone does his or her share, but each individual can do better by freeloading. Consider a forested island in which there is enough wood for everyone if everyone takes only their share. However, any one individual can build a bigger house or boat or have larger fires by taking more than his or her share. Unfortunately, if it becomes clear that some people are getting away with taking more than their share, everyone will have an incentive to get as much as possible while anything is left. If everyone follows this logic, as happened in Easter Island, the forest is destroyed and everyone suffers.⁹

This dilemma, in which the group does best if everyone cooperates, each individual can do better by cheating, but the whole group suffers if everyone cheats, is termed the “prisoner's dilemma.”¹⁰ Biologists have discovered that this dilemma arises even among colonies of micro-organisms, such as slime molds forming colonies to reproduce and

6 Baron-Cohen, S., *Mindblindness: An Essay on Autism and Theory of Mind*, MIT Press (1997).

7 Bloom, P., and Veres, C., The perceived intentionality of groups, *Cognition* 71:1, B1-B9, 3 May 1999.

8 See generally, Guthrie, S., *Faces in the clouds: a new theory of religion*, Oxford University Press (1993).

9 Diamond, J., *Collapase: How Societies Choose to Fail or Succeed*, New York: Viking (2004).

10 The term “prisoner's dilemma” comes from a scenario in which two prisoners are under arrest and each can get reduced time by ratting on the other if the other doesn't talk, but if both rat out the other, both get long sentences.

yeasts producing enzymes to break down sucrose (it's better to freeload by letting your fellow yeast pay the bio-chemical price for the enzyme, enjoying the resulting glucose for free, but if all yeast cells freeload, they all starve).¹¹

The prisoner's dilemma is particularly problematic for human groups because our success depends on our flexibility in forming cooperative groups to meet the demands of new situations. Such groups are effective only if there are few freeloaders. Insuring that a person will cooperate, rather than cheat, is critical for determining whether that person should be allowed in the group and permitted to share the benefits of group activities. Social scientists have shown that the keys to preventing freeloaders are *reputation* and *commitment*.

Reputation is the perception by group members of a person's likelihood of acting fairly as opposed to being a freeloader. People everywhere are acutely sensitive to freeloaders and cheaters, and people everywhere *gossip* about whether people cooperate or cheat, and whether they are sincere or hypocritical.

Turning to commitment, Cornell economist Robert Frank demonstrated in his influential book "Passions Within Reason" that in a wide range of situations it is beneficial to *commit* oneself to behavior even if that behavior itself is not directly beneficial.¹² For example, a happy marriage requires the mutual trust that comes from each spouse making a commitment to be loyal to the other even if someone wealthier or more attractive becomes available. Passing up a wealthier or more attractive prospective mate might be disadvantageous, but making a commitment to the spouse one has is hugely advantageous.

In the case of commitment to group cooperation, the most effective commitment is one that other members of the group are aware of and believe to be sincere. Thus, the best way for a person to establish that he or she is a cooperator is to make a visible, public commitment to cooperation that is hard to fake. An extreme example is a person who tries to save his comrades by throwing himself on a grenade. Such a person has demonstrated his commitment in an unfakeable way even if the grenade turns out to be a dud. He will be trusted by his comrades in a way that someone who runs away when a fight starts would never be. In general, the more burdensome or costly a commitment, the stronger and more convincing the signal of sincerity, and the greater the likelihood that other members of the group will reciprocate.

Fraternalities and secret societies build loyalty by forcing members to undergo painful or embarrassing public initiations. Many preindustrial societies require youths to undergo

11 Gore, J., Youk, H., and van Oudenaarden, A., Snowdrift game dynamics and facultative cheating in yeast, *Nature* 459, 253-256 (14 May 2009).

12 Frank, R., *Passions within reason: the strategic role of emotion*, Norton, New York (1988).

agonizing or humiliating rituals before becoming full tribal members, such as the dozens of wasp stings that must be silently endured by young men in Suriname, or the excruciating ritual circumcision endured by adolescent Khoisa men in Southern Africa. An academic friend commenting on a draft of this talk added that dissertation defenses should be added to this list.

There is extensive evidence that more burdensome initiations lead to more dedicated group membership. Anthropologists Richard Sosis and Candace Alcorta found that the life-span of 19th century communes was greater among religious than among secular communes, and in religious communes, the greater the burden of costly rituals and taboos, the longer-lasting the commune.¹³

To summarize, this so-called “costly signaling” theory holds that a commitment is effective to the extent that it can't be faked or has a cost to a potential freeloader that outweighs the potential benefits from faking the commitment. Evolutionary theory holds that the great rewards of cooperative social life produced selective pressure in favor of individuals able to make and recognize commitments to group cooperation.

So how does the human tendency to anthropomorphize, together with ability to make and recognize commitments to group cooperation, explain religion? Answering this requires one last puzzle piece, provided by British anthropologist Robin Dunbar. Dunbar hypothesized, based on human brain capacity, that there must be an upper limit of about 150 on the number of people with whom one can have a social relationship.¹⁴ In a cross-cultural survey, Dunbar found that subsistence villages and nomadic tribes become unstable and split once this limit has been reached. His explanation for this limit was that you can't keep track of the reputations and commitments of more than about 150 people, a quantity now known as Dunbar's number.¹⁵

The tremendous benefits of life in larger groups, such as stable agricultural food supplies and specialized social roles, are available only when there is some mechanism for insuring cooperation among groups containing more than Dunbar's number of people, that is, more people than any one person can have a relationship with. The solution to this problem, which each monotheistic faith either borrowed from some other faith or discovered independently, is to channel the natural human tendency to anthropomorphize *away* from natural processes (like thunder) and *toward* a personification of the group itself as a God who desires humans to act cooperatively toward one another. At the same time, the commitment mechanism is redirected from

13 Sosis, R. and Alcorta, C., Signaling, solidarity, and the sacred: the evolution of religion behavior, *Evolutionary Anthropology* 12:264-274 (2003).

14 Dunbar, R., Neocortex size as a constraint on group size in primates, *Journal of Human Evolution* 22:469-493 (1992).

15 The 150 person size has subsequently been revised upward by some researchers to the range of 200-300. McCarty, C., Killworth, P., Bernard, H., Johnsen, E. and Shelley, G. Comparing Two Methods for Estimating Network Size, *Human Organization* 60:28-39. (2000).

members of the group to the *God personifying the group*. This permits ritual demonstrations of commitment to God to play the same role in *large* communities that commitments to the group itself play in *smaller* communities: insuring cooperation. The difference is that commitment to a moralizing God promotes cooperation even among those who don't know each others' reputations first-hand.

While this theory might seem far-fetched, there is in fact abundant evidence that moralizing Gods promote cooperation in large groups. A recent analysis of 186 societies showed that the larger the group size, the greater the likelihood that the group has moralizing Gods, as predicted by the theory.¹⁶ Other surveys have shown that religious people are perceived to be more trustworthy and cooperative, especially by other religious people.

Numerous experiments have demonstrated that in *anonymous* situations there is no direct relationship between belief in the supernatural and moral behavior.¹⁷ But when behavior would be known by other people, greater religiosity is strongly associated with greater altruism.¹⁸ H.L Mencken's quote that "Conscience is the inner voice that warns us that someone may be looking" thus seems to be particularly true for the religious. When experimenters trigger thoughts of God or other supernatural beings, experimental subjects act more generously to strangers and are less likely to cheat.¹⁹ All these experiments show that, for a believer, God is a surrogate for one's peers, and that the judgment of God plays much the same role as one's reputation in one's community. Belief in God promotes cooperative behavior in believers by providing a constant observer that acts the way their peers would if they were present.

In summary, the evolutionary theory of religion holds that natural selection favored religion because it promoted cooperation in large groups. God personifies the group, God's will expresses the norms of the group, and God's omniscience serves to monitor compliance with those norms by group members. Commitment to God is established by rituals and practices that are hard to fake and burdensome for nonbelievers. This arrangement solves the prisoner's dilemma by inducing group members to make a sincere commitment to cooperation and by creating a monitoring system that works even when group members are alone.

Having described the theory, let's see how well it explains the puzzles from the start of this talk.

1. Why do most theistic religions have at least one belief that everyone but adherents

16 Roes, F., and Raymond, M. Belief in moralizing gods, *Evolution and Human Behavior* 24:126-135 (2003).

17 Norenzayan, A., and Shariff, A., *ibid.*; Hauser, M., and Singer, P., *Morality Without Religion*. Project Syndicate. (2005).

18 Norenzayan, A., and Shariff, A., *ibid.*, at 60.

19 Reminders of an honor code have a similar effect. *Ibid.*

of that particular religion find totally unbelievable? According to the theory, commitment must be hard to fake and burdensome for would-be freeloaders. A sincere, public profession of belief in something that outsiders find unbelievable satisfies these requirements. The more unbelievable the doctrine, the harder it is to fake a sincere belief in the doctrine, and the deeper and more convincing the commitment to the group. Professing a belief that everyone shares, like the importance of sharing or gravity, wouldn't constitute a commitment that solves the prisoner's dilemma because the cost of professing the obvious would be less than the benefits of faking the commitment and freeloading.

2. In monotheistic religions, why is God so preoccupied with sex, food, rituals, and property rights? According to the theory, God is a personification of the group, and God's will represents the norms of the group. Stability in large groups requires shared conventions for sex, food preparation, collective rituals, and property, so group members typically must subordinate their desires to these conventions. It follows that the God of the group should judge group members based on how well they follow these essential norms.
3. Why is heresy often worse than murder or rape? Murder and rape are crimes against individuals, but heresy is an attack on the legitimacy of the deity that represents the entire group and all its norms. All three are crimes, but heresy is a greater threat to the survival of the entire group as a stable entity.
4. Why is so much of the world's violence committed in the name of a loving and merciful God? According to the theory, belief in God is a mechanism for inducing large groups of people to make binding commitments to cooperation and altruism towards one another. Those who do not worship the same God, however, are not party to this commitment. Thus, tribalism applies not just to groups themselves, but to the Gods that personify those groups. Indeed, one would expect a group-personifying God to insist that believers be willing to sacrifice themselves for other believers in conflicts with other groups. Anything less would be a violation of the shared commitment.

In summary, the evolutionary theory of religion seems to provide plausible explanations to the puzzles that a few minutes ago seemed quite bewildering.

Now, it's the nature of science that theories must be revised or replaced as new facts are discovered. But for now, the evolutionary theory of religion seems plausible, is supported by historical and experimental evidence, and is capable of explaining facts about religion that otherwise seem very puzzling. If we assume that this theory is correct, what are the implications for traditional and humanistic religions?

Let's start with traditional theistic religions. Does the theory of God as a personification of group norms that evolved to promote cooperation in large groups mean that Richard Dawkins and Sam Harris are right that God is a fairy tale? Absolutely not! All the major

monotheistic faiths hold that the true nature of God is beyond the grasp of limited human comprehension.²⁰ We are restricted to the senses that evolution has provided us. We can't see the ultra-violet or infra-red colors of the world, but only the portion of the spectrum that was important for the survival of our ancestors. A believer can argue that, similarly, we can't see the full spectrum of God's nature, but only the portion that can be grasped by minds that evolved in gossiping, cooperative, social organisms. The fact that the God we worship is a personification of group norms tells us more about how we developed than about God's true nature. In sum, the evolutionary theory of religion doesn't negate traditional theology, but is just another strand of the evolutionary story that believers must incorporate into the traditional theological narrative. By contrast, the theory *does* seem to contradict the New Atheist view of belief in God as a destructive mass delusion by suggesting that it is, instead, a very effective adaptation to life in large groups.

How does the evolutionary theory of religion impact humanistic religions that are not based on belief in the supernatural? The theory hypothesizes that religions promote cooperative behavior by inducing group members to make a commitment to cooperation and altruism with other group members. Monotheistic faiths are *creedal* religions in which commitment consists of a hard-to-fake profession of belief in an invisible deity that monitors individual behavior. However, other kinds of hard-to-fake commitments can serve the same purpose. For example, being born to Jewish parents gives one an unfakeable connection to the Jewish religion that doesn't depend on beliefs; one can be a Reform Jew without believing in God. Similarly, one can be a Buddhist simply by practicing meditation of an appropriate type without having to believe in the supernatural or be born of Buddhist parents.

Another commitment mechanism is shared affirmation of a covenant or agreement with other members to recognize a common set of values and principles. Unitarianism is a *covenantal* religion based on this approach to commitment. Evolutionary religion theory predicts that the intensity of religious affiliation should be proportional to how costly or difficult it is to fake one's commitment to the group. This suggests that Unitarianism's failure to demand public profession of belief in the unbelievable should lead to less fervent adherence to Unitarianism than to religions that require fantastic beliefs. Indeed, it is hard for most people to imagine a “fanatical” or “extremist” Unitarian. It may be that the description of Unitarianism as “covenantal” understates the importance of demonstrations of commitment to the welfare of others through social action, pledging, and the other altruistic actions that many may feel is the essence of Unitarianism. Moreover, a full commitment to the “inherent dignity and worth of every person” is actually very difficult for most people. Regardless, the evolutionary theory of religion shows how covenantal religions solve the same problem of promoting group cooperation and altruism as creedal religions, but in a very different fashion.

20 Armstrong, K., *A history of God*, Random House Publishing Group, 1993.

I want to close by addressing the last puzzle of religion, which some of you may have noticed that I skipped earlier: “Why do many believers insist that life would be meaningless without God, but meaningful with God?” This solution to this puzzle is less straightforward than the others, but I think that the evolutionary theory of religion provides an insight here as well. During the period when human kind evolved, we lived in small stable groups, like the hunting-gathering people of today. We spent our whole lives with the same group of people, and our connection to them meant that we never felt alone and never needed to wonder who cared about our welfare or who would be helped by our efforts or hurt by our transgressions. The meaning of our lives came from this unbreakable connection to *our people*. As the size of societies grew, we had vastly more choices of where to live, whom to associate with, and what jobs and pleasures to pursue. But we paid for this autonomy by losing our encompassing, meaning-giving tribal community.

I am convinced that the meaning of life ultimately comes from our connection to others: those whom we love and who love us, those we team with, those we compete against, those who care about our joys, sorrows, triumphs, and defeats. Theistic religions give believers this meaning by providing a God that is a *proxy* for the all-encompassing village of our evolutionary past, one that is always aware of our activities and always concerned about our welfare and our compliance with group norms.

Humanist religions provide meaning as well, without requiring a belief in the supernatural. But a humanistic substitute for a theistic faith must meet the challenge that comes from not having God to serve as a proxy for our religious village. It is much more challenging to make a commitment to an entire religious community, much less the entire human family, than to a single divine entity who represents both. Our challenge as religious humanists is to make and live by commitments as broad as the entire human family, as long as our lives, and as deep as our need for one another.

So be it.