The Cultural Evolution of Religion

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After almost a century of dwelling in two "non-overlapping magisteria," as Steven Jay Gould once put it, religion and science are coming together again. Long the exclusive province of the humanities and left outside of the mainstream of psychology and the behavioural sciences, religion is gaining scientific attention at a rapid pace. The dismantling of the taboos that have kept religion out of the scientific spotlight will take time (Dennett, 2006). Nevertheless, these are exciting times, and we can now safely say that religion—to paraphrase Chomsky about language—has been upgraded from scientific mystery to scientific puzzle (Boyer, 2001). This growing scientific interest promises to offer a naturalistic account for a deeply affecting aspect of human lives that is widespread in all known cultures in the world.

In this chapter we explain the relation between religion and prosocial behaviours within an evolutionary perspective. In putting together this synthesis, we cover a large amount of territory from evolutionary biology, evolutionary and cultural anthropology, sociology, history, game theory, neuroscience, behavioural economics, and our home field, social psychology. We show how different findings from these diverse fields can be fruitfully integrated under a unifying theoretical framework grounded in an evolutionary perspective that takes into account human cultural learning. We also explain how this integrative approach highlights a number of unresolved questions for future research, such as the relation between religion and moral psychology, how modern secular societies sustain cooperation and trust without religion, and as

any theory of religion worth its salt must attempt, we offer a theoretical speculation to explain the widespread existence of atheism as a psychological and cultural phenomenon.

Religious prosociality is the idea that religions facilitate acts that benefit others at a personal cost (Norenzayan & Shariff, 2008). All major religions explicitly encourage prosociality in their adherents (Batson, Schoenrade, & Ventis, 1993). Many social science theories have pointed to religion as a cultural facilitator of social cohesion and ingroup solidarity (Durkheim, 1995; see Wilson, 2002, and Sosis & Alcorta, 2003, for discussions). However the debate on religion's role in prosocial behaviour has been polemical, producing more heat than insight. In recent years, two new developments have altered this picture. First, explanations for the evolutionary origins of religion have gained focus and empirical plausibility, bolstered by a small but growing empirical base that unites several academic disciplines (Boyer, 2001; Barrett, 2004; Atran & Norenzayan, 2004; Sosis & Alcorta, 2003; McNamara, 2006). Second, evolutionary explanations for the origins of human prosociality have been developed that model the interaction of innate tendencies with cultural learning (Henrich & Henrich, 2007; Richerson & Boyd, 2005). These two developments can now be fruitfully synthesized to explain two fundamental, interrelated aspects of human social life: (1) the key role of religion in the rise of large, cooperative societies in the last fifteen millenia, and (2) the cultural spread and persistence of religious beliefs on a worldwide scale.

The Evolutionary Landscape of Religion

There is growing agreement that the suite of psychological tendencies that support and give rise to religious beliefs, have been shaped by the evolutionary forces that have constrained ordinary human social life throughout history. However to date, there is no scientific consensus

among evolutionary researchers as to whether religious belief itself was naturally selected in the human lineage. One view is that at least some religious beliefs and behaviours are biological adaptations for cooperative group-living that have maximized genetic fitness at the individual level (Johnson & Bering, 2006; Sosis & Alcorta, 2003); another, is that religion is a biological adaptation for group living which evolved by multilevel selection (Wilson, 2002).

Two additional accounts view religion as a cultural byproduct of evolved psychology, and invoke cultural evolutionary processes to explain religion's wide reach. One proposes that religious content itself is a cultural by-product of a suite of psychological tendencies evolved in the Pleistocene for other purposes, in particular detecting and inferring the content of other minds and sensitivity to one's prosocial reputation in the group (Atran & Norenzayan, 2004, Boyer, 2001). Religious beliefs that were compatible with these psychological tendencies culturally spread through social learning mechanisms and could solve adaptive problems, especially, but not exclusively, the problem of cooperation in large groups. Another cultural evolutionary perspective, known as cultural group selection (Henrich & Henrich, 2007; see also Wilson, 2002), maintains that competition among social groups may have favored the spread of fitness-enhancing, socially transmitted cultural beliefs that gave rise to religious prosociality (Boyd & Richerson, 2002; Henrich & Henrich, 2007; Wilson, 2002). These various evolutionary theories of religion have much in common, and all predict that religious beliefs and behaviors have facilitated human prosocial tendencies, but there is disagreement as to exactly how this might have occurred. Next, we outline an evolutionary scenario that is compatible with either of the two cultural evolutionary perspectives; towards the end we return to these different theoretical accounts in light of the evidence presented.

Religions have core features that regularly reoccur across cultures and historical periods (Atran & Norenzayan, 2004; Barrett, 2004; Boyer, 2001; Lawson & McCauley, 1990). One such feature is derived from a "theory of mind" faculty, which facilitates the detection of other minds and inferring their content. This in turn supplies the cognitive basis for the pervasive belief in supernatural agents. People attribute humanlike beliefs and desires to God, just as they do to other people, and religions invariably anthropomorphize God and other supernatural agents (Guthrie, 1993). Consistent with this reasoning, thinking about God activates brain regions associated with theory of mind (Kopogiannis, et al., 2009). Furthermore, the autistic spectrum—which involves deficits in theory of mind—is associated with lower belief in God, and individual differences in mentalizing ability statistically mediate this relationship (Norenzayan & Gervais, 2009).

But supernatural agents, unlike their earthly counterparts, are believed to transcend physical, biological, and psychological limitations (Atran & Norenzayan, 2004, Boyer, 2001). Once these beliefs were cognitively in place, their content was subjected to cultural selection, giving rise to belief in morally concerned policing agents who use these supernatural powers to observe, punish, and reward human social interactions. Hard-to-fake religious behavior, such as fasts, food taboos, and costly ritual performance, in turn reliably signaled the presence of devotion and therefore cooperative intention towards ingroup members, buffering religious groups from freeloaders and reinforcing cooperative norms. Religious prosociality, thus softened the genetic constraints inherent in kinship-based and (direct or indirect) reciprocity-based altruism which severely limit group size. In this way, religious prosociality facilitated the rise of stable, large, cooperative moral communities of genetically unrelated individuals.

We expect that religious prosociality culturally exploits the acute human sensitivity to prosocial reputation (Fehr & Fischbacker, 2003), a psychological mechanism originally unrelated to religion, which evolved to facilitate strong reciprocal cooperative bonds (Gintis, Bowles, Boyd, & Fehr, 2003). In an intensely social, gossiping species, reputational concern likely contributed to the evolutionary stability of strong cooperation between strangers. Individuals known to be selfish could be detected and subsequently excluded from future interaction, and under some conditions punished even at personal cost (Gintis, et al, 2003; Henrich, et al., 2006). The threat of being found out, therefore, became a potent motivator for good behavior. Studies have shown that even subtle exposure to schematic drawings resembling human eyes increase prosocial behavior in economic games (Haley & Fessler, 2005) and decrease cheating in naturalistic settings (Bateson, Nettle, & Roberts, 2006). The cognitive awareness of morally concerned Gods is likely to heighten prosocial reputational concerns among believers, just as the cognitive awareness of human watchers do among believers and nonbelievers alike. However omniscient, morally concerned supernatural watchers, to the degree that they are genuinely believed and cognitively salient, offer the powerful advantage that cooperative interactions can be monitored even in the absence of social monitoring by humans.

The line of reasoning outlined above accounts for a wide range of empirical evidence linking religion to prosocial tendencies, and predicts that this relationship ought to be context sensitive, with clear boundary conditions. First, religious devotion is expected to be associated with greater prosocial reputational concern. Second, religious situations would automatically activate thoughts of moralizing divine agents and habitually facilitate prosocial behavior. It follows that experimentally inducing awareness of morally concerned supernatural agents would also increase prosociality even when no one is watching; that is, even when the situation is

objectively anonymous. But this should be the case only to the extent thoughts of supernatural agents are cognitively accessible in the moment when prosocial decisions are called for. Third, religious behavior that signals genuine devotion would be expected to induce greater cooperation and trust. Fourth, large societies which have successfully stabilized high levels of cooperative norms would be more likely than smaller ones to espouse belief in morally concerned Gods who actively monitor human interactions. In the remainder of this chapter, we critically examine the available empirical evidence in light of these four predictions.

Religion and Prosocial Behavior: Doing Good vs. Looking Good

If religions centered around moralizing Gods promote prosociality, it would be expected that individuals who report stronger belief in such Gods have stronger altruistic tendencies. Sociological surveys suggest this is the case. Those who frequently pray and attend religious services reliably report more prosocial behavior, such as charitable donations and volunteerism (Brooks, 2006). This "charity gap" is consistent across surveys, and remains after controlling for income disparities, political orientation, marital status, education level, age and gender. These findings have been much publicized as evidence that religious people are more prosocial than the non-religious (Brooks, 2006). However, it remains unresolved whether this charity gap persists beyond the ingroup boundaries of the religious groups (Monsma, 2007). More importantly, these surveys are entirely based on self-reports of prosocial behavior. Psychologists have long known that self-reports of socially desirable behaviors (such as charitability) may not be accurate and may instead reflect impression management or self-deception (Paulhus, 1984). If, as we hypothesize, religious individuals are more motivated to maintain a prosocial reputation than the non-religious, then the former may be more likely to engage in prosocial reputation management. Supporting this hypothesis, psychological research summarizing many studies has found that

measures of religiosity are positively associated with tests of socially desirable responding, a common human tendency to project a positive image of oneself in evaluative contexts (Trimble, 1997). This latter association raises questions not only about the nature of the prosocial tendencies found in the sociological surveys, but about the behavioral reality of the differences as well. To address the methodological limitations inherent in self-reports, experiments with behavioral outcomes must be consulted.

In several behavioral studies, researchers failed to find any reliable association between religiosity and prosocial tendencies. In the classic "Good Samaritan" experiment, for example, researchers staged an anonymous situation modeled after the Biblical parable—a man was lying on a sidewalk appearing sick and in need of assistance. Participants varying in religiousness were led to pass by this victim (actually a research confederate) on their way to complete their participation in a study. Their likelihood of offering help to the victim was unobtrusively recorded. Results showed no relationship between religiosity and helping in this anonymous context (Darley & Batson, 1973). Only a situational variable—whether participants were told to rush or take their time—led to reliable differences in helping rates.

Other behavioral studies, however, have found reliable associations between religiosity and prosociality but under limited conditions. In one study, participants played a public goods game, which allowed researchers to compare levels of cooperation between secular and religious kibbutzim in Israel. In this game, two members of the same kibbutz who remained anonymous to each other were given access to a "public good"—an envelope with a certain amount of money. Each participant simultaneously decided how much money to withdraw from the envelope and keep. If the sum of the requests was equal or below the total amount in the envelope, players got to keep the money they requested. If the sum of the requests exceeded this total, the players

received nothing. The results showed that, controlling for relevant predictors, systematically less money was withdrawn in the religious kibbutzim than in the secular ones (Sosis & Ruffle, 2003).

Thus, unlike studies such as the "Good Samaritan," there were greater levels of contributions to the public good in religious than secular kibbutzim. One key difference is that reminders of God are likely to be chronically present in religious kibbutz, where religious prayer and attendance are a daily part of life. Another is that prosociality in the religious kibbutz clearly benefited ingroup members. In the kibbutzim study, highly religious men, who engaged in daily and communal prayer, took the least amount of money from the common pool, thereby showing the greatest amount of ingroup cooperation. It is also possible that regular, communal prayer involves public ritual participation, which, independent of devotion to a morally concerned deity, might also encourage more prosociality (Sosis & Ruffle, 2003).

In another ambitious investigation spanning fourteen small-scale societies of pastoralists and horticulturalists, Henrich and colleagues (2009) measured the association between religious belief and prosocial behaviour in three well-known economic games. In the Dictator Game, two anonymous players are allotted a sum of real money in a one-shot interaction. Player 1 must decide how to divide this sum between himself and Player 2. Player 2 then receives the allocation from Player 1, and the game ends. Player 1's allocation (the *offer*) to Player 2 provides a measure of generosity or fairness in this context. The Ultimatum Game is identical to the Dictator Game, except that Player 2 can accept or reject the offer. If Player 2 specifies that he would accept the amount of the actual offer, then he receives the amount of the offer and Player 1 receives the rest. If Player 2 specifies that he would reject the amount actually offered, both players receive zero. Player 1's offer measures a combination of intrinsic motivation toward fairness in this context and an assessment of the likelihood of rejection. In the Third Party

Punishment Game two players are again allotted a sum of money, Player 1 must decide how much of this sum to give to Player 2, but now a third player also receives the equivalent of one-half the sum and has the opportunity to punish Player 1 for any given offer, by paying a certain cost. Player 1's offer measures a combination of intrinsic motivation toward fairness and an assessment of the punishment threat.

Henrich and colleagues found that, controlling for a variety of socio-demographic variables, those who believed in the moralizing Abrahamic God (as opposed to those who believed in the local deities who are not as morally concerned) made larger offers in the Dictator Game and the Ultimatum Game. However belief in God did not reliably predict offers in the Third Party Punishment Game. One possible explanation for this pattern of findings is that belief in a morally involved supernatural watcher is most likely to matter when the situation contains no threat of third party punishment. In other words, the credible threat of corporeal punishment might have crowded out the motivation to act fairly that is induced by fear of supernatural punishment.

Another approach to clarifying the nature and boundary conditions of religious prosociality is to investigate the altruistic or egoistic motivation underlying the prosocial act. One possibility holds that the greater prosociality of the religious is driven by an empathic motive to ameliorate the condition of others. Alternatively, prosocial behavior could be driven by egoistic motives, such as projecting a positive image, or avoiding guilt (failing to live up to one's prosocial self-image). The preponderance of the evidence supports the latter explanation. Studies repeatedly indicate that the association between conventional religiosity and prosociality occurs primarily when a reputation-related egoistic motivation has been activated (Batson, et al, 1993). In one experiment, for example, participants were given the option of volunteering to raise

money for a sick child who could not pay his medical bills (Batson, et al., 1989). In one

condition, participants were led to believe that they would certainly be called upon if they

volunteered. In another, participants could volunteer while told that they were unlikely to be

called upon. In the latter condition, participants could reap the social benefits of feeling (or

appearing) helpful without the cost of the actual altruistic act. Only in this latter situation was a

link between religiosity and prosociality evident. Many studies have corroborated that religiosity

predicts prosocial behavior primarily when the prosocial act could promote a positive image for

the participant, either in their own eyes or in the eyes of observers (Batson, et al, 1993).

As insightful as these behavioral studies are, however, causal inference has been limited

by their reliance on correlational designs. If religiosity is related to prosocial behavior under

some contexts, it is possible that having a prosocial disposition causes one to be religious, or that

a third variable (such as dispositional empathy or guilt-proneness) causes both prosocial and

religious tendencies. Recent controlled experiments have addressed this limitation by

experimentally inducing thoughts of supernatural agents and then measuring prosocial behavior.

When Big Eye in the Sky is Watching

If religious belief has a causal effect on prosocial tendencies, then experimentally

induced thoughts of morally involved supernatural agents should increase prosocial behavior in

controlled conditions. In one such experimental study, children were explicitly instructed not to

look inside a box, and then left alone in the room with it (Bering, 2006). Those who were

previously told that a fictional supernatural agent, Princess Alice, was watching were

significantly less likely to peek inside the forbidden box. Another study (Johnson & Bering,

2006) found a similar effect among university students. Participants who were randomly

assigned to a condition in which they were casually told that the ghost of a dead student had been spotted in the experimental room cheated less on a rigged computer task. A different study conceptually replicated this effect—temporary and subliminal activation of God concepts led to lower rates of cheating (Randolph-Seng & Nielsen, 2007). In the control condition of this study, religiosity as an individual difference measure did not predict levels of cheating.

We have proposed that the concept of moralizing Gods stabilized cooperation levels in large groups of anonymous individuals, where reputational and reciprocity incentives are insufficient. If so, then reminders of God may not only reduce cheating, but they may also curb selfish behavior and increase generosity towards strangers. This hypothesis was tested and confirmed in two anonymous Dictator Game experiments, one with a sample of university students, and another with non-student adults (Shariff & Norenzayan, 2007). In one experiment, adult non-student participants were randomly assigned to three groups. Participants in the religious prime group unscrambled sentences that contained words such as God, divine, and spirit. The neutral control group played the same word game, but with non-religious content. The secular prime group played the game with words such as civic, jury, and police—thereby priming them with thoughts of secular moral authority. This well-established implicit priming procedure activates a particular concept without any conscious awareness (Bargh & Chartrand, 1999). Each participant subsequently played the anonymous Dictator Game. Nearly double the money was offered by the givers with God on their minds. Furthermore, the results showed not only a quantitative increase in generosity, but also a qualitative shift in social norms. In the control group, the modal response was purely selfish: most players pocketed all ten dollars. In the God group, the mode shifted to fairness: a plurality of participant split the money evenly. The group which was primed with secular institutions of morality also showed greater generosity

than the control group, in fact, as much as was found in the God group. This finding has been replicated with a Chilean Catholic sample, showing similar religious priming effects on generosity in the Dictator Game, and on cooperation levels in the Prisoner's Dilemma Game (Ahmed & Salas, 2009). Another set of studies demonstrated that religious primes increased (1) the accessibility of prosocial thoughts, and (2) charitable behavioral intentions (Pichon, et al, 2007).

What are the psychological processes that might explain this link between God primes and prosociality? Two accounts suggest themselves, and both gain plausibility given two distinct but well-supported empirical literatures. The *behavioural priming* or *ideomotor* account is supported by considerable evidence showing that prosocial behavior can be facilitated by activating nonconscious altruistic thoughts (e.g., Bargh, et al., 2001). Thoughts of God are associated with notions of benevolence and charity, and therefore activating these thoughts may activate prosocial behaviour. The *supernatural watcher* account is supported by extensive evidence that heightened reputational concerns increase prosociality (e.g., Fehr & Fischbacher, 2003). Thoughts of God may have increased the feeling of being watched by a morally concerned observer, thus removing the purported anonymity of the situation. This in turn is known to increase prosocial behaviour. These two mechanisms are not mutually exclusive, and may even reinforce each other in everyday life.

This raises a crucial question: what evidence can distinguish the supernatural watcher account from behavioral-priming processes? First, if the priming effects of God concepts are weaker or nonexistent for non-believers, then the effect could not be solely due to ideomotor processes, which are typically impervious to prior explicit beliefs or attitudes. Second, if God primes make religious participants attribute actions to an external source of agency, these effects

could not be explained by ideomotor processes, as such manipulations disambiguate the felt presence of supernatural watchers from their alleged prosocial consequences. Finally, if the supernatural watcher explanation is at play, religious primes should arouse social evaluation of the self. Moreover, such reputational awareness should moderate the magnitude of the prime's effect on prosocial behavior.

Currently, evidence on the first point is mixed. However, close examination of the findings betrays a revealing pattern. All but one of these priming studies recruited student samples, which can be problematic since beliefs, attitudes, and social identity among students can be unstable, raising questions about the reliability of chronic individual difference measures of religious belief and identity measures for students who are still in transition to adulthood (Sears, 1986; Henrich, Heine, Norenzayan, in press). Thus, student atheists might be at best "soft atheists." In the only religious priming experiment we are aware of that recruited a non-student adult sample (Shariff & Norenzayan, 2007, Study 2), the effect of the prime emerged again for theists, but disappeared for these "hard" atheists.

Regarding the second question, one experiment clearly separates the felt presence of a supernatural agent from prosocial outcomes. Dijksterhuis, Preston, Wegner, & Aarts (2008) found that after being subliminally primed with the word "God," believers (but not atheists) were more likely to ascribe an outcome to an external source of agency, rather than their own actions. In addition, religious belief positively correlates with greater concern with social evaluation of the self (Trimble, 1997), and recent experimental evidence points to this being a causal relationship. Gervais & Norenzayan (2009) found that priming God concepts increased public self-awareness (Govern & Marsch, 2001) – a measure that taps into feelings of being the target of social evaluation. In contrast, and as predicted, the prime had no effect on private self-

awareness. All the evidence points to the prediction that prosocial effects of religious primes are moderated by measures of evaluative concern, a key expectation of the supernatural watcher hypothesis, which would be incompatible with a purely ideomotor account.

In Gods We Trust

In the absence of reputational information about a stranger's prosocial inclinations, outward evidence of sincere belief in the same or similar morally concerned Gods may serve as a reliable cooperative signal. But a signal is reliable only to the extent that it cannot be faked by potential freeloaders. Since professions of religious belief can be easily faked, theorists of religion have recognized that evolutionary pressures have favoured costly religious commitment, such as restrictions on behaviour and some forms of ritual participation, which validates the sincerity of otherwise unobservable religious belief (Irons, 2001; Sosis & Alcorta, 2003).

Evidence from attitudinal surveys shows religious individuals to be considered more trustworthy and more cooperative than nonbelievers, and not just by the religious (Edgell, Gerteis, & Hartmann, 2006). Extensive ethnographic evidence also suggests that in historical and social contexts lacking reliable social monitoring institutions, membership in religious communities who adhere to the same Gods may have lowered monitoring costs and thereby facilitated trust-dependent trade relations. The spread of Islam in Africa, which preceded the flourishing of wide-scale trade among Muslim converts (Ensminger, 1997), and the trade networks of Medieval Jewish Maghrebi merchants (Greif, 1993) are two examples consistent with the idea that costly commitment to the same supernatural deity can foster intense cooperation in communities otherwise highly vulnerable to defection.

The few laboratory studies examining religion's role in trusting behavior support this conclusion as well. Trust can be defined as a costly investment in a person or entity, with the future expectation of return. In one well-researched laboratory game of trust (Berg, Dickhaut, McCabe, 1995), participants were randomly assigned to be a proposer (truster) or a responder (trustee). In the first step, the proposer decides how much money to forward to the responder, which gets multiplied. In the second step, the responder decides how much money to send back to the proposer. By transferring money to the responder, the proposer stands to gain, but only if the responder can be trusted to reciprocate. In a variation of this trust experiment, researchers measured individual differences in the religiosity of the proposer and the responder. In addition, in some trials proposers knew about the level of religiosity of the responder. Results indicated that more money was forwarded to responders when they were perceived to be religious, and this was particularly true for religious proposers (Tan & Vogel, 2008). Furthermore, religious responders were more likely to reciprocate the proposer's offer than less religious responders. But if sincere belief in a morally concerned deity serves as a reliable signal that elicits cooperation, where does religious trust end and distrust begin? How do believers approach believers of other faiths, and especially those who do not believe at all? In other words, what are the limits of religious prosociality?

Religious Distrust and the Limits of Religious Prosociality

The literature reviewed thus far suggests that beliefs in supernatural agents capable of monitoring human behavior are potent motivators of prosocial behavior and trust. But how far does this trust extend? For example, do religious believers preferentially trust members of other, perhaps competing, faiths? If so, are there any groups of people who are systematically excluded from the reach of religious prosociality?

People should be most trusting of those who worship the same deities as them. However, the logic of religious prosociality predicts that trust can be extended beyond the immediate religious community as long as these outsiders adhere to some kind of supernatural sanctioning that constrains their behaviour. Thus Muslims might be able to trust Christians, who at least in principle believe in the same all-powerful, morally involved God. Christians might trust Hindus who believe in an entire pantheon of supernatural monitors. Trust can be extended to potential cooperation partners if the latter adhere to some kind of supernatural monitoring which induces greater cooperativeness.

The claim that members of one religious group will also trust members of other religious groups is admittedly speculative, but it does receive some support. Sosis (2005) argues that religious signals of trustworthiness can be co-opted by members of other religious groups. He notes, for example, that Mormons are viewed as particularly trustworthy nannies by non-Mormon New Yorkers (Frank, 1988), and Sikhs are viewed by non-Sikhs as trustworthy economic partners (Paxson, 2004). In at least some situations, observers appear to use commitment to even rival gods as signals of trustworthiness.

Matters are different for atheists, however. If belief in gods is perceived to be a reliable signal of trustworthiness, it follows that those who explicitly deny the existence of God are sending the wrong signal: they are perceived to be non-cooperators by the religious. A key consequence of religious prosociality, therefore, is distrust of atheists. History is rife with moral distrust of atheists. Even as major a figure of the Enlightenment as John Locke thought that atheists undermine the moral fabric of society: "…those are not at all to be tolerated who deny the being of a God. Promises, covenants, and oaths, which are the bonds of human society, can

have no hold upon an atheist. The taking away of God, though but even in thought, dissolves

all." Ironically, this quote comes from his 1689 Letter Concerning Toleration!

At first glance, anti-atheist distrust and prejudice is puzzling. Atheists are not a

particularly large, visible, or powerful group in religious societies. Yet there is abundant

evidence that atheists are the least trusted group in cultures that have religious majorities. Polls

leading up to the 2008 presidential election in the United States vividly illustrate this selective

exclusion of atheists. In a February, 2007 Gallup poll, for instance, 95% of respondents stated

that they would vote for a Catholic candidate, 92 % would vote for a Jewish candidate, and 72%

would vote for a Mormon Candidate. However, fewer than half (45%) of people said that they

would vote for an atheist. In fact, atheists were the only group included in the poll (including

twice-divorced candidates, elderly candidates, and homosexual candidates) that could not recruit

a majority vote. Relative to other minority groups, antipathy towards atheists as measured in this

sort of poll has remained remarkably stable over the last 50 years, decades which saw increasing

acceptance of most other groups (Edgell, Gerteis, & Hartmann, 2006). This pattern of findings is

consistent with the idea that religious distrust is not merely a reflection of a general distrust of

outgroup members. People following other religions are as much outsiders, and often more so,

than atheists. Yet atheists who are ethnically similar are trusted less than even members of

outgroups who are religiously, linguistically, and ethnically different.

This anti-atheist prejudice extends to a wide range of moral domains. In a widely

discussed paper, Edgell and colleagues (2006) found that respondents rated atheists as the group

that least shares their own vision of America, and rated an atheist as the individual that they

would most disapprove of as a marriage partner for their child. This pattern is striking. As these

authors (pp. 217-8) note:

"Americans are less accepting of atheists than of any of the other groups we asked about, and by a wide margin. The next-closest category on both measures is Muslims. We expected Muslims to be a lightning-rod group, and they clearly were. This makes the response to atheists all the more striking. For many, Muslims represent a large and mostly external threat, dramatized by the loss of life in the World Trade Center attacks and the war in Iraq. By contrast, atheists are a small and largely silent internal minority."

Indeed, in the context of recent conflicts in the world that involve Americans, it is surprising that atheists were liked less than Muslims. However, in the context of religious prosociality, the logic underlying anti-atheist prejudice becomes clear. Atheists, who do not believe in punishing supernatural agents and who do not adopt conspicuous signals of religious commitment, should above all be viewed as untrustworthy, rather than "merely" unpleasant. This prediction stands apart from a long tradition in social psychology that takes a one-size-fits-all approach to prejudice, viewing it as a generalized feeling of dislike towards outgroups. Although there is some tangential evidence that distrust is central to anti-atheist prejudice—for instance, most Americans report that morality is impossible without belief in God (Pew Research Center, 2002)—the hypothesis has only recently received rigorous empirical attention.

Gervais, Shariff, & Norenzayan (2009) derived a number of more specific predictions about the psychological underpinnings of potential atheist distrust (rather than atheist dislike). First, and most obviously, we predicted belief in God would be more strongly related to specific distrust of atheists rather than general dislike of atheists. As expected, belief in God was more strongly related to distrust of atheists than to dislike of atheists, based on a computer task that measures implicit associations (based on reaction times when an atheist target was paired with distrust words like "lying" and "dishonest," as opposed to dislike words such as "hostile" and "hate").

Second, we predicted that exclusion of atheists would be most pronounced when trust is a particularly valued characteristic. To explore this possibility, we had participants state whether they would prefer to hire an atheist or a religious candidate for either a high-trust job (a daycare worker) or a low-trust job (a waitress) that were matched for other characteristics such as friendliness and intelligence. As expected, participants significantly excluded the atheist when hiring a daycare worker, and showed no such preference when hiring a waitress.

Finally, we predicted that participants would rate an atheist as less trustworthy, though no less pleasant or intelligent, than a religious believer. In addition, we sought to compare anti-atheist prejudice to ethnic prejudice, which is a benchmark comparison in the study of prejudice. To do so, we gave participants two fictional targets to rate on a number of attributes. We rigged the experiment so that one target would always be an atheist of the participant's own ethnicity and the other target would always be religious, but of a different ethnicity. Overall, participants did not report that they felt more warmly towards either target. Nor did they differentiate between the targets based on intelligence or pleasantness. But they rated the atheist as significantly less trustworthy than the religious target.

These studies revealed consistent distrust of atheists, even within the relatively secularized context of a liberal university in Vancouver, Canada. Atheist distrust should be even more potent in more strongly religious societies, in which atheists would be viewed as even more deviant. At the same time, distrust of atheists among religious believers might be reduced in countries with more atheists. Though seemingly intuitive, this prediction runs counter to decades of research demonstrating that prejudice increases in concert with relative outgroup size (e.g., Fossett & Kiecolt, 1989; Giles & Evans, 1986; Pettigrew, 1959). Gervais (2009) explored the relationship between atheist prevalence and distrust of atheists in a series of three studies. In an

archival analysis of anti-atheist prejudice among more than 40,000 believers from 54 countries, anti-atheist prejudice was reduced where atheists are more common, controlling for individual differences in age, sex, educational attainment, income, liberalism/conservativism, and church attendance, as well as international differences in socioeconomic development and Individualism/Collectivism. In another study, a more focused followup study using a university sample, perceptions of how common atheists are were associated with reduced anti-atheist prejudice, especially among the *most* deeply religious participants. Finally, it was found that experimentally induced reminders of how common atheists are statistically eliminated anti-atheist prejudice. Across all of these studies, anti-atheist prejudice was reduced where atheists are common, further setting anti-atheist prejudice apart from other forms of prejudice that are less influenced by religious prosociality.Combined, these studies support the notion that anti-atheist prejudice is based on distrust and distinct from other types of prejudice, as an understanding of religious prosociality predicts.

How to Keep Free-riders Away: The Evolution of Costly Religious Behaviours

We have seen that religious thoughts increase prosocial behaviour, religious faith evokes trust, and lack of belief leads to social exclusion. But if religious groups are cooperative groups, what would prevent selfish imposters from faking belief, receiving cooperative benefits without reciprocating? Costly religious signals that cannot be easily faked, such as costly ritual performance (though not all rituals are costly), various restrictions on behaviour (sex, material belongings), diet (fasts and food taboos), and lifestyle (strict marriage rules, dress codes) were an evolutionary solution to this well-known problem of social life. These behaviours consume

effort, time and resources, and appear irrational to outsiders. But just as the irrationality of falling in love communicates commitment to a relationship (Gonzaga & Haselton, 2008), religious fervour has its logic too: it communicates a hard-to-fake signal of commitment to the group, as only true believers would be willing to pay these costs. These high costs discourage potential freeloaders, and explain why "strict" churches, mosques, and synagogues are strong—they have more committed members.

Sociological analyses are consistent with the idea that groups imposing more costly requirements have members who are more committed. Controlling for relevant socio-demographic variables, "strict" Protestant and Jewish denominations (Mormons, Orthodox) show higher levels of church and synagogue attendance and more monetary contributions to their religious communities (despite *lower* average income levels) than less strict ones (Methodist, Reform) (Iannacone, 1992). However these findings do not demonstrate that strictness predicts community survival and growth. In another systematic investigation, religious and secular communes in 19th century America, which had to solve the collection action problems to survive, were examined. Religious communes were found to outlast those motivated by secular ideologies such as socialism (Sosis & Alcorta, 2003).

In a further quantitative analysis of 83 of these religious and secular communes (Sosis & Bressler, 2003) for which more detailed records are available, it was found that religious communes imposed more than twice as many costly requirements (including food taboos and fasts, constraints on material possessions, marriage, sex, and communication with the outside world) than secular ones, and this difference emerged for each of the 22 categories of costly requirements examined. Moreover, religious communes were about three times less likely than secular ones to dissolve at any given year as a result of internal conflict or economic hardship.

Importantly for costly religious signaling, the number of costly requirements predicted religious commune longevity (R^2 = .38) after controlling for population size and income, and year the commune was founded; contrary to expectations, the number of costly requirements did not predict longevity for secular communes. Finally, religious ideology was no longer a predictor of commune longevity once the number of costly requirements was statistically controlled, suggesting that the survival advantage of religious communes was due to the greater costly commitment of their members. These results are suggestive, but imply that greater costly commitment is at best a partial explanation as to why religious communes outlasted secular ones. Other aspects of religion that might promote greater community stability are open for investigation.

If costly religious behaviours are a commitment device that ensures success of religious groups, they are an even more important element in making for successful religious leaders (Henrich, 2009). When religious leaders' actions credibly signal their underlying belief, this in turn helps their beliefs to spread. If, on the other hand, they are not willing to make a significant sacrifice for their belief, then observers–even children–withhold their own commitment. Once people believe, they are more likely to perform similar displays themselves, which offers another explanation as to why potentially costly behaviours spread in religious groups that offer cooperative benefits to their members. Potentially costly displays often come in the form of altruism towards other ingroup members, further ratcheting up the level of ingroup cooperation and benefiting such groups in cultural group selection.

Clearly more research is needed, including further experimental studies and alternative mathematical models of costly religious behaviour (either as a stable strategy characteristic of individuals, or as a stable strategy that takes into account intergroup social competition), before

firm conclusions can be reached. The evidence, however, is suggestive of the possibility that religious belief, to the extent that it could be advertised with sincerity, may enhance within-group interpersonal trust, lower monitoring costs, further reinforcing intragroup prosocial tendencies. This resolves a key puzzle about religion that has long baffled observers—why many religious behaviours and rituals demand sacrifice of time, effort, and resources.

How Big Watchful Deities Helped Construct Big Groups

Belief in moralizing Gods enhance within-group interpersonal trust, lowers monitoring costs, and thus stabilizes prosocial norms even in the absence of social monitoring mechanisms. If so, religious prosociality would be expected to expand the reach of cooperative norms, facilitating the emergence of larger cooperative communities which otherwise would be vulnerable to collapse. We examine this hypothesized association between moralizing Gods and large group size next.

From large village settlements at the dawn of agriculture, to modern metropolises today, human beings are capable of living in extraordinarily large cooperative groups. However, extrapolating from cross-species comparisons of neocortex size, it has been estimated that human group sizes cannot exceed 150 individuals before groups divide or collapse (Dunbar, 2003). While this specific number can be debated, it is apparent today that the size of human settlements since the end of the Pleistocene far exceed the limitations that kin-based and reciprocity-based altruism place on group size.

Cultural evolution, driven by between-group competition for resources and habitats, has favored large groups. However large groups, which until recently lacked social monitoring mechanisms, are vulnerable to collapse due to high rates of freeloading (Gintis, et al, 2003). If

unwavering and pervasive belief in moralizing Gods buffered against such freeloading, then belief in such Gods should be more likely in larger human groups where the threat of freeloading is most acute. In a cross cultural analysis of 186 societies using the Standard Cross Cultural Sample, group size was indeed a strong predictor of belief in moralizing Gods. The larger the group size, the more likely the group culturally sanctioned omniscient, all-powerful, morally concerned deities who directly observe, reward, and punish social behavior (Roes & Raymond, 2003). This finding held controlling for the cultural diffusion of moralizing Gods via Christian and Muslim missionary activity, as well as for indicators of population density and societal inequality. Similarly, controlling for a number of factors, moralizing Gods are more likely in societies with high water scarcity, where the need to minimize freeloading is also pronounced (Snarey, 1996). Thus, moralizing Gods are culturally selected when freeloading is more prevalent or particularly detrimental to group stability.

How Big Watchful Deities Came to Be: Alternative Evolutionary Scenarios

We have argued (see also Norenzayan & Shariff, 2008; Norenzayan, in press; Shariff, et al, 2010) that integrating cognitive byproduct theories of religion and cultural evolutionary explanations for cooperation yields a cogent explanation for the rise and persistence of religious beliefs. Once belief in supernatural agency emerged as a byproduct of mundane cognitive processes, cultural evolution favoured the spread of a special type of supernatural agent – moralizing high Gods. Growing evidence is converging on the conclusion that sincere belief in these omniscient supernatural watchers facilitated cooperation and trust among strangers (Norenzayan & Shariff, 2008). Not surprisingly, this cultural spread coincided with the

expansion of human cooperation into ever larger groups over the last fifteen millenia (Cauvin, 2000).

An alternative evolutionary account (e.g. Bering, McLeod,, & Shackelford, 2005; Johnson & Bering, 2006) is that belief in morally concerned Gods was naturally selected by maximizing the genetic fitness of group-living individuals. In particular, such belief reduced the fitness costs associated with non-cooperation in an intensely social, gossiping species such as ours, where individual survival heavily depends on group-living. Although there is considerable agreement between this view and ours, the evolutionary scenario we have outlined here has the virtue of explaining a feature of religious prosociality that would be baffling if it arose as a genetic adaptation – namely, the systematic cultural covariation between the prevalence of moralizing Gods and group size (e.g., Roes & Raymond, 2003). The deities of most small-scale societies tend to be neither fully omniscient, nor morally concerned. This is puzzling since these groups more closely approximate ancestral conditions, and should be most likely to reveal such a genetic adaptation. However, consistent with the cultural evolutionary scenario, it is the evolutionarily recent anonymous social groups, facing the breakdown of reputational and kin selection mechanisms for cooperation, which most strongly espouse belief in such Gods.

Second, a genetic adaptation account at the level of individuals faces another theoretical challenge: mathematical modeling of cooperative behaviour shows that reputation management as a strategy does not achieve evolutionary stability beyond dyadic relationships (Henrich & Henrich 2007). To the extent that these mathematical models are empirically supported, widespread belief in God concepts cannot be explained by reputational sensitivity at the individual level. To account for this, another variant of the cultural evolutionary account would invoke cultural group selection, such that ancestral societies that learned to uphold moralizing

God concepts would have outcompeted those without, given the cooperative advantage of believing groups (Wilson 2002). Unlike genetic group selectionist accounts of altruistic behaviour in humans, which face a number of well-known theoretical and empirical challenges (e.g., Atran 2002), cultural group selection is more plausible theoretically and substantiated empirically (see, e.g., Henrich & Henrich 2007).

Finally, a purely genetic adaptation account makes a surprising, and in our view empirically questionable, prediction. Namely, if belief in moralizing Gods is strictly innate, then real atheists should not exist in any great numbers. In fact, atheists are the fourth largest religious group in the world, trailing only Christians, Muslims, and Hindus; people who do not believe in any gods are 58 times more numerous than Mormons, 41 times more numerous than Jews, and twice as numerous as Buddhists (Zuckerman, 2007). One argument is that atheists – hundreds of millions of people – are deluded about their own beliefs, and that "explicit atheism" masks a universal "implicit theism" Although a number of authors have argued for such a scenario, and have doubted the long-term plausibility of atheism (e.g., Barrett, 2004; Boyer, 2008; Bloom, 2007), this claim has not received any direct empirical support. Furthermore, there is preliminary evidence that, in at least some cases (as already discussed), self-proclaimed atheists, unlike believers, are uninfluenced by even implicit and subliminal reminders of God (Dijksterhuis, et al., 2008; Shariff & Norenzayan, 2007, Study 2). Barrett (2004) noted that "a complete scientific account of belief in God must explain not only why it is that people believe, but also why sometimes they don't believe in God or gods." It is unclear how a genetic adaptationist explanation for belief explains why anyone, let alone hundreds of millions of people, does not believe in gods. In contrast, a cultural evolutionary account can more easily accommodate the viability of nonbelief, even at a large scale. Even if humans are equipped with deeply rooted,

reliably developing cognitive dispositions that make belief in supernatural agents "easy to think," cultural variability in the availability of religious models in one's environment may interact with these tendencies, and give rise to different levels of religious conviction in adulthood, including nonbelief. However, given that we know next to nothing about the psychological antecedents of atheism, we do not yet understand what aspects of one's social environment, if any, or socialization period, predict the likelihood of nonbelief in adulthood.

Conclusions

Voltaire said, "if there were no God, it would be necessary to invent him." We have argued, with Voltaire, that the idea of morally involved, omniscient Gods was a remarkable cultural innovation that solved the problem of cooperation in the large anonymous communities of recent human history. As groups grow in size, social situations become more anonymous, and prosocial tendencies are hard to sustain. However, if "watched people are nice people," as extensive research in social psychology and behavioural economics shows, then "supernatural watchers" who can observe social interactions and threaten to punish selfish acts and reward prosocial ones, encourage cooperative behaviour and trust even when no one is watching. Because religious groups are communities of co-operators based on trust, they are vulnerable to collapse unless free-riders are detected and excluded. Evolutionary pressures must have therefore selected for costly religious behaviours (such as fasts and some forms of costly ritual participation) that are hard to fake and are reliable indicators of honest commitment.

Religious prosociality is a complex coevolutionary phenomenon that draws jointly on genetic and cultural processes. The human psychological repertoire honed by natural selection gave rise to hypervigilence in detecting intentional agents and their mental states, and active

management of prosocial reputations. These tendencies facilitated the cultural transmission of belief in moralizing Gods, which in turn caused greater levels of prosocial tendencies, ultimately leading to larger and more stable cooperative groups. Costly religious commitment further buffered religious groups from freeloaders by serving as a reliable signal which advertised a hard-to-fake cooperative intention towards ingroup members.

Many religious traditions around the world explicitly encourage the faithful to be unconditionally prosocial (Batson, et al., 1993; Monsma, 2007), yet theoretical considerations and empirical evidence indicate that religiously socialized individuals should be, and are, much more discriminate in their prosociality. Although empathy and compassion as social-bonding emotions do exist, and may play a role in prosocial acts some of the time (Keltner & Haidt, 2001), there is little direct evidence we are aware of that such emotions are implicated in religious prosociality. We await more research to shed light on any possible links between religious prosociality and the prosocial emotions such as empathy, compassion, guilt, and shame.

The preponderance of the evidence points to religious prosociality being a bounded phenomenon. Religion's influence on prosociality is most evident when the situation calls for maintaining a favorable social reputation within the ingroup. When thoughts of morally concerned deities are cognitively salient, an objectively anonymous situation becomes non-anonymous and therefore reputationally relevant. This could occur either when such thoughts are induced experimentally, or in religious situations, such as when people attend religious services or engage in ritual performance. This explains why the religious situation is more important than the religious disposition in predicting prosocial behavior.

Morally concerned deities, combined with costly religious signalling, were until recently the primary stabilizers of large cooperative social groups. However the spread of secular institutions, such as courts, policing authorities, and effective contract-enforcing mechanisms in some modern societies raise the spectre of large scale prosociality without religion. Religions continue to be powerful facilitators of prosociality, but they may no longer be the only ones. While this is a complex question that cannot be resolved with the current available evidence, there are some indications that secular societies may have passed a threshold, no longer needing religion to sustain large scale prosociality. For example, active members of secular organizations are at least as likely to report donating to charity as active members of religious ones (Putnam, 2000). Supporting this conclusion, experimentally induced reminders of secular moral authority had as much effect on generous behaviour in an economic game as reminders of God (Shariff & Norenzayan, 2007), and there are many examples of modern large, cooperative societies with a great degree of intragroup trust, which are not very religious (Hermann, Thöni, & Gächter, 2008). In fact, some of the most cooperative and trusting societies on earth, such as those in Scandinavia, are also the least religious in the world (Zuckerman, 2008). People have found ways to be nice to strangers without God.

Is the future of the world towards secularization, or towards more religious fervour? Worldwide sociological evidence shows that societies, as they experience economic growth and greater conditions of existential security, move towards more secularization; yet, because religiosity has a net positive effect on fertility rates, even after controlling for socioeconomic status (Blume, 2009), secular societies are shrinking, while religious ones are expanding. As a result, a larger proportion of the world's population remains religious, and the world has more religious people than ever before (Norris & Inglehart, 2004).

Despite the scientific progress in explaining the effects of religion on prosociality, open and important questions remain. In recent years moral psychology has received a great deal of scientific attention (Haidt, 2007), and while most of the studies reviewed above concern behavioral outcomes, the relation between religious prosociality and moral intuitions and reasoning is ripe for further investigation. The finding that religiosity evokes greater trust also calls for more experimental and theoretical research, including mathematical modeling to establish the specific conditions under which costly religious commitment could evolve as a stable individual strategy, and whether multilevel selection models are needed. Finally, as we have seen, religious prosociality is not extended indiscriminately; the 'dark side' of within-group cooperation is between-group competition and conflict (Choi & Bowles, 2007). The same mechanisms involved in ingroup altruism may also facilitate outgroup antagonism. This is an area of no small debate, but scientific attention is needed to examine precisely how individuals and groups determine who are the beneficiaries of religious prosociality, and who its victims

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