

Creating Consilience

Integrating the Sciences

and the Humanities

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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, scientific interest in religion is on the rise again. Long the exclusive province of the humanities and left outside of the mainstream of psychology and the cognitive and behavioral 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 behaviors within an evolutionary perspective. In putting together this synthesis, we cover a large amount of territory from evolutionary biology, sociology, history, evolutionary and cultural anthropology, game theory, neuroscience, behavioral 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 that is grounded in an evolutionary perspective that gives center stage to human cultural evolution, and thus is compatible with cultural variability in religious thought and behavior across societies and throughout history (for discussions, see Richerson and Boyd 2005; Henrich and Henrich 2007). No doubt, this synthesis is in its infancy, and many important details and assumptions continue to be actively debated and elaborated. In this regard, we also highlight 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 theoretical speculations to explain the widespread existence of atheism as a psychological and cultural phenomenon.

The debate on religion’s role in prosocial behavior has been polemical. 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 and Norenzayan 2004; Sosis and 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 and Henrich

capacities that were evolutionary by-products of human cognitive architecture that, once in place, could give rise to belief in supernatural agents (gods, ghosts, ancestor spirits).

Religious beliefs draw on several core cognitive features that are reliably developing, and regularly reoccur across cultures and historical periods (Atran and Norenzayan 2004; Barrett 2004; Boyer 2001; Lawson and McCauley 1990). One such feature is derived from a mentalizing or “Theory of Mind” faculty, which allows people to detect and infer the content of other minds. This in turn supplies the cognitive basis for the dualistic intuition that “mind stuff” is distinct from “physical stuff” (Bloom 2007) and may give rise to the pervasive belief in disembodied supernatural agents, such as gods and spirits, who are believed to possess humanlike beliefs and desires (Guthrie, 1993; Barrett and Keil 1996). Consistent with this reasoning, thinking about God activates brain regions associated with theory of mind (Kapogiannis, et al. 2009; Schjoedt, Stodkilde-Jorgensen, Geerts, & Roepstorff 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 mediate this relationship (Norenzayan, Gervais, & Trzesniewski 2011). Finally, it appears that mentalizing may also explain why women tend to be more religious than men: women, who are generally superior mentalizers, find it easier to mentally represent supernatural agents, and, therefore, are more likely to believe in them (Norenzayan et al 2011).

The relationship between mentalizing and belief in supernatural agents rests on the important distinction between the “proper” domain of a mental faculty, and its “cultural” domain (Sperber 1996). The mentalizing faculty, that is applicable to human agents (its proper domain), is also partially triggered by supernatural agent beliefs (one of its cultural domains that overlaps with the proper domain). This explains how a genetically evolved mental faculty (mentalizing), that was naturally selected because of a pre-existing proper domain (human agents), can produce culturally diverse mental representations (various supernatural agent beliefs) that nevertheless are activated by it. Once supernatural agent beliefs were cognitively in place, their content could be subjected to cultural selection. Despite being anthropomorphized (Barrett and Keil 1996), supernatural agents, unlike their earthly counterparts, are believed to transcend physical, biological, and psychological limitations, some more than others (Atran and Norenzayan 2004; Boyer 2001). Furthermore, some cultural versions gave 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 may have reliably signaled the presence of devotion to these agents and galvanized greater group commitment, reinforcing ingroup cooperative norms. Religious prosociality thus softened the genetic constraints inherent in kinship-based and (direct or indirect) reciprocity-based altruism that otherwise severely limit group size. In this way, religious prosociality facilitated the rise of stable, large, cooperative moral communities of genetically unrelated individuals (Norenzayan and Shariff 2008; Roes & Raymond 2003).

A second core psychological feature that religions exploit is the acute human sensitivity to prosocial reputation (Fehr and Fischbacher 2003), a psychological mechanism originally unrelated to religion, which evolved to facilitate various strategies of reciprocal cooperation among interacting humans (Nowak and Sigmund 2005; Gintis, Bowles,

Boyd, and 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. Highlighting the importance of reputational mechanisms in the evolution of prosocial behavior, studies have shown that people are more prosocial in economic games when the situation is not anonymous (Hoffman, McCabe, Shachat, and Smith 1994), and when they expect repeated future interactions than if future interactions are absent (Fehr and Gächter 2002). Even subtle exposure to schematic drawings resembling human eyes increase prosocial behavior in anonymous economic games (Haley and Fessler 2005) and decrease cheating in naturalistic settings (Bateson, Nettle, and 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 non-believers alike. 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 humans (for distinct but related arguments, see Johnson and Bering 2006; Johnson 2009; Bering 2011).

The line of reasoning just outlined 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. However, this should be the case only to the extent that 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 that 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

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religious people are more prosocial than the non-religious (Brooks 2006). However, it remains unresolved whether this charity gap persists beyond the in-group 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 were students at the Princeton Theological Seminary who were generally religious, but nevertheless scored differently on several distinct dimensions of religiosity. They 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 dimension or degree of religiosity and helping in this anonymous context (Darley and 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, albeit 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 (Sosis and Ruffle 2003). In this game that assesses cooperation and/or coordination, 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 for themselves. If the sum of the withdrawals was equal or below the total amount in the envelope, players got to keep the money they requested. If the sum of the withdrawals 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.

Thus, unlike studies such as the “Good Samaritan,” there were greater levels of contributions to the public good in religious rather 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 in-group 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 in-group 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 and Ruffle 2003).

In another ambitious investigation spanning 14 small-scale societies of pastoralists and horticulturalists, Henrich and colleagues (2009) measured the association between religious belief and prosocial behavior 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 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 sociodemographic 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 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. 1993). 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

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religiosity and prosociality evident. Several studies conducted by Batson and his colleagues 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 issue 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 and 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. In these two studies, however, it is unclear whether the supernatural constructs being activated were perceived to be morally concerned. In a different study, temporary and subliminal activation of God concepts led to lower rates of cheating in an anonymous context (Randolph-Seng and 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 also curb selfish behavior and increase generosity toward 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 and Norenzayan 2007). In one experiment, adult nonstudent 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 nonreligious 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 and 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 that 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 important finding suggests that religious belief is only one of several sources of prosociality—an idea to which we will return later. 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 and Salas 2008). 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 *behavioral priming* or *ideomotor* account is supported by considerable evidence showing that prosocial behavior can be facilitated by activating non-conscious 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 behavior. The *supernatural watcher* account is supported by extensive evidence that heightened reputational concerns increase prosociality (e.g., Fehr and 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 behavior. 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 nonbelievers, 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. Lastly, 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, with some experiments showing religious priming effects irrespective of participants' prior religious conviction, whereas others demonstrating effects specific to believers only (Norenzayan, Shariff, and Gervais 2010). However, close examination of the findings betrays a revealing pattern. All but one of the relevant studies recruited student samples, which can be problematic because 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 et al. 2010). Thus, student atheists might be at best "soft atheists." In the only religious priming experiment we are aware of that recruited a nonstudent adult sample (Shariff and Norenzayan 2007, Study 2), the effect of the prime emerged again for theists, but disappeared for these "hard" atheists.

Regarding the supernatural watcher account, being subliminally primed with God is likely to ascribe a supernatural presence. In addition, the activation of the supernatural watcher causal relationship increased prosocial feelings of being watched, but had no effect on prosocial behavior, which is a key prediction of a purely ideomotor

In the absence of outward evidence, the supernatural watcher may serve as a religiously motivated mechanism for individuals: they may be more generous, and not just in the laboratory. Geographic evidence of social monitoring in the same God conditions across 23 countries is heavily dependent on the presence of wide-scale monitoring of Medieval-style behavior. The idea that the supernatural watcher explanation for cooperation in the Dictator Game is geographic data provides a natural explanation for example the high cooperation in social networks along with the high generosity elicited in the Dictator Game. These limitations are discussed in the next section.

The few laboratory studies that support this explanation are consistent with the idea that the supernatural watcher is a trust (Berg, Dickhaut, and Rabin 1995) or a prosocial (truster) behavior. The idea that the supernatural watcher is a trust (Berg, Dickhaut, and Rabin 1995) or a prosocial (truster) behavior is supported by the fact that the supernatural watcher is a trust (Berg, Dickhaut, and Rabin 1995) or a prosocial (truster) behavior. The idea that the supernatural watcher is a trust (Berg, Dickhaut, and Rabin 1995) or a prosocial (truster) behavior is supported by the fact that the supernatural watcher is a trust (Berg, Dickhaut, and Rabin 1995) or a prosocial (truster) behavior.

Regarding the second question, one experiment clearly separates the felt presence of a supernatural agent from prosocial outcomes. Dijksterhuis et al. (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 and Norenzayan (2009) found that priming God concepts increased public self-awareness (Govern and 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, which is a key expectation of the supernatural watcher hypothesis and 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. Evidence from attitudinal surveys shows religious individuals to be considered more trustworthy and more cooperative than non-believers, and not just by the religious (Edgell, Gerteis, and 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 trade relations across geographical boundaries and even ethnically diverse communities that heavily depend on trust. 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. These ethnographic data provide rich case studies. However, they are open to other interpretations, for example that religious conversions led to greater access to pre-established trade networks along these religious lines, or that some other feature correlated with religiosity elicited greater trust. Therefore, further controlled studies are needed to address these limitations.

The few laboratory studies that have examined 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, knowing that any transferred amount gets multiplied. In the second step, the responder decides how much money, if any, 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 and Vogel 2008). Furthermore, religious responders were more likely to reciprocate the proposer's offer than less religious responders. However, 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. 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 themselves. 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 behavior. 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 that 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 noncooperators by the religious. A key consequence of religious prosociality, therefore, is distrust of atheists. History is rife with 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"! (Locke [1983] 1689).

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most members of other religions receive some support. Sosis and Sosis (2003) reported that members of other religions are viewed as particularly trustworthy (Sosis 1988), and Sikhs are viewed as particularly trustworthy (Sosis 2004). In at least one study, rival gods as signals of

perceived to be a reliable indicator of the existence of God and moral agents by the religious. The lack of belief of atheists. History is full of examples as John Locke (1690) wrote those are not at all to be trusted. Oaths, which are the taking away of God, come from his 1689

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 percent of respondents stated that they would vote for a Catholic candidate, 92 percent for a Jewish candidate, and 72 percent for a Mormon Candidate. However, fewer than half (45 percent) said 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 toward atheists as measured in this sort of poll has remained remarkably stable over the last 50 years in the United States, decades that saw increasing acceptance of most other groups (Edgell, Gerteis, and Hartmann 2006). This pattern of findings is consistent with the idea that religious distrust is not merely a reflection of a general distrust of out-group 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 out-groups who are religiously, linguistically, and ethnically different.

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 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. (217–218)

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 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 toward out-groups. 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, and Norenzayan (2009) derived a number of specific predictions about the psychological underpinnings of potential atheist distrust (rather than atheist dislike).

First, and most obviously, they 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 like “hostile” and “hate”).

Second, they predicted that exclusion of atheists would be most pronounced when trust is a particularly valued characteristic. To explore this possibility, they had participants state whether they would prefer to hire an atheist or a religious candidate for either a high-trust job (a day-care 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 day-care worker, and showed no such preference when hiring a waitress.

Lastly, Gervais and colleagues predicted that participants would rate an atheist as less trustworthy, though no less pleasant or intelligent, than a religious believer. In addition, they sought to compare anti-atheist prejudice to ethnic prejudice, which is a benchmark comparison in the study of prejudice. To do so, they gave participants two fictional targets to rate on a number of attributes. They 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 toward either target. Nor did they differentiate between the targets based on intelligence or pleasantness. However, they rated the atheist as significantly less trustworthy than the religious target.

These studies reveal 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 and Kiecolt 1989; Giles and Evans 1986; Pettigrew 1959). Gervais (in press) 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/conservatism, and church attendance, as well as international differences in socioeconomic development and individualism/collectivism. In another study, a more focused follow-up 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. Lastly, it was found that experimentally induced reminders of how common atheists are statistically eliminated anti-atheist prejudice. Across all 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 is distinct from other types of prejudice, as an understanding of religious prosociality predicts.

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However, ability are cultural behavioral displays as adaptation to religious belief leads to it is costlier are cooperative receiving religious displays from 2 signals that commitment. However, for example, its than the assessing seems to be beliefs under natural selection. counteracted. However, to maintain the same level of commitment, the religious display is more costly than the atheist display. This is because the religious display is more visible to the community, and thus more costly to maintain. The religious display is also more likely to be interpreted as a signal of commitment, and thus more likely to be punished if it is not maintained. The atheist display is less visible to the community, and thus less costly to maintain. The atheist display is also less likely to be interpreted as a signal of commitment, and thus less likely to be punished if it is not maintained.

HOW TO GALVANIZE GROUP SOLIDARITY: THE EVOLUTION OF COSTLY RELIGIOUS DISPLAYS

One of the most striking aspects of many religious groups is the prevalence of costly religious displays. Costly ritual performances—such as rites of terror, various restrictions on behavior (sex, material belongings), diet (fasts and food taboos), and lifestyle (strict marriage rules, dress codes)—consume effort, time, and resources, are emotionally loaded, and appear irrational to outsiders. However, just as the irrationality of falling in love communicates commitment to a relationship (Gonzaga and Haselton 2008), religious fervour may have its logic too: it communicates a hard-to-fake commitment to the beliefs of the religious group.

However, the exact mechanisms by which these behaviors achieve evolutionary stability are currently debated. One prominent view is ritual signaling. Grounded in the behavioral ecology perspective, this view argues that the tendency for costly religious displays is a reliable signal of group commitment that was a naturally selected adaptation for life in cooperative groups (Sosis and Alcorta 2003). We have seen that religious thoughts increase prosocial behavior, religious faith evokes trust, and lack of belief leads to social exclusion. In this view, a signal is reliable only to the extent that it is costlier to fake by potential freeloaders than for cooperators. If religious groups are cooperative groups, what would prevent selfish imposters from faking belief, receiving cooperative benefits without reciprocating? Because mere professions of religious belief can be easily faked, evolutionary pressures have favored costly religious displays that are not subject to rational calculations of cost-benefit analysis (Irons 2001; Sosis and Alcorta 2003). Thus, costly religious behaviors are seen as honest signals that reliably advertise the unobservable trait of religious belief and/or group commitment.

However, this reasoning has been challenged on several grounds (Henrich 2009). For example, it is unclear why it is more costly for non-believers to perform the costly acts than for believers, since beliefs are culturally transmitted, and are quite unlike possessing a genetically fixed physical attribute (such as physical stamina or height). It seems that explaining costly religious displays presupposes cultural transmission of beliefs underlying these behaviors. Another distinct hypothesis, then, derives from a cultural evolutionary perspective, and holds that costly religious behaviors are credibility-enhancing displays (CREDs), which are reliably associated with genuine belief in counterintuitive gods and can be used to infer sincere commitment to them (Henrich 2009). Costly religious displays are often seen in successful religious leaders. For instance, Henrich discusses how early Christian saints, by their willing martyrdom, became potent cultural models and encouraged the cultural spread of Christian beliefs. 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—will withhold their own commitment. Once people believe, they are more likely to perform similar displays themselves, which offers another explanation about why potentially costly behaviors spread in religious groups. Potentially costly displays often come in the form of altruism toward other ingroup members, further

ratcheting-up the level of in-group cooperation and benefiting such groups. One key difference between these two frameworks, then, is in regard to whether costly displays cause greater commitment to religious beliefs. The CRED framework predicts that costly religious displays *cause* greater commitment to the religious beliefs of the group as a result of cultural contagion, whereas the ritual signaling framework sees costly displays merely as reliable signals that elicits cooperation without causal effects on levels of group commitment.

Regardless of the theoretical debates and the precise mechanisms that are at play, there is mounting evidence that costly religious displays emerge and contribute to group solidarity, further cementing religious prosociality in groups with moralizing gods. Sociological analyses are consistent with the idea that groups that impose more costly requirements have members who are more committed (Iannacone 1994). 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 investigation, religious and secular communes in nineteenth 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 and Alcorta 2003). In a further quantitative analysis of 83 of these religious and secular communes (Sosis and 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. Religious ideology was not 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 cost commitment of their members. Although these findings are revealing, more research is clearly needed, including further experimental studies and alternative mathematical models of costly religious behavior (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 can be advertised with sincerity, may enhance within-group interpersonal trust and commitment, further reinforcing intragroup prosocial tendencies. This resolves a key puzzle about religion that has long baffled observers—why many religious behaviors and rituals demand sacrifice of time, effort, and resources.

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HOW BIG

HOW BIG WATCHFUL DEITIES HELPED CONSTRUCT BIG GROUPS

It appears, then, that belief in moralizing Gods, supported by costly religious displays, enhance within-group interpersonal trust and group solidarity, and thus stabilize prosocial norms even in the absence of social monitoring mechanisms. This being the case, religious prosociality would be expected to expand the reach of cooperative norms, facilitating the emergence of larger cooperative communities that 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, 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). Although this specific number can be debated, it is apparent today that, since the end of the Pleistocene, the size of human groups has often far exceeded the limitations that kin-based and reciprocity-based altruism placed on group size.

It has been hypothesized that cultural evolution, driven by between-group competition for resources and habitats, has favored large groups (Alexander 1987). There is evidence supporting this hypothesis: in the 186 societies of the standard cross-cultural sample (SCCS), prevalence of conflict among societies, resource-rich environments, and group size are positively intercorrelated (Roes and Raymond 2003); in fact, it has been argued that these were the antecedent conditions that gave rise to politically centralized states (see Carneiro 1970). However, as groups expand in size, situations become more anonymous, and prosocial norms are harder to stabilize. Therefore, 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 using again the SCCS, 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 and 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 appear to be culturally selected for when freeloading is more prevalent or particularly detrimental to group stability.

HOW BIG WATCHFUL DEITIES CAME TO BE: ALTERNATIVE EVOLUTIONARY SCENARIOS

We have argued (Norenzayan and Shariff 2008; Norenzayan, 2010; Shariff et al. 2010) that integrating cognitive by-product 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 by-product of mundane cognitive processes, cultural evolution favored the spread of a special type of supernatural agent—moralizing high Gods. Growing evidence is converging on the conclusion that belief in these omniscient supernatural watchers facilitated cooperation and trust among strangers (Norenzayan and Shariff 2008). Not surprisingly, this cultural spread coincided with the expansion of human cooperation into ever-larger groups over the last 15 millennia (Cauvin 2000).

An alternative evolutionary account (e.g., Bering et al. 2005; Johnson and Bering 2006; Johnson, 2009) is that belief in morally concerned Gods was selected by maximizing the genetic fitness of group-living individuals. In particular, it is argued that such belief reduced the fitness costs associated with noncooperation in an intensely social, gossiping species such as ours, in which individual survival heavily depends on group living. There is considerable agreement between this view and ours, and it may be premature to reach firm conclusions. Nevertheless, we can offer some preliminary speculations toward the goal of ultimately distinguishing these possible scenarios and testing their plausibility against the growing amount of evidence.

The cultural 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 co-variation between the prevalence of moralizing Gods and group size (e.g., Roes and Raymond 2003). The deities of most small-scale societies tend to be neither fully omniscient nor morally concerned. This is puzzling for adaptationist arguments, since these groups more closely approximate ancestral conditions, and they should be most likely to reveal such a genetic adaptation. However, we gain appreciation for why this is so when we realize that, in small hunter-gatherer bands, relationships typically are among kin or reciprocating partners, and, although people may encounter strangers occasionally, especially outside of group boundaries, situations calling for cooperation are rarely anonymous. In these intimate, transparent groups, reputations can be monitored with ease and social transgressions are difficult to hide. As a result, supernatural policing is unnecessary and relationships with spirits and gods in these groups tend not to have a moral dimension (Wright 2009). In contrast, in evolutionarily recent anonymous social groups interactions among strangers is a regular aspect of daily life. It is these large modern societies, facing the breakdown of reputational and kin selection mechanisms for cooperation, which most strongly espouse belief in such Gods. This cross-cultural pattern—increased moral involvement of Gods as groups gain in size—can be elegantly explained by the cultural evolutionary scenario. It also speaks against the genetic adaptation account, unless we assume that a genetic adaptation for belief in moralizing Gods arose independently, multiple times in multiple societies, in the last 15 thousand years. Although this latter possibility cannot be conclusively ruled out, it is an unlikely scenario.

Second, a genetic adaptation account at the level of individuals faces another theoretical challenge: mathematical modeling of cooperative behavior shows that reputation management as a strategy does not achieve evolutionary stability beyond dyadic relationships (Henrich and Henrich 2007). To the extent that this is the case, widespread belief in God concepts cannot be explained by reputational sensitivity at the individual level. To

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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 behavior in humans, which face a number of well-known theoretical and empirical challenges (e.g., Atran 2002), cultural group selection, although a minority view among researchers, is more plausible theoretically and better substantiated empirically (see Henrich and Henrich 2007).

Lastly, a purely genetic adaptation account makes a surprising prediction, which remains to be examined, namely, if belief in moralizing Gods is 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 “explicit atheism” masks a universal “implicit theism.” 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; Slingerland 2008). This possibility should be taken seriously—after all, explicit belief can be unhinged from implicit belief, as people often have little or no introspective access into their own mental states that operate outside of conscious awareness (e.g., Nisbett and Wilson 1977). Nevertheless, the claim that explicit atheism masks implicit theism has remained untested. 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 and Norenzayan 2007). Barrett (2004) noted that we must explain, not only why it is that most people believe, but also why some don’t. It is presently unknown how a genetic adaptationist explanation for belief explains why anyone—let alone hundreds of millions of people—could fail to believe in gods. In contrast, a cultural evolutionary account can more easily accommodate the viability of non-belief, 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 non-belief. 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 predicts the likelihood of non-belief 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 behavioral economics shows, then “supernatural watchers” who can observe social interactions and threaten to

punish selfish acts and reward prosocial ones, encourage cooperative behavior 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. Therefore, evolutionary pressures must have selected for costly religious behaviors (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 co-evolutionary phenomenon that draws jointly on genetic and cultural processes. The human psychological repertoire honed by natural selection gave rise to hypervigilance 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 that advertised a hard-to-fake cooperative intention toward in-group 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 and 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 in-group. When thoughts of morally concerned deities are cognitively salient, an objectively anonymous situation becomes nonanonymous 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 signaling, 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 specter of large scale prosociality without religion. Religions continue to be powerful facilitators of prosociality, but they may no longer be the only ones. Although 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 behavior in an economic game as reminders of God (Shariff and Norenzayan

2007), and the degree of intrinsic prosociality (e.g., 2008). In fact, in Scandinavia, researchers found ways to

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2007), and there are many examples of modern large, cooperative societies with a great degree of intragroup trust that are not very religious (Hermann, Thöni, and 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 toward secularization, or toward more religious fervor? Worldwide sociological evidence shows that societies, as they experience economic growth and greater conditions of existential security, move toward 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 and 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 although most of the studies already reviewed 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 multi-level 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 and Bowles 2007). The same mechanisms involved in in-group altruism may also facilitate out-group 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 are its victims.

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