Religious Prosociality:
A Synthesis

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Abstract

Religion is a ubiquitous aspect of human cultures; yet until recently, we knew relatively little about its natural origins and effects on human minds and societies. This is changing, as scientific interest in religion is on the rise. Debates about the evolutionary origins and functions of religion, including its origins in genetic and cultural evolution, hinge on a set of empirical claims about religious prosociality: whether, and through what particular psychological and cultural pathways, certain religious beliefs and practices encourage prosocial behaviors. Here we synthesize and evaluate the scientific literature on religious prosociality, highlighting both gaps and open questions. Converging evidence from several fields suggests a nuanced pattern such that some religious beliefs and practices, under specific socio-historical contexts, foster prosocial behaviors among strangers. This emerging picture is beginning to reveal the psychological mechanisms underlying religious prosociality. Further progress will depend on resolving outstanding puzzles, such as whether religious prosociality exists in small-scale societies, the extent to which it is constrained by in-group boundaries, and the psychology underlying various forms of nonbelief.

1. Introduction

It has long been argued that religions facilitate acts that benefit others at a personal cost, a hypothesis that can be termed religious prosociality (Norenzayan and Shariff 2008). This idea has a long history in the social sciences (e.g., Durkheim 1912/1995; Wilson 2002) and has

5   returned to center stage in recent debates about the evolutionary origins of religions (Bulbulia et al 2008; Norenzayan and Shariff 2008; Atran and Henrich 2010). These debates revolve around whether religion arose as cognitive byproducts of evolved cognitive biases (e.g., Boyer 2001, 2008; Barrett 2004; Lawson and McCauley 1990; Atran and Norenzayan 2004), whether it, or some parts of it, is a genetic adaptation for cooperation either at the individual level (e.g., Bering

10   2006, 2011; Johnson 2009; Sosis and Alcorta 2003; Schloss and Murray 2011), or through a process of multi-level selection (Wilson 2002; Wade 2009). A third alternative synthesizes the cognitive byproduct approach with cultural evolutionary theory (e.g., Richerson and Boyd 2005). In this view, a suite of cognitive biases lead to intuitions that support religious beliefs. Some cultural variants of these beliefs are then harnessed by cultural evolution and intergroup cultural

15   competition to enable large-scale cooperation (e.g., Norenzayan and Shariff 2008; Norenzayan and Gervais 2012; Atran and Henrich 2010; Henrich 2009; Slingerland et al this volume; see also Wilson 2007).

Progress on these debates critically depends on a number of empirical claims about whether, and through what specific pathways, religious beliefs and practices encourage prosociality. In

20   surveying the evidence, we do not need, and do not offer, a strict definition of religion in terms of necessary and sufficient features, as religion is best seen as a family resemblance construct that consists of various converging elements (see for example, Atran and Norenzayan 2004; Boyer 2001). As in any other scientific enterprise, we think an outline of the features of what is "religion" cannot be decided a priori, but emerges out of years of rigorous empirical and

25   theoretical research. The theoretical claims and debates about the origins of religion are addressed elsewhere (Slingerland et al. this volume). Here we offer a non-exhaustive synthesis of the key aspects of the growing empirical literature that competing evolutionary theories must account for. We offer some conclusions, point to some apparent inconsistencies and possible resolutions, debate methodological challenges, and finally, we point to outstanding questions for

30   future research.

2. Surveys of Religiosity and Self-Reported Charitability

One of the earliest empirical works linking religion to prosocial behavior comes from sociology. There is a long line of survey findings done in the United States and elsewhere suggesting that those who frequently pray and attend religious services (Christians and Jews of various

5   denominations, as well as Muslims and Hindus) reliably report more prosocial behavior, such as more charitable donations and volunteerism (Brooks 2006). Brooks reports, for example, that 91% of religious people (defined as those who attend religious services weekly or more often) report donating money to charities, compared to only 66% secularists (defined as those who attend religious services a few times a year or less or those who declare no religious affiliation).

10   The results for volunteering time are 67% vs. 44%. This "charity gap" is consistent across surveys, and remains after statistically controlling for income disparities, political conservatism, marital status, education level, age, and gender. Some commentators cite these findings as evidence that religious people are more prosocial than non-religious (Brooks 2006).

However, there are several limitations to these findings. One unresolved issue is whether this

15   charity gap persists beyond the in-group boundaries of the religious groups (Monsma 2007). Another is the extent to which this finding generalizes to more secularized societies with stronger social safety nets, where governments have usurped the traditionally strong social functions of religious charities (Norris and Inglehart 2004). Third, a more serious limitation of these findings is that these surveys are based on self-reports of prosocial behavior, and are therefore open to

20   several alternative interpretations (for a critique, see Norenzayan and Shariff 2008). There is a long line of work in psychology showing that self-reports of socially desirable behaviors such as charitability or honesty are often exaggerated, and are strongly influenced by social desirability, impression management, or self-deception (Paulhus 1984). Therefore, the "charity gap" found in these surveys may be more reflective of "appearing good," rather than "doing good." This

25   interpretation is plausible since religiosity is positively associated with socially desirable responding (e.g., Sedikides and Gebauer 2010). Finally, new experimental evidence suggests this relationship is causal: religious reminders increase impression management concerns among believers (Gervais and Norenzayan 2011). These findings raise serious questions about the validity of relying on self-reports that assess charitable behavior or generosity. To address these

methodological limitations, experiments that assess prosocial behavioral (not self-report of prosocial behavior) are necessary.

2. Correlating Religious Involvement and Prosocial Behavior

In social psychology, Batson and colleagues systematically explored this question. In several
5   behavioral studies under anonymous conditions, researchers failed to find any reliable association between religiosity and prosocial tendencies (Darley and Batson 1973). Subsequently, several laboratory studies with Christian university student participants in the US, have found that religious involvement does predict more prosocial behavior, but only when the prosocial act could promote a positive image for the participant, either in their own eyes or in the eyes of
10   observers (Batson et al. 1993).

Other behavioral studies have also found reliable associations between various indicators of religiosity and prosociality, albeit under limited conditions. A study employing a common pool resources game, which allowed researchers to compare levels of cooperation between secular and religious kibbutzim in Israel (Sosis and Ruffle 2003), showed higher cooperation in the
15   religious kibbutzim than in the secular ones; the effect was driven by highly religious men, who engaged in daily and communal prayer, and took the least amount of money from the common pool. A study conducted by Soler (in press), among members of an Afro-Brazilian religious group, showed similar results: controlling for various socio-demographic variables, individuals who displayed higher levels of religious commitment behaved more generously in a public goods
20   economic game and reported more instances of both giving and receiving within their religious community. Ahmed (2009) found similar results in a public goods game in a study conducted in rural India with a Muslim population. Devout Muslim students in a *madrassah* contributed more to a public good compared to a matched group of students in a secular school. The effect was sizable. Whereas 15% of secular participants contributed nothing, only 2% did so in the more
25   religious group.

Prosocial religions, such as Christianity, Islam, and many variants of Hinduism, endorse a package of beliefs and practices revolving around powerful, omniscient, and morally involved gods who demand credible displays of faith from their adherents. In an investigation spanning 15 societies of pastoralists and horticulturalists, Henrich et al. (2010) measured the association
30   between religious participation and prosocial behavior in three standard bargaining games.

Unlike previous studies, this one specifically tested the idea that participation in prosocial religions engenders more prosocial behavior compared to participation in local religions that typically do not have a prosocial dimension. Henrich and colleagues found that, controlling for a host of demographic and economic variables, participation in a world religion (Christian or

5   Muslim) increased offers in the Dictator Game by 6%, and in the Ultimatum game by 10% (when the stake was standardized at 100).

Interestingly, however, world religion did not reliably predict offers in another economic game, a Third Party Punishment Game that allowed people to punish others for not playing fairly. In this experiment, people in some societies also made lower (less equal) offers. Analyzing the data

10   from all three experiments indicates that adding the third party punishment drove out the component of prosociality created by religion. This, combined with other recent findings showing that secular and divine sources of punishment are perceived to be interchangeable (Laurin et. al. in press), suggest that adding a third party punisher "replaced god" in a sense, leading to both lower offers and no impact of religion in this experiment.

15   There are several potential pathways through which religion might operate to increase prosociality. One possible pathway, which we explain further below, is the supernatural monitoring hypothesis: religious believers act prosocially to the extent that they experience being under supernatural surveillance by watchful, moralizing gods (Norenzayan and Shariff 2008; Bering 2011). Further, believing in constant divine surveillance might lead to a habitualization of

20   certain prosocial behaviors. Relatedly, another potential complementary pathway involves extravagant rituals or seemingly costly devotions (Slingerland et al. this volume). Such practices can sustain greater prosociality and social solidarity because, as credible displays of deep faith, they lead to more successful cultural transmission of these belief-ritual complexes (Henrich 2009). Alternatively, or in addition, ritual participation may serve as a cooperative signal,

25   encouraging greater prosocial behavior (Sosis and Alcorta 2003). There likely are other pathways as well (see Slingerland et al. this volume, for discussion).

The anthropological record is consistent with these ideas. In moving from the smallest scale human societies to the largest and most complex, Big Gods – powerful, omniscient, interventionist supernatural watchers who demand extravagant displays of loyalty– go from

30   relatively rare to increasingly common (Roes and Raymond 2003; Swanson, 1966), and morality

and religion move from largely disconnected to increasingly intertwined (Wright 2009). As societies get larger and more complex, ritual forms also change, becoming more frequent and dogmatic, increasingly used to transmit and reinforce religious orthodoxy (Atkinson and Whitehouse 2012). A recent cross-cultural study (Atkinson and Bourrat 2010) provides evidence
5   that participation in prosocial religions goes hand in hand with a stricter moral enforcement of norms. In a large global sample of 87 countries from the World Value Survey, beliefs about two related sources of supernatural monitoring and punishment—God and the afterlife, as well as frequency of religious attendance, were found to independently predict harsher condemnation of a range of moral transgressions, such as cheating on taxes, or fare-skipping on public transport.
10   Importantly, belief in a personal God was more strongly related to these outcomes than belief in an abstract impersonal God.

3. Reconciling Inconsistent Findings on Religious Prosociality

In recent laboratory studies conducted in Western societies (mostly with university students), where prosocial behavior is measured in anonymity, individual differences in religious
15   commitment typically fail to reliably predict prosocial behavior (for a discussion, see Norenzayan and Gervais 2012). This is similar to earlier findings that indicate that religious participants show greater prosocial tendencies when the prosocial act can enhance one's self-image, but that religiosity is a null-predictor when no such reputational incentives are available (e.g., Batson et al 1993). These findings deserve more scrutiny. Why is it that religious
20   involvement predicts prosocial behavior in some studies, but not others? Here we suggest three explanations that resolve these inconsistencies.

One explanation is that, compared to a typical social psychology study with student samples, reminders of religion are likely to be more chronically present in religious kibbutz, madrasahs, and Candomble communities, where religious prayer and attendance are a daily part of life. This
25   is important because any behavior is more likely to occur to the extent that concepts associated with these behaviors are primed through situational cues (e.g., Bargh and Chartrand 1999). Another factor is that prosociality in these communities clearly benefited in-group members (despite being anonymous), whereas in psychological studies done in anonymous contexts, the victim or the recipient of generosity typically is a total stranger. In the classic "Good Samaritan"
30   Study (Darley and Batson 1973), for example, seminary students were led to walk past a stranger

(actually, a confederate of the researcher) lying on the ground who appeared in need of help. Levels or types of religious involvement failed to predict helping rates.

A third important factor that helps reconcile these null findings with the literature reviewed above is cultural differences in the strength of secular institutions. Note that all of the studies that
5   have found weak or no reliable associations between religiosity and prosociality have been conducted in Western, Educated, Industrialized, Rich and Democratic (WEIRD) samples (Henrich et al. 2010), whereas all the studies that have found reliable associations have typically been conducted in non-WEIRD samples. In WEIRD societies, high trust levels towards secular institutions (the police, courts, governments) encourage high levels of prosocial behavior across
10   the board (Hruschka and Henrich submitted paper) and might crowd out the influence of religion on prosociality. Conversely, in societies with weak institutions, religion has no credible alternative and is the main driver of broad prosociality. Consistent with this idea, in societies with strong institutions such as Canada, experimentally induced subtle reminders of secular authority (e.g., concepts such as police, court, judge) reduce believers' reliance on religion as a
15   source of morality (Gervais and Norenzayan in press). Furthermore, in a cross-national analysis, it was found that, controlling for a number of relevant factors such as human development, general trust, and individualism, believers are more trusting of atheists in politics if they are culturally exposed to strong secular institutions as measured by the World Bank's index (Norenzayan and Gervais submitted paper).In summary, a growing number of behavioral studies
20   have found associations between religious commitment and prosocial tendencies, especially when secular sources of prosocial behavior are unavailable (i.e., weak institutions), reputational cues are heightened (e.g., helping is not anonymous), and the targets of prosociality are in-group members (we return to this latter point later in this report). However, causal inference in these studies is limited by their reliance on correlational designs. If religious devotion is related to
25   prosocial behavior in some contexts, it cannot be conclusively ruled out 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 religious thinking and subsequently measuring prosocial behavior.

4. Experimental Evidence: Religious Priming

If religious belief has a causal effect on prosocial tendencies, then experimentally-induced religious thoughts should increase prosocial behavior in controlled conditions. If so, subtle religious reminders may reduce cheating, curb selfish behavior, and increase generosity towards

5   strangers. This hypothesis was tested and supported in two anonymous Dictator Game experiments, one with a sample of university students, and another with non-student adults in Canada (Shariff and 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 secular prime group

10   unscrambled sentences with words such as *civic*, *jury*, *police*; and the control group unscrambled sentences with entirely neutral content. Each participant subsequently played an anonymous double-blind one-shot Dictator Game. (Post-experimental interviews showed that participants were unaware of religious content and remained naïve concerning the hypothesis being tested). Compared to the control, nearly twice as much money was offered by subjects in the religious

15   prime group, who not only showed a quantitative increase in generosity but also a qualitative shift in social norms. In the control group, the modal response was selfish: most players pocketed the full ten dollar stake allotted to them. In the religious prime group, the mode shifted to equality: participants split the money evenly. Of particular interest, the secular prime group showed the same pattern as the religious prime group, suggesting that secular mechanisms, when

20   they are available, can also encourage generosity.

These findings have 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 2011). Religious primes have also been shown to reduce cheating among student samples in North America (Randolph-Seng and Nielsen 2007), as well as in

25   children (Piazza, Bering, and Ingram, 2011). McKay et al. (2010) found that subliminal religious priming increased third-party costly punishment of unfair behavior in a Swiss sample, but only for religious participants who had previously donated to a religious charity (see Laurin et al. in press, for similar results regarding altruistic punishment).

There is some evidence that priming effects are to some extent parochial as well as prosocial, as

30   prime-induced religious prosociality is sensitive to group boundaries. This question is open for

detailed investigation. Currently we know of one preliminary study with Canadian Christians (Shariff and Norenzayan unpublished data) suggesting that, in a one-shot Dictator game, religiously primed Christian givers were most generous towards a Christian receiver, less generous towards a stranger with unknown religious affiliation, and even less generous towards a
5   Muslim receiver (playing with a Muslim receiver was the equivalent of not being primed with religious words). This is not surprising given that human prosocial behavior is shaped by parochial concerns (Koopmans and Rebers 2009).

In summary, a small but growing literature shows that the arrow of causality goes from religion to a variety of prosocial behaviors, including generosity, honesty, cooperation, and altruistic
10   punishment. Next we examine the psychological mechanisms underlying these religious priming effects, and explore evidence that these effects are due – at least in part – to perceptions of being under supernatural monitoring.

5. Why Do Religious Reminders Increase Prosociality?

What are the psychological processes that might explain the empirical link between religious
15   primes and prosociality? Two distinct accounts suggest themselves. The *supernatural monitoring* account argues that heightened awareness of being under social surveillance increases prosociality. Thoughts of religions invariably activate reminders that God or gods -- omniscient and morally concerned judges – are watching (Gervais and Norenzayan 2012). Granted, as an ultrasocial species, humans can be prosocial even when no one is watching (Henrich and Henrich
20   2007; Barmettler et al. in press). Nevertheless, being under social surveillance encourages prosociality. A large number of studies show that feelings of anonymity – even illusory anonymity such as the act of wearing dark glasses or sitting in a dimly lit room – increase the likelihood of selfishness and cheating (Zhong et al 2010; see also Hoffman et al. 1994). Conversely, social surveillance, for example being in front of cameras or audiences, has the
25   opposite effect. Even incidental and subtle exposure to representations of eyes encourages good behavior towards strangers in the laboratory (Haley and Fessler 2005; Rigdon et al. 2009) and in real-world settings (Bateson et al. 2006; but see Fehr and Schneider 2009, for a critique). As the saying goes, "watched people are nice people." It is no surprise, then, that the notion of supernatural watchers who observe, punish, and reward morally relevant behaviors has culturally
30   spread in prosocial religions.

A second possibility is the *behavioral priming* or *ideomotor* account. The idea behind this hypothesis is that prosocial behavior is more likely if concepts related to benevolence or generosity are nonconsciously activated (e.g., Bargh et al. 2001). If thoughts of God are associated with notions of benevolence and charity, then priming these thoughts may activate

5   prosocial behavior, just as activating the social stereotype of the "elderly" increases behaviors consistent with it, such as slow walking speed (Bargh and Chartrand 1999) (for this interpretation, see Randolph-Sengh and Nielsen 2007; Pichon et al 2007). To be clear, these two accounts are not mutually exclusive, and in fact may operate together to produce prosocial effects of religion. The vital question is not whether ideomotor effects result from religious

10   primes -- they almost certainly do. Instead, it is important to ask whether supernatural monitoring effects *also* result from religious primes.

What evidence can distinguish the supernatural watcher account from behavioral-priming processes? Norenzayan et al (2010) discuss three empirical criteria. First, if the supernatural watcher account is at play, religious primes should arouse both feelings of external authorship

15   for events and perceptions of being under social surveillance independent of any prosocial behavior. Second, if religious priming effects are weaker or nonexistent for non-believers, then the effect could not be solely due to ideomotor processes, which are argued to be impervious to prior explicit beliefs or attitudes associated with the behavior (for example, see Bargh et al 2001; Bargh and Chartrand, 1999). This is because everyone, including non-believers, is aware of

20   (though they do not necessarily endorse) the association between religious concepts and benevolence. Therefore, if ideomotor processes are solely responsible for these effects, awareness should be sufficient to trigger priming effects. Third, differing perceptions of supernatural agents can disentangle these two accounts. Specifically, the supernatural monitoring hypothesis predicts that the belief that God is punitive should encourage more prosociality,

25   whereas the ideomotor account would lead to the contrary expectation -- that belief in a benevolent God is a stronger motivator for prosocial behavior.

Addressing the first question, several religious priming experiments clearly separate the felt presence of a supernatural agent from their prosocial outcomes. Dijksterhuis et al. (2008) found that after being subliminally primed with the word "God," believers (but not atheists) were more

30   likely to ascribe an outcome to an external source of agency, rather than their own actions. In four studies, Gervais and Norenzayan (2012) followed up on this line of reasoning and found that

thinking of God does, indeed, influence variables that are sensitive to perceived social surveillance, independent of any ideomotor effects associated with benevolence or prosociality. The results suggest that religious primes trigger not only notions of benevolence, but also experiences associated with mind perception (that is, feelings of being observed by an intentional

5   agent) as the supernatural monitoring hypothesis predicts (for evidence that religious agents trigger mind perception, see also Norenzayan et al. 2012).

To address the second question, it is necessary to re-examine the priming literature in light of the second criterion: do God primes influence behavior independent of prior belief, or are these effects confined to believers? Ideomotor processes typically do not interact with prior belief. A

10   supernatural monitoring account, on the other hand, would suggest that people who believe in the actual existence of supernatural beings should be most susceptible to these primes, whereas nonbelievers should be less susceptible. The answer to this question is also crucially important for debates about evolutionary origins of religion. Genetic adaptationist accounts of religious prosociality (for a discussion, see Schloss and Murray 2011) would predict that everyone, even

15   self-declared atheists, are responsive to supernatural monitoring effects (e.g., Bering 2011). Cultural evolutionary accounts of religious prosociality, on the other hand, are more compatible with the prediction that responsiveness to supernatural monitoring is culturally variable (e.g., Norenzayan and Shariff 2008; Henrich et al. 2010). To be clear, socialization with culturally variable concepts of the divine could produce effects on prosociality that supplement or compete

20   with universal religious tendencies to behave prosocially. Therefore, cultural variability is not incompatible with a genetic adaptationist account, provided there is no complete absence of an effect for non-believers. Moreover, the answer to this question reveals critical details about the psychology of atheism, a topic of great importance ripe for research, but unfortunately beyond the scope of this report.

25   A review of the (admittedly limited) relevant evidence suggests that at least some nonbelievers are impervious to religious priming effects, a finding that is compatible with the idea that supernatural monitoring plays a part in religious priming effects. There is currently mixed evidence as to whether religious priming effects (typically bypassing conscious awareness) interact with explicit belief (see Norenzayan et al. 2010, for discussion). Some studies have

30   found religious priming effects—irrespective of the explicit prior religious belief of participants—on honesty (Randolph-Sengh and Nielsen 2007), generosity in the dictator game

(Shariff and Norenzayan 2007, Study 1), public self-awareness (Gervais and Norenzayan 2012, Study 3) and prosocial intentions (Pichon et al 2007). Several other studies, however, found significant interaction with prior religious belief, reflecting null effects for non-believers (Dijksterhuis et al. 2008; Shariff and Norenzayan 2007, Study 2; McKay et al. 2010; Gervais and

5   Norenzayan 2012; Piazza et al., 2011; Laurin et al., in press). The findings of Gervais and Norenzayan (2012) are particularly instructive. Meta-analyses revealed that, for believers, religious primes increased perceived social surveillance across 3 studies ($p < .0001$, *Cohen's d*= .65), whereas, for nonbelievers, religious reminders did not significantly affect perceived social surveillance ($p = .38$, *Cohen's d*= -.20). Laurin and colleagues found similarly that the

10   effects of reminders of God were specific to believers only, and led to increased punishing behvavior. Furthermore, believing that God is punishing caused *less* punishing behavior (presumably because participants could offload punishing duties to God). This last point is the opposite of what one would predict on the ideomotor account.

Further examination of the priming studies portrays a revealing pattern: all the priming studies

15   that have shown no interaction with prior belief have also recruited exclusively American university student samples. However, student atheists, particularly in religious America, might be "soft atheists." In one religious priming experiment that recruited a non-student adult sample in Vancouver, Canada (Shariff and Norenzayan 2007, Study 2), the effect of the prime emerged for believers, but disappeared entirely for "hard" atheists. Similarly, in the majority nonreligious

20   Netherlands, Dutch student nonbelievers were not responsive to religious priming effects, even when they were presented subliminally (Dijksterhuis et al. 2008). Finally, in the more secular environment of Vancouver, we have found across several studies no reliable priming effects on student nonbelievers (Gervais and Norenzayan 2012).

Finally, consistent with the theoretical idea that punishments are superior to rewards in

25   sustaining prosocial behavior, there is a *negative* relationship between cheating behavior and the degree to which people endorse a vision of God as punitive and judging, whereas cheating rates *increase* with the belief that God is benevolent and forgiving (Shariff and Norenzayan 2011; Debono et al, unpublished data). Consistent with these experimental findings, cross national analyses (Shariff & Rhemtulla, 2012) reveal that, controlling for a number of relevant socio-

30   economic and psychological variables such as GDP, economic inequality, belief in God, and relevant personality dimensions, belief in hell is negatively related to crime rates, whereas belief

in heaven has the opposite effect. As with the Laurin et. al. findings just mentioned, these results are difficult to reconcile with a purely ideomotor account, which presumably would lead to the opposite expectation (i.e., that a benevolent and kind God would more clearly fit the prosocial stereotype that causes greater prosocial behavior and less anti-social behavior; and that reminders

5   of a benevolent God would reduce punishing behavior).

To summarize what we know about the psychological mechanisms underlying religious priming, several lines of evidence show that religious reminders increase the perception of external authorship of events and perceptions of social surveillance independent of any prosocial consequences. In addition, there is mounting evidence that the effects of religious primes are

10   most effective among believers, and there is provocative (though preliminary) evidence that mature nonbelievers are less susceptible, and possibly immune, to these primes. A reasonable initial conclusion from the empirical evidence is that, at the very least, both accounts remain viable. Therefore, the supernatural monitoring hypothesis and the ideomotor hypothesis may reflect the operation of independent psychological mechanisms that link religion to prosocial

15   tendencies. These mechanisms also have differing theoretical implications for the relationship between religion and prosociality. Whereas the ideomotor hypothesis posits that the link between religion and prosociality is the *consequence* of a cultural association reflected at the cognitive level, the supernatural monitoring hypothesis speaks to the more basic evolutionary question of *why* religion might *cause* large scale anonymous prosociality in humans. If reminders of

20   moralizing gods make people feel watched, then beliefs in moralizing gods, who can monitor social interactions even when no humans are watching, may have been instrumental for promoting large-scale human cooperation.

6. Ethnographic and Historical Evidence: How Supernatural Monitoring Contributed to Large-Scale Prosociality

25   Over time and as groups gain in size, morality and religion move from disconnected to increasingly intertwined, and gods become more powerful, moralizing and interventionist (Wright 2009). Ethnographic work shows that in foraging and hunting groups, such as the Hadza or the San, religion does not have a moral dimension and the gods are largely indifferent to human moral affairs (Boyer 2001; Swanson 1966). In an earlier assessment of the ethnographic

30   record, Swanson (1966 p. 153) concluded, "The people of modern Western nations are so

steeped in these beliefs which bind religion and morality, that they find it hard to conceive of societies which separate the two. Yet most anthropologists see such a separation as prevailing in primitive societies." Here we briefly highlight ethnographic and historical evidence that indicates that across groups and over time, supernatural monitoring co-evolved with increasingly large,

5   complex, cooperative societies.

Stark (2001) found that only 23.9% of the 427 cultures in the cross cultural database acknowledge a god who is active in human affairs and is specifically supportive of human morality. Religions with such gods are, in fact, peculiar. Yet, the vast majority of human beings today live in prosocial religious groups with big moralizing gods. Going further, in one notable

10 analysis using the Standard Cross-Cultural Sample, Roes and Raymond (2003) showed that the variability in supernatural sanctioning found in the ethnographic record is correlated with group size -- the larger the group size, the more likely the group has culturally sanctioned omniscient, all-powerful, morally concerned deities who directly observe, reward, and punish social behavior. This highlights one problem with much work in the cognitive science of religion, as Christianity

15 is often used as a representative religion, when in fact it's a rather unusual religion.

These ethnographic findings converge with what can be gleaned from historical analyses. The archaeological record is of course limited, but available evidence hints at the possibility that the expansion of regular rituals and the construction of religiously significant monumental architecture co-emerged with increasing societal size, political complexity, and reliance on

20 agriculture (Marcus and Flannery 2004; Cauvin, 1999). Evidence for this can be found in Çatalhöyük, a 9500 old Neolithic site in southern Anatolia (for a discussion, see Whitehouse and Hodder 2010). The excavation of Göbekli Tepe, a 11,000 year-old complex of monumental architecture, suggests that it may have been one of the world's first temples, where hunter-gatherers possibly congregated and engaged in organized religious rituals (Schmidt 2000).

25 Once the written historical record begins it becomes much easier to establish clear links between large-scale cooperation, ritual elaboration, and powerful gods who police human behaviour. This historical work is ongoing, and many questions are being actively debated. However, some historical patterns have emerged. The best documented of the historical work looks at Abrahamic faiths. Wright (2009) provides a useful summary of textual evidence that reveals the gradual

30 evolution of the Abrahamic God from a rather limited, whimsical, tribal war god—a subordinate

in the Pantheon—to the unitary, supreme, moralizing deity of two of the world's largest religious communities. Evidence from early China also shows that supernatural monitoring played a key role in the emergence of the first large-scale societies in East Asia (see Slingerland et al. this volume). In an analysis that compares the longevity of religious and secular communes in 19th

5   century America, Sosis and Bressler (2003) found that religious communes out-competed secular ones, and this survival advantage was statistically explained by the costly displays and restrictions on behaviors that religious communes imposed on their members (Henrich 2009). (Presumably these behaviors increased in-group commitment and cooperation). The ethnographic and historical record, taken together with the empirical evidence reviewed above,

10   points to the idea that religious beliefs and practices played a key role in the spread of prosocial groups in the last 12,000 years.

7. Outstanding Questions

We conclude with some outstanding questions for further research that can advance theoretical work on the origins of religious prosociality, and invite discussion about future directions.

15   • An important extension would be to conduct religious priming studies in smaller-scale societies, where reminders of morally indifferent gods could be compared to the Abrahamic God or the powerful, moralizing gods of other world religions. These comparisons would help researchers tease apart cultural evolutionary explanations from genetic adaptationist explanations of religious prosociality.

20   • A deeper understanding of the psychology underlying atheism also can shed light on competing explanations for the evolutionary origins of religion. For example, genetic adaptationist arguments for religion would presumably predict that even atheists are responsive to nonconscious religious priming. Cultural evolutionary explanations, in contrast, would predict that *at least some atheists* would be immune to religious priming.

25   Studies could compare "atheist converts" with "lifetime atheists" to clarify the extent to which religious prosociality is culturally learned. These questions are ripe for empirical investigation.

• Historical and cross-cultural comparative work can be done to examine the extent to which secular alternatives to religious prosociality — institutions such as courts,

30   contracts, and police — can culminate in religion's decline in societies. This again could

help us understand the extent to which religious prosociality is genetically fixed, culturally learned, or both.

- It is important to tease apart the relative effects of various components of "religion" on prosociality. Future studies can assess in a more fine-grained fashion the extent to which
5   religious prosociality is explained by belief in supernatural monitors, supernatural punishment mechanisms such as belief in heaven vs. hell, karma, fate, as well as by various forms of extravagant displays of faith often found in ritual participation.

- Beyond anecdotal evidence, we know relatively little about the social boundaries of religious prosociality. Does it weaken, or break down, where the religious in-group ends
10   and the out-group begins? Or is religious prosociality, in some respects, extended universally? Can religious prosociality be harnessed and co-opted to extend cooperation and solve collective action problems?

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