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Prosocial Religions as Folk-Technologies of Mutual Policing

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Why do humans believe in moralizing gods? Leading accounts argue that these beliefs evolved because they help societies grow and promote group cooperation. Yet recent evidence suggests that beliefs in moralizing gods are not limited to large societies and might not have strong effects on cooperation. Here, we propose that beliefs in moralizing gods develop because individuals shape supernatural beliefs to achieve strategic goals in within-group interactions. People have a strategic interest in controlling others' cooperation, either to extort benefits from them or to gain reputational benefits for protecting the public good. Moreover, they believe, based on their folk-psychology, that others would be less likely to cheat if they feared supernatural punishment. Thus, people endorse beliefs in moralizing gods to manipulate others into cooperating. Prosocial religions emerge from a dynamic of mutual monitoring, in which each individual, lacking confidence in the cooperativeness of conspecifics, attempts to incentivize others' cooperation by endorsing beliefs in supernatural punishment. We show how variations of this incentive structure explain the variety of cultural attractors toward which supernatural punishment converges, including extractive religions that extort benefits from exploited individuals, prosocial religions geared toward mutual benefit, and forms of prosocial religion where belief in moralizing gods is itself a moral duty. We review evidence for nine predictions of this account and use it to explain the decline of prosocial religions in modern societies. Supernatural punishment beliefs seem endorsed as long as people believe them necessary to ensure others' cooperation, regardless of their objective effectiveness in doing so.

Keywords: religion, supernatural punishment, moralizing gods, evolutionary psychology, cultural evolution

Across societies, spirits, gods, and karmic forces are believed to punish uncooperative behaviors, such as theft, murder, adultery, and stinginess. They punish wrongdoers with disease, premature death, or eternal damnation in hell and reward cooperative behavior in this life or the next (Bendixen, Lightner, & Purzycki, 2023). These beliefs, which form the cornerstone of prosocial religions (Norenzayan et al., 2016), are commonly referred to as beliefs in "moralizing gods" (M. Lang et al., 2019) or "moralistic supernatural punishment" (Lightner et al., 2023). Following previous work, we use these terms interchangeably to mean beliefs in gods or supernatural forces that monitor and punish cheating in human cooperative interactions.[1] This definition excludes the many supernatural forces which, across cultures, do not care about cooperation between humans (Boyer, 2020a) or punish behaviors unrelated to cooperation, such as violations of taboos or magical rituals that do not harm the interests of other human beings (Boehm, 2008; Liénard & Boyer, 2006; Singh & Henrich, 2020).

Beliefs in moralizing gods recur across human groups. They're a central component of the major world religions, including Abrahamic cults (e.g., Islam, Judaism, Christianity; Bernstein & Katz, 2010), karmic religions (e.g., Buddhism, Hinduism, Jainism;

[1] Although not everyone uses this definition (see, e.g., Galen, 2012), this is the basic construct that most cognitive and evolutionary researchers seek to explain, whether they call it "supernatural punishment" D. D. P. Johnson, 2009, 2016), "broad supernatural punishment" (Watts et al., 2015), "moralistic supernatural punishment" (Bendixen, Lightner, & Apicella, 2023; Turchin et al., 2023), beliefs in "moralizing" or "moralistic" gods (M. Lang et al., 2019; Norenzayan et al., 2016; Purzycki et al., 2016; Roes & Raymond, 2003), "moralizing religions" (Baumard et al., 2015; Turchin et al., 2023), or "prosocial religions" (Norenzayan et al., 2016).

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Purzycki & Holland, 2019; White, Norenzayan, et al., 2019), and Chinese and Japanese folk religions (Bellah, 2008; Bernstein & Katz, 2010; Clark & Winslett, 2011). Although these beliefs were long assumed to be limited to large-scale societies (Baumard et al., 2015; Norenzayan et al., 2016; Peoples et al., 2016; Roes & Raymond, 2003; Turchin et al., 2023; Tylor, 1871), this conclusion seems an artifact of data sets biased against detecting moralizing gods in smaller societies (Bendixen, Lightner, & Purzycki, 2023; Lightner et al., 2023). Consistent with longstanding emphases on the moralizing gods of small-scale societies (Evans-Pritchard, 1965; D. D. Johnson, 2015, 2016; A. Lang, 1900), more recent research, including quantitative ethnographies (Purzycki, 2016; Singh et al., 2021; Townsend et al., 2020), surveys of the ethnographic record (Boehm, 2008; Watts et al., 2015), and experiments across 15 field sites (Bendixen, Apicella, et al., 2023; Purzycki, Willard, et al., 2022), show that beliefs in moralizing gods appear in human societies of all scales.

Among Mentawai horticulturalists in Indonesia, for example, people believe that a crocodile spirit, *Sikameinan*, attacks people who fail to share meat within their clan (Singh et al., 2021). Among Ik hunter–gatherers of Uganda, similarly, a majority of participants answered that Earth spirits cause trouble to people who do not share with others (Townsend et al., 2020). Across 15 field sites, from the Tyva Republic to the Hadza of Tanzania, respondents were more likely than not to answer that supernatural agents are concerned with sanctioning uncooperative behaviors such as theft, murder, and deceit (Purzycki, Willard, et al., 2022). Although these "small gods" often have weaker powers, more limited knowledge, and a narrower moral jurisdiction than the "big gods" of world religions (Boehm, 2008; Purzycki, 2013; Singh et al., 2021), their recurrence suggests that human societies everywhere tend to develop beliefs in moralizing gods.

Why, then, do humans everywhere develop beliefs in gods that reward virtue and punish bad people? This question is at the heart of a central debate in the evolution of religion that pits by-product theories against cultural group selection theories.

Existing Theories Fail to Explain Prosocial Religion

According to "by-product" theories, beliefs in moralizing gods culturally evolve because they are cognitively attractive (Baumard & Boyer, 2013a, 2013b; Boyer, 2001). People, the argument goes, are predisposed to interpret misfortune as a retribution for past immoral behavior and good fortune as a reward for moral behavior (Banerjee & Bloom, 2017; Baumard & Chevallier, 2012; Callan et al., 2014). These intuitions about immanent justice may emerge as functionless by-products of fairness intuitions, which evolved for rewarding cooperators and punishing cheaters in everyday cooperative interactions (André et al., 2022; Baumard et al., 2013; Starmans et al., 2017). By-product theorists contend that, as a useless by-product of this function, fairness intuitions make it intuitive for people to think that supernatural forces reward virtue and sanction bad people (Baumard & Boyer, 2013a; White & Norenzayan, 2019; White et al., 2021). This cognitive attractiveness would fuel a process of cultural attraction by which people transform religious beliefs into moralistic forms over the course of their cultural transmission (Baumard & Boyer, 2013a; Sperber, 1996).

As researchers have noted, however, this by-product approach to religion faces several problems (Norenzayan, 2015). Most strikingly, it does not explain why prosocial religions exhibit markers of *functional design*. By definition, a functionless by-product does not serve any function. Yet prosocial religions do seem functional: Their recurrent features appear geared toward producing a specific outcome, namely, incentivizing cooperation (D. Johnson, 2016; Norenzayan et al., 2016; Wilson, 2010). This functional design manifests in several features.

First, moralizing gods sanction free riding with severe punishments—from deadly illness to eternal damnation—which make wrongdoing sufficiently costly to counterbalance the benefits of behaving badly (D. Johnson, 2016; Norenzayan, 2013). Second, moralizing gods can spot cheaters even when humans would not (Purzycki et al., 2012), which conveniently fills the blind spots of secular social control (D. Johnson, 2011, 2016; Norenzayan, 2013). Third, unlike human punishment, gods' motivation to punish is not compromised by the second-order free-rider problem—the individual temptation to let others pay the cost of punishment while not oneself contributing to curbing free riding (D. Johnson, 2016; Norenzayan, 2013; Yamagishi, 1986). Fourth, rituals prescribed by moralizing gods seem well suited to cultivate prosocial motivations. They require believers to make penance for their misdeeds (Coşgel & Miceli, 2018; Olivelle, 2011; Singh et al., 2021), to cultivate virtuous character traits (Fitouchi et al., 2023; McCullough & Carter, 2013), and to engage in collective rituals galvanizing group solidarity (Norenzayan et al., 2016). If prosocial religions are by-products, why do they seem so functional?

Another family of theories, based on cultural group selection, takes this apparent functionality seriously by proposing that prosocial religions are cultural adaptations for large-scale cooperation (Atran & Henrich, 2010; Henrich & Muthukrishna, 2021; Norenzayan, 2013; Norenzayan et al., 2016; Roes & Raymond, 2003). On this account, religious beliefs initially emerge as by-products of cognitive biases (e.g., mentalizing, teleological thinking; Banerjee & Bloom, 2014), with cultural group selection subsequently selecting the beliefs that provide group-level benefits (Norenzayan et al., 2016). Because they feared divine punishments and felt monitored by moralizing gods, this argument goes, groups with beliefs in moralizing gods would have cooperated more. As a result, they would have expanded the scale of their cooperation beyond what kin altruism and reciprocity can sustain and would have outcompeted less cooperative groups in intergroup competition (Henrich & Muthukrishna, 2021; Norenzayan, 2013; Norenzayan et al., 2016). Through processes such as warfare (see also Turchin, 2016; Turchin et al., 2023), demographic expansion, and migration into successful groups, these groups and their culture would have proliferated, leading to the spread of prosocial religions (Norenzayan et al., 2016).

While cultural group selection theories are consistent with the functional design of prosocial religions, they assume that beliefs in moralizing gods are objectively effective for making people more cooperative (Norenzayan, 2013; Norenzayan et al., 2016). However, evidence for this claim is mixed and debated (for critical reviews, Bendixen, Lightner, & Purzycki, 2023; Bloom, 2012; Galen, 2012; Hoffmann, 2013; Kavanagh et al., 2020; Oviedo, 2016; Tsang et al., 2021). A range of psychological findings suggests prosocial effects of beliefs in moralizing gods (Kelly et al., 2024; M. Lang et al., 2019; Pasek et al., 2023; Purzycki et al., 2016; Shariff, 2015; Shariff et al., 2016; Townsend et al., 2020; White, Kelly, et al., 2019; Yilmaz & Bahçekapili, 2016). But key findings, notably prosocial effects of

religious primes in economic games, fail to replicate (Berniūnas et al., 2020; Billingsley et al., 2018; Gomes & McCullough, 2015; Purzycki et al., 2018; Willard, 2018). Along with other mixed results (Purzycki & Kulundary, 2018; M. Stagnaro et al., 2022; Vardy & Atkinson, 2022), recent studies find small or null relationships between religious belief and cooperation when controlling for relevant variables (Galen et al., 2015; Ge et al., 2019; Major-Smith, 2023; M. N. Stagnaro et al., 2020), and both lab experiments and large-scale surveys ($N >$ 200,000) even find *negative* associations between religiosity and propensities for large-scale cooperation (Galen et al., 2020; Jacquet et al., 2021). Most recently, preregistered analyses of economic games with more than 1,000 participants across 15 field sites—including Yasawa (Fiji), Pesqeiro (Brazil), the Sursurunga (Papua New Guinea), and the Turkana (Northern Kenya)—conclude that "gods' moral concerns do not play a direct, cross-culturally reliable role in motivating cooperative behavior" (Bendixen, Lightner, & Apicella, 2023, p. 1). While future research will shed light on this issue, the mixed evidence so far warrants doubting a key assumption of cultural group selection theories—that religious beliefs enhance cooperation sufficiently to cause differential success in intergroup competition. Accordingly, several researchers have recently called for a rethinking of the relationship between religion and cooperation in cultural evolution (Bendixen, Lightner, & Purzycki, 2023; Fitouchi & Singh, 2022; Jacquet et al., 2021; Kavanagh et al., 2020; Saroglou & Craninx, 2021).

In what follows, we propose an alternative to both by-product and cultural group selection theories—the *mutual policing theory*. Although compatible with the possibility that prosocial religions might promote cooperation, our account does not require this premise to explain their cultural evolution.

Introducing the Mutual Policing Theory

Both the pure by-product approach and cultural group selection theories seem to overlook that people routinely use supernatural beliefs to achieve instrumental ends, often strategic ones. Take a concrete example. Among the Selk'nam hunter–gatherers (Tierra del Fuego), the men told the women that a punitive spirit, *Shoort*, punishes wives who disobey their husband (Chapman, 1982, pp. 113–114). To make women believe that *Shoort*'s punishment is a real threat, men disguised themselves as *Shoort* during religious ceremonies and attacked "those women whose behavior has not conformed to the model of subservient wife" (Chapman, 1982, p. 113). The man disguised as *Shoort* may "frighten [a woman] by shaking her hut violently. … But he may also stab her with a stick, or even beat her and tear down her dwelling" (Chapman, 1982, p. 113). This example captures two insights at the core of our model. First, beliefs in punitive gods do not need group competition to emerge or stabilize: They can arise because some people have a within-group self-interest in communicating them. In this case, men have a fitness interest in controlling women's behavior. Second, religious beliefs are more than by-products: They do *serve a function*, in the sense that people use them to achieve instrumental goals. In this case, their function is to encourage women to submit to men's will.

Shoort is not a prosocial god: He does not punish cheating behaviors such as theft, murder, or stinginess but rather polices women's behavior for the exclusive benefit of men. But similar mechanisms, we will argue, can also explain prosocial forms of punitive gods—gods that punish cheating and enjoin charity, kindness, and other cooperative behaviors. People have fitness interests in incentivizing others to cooperate—either because this benefits them directly or because they gain reputational benefits from doing so. Moreover, people believe, based on folk-psychological inferences, that other people would be less likely to cheat if they felt watched over by punitive gods. As a result, we argue, people endorse and communicate beliefs in moralizing gods to manipulate others into cooperating. Prosocial religions emerge as the macrolevel cultural products of these microlevel strategic interactions, iterated over cultural evolution. As people cumulatively refine religious culture to police each other's behavior, they shape religious technologies that become intuitively better at promoting cooperation. Prosocial religions end up with functional design features despite unclear evidence that they actually promote cooperation. What matters is that people perceive them as useful for achieving their goals.

In the following, we unpack the foundations of the mutual policing theory at the biological, psychological, and cultural evolutionary levels and derive key predictions from this account. We then review historical, psychological, ethnographic, and cross-cultural evidence for these predictions, showing the central role of policing motivations and folk-psychology in shaping religious culture. We then use the mutual policing model to explain the decline of prosocial religions in modern societies and conclude by considering implications for cultural evolution more generally.

The Mutual Policing Theory

Prosocial religions, we argue, culturally evolve as people design and selectively retain supernatural beliefs they perceive—based on their folk-psychology—to be likely to manipulate others into cooperating. This model assumes that people intuitively believe that, if other people believe in the supernatural punishment of uncooperative behaviors, they will be more likely to cooperate; that people, as a result, try to implant these beliefs in others' mind to deter them from cheating; and that recipients are motivated to endorse those beliefs to avoid reputational costs. Because people can police both for their own self-interest and for mutual benefit, policing incentives generate both extractive beliefs that serve selfish interests and prosocial beliefs that serve the common good.

People Believe That Believing in Moralizing Gods Makes People More Cooperative

While much of previous research has been guided by the idea that religion promotes cooperation, we propose to turn the reasoning on its head. While scholars still debate whether beliefs in moralizing gods *objectively* facilitate cooperation (see Introduction), a less contested finding is that *people believe* that these beliefs motivate cooperation. Across 34 countries of six continents, survey data show that a median of 45% of people consider believing in god as "necessary to be moral and have good values" (Tamir et al., 2020). Experimental evidence demonstrates that, across 13 societies with Hindu, Buddhist, Christian, Muslim, and nonreligious majorities, people intuitively perceive religious believers to be less likely than atheists to commit immoral acts—such as serial murder or animal

torture—and perceive religious believers to be more likely to engage in prosocial behavior (Dayer et al., 2024; Gervais, 2013, 2014; Gervais et al., 2017; see also Tan & Vogel, 2008). Studies based on trust games, similarly, find that people are more likely to trust believers in karmic punishment, despite a lack of an association between believing in karma and actual trustworthiness (Ong et al., 2022).

This converges with historical and ethnographic evidence for the folk-psychological belief that belief in moralizing gods motivates cooperation. Among Mentawai horticulturalists of Indonesia, for example, respondents spontaneously suggested that fear of the local moralistic spirit, *Sikameinan*, deters people from wrongdoing (Singh et al., 2021, p. 66). "Fear him who does not fear God, but do not fear him who fears God," a Kazakh proverb similarly taught (Grodekov, 2010, p. 239). And long before the Roman Empire adopted Christianity, Cicero (1st c. BCE) saw a social utility in beliefs in moralizing gods: "Who will deny that such beliefs are useful when he remembers … how many persons are deterred from crime by fear of divine punishment" (Liebeschuetz, 1989, p. 49).

This folk-psychological belief—that belief in moralizing gods encourages cooperation—is likely to emerge from computations involved in theory of mind. To predict the behavior of others, people instinctively employ a causal model in which the behavior of other people derives from their beliefs and their desires (Ho et al., 2022; Jara-Ettinger et al., 2016). Specifically, theory of mind represents other people as rational agents who make decisions which, they believe, will maximize their expected utility—maximizing their rewards and minimizing their losses (Baker et al., 2017; Bridgers et al., 2020; Jara-Ettinger, 2019; Jara-Ettinger et al., 2016, 2017). For example, if Bob believes it is raining outside and does not want to get wet, you infer that he will likely take an umbrella before stepping outside—to avoid the cost of getting wet. Similarly, we argue that people intuitively expect that, if Bob believes that God punishes adultery with eternal torture in hell, he will be less likely to cheat on his partner. Consistent with this idea, the relationship between religiosity and perceived trustworthiness has been found to be mediated by participants' belief that "people behave better when they feel that God is monitoring their behavior" (Gervais et al., 2011). In fact, people hold the folk-psychological intuition that people behave better not only when *God* is monitoring their behavior but when *any* entity capable of punishment, including secular authorities and other people in general, monitors their behavior (Kelley & Michela, 1980; Kruglanski, 1970; Miller et al., 2005; Strickland, 1958; Strickland et al., 1976).

In other words, our account does not assume that humans have evolved specific adaptations to believe that supernatural punishment promotes cooperation. This belief develops from more general theory of mind mechanisms that are not specific to religious belief. These mechanisms give people the intuition that others will avoid behaviors that result in net costs to themselves—whether those costs come from secular punishment, supernatural punishment, or any other process.

People Communicate Beliefs in Moralizing Gods to Control Conspecifics' Behaviors

Because they benefit from others' cooperation, humans benefit from monitoring, punishment, and deterrence of others' selfishness. Policing behaviors are adaptive when the inclusive fitness benefits the policer gets from their partners' increased cooperation outweigh the costs of the policing that generates this increase in cooperation (El Mouden et al., 2010; Frank, 1995, 1996, 2003; Singh & Boomsma, 2015). Given these fitness benefits, policing behaviors evolve in many social species, including social bacteria (Manhes & Velicer, 2011), eusocial insects (F. L. W. Ratnieks & Wenseleers, 2005; Q. Sun et al., 2020), mongooses (Cant et al., 2014), macaques (Beisner & McCowan, 2013; Flack et al., 2006), and vervet monkeys (Arseneau-Robar et al., 2016, 2018). A well-studied example is mutual policing among worker honeybees, which prevent each other from reproducing at the expense of the colony by destroying worker-laid eggs or aggressing reproducing workers (F. L. Ratnieks, 1988; F. L. W. Ratnieks & Visscher, 1989). Social scientists have long noted that humans across cultures (Black, 1984; Boehm, 1999, 2000, 2012; Hechter, 1988) and early in development (Yang et al., 2018; Yudkin et al., 2020) also attempt to increase their conspecifics' level of cooperation. This social control takes various forms, from the ostracism (Boehm, 1999, 2012), public criticism (Boehm, 2012; Wiessner, 2005), and institutional regulation of antisocial behaviors (Leeson, 2009; Lienard, 2014; Ostrom, 1990) to coordinated corporal punishments going as far as execution (Boyd et al., 2010; Molleman et al., 2019; Wrangham, 2019).

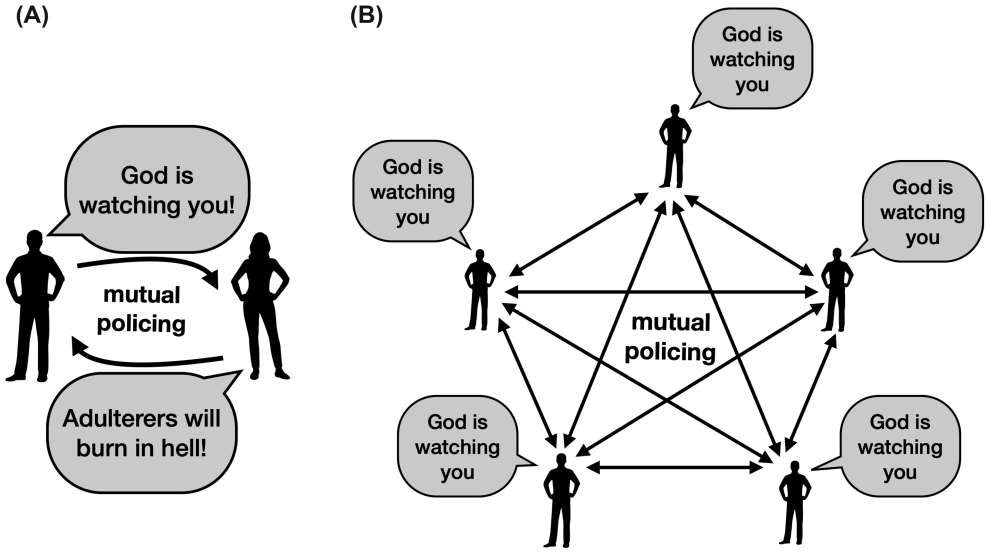
Monitoring and punishing selfishness, however, is often highly costly to the policer, who must invest time and energy in monitoring others and can experience retaliation and reputational damages (Arai et al., 2023; Black, 2000; Guala, 2012; Raihani & Bshary, 2019; Wiessner, 2005). By contrast, communicating beliefs in supernatural monitoring and punishment is less costly for at least two reasons. First, telling a cheater that the gods will punish them is cheaper than spending time and energy actually policing their behavior. Second, appealing to supernatural punishment allows the policer to shirk responsibility for reproving the cheater's behavior—"it's god who punishes you, not me!" This makes retaliation by the cheater unjustifiable and allows the policer to avoid the reputational damage that punishers sometimes experience (see Arai et al., 2023; Wiessner, 2005).

Because people believe that beliefs in supernatural punishment can make others more cooperative, they likely perceive communicating these beliefs as a cost-effective strategy for policing, allowing them to incentivize others' cooperation while avoiding the costs of real-world policing. Thus, we argue that beliefs that "God is watching you," "selfishness brings bad karma," and "adulterers will burn in hell" stabilize in human populations because people perceive them (not necessarily consciously) as likely to inspire cooperation in others by increasing the perceived cost of free riding. They emerge from a dynamic of mutual policing, in which everyone, lacking confidence in the spontaneous cooperation of conspecifics, attempts to incentivize their cooperation by endorsing beliefs in supernatural punishment (Figure 1).

Three points are important here. First, our account assumes that people do not passively acquire religious beliefs from others but rather actively use and shape religious beliefs to advance their fitness interests—in line with a growing body of research in the cognitive science of religion (Boyer, 2020b, 2021, 2022; Fitouchi & Singh, 2022; Moon, 2021; Moon et al., 2019, 2022). Take how people used supernatural explanations of misfortune strategically in a village of Central Serbia (Jerotijević, 2015). Jerotijević (2015) reported that when informants explained their own misfortunes, such as their illness or money problems, they attributed them to attacks by

Figure 1

Policing Interests Stabilize Beliefs in Supernatural Punishment in a Population



Note. Panel A: Mutual policing through supernatural punishment in dyadic cooperation. Panel B: Mutual policing through supernatural punishment in n-person collective action.

witchcraft, implying that "they did not deserve all the bad things that happened to them" (Jerotijević, 2015, p. 270)—a clearly self-serving attribution. In contrast, "when something bad happened to someone else … people believed that the person was being punished by God. … Their aim is to 'warn' wrongdoers and cheats that 'this is what happens to sinners'" (Jerotijević, 2015, p. 270). In other words, people's endorsement of supernatural beliefs depends on their strategic interests.

Second, we do not assume that people have biologically evolved, domain-specific adaptations for policing with supernatural punishment. Supernatural punishment is just one of the many tools that people develop to achieve policing goals, many of these tools being secular. In fact, people routinely attempt to manipulate others' *secular* beliefs about the likelihood of detection and punishment to encourage them to cooperate. Studies of "parenting by lying" show that parents in various cultures regularly communicate false secular beliefs to their children—saying, for example, that the police will come punish them—when other means of controlling children's behavior prove ineffective (Brown, 2002; Heyman et al., 2009, 2013). Across cultures, similarly, people narrate stories that emphasize the dangerous consequences of behaving selfishly, and the long-term benefits of behaving cooperatively, likely in the hope of encouraging prosocial behaviors in listeners (Dundes, 1962; Du Toit, 1964; Smith et al., 2017; Thompson, 1946; see also Wiessner, 2014). Sometimes, people use supernatural beliefs for the same goal, such as when parents tell their children that Santa Claus will not bring them any present if they misbehave (Goldstein & Woolley, 2016; Heyman et al., 2013). But there is nothing specific to religion in our account. People simply select supernatural punishment as one of the many beliefs they perceive, based on their theory of mind, as likely to influence others' behavior in desired directions.

Third, if supernatural punishment does not *actually* make people more cooperative (as discussed in the Introduction), why should people think it works and use it for policing? Three important factors seem to be the low cost of endorsing supernatural beliefs, the uncertainty about their efficacy, and the high potential benefits. It is not easy to determine with certainty whether supernatural punishment works; even professional social scientists remain uncertain on the matter! (see introduction). What people do know, however, is that the cost of communicating a belief is low; it does not cost much to say, "God will punish you!" Thus, people do not lose much by communicating the belief even if it does not work. By contrast, if the belief happens to work, failing to communicate it is very costly. It means missing an opportunity to discourage others from cheating you. Given the low cost of communication, then, the rational strategy should be to communicate the belief despite uncertainty about objective benefits. This aligns with the general conclusion of error-management theory: In the face of uncertainty, the adaptive strategy is to bias decision making toward making the less costly form of error (Beck & Forstmeier, 2007; Foster & Kokko, 2009; Haselton & Nettle, 2006; McKay & Dennett, 2009).

Why Should Recipients Accept the Beliefs?

Humans have evolved cognitive mechanisms of epistemic vigilance, by which they assess the reliability of communicated beliefs to protect against manipulation (Mercier, 2017, 2020; Sperber et al., 2010). They are less likely, for example, to adopt beliefs transmitted by people who have a self-interest in deceiving them (Mills & Keil, 2005; Reyes-Jaquez & Echols, 2015; Street & Richardson, 2015). If people communicate supernatural punishment beliefs to manipulate others into cooperating, why should recipients

accept those beliefs rather than rejecting them to avoid being manipulated, which could stop their cultural transmission?

Recipients Need Not Accept the Beliefs for Them to Seem Widespread

One possibility is that recipients do not accept the beliefs. In many cases, beliefs in supernatural punishment might seem widespread in a population despite nobody believing them. The appearance of belief can result from policers endorsing the beliefs to manipulate recipients and from recipients pretending to accept the beliefs to avoid being harmed by policers. Take again the Selk'nam foragers mentioned in the introduction. Men told women that a punitive spirit, *Shoort*, "will punish them if they were negligent wives or mothers" (Tierra del Fuego: Chapman, 1982, p. 114). Men invested time and energy trying to convince women of the reality of this punishment. During religious ceremonies, they disguised themselves as *Shoort* to "make his presence felt and to select for punishment those women whose behavior has not conformed to the model of subservient wife" (Chapman, 1982, p. 113). To make the belief even more credible, they pretended that men, too, were punished by *Shoort*. They faked being attacked by making scary noises and screams from the site of the ceremony from which the women were kept away (Darmangeat, 2009, p. 132). Despite all these efforts, according to anthropologist Anna Chapman, women were not naive and "knew the secret"—they simply did not reveal "their knowledge of the secret to the men … for fear of arousing aggression" (Chapman, 1982, p. 153; see also Bridges, 1948).

Beliefs in Supernatural Punishment Provide Hard-to-Falsify Explanations of Misfortune

In many cases, however, recipients might accept beliefs in supernatural punishment. We argue that this is due to policers iteratively shaping, over cultural evolution, beliefs that they perceive as more likely to bypass recipients' epistemic vigilance, based on both trial-and-error and folk-understanding of cognitive mechanisms in recipients (see Ho et al., 2022). Such winnowing explains several design features of supernatural punishment.

First, policers exploit uncertainties about the causes of misfortunes. Across cultures, people are more likely to accept supernatural beliefs when trying to explain events that are fitness-consequential (e.g., deadly illness) yet difficult to explain by natural causation or nonsupernatural agents (J. L. Barrett & Lanman, 2008; Gray & Wegner, 2010; Hong, 2024; Singh, 2021). This includes explaining why someone suddenly became ill or why a fatal accident happened to this particular person at this particular time (Boyer, 2020a; Evans-Pritchard, 1937; Legare et al., 2012; see also Jackson et al., 2023). When such misfortunes happen, people consider many cognitively plausible explanations, several of which do not involve supernatural punishment (Singh et al., 2021). If Maria is seriously ill, the reason may be that she has been attacked by sorcery (Singh, 2021) or that she has violated a nonmoral taboo (see Boehm, 2008; Hong, 2024) or that she has failed to perform the appropriate sacrifices to some capricious ancestor spirit (see Boyer, 2022). Another possible explanation, however, is that Maria's illness is a supernatural retribution for her previous failures to cooperate—an explanation which, as by-product theories put forward, accords with immanent justice intuitions (Banerjee & Bloom, 2017; Baumard & Boyer 2013a; Baumard & Chevallier, 2012; Callan et al., 2014).

In this context, we argue, policers exploit uncertainties about the causes of misfortunes, as well as immanent justice intuitions, to push the moralistic explanation (supernatural punishment) over the nonmoralistic ones (e.g., violation of a nonmoral taboo). Among the Yaghan foragers, for example, "upon the death of an own child or a near relative, the neighbors point to the mourner with the expression: 'Watauinéwa is punishing him!'" (Tierra del Fuego: Gusinde & Schütze, 1937, p. 961). Similarly, after the great fire of London, "preachers of every denomination exhorted Londoners to repent for the many varieties of iniquity that had provoked God into torching the city" (McCullough, 2020, p. 198; see Tinniswood, 2004). And among the Ojibwa, "any serious illness is associated with some prior conduct which involved an infraction of moral rules … 'Because a person does bad things, that is where sickness … starts', is the way one informant phrased it" (North America: Hallowell, 1976, p. 410).

A second way to circumvent epistemic vigilance is to make the belief unfalsifiable. As Schneider put it, a supernatural sanction which "specifies that the criminal's left arm will fall off at noon on the third day following the crime cannot be maintained for long" (Schneider, 1957, pp. 798–799). That is because if noon passes and nothing happens—which is most likely—the recipient will downgrade their evaluation of the plausibility of supernatural punishment in light of the countervailing evidence (for a formal analysis, see Leeson, 2014). By contrast, "a supernatural sanction which specifies that someone will die can be maintained because the probability that someone will die is equivalent to certainty" (Schneider, 1957, pp. 798–799). When death will happen, there will be no way to know if it happened because of supernatural punishment or because it would have happened anyway (see Leeson, 2014). People seem to understand that such vagueness is useful for decreasing the risk of being disproven. Indeed, they prefer vague formulations when lying to others in secular contexts (Deversi et al., 2021; Serra-Garcia et al., 2011; K.-K. Sun & Papadokonstantaki, 2023). They may do the same, we suggest, when trying to manipulate others with supernatural punishment. Another way to make supernatural punishment unfalsifiable is to make it unobservable, such as by postponing it to the afterlife (Leeson, 2014). This explains why beliefs in supernatural punishment take the form either of vague assertions about events that will happen anyway ("cheaters will die or get sick!") or of precise assertions about unobservable events ("sinners will be thrown into a snake pit in hell!").

Beliefs in Supernatural Punishment Exploit Threat-Detection Mechanisms

Third, policers can exploit cognitive mechanisms of threat detection in recipients. Beliefs about threats can bypass epistemic vigilance because the cost of a false positive (accepting that the threat exists when in fact it does not) is greater than the cost of a false negative (rejecting that the threat exists when in fact it does; Boyer, 2018, 2021; D. D. P. Johnson et al., 2013). Consistent with this logic, experimental evidence shows that people intuitively ascribe a higher probability to threats than to positive predictions (Fessler et al., 2014; Hilbig, 2009, 2012), are more willing to ask for additional information about them (Blaine & Boyer, 2018), and perceive senders of those beliefs as more competent (Boyer & Parren, 2015).

People seem to have a folk-understanding of this potential of threatening information to bypass epistemic vigilance. Journalists have long understood that "if it bleeds, it leads"—the intuition that stories about crime and bloodshed sell more newspapers than good news—and accordingly report more bad news to attract consumer attention (Lengauer et al., 2012; Robertson et al., 2023; Soroka et al., 2019). In transmission chain experiments, people prefer to transmit threatening information over positive or neutral information on the same topic (Blaine & Boyer, 2018), possibly because they understand that threatening information is more likely to be accepted (Boyer, 2021). In economic games, people even pay costs to increase others' perceptions of group threats in order to manipulate their behavior (Barclay & Benard, 2013, 2020). Thus, when trying to convince others of the reality of supernatural punishment, people may similarly tweak these beliefs into more threatening form to increase plausibility. Consistent with this idea, beliefs in supernatural punishment seem concocted to be threatening: They insist on the severity of the suffering that awaits sinners, be it an awful death, fatal disease, or being tormented by demons for eternity.

Recipients Endorse Beliefs in Supernatural Punishment to Avoid Reputational Costs

Aside from these epistemic logics, we argue that acceptance of beliefs in supernatural punishment is further facilitated by reputational incentives. These incentives emerge from the same folk-psychological belief that makes supernatural punishment useful for policing others, namely, the belief that believing in supernatural punishment makes people more cooperative. Because people believe that believing in supernatural punishment makes people more cooperative, individuals who do not believe in supernatural punishment are perceived as more likely to cheat (Gervais, 2013; Gervais et al., 2011, 2017; Ong et al., 2022; Tan & Vogel, 2008) and thus tend to be avoided as cooperative partners (Abrams et al., 2020) and provided with fewer benefits in cooperative interactions (McCullough et al., 2016; Ong et al., 2022). Thus, people who do not endorse belief in supernatural punishment run the risk of failing to attract other people's cooperation. This further compels recipients to adopt beliefs in supernatural punishment to secure a good reputation as a cooperative partner.

At the proximate level, this is likely handled by mechanisms of reputation management that are not specific to religious belief. People have cognitive adaptations for learning which traits are reputationally valued in their environment and strategically display them to attract others' trust (Asaba & Gweon, 2022; Heyman et al., 2021; see also Manrique et al., 2021). These mechanisms likely apply to religious belief as they do for any trait, compelling people to endorse beliefs in supernatural punishment to secure a good reputation. Does this mean that people only strategically *pretend* to believe in supernatural punishment to protect their reputation? That may be the case in some situations. Psychological and sociological evidence indicates that atheists often hide their lack of belief through socially desirable responding (Gervais & Najle, 2018; Hadaway et al., 1993). However, the ultimate, reputational function of believing in supernatural punishment is also compatible with people *genuinely* believing at the proximate level. Genuinely believing in God, in fact, might be the most efficient way to convince others that you believe in God—and thus that you are a trustworthy cooperative partner (see von Hippel & Trivers, 2011). In other words, as many have noted, ultimately social incentives can translate into sincere epistemic states at the proximate level (Funkhouser, 2017; Kurzban & Aktipis, 2007; D. Williams, 2021). Consistent with this idea, meta-analytic evidence indicates that people who engage more in reputation management exhibit higher levels of *intrinsic* religiosity—a construct related to sincere religious belief and lifestyle (Sedikides & Gebauer, 2010).

The Varieties of Religious Policing: From Extractive to Prosocial Religion

We can now refine the central tenet of the mutual policing model—that people endorse supernatural punishment to police others' behavior—by examining the specific strategic interests driving this policing. In this section, we apply standard social evolution theory (West et al., 2007, 2011, 2021) to identify the incentive structures that lead people to police others. We argue that these varying incentive structures account for the diverse forms of supernatural punishment observed across contexts and cultures (see Figure 2).

What is commonly referred to as "beliefs in moralizing gods" or "moralistic supernatural punishment" (D. Johnson, 2016; M. Lang et al., 2019; Lightner et al., 2023; Norenzayan et al., 2016; Purzycki et al., 2016; Turchin et al., 2023) represents one specific type of supernatural punishment found in human societies. We categorize this type as *prosocial* because it encourages cooperative behavior by punishing cheating in cooperative interactions (e.g., theft, murder, stinginess). In contrast, we term other forms *extractive* when supernatural punishment does not target uncooperative behaviors such as theft or murder but rather punishes failures to serve the self-interests of certain individuals (e.g., dominant individuals at the expense of subordinates).

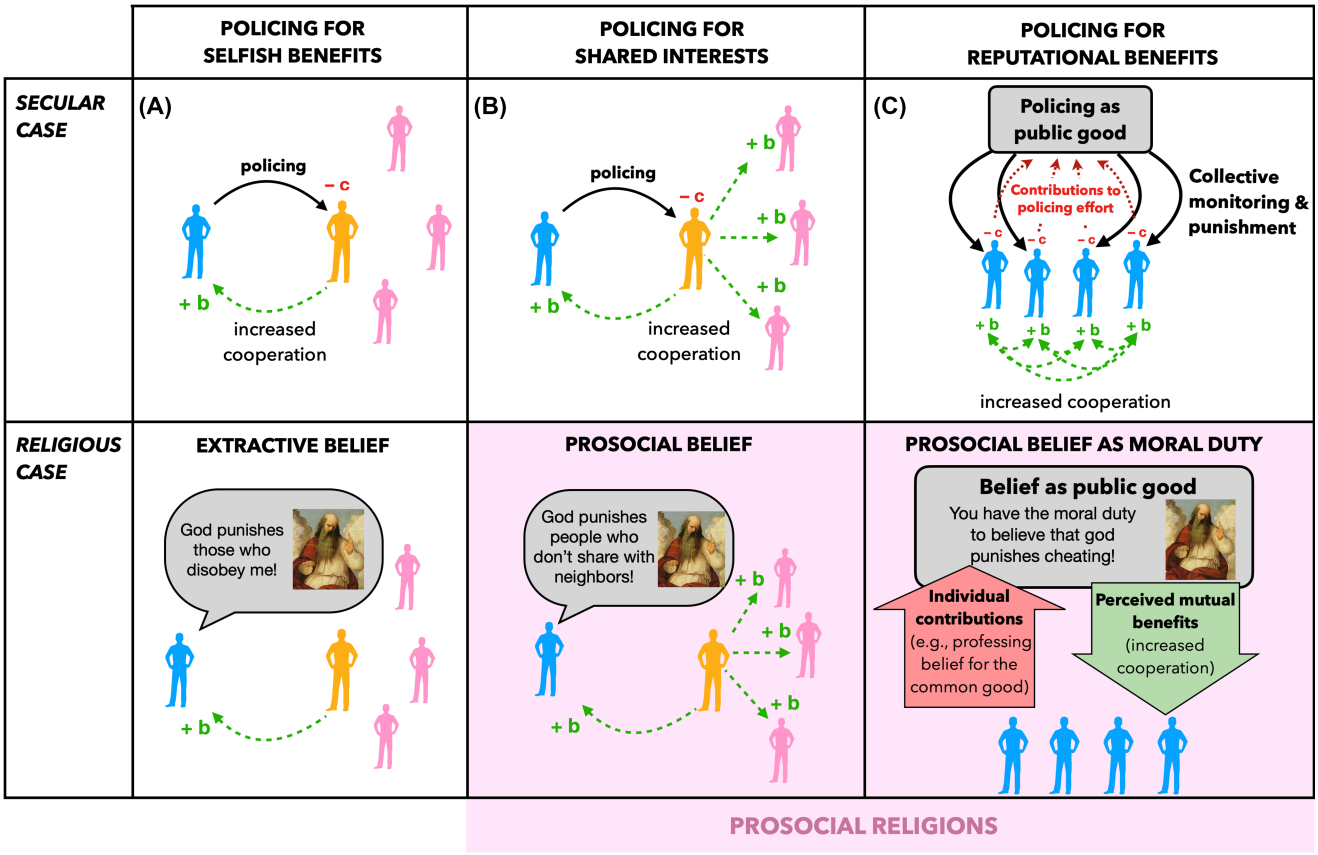
Prosocial forms of supernatural punishment, we argue, emerge as a particular case of the use of supernatural punishment to police others, where policers have an interest in incentivizing behavior that favors the public good. Such a prosocial interest may reflect overlapping interests with other group members, such as in a shared preference for social order, or reputational incentives, such as when people gain a good reputation for policing for the common good. *Extractive* forms of supernatural punishment, in contrast, emerge when policers have a self-interest in incentivizing behavior that serves only their personal interests, such as when Selk'nam men used *Shoort* to dominate women (Chapman, 1982).

Selfish Policing Results in Extractive Supernatural Punishment

A central distinction in social evolution theory is that between selfish and cooperative behaviors (Hamilton, 1964; West et al., 2007, 2011, 2021). Selfishness refers to any behavior that provides fitness benefits to the actor while inflicting costs on the recipient (±) (Hamilton, 1964). Cooperation, by contrast, refers to any behavior that provides benefits to an individual other than the actor (+/+ or −/+) (Hamilton, 1964; West et al., 2007, 2011). Policing is selfish when it aims at providing exclusive benefits to the policer while inflicting costs on the recipient and having neutral or negative effects on bystanders (Figure 2A). This is the case, for example, when a slave owner punishes his slaves to ensure that they work hard enough for him. Because people believe that supernatural punishment can influence others' behaviors, they should sometimes use those beliefs

Figure 2

Types of Policing Behaviors and Their Religious Counterparts



Note. Panel A: Selfish policing provides exclusive benefits to the policer while imposing costs on the recipient and having neutral or negative effects on bystanders. Panel B: Policing based on shared interests functions to benefit the policer yet happens to benefit bystanders by incidentally increasing cooperation toward them as well. Panel C: In reputation-based policing, individuals cooperate to police cooperation. Each individual pays a cost to contribute to the policing effort to promote higher levels of mutually beneficial cooperation in the group. When based on the promotion of beliefs in supernatural punishment, each of these policing strategies generates a particular type of supernatural punishment belief documented in human societies—here labeled "extractive belief" (A), "prosocial belief" (B), and "prosocial belief as a moral duty" (C). See the online article for the color version of this figure.

for selfish policing goals. This should result in beliefs designed to exclusively benefit their promoters at the expense of other individuals. In those beliefs, gods should be said to punish behavior that harm the promoter's own self-interest, rather than to punish uncooperative behaviors that harm the group at large.

Selfish policing helps to explain why, although punitive gods often encourage cooperative behavior, they also often appear extractive in many contexts. In world religions, the very same gods that prescribe charity, kindness, and turning the other cheek also have an extractive facet. The Muslim god commands women to obey men (Dickemann, 1981; B. I. Strassmann et al., 2012); the Hindu *Law of Manu* demands that a "virtuous wife should constantly serve her husband like a god, even if he behaves badly, freely indulges his lust and is devoid of any good qualities" (Doniger, 2014, p. 259); and the doctrine of the "divine right of kings" in medieval Europe held that any opposition to the king was against God's will (Bentzen & Gokmen, 2023; see also Cronk, 1994; de Aguiar & Cronk, 2011).

In small-scale societies, too, supernatural punishment is often extractive. Among the Siriono of Bolivia, young people were warned that they will get sick if they do not "give their game and fish to the old people" (Priest, 1966, p. 1246). Among the Hadza, women and children were warned that they could suffer supernatural sanctions, such as serious illness, if they approached *epeme* meat—the most prized parts of the largest animals and the exclusive privilege of adult males (Marlowe, 2010, pp. 57–58; Woodburn, 1979, p. 254). Among the Enga of Papua New Guinea, young men from around puberty were said to be married to a "spirit woman" who forbade them from having sexual relations with human women (Wiessner & Pupu, 2021; Wiessner & Tumu, 1998). If they were to cheat on the spirit woman, she would punish them by inhibiting their growth into beautiful and intelligent men (Wiessner & Pupu, 2021). By excluding young males from the mating market, the belief seems conveniently designed to reserve women for the polygynous marriages of older men (see Wiessner & Pupu, 2021).

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Note that selfish policing can occur in the absence of power asymmetries. In the secular case, when people deter neighbors from robbing them, for example, by installing surveillance cameras in their homes, they are protecting themselves from being attacked without incentivizing cooperation in the group at large. The same holds in the religious case. On many Polynesian islands, families placed taboos on their own fruit trees and vegetable gardens, thereby signaling to potential thieves that supernatural forces would punish the theft of their property with illness, death, or shark attacks (Williamson, 2013, pp. 134–136; see also Bell, 1953; Hogbin & Malinowski, 1934; Wright, 2009). Such beliefs that supernatural forces punish, not theft in general but theft from the promoter of the belief specifically, seem to originate in selfish policing.

Thus, a critical prediction of the mutual policing model is that beliefs in supernatural punishment should emerge not only under prosocial forms that punish uncooperative behaviors but also under extractive forms that serve selfish interests. This contrasts with cultural group selection theories, according to which punitive gods evolve because they increase cooperation, which predict that punitive gods should mostly be concerned with group cooperation (Norenzayan et al., 2016; see also D. Johnson, 2016). In our framework, prosocial supernatural punishment evolves as a *particular case* of the use of supernatural punishment for policing others, where the policer benefits from encouraging cooperation in the group at large.

Policing With Shared Interests Results in Prosocial Supernatural Punishment

As long noted by social evolution theorists, policing often generates public good benefits for individuals other than the policer (El Mouden et al., 2010; Singh & Boomsma, 2015; Q. Sun et al., 2020). This is the case when, by monitoring and punishing a recipient, you induce the recipient to increase her level of cooperation, not only toward you, but also toward other individuals. In pigtailed macaques, for example, dominant individuals directly benefit from policing within-group conflicts yet thereby also benefit other individuals as a by-product, by decreasing conflict rates (Flack, de Waal, et al., 2005; Flack, Krakauer, et al., 2005; Flack et al., 2006). In these cases, policing is *cooperative* behavior in the sense that it provides benefits to individuals other than the actor (West et al., 2007).

Among cooperative behaviors, however, one must distinguish between cooperation based on *shared interests* (or "by-product cooperation") and cooperation based on reciprocity and reputation (West et al., 2007, 2011, 2021). Cooperation for shared interests refers to behaviors that benefit other individuals only as a by-product of being already in the actor's direct self-interest (Leimar & Connor, 2003; Leimar & Hammerstein, 2010; West et al., 2011). Unlike reciprocal and reputation-based cooperation, this form of cooperation does not imply a free-rider problem, since the benefits that the actor receives from their cooperative behavior are not dependent on recipients or third parties providing benefits to the actor in return.

Many policing behaviors belong to this category. The term "mutual policing" was originally coined in the animal literature to refer to such policing behaviors that generate by-product benefits for other individuals despite being in the direct self-interest of the policer (Cant et al., 2014; Frank, 1995; F. L. Ratnieks, 1988; Q. Sun et al., 2020). For example, in the mutual policing of worker honeybees, each worker has an inclusive fitness interest in preventing other workers from reproducing (El Mouden et al., 2010). However, when a given worker W_1 polices another worker W_2, this happens to benefit all the other workers (W_3, W_4, W_5, …, W_n) because they all have the same interest: none of them want W_2 to reproduce (F. L. Ratnieks, 1988; F. L. W. Ratnieks & Visscher, 1989; F. L. W. Ratnieks & Wenseleers, 2005). All workers end up policing each other, with no incentive to free ride on each other's policing, because each worker's contribution increases the benefit she receives from policing sufficiently to be worth the cost regardless of whether other workers are also policing.

Beliefs in gods that punish uncooperative behaviors, we argue, can emerge from a similar incentive structure where the policer's interests align with the interests of other individuals. Take the punitive spirit *Sikameinan* among the Mentawai horticulturalists, believed to attack people who fail to share meat within their clan (Singh et al., 2021). Each clan member has an interest in incentivizing other clan members to share meat with him or her. To this end, it is useful to communicate the belief that *Sikameinan* will punish failure to share with clan members ("Share with the clan or you'll get sick!"). By appealing to *Sikameinan*, however, each individual generates by-product benefits to other clan members by increasing the probability that meat will be shared with them as well (Figure 2B). All clan members end up policing each other by appealing to *Sikameinan*, with no incentive to free ride on each other's policing, because appealing to *Sikameinan* is cheap enough to be worth the cost regardless of whether other individuals are also policing.

Similarly, among the Kiowa bison hunters (North America), killing or taking revenge on someone after publicly reconciling with them was said to be followed by *taido* (Richardson, 1940). *Taido* was a supernatural sanction "whereby the killer was pursued to the end of his days with bad luck in hunting, herding and warfare, resulting in poverty, sickness and death" (Richardson, 1940, pp. 36, 11, 61). Ethnographic evidence indicates that everyone among the Kiowa had a strong shared interest in preventing cycles of killing and counter-killing (Fitouchi & Singh, 2023; Hoebel, 2009; Richardson, 1940). Indeed, these destructive cycles of revenge could end up harming everyone in the group, not just the disputants themselves (Richardson, 1940). Thus, we suggest that everyone had a shared interest in trying to deter intratribal killing and revenge by endorsing the belief in *taido*, particularly given the low cost of communicating the belief.

In other words, beliefs in prosocial supernatural punishment—forces that punish uncooperative behaviors such as murder or stinginess—can arise from self-interested motivations to police when the policers' interests coincide with the common interest.

Reputation-Based Policing Results in the Moral Duty to Believe in Prosocial Supernatural Punishment

Humans also engage in forms of policing that are cooperative in a stronger sense. Given their capacity for reciprocal and reputation-based cooperation (Clutton-Brock, 2009), they engage in collective actions aimed at promoting cooperation in their group (Figure 2C), even when the individual cost of participating in policing is greater than the marginal benefit each individual receives from his participation (Lie-Panis et al., in press; Yamagishi, 1986). Ostrom (1990), for example, famously reviewed how many small-scale communities have collectively organized to control free riding by,

for example, hiring specialized monitors to watch over common pool resources (see also Greif, 1993; Greif et al., 1994). As they require costly contributions, these cooperative interactions imply a second-order free-rider problem: Individuals have an incentive to benefit from the increased cooperation that policing generates without themselves paying the cost of contributing to policing (Hechter, 1988; Heckathorn, 1989; Ostrom, 1990; Yamagishi, 1986).

Cooperative policing can be stabilized by social incentives such as reciprocal rewarding and reputational dynamics, which allow individuals to overcome the second-order free-rider problem (Ostrom, 1990; Ozono et al., 2016; Pal & Hilbe, 2022). Evolutionary models, experimental evidence, and ethnographic data show that individuals are motivated to pay costs to police cooperatively when they gain reputational benefits for doing so (Barclay, 2005; Glowacki & von Rueden, 2015; Jordan et al., 2016; Lie-Panis et al., in press; Ostrom, 1990; Pal & Hilbe, 2022). In the communities surveyed by Ostrom (1990), for instance, "The individual who finds a rule-infractor gains status and prestige for being a good protector of the commons" (Ostrom, 1990, p. 96). Another mechanism to incentivize cooperative policing is to reward policers conditionally on whether they police for the public interest (see also Ozono et al., 2016; Sasaki et al., 2015; Wang et al., 2018). In Ostrom's case studies, for instance, monitors were rewarded by payments if they did their job well and fired by the community if discovered slacking off (Ostrom, 1990, pp. 88, 96).

Importantly, when policing is the object of such a collective action, it is treated cognitively as any form of reciprocal cooperation. That is, people compute that everyone has a moral duty to contribute to the policing effort (André et al., 2022). Taking the benefits of others' costly investments in policing, while not yourself paying the cost of policing (e.g., by cheating on the taxes that pay for policemen), amounts to free riding on your cooperative partners—the typical kind of behavior that people judge morally wrong (André et al., 2022; Curry et al., 2019; Graham et al., 2013). Just as people moralize free riding in other collective actions (Cubitt et al., 2011; Delton et al., 2013; Levine et al., 2020; Mathew & Boyd, 2014), people who free ride on others' contributions to policing are perceived as moral violators (Mathew, 2017).

These collective actions for policing cooperation, we argue, also have a religious counterpart (Figure 2C). When people perceive that the erosion of beliefs in supernatural punishment could jeopardize people's motivation to cooperate, resulting in social disorder (Israel, 1995, p. 373; Jones, 1980), the maintenance of religious belief in society is perceived as a public good to which everyone has a moral duty to contribute. Everyone has a duty to pay costs to stabilize the belief in supernatural punishment, to ensure that everyone will benefit from an acceptable level of cooperation and social harmony. In this collective action, people have the moral duty to educate their children religiously, to publicly support belief in the supernatural punishment of cheating, and to abstain from behavior that might undermine other people's faith, such as blasphemy, defamation of religion, and public renunciation of faith (see Grim, 2012; Jones, 1980; Nash, 2007). And people who cheat in the collective action for maintaining faith—apostates, blasphemers, and other preachers of sacrilegious ideas—earn a bad moral reputation for threatening the stability of cooperation in the group. In medieval and early modern Europe, for example, blasphemy was condemned as a threat to the "public-order" and the "moral and material safety of the nation," because it could "alienate the mind of others from the love and reverence of God" (Nash, 2007, pp. 3–5; see also Jones, 1980). In the early years of the Dutch Republic (16th c.), similarly, political thinkers feared that "if parents … fail to instill veneration for the Church and 'fear of God' into their offspring, then morality, and with it the social order, would surely collapse" (Israel, 1995, p. 373).

This helps to explain why many prosocial religions not only feature beliefs in prosocial supernatural punishment but also make it a *moral duty* to endorse, spread, and protect these beliefs (see also Dennett, 2007). The Christian Church, for example, requires people to publicly and regularly profess their belief in heaven and the judgment of the dead in the afterlife (e.g., by reciting the Apostles' Creed: Cross & Livingstone, 2005; Lindbeck, 2020). More generally, as of 2014, about 26% of the world's countries and territories had antiblasphemy laws or policies, and 13% had laws or policies sanctioning apostasy—the public renunciation of faith (Theodorou, 2016; see also Grim, 2012). While these laws may be in part favored by the self-interest of rulers (something we discuss below), psychological evidence shows that many ordinary people also see atheism, blasphemy, and sacrilegious ideas as morally wrong (Ritter et al., 2016; Royzman et al., 2014; Schein et al., 2016).

Finally, the notion that religious belief is an object of collective action also helps explain why many prosocial religions institutionalize (see, e.g., Vlerick, 2020). By this, we mean that people develop complex social organizations, such as clerical institutions, to organize their collective action for promoting religious belief in society. In the secular case, collective policing often takes the form of complex policing institutions with a division of labor in the collective action for policing—with guards, policemen, and justice courts, each endowed with a special role in the policing of free riding (Ostrom, 1990). In the same way, collective policing based on religious beliefs takes the form of complex clerical institutions—with priests, churches, and religious schools, each endowed with a special role in the dissemination of supernatural punishment beliefs in society (Figure 2C). Just as secular policing is entrusted to professional policemen, who are paid by the community to monitor and punish free riding, religious policing is entrusted to professional priests, who are paid by the community to hold the Mass, teach the religious doctrine, preach prosocial commandments, and remind everyone of the prospect of God's punishment in the afterlife.

Interim Summary

In sum, because mutual policing can be underpinned either by selfish interests, shared interests, or reputation-based cooperation, it provides a unifying explanation for why beliefs in supernatural punishment are sometimes extractive, sometimes prosocial, and sometimes a moral duty (Figure 2). Of course, this typology only aims to capture ideal-typic design features of beliefs, not to classify existing religions (such as "Islam" or "Christianity") into clear-cut categories. Actual religions often mix many of these features, given the variety of incentive structures from which they emerge. Medieval Christianity, for example, arguably mixes extractive supernatural punishment (e.g., the divine right of kings), prosocial supernatural punishment (e.g., turning the other cheek), and the moral duty to endorse prosocial beliefs (e.g., profession of faith).

The Technological Evolution of Prosocial Religions

While religious culture is often seen as fundamentally different from technological culture (Jagiello et al., 2022), we argue that religious evolution can be understood as a special case of technological evolution. When developing technical artifacts (e.g., hammers), people design variants that they perceive, based on technical reasoning, as efficient for achieving a given goal (e.g., hammering nails; Osiurak & Reynaud, 2020; Osiurak et al., 2021, 2023). After observing the effectiveness of different variants, people iteratively tweak existing variants to increase their efficiency and retain those they perceive—potentially wrongly—as the most efficient (Singh, 2022).

Recent work suggests that many religious traditions are no different and are best understood as serving instrumental goals (André et al., 2023; Hong & Henrich, 2021; Singh, 2022). Just as people design effective-seeming hammers based on technical intuitions, they also design, based on intuition and trial-and-error, supernatural practices that they perceive to be effective in achieving some goal—such as making rain fall or warding off misfortune (Hong & Henrich, 2021; Hong et al., 2024; Singh, 2021, 2022). They craft divination techniques to reveal inaccessible information (Hong & Henrich, 2021); design shamanistic interactions with spirits as effective-seeming ways to manage misfortune (Singh, 2018); and perform magical rituals to influence otherwise uncontrollable outcomes, such as illness or crop failure (Hong et al., 2024; Singh, 2021).

Our account extends this approach to prosocial religions. Just as people craft magical techniques for making rain fall (Hong et al., 2024), they selectively retain beliefs in supernatural punishment they perceive—based on their folk-psychology—to be effective in influencing others' behaviors. As with any cultural tool, people can tweak, improve, and elaborate on existing variants to better satisfy their policing goals, driving the cultural evolution of prosocial religions. And just as in technological evolution, this process can be cumulative when iterated over generations (Mesoudi & Thornton, 2018). Individuals in one generation may inherit beliefs in supernatural punishment from the previous generation. To better achieve their policing goal, they may tweak this belief into a form that seems more effective at encouraging cooperation, such as by refining the gradation of afterlife retribution. This might involve inventing a new place in the afterlife for intermediate levels of punishment, such as purgatory (Le Goff, 1986), to convince moderate sinners that they are not yet condemned to hell and that it is still worth behaving better.

This cumulative improvement in perceived efficiency helps explain why prosocial religions end up with apparently functional design features, intuitively well suited to promote cooperation, despite unclear evidence that they have strong prosocial effects. In our model, the ultimate driver of their cultural evolution is the folk-psychological intuition that they deter selfishness, not objective adaptive benefits they provide by increasing cooperation. Of course, people's subjective perception of efficacy may stem from prosocial religions truly being effective. But it need not be: Often, people (even professional policymakers) are wrong when making causal inferences about human behavior and design ineffective interventions when attempting to instill behavioral change (Cameron et al., 2021; Hoffman et al., 2022; Ott & Santelli, 2007). In the same way that erroneous perceptions of usefulness stabilize many ineffective public policies (Cameron et al., 2021), prosocial religions may stabilize because people wrongly perceive them to be efficient social technologies. Just as ineffective folk medicines develop the world over as people try to cure diseases (Miton et al., 2015), ineffective folk social technologies may develop everywhere as people do their best to make each other better people.

Cross-Disciplinary Evidence

The mutual policing theory generates at least nine predictions for the cultural design, cross-cultural variations, interindividual differences, and psychological mechanisms of prosocial religions and beliefs in supernatural punishment. In this section, we derive these predictions and review historical, psychological, cross-cultural, and ethnographic evidence that support them.

Prediction 1: People should invest more in supernatural punishment beliefs when they are more motivated to police each other. We thus expect that:

Prediction 1a: Individuals who desire higher levels of social control should be more likely to endorse supernatural punishment beliefs.

Prediction 1b: Lower trust in others should be associated with greater endorsement of supernatural punishment beliefs.

Prediction 1c: Societies with stricter social norms and greater disapproval of deviance (i.e., greater "cultural tightness"; Gelfand et al., 2017) should be more likely to exhibit supernatural punishment beliefs.

Prediction 2: People should invest more in supernatural punishment beliefs when they perceive them to be effective for motivating others to cooperate.

Prediction 3: People should invest more in supernatural punishment beliefs when they perceive an added value of supernatural policing over secular means of policing others' behaviors. We thus expect that:

Prediction 3a: People should invest more in supernatural punishment beliefs when their desired level of social control is harder to achieve by secular means.

Prediction 3b: Supernatural punishment beliefs should preferentially target behaviors that are difficult to police by secular means.

Prediction 4: Supernatural punishment beliefs should preferentially target behaviors that people are motivated to control in everyday life.

Prediction 5: Supernatural punishment beliefs should emerge, not only in forms that promote mutually beneficial cooperation but also in more extractive forms that serve selfish interests.

Prediction 6: Aside from beliefs, the rituals promoted by prosocial religions should exhibit evidence of deliberate design for policing purposes.

Prediction 1: People Invest More in Supernatural Punishment Beliefs When They Are More Motivated to Police Each Other

If supernatural punishment beliefs develop as cultural tools for individual policing strategies, people should invest more in prosocial religions when they are more motivated to police others' behavior. This prediction is specific to the mutual policing theory since it is the only theory to assume that supernatural punishment originates in individual policing motivations (although see Swanson, 1960, pp. 159–160, for a potentially similar logic). Other evolutionary theories, especially cultural group selection, hold that supernatural punishment beliefs originate not in individuals' policing strategies but in the group-level benefits they provide by increasing cooperation (Norenzayan et al., 2016; see also D. Johnson, 2016). Thus, these theories predict that holding supernatural punishment beliefs should be associated with greater *cooperativeness* (Norenzayan et al., 2016), rather than with greater motivations to police conspecifics' behavior. Reliable evidence that supernatural punishment beliefs are not associated with policing motivations would pose a considerable challenge to the mutual policing theory.

Converging lines of evidence support Prediction 1. First, individual-level religiosity is associated with greater motivations to control others' behaviors (*Prediction 1a*). Support for harsher punishment of criminal behavior (e.g., death penalty, corporal punishment) and greater motivations to punish norm violators predict endorsement of punitive religious beliefs (Bader et al., 2010; Bones & Sabriseilabi, 2018; Grasmick et al., 1993; Jackson, Caluori, Abrams, et al., 2021). Across dozens of countries, individuals who report greater religiosity and stronger beliefs in supernatural punishment tend to also support tighter restrictions on individuals' behaviors, namely, by rating uncooperative and sexual behaviors as less justifiable (Atkinson & Bourrat, 2011; Jacquet et al., 2021; Weeden & Kurzban, 2013).

Second, many studies find that religiosity and belief in punitive gods are associated with lower social trust (*Prediction 1b*), not only across groups but also between individuals within a same cultural group, and whether trust is measured by questionnaires (Berggren & Bjørnskov, 2011; Jacquet et al., 2021; Mencken et al., 2009; Valente & Okulicz-Kozaryn, 2021; though see Dilmaghani, 2017) or by trust games (Galen et al., 2020; see also Purzycki et al., 2020). This makes sense if people invest in punitive religious beliefs as a means to police others' behaviors, as the less people trust that other people will spontaneously behave cooperatively, the more they support or invest in policing others' cooperation (Nettle & Saxe, 2021; Yamagishi, 1986, 1988). Supporting this interpretation, in more than 295,000 individuals in more than 100 countries, individual-level motivations to police others' (in particular sexual) behaviors mediate the relationship between low trust and religiosity (Jacquet et al., 2021).

Third, similar patterns emerge with society-level markers of policing motivations (*Prediction 1c*). In 86 nonindustrial societies of the Standard Cross-Cultural Sample, societies with lower tolerance of deviance and more restrictive social norms (i.e., greater "cultural tightness") are more likely to exhibit beliefs in moralizing high gods (Jackson et al., 2020). Across 33 contemporary nations, tighter nations are more religious (Gelfand et al., 2011). Across more than 100 countries covering more than 90% of the world's population, low religiosity strongly correlates with "individual-choice norms" that oppose strong social control of individual lifestyles ($r = -0.77$; R. F. Inglehart, 2020). Within the United States, state-level cultural tightness predicts participants' propensity to report believing in hell (Jackson, Caluori, Abrams, et al., 2021), and tighter Chinese provinces have more Taoist and Buddhist temples, as well as churches and mosques (Chua et al., 2019). Moreover, historical increases in linguistic markers of cultural tightness between 1800 and 2000 have been found to predict, and to *precede*, historical increases in the punitiveness of religious beliefs, suggesting that increases in cultural tightness—indicating greater policing motivations—caused increased communication of punitive religious beliefs in the population (Jackson, Caluori, Abrams, et al., 2021).

Fourth, experimental evidence further suggests a causal role of policing motivations. Experimentally increasing participants' motivation to punish norm violators increases their endorsement of punitive religious beliefs (Jackson, Caluori, Abrams, et al., 2021; see also Stanley & Kay, 2022). Participants who experience a breach in trust—by being exploited by their partner in a trust game—are more likely than controls to attribute to God more punitive attitudes toward greed (Purzycki et al., 2020). Similarly, increasing people's perceptions of the prevalence of conflict and social disorder in their environment leads them to rate punitive gods as more important, this effect being mediated by support for tighter controls of individual behaviors (Caluori et al., 2020).

Prediction 2: People Invest More in Supernatural Punishment Beliefs When They Perceive Them to Be Effective for Incentivizing Cooperation

According to our account, people promote supernatural punishment beliefs because they hold the folk-psychological belief that, if others believed in supernatural punishment, they would be more likely to cooperate (see People Believe That Believing in Moralizing Gods Makes People More Cooperative section). In other words, people should invest more in supernatural punishment not only when they are more motivated to police others' behaviors but also when they perceive these beliefs to be effective for that end. Converging lines of evidence support this prediction.

First, ethnographic and historical evidence indicates that people endorse beliefs in supernatural punishment because they consider them efficient for inspiring cooperation in others. Take, for example, the Yahgan hunter–gatherers of South America, who believed in a "Supreme Being, who saw everything and who punish delinquents with shortened life and with the death of their children" (Cooper, 1946, p. 99). Yaghan informants reported deliberately instilling fear of this god in young people to scare them into cooperating:

> It is good to implant the fear of him in the candidates! For now they will more faithfully follow all the teachings and will live as good, industrious human beings. That is why they are often threatened with this villain! (Gusinde & Schütze, 1937, p. 763)

In medieval China and Europe, similarly, "the state strove to propagate beliefs in divine retribution after death as a means of preventing crime" (Bernstein & Katz, 2010, p. 241). Charlemagne,

King of the Franks and then Emperor (8–9th c.), "came to consider hell as a sanction that could reinforce his own imperial view of the cosmos and the political order" (Bernstein & Katz, 2010, p. 222). Even the French revolutionaries (18th c.), who sought to weaken the Christian Church's influence on society, nonetheless recreated a prosocial religion from scratch—the "Cult of the Supreme Being"—deemed necessary to ensure citizens' compliance to Republican virtue (Desmons, 2009; Smyth, 2016; Vovelle, 2002). As Robespierre put it: "The concept of the Supreme Being and of the immortality of the soul is a continuous call to justice, which makes it both social and republican" (Smyth, 2016, p. 22).

Second, using data from the World Value Surveys, Abrams et al. (2020) provided evidence that nations with stronger beliefs that religion is necessary for moral behavior are less likely to secularize over time. This supports the idea that the more people perceive religion as necessary for encouraging cooperation, the more they invest in religion—in the sense, here, of not abandoning it. Importantly, this relationship is also observed at the individual level. People who report a greater belief that religion is necessary for moral behavior are less likely to abandon religion across their lifespan (Abrams et al., 2020). Moreover, these people also tend to feel greater guilt over abandoning religion (Abrams et al., 2020). Indeed, guilt is the emotion that people feel when they perceive themselves to have violated a moral duty toward cooperation partners in reciprocal cooperative interactions (Fitouchi et al., 2024; Tomasello, 2020). Thus, the fact that people also feel guilty about abandoning religion suggests that they construe investment in religion itself as a moral duty toward other people, consistent with our proposal that people sometimes perceive themselves as engaged in a collective action to maintain religion in society.

Prediction 3: People Invest More in Supernatural Punishment Beliefs When They Perceive an Added Value Over Secular Means of Policing

If people use religious beliefs for everyday policing, they should rely on them more when they perceive them to add value beyond secular means of policing. Indeed, we expect people to believe that threats of supernatural punishment are less effective for motivating cooperation than threats of *secular* punishment, because threats of secular punishment are based on less mysterious entities (e.g., police officers rather than invisible spirits) and are therefore likely to be more credible. Thus, we expect people to use threats of supernatural punishment more to compensate for the shortcomings of secular policing than to rely on supernatural punishment when secular policing is already deemed sufficient. We thus expect the following patterns.

First, the more people trust that secular policing institutions (e.g., the state) are sufficient to incentivize cooperation, the less they should rely on beliefs in supernatural punishment to deter uncooperative behaviors (*Prediction 3a*). Supporting this prediction, data from the World Value Surveys suggests that, across countries, religiosity decreases as societies develop stable and efficient political institutions (Norris & Inglehart, 2004, 2011). Distrust of atheists, similarly, is lower in countries with a strong secular rule of law (Norenzayan & Gervais, 2015). These group-level results may also be consistent with cultural group selection theories, as it has been proposed that the group-level selection pressures for religion to promote cooperation may weaken when societies develop efficient political institutions (Norenzayan et al., 2016). However, compared to cultural group selection theories, the mutual policing theory distinctively predicts that similar relationships should also be found at the individual level, within the same cultural group. Consistent with this prediction, studies suggest that experimentally increasing people's perceptions of governmental instability increase people's endorsement of beliefs in a controlling God, with this effect being mediated by participants' "need for order and control" (Kay et al., 2010). These individual-level patterns, as well as their group-level manifestations, are also predicted by existential insecurity theory (Immerzeel & van Tubergen, 2013; Norris & Inglehart, 2011)—an account that we discuss below (see Explaining the Fall of Prosocial Religions section). A distinctive prediction of mutual policing, however, is that similar effects should be observed for extractive forms of supernatural punishment beliefs. In medieval Christianity, for example, communities of monks appealed to supernatural punishment to protect their property against intruders especially when they lacked the military means to do so and when government protection was unavailable (Leeson, 2014; L. K. Little, 1993).

Second, supernatural punishment beliefs should target behaviors that people struggle to police by secular means (*Prediction 3b*). As people reasoned in a draft of the Declaration of Rights of Man, "Since the law cannot reach secret crimes, it must be supplemented by religion" (art. 16; Edelstein, 2018, pp. 184–185). In line with this idea, world religions have been especially concerned with policing private behaviors difficult to police by the state, such as "vicious habits" of drinking, gambling, and fornication whose punishment in hell was described in great precision, as well as "sinful thoughts" arising in the intimacy of individual conscience (e.g., lustful or violent thoughts), which could be policed, for example, by confession to a priest (Cohen, 2003; Cohen & Rozin, 2001; Fitouchi et al., 2023; Tentler, 2015). Also in line with this logic, studies consistently find that individual-level religiosity across contemporary countries is more strongly associated with the individual-level tendency to condemn private behaviors such as sexual practices than with condemning uncooperative behaviors subject to legal enforcement, such as cheating on taxes (Jacquet et al., 2021; Moon et al., 2019; Weeden & Kurzban, 2013, 2016; see also Hone et al., 2021). In 17th-century England, similarly, politicians explicitly appreciated this added value of religion over secular social control: They thought that people "are governed by the pulpit more than the sword in time of peace," that "no temporal government could have a sure support without a national church that adhered to it," and that "[r]eligion it is that keeps the subjects in obedience" (Hill, 2002, p. 76). This is not specific to world religions or large-scale societies. Among the Mentawai horticulturalists, the moralistic spirit *Sikameinan* specifically punishes one of the few transgressions—failing to share meat (Singh et al., 2021)—that is not enforceable through secular justice (Fitouchi & Singh, 2023; Singh & Garfield, 2022).

Prediction 4: Supernatural Punishment Beliefs Target Behaviors People Are Motivated to Police in Everyday Life

If beliefs in punitive gods emerge as people attempt to incentivize others' cooperation, supernatural punishment should target behaviors

that people are motivated to deter in everyday life. In line with this prediction, a growing body of evidence suggests that the content of beliefs in punitive gods adapts, in a fine-grained manner, to the local policing problems people face in different ecologies (Bendixen, Apicella, et al., 2023; Bendixen & Purzycki, 2020; McNamara & Purzycki, 2020; Purzycki, Bendixen, et al., 2022).

Using a free-list method, Bendixen, Apicella, et al. (2023) asked participants from eight diverse societies (e.g., Fiji, Tanna, Mauritius, Marajo of Brazil, Hadza of Tanzania) to list behaviors disapproved by their local deities. They show that these behaviors correspond to locally salient social dilemmas people encounter in everyday life and which they often struggle to police by secular means. In the Tyva Republic, local spirits *cher eezi* especially dislike environmental pollution and overexploitation of natural resources—a salient social problem in this particular socio-ecology and difficult to police by secular means (Bendixen, Apicella, et al., 2023; Purzycki, 2011, 2016; Purzycki, Bendixen, et al., 2022). By contrast, in Tanna (Vanuatu), which relies on horticulture for subsistence, local gods punish violations of garden taboos, which likely contribute to proper cultivation and distribution of collective resources in this particular ecology (Bendixen, Apicella, et al., 2023). In other words, cross-cultural variation in the very content of supernatural punishment beliefs mirrors variation in the policing problems people face in everyday life, consistent with people tailoring supernatural punishment beliefs to specific policing problems they face on a regular basis.

Prediction 5: Supernatural Punishment Beliefs Emerge, Not Only Under Prosocial Forms but Also Under Extractive Forms That Serve Selfish Interests

Because people's policing agendas can be selfish as well as cooperative, the mutual policing theory predicts that beliefs in supernatural punishment should just as easily take extractive forms serving selfish interests as prosocial forms serving mutual benefit (see The Varieties of Religious Policing section). Three lines of quantitative evidence support this prediction.

First, rulers of Ancient, Medieval, and Early Modern states promoted beliefs in supernatural punishment to compel subjects into obedience—from Ancient Egypt and Mesopotamia to Medieval China and Europe (Bentzen & Gokmen, 2023; Bernstein & Katz, 2010; Cronk, 1994; Morris, 2015; Wright, 2009; see also Watts et al., 2016). In a sample of 1,265 preindustrial societies, Bentzen and Gokmen (2023) show that more stratified societies—where leaders have greater incentives to use religion to legitimize power—are more likely to develop beliefs in moralizing high gods, after controlling for social complexity and agricultural intensity. Using irrigation potential as an instrument for stratification among agricultural societies (Bentzen et al., 2017), they further show that exogenous variation in stratification leads to greater belief in moralizing high gods and greater institutionalization of religion, proxied by the prevalence of religious laws (Bentzen & Gokmen, 2023). These results support the idea that the cultural stabilization of supernatural punishment beliefs is partly driven by powerful individuals promoting these beliefs for selfish policing purposes (see Cronk, 1994; de Aguiar & Cronk, 2011).

Second, selfish supernatural policing recurs in small-scale societies. Take beliefs in supernatural punishment among the Dogon of Mali (B. I. Strassmann, 1992, 1996). Women are threatened with supernatural sanctions, such as famine and illness, if they refuse to segregate in menstrual huts during their menses (B. I. Strassmann, 1992, 1996). Genetic and ethnographic evidence shows that these taboos and supernatural threats allow males to police female sexuality and increase their paternity certainty by publicizing women's reproductive cycle (B. I. Strassmann, 1992; B. I. Strassmann et al., 2012). Third, a large body of evidence indicates that individuals with a monogamous reproductive strategy—people who invest in parental care and committed pair-bonds—use religion as a tool to police sexual promiscuity around them, in order to protect against cuckoldry or mate poaching and facilitate familial stability (Jacquet et al., 2021; Kerry et al., 2023; McCullough et al., 2005; Moon, 2021; Moon et al., 2019; Weeden & Kurzban, 2013, 2016; Weeden et al., 2008).

Prediction 6: There Should Be Evidence of Deliberate Policing Purpose in Prosocial Religious Rituals

If prosocial religions are shaped by policing goals, we should expect deliberate policing to shape not just beliefs in supernatural punishment but the associated rituals, as well. Several lines of evidence support this prediction.

Confession of Sins

Policing goals are apparent in confession rituals. Consider the Christian Church's decision to make confession mandatory for all at least once a year, from the 13th century onward (Bériou, 1983; Tentler, 2015). In line with the mutual policing model, historians have argued that the Christian hierarchy deliberately designed mandatory confession as a technology of social control (L. Little, 1981; Martin, 1983; Tentler, 1974, 2015). First, a huge number of manuals provided priests with very precise techniques about how to conduct confession, making clear that people construed confession as an instrumental technology:

> This literature was practical. The *summas* and manuals for confessors were designed for use. A priest could find out what he wanted to know by consulting them because they were organized especially with that in mind. No better example of this practicality can be imagined than the creation of the alphabetical summa, which makes it possible to get information immediately on a specific topic. (Tentler, 2015, p. 49; see also L. Little, 1981)

Second, confession appears grounded in the folk-psychological intuition that triggering guilt—by making people confess their sins—was an efficient way to make people more cooperative (Tentler, 2015, pp. 129, 130, 161–162, 345–347). Techniques of confession were "designed to make people understand concretely and feel acutely their own personal guilt" (Tentler, 2015, pp. 161–162). These design features are consistent with psychological evidence that people understand the prosocial effects of guilt and exploit this folk-understanding by strategically inducing guilt in others to nudge them into cooperating (Baumeister et al., 1994, 1995; Huhmann & Brotherton, 1997; Vangelisti et al., 1991; though see Cardella, 2016). The ecclesiastical hierarchy appears to have

done just this, by designing confession as a "system of discipline primarily through guilt" (Tentler, 2015, p. 347).[2]

Penance Rituals

Penance rituals—found in several prosocial religions (e.g., Hinduism: Olivelle, 2011; Christianity: Meens, 2014; Tentler, 2015)—also appear to be shaped by people's policing goals. First, the community requires the penitent to publicly confess their crime (early Christianity: Tentler, 2015, pp. 4–9; Ancient India: Olivelle, 2011). This is used by many communities deploying high levels of social control, as public confession increases the reputational cost of cheating while decreasing policing costs by deterring observers from future cheating (Hechter, 1988, 1990). Second, penance requires wrongdoers to suffer hard treatments, such as ascetic abstinence or inflictions of pain, well suited to deter future wrongdoing by increasing its cost (Coşgel & Miceli, 2018; Tentler, 2015). Third, penance requires culprits to credibly signal contrition and genuinely make amends for their fault—a necessary condition for being forgiven by the community (Tentler, 2015, p. 13). This is consistent with psychological evidence that people perceive sincere, costly apology as a necessary condition for cheaters to behave more cooperatively in the future (Ohtsubo & Watanabe, 2009; Watanabe & Ohtsubo, 2012).

Accordingly, historical studies of penance in early Christianity explicitly characterize them as a technology of mutual policing:

> Penitential institutions, developed in the first centuries of the ancient and medieval church … existed first of all to insure discipline, to exercise control. … The willing recourse to excommunication; the public nature of exclusion, retribution, and reconciliation; concentration on the most serious crimes against marriage, property, and life; and the punitive nature of the system's sanctions: all of these harsh characteristics point to the prominent role played by the church in the maintenance of social order … it preserved order in a highly restricted local community, which expected strict obedience to its rules and, when there were failures, gave only one difficult chance for readmission to full privileges in that group. … The first function of ecclesiastical penance then is discipline, or social control. (Tentler, 2015, pp. 12–13)

Explaining the Fall of Prosocial Religions

While prosocial religions are widespread across cultures (Lightner et al., 2023), many societies have experienced a decline in religious belief and participation in the last centuries (R. F. Inglehart, 2020; Jackson, Caluori, Gray, et al., 2021). As long noted, this fall of religion is strongly associated with economic development and modernization (R. F. Inglehart, 2020; R. Inglehart & Baker, 2000; Paldam & Gundlach, 2013). Virtually all societies secularize as they become richer (Herzer & Strulik, 2017; R. F. Inglehart, 2020; R. Inglehart & Baker, 2000; Norris & Inglehart, 2011), while societies that remain highly religious are the poorest and most ecologically insecure (Barber, 2011, 2013; Botero et al., 2014; R. F. Inglehart, 2020; although relative inequality also matters: Solt et al., 2011). Social scientists have sought to explain the association between affluence and secularization: Why do prosocial religions vanish in high-income societies?

A leading proposal—the existential security hypothesis—argues that abundant resources, social insurance, and secure health care make religion less attractive as a means to appease anxieties about existential threats (Barber, 2011, 2013; Immerzeel & van Tubergen, 2013; R. F. Inglehart, 2020; Norris & Inglehart, 2011). Consistent with this view, people across culture use supernatural practices to prevent misfortunes such as death, hunger, or disease (Boyer, 2020a; Singh, 2025) and alleviate anxieties over uncontrollable outcomes (M. Lang et al., 2020; Sosis, 2007; Sosis & Handwerker, 2011). Another longstanding hypothesis attributes the fall of religion to the rise of science and education, fueling a "disenchantment of the world" by which rationalist worldviews replace supernatural beliefs (Becker et al., 2017; Braun, 2012; Gifford, 2019; Hungerman, 2014; Weber, 2013).

While these accounts likely explain part of the secularization process, they focus on the fall of religion in general. Economic modernity, however, associates not only with a decline of supernatural beliefs in general but also with a decreased appeal of the punitive, moralistic aspect of religion specifically (see, e.g., Tromp et al., 2021). Many people in modern societies still hold supernatural beliefs—such as "spirituality without religion" or New Age beliefs broadly construed (Jackson, Caluori, Gray, et al., 2021; K. A. Johnson et al., 2018; Lindeman et al., 2019; Lipka & Gecewicz, 2017)—while at the same time distancing themselves from the moralistic values of institutional religions (Houtman & Aupers, 2007; Houtman & Mascini, 2002; Wixwat & Saucier, 2021). Even people who remain religious, in fact, represent God less and less as a punitive figure and more and more as a loving, merciful, and forgiving agent (Fincham et al., 2019; Jackson, Caluori, Gray, et al., 2021; K. A. Johnson et al., 2019; Shepperd et al., 2019; Silverman et al., 2016).

The mutual policing theory explains the fall of the moralistic aspect of religion—that is, not religious beliefs in general but beliefs in moralistic supernatural punishment specifically. People in rich, modern environments exhibit especially high levels of social trust (de Courson & Nettle, 2021; Nettle, 2015; Ortiz-Ospina et al., 2024; Petersen & Aarøe, 2015), spontaneous prosociality toward strangers (Holland et al., 2012; Nettle, 2015; Silva & Mace, 2014; Zwirner & Raihani, 2020), and low rates of crime, violence, and homicides (de Courson & Nettle, 2021; de Courson et al., 2023; Radkani et al., 2023). In this context, we argue that people are less inclined to believe that the prospect of supernatural punishment is necessary to ensure other people's cooperation. Rather, people trust others to behave prosocially without having to feel watched over by punitive gods.

This increase in social trust reduces the strategic value of supernatural punishment beliefs in two ways. The first concerns the self-interested motivations for endorsing these beliefs (see Policing for Shared Interests Results in Prosocial Supernatural Punishment section). Since people think that others will not cheat anyway, whether they believe in divine punishment or not, they no longer find it useful to communicate beliefs in punitive gods. Indeed, it is only when you believe that others would cheat if they were not monitored that it is worth paying costs to incentivize their

[2] According to Tentler (2015), "In theory and practice, sacramental confession provided a comprehensive and organized system of social control. … Moral and legal norms—which medieval religious authorities were disposed to believe were in agreement—had to be obeyed … the heart of the system is reliance on internal feelings of guilt. If the system is working, sinners will feel guilty outside of confession; and confession will help insure that guilt is elicited independently of the presence of any other human being. The institutions of forgiveness belong most decidedly to a religion of conscience and a system of discipline primarily through guilt" (pp. 345–347).

cooperation (Nettle & Saxe, 2021; Yamagishi, 1986, 1988). On the recipient side, the reputational cost of disbelief is also reduced, since other people think they can trust you anyway, whether you believe in divine punishment or not.

The second reason concerns the moral motivations for endorsing supernatural punishment beliefs (see Reputation-Based Policing Results in the Moral Duty to Believe in Supernatural Punishment section). Since people in high-trust societies can be sure that mutually beneficial cooperation will survive regardless of whether others believe in divine punishment, they have less reason to regard beliefs in punitive gods as a moral duty. Like any form of collective action that has become useless, the cooperative maintenance of supernatural punishment beliefs is no longer part of the social contract, and atheism, blasphemy, and apostasy, for example, are no longer considered morally wrong. This dynamic also reduces the reputational pressure to endorse belief in punitive gods, since failing to do so no longer amounts to cheating your cooperative partners in the collective action for belief. These two forces, driven by a decline in the perceived utility of religion for sustaining cooperation, lead people to turn away from prosocial religions. This proposal generates the following predictions.

First, higher social trust should decrease the perception that people need to believe in punitive gods to behave cooperatively. Consistent with this, people in richer societies (where prosocial religions decline) not only trust other people more (Ortiz-Ospina et al., 2024) but also disagree more with the idea that believing in God is necessary to be moral ($r = -0.86$; Tamir et al., 2020). Second, the decline of prosocial religions should be part of a more general decrease in people's motivation to police each other's behavior. As people trust each other more, they should invest less in social control more generally, not just in social control through religious belief. Supporting this idea, across contemporary societies, people in materially safer environments are not only less religious; they also tolerate deviance more (Gelfand et al., 2011; Harrington & Gelfand, 2014), support individual freedom of choice and emancipation from strict norms (R. F. Inglehart, 2020; Welzel, 2013; Welzel & Inglehart, 2020), and are less supportive of other mechanisms of social control such as repressive legal systems (Miethe et al., 2005; Wenzel & Thielmann, 2006; K. E. G. Williams et al., 2019) and authoritarian governance (Nettle & Saxe, 2021; Norris & Inglehart, 2019; Safra et al., 2017). Diachronically, too, the secularization process has been associated with a decline in conservative moral values, traditional social controls (R. Inglehart, 2018; R. Inglehart & Baker, 2000), and the restrictiveness of social norms (Jackson et al., 2019). The decline of moralizing religions, in other words, appears to be just one of the many facets of a declining culture of mutual policing.

A third prediction concerns whether the fall of religion is mostly driven by individual- or group-level dynamics. Cultural group selection theories predict that group-level dynamics should be more important. In that vein, proponents of cultural group selection have interpreted the decline of religion in developed countries as consistent with their account: Once cultural groups have stabilized secular institutions that enforce large-scale cooperation efficiently, this would weaken the group-selection pressures that favor prosocial religions (Norenzayan et al., 2016). It remains unclear to us, however, how any of the modeled mechanisms of cultural group selection—interdemic selection (Boyd & Richerson, 1988, 1990), payoff-biased migration (Boyd & Richerson, 2009), or prestige-biased group imitation (Boyd & Richerson, 2002)—can account for the changes observed. Interdemic selection seems to be too slow of a process (Soltis et al., 1995), given the particularly fast pace of secularization (R. F. Inglehart, 2020); and we know of no evidence that the decline of religion is attributable to more secular countries outcompeting the more religious ones among the developed countries. Cultural group selection by payoff-biased migration and prestige-biased imitation are theoretically fast enough (Boyd & Richerson, 2002, 2009), yet there are few indications that secularization has been driven by large-scale imitation or migration either.

By contrast, the mutual policing theory predicts that the decline of religion should be mostly driven by a shift in individual-level motivations to police others' behaviors, as individuals with greater social trust, or a greater perception that secular policing institutions are sufficient, lose interest in supernatural punishment beliefs. In line with this logic, the relationship between high trust and low religiosity is not only observed between countries but also between individuals within countries. Synchronically, within the same cultural group and among individuals governed by the same group-level political institutions, individuals of higher socioeconomic status, who are known to exhibit higher social trust (Guillou et al., 2021; Nettle, 2015; Stamos et al., 2019), believe less that belief in god is necessary for moral behavior (Tamir et al., 2020), are less religious, and invest less in organized, moralistic religions (Houtman & Aupers, 2007; Houtman & Mascini, 2002; Silveus & Stoddard, 2020; Storm, 2017). Diachronically, too, time series data both within the United States and in European countries indicate that the fall of organized religions between 1981 and the 2000s is driven by younger cohorts rejecting the moralistic values of organized religions as these cohorts develop more individualistic values of emancipation from traditional social controls (Hout & Fischer, 2014; Houtman & Aupers, 2007; Houtman & Mascini, 2002; see also Houtman et al., 2009; R. F. Inglehart, 2020).

Concluding Remarks

The last 4 decades have witnessed the application of evolutionary and cognitive models to explain patterns in human culture. From magic to music, justice to visual art, monogamy to the rise of the state, sociocultural traditions long outside of the purview of naturalistic approaches have been fruitfully analyzed as the emergent products of evolved psychologies interacting over cultural evolutionary time (Boyer, 2018; Henrich, 2020; Richerson & Boyd, 2005; Scott-Phillips et al., 2018). Given its importance in social life, religion has been among the most—if not *the* most—studied topic in this new science of culture (Boyer, 2001; Norenzayan, 2013; Purzycki & Sosis, 2022; Sosis, 2006; Whitehouse, 2004; Wilson, 2010). As such, it has served as a gauntlet to develop, test, and refine approaches that can then be applied to other cultural domains.

A longstanding tension in the naturalistic study of religion, and thus in the study of culture more generally, has been between by-product (Beck & Forstmeier, 2007; Bloom, 2007, 2009; Boyer, 2001, 2003) and adaptationist accounts (Bering, 2006; D. Johnson, 2016; D. Johnson & Bering, 2006). More recently, scholars have sought to reconcile these approaches, arguing that cultural group selection can select among beliefs that emerge incidentally from cognitive biases, resulting in prosocial supernatural punishment beliefs (Atran & Henrich, 2010; Norenzayan, 2013; Norenzayan et al., 2016). Still, such syntheses assume a group-adaptationist

logic: Cultural products that are functional, widespread, and socially important—like prosocial religions—are argued to develop because they promote group fitness.

Here, we have not only proposed an alternative account of prosocial religion; we have also sought to demonstrate a new approach for studying much of human culture. Religious beliefs, as well as other "symbolic" domains like magic (Hong & Henrich, 2021), moral norms (Fitouchi et al., 2023), and justice institutions (Fitouchi & Singh, 2023), may develop not to promote group-level benefits, but because individuals craft them to satisfy instrumental goals (Baumard et al., 2023; Singh, 2022). Notably, individuals are constrained by the limitations of their own psychologies. Just as they (erroneously) intuit that rain magic or voodoo dolls are effective for changing the weather and harming rivals (Singh, 2021), they intuit that beliefs in supernatural punishment will make their neighbors more cooperative, even if this is not the case. Our perception of utility, rather than objective utility, may often determine cultural success (Singh, 2022).

This approach to culture addresses features of cultural transmission sometimes overlooked by scholars advocating by-product or group-adaptationist accounts. The most important is individual motivation (André et al., in press; Boyer, 2020b, 2022; Moon, 2021). Much of culture survives only as long as individuals perceive an interest in maintaining it. Magical practices survive as long as people use them. Stories exist as long as people tell them. Similarly, beliefs in supernatural punishment exist only as long as people endorse them. As we have shown, shifting the focus to individual motivations ends up providing a powerful lever for explaining cultural design: Individuals not only decide to endorse, adopt, or reject beliefs; they also craft them into forms they deem useful.

This functional design of culture, either downplayed in by-product approaches or a result of impersonal selection in cultural group selection theories, thus plausibly develops as people shape effective-seeming technologies for satisfying their goals. Importantly, these goals are not random. Given how natural selection has shaped reward functions in individual brains (H. C. Barrett, 2015; Tooby et al., 2008), people's goals often align with their fitness interests. Thus, as evolved minds shape culture to maximize fitness-good currencies—such as food, status, or moral reputation—they imprint on cultural stuff the functional requirements of their genetic interests (Baumard et al., 2023). It is easy to accept that spears or harpoons develop through an endless instrumental winnowing aimed at achieving fitness-relevant goals, such as acquiring food or killing enemies. Supernatural punishment beliefs, we argue, may be no different. People's urge to control the conduct of groupmates—either for the selfish end of getting more food and sex or for the moral goal of making the world less unjust—acts as a systematic force over cultural transmission chains, ending in beliefs in heaven, wrathful gods, and supernatural justice.

References

Abrams, S., Jackson, J. C., Vonasch, A., & Gray, K. (2020). *Moralization of religiosity explains worldwide trends in religious belief* [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/5a2db

André, J.-B., Baumard, N., & Boyer, P. (in press). *The mystery of symbolic culture: What fitness costs? What fitness benefits?* [Preprint]. https://doi.org/10.31219/osf.io/kdh7t

André, J.-B., Baumard, N., & Boyer, P. (2023). Cultural evolution from the producers' standpoint. *Evolutionary Human Sciences*, *5*, Article e25. https://doi.org/10.1017/ehs.2023.20

André, J.-B., Fitouchi, L., Debove, S., & Baumard, N. (2022). *An evolutionary contractualist theory of morality*. PsyArXiv. https://doi.org/10.31234/osf.io/2hxgu

Arai, S., Tooby, J., & Cosmides, L. (2023). Why punish cheaters? Those who withdraw cooperation enjoy better reputations than punishers, but both are viewed as difficult to exploit. *Evolution and Human Behavior*, *44*(1), 50–59. https://doi.org/10.1016/j.evolhumbehav.2022.10.002

Arseneau-Robar, T. J. M., Müller, E., Taucher, A. L., van Schaik, C. P., Bshary, R., & Willems, E. P. (2018). Male monkeys use punishment and coercion to de-escalate costly intergroup fights. *Proceedings of the Royal Society B: Biological Sciences*, *285*(1880), Article 20172323. https://doi.org/10.1098/rspb.2017.2323

Arseneau-Robar, T. J. M., Taucher, A. L., Müller, E., van Schaik, C., Bshary, R., & Willems, E. P. (2016). Female monkeys use both the carrot and the stick to promote male participation in intergroup fights. *Proceedings of the Royal Society B: Biological Sciences*, *283*(1843), Article 20161817. https://doi.org/10.1098/rspb.2016.1817

Asaba, M., & Gweon, H. (2022). Young children infer and manage what others think about them. *Proceedings of the National Academy of Sciences of the United States of America*, *119*(32), Article e2105642119. https://doi.org/10.1073/pnas.2105642119

Atkinson, Q. D., & Bourrat, P. (2011). Beliefs about God, the afterlife and morality support the role of supernatural policing in human cooperation. *Evolution and Human Behavior*, *32*(1), 41–49. https://doi.org/10.1016/j.evolhumbehav.2010.07.008

Atran, S., & Henrich, J. (2010). The evolution of religion: How cognitive by-products, adaptive learning heuristics, ritual displays, and group competition generate deep commitments to prosocial religions. *Biological Theory*, *5*(1), 18–30. https://doi.org/10.1162/BIOT_a_00018

Bader, C. D., Desmond, S. A., Carson Mencken, F., & Johnson, B. R. (2010). Divine justice: The relationship between images of god and attitudes toward criminal punishment. *Criminal Justice Review*, *35*(1), 90–106. https://doi.org/10.1177/0734016809360329

Baker, C. L., Jara-Ettinger, J., Saxe, R., & Tenenbaum, J. B. (2017). Rational quantitative attribution of beliefs, desires and percepts in human mentalizing. *Nature Human Behaviour*, *1*(4), Article 0064. https://doi.org/10.1038/s41562-017-0064

Banerjee, K., & Bloom, P. (2014). Why did this happen to me? Religious believers' and non-believers' teleological reasoning about life events. *Cognition*, *133*(1), 277–303. https://doi.org/10.1016/j.cognition.2014.06.017

Banerjee, K., & Bloom, P. (2017). You get what you give: Children's karmic bargaining. *Developmental Science*, *20*(5), Article e12442. https://doi.org/10.1111/desc.12442

Barber, N. (2011). A cross-national test of the uncertainty hypothesis of religious belief. *Cross-Cultural Research: The Journal of Comparative Social Science*, *45*(3), 318–333. https://doi.org/10.1177/1069397111402465

Barber, N. (2013). Country religiosity declines as material security increases. *Cross-Cultural Research: The Journal of Comparative Social Science*, *47*(1), 42–50. https://doi.org/10.1177/1069397112463328

Barclay, P. (2005). Reputational benefits for altruistic punishment. *Evolution and Human Behavior*, *27*(5), 325–344. https://doi.org/10.1016/j.evolhumbehav.2006.01.003

Barclay, P., & Benard, S. (2013). Who cries wolf, and when? Manipulation of perceived threats to preserve rank in cooperative groups. *PLOS ONE*, *8*(9), Article e73863. https://doi.org/10.1371/journal.pone.0073863

Barclay, P., & Benard, S. (2020). The effects of social vs. asocial threats on group cooperation and manipulation of perceived threats. *Evolutionary Human Sciences*, *2*, Article e54. https://doi.org/10.1017/ehs.2020.48

Barrett, H. C. (2015). *The shape of thought: How mental adaptations evolve*. Oxford University Press. https://doi.org/10.1093/acprof:Oso/9780199348305.001.0001

Barrett, J. L., & Lanman, J. A. (2008). The science of religious beliefs. *Religion*, *38*(2), 109–124. https://doi.org/10.1016/j.religion.2008.01.007

Baumard, N., André, J.-B., & Sperber, D. (2013). A mutualistic approach to morality: The evolution of fairness by partner choice. *Behavioral and Brain Sciences*, *36*(1), 59–78. https://doi.org/10.1017/S0140525X11002202

Baumard, N., & Boyer, P. (2013a). Explaining moral religions. *Trends in Cognitive Sciences*, *17*(6), 272–280. https://doi.org/10.1016/j.tics.2013.04.003

Baumard, N., & Boyer, P. (2013b). Religious beliefs as reflective elaborations on intuitions: A modified dual-process model. *Current Directions in Psychological Science*, *22*(4), 295–300. https://doi.org/10.1177/0963721413478610

Baumard, N., & Chevallier, C. (2012). What goes around comes around: The evolutionary roots of the belief in immanent justice. *Journal of Cognition and Culture*, *12*(1–2), 67–80. https://doi.org/10.1163/156853712X633938

Baumard, N., Fitouchi, L., André, J.-B., Nettle, D., & Scott-Philipps, T. (2023). *The gene's-eye view of culture* [Preprint]. https://ecoevorxiv.org/repository/view/6303/

Baumard, N., Hyafil, A., Morris, I., & Boyer, P. (2015). Increased affluence explains the emergence of ascetic wisdoms and moralizing religions. *Current Biology*, *25*(1), 10–15. https://doi.org/10.1016/j.cub.2014.10.063

Baumeister, R. F., Stillwell, A. M., & Heatherton, T. F. (1994). Guilt: An interpersonal approach. *Psychological Bulletin*, *115*(2), 243–267. https://doi.org/10.1037/0033-2909.115.2.243

Baumeister, R. F., Well, A. M. S., Heatherton, T. F., Roy, R., Baumeister, F., & Psychology, D. O. (1995). Personal narratives about guilt: Role in action control and interpersonal relationships. *Basic and Applied Social Psychology*, *17*(1), 173–198. https://doi.org/10.1207/s15324834basp1701&2_10

Beck, J., & Forstmeier, W. (2007). Superstition and belief as inevitable by-products of an adaptive learning strategy. *Human Nature*, *18*(1), 35–46. https://doi.org/10.1007/BF02820845

Becker, S. O., Nagler, M., & Woessmann, L. (2017). Education and religious participation: City-level evidence from Germany's secularization period 1890–1930. *Journal of Economic Growth*, *22*(3), 273–311. https://doi.org/10.1007/s10887-017-9142-2

Beisner, B. A., & McCowan, B. (2013). Policing in nonhuman primates: Partial interventions serve a prosocial conflict management function in rhesus macaques. *PLOS ONE*, *8*(10), Article e77369. https://doi.org/10.1371/journal.pone.0077369

Bell, F. L. S. (1953). Land tenure in Tanga. *Oceania*, *24*(1), 28–57. https://doi.org/10.1002/j.1834-4461.1953.tb00588.x

Bellah, R. N. (2008). *Tokugawa religion*. Simon and Schuster.

Bendixen, T., Apicella, C., Atkinson, Q., Cohen, E., Henrich, J., McNamara, R. A., Norenzayan, A., Willard, A. K., Xygalatas, D., & Purzycki, B. G. (2023). Appealing to the minds of gods: Religious beliefs and appeals correspond to features of local social ecologies. *Religion, Brain & Behavior*, *14*(2), 183–205. https://doi.org/10.1080/2153599X.2023.2178487

Bendixen, T., Lightner, A. D., Apicella, C., Atkinson, Q., Bolyanatz, A., Cohen, E., Handley, C., Henrich, J., Klocová, E. K., Lesorogol, C., Mathew, S., McNamara, R. A., Moya, C., Norenzayan, A., Placek, C., Soler, M., Vardy, T., Weigel, J., Willard, A. K., … Purzycki, B. G. (2023). Gods are watching and so what? Moralistic supernatural punishment across 15 cultures. *Evolutionary Human Sciences*, *5*, Article e18. https://doi.org/10.1017/ehs.2023.15

Bendixen, T., Lightner, A. D., & Purzycki, B. G. (2023). The cultural evolution of religion and cooperation. In J. J. Tehrani, J. Kendal, & R. Kendal (Eds.), *The Oxford handbook of cultural evolution* (online ed., pp. C47S1–C47N5). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780198869252.013.47

Bendixen, T., & Purzycki, B. G. (2020). Peering into the minds of gods: What cross-cultural variation in gods' concerns can tell us about the evolution of religion. *Journal for the Cognitive Science of Religion*, *5*(2), 142–165. https://doi.org/10.1558/jcsr.40951

Bentzen, J. S., & Gokmen, G. (2023). The power of religion. *Journal of Economic Growth*, *28*(1), 45–78. https://doi.org/10.1007/s10887-022-09214-4

Bentzen, J. S., Kaarsen, N., & Wingender, A. M. (2017). Irrigation and Autocracy. *Journal of the European Economic Association*, *15*(1), 1–53. https://doi.org/10.1111/jeea.12173

Berggren, N., & Bjørnskov, C. (2011). Is the importance of religion in daily life related to social trust? Cross-country and cross-state comparisons. *Journal of Economic Behavior & Organization*, *80*(3), 459–480. https://doi.org/10.1016/j.jebo.2011.05.002

Bering, J. M. (2006). The folk psychology of souls. *Behavioral and Brain Sciences*, *29*(5), 453–462. https://doi.org/10.1017/S0140525X06009101

Bériou, N. (1983). *Autour de latran IV: La naissance de la confession moderne et sa diffusion* [Around lateran IV: The birth of modern confession and its diffusion]. Le Cerf.

Berniūnas, R., Dranseika, V., & Tserendamba, D. (2020). Between Karma and Buddha: Prosocial behavior among Mongolians in an anonymous economic game. *The International Journal for the Psychology of Religion*, *30*(2), 142–160. https://doi.org/10.1080/10508619.2019.1696497

Bernstein, A. E., & Katz, P. R. (2010). The rise of postmortem retribution in China and the west. *The Medieval History Journal*, *13*(2), 199–257. https://doi.org/10.1177/097194581001300202

Billingsley, J., Gomes, C. M., & McCullough, M. E. (2018). Implicit and explicit influences of religious cognition on dictator game transfers. *Royal Society Open Science*, *5*(8), Article 170238. https://doi.org/10.1098/rsos.170238

Black, D. (1984). Social control as a dependent variable. In D. Black (Eds.), *Toward a general theory of social control* (pp. 1–36). Academic Press. https://doi.org/10.1016/B978-0-12-102801-5.50007-8

Black, D. (2000). Evolutionary origins of morality. *Journal of Consciousness Studies*, *7*(1), 1–36. https://doi.org/10.1016/B978-0-12-102801-5.50007-8

Blaine, T., & Boyer, P. (2018). Origins of sinister rumors: A preference for threat-related material in the supply and demand of information. *Evolution and Human Behavior*, *39*(1), 67–75. https://doi.org/10.1016/j.evolhumbehav.2017.10.001

Bloom, P. (2007). Religion is natural. *Developmental Science*, *10*(1), 147–151. https://doi.org/10.1111/j.1467-7687.2007.00577.x

Bloom, P. (2009). Religious belief as an evolutionary accident. In J. P. Schloss & M. Murray (Eds.), *The believing primate: Scientific, philosophical, and theological reflections on the origin of religion* (pp. 118–127). Oxford University Press.

Bloom, P. (2012). Religion, morality, evolution. *Annual Review of Psychology*, *63*(1), 179–199. https://doi.org/10.1146/annurev-psych-120710-100334

Boehm, C. (1999). *Hierarchy in the forest: The evolution of egalitarian behavior*. Harvard University Press. https://doi.org/10.4159/9780674028449

Boehm, C. (2000). Conflict and the evolution of social control. *Journal of Consciousness Studies*, *7*(1–2), 79–101. https://www.ingentaconnect.com/content/imp/jcs/2000/00000007/F0020001/1126

Boehm, C. (2008). A biocultural evolutionary exploration of supernatural sanctionning. In J. Bulbulia, R. Sosis, E. Harris, R. Genet, & K. Wyman (Eds.), *Evolution of religion: Studies, theories, and critiques* (pp. 143–152). Collins Foundation Press.

Boehm, C. (2012). *Moral origins: The evolution of virtue, altruism, and shame*. Basic Books.

Bones, P. D. C., & Sabriseilabi, S. (2018). Sinners in the hands of an angry god: An exploration of religious forces on support for the death penalty: Sinners in the hands of an angry god. *Journal for the Scientific Study of Religion*, *57*(4), 707–722. https://doi.org/10.1111/jssr.12553

Botero, C. A., Gardner, B., Kirby, K. R., Bulbulia, J., Gavin, M. C., & Gray, R. D. (2014). The ecology of religious beliefs. *Proceedings of the National Academy of Sciences of the United States of America*, *111*(47), 16784–16789. https://doi.org/10.1073/pnas.1408701111

Boyd, R., Gintis, H., & Bowles, S. (2010). Coordinated punishment of defectors sustains cooperation and can proliferate when rare. *Science*, *328*(5978), 617–620. https://doi.org/10.1126/science.1183665

Boyd, R., & Richerson, P. J. (1988). *Culture and the evolutionary process*. University of Chicago Press.

Boyd, R., & Richerson, P. J. (1990). Group selection among alternative evolutionarily stable strategies. *Journal of Theoretical Biology*, *145*(3), 331–342. https://doi.org/10.1016/S0022-5193(05)80113-4

Boyd, R., & Richerson, P. J. (2002). Group beneficial norms can spread rapidly in a structured population. *Journal of Theoretical Biology*, *215*(3), 287–296. https://doi.org/10.1006/jtbi.2001.2515

Boyd, R., & Richerson, P. J. (2009). Voting with your feet: Payoff biased migration and the evolution of group beneficial behavior. *Journal of Theoretical Biology*, *257*(2), 331–339. https://doi.org/10.1016/j.jtbi.2008.12.007

Boyer, P. (2001). *Religion explained*. Random House.

Boyer, P. (2003). Religious thought and behaviour as by-products of brain function. *Trends in Cognitive Sciences*, *7*(3), 119–124. https://doi.org/10.1016/S1364-6613(03)00031-7

Boyer, P. (2018). *Minds make societies: How cognition explains the world humans create*. Yale University Press.

Boyer, P. (2020a). Informal religious activity outside hegemonic religions: Wild traditions and their relevance to evolutionary models. *Religion, Brain & Behavior*, *10*(4), 459–472. https://doi.org/10.1080/2153599X.2019.1678518

Boyer, P. (2020b). Why divination?: Evolved psychology and strategic interaction in the production of truth. *Current Anthropology*, *61*(1), 100–123. https://doi.org/10.1086/706879

Boyer, P. (2021). Deriving features of religions in the wild: How communication and threat-detection may predict spirits, gods, witches, and shamans. *Human Nature*, *32*(3), 557–581. https://doi.org/10.1007/s12110-021-09410-y

Boyer, P. (2022). Why we blame victims, accuse witches, invent taboos, and invoke spirits: A model of strategic responses to misfortune. *Journal of the Royal Anthropological Institute*, *28*(4), 1345–1364. https://doi.org/10.1111/1467-9655.13826

Boyer, P., & Parren, N. (2015). Threat-related information suggests competence: A possible factor in the spread of rumors. *PLOS ONE*, *10*(6), Article e0128421. https://doi.org/10.1371/journal.pone.0128421

Braun, C. (2012). Explaining global secularity: Existential security or education? *Secularism and Nonreligion*, *1*, 68–93. https://doi.org/10.5334/snr.ae

Bridgers, S., Jara-Ettinger, J., & Gweon, H. (2020). Young children consider the expected utility of others' learning to decide what to teach. *Nature Human Behaviour*, *4*(2), 144–152. https://doi.org/10.1038/s41562-019-0748-6

Bridges, E. L. (1948). *Uttermost part of the earth*. Hodder & Stoughton.

Brown, P. (2002). Everyone has to lie in Tzeltal. In S. Blum-Kulka & C. E. Snow (Eds.), *Talking to adults* (pp. 245–280). Psychology Press.

Callan, M., Sutton, R., Harvey, A., & Dawtry, R. (2014). Immanent justice reasoning: Theory, research, and current directions. *Advances in Experimental Social Psychology*, *49*, 105–161. https://doi.org/10.1016/B978-0-12-800052-6.00002-0

Caluori, N., Jackson, J. C., Gray, K., & Gelfand, M. (2020). Conflict changes how people view god. *Psychological Science*, *31*(3), 280–292. https://doi.org/10.1177/0956797619895286

Cameron, L., Seager, J., & Shah, M. (2021). Crimes against morality: Unintended consequences of criminalizing sex work. *The Quarterly Journal of Economics*, *136*(1), 427–469. https://doi.org/10.1093/qje/qjaa032

Cant, M. A., Nichols, H. J., Johnstone, R. A., & Hodge, S. J. (2014). Policing of reproduction by hidden threats in a cooperative mammal. *Proceedings of the National Academy of Sciences of the United States of America*, *111*(1), 326–330. https://doi.org/10.1073/pnas.1312626111

Cardella, E. (2016). Exploiting the guilt aversion of others: Do agents do it and is it effective? *Theory and Decision*, *80*(4), 523–560. https://doi.org/10.1007/s11238-015-9513-0

Chapman, A. (1982). *Drama and power in a hunting society: The Selk'nam of Tierra del Fuego*. CUP Archive.

Chua, R. Y. J., Huang, K. G., & Jin, M. (2019). Mapping cultural tightness and its links to innovation, urbanization, and happiness across 31 provinces in China. *Proceedings of the National Academy of Sciences of the United States of America*, *116*(14), 6720–6725. https://doi.org/10.1073/pnas.1815723116

Clark, K. J., & Winslett, J. (2011). The evolutionary psychology of Chinese religion: Pre-qin high gods as punishers and rewarders. *Journal of the American Academy of Religion*, *79*(4), 928–960. https://doi.org/10.1093/jaarel/lfr018

Clutton-Brock, T. (2009). Cooperation between non-kin in animal societies. *Nature*, *462*(7269), 51–57. https://doi.org/10.1038/nature08366

Cohen, A. B. (2003). Religion, likelihood of action, and the morality of mentality. *The International Journal for the Psychology of Religion*, *13*(4), 273–285. https://doi.org/10.1207/S15327582IJPR1304_4

Cohen, A. B., & Rozin, P. (2001). Religion and the morality of mentality. *Journal of Personality and Social Psychology*, *81*(4), 697–710. https://doi.org/10.1037/0022-3514.81.4.697

Cooper, J. M. (1946). The Yahgan. In J. H. Steward (Eds.), *Handbook of South American Indians* (pp. Vol. 1, pp. 81–106). Cooper Square Publishers.

Coşgel, M., & Miceli, T. J. (2018). The price of redemption: Sin, penance, and marginal deterrence. *Journal of Economic Behavior & Organization*, *156*, 206–218. https://doi.org/10.1016/j.jebo.2018.10.012

Cronk, L. (1994). Evolutionary theories of morality and the manipulative use of signals. *Zygon*, *29*(1), 81–101. https://doi.org/10.1111/j.1467-9744.1994.tb00651.x

Cross, F. L., & Livingstone, E. A. (2005). *The Oxford dictionary of the Christian church*. Oxford University Press. https://doi.org/10.1093/acref/9780192802903.001.0001

Cubitt, R. P., Drouvelis, M., Gächter, S., & Kabalin, R. (2011). Moral judgments in social dilemmas: How bad is free riding? *Journal of Public Economics*, *95*(3–4), 253–264. https://doi.org/10.1016/j.jpubeco.2010.10.011

Curry, O. S., Mullins, D. A., & Whitehouse, H. (2019). Is it good to cooperate? Testing the theory of morality-as-cooperation in 60 societies. *Current Anthropology*, *60*(1), 47–69. https://doi.org/10.1086/701478

Darmangeat, C. (2009). *Le communisme primitif n'est plus ce qu'il était. Aux Origines de l'oppression Des Femmes* [Primitive communism isn't what it used to be: On the origins of the oppression of women]. Smolny.

Dayer, A., Aswamenakul, C., Turner, M. A., Nicolay, S., Wang, E., Shurik, K., & Holbrook, C. (2024). Intuitive moral bias favors the religiously faithful. *Scientific Reports*, *14*(1), Article 18291. https://doi.org/10.1038/s41598-024-67960-4

de Aguiar, R., & Cronk, L. (2011). Stratification and supernatural punishment: Cooperation or obedience? *Religion, Brain & Behavior*, *1*(1), 73–75. https://doi.org/10.1080/2153599X.2011.558710

de Courson, B., Frankenhuis, W. E., Nettle, D., & van Gelder, J.-L. (2023). Why is violence high and persistent in deprived communities? A formal model. *Proceedings of the Royal Society B: Biological Sciences*, *290*(1993), Article 20222095. https://doi.org/10.1098/rspb.2022.2095

de Courson, B., & Nettle, D. (2021). Why do inequality and deprivation produce high crime and low trust? *Scientific Reports*, *11*(1), Article 1937. https://doi.org/10.1038/s41598-020-80897-8

Delton, A. W., Nemirow, J., Robertson, T. E., Cimino, A., & Cosmides, L. (2013). Merely opting out of a public good is moralized: An error management approach to cooperation. *Journal of Personality and Social Psychology*, *105*(4), 621–638. https://doi.org/10.1037/a0033495

Dennett, D. C. (2007). *Breaking the spell: Religion as a natural phenomenon* (Reprint ed.). Penguin Publishing Group.

Desmons, É. (2009). Réflexions sur la politique et la religion, de Rousseau à Robespierre [Reflections on politics and religion, from Rousseau to Robespierre]. *Revue Francaise d'Histoire des Idees Politiques*, *29*(1), 77–93. https://doi.org/10.3917/rfhip.029.0077

Deversi, M., Ispano, A., & Schwardmann, P. (2021). Spin doctors: An experiment on vague disclosure. *European Economic Review*, *139*, Article 103872. https://doi.org/10.1016/j.euroecorev.2021.103872

Dickemann, M. (1981). Paternal confidence and dowry competition: A biocultural analysis of purdah. In R. D. Alexander, & D. W. Tinkle (Eds.), *Natural selection and social behavior* (pp. 417–438). Chiron Press.

Dilmaghani, M. (2017). Religiosity and social trust: Evidence from Canada. *Review of Social Economy*, *75*(1), 49–75. https://doi.org/10.1080/00346764.2016.1186820

Doniger, W. (2014). *On Hinduism*. Oxford University Press. https://doi.org/10.1093/acprof:Oso/9780199360079.001.0001

Du Toit, B. M. (1964). Gadsup culture hero tales. *Journal of American Folklore*, *77*(306), 315–330. https://doi.org/10.2307/537380

Dundes, A. (1962). *The morphology of North American Indian folktales*. Indiana University.

Edelstein, D. (2018). *On the spirit of rights*. University of Chicago Press. https://doi.org/10.7208/chicago/9780226589039.001.0001

El Mouden, C., West, S. A., & Gardner, A. (2010). The enforcement of cooperation by policing. *Evolution: International Journal of Organic Evolution*, *64*(7), 2139–2152. https://doi.org/10.1111/j.1558-5646.2010.00963.x

Evans-Pritchard, E. E. (1937). *Witchcraft, oracles and magic among the Azande*. Clarendon Press. https://ehrafworldcultures-yale-edu.proxy.library.upenn.edu/document?id=fo07-071

Evans-Pritchard, E. E. (1965). *Theories of primitive religion*. https://ixtheo.de/Record/1113315040

Fessler, D. M. T., Pisor, A. C., & Navarrete, C. D. (2014). Negatively-biased credulity and the cultural evolution of beliefs. *PLOS ONE*, *9*(4), Article e95167. https://doi.org/10.1371/journal.pone.0095167

Fincham, F. D., May, R. W., & Kamble, S. V. (2019). Are Hindu representations of the divine prototypically structured? *Psychology of Religion and Spirituality*, *11*(2), 101–110. https://doi.org/10.1037/rel0000166

Fitouchi, L., André, J.-B., & Baumard, N. (2023). Moral disciplining: The cognitive and evolutionary foundations of puritanical morality. *Behavioral and Brain Sciences*, *46*, Article e293. https://doi.org/10.1017/S0140525X22002047

Fitouchi, L., André, J.-B., & Baumard, N. (2024). Are there really so many moral emotions? Carving morality at its functional joints. In L. Al-Shawaf & T. K. Shackelford (Eds.), *The Oxford handbook of evolution and the emotions* (pp. 944–967). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780197544754.013.35

Fitouchi, L., & Singh, M. (2022). Supernatural punishment beliefs as cognitively compelling tools of social control. *Current Opinion in Psychology*, *44*, 252–257. https://doi.org/10.1016/j.copsyc.2021.09.022

Fitouchi, L., & Singh, M. (2023). Punitive justice serves to restore reciprocal cooperation in three small-scale societies. *Evolution and Human Behavior*, *44*(5), 502–514. https://doi.org/10.1016/j.evolhumbehav.2023.03.001

Flack, J. C., de Waal, F. B. M., & Krakauer, D. C. (2005). Social structure, robustness, and policing cost in a cognitively sophisticated species. *American Naturalist*, *165*(5), E126–E139. https://doi.org/10.1086/429277

Flack, J. C., Girvan, M., de Waal, F. B. M., & Krakauer, D. C. (2006). Policing stabilizes construction of social niches in primates. *Nature*, *439*(7075), 426–429. https://doi.org/10.1038/nature04326

Flack, J. C., Krakauer, D. C., & de Waal, F. B. M. (2005). Robustness mechanisms in primate societies: A perturbation study. *Proceedings Biological Sciences*, *272*(1568), 1091–1099. https://doi.org/10.1098/rspb.2004.3019

Foster, K. R., & Kokko, H. (2009). The evolution of superstitious and superstition-like behaviour. *Proceedings of the Royal Society B: Biological Sciences*, *276*(1654), 31–37. https://doi.org/10.1098/rspb.2008.0981

Frank, S. A. (1995). Mutual policing and repression of competition in the evolution of cooperative groups. *Nature*, *377*(6549), 520–522. https://doi.org/10.1038/377520a0

Frank, S. A. (1996). Policing and group cohesion when resources vary. *Animal Behaviour*, *52*(6), 1163–1169. https://doi.org/10.1006/anbe.1996.0263

Frank, S. A. (2003). Perspective: Repression of competition and the evolution of cooperation. *Evolution; International Journal of Organic Evolution*, *57*(4), 693–705. https://doi.org/10.1554/0014-3820(2003)057[0693:PROCAT]2.0.CO;2

Funkhouser, E. (2017). Beliefs as signals: A new function for belief. *Philosophical Psychology*, *30*(6), 809–831. https://doi.org/10.1080/09515089.2017.1291929

Galen, L. W. (2012). Does religious belief promote prosociality? A critical examination. *Psychological Bulletin*, *138*(5), 876–906. https://doi.org/10.1037/a0028251

Galen, L. W., Kurby, C. A., & Fles, E. H. (2020). Religiosity, shared identity, trust, and punishment of norm violations: No evidence of generalized prosociality. *Psychology of Religion and Spirituality*, *14*(2), 260–272. https://doi.org/10.1037/rel0000320

Galen, L. W., Sharp, M., & McNulty, A. (2015). Nonreligious group factors versus religious belief in the prediction of prosociality. *Social Indicators Research*, *122*(2), 411–432. https://doi.org/10.1007/s11205-014-0700-0

Ge, E., Chen, Y., Wu, J., & Mace, R. (2019). Large-scale cooperation driven by reputation, not fear of divine punishment. *Royal Society Open Science*, *6*(8), Article 190991. https://doi.org/10.1098/rsos.190991

Gelfand, M. J., Harrington, J. R., & Jackson, J. C. (2017). The strength of social norms across human groups. *Perspectives on Psychological Science*, *12*(5), 800–809. https://doi.org/10.1177/1745691617708631

Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., Duan, L., Almaliach, A., Ang, S., Arnadottir, J., Aycan, Z., Boehnke, K., Boski, P., Cabecinhas, R., Chan, D., Chhokar, J., D'Amato, A., Subirats Ferrer, M., Fischlmayr, I. C., … Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science*, *332*(6033), 1100–1104. https://doi.org/10.1126/science.1197754

Gervais, W. M. (2013). In godlessness we distrust: Using social psychology to solve the puzzle of anti-atheist prejudice: In godlessness we distrust. *Social and Personality Psychology Compass*, *7*(6), 366–377. https://doi.org/10.1111/spc3.12035

Gervais, W. M. (2014). Everything is permitted? People intuitively judge immorality as representative of atheists. *PLOS ONE*, *9*(4), Article e92302. https://doi.org/10.1371/journal.pone.0092302

Gervais, W. M., & Najle, M. B. (2018). How many atheists are there? *Social Psychological & Personality Science*, *9*(1), 3–10. https://doi.org/10.1177/1948550617707015

Gervais, W. M., Shariff, A. F., & Norenzayan, A. (2011). Do you believe in atheists? Distrust is central to anti-atheist prejudice. *Journal of Personality and Social Psychology*, *101*(6), 1189–1206. https://doi.org/10.1037/a0025882

Gervais, W. M., Xygalatas, D., McKay, R. T., van Elk, M., Buchtel, E. E., Aveyard, M., Schiavone, S. R., Dar-Nimrod, I., Svedholm-Häkkinen, A. M., Riekki, T., Klocová, E. K., Ramsay, J. E., & Bulbulia, J. (2017). Global evidence of extreme intuitive moral prejudice against atheists. *Nature Human Behaviour*, *1*(8), Article 0151. https://doi.org/10.1038/s41562-017-0151

Gifford, P. (2019). *The plight of Western religion: The eclipse of the other-worldly*. Oxford University Press. https://doi.org/10.1093/oso/9780190095871.001.0001

Glowacki, L., & von Rueden, C. (2015). Leadership solves collective action problems in small-scale societies. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, *370*(1683), Article 20150010. https://doi.org/10.1098/rstb.2015.0010

Goldstein, T. R., & Woolley, J. (2016). Ho! Ho! Who? Parent promotion of belief in and live encounters with Santa Claus. *Cognitive Development*, *39*, 113–127. https://doi.org/10.1016/j.cogdev.2016.04.002

Gomes, C. M., & McCullough, M. E. (2015). The effects of implicit religious primes on dictator game allocations: A preregistered replication experiment. *Journal of Experimental Psychology: General*, *144*(6), e94–e104. https://doi.org/10.1037/xge0000027

Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S. P., & Ditto, P. H. (2013). Moral foundations theory. *Advances in Experimental Social Psychology*, *47*, 55–130. https://doi.org/10.1016/B978-0-12-407236-7.00002-4

Grasmick, H. G., Cochran, J. K., Bursik, R. J., Jr., & Kimpel, M. (1993). Religion, punitive justice, and support for the death penalty. *Justice Quarterly*, *10*(2), 289–314. https://doi.org/10.1080/07418829300091831

Gray, K., & Wegner, D. M. (2010). Blaming god for our pain: Human suffering and the divine mind. *Personality and Social Psychology Review*, *14*(1), 7–16. https://doi.org/10.1177/1088868309350299

Greif, A. (1993). Contract enforceability and economic institutions in early trade: The Maghribi traders' coalition. *The American Economic Review*, *83*, 525–548. https://www.jstor.org/stable/2117532

Greif, A., Milgrom, P., & Weingast, B. R. (1994). Coordination, commitment, and enforcement: The case of the merchant guild. *Journal of Political Economy*, *102*(4), 745–776. https://doi.org/10.1086/261953

Grim, B. J. (2012). *Laws penalizing blasphemy, apostasy and defamation of religion are widespread*. Pew Research Center.

Grodekov, N. I. (2010). *The Kazakhs and Kirgiz of the Syr-Darya Oblast*. Human Relations Area Files.

Guala, F. (2012). Reciprocity: Weak or strong? What punishment experiments do (and do not) demonstrate. *Behavioral and Brain Sciences*, *35*(1), 1–15. https://doi.org/10.1017/S0140525X11000069

Guillou, L., Grandin, A., & Chevallier, C. (2021). Temporal discounting mediates the relationship between socio-economic status and social trust. *Royal Society Open Science*, *8*(6), Article 202104. https://doi.org/10.1098/rsos.202104

Gusinde, M., & Schütze, F. (1937). *The Yahgan: The life and thought of the water nomads of Cape Horn*. Die Feuerland-Indianer [The Fuegian Indians], Vol. II. https://ehrafworldcultures.yale.edu/document?id=sh06-001

Hadaway, C. K., Marler, P. L., & Chaves, M. (1993). What the polls don't show: A closer look at U.S. church attendance. *American Sociological Review*, *58*(6), 741–752. https://doi.org/10.2307/2095948

Hallowell, A. I. (1976). Ojibwa world view and disease. *Contributions to anthropology : Selected papers of A. Irving Hallowell*. University of Chicago Press. https://ehrafworldcultures.yale.edu/document?id=ng06-077

Hamilton, W. D. (1964). The genetical evolution of social behaviour. II. *Journal of Theoretical Biology*, *7*(1), 17–52. https://doi.org/10.1016/0022-5193(64)90039-6

Harrington, J. R., & Gelfand, M. J. (2014). Tightness-looseness across the 50 United States. *Proceedings of the National Academy of Sciences of the United States of America*, *111*(22), 7990–7995. https://doi.org/10.1073/pnas.1317937111

Haselton, M. G., & Nettle, D. (2006). The paranoid optimist: An integrative evolutionary model of cognitive biases. *Personality and Social Psychology Review*, *10*(1), 47–66. https://doi.org/10.1207/s15327957pspr1001_3

Hechter, M. (1988). *Principles of group solidarity* (1. paperback printing). University of California Press.

Hechter, M. (1990). The attainment of solidarity in intentional communities. *Rationality and Society*, *2*(2), 142–155. https://doi.org/10.1177/1043463190002002004

Heckathorn, D. D. (1989). Collective action and the second-order free-rider problem. *Rationality and Society*, *1*(1), 78–100. https://doi.org/10.1177/1043463189001001006

Henrich, J. (2020). *The weirdest people in the world: How the west became psychologically peculiar and particularly prosperous*. Farrar, Straus and Giroux.

Henrich, J., & Muthukrishna, M. (2021). The origins and psychology of human cooperation. *Annual Review of Psychology*, *72*(1), 207–240. https://doi.org/10.1146/annurev-psych-081920-042106

Herzer, D., & Strulik, H. (2017). Religiosity and income: A panel cointegration and causality analysis. *Applied Economics*, *49*(30), 2922–2938. https://doi.org/10.1080/00036846.2016.1251562

Heyman, G. D., Compton, A. M., Amemiya, J., Ahn, S., & Shao, S. (2021). Children's reputation management: Learning to identify what is socially valued and acting upon it. *Current Directions in Psychological Science*, *30*(4), 315–320. https://doi.org/10.1177/09637214211009516

Heyman, G. D., Hsu, A. S., Fu, G., & Lee, K. (2013). Instrumental lying by parents in the US and China. *International Journal of Psychology*, *48*(6), 1176–1184. https://doi.org/10.1080/00207594.2012.746463

Heyman, G. D., Luu, D. H., & Lee, K. (2009). Parenting by lying. *Journal of Moral Education*, *38*(3), 353–369. https://doi.org/10.1080/03057240903101630

Hilbig, B. E. (2009). Sad, thus true: Negativity bias in judgments of truth. *Journal of Experimental Social Psychology*, *45*(4), 983–986. https://doi.org/10.1016/j.jesp.2009.04.012

Hilbig, B. E. (2012). How framing statistical statements affects subjective veracity: Validation and application of a multinomial model for judgments of truth. *Cognition*, *125*(1), 37–48. https://doi.org/10.1016/j.cognition.2012.06.009

Hill, C. (2002). *The century of revolution 1603–1714*. Routledge: Taylor & Francis e-Library.

Ho, M. K., Saxe, R., & Cushman, F. (2022). Planning with theory of mind. *Trends in Cognitive Sciences*, *26*(11), 959–971. https://doi.org/10.1016/j.tics.2022.08.003

Hoebel, E. (2009). *The law of primitive man: A study in comparative legal dynamics*. Harvard University Press. https://doi.org/10.2307/j.ctv322v463

Hoffman, S. J., Baral, P., Rogers Van Katwyk, S., Sritharan, L., Hughsam, M., Randhawa, H., Lin, G., Campbell, S., Campus, B., Dantas, M., Foroughian, N., Groux, G., Gunn, E., Guyatt, G., Habibi, R., Karabit, M., Karir, A., Kruja, K., Lavis, J. N., … Poirier, M. J. P. (2022). International treaties have mostly failed to produce their intended effects. *Proceedings of the National Academy of Sciences of the United States of America*, *119*(32), Article e2122854119. https://doi.org/10.1073/pnas.2122854119

Hoffmann, R. (2013). The experimental economics of religion. *Journal of Economic Surveys*, *27*(5), 813–845. https://doi.org/10.1111/j.1467-6419.2011.00716.x

Hogbin, H. I., & Malinowski, B. (1934). *Law and order in Polynesia: A study of primitive legal institutions*. Shoe String Press.

Holland, J., Silva, A. S., & Mace, R. (2012). Lost letter measure of variation in altruistic behaviour in 20 neighbourhoods. *PLOS ONE*, *7*(8), Article e43294. https://doi.org/10.1371/journal.pone.0043294

Hone, L. S., McCauley, T. G., Pedersen, E. J., Carter, E. C., & McCullough, M. E. (2021). The sex premium in religiously motivated moral judgment. *Journal of Personality and Social Psychology*, *120*(6), 1621–1633. https://doi.org/10.1037/pspp0000296

Hong, Z. (2024). The cognitive origin and cultural evolution of taboos in human societies. *Journal of the Royal Anthropological Institute*, *30*(3), 724–742. https://doi.org/10.1111/1467-9655.14098

Hong, Z., & Henrich, J. (2021). The cultural evolution of epistemic practices: The Case of Divination. *Human Nature*, *32*(3), 622–651. https://doi.org/10.1007/s12110-021-09408-6

Hong, Z., Slingerland, E., & Henrich, J. (2024). Magic and empiricism in early Chinese rainmaking. *Current Anthropology*, *65*(2), 343–363. https://doi.org/10.1086/729118

Hout, M., & Fischer, C. (2014). Explaining why more Americans have no religious preference: Political backlash and generational succession, 1987–2012. *Sociological Science*, *1*, 423–447. https://doi.org/10.15195/v1.a24

Houtman, D., & Aupers, S. (2007). The spiritual turn and the decline of tradition: The spread of post-Christian spirituality in 14 western countries, 1981–2000. *Journal for the Scientific Study of Religion*, *46*(3), 305–320. https://doi.org/10.1111/j.1468-5906.2007.00360.x

Houtman, D., Aupers, S., & Heelas, P. (2009). Christian religiosity and new age spirituality: A cross-cultural comparison. *Journal for the Scientific Study of Religion*, *48*(1), 169–179. https://doi.org/10.1111/j.1468-5906.2009.01435_2.x

Houtman, D., & Mascini, P. (2002). Why do churches become empty, while new age grows? Secularization and religious change in the Netherlands. *Journal for the Scientific Study of Religion*, *41*(3), 455–473. https://doi.org/10.1111/1468-5906.00130

Huhmann, B. A., & Brotherton, T. P. (1997). A content analysis of guilt appeals in popular magazine advertisements. *Journal of Advertising*, *26*(2), 35–45. https://doi.org/10.1080/00913367.1997.10673521

Hungerman, D. M. (2014). The effect of education on religion: Evidence from compulsory schooling laws. *Journal of Economic Behavior & Organization*, *104*, 52–63. https://doi.org/10.1016/j.jebo.2013.09.004

Immerzeel, T., & van Tubergen, F. (2013). Religion as Reassurance? Testing the Insecurity Theory in 26 European Countries. *European Sociological Review*, *29*(2), 359–372. https://doi.org/10.1093/esr/jcr072

Inglehart, R. (2018). *Cultural evolution: People's motivations are changing, and reshaping the world*. Cambridge University Press. https://doi.org/10.1017/9781108613880

Inglehart, R., & Baker, W. E. (2000). Modernization, cultural change, and the persistence of traditional values. *American Sociological Review*, *65*(1), 19–51. https://doi.org/10.1177/000312240006500103

Inglehart, R. F. (2020). *Religion's sudden decline: What's causing it, and what comes next?* Oxford University Press.

Israel, J. (1995). *The Dutch Republic: Its rise, greatness and fall, 1477–1806*. Clarendon Press. https://doi.org/10.1093/oso/9780198730729.001.0001

Jackson, J. C., Caluori, N., Abrams, S., Beckman, E., Gelfand, M., & Gray, K. (2021). Tight cultures and vengeful gods: How culture shapes religious belief. *Journal of Experimental Psychology: General*, *150*(10), 2057–2077. https://doi.org/10.1037/xge0001033

Jackson, J. C., Caluori, N., Gray, K., & Gelfand, M. (2021). The new science of religious change. *American Psychologist*, *76*(6), 838–850. https://doi.org/10.1037/amp0000818

Jackson, J. C., Dillion, D., Bastian, B., Watts, J., Buckner, W., DiMaggio, N., & Gray, K. (2023). Supernatural explanations across 114 societies are more common for natural than social phenomena. *Nature Human Behaviour*, *7*(5), 707–717. https://doi.org/10.1038/s41562-023-01558-0

Jackson, J. C., Gelfand, M., De, S., & Fox, A. (2019). The loosening of American culture over 200 years is associated with a creativity-order trade-off. *Nature Human Behaviour*, *3*(3), 244–250. https://doi.org/10.1038/s41562-018-0516-z

Jackson, J. C., Gelfand, M., & Ember, C. R. (2020). A global analysis of cultural tightness in non-industrial societies. *Proceedings of the Royal Society B*, *287*(1930), Article 20201036. https://doi.org/10.1098/rspb.2020.1036

Jacquet, P. O., Pazhoohi, F., Findling, C., Mell, H., Chevallier, C., & Baumard, N. (2021). Predictive modeling of religiosity, prosociality, and moralizing in 295,000 individuals from European and non-European populations. *Humanities & Social Sciences Communications*, *8*(1), Article 9. https://doi.org/10.1057/s41599-020-00691-9

Jagiello, R., Heyes, C., & Whitehouse, H. (2022). Tradition and invention: The bifocal stance theory of cultural evolution. *Behavioral and Brain Sciences*, *45*, Article e249. https://doi.org/10.1017/S0140525X22000383

Jara-Ettinger, J. (2019). Theory of mind as inverse reinforcement learning. *Current Opinion in Behavioral Sciences*, *29*, 105–110. https://doi.org/10.1016/j.cobeha.2019.04.010

Jara-Ettinger, J., Floyd, S., Tenenbaum, J. B., & Schulz, L. E. (2017). Children understand that agents maximize expected utilities. *Journal of Experimental Psychology: General*, *146*(11), 1574–1585. https://doi.org/10.1037/xge0000345

Jara-Ettinger, J., Gweon, H., Schulz, L. E., & Tenenbaum, J. B. (2016). The naïve utility calculus: Computational principles underlying commonsense psychology. *Trends in Cognitive Sciences*, *20*(8), 589–604. https://doi.org/10.1016/j.tics.2016.05.011

Jerotijević, D. (2015). The coexistence of different explanatory models of misfortune: A case from Serbia. *Human Affairs*, *25*(3), 261–275. https://doi.org/10.1515/humaff-2015-0022

Johnson, D. (2011). Why god is the best punisher. *Religion, Brain & Behavior*, *1*(1), 77–84. https://doi.org/10.1080/2153599X.2011.558714

Johnson, D. (2016). *God is watching you: How the fear of God makes us human*. Oxford University Press.

Johnson, D., & Bering, J. (2006). Hand of god, mind of man: Punishment and cognition in the evolution of cooperation. *Evolutionary Psychology*, *4*(1). https://doi.org/10.1177/147470490600400119

Johnson, D. D. (2015). Big gods, small wonder: Supernatural punishment strikes back. *Religion, Brain & Behavior*, *5*(4), 290–298. https://doi.org/10.1080/2153599X.2014.928356

Johnson, D. D. P. (2009). The error of god: Error management theory, religion, and the evolution of cooperation. In S. A. Levin (Ed.), *Games, groups, and the global good* (pp. 169–180). Springer. https://doi.org/10.1007/978-3-540-85436-4_10

Johnson, D. D. P., Blumstein, D. T., Fowler, J. H., & Haselton, M. G. (2013). The evolution of error: Error management, cognitive constraints, and adaptive decision-making biases. *Trends in Ecology & Evolution*, *28*(8), 474–481. https://doi.org/10.1016/j.tree.2013.05.014

Johnson, K. A., Okun, M. A., Cohen, A. B., Sharp, C. A., & Hook, J. N. (2019). Development and validation of the five-factor LAMBI measure of God representations. *Psychology of Religion and Spirituality*, *11*(4), 339–349. https://doi.org/10.1037/rel0000207

Johnson, K. A., Sharp, C. A., Okun, M. A., Shariff, A. F., & Cohen, A. B. (2018). SBNR identity: The role of impersonal god representations, individualistic spirituality, and dissimilarity with religious groups. *The International Journal for the Psychology of Religion*, *28*(2), 121–140. https://doi.org/10.1080/10508619.2018.1445893

Jones, P. (1980). Blasphemy, offensiveness and law. *British Journal of Political Science*, *10*(2), 129–148. https://doi.org/10.1017/S0007123400002064

Jordan, J. J., Hoffman, M., Bloom, P., & Rand, D. G. (2016). Third-party punishment as a costly signal of trustworthiness. *Nature*, *530*(7591), 473–476. https://doi.org/10.1038/nature16981

Kavanagh, C., Jong, J., & Whitehouse, H. (2020). Ritual and religion as social technologies of cooperation. In L. J. Kirmayer, C. M. Worthman, S. Kitayama, R. Lemelson, & C. Cummings (Eds.), *Culture, mind, and brain* (1st ed., pp. 325–362). Cambridge University Press. https://doi.org/10.1017/9781108695374.016

Kay, A. C., Shepherd, S., Blatz, C. W., Chua, S. N., & Galinsky, A. D. (2010). For god (or) country: The hydraulic relation between government instability and belief in religious sources of control. *Journal of Personality and Social Psychology*, *99*(5), 725. https://doi.org/10.1037/a0021140

Kelley, H. H., & Michela, J. L. (1980). Attribution theory and research. *Annual Review of Psychology*, *31*(1), 457–501. https://doi.org/10.1146/annurev.ps.31.020180.002325

Kelly, J. M., Kramer, S. R., & Shariff, A. F. (2024). Religiosity predicts prosociality, especially when measured by self-report: A meta-analysis of almost 60 years of research. *Psychological Bulletin*, *150*(3), 284–318. https://doi.org/10.1037/bul0000413

Kerry, N., Prokosch, M., & Murray, D. (2023). The holy father (and mother)? Multiple tests of the hypothesis that parenthood and parental care motivation lead to greater religiosity. *Personality and Social Psychology Bulletin*, *49*(5), 709–726. https://doi.org/10.1177/01461672221076919

Kruglanski, A. W. (1970). Attributing trustworthiness in supervisor-worker relations. *Journal of Experimental Social Psychology*, *6*(2), 214–232. https://doi.org/10.1016/0022-1031(70)90088-0

Kurzban, R., & Aktipis, C. A. (2007). Modularity and the social mind: Are psychologists too self-ish? *Personality and Social Psychology Review*, *11*(2), 131–149. https://doi.org/10.1177/1088868306294906

Lang, A. (1900). *The making of religion*. Genesis Publishing.

Lang, M., Krátký, J., & Xygalatas, D. (2020). The role of ritual behaviour in anxiety reduction: An investigation of Marathi religious practices in Mauritius. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *375*(1805), Article 20190431. https://doi.org/10.1098/rstb.2019.0431

Lang, M., Purzycki, B. G., Apicella, C. L., Atkinson, Q. D., Bolyanatz, A., Cohen, E., Handley, C., Kundtová Klocová, E., Lesorogol, C., Mathew, S., McNamara, R. A., Moya, C., Placek, C. D., Soler, M., Vardy, T., Weigel, J. L., Willard, A. K., Xygalatas, D., Norenzayan, A., & Henrich, J. (2019). Moralizing gods, impartiality and religious parochialism across 15 societies. *Proceedings of the Royal Society B: Biological Sciences*, *286*(1898), Article 20190202. https://doi.org/10.1098/rspb.2019.0202

Le Goff, J. (1986). *The birth of purgatory*. University of Chicago Press.

Leeson, P. T. (2009). *The invisible hook: The hidden economics of pirates*. Princeton University Press. https://doi.org/10.1515/9781400829866

Leeson, P. T. (2014). "God damn": The law and economics of monastic malediction. *Journal of Law Economics and Organization*, *30*(1), 193–216. https://doi.org/10.1093/jleo/ews025

Legare, C. H., Evans, E. M., Rosengren, K. S., & Harris, P. L. (2012). The coexistence of natural and supernatural explanations across cultures and development. *Child Development*, *83*(3), 779–793. https://doi.org/10.1111/j.1467-8624.2012.01743.x

Leimar, O., & Connor, R. C. (2003). By-product benefits, reciprocity, and pseudoreciprocity in mutualism. In P. Hammerstein (Eds.), *Genetic and cultural evolution of cooperation* (pp. 203–222). MIT Press.

Leimar, O., & Hammerstein, P. (2010). Cooperation for direct fitness benefits. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, *365*(1553), 2619–2626. https://doi.org/10.1098/rstb.2010.0116

Lengauer, G., Esser, F., & Berganza, R. (2012). Negativity in political news: A review of concepts, operationalizations and key findings. *Journalism*, *13*(2), 179–202. https://doi.org/10.1177/1464884911427800

Levine, S., Kleiman-Weiner, M., Schulz, L., Tenenbaum, J., & Cushman, F. (2020). The logic of universalization guides moral judgment. *Proceedings of the National Academy of Sciences of the United States of America*, *117*(42), 26158–26169. https://doi.org/10.1073/pnas.2014505117

Lie-Panis, J., Fitouchi, L., Baumard, N., & André, J.-B. (in press). The social leverage effect: Institutions transform weak reputation effects into strong incentives for cooperation. *Proceedings of the National Academy of Sciences*.

Liebeschuetz, J. H. W. G. (1989). *Continuity and change in Roman religion*. Clarendon Press.

Lienard, P. (2014). Beyond kin: Cooperation in a tribal society. In P. A. M. Van Lange, B. Rockenbach, & T. Yamagishi (Eds.), *Reward and punishment in social dilemmas* (pp. 214–234). Oxford University Press.

Liénard, P., & Boyer, P. (2006). Whence collective rituals? A cultural selection model of ritualized behavior. *American Anthropologist*, *108*(4), 814–827. https://doi.org/10.1525/aa.2006.108.4.814

Lightner, A. D., Bendixen, T., & Purzycki, B. G. (2023). Moralistic supernatural punishment is probably not associated with social complexity. *Evolution and Human Behavior*, *44*(6), 555–565. https://doi.org/10.1016/j.evolhumbehav.2022.10.006

Lindbeck, G. A. (2020). *Creed*. Encyclopedia Britannica. https://www.britannica.com/topic/creed

Lindeman, M., van Elk, M., Lipsanen, J., Marin, P., & Schjødt, U. (2019). Religious unbelief in three western European countries: Identifying and characterizing unbeliever types using latent class analysis. *The International Journal for the Psychology of Religion*, *29*(3), 184–203. https://doi.org/10.1080/10508619.2019.1591140

Lipka, M., & Gecewicz, C. (2017). *More Americans now say they're spiritual but not religious*. Pew Research Center. Retrieved December 22, 2022, from https://www.pewresearch.org/fact-tank/2017/09/06/more-americans-now-say-theyre-spiritual-but-not-religious/

Little, L. (1981). Les techniques de la confession et la confession comme technique [The techniques of confession and confession as a technique]. *Publications de l'École Française de Rome*, *51*(1), 87–99. https://www.persee.fr/doc/efr_0000-0000_1981_act_51_1_1371

Little, L. K. (1993). *Benedictine maledictions: Liturgical cursing in Romanesque France*. Cornell University Press.

Major-Smith, D. (2023). Exploring causality from observational data: An example assessing whether religiosity promotes cooperation. *Evolutionary Human Sciences*, *5*, Article e22. https://doi.org/10.1017/ehs.2023.17

Manhes, P., & Velicer, G. J. (2011). Experimental evolution of selfish policing in social bacteria. *Proceedings of the National Academy of Sciences of the United States of America*, *108*(20), 8357–8362. https://doi.org/10.1073/pnas.1014695108

Manrique, H. M., Zeidler, H., Roberts, G., Barclay, P., Walker, M., Samu, F., Fariña, A., Bshary, R., & Raihani, N. (2021). The psychological foundations of reputation-based cooperation. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *376*(1838), Article 20200287. https://doi.org/10.1098/rstb.2020.0287

Marlowe, F. W. (2010). *The Hadza: Hunter–gatherers of Tanzania*. University of California Press.

Martin, H. (1983). Confession et controle social à la fin du Moyen Age [Confession and social control at the end of the middle ages]. In Groupe de la Bussière (Ed.), *Pratiques de La Confésion: Des Péres Du Désert à Vatican II* (pp. 117–135). Du Cerf.

Mathew, S. (2017). How the second-order free rider problem is solved in a small-scale society. *The American Economic Review*, *107*(5), 578–581. https://doi.org/10.1257/aer.p20171090

Mathew, S., & Boyd, R. (2014). The cost of cowardice: Punitive sentiments towards free riders in Turkana raids. *Evolution and Human Behavior*, *35*(1), 58–64. https://doi.org/10.1016/j.evolhumbehav.2013.10.001

McCullough, M. E. (2020). *The kindness of strangers: How a selfish ape invented a new moral code*. Simon and Schuster.

McCullough, M. E., & Carter, E. C. (2013). Religion, self-control, and self-regulation: How and why are they related? In K. I. Pargament, J. J. Exline, & J. W. Jones (Eds.), *APA handbook of psychology, religion, and spirituality: Vol. 1. Context, theory, and research* (pp. 123–138). American Psychological Association. https://doi.org/10.1037/14045-006

McCullough, M. E., Enders, C. K., Brion, S. L., & Jain, A. R. (2005). The varieties of religious development in adulthood: A longitudinal investigation of religion and rational choice. *Journal of Personality and Social Psychology*, *89*(1), 78–89. https://doi.org/10.1037/0022-3514.89.1.78

McCullough, M. E., Swartwout, P., Shaver, J. H., Carter, E. C., & Sosis, R. (2016). Christian religious badges instill trust in Christian and non-Christian perceivers. *Psychology of Religion and Spirituality*, *8*(2), 149–163. https://doi.org/10.1037/rel0000045

McKay, R. T., & Dennett, D. C. (2009). The evolution of misbelief. *Behavioral and Brain Sciences*, *32*(6), 493–510. https://doi.org/10.1017/S0140525X09990975

McNamara, R. A., & Purzycki, B. G. (2020). Minds of gods and human cognitive constraints: Socio-ecological context shapes belief. *Religion, Brain & Behavior*, *10*(3), 223–238. https://doi.org/10.1080/2153599X.2019.1678510

Meens, R. (2014). *Penance in medieval Europe, 600–1200*. Cambridge University Press. https://doi.org/10.1017/CBO9781139029667

Mencken, F. C., Bader, C., & Embry, E. (2009). In god we trust: Images of god and trust in the United States among the highly religious. *Sociological Perspectives*, *52*(1), 23–38. https://doi.org/10.1525/sop.2009.52.1.23

Mercier, H. (2017). How gullible are we? A review of the evidence from psychology and social science. *Review of General Psychology*, *21*(2), 103–122. https://doi.org/10.1037/gpr0000111

Mercier, H. (2020). *Not born yesterday: The science of who we trust and what we believe*. Princeton University Press. https://doi.org/10.1515/9780691198842

Mesoudi, A., & Thornton, A. (2018). What is cumulative cultural evolution? *Proceedings of the Royal Society B: Biological Sciences*, *285*(1880), Article 20180712. https://doi.org/10.1098/rspb.2018.0712

Miethe, T. D., Lu, H., & Deibert, G. R. (2005). Cross-national variability in capital punishment: Exploring the sociopolitical sources of its differential legal status. *International Criminal Justice Review*, *15*(2), 115–130. https://doi.org/10.1177/1057567705283954

Miller, D. T., Visser, P. S., & Staub, B. D. (2005). How surveillance begets perceptions of dishonesty: The case of the counterfactual sinner. *Journal of Personality and Social Psychology*, *89*(2), 117–128. https://doi.org/10.1037/0022-3514.89.2.117

Mills, C. M., & Keil, F. C. (2005). The development of cynicism. *Psychological Science*, *16*(5), 385–390. https://doi.org/10.1111/j.0956-7976.2005.01545.x

Miton, H., Claidière, N., & Mercier, H. (2015). Universal cognitive mechanisms explain the cultural success of bloodletting. *Evolution and Human Behavior*, *36*(4), 303–312. https://doi.org/10.1016/j.evolhumbehav.2015.01.003

Molleman, L., Kölle, F., Starmer, C., & Gächter, S. (2019). People prefer coordinated punishment in cooperative interactions. *Nature Human Behaviour*, *3*(11), 1145–1153. https://doi.org/10.1038/s41562-019-0707-2

Moon, J. W. (2021). Why are world religions so concerned with sexual behavior? *Current Opinion in Psychology*, *40*, 15–19. https://doi.org/10.1016/j.copsyc.2020.07.030

Moon, J. W., Krems, J. A., Cohen, A. B., & Kenrick, D. T. (2019). Is nothing sacred? Religion, sex, and reproductive strategies. *Current Directions in Psychological Science*, *28*(4), 361–365. https://doi.org/10.1177/0963721419838242

Moon, J. W., Tratner, A. E., & McDonald, M. M. (2022). Men are less religious in more gender-equal countries. *Proceedings of the Royal Society B: Biological Sciences*, *289*(1968), Article 20212474. https://doi.org/10.1098/rspb.2021.2474

Morris, I. (2015). *Foragers, farmers, and fossil fuels: How human values evolve*. Princeton University Press. https://doi.org/10.1515/9781400865512

Nash, D. (2007). *Blasphemy in the Christian world: A history*. Oxford University Press.

Nettle, D. (2015). *Tyneside neighbourhoods: Deprivation, social life and social behaviour in one British city*. Open Book Publishers. https://doi.org/10.11647/OBP.0084

Nettle, D., & Saxe, R. (2021). "if men were angels, no government would be necessary": The intuitive theory of social motivation and preference for authoritarian leaders. *Collabra: Psychology*, *7*(1), Article 28105. https://doi.org/10.1525/collabra.28105

Norenzayan, A. (2013). *Big gods: How religion transformed cooperation and conflict*. Princeton University Press.

Norenzayan, A. (2015). Big questions about Big gods: Response and discussion. *Religion, Brain & Behavior*, *5*(4), 327–342. https://doi.org/10.1080/2153599X.2014.928359

Norenzayan, A., & Gervais, W. M. (2015). Secular rule of law erodes believers' political intolerance of atheists. *Religion, Brain & Behavior*, *5*(1), 3–14. https://doi.org/10.1080/2153599X.2013.794749

Norenzayan, A., Shariff, A. F., Gervais, W. M., Willard, A. K., McNamara, R. A., Slingerland, E., & Henrich, J. (2016). The cultural evolution of prosocial religions. *Behavioral and Brain Sciences*, *39*, Article e1. https://doi.org/10.1017/s0140525x14001356

Norris, P., & Inglehart, R. (2004). *Sacred and secular*. Cambridge University Press.

Norris, P., & Inglehart, R. (2011). *Sacred and secular: Religion and politics worldwide*. Cambridge University Press. https://doi.org/10.1017/CBO9780511894862

Norris, P., & Inglehart, R. (2019). Authoritarian and populist values. In P. Norris & R. Inglehart (Eds.), *Cultural backlash: Trump, Brexit, and authoritarian populism* (pp. 85–212). Cambridge University Press. https://www.cambridge.org/core/books/cultural-backlash/authoritarian-and-populist-values/EBB3D54D4D75E03B36816372F4C3F25F

Ohtsubo, Y., & Watanabe, E. (2009). Do sincere apologies need to be costly? Test of a costly signaling model of apology. *Evolution and Human Behavior*, *30*(2), 114–123. https://doi.org/10.1016/j.evolhumbehav.2008.09.004

Olivelle, P. (2011). Penance and punishment: Marking the body in criminal law and social ideology of ancient India. *The Journal of Hindu Studies*, *4*(1), 23–41. https://doi.org/10.1093/jhs/hir011

Ong, H. H., Evans, A. M., Nelissen, R. M. A., & Van Beest, I. (2022). Belief in karma is associated with perceived (but not actual) trustworthiness. *Judgment and Decision Making*, *17*(2), 362–377. https://doi.org/10.1017/S1930297500009141

Ortiz-Ospina, E., Roser, M., & Arriagada, P. (2024). *Trust*. Our World in Data. https://ourworldindata.org/trust

Osiurak, F., Claidière, N., & Federico, G. (2023). Bringing cumulative technological culture beyond copying versus reasoning. *Trends in Cognitive Sciences*, *27*(1), 30–42. https://doi.org/10.1016/j.tics.2022.09.024

Osiurak, F., Lasserre, S., Arbanti, J., Brogniart, J., Bluet, A., Navarro, J., & Reynaud, E. (2021). Technical reasoning is important for cumulative technological culture. *Nature Human Behaviour*, *5*(12), 1643–1651. https://doi.org/10.1038/s41562-021-01159-9

Osiurak, F., & Reynaud, E. (2020). The elephant in the room: What matters cognitively in cumulative technological culture. *Behavioral and Brain Sciences*, *43*, Article e156. https://doi.org/10.1017/S0140525X19003236

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press. https://doi.org/10.1017/CBO9780511807763

Ott, M. A., & Santelli, J. S. (2007). Abstinence and abstinence-only education. *Current Opinion in Obstetrics & Gynecology*, *19*(5), 446–452. https://doi.org/10.1097/GCO.0b013e3282efdc0b

Oviedo, L. (2016). Religious attitudes and prosocial behavior: A systematic review of published research. *Religion, Brain & Behavior*, *6*(2), 169–184. https://doi.org/10.1080/2153599X.2014.992803

Ozono, H., Jin, N., Watabe, M., & Shimizu, K. (2016). Solving the second-order free rider problem in a public goods game: An experiment using a leader support system. *Scientific Reports*, *6*(1), Article 38349. https://doi.org/10.1038/srep38349

Pal, S., & Hilbe, C. (2022). Reputation effects drive the joint evolution of cooperation and social rewarding. *Nature Communications*, *13*(1), Article 5928. https://doi.org/10.1038/s41467-022-33551-y

Paldam, M., & Gundlach, E. (2013). The religious transition. A long-run perspective. *Public Choice*, *156*(1–2), 105–123. https://doi.org/10.1007/s11127-012-9934-z

Pasek, M. H., Kelly, J. M., Shackleford, C., White, C. J. M., Vishkin, A., Smith, J. M., Norenzayan, A., Shariff, A., & Ginges, J. (2023). Thinking about god encourages prosociality toward religious outgroups: A cross-cultural

investigation. *Psychological Science*, *34*(6), 657–669. https://doi.org/10.1177/09567976231158576

Peoples, H. C., Duda, P., & Marlowe, F. W. (2016). Hunter–gatherers and the origins of religion. *Human Nature*, *27*(3), 261–282. https://doi.org/10.1007/s12110-016-9260-0

Petersen, M. B., & Aarøe, L. (2015). Birth weight and social trust in adulthood: Evidence for early calibration of social cognition. *Psychological Science*, *26*(11), 1681–1692. https://doi.org/10.1177/0956797615595622

Priest, P. N. (1966). Provision for the aged among the Sirionó Indians of Bolivia. *American Anthropologist*, *68*(5), 1245–1247. https://doi.org/10.1525/aa.1966.68.5.02a00130

Purzycki, B. G. (2011). Tyvan *cher eezi* and the socioecological constraints of supernatural agents' minds. *Religion, Brain & Behavior*, *1*(1), 31–45. https://doi.org/10.1080/2153599X.2010.550723

Purzycki, B. G. (2013). The minds of gods: A comparative study of supernatural agency. *Cognition*, *129*(1), 163–179. https://doi.org/10.1016/j.cognition.2013.06.010

Purzycki, B. G. (2016). The evolution of gods' minds in the Tyva Republic. *Current Anthropology*, *57*(S13), S88–S104. https://doi.org/10.1086/685729

Purzycki, B. G., Apicella, C., Atkinson, Q. D., Cohen, E., McNamara, R. A., Willard, A. K., Xygalatas, D., Norenzayan, A., & Henrich, J. (2016). Moralistic gods, supernatural punishment and the expansion of human sociality. *Nature*, *530*(7590), 327–330. https://doi.org/10.1038/nature16980

Purzycki, B. G., Bendixen, T., Lightner, A. D., & Sosis, R. (2022). Gods, games, and the socioecological landscape. *Current Research in Ecological and Social Psychology*, *3*, Article 100057. https://doi.org/10.1016/j.cresp.2022.100057

Purzycki, B. G., Finkel, D. N., Shaver, J., Wales, N., Cohen, A. B., & Sosis, R. (2012). What does god know? Supernatural agents' access to socially strategic and non-strategic information. *Cognitive Science*, *36*(5), 846–869. https://doi.org/10.1111/j.1551-6709.2012.01242.x

Purzycki, B. G., Henrich, J., Apicella, C., Atkinson, Q. D., Baimel, A., Cohen, E., McNamara, R. A., Willard, A. K., Xygalatas, D., & Norenzayan, A. (2018). The evolution of religion and morality: A synthesis of ethnographic and experimental evidence from eight societies. *Religion, Brain & Behavior*, *8*(2), 101–132. https://doi.org/10.1080/2153599X.2016.1267027

Purzycki, B. G., & Holland, E. C. (2019). Buddha as a god: An empirical assessment. *Method & Theory in the Study of Religion*, *31*(4–5), 347–375. https://doi.org/10.1163/15700682-12341453

Purzycki, B. G., & Kulundary, V. (2018). Buddhism, identity, and class: Fairness and favoritism in the Tyva Republic. *Religion, Brain & Behavior*, *8*(2), 205–226. https://doi.org/10.1080/2153599X.2016.1267031

Purzycki, B. G., & Sosis, R. (2022). *Religion evolving: Cultural, cognitive, and ecological dynamics*. Equinox Publishing Limited. https://doi.org/10.1558/isbn.9781800500532

Purzycki, B. G., Stagnaro, M. N., & Sasaki, J. (2020). Breaches of trust change the content and structure of religious appeals. *Journal for the Study of Religion, Nature and Culture*, *14*(1), 71–94. https://doi.org/10.1558/jsrnc.38786

Purzycki, B. G., Willard, A. K., Klocová, E. K., Apicella, C., Atkinson, Q., Bolyanatz, A., Cohen, E., Handley, C., Henrich, J., Lang, M., Lesorogol, C., Mathew, S., McNamara, R. A., Moya, C., Norenzayan, A., Placek, C., Soler, M., Vardy, T., Weigel, J., … Ross, C. T. (2022). The moralization bias of gods' minds: A cross-cultural test. *Religion, Brain & Behavior*, *12*(1–2), 38–60. https://doi.org/10.1080/2153599X.2021.2006291

Radkani, S., Holton, E., de Courson, B., Saxe, R., & Nettle, D. (2023). Desperation and inequality increase stealing: Evidence from experimental microsocieties. *Royal Society Open Science*, *10*(7), Article 221385. https://doi.org/10.1098/rsos.221385

Raihani, N. J., & Bshary, R. (2019). Punishment: One tool, many uses. *Evolutionary Human Sciences*, *1*, Article e12. https://doi.org/10.1017/ehs.2019.12

Ratnieks, F. L. (1988). Reproductive harmony via mutual policing by workers in eusocial Hymenoptera. *American Naturalist*, *132*(2), 217–236. https://doi.org/10.1086/284846

Ratnieks, F. L. W., & Visscher, P. K. (1989). Worker policing in the honeybee. *Nature*, *342*, 796–797. https://doi.org/10.1038/342796a0

Ratnieks, F. L. W., & Wenseleers, T. (2005). Evolution: Policing insect societies. *Science*, *307*(5706), 54–56. https://doi.org/10.1126/science.1106934

Reyes-Jaquez, B., & Echols, C. H. (2015). Playing by the rules: Self-interest information influences children's trust and trustworthiness in the absence of feedback. *Cognition*, *134*, 140–154. https://doi.org/10.1016/j.cognition.2014.10.002

Richardson, J. (1940). *Law and status among the Kiowa Indians* (Vol. 1). University of Washington Press.

Richerson, P. J., & Boyd, R. (2005). *Not by genes alone: How culture transformed human evolution*. University of Chicago Press.

Ritter, R. S., Preston, J. L., Salomon, E., & Relihan-Johnson, D. (2016). Imagine no religion: Heretical disgust, anger and the symbolic purity of mind. *Cognition and Emotion*, *30*(4), 778–796. https://doi.org/10.1080/02699931.2015.1030334

Robertson, C. E., Pröllochs, N., Schwarzenegger, K., Pärnamets, P., Van Bavel, J. J., & Feuerriegel, S. (2023). Negativity drives online news consumption. *Nature Human Behaviour*, *7*(5), 812–822. https://doi.org/10.1038/s41562-023-01538-4

Roes, F., & Raymond, M. (2003). Belief in moralizing gods. *Evolution and Human Behavior*, *24*(2), 126–135. https://doi.org/10.1016/S1090-5138(02)00134-4

Royzman, E., Atanasov, P., Landy, J. F., Parks, A., & Gepty, A. (2014). CAD or MAD? Anger (not disgust) as the predominant response to pathogen-free violations of the divinity code. *Emotion*, *14*(5), 892–907. https://doi.org/10.1037/a0036829

Safra, L., Algan, Y., Tecu, T., Grèzes, J., Baumard, N., & Chevallier, C. (2017). Childhood harshness predicts long-lasting leader preferences. *Evolution and Human Behavior*, *38*(5), 645–651. https://doi.org/10.1016/j.evolhumbehav.2017.05.001

Saroglou, V., & Craninx, M. (2021). Religious moral righteousness over care: A review and a meta-analysis. *Current Opinion in Psychology*, *40*, 79–85. https://doi.org/10.1016/j.copsyc.2020.09.002

Sasaki, T., Uchida, S., & Chen, X. (2015). Voluntary rewards mediate the evolution of pool punishment for maintaining public goods in large populations. *Scientific Reports*, *5*(1), Article 8917. https://doi.org/10.1038/srep08917

Schein, C., Ritter, R. S., & Gray, K. (2016). Harm mediates the disgust-immorality link. *Emotion*, *16*(6), 862–876. https://doi.org/10.1037/emo0000167

Schneider, D. M. (1957). Political organization, supernatural sanctions and the punishment for incest on yap. *American Anthropologist*, *59*(5), 791–800. https://doi.org/10.1525/aa.1957.59.5.02a00040

Scott-Phillips, T., Blancke, S., & Heintz, C. (2018). Four misunderstandings about cultural attraction. *Evolutionary Anthropology*, *27*(4), 162–173. https://doi.org/10.1002/evan.21716

Sedikides, C., & Gebauer, J. E. (2010). Religiosity as self-enhancement: A meta-analysis of the relation between socially desirable responding and religiosity. *Personality and Social Psychology Review*, *14*(1), 17–36. https://doi.org/10.1177/1088868309351002

Serra-Garcia, M., van Damme, E., & Potters, J. (2011). Hiding an inconvenient truth: Lies and vagueness. *Games and Economic Behavior*, *73*(1), 244–261. https://doi.org/10.1016/j.geb.2011.01.007

Shariff, A. F. (2015). Does religion increase moral behavior? *Current Opinion in Psychology*, *6*, 108–113. https://doi.org/10.1016/j.copsyc.2015.07.009

Shariff, A. F., Willard, A. K., Andersen, T., & Norenzayan, A. (2016). Religious priming: A meta-analysis with a focus on prosociality. *Personality and Social Psychology Review*, *20*(1), 27–48. https://doi.org/10.1177/1088868314568811

Shepperd, J. A., Pogge, G., Lipsey, N. P., Miller, W. A., & Webster, G. D. (2019). Belief in a loving versus punitive god and behavior. *Journal of Research on Adolescence*, *29*(2), 390–401. https://doi.org/10.1111/jora.12437

Silva, A. S., & Mace, R. (2014). Cooperation and conflict: Field experiments in Northern Ireland. *Proceedings of the Royal Society B: Biological Sciences*, *281*(1792), Article 20141435. https://doi.org/10.1098/rspb.2014.1435

Silverman, G. S., Johnson, K. A., & Cohen, A. B. (2016). To believe or not to believe, that is not the question: The complexity of Jewish beliefs about god. *Psychology of Religion and Spirituality*, *8*(2), 119–130. https://doi.org/10.1037/rel0000065

Silveus, N., & Stoddard, C. (2020). Identifying the causal effect of income on religiosity using the earned income tax credit. *Journal of Economic Behavior & Organization*, *178*, 903–924. https://doi.org/10.1016/j.jebo.2020.08.022

Singh, M. (2018). The cultural evolution of shamanism. *Behavioral and Brain Sciences*, *41*, Article e66. https://doi.org/10.1017/S0140525X17001893

Singh, M. (2021). Magic, explanations, and evil: The origins and design of witches and sorcerers. *Current Anthropology*, *62*(1), 2–29. https://doi.org/10.1086/713111

Singh, M. (2022). *Subjective selection and the evolution of complex culture* [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/4t2ud

Singh, M. (2025). *Shamanism: The timeless religion*. Knopf.

Singh, M., & Boomsma, J. J. (2015). Policing and punishment across the domains of social evolution. *Oikos*, *124*(8), 971–982. https://doi.org/10.1111/oik.02064

Singh, M., & Garfield, Z. H. (2022). Evidence for third-party mediation but not punishment in Mentawai justice. *Nature Human Behaviour*, *6*(7), 930–940. https://doi.org/10.1038/s41562-022-01341-7

Singh, M., & Henrich, J. (2020). Why do religious leaders observe costly prohibitions? Examining taboos on Mentawai shamans. *Evolutionary Human Sciences*, *2*, Article e32. https://doi.org/10.1017/ehs.2020.32

Singh, M., Kaptchuk, T. J., & Henrich, J. (2021). Small gods, rituals, and cooperation: The Mentawai water spirit Sikameinan. *Evolution and Human Behavior*, *42*(1), 61–72. https://doi.org/10.1016/j.evolhumbehav.2020.07.008

Smith, D., Schlaepfer, P., Major, K., Dyble, M., Page, A. E., Thompson, J., Chaudhary, N., Salali, G. D., Mace, R., Astete, L., Ngales, M., Vinicius, L., & Migliano, A. B. (2017). Cooperation and the evolution of hunter–gatherer storytelling. *Nature Communications*, *8*(1), Article 1853. https://doi.org/10.1038/s41467-017-02036-8

Smyth, J. (2016). *Robespierre and the festival of the supreme being: The search for a republican morality*. Manchester University Press.

Solt, F., Habel, P., & Grant, J. T. (2011). Economic inequality, relative power, and religiosity. *Social Science Quarterly*, *92*(2), 447–465. https://doi.org/10.1111/j.1540-6237.2011.00777.x

Soltis, J., Boyd, R., & Richerson, P. J. (1995). Can group-functional behaviors evolve by cultural group selection?: An empirical test. *Current Anthropology*, *36*(3), 473–494. https://doi.org/10.1086/204381

Soroka, S., Fournier, P., & Nir, L. (2019). Cross-national evidence of a negativity bias in psychophysiological reactions to news. *Proceedings of the National Academy of Sciences of the United States of America*, *116*(38), 18888–18892. https://doi.org/10.1073/pnas.1908369116

Sosis, R. (2006). Religious behaviors, badges, and bans: Signally theory and the evolution of religion. In P. McNamara (Ed.), *Where god and science meet* (pp. 61–86). Praeger.

Sosis, R. (2007). Psalms for safety: Magico-religious responses to threats of terror. *Current Anthropology*, *48*(6), 903–911. https://doi.org/10.1086/523015

Sosis, R., & Handwerker, W. P. (2011). Psalms and coping with uncertainty: Religious Israeli women's responses to the 2006 Lebanon war. *American Anthropologist*, *113*(1), 40–55. https://doi.org/10.1111/j.1548-1433.2010.01305.x

Sperber, D. (1996). *Explaining culture: A naturalistic approach*. Basil Blackwell.

Sperber, D., Clément, F., Heintz, C., Mascaro, O., Mercier, H., Origgi, G., & Wilson, D. (2010). Epistemic vigilance. *Mind & Language*, *25*(4), 359–393. https://doi.org/10.1111/j.1468-0017.2010.01394.x

Stagnaro, M., Stibbard Hawkes, D., & Apicella, C. (2022). Do religious and market-based institutions promote cooperation in Hadza hunter–gatherers? *Religion, Brain & Behavior*, *12*(1–2), 171–189. https://doi.org/10.1080/2153599X.2021.2006293

Stagnaro, M. N., Arechar, A. A., & Rand, D. G. (2020). Are those who believe in god really more prosocial? *Religion, Brain & Behavior*, *10*(4), 444–458. https://doi.org/10.1080/2153599X.2019.1695656

Stamos, A., Altsitsiadis, E., & Dewitte, S. (2019). Investigating the effect of childhood socioeconomic background on interpersonal trust: Lower childhood socioeconomic status predicts lower levels of trust. *Personality and Individual Differences*, *145*, 19–25. https://doi.org/10.1016/j.paid.2019.03.011

Stanley, M. L., & Kay, A. C. (2022). Belief in divine moral authority satisfies the psychological need for structure and increases in the face of perceived injustice. *Journal of Experimental Social Psychology*, *101*, Article 104302. https://doi.org/10.1016/j.jesp.2022.104302

Starmans, C., Sheskin, M., & Bloom, P. (2017). Why people prefer unequal societies. *Nature Human Behaviour*, *1*(4), Article 0082. https://doi.org/10.1038/s41562-017-0082

Storm, I. (2017). Does economic insecurity predict religiosity? Evidence from the European social survey 2002–2014. *Sociology of Religion*, *78*(2), 146–172. https://doi.org/10.1093/socrel/srw055

Strassmann, B. (1996). Menstrual hut visits by Dogon women: A hormonal test distinguishes deceit from honest signaling. *Behavioral Ecology*, *7*(3), 304–315. https://doi.org/10.1093/beheco/7.3.304

Strassmann, B. I. (1992). The function of menstrual taboos among the dogon: Defense against Cuckoldry? *Human Nature*, *3*(2), 89–131. https://doi.org/10.1007/BF02692249

Strassmann, B. I., Kurapati, N. T., Hug, B. F., Burke, E. E., Gillespie, B. W., Karafet, T. M., & Hammer, M. F. (2012). Religion as a means to assure paternity. *Proceedings of the National Academy of Sciences of the United States of America*, *109*(25), 9781–9785. https://doi.org/10.1073/pnas.1110442109

Street, C. N. H., & Richardson, D. C. (2015). Lies, damn lies, and expectations: How base rates inform lie-truth judgments: Base rate beliefs in lie detection. *Applied Cognitive Psychology*, *29*(1), 149–155. https://doi.org/10.1002/acp.3085

Strickland, L. H. (1958). Surveillance and trust. *Journal of Personality*, *26*(2), 200–215. https://doi.org/10.1111/j.1467-6494.1958.tb01580.x

Strickland, L. H., Barefoot, J. C., & Hockenstein, P. (1976). Monitoring behavior in the surveillance and trust paradigm. *Representative Research in Social Psychology*, *7*(1), 51–57. https://psycnet.apa.org/record/1976-26061-001

Sun, K.-K., & Papadokonstantaki, S. (2023). Lying aversion and vague communication: An experimental study. *European Economic Review*, *160*, Article 104611. https://doi.org/10.1016/j.euroecorev.2023.104611

Sun, Q., Hampton, J. D., Merchant, A., Haynes, K. F., & Zhou, X. (2020). Cooperative policing behaviour regulates reproductive division of labour in a termite. *Proceedings of the Royal Society B: Biological Sciences*, *287*(1928), Article 20200780. https://doi.org/10.1098/rspb.2020.0780

Swanson, G. E. (1960). *The birth of the gods: The origin of primitive beliefs* (Vol. 93). University of Michigan Press. https://doi.org/10.3998/mpub.6484

Tamir, C., Connaughton, A., & Salazar, A. M. (2020). *People's thoughts on whether belief in God is necessary to be moral vary by economic development, education and age*. Pew Research Center.

Tan, J. H. W., & Vogel, C. (2008). Religion and trust: An experimental study. *Journal of Economic Psychology*, *29*(6), 832–848. https://doi.org/10.1016/j.joep.2008.03.002

Tentler, T. N. (1974). The summa for confessors as an instrument of social control. In H. Oberman & C. Edward Trinkaus (Eds.), *The pursuit of holiness in late medieval and renaissance religion* (pp. 103–137). Brill. https://doi.org/10.1163/9789004477414_008

Tentler, T. N. (2015). *Sin and confession on the eve of the reformation*. Princeton University Press. https://doi.org/10.1515/9781400871407

Theodorou, A. E. (2016). *Which countries still outlaw apostasy and blasphemy*. Pew Research Center.

Thompson, S. (1946). *The folktale*. Dryden Press. https://catalog.hathitrust.org/Record/001276234

Tinniswood, A. (2004). *By permission of heaven: The story of the great fire of London*. Random House.

Tomasello, M. (2020). The moral psychology of obligation. *Behavioral and Brain Sciences*, *43*, Article e56. https://doi.org/10.1017/S0140525X19001742

Tooby, J., Cosmides, L., Sell, A., Lieberman, D., & Sznycer, D. (2008). Internal regulatory variables and the design of human motivation: A computational and evolutionary approach. In A. J. Elliot (Ed.), A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation* (pp. 251–271). Erlbaum.

Townsend, C., Aktipis, A., Balliet, D., & Cronk, L. (2020). Generosity among the Ik of Uganda. *Evolutionary Human Sciences*, *2*, Article e23. https://doi.org/10.1017/ehs.2020.22

Tromp, P., Kulkova, A., & Houtman, D. (2021). *Research note: Religious decline or religious change? Evidence from thirteen western-European countries (1981–2008)*.

Tsang, J.-A., Al-Kire, R. L., & Ratchford, J. L. (2021). Prosociality and religion. *Current Opinion in Psychology*, *40*, 67–72. https://doi.org/10.1016/j.copsyc.2020.08.025

Turchin, P. (2016). *Ultrasociety: How 10,000 years of war made humans the greatest cooperators on earth*. Beresta Books Chaplin.

Turchin, P., Whitehouse, H., Larson, J., Cioni, E., Reddish, J., Hoyer, D., Savage, P. E., Covey, R. A., Baines, J., Altaweel, M., Anderson, E., Bol, P., Brandl, E., Carballo, D. M., Feinman, G., Korotayev, A., Kradin, N., Levine, J. D., Nugent, S. E., … François, P. (2023). Explaining the rise of moralizing religions: A test of competing hypotheses using the Seshat databank. *Religion, Brain & Behavior*, *13*(2), 167–194. https://doi.org/10.1080/2153599X.2022.2065345

Tylor, E. B. (1871). *Primitive culture: Researches into the development of mythology, philosophy, religion, art, and custom*. J. Murray.

Valente, R. R., & Okulicz-Kozaryn, A. (2021). Religiosity and trust: Evidence from the United States. *Review of Religious Research*, *63*(3), 343–379. https://doi.org/10.1007/s13644-020-00437-8

Vangelisti, A. L., Daly, J. A., & Rudnick, J. R. (1991). Making people feel guilty in conversations. *Human Communication Research*, *18*(1), 3–39. https://doi.org/10.1111/j.1468-2958.1991.tb00527.x

Vardy, T., & Atkinson, Q. D. (2022). Moralistic and local god beliefs and the extent of prosocial preferences on Tanna Island, Vanuatu. *Religion, Brain & Behavior*, *12*(1–2), 79–96. https://doi.org/10.1080/2153599X.2021.2006290

Vlerick, M. (2020). The cultural evolution of institutional religions. *Religion, Brain & Behavior*, *10*(1), 18–34. https://doi.org/10.1080/2153599X.2018.1515105

von Hippel, W., & Trivers, R. (2011). The evolution and psychology of self-deception. *Behavioral and Brain Sciences*, *34*(1), 1–16. https://doi.org/10.1017/S0140525X10001354

Vovelle, M. (2002). *La Révolution contre l'Eglise: De la Raison à l'Etre suprême* [The revolution against the church: From reason to the supreme being]. Ohio State University Press.

Wang, Q., He, N., & Chen, X. (2018). Replicator dynamics for public goods game with resource allocation in large populations. *Applied Mathematics and Computation*, *328*, 162–170. https://doi.org/10.1016/j.amc.2018.01.045

Watanabe, E., & Ohtsubo, Y. (2012). Costly apology and self-punishment after an unintentional transgression. *Journal of Evolutionary Psychology*, *10*(3), 87–105. https://doi.org/10.1556/JEP.10.2012.3.1

Watts, J., Greenhill, S. J., Atkinson, Q. D., Currie, T. E., Bulbulia, J., & Gray, R. D. (2015). Broad supernatural punishment but not moralizing high gods precede the evolution of political complexity in Austronesia. *Proceedings of the Royal Society B: Biological Sciences*, *282*(1804), Article 20142556. https://doi.org/10.1098/rspb.2014.2556

Watts, J., Sheehan, O., Atkinson, Q. D., Bulbulia, J., & Gray, R. D. (2016). Ritual human sacrifice promoted and sustained the evolution of stratified societies. *Nature*, *532*(7598), 228–231. https://doi.org/10.1038/nature17159

Weber, M. (2013). *The protestant ethic and the spirit of capitalism*. Routledge. https://doi.org/10.4324/9781315063645

Weeden, J., Cohen, A. B., & Kenrick, D. T. (2008). Religious attendance as reproductive support. *Evolution and Human Behavior*, *29*(5), 327–334. https://doi.org/10.1016/j.evolhumbehav.2008.03.004

Weeden, J., & Kurzban, R. (2013). What predicts religiosity? A multinational analysis of reproductive and cooperative morals. *Evolution and Human Behavior*, *34*(6), 440–445. https://doi.org/10.1016/j.evolhumbehav.2013.08.006

Weeden, J., & Kurzban, R. (2016). *The hidden agenda of the political mind: How self-interest shapes our opinions and why we won't admit it*. Princeton University Press.

Welzel, C. (2013). *Freedom rising*. Cambridge University Press. https://doi.org/10.1017/CBO9781139540919

Welzel, C., & Inglehart, R. (2020). Political culture. In D. Caramani (Ed.), *Comparative Politics* (5th ed., p. 619). Oxford University Press.

Wenzel, M., & Thielmann, I. (2006). Why we punish in the name of justice: Just desert versus value restoration and the role of social identity. *Social Justice Research*, *19*(4), 450–470. https://doi.org/10.1007/s11211-006-0028-2

West, S. A., Cooper, G. A., Ghoul, M. B., & Griffin, A. S. (2021). Ten recent insights for our understanding of cooperation. *Nature Ecology & Evolution*, *5*(4), 419–430. https://doi.org/10.1038/s41559-020-01384-x

West, S. A., El Mouden, C., & Gardner, A. (2011). Sixteen common misconceptions about the evolution of cooperation in humans. *Evolution and Human Behavior*, *32*(4), 231–262. https://doi.org/10.1016/j.evolhumbehav.2010.08.001

West, S. A., Griffin, A. S., & Gardner, A. (2007). Social semantics: Altruism, cooperation, mutualism, strong reciprocity and group selection. *Journal of Evolutionary Biology*, *20*(2), 415–432. https://doi.org/10.1111/j.1420-9101.2006.01258.x

White, C. J. M., Kelly, J. M., Shariff, A. F., & Norenzayan, A. (2019). Supernatural norm enforcement: Thinking about karma and god reduces selfishness among believers. *Journal of Experimental Social Psychology*, *84*, Article 103797. https://doi.org/10.1016/j.jesp.2019.03.008

White, C. J. M., & Norenzayan, A. (2019). Belief in karma: How cultural evolution, cognition, and motivations shape belief in supernatural justice. *Advances in Experimental Social Psychology*, *60*, 1–63. https://doi.org/10.1016/bs.aesp.2019.03.001

White, C. J. M., Norenzayan, A., & Schaller, M. (2019). The content and correlates of belief in karma across cultures. *Personality and Social Psychology Bulletin*, *45*(8), 1184–1201. https://doi.org/10.1177/0146167218808502

White, C. J. M., Willard, A. K., Baimel, A., & Norenzayan, A. (2021). Cognitive Pathways to Belief in Karma and Belief in God. *Cognitive Science*, *45*(1), Article e12935. https://doi.org/10.1111/cogs.12935

Whitehouse, H. (2004). *Modes of religiosity: A cognitive theory of religious transmission*. Rowman Altamira.

Wiessner, P. (2005). Norm enforcement among the Ju/'hoansi Bushmen: A case of strong reciprocity? *Human Nature*, *16*(2), 115–145. https://doi.org/10.1007/s12110-005-1000-9

Wiessner, P. (2014). Embers of society: Firelight talk among the Ju/'hoansi Bushmen. *Proceedings of the National Academy of Sciences of the United States of America*, *111*(39), 14027–14035. https://doi.org/10.1073/pnas.1404212111

Wiessner, P., & Pupu, N. (2021). When marital institutions break down: Impact and adaptation among the Enga of Papua New Guinea. *Evolutionary Human Sciences*, *3*, Article e19. https://doi.org/10.1017/ehs.2021.13

Wiessner, P., & Tumu, A. (1998). *Historical vines: Enga networks of exchange, ritual and warfare in Papua New Guinea*. Smithsonian Inst Press.

Willard, A. K. (2018). Religion and prosocial behavior among the Indo-Fijians. *Religion, Brain & Behavior*, *8*(2), 227–242. https://doi.org/10.1080/2153599X.2016.1267032

Williams, D. (2021). Socially adaptive belief. *Mind & Language*, *36*(3), 333–354. https://doi.org/10.1111/mila.12294

Williams, K. E. G., Votruba, A. M., Neuberg, S. L., & Saks, M. J. (2019). Capital and punishment: Resource scarcity increases endorsement of the death penalty. *Evolution and Human Behavior*, *40*(1), 65–73. https://doi.org/10.1016/j.evolhumbehav.2018.08.002

Williamson, R. W. (2013). *Religion and social organization in central Polynesia*. Cambridge University Press.

Wilson, D. (2010). *Darwin's cathedral: Evolution, religion, and the nature of society*. University of Chicago Press.

Wixwat, M., & Saucier, G. (2021). Being spiritual but not religious. *Current Opinion in Psychology*, *40*, 121–125. https://doi.org/10.1016/j.copsyc.2020.09.003

Woodburn, J. (1979). Minimal politics: The political organization of the Hadza of North Tanzania. W. A. Shack, & P. S. Cohen (Eds.), *Politics in leadership: A comparative perspective* (pp. 244–266). Clarendon Press.

Wrangham, R. (2019). *The goodness paradox: The strange relationship between virtue and violence in human evolution*. Vintage.

Wright, R. (2009). *The evolution of god*. Little, Brown and Company.

Yamagishi, T. (1986). The provision of a sanctioning system as a public good. *Journal of Personality and Social Psychology*, *51*(1), 110–116. https://doi.org/10.1037/0022-3514.51.1.110

Yamagishi, T. (1988). The provision of a sanctioning system in the United States and Japan. *Social Psychology Quarterly*, *51*(3), 265–271. https://doi.org/10.2307/2786924

Yang, F., Choi, Y.-J., Misch, A., Yang, X., & Dunham, Y. (2018). In defense of the commons: Young children negatively evaluate and sanction free riders. *Psychological Science*, *29*(10), 1598–1611. https://doi.org/10.1177/0956797618779061

Yilmaz, O., & Bahçekapili, H. G. (2016). Supernatural and secular monitors promote human cooperation only if they remind of punishment. *Evolution and Human Behavior*, *37*(1), 79–84. https://doi.org/10.1016/j.evolhumbehav.2015.09.005

Yudkin, D. A., Van Bavel, J. J., & Rhodes, M. (2020). Young children police group members at personal cost. *Journal of Experimental Psychology: General*, *149*(1), 182–191. https://doi.org/10.1037/xge0000613

Zwirner, E., & Raihani, N. (2020). Neighbourhood wealth, not urbanicity, predicts prosociality towards strangers. *Proceedings of the Royal Society B: Biological Sciences*, *287*(1936), Article 20201359. https://doi.org/10.1098/rspb.2020.1359

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