Belief in Karma: How cultural evolution, cognition, and motivations shape belief in supernatural justice

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Abstract

Karma is believed to be a source of supernatural justice through which actions lead to morally-congruent outcomes, within and across lifetimes. It is a central tenet of many world religions and appears in the social evaluations expressed by religious and non-religious individuals across diverse cultural contexts. Despite its prevalence, research directly investigating belief in karma is currently underrepresented in psychological studies of religion, morality, and justice. In this chapter, we situate karma within existing theories of religious cognition and justice beliefs, while highlighting how it is related to, but distinct from, belief in moralizing gods, beliefs about justice that lack religious or supernatural connotations, and magical thinking. We first describe two prominent explanations for the cross-cultural prevalence of supernatural justice beliefs: These beliefs arise as the by-products of other, more general cognitive mechanisms, and these beliefs are supported by core motivations for sense-making, meaning maintenance, and psychological control. We then consider how questions left unresolved by these cognitive and motivational perspectives, regarding the cross-cultural variability in explicit supernatural justice beliefs, can be explained through a cultural evolutionary perspective on religious cognition. Finally, we describe how these supernatural justice beliefs affect causal judgments and elicit norm-adherence and prosociality among believers.

Keywords: Karma, Causal reasoning, Immanent justice reasoning, Justice motivation, Cultural evolution, Prosocial behavior, Moral judgments, Religion, Belief in God, Intuitive thinking

1. Introduction

How do people explain why some individuals experience good fortune—wealth, status, health, and prosocial treatment from others—whereas others experience struggles, failures, and suffering in life? Many people throughout the world believe that the cause of good and bad life experiences can be traced to a person's past good and bad actions. Good acts cause good things to happen, bad acts cause bad things to happen, and these causal connections are etched into the fabric of the universe over long timescales, even when no physical connection is discernible between actions and experiences.   This belief that "what goes around, comes around" is commonly found in many world religions. It is central to the worldview depicted by karmic religious traditions – including Hinduism, Buddhism, and their offshoots, such as Jainism and Sikhism – that together have over 1.5 billion adherents worldwide (Pew Research Center, 2015), and also appears in spiritual and New Age movements that are rapidly growing in secularized Western communities (Bender, 2010; Willard & Norenzayan, 2017). Despite the prevalence of this belief in the world's religious landscape, our knowledge about the psychology of karma is limited. This is not surprising, considering that only a fraction of the world's vast cultural diversity makes it into the psychological laboratory (Henrich, Heine, & Norenzayan, 2010), a state of affairs that persists in psychology's treatment of religion (Norenzayan, 2016).

In this article, we build on previous literatures and discuss recent findings that address this gap in psychological research about belief in karma. We begin by discussing the content and structure of belief in karma, as well as conceptual similarities and differences with other psychological phenomena, particularly belief in god and just world beliefs. Next, we describe two prominent explanations for the cross-cultural prevalence of supernatural justice beliefs: (1) supernatural beliefs arise as the by-products of other, more general cognitive mechanisms, and

(2) supernatural beliefs are supported by core motivations for sense-making, meaning

maintenance, and psychological control. We then consider how questions left unresolved by

these cognitive and motivational perspectives can be explained through a cultural evolutionary

perspective on religious cognition. This cultural evolutionary perspective integrates research on

evolved cognitive processes and motivations with research on social learning and the evolution

of culture over historical time, to explain both cross-cultural regularities as well as cultural

variation in the specific supernatural justice beliefs. Finally, we describe how these culturally-

supported supernatural justice beliefs shape causal judgments and elicit prosocial behavior

among believers.

We support our discussion with evidence drawn from past psychological research about

justice and religion, which was typically not intended to directly investigate karma beliefs, and

therefore when necessary we supplement this with evidence drawn from qualitative surveys,

anthropological investigations, and historical documentation of karmic beliefs and practices. We

also describe several recent psychological studies that adhere to the best practices of

contemporary open science, including high-powered, preregistered studies, to directly test

relevant hypotheses, highlight several intriguing findings worthy of replication, and generate

novel hypotheses that could be fruitfully tested using psychological methods.

What is belief in karma? Throughout this article, we use "karma" or "belief in karma" to

refer to the folk belief in ethical causation within and across lifetimes, that is, the expectation that

a person's moral actions affect their future experiences, with good actions increasing the

likelihood of good experiences and bad acts increasing bad experiences. Importantly, karmic

consequences operate even (and perhaps, especially) when the connection between actions and

outcomes is causally opaque: Fair outcomes are not only received at the hands of other people

who are aware of one's past moral actions; instead, experiences are attributable to past moral action even in the absence of mundane physical causes, biological causes, second- or third-party punishment, and direct- or indirect-reciprocity. Karma is also believed to operate across infinitely-long timescales, including endless cycles of reincarnation. This means that karmic justice for past actions can be used to explain (a) how a person is treated by others, (b) experiences that are not intentionally caused by human actions, including illness, accidents, and natural disasters, and (c) a person's status, wealth, and health at birth.

This conceptualization of karma is distinct from, but overlaps substantially with, the prototypical features of karma as a religious doctrine that originated in Indic religious traditions (e.g., Hinduism, Buddhism, and Jainism, Bronkhorst, 2011; Obeyesekere, 2002), while also capturing lay theories about karmic attributions that are documented in ethnographic studies in India and other Asian populations. Breaches of ethical codes of conduct—including harmful, uncooperative, and dishonest behavior; lack of loyalty to one's community; impure and disgusting actions; and failure to fulfil role-related responsibilities—are believed to lead to suffering in the form of pain, illness, psychological disorders, and social disharmony (Bhangaokar & Kapadia, 2009; Shweder, Much, Mahapatra, & Park, 1997). Karma is especially salient as a cause of illness, as documented in several qualitative studies of health-related behavior in Asian cultural contexts: Karma has been used to explain why some individuals get cancer and others do not, among Taiwanese, Chinese, and Thai cancer sufferers (Liamputtong & Suwankhong, 2016; Tang, Mayer, Chou, & Hsiao, 2016; Yeo et al., 2005); in Indonesian mothers' explanations for children diagnosed with autism (Riany et al., 2016); in Vietnamese monks' and nuns' explanations for people suffering with mental illness (Nguyen, Yamada, & Dinh, 2012); in Vietnamese lay-people's explanation for HIV/AIDS following from drug use

(Thi Ho & Maher, 2008); and among Thai mothers who have passed HIV on to their children (Kubotani & Engstrom, 2005; Liamputtong, Haritavorn, & Kiatying-Angsulee, 2012; Ross, Sawatphanit, & Suwansujarid, 2007).

To measure belief in karma as conceptualized above, we recently developed the Belief in Karma Questionnaire (White, Norenzayan, & Schaller, in press). We find that this belief—combining elements of morality, causality, and reincarnation—reflects a meaningful and coherent individual difference with good reliability and validity. We found that, as expected, scores were higher among adherents to religious traditions that contain explicit karmic doctrines (e.g., Hindus, Buddhists), and lower (though not at floor) among Christians and non-religious Westerners. However, belief in karma is not reducible to affiliation with Hinduism and Buddhism, anymore than belief in God is reducible to affiliation with Christianity, Islam, Hinduism, or other theistic traditions. Below, we report evidence of karmic beliefs from a variety of samples, drawn from different religious contexts and cultures with different cultural exposure to explicit notions of karma. We also discuss how karma is conceptually and empirically distinct from (1) belief in god, an alternative source of supernaturally-enforced justice, and (2) perceptions of justice that lack obvious supernatural connotations, such as the expectation of interpersonal reciprocity, trust in secular legal justice, or generalized belief in immanent or distributive justice.

2. Karma, Supernatural Causation, and Beliefs about Justice and Fairness

In this section, we outline the conceptual distinctions between karma and related concepts, and discuss empirical evidence that belief in karma is associated with, but not reducible to, these concepts. Throughout this chapter, we discuss karma alongside existing research regarding belief in god and regarding non-supernatural justice beliefs, to highlight that

all three of these beliefs share conceptual and psychological similarities. These psychological

similarities imply that these beliefs (1) may be influenced by similar evolutionary processes, (2)

may be rooted in similar cognitive mechanisms, and (3) may have similar outcomes for

believers' judgments and behaviors. Given the lack of existing research directly examining belief

in karma, research regarding god beliefs and justice beliefs also provides a good starting point

for testable hypotheses about the psychology of karma. However, each of these concepts has its

own unique elements and distinct cultural histories, implying that belief in karma, god, and

justice can sometimes exert divergent effects among believers.

2.1. Karma in Relation to Fate, God, and Witchcraft

Around the world, people believe in a multitude of supernatural causes for misfortune

(Shweder et al., 1997; Legare & Gelman, 2008). In many cultures, karma exists alongside belief

in fate, gods, evil spirits, witchcraft, and/or the evil eye as possible explanations for life

experiences. These causal explanations are not mutually exclusive; the same individual may

accept a variety of supernatural and biological causal frameworks, and may even apply them

simultaneously to explain a single event (e.g., witchcraft or bad karma make a person vulnerable

to diseases transmitted through germs, Dundes, 1992; Hiebert, 1983; Legare, Evans, Rosengren,

& Harris, 2012; Legare & Gelman, 2008; Nguyen & Rosengren, 2004; Raman & Gelman, 2004;

Raman & Winer, 2002; Shweder et al., 1997; Young et al., 2011). However, karma possesses

unique elements that are worth distinguishing from other supernatural beliefs.

Belief in fate, like karma, involves the expectation that certain life experiences are

"meant to be" and happen for pre-determined reasons (Norenzayan & Lee, 2010). However, fate

is not necessarily due to a person's past moral behavior. Fate might be determined by

astrological configurations at the time of one's birth, the will of the gods, and other non-moral

considerations, whereas karma locates the source of current experiences specifically in past moral actions (Daniel, 1983).

        In many religious traditions, gods, like karma, are concerned with human morality and may actively intervene in people's lives to reward and punish morally relevant actions (Norenzayan, 2013). The gods, and perhaps Karma too, are seen as ultimate enforcers of an unseen moral order that is deeply ingrained into the fabric of the universe. As a result, believers often turn to these supernatural agents and forces to make sense of good fortune and, counter-intuitively, suffering, especially when human agency cannot explain these experiences (such as when natural disasters strike, Grey & Wegner, 2010). However, the gods are believed to possess many features not obviously present in karma. Gods exist independently of human beings and possess independent agency, desires, and motivations. Also, believers mentally represent gods as independent agents with anthropomorphic minds (Barrett & Keil, 1996; Heiphetz, Lane, Waytz, & Young, 2016; Purzycki, 2013; Shtulman & Lindeman, 2016), and believers engage in personal relationships with gods much as they would with other humans (e.g., viewing god as an attachment figure, Davis, Moriarty, & Mauch, 2013; Granqvist, Mikulincer, & Shaver, 2010). On the other hand, karma is often depicted as an impersonal force or law, merely describing the causal connections between morally-relevant actions and events (Bronkhorst, 2011; Daniel, 1983; Wadley, 1983). It is a matter of debate as to whether any of these agentic features apply to belief in karma, an issue that we take up below.

        For example, Hindus often claim to believe in karma and a pantheon of agentic gods, but although visual depictions of Hindu gods with human-like bodies are common, karma is not depicted as an anthropomorphic entity. Hindu devotees have personal relationships with their gods, which they express through emotional attachment, gestures of respect, and sacrificial

offerings; but believers do not have any comparable devotional relationship with karma.

Attributing misfortune to gods, rather than karma, is also associated with different behavioral

scripts for remedying the situation (Nuckolls, 1991, 1992). Believers can pray to the gods and

bargain with them to obtain desired outcomes, whereas the negative effects of karma are more

likely to be mitigated through divination, penitential actions, or prescribed rituals for

accumulating karmic merit (Aktor, 2012; Fuller, 2004; Young, Morris, Burrus, Krishnan, &

Regmi, 2011). A substantial psychological literature has documented the causes and

consequences of belief in agentic gods, but it is an open question how well these findings apply

to belief in impersonal karmic causality.

Belief in witchcraft and magical causality, like karma, also posits unseen causal

connections between actions and conceptually-similar experiences. However, witchcraft often

entails a variety of considerations and mediating factors that are absent in karmic causality.

Witchcraft is initiated and mediated by special rituals, magical objects, and the intercession of

supernatural agents that do the witch's bidding (Singh, 2018a; Sørensen, 2007). Karmically-

caused experiences can be concisely explained by past (im)moral behavior without additional

mediating forces. Even when rituals are used to elicit karmic consequences, they seem to follow

different principles than those of sympathetic magic: Sympathetic magic follows principles of

contagion, such as dose insensitivity (Nemeroff & Rozin, 2000), whereas karma is often

construed as an exchangeable quantity, where the amount of merit accumulated is proportionate

to the deed performed (Cadge, 2005; Sherrill, 2000). Karmic causality is also focused on

explaining how one person's actions impact themselves in the future, whereas witchcraft

explains how one person can affect another: A cross-culturally-prevalent idea is that other

people's jealousy and malice cause illness and misfortune, through witchcraft and the evil eye

(Dundes, 1992; Singh, 2018a), which leads to fear of other people's jealousy and general distrust in society (Gershman, 2015, 2016). Witchcraft reflects how one person's actions affect another through magical causality and need not depend on moral behavior, whereas karma is primarily about one's own moral actions and experiences.

2.2. Karma, Justice, and Fairness

Karma is also conceptually similar to a variety of justice beliefs (e.g., a preference for interpersonal fairness, belief in a just world, immanent justice attributions) that have traditionally been studied in social psychology without overt supernatural connotations or linking them to obvious religious concepts. The belief that people should treat one another fairly—being kind, honest, and cooperative to those who help oneself; avoiding or punishing those who commit moral transgressions; and generally distributing benefits to those who deserve it—is implicated in many social judgments. Giving fair rewards to those who deserve it is a preference expressed by young children (Kanngiesser & Warneken, 2012; McAuliffe, Blake, Steinbeis, & Warneken, 2017; McAuliffe, Jordan, & Warneken, 2015; Meristo & Surian, 2014; Surian & Franchin, 2017) and is a moral virtue endorsed by adults from diverse cultural contexts (Baumard, André, & Sperber, 2013; Graham et al., 2013; Purzycki et al., 2018; Vauclair, Wilson, & Fischer, 2014). Similarly, immoral behavior is viewed as deserving of punishments proportionate to the offence (Carlsmith & Darley, 2008), ensuring that, in the long run, good people have good experiences and bad people have bad experiences.

Human agents can enforce justice when they can monitor moral/immoral behavior and are willing and able to respond with appropriate rewards/punishments. But human abilities are limited: Good people as well as bad people can be cheated and harmed by others' selfish actions; immoral behavior can go unpunished when human justice cannot identify, locate, or punish the

transgressor; and many phenomena that cause suffering cannot be controlled by human actions, including natural disasters, accidents, illnesses, and one's social status at birth. Despite this, psychologists have documented many patterns of judgment that reflect an expectation of justice more generally, outside of the constraints of human causal power. Many people expect justice as a general principle of the universe, and they are motivated to defend this worldview when it is threatened (Hafer & Bègue, 2005; Lerner, 1980). This expectation of justice has been documented in Asian cultural contexts where people explicitly endorse karmic causality (e.g., Murayama & Miura, 2016; Young et al., 2011). But karma-like causal attributions have also been widely studied among Westerners who do not obviously evoke supernatural or religious concepts when making justice judgments, and who would likely deny explicit belief in karma if asked (White et al., in press).

For example, many people make dispositional inferences based on people's experiences, reporting that current good and bad fortune is due to past actions, or reflects a person's moral character, even when these past actions and character traits are not specified or unknown to the perceiver (Gilbert, 1998; Lerner, 1980). Additionally, North American participants are often willing to make immanent justice attributions, such as admitting that an uncontrollable misfortune is caused by a salient past moral transgressions, while strongly rejecting that misfortune is caused by morally-irrelevant past actions (Callan, Ellard, & Nicol, 2006; Callan, Sutton, & Dovale, 2010; Young et al., 2011). Even people who explicitly deny immanent justice attributions show evidence of intuitive reactions consistent with fairness principles. Reaction time studies indicate that French participants, who explicitly rejected causal attributions for misfortune, still showed evidence of immanent justice intuitions that required effortful suppressions: Participants were slower to reject causal attributions when misfortune followed

proportionate bad deeds, and quicker to reject causal attributions when misfortune followed good

actions and when misfortune was disproportionate to misdeeds (Baumard & Chevallier, 2012),

an intriguing finding that is worth replicating in larger and more culturally-diverse samples.

Similar expectations appear among North Americans when making predictions about the

future: People who engage in immoral behavior are expected to have a greater likelihood of bad

experiences in the future, at the hands of other people (e.g., being betrayed by a friend, being

treated rudely by other people) and forces of nature (e.g., getting a serious illness, having their

home damaged by a natural disaster, White, Schaller, & Norenzayan, 2019). Even when not

explicitly endorsed, this expectation has been found in North American children and adults who

are more likely to engage in prosocial behavior when they want to improve success in unrelated

future situations, a strategy known as "karmic bargaining" (Banerjee & Bloom, 2017; Converse,

Risen, & Carter, 2012)

In Western samples, karmic bargaining is especially prevalent when belief in a just world

is combined with uncertainty about the future. Converse et al. (2012) found greater prosocial

behavior among American students and adult online samples after they wrote about a personally-

relevant ongoing situation that they wanted to turn out well (e.g., important test, job interview, or

medical procedure), compared to participants who wrote about their daily routine. This effect

was replicated in the context of a job fair, where job-seekers donated more money to charity

when they were reminded about the uncertainty of their employment opportunities, compared to

when they felt secure in their prospects. Subsequently, those who donated money felt more

optimistic about their future.

Banerjee and Bloom (2017) also found karmic bargaining among American 4- to 6-year-

old children. Children accepted that giving stickers away to another child would help them to

win a dice rolling game, and they were more willing to engage in this strategy when they felt

more uncertain about their chances. They rejected the efficacy of throwing out the stickers (an

alternative personally-costly but non-prosocial strategy). There is also some evidence that belief

in a just world may encourage greater prosociality in general, because through prosocial actions

a person can ensure good future outcomes. Among Canadian undergraduates, belief in a just

world was found to be negatively associated with several antisocial personality traits, including

delinquency, Machiavellianism, dishonesty, and a tendency to use unjust means to pursue goals

(Hafer, 2000).

Therefore, patterns of social judgment and prosocial behavior suggest that immanent

justice attributions (analogous to the concept of karma) may result from intuitions that are

prevalent in many populations, regardless of exposure to particular karmic religious doctrines.

However, the intuitive perception of an association between salient immoral behavior and salient

misfortune does not necessarily translate into a general, explicit belief in moral causality. In

contrast, belief in karma reflects a meaningful individual difference that persists across

situations, in the absence of the obvious antecedents to misfortune and obvious consequences for

immorality that are required to evoke perceptions of immanent justice (i.e., it exists as an explicit

belief with high test-retest reliability, White et al., in press). Although belief in a just world and

immanent justice attributions have occasionally been referred to as "magical thinking" by

researchers (e.g., Callan, Sutton, Harvey, & Dawtry, 2014; Lerner, 1980), existing research on

justice beliefs are not currently well-integrated into existing theories of supernatural cognition

and magical thinking. In the next section, we discuss how several existing theories of religious

cognition offer insight into the causes and consequences of belief in karma, belief in god, and

more generalized beliefs in a just world.

These theories tend to come in three different forms: First, cognitive by-product accounts locate the origin of supernatural beliefs in evolved, cross-culturally recurrent cognitive tendencies that are not themselves specialized for supernatural beliefs. Second, motivational accounts propose that supernatural beliefs are adopted and maintained because they satisfy believers' motivations for meaning-making, structure, and personal control over life events. Finally, the cultural evolutionary perspective integrates research on evolved cognitive processes and motivations with research on cultural learning and the evolution of culture over historical time, to explain both cross-cultural regularities as well as variability in specific beliefs. Each of these theoretical perspectives offers unique predictions about the psychology of supernatural justice beliefs, and we discuss research about karma, god, and belief in a Just World as important domains in which to test the generalizability of these hypotheses.

3. Cognitive Accounts of Belief in Karma and Related Forms of Supernatural Justice

3.1. Dual Processes and Cognitive By-Products

In explaining the cross-cultural prevalence of supernatural justice beliefs, a good place to start is the basic cognitive processes that make such beliefs intuitively compelling, making them a good fit to the way human minds work. A central argument in recent research on the cognitive science of religion is that supernatural beliefs have their foundations in evolved cognitive tendencies that, though not specifically adapted for religious cognitions, facilitate the adoption of supernatural beliefs. These tendencies are hypothesized to be intuitive cognitive processes that possibly have innate components and are reliably developing across disparate cultural contexts.

For example, the widespread tendency to believe in supernatural agents (e.g., gods and ghosts, who possess anthropomorphic mental states and are believed to have personal relationships with believers) may reflect socio-cognitive abilities that evolved to guide social

interactions among human agents, such as the automatic tendency to perceive agency in spontaneous, self-directed movements (Atran, 2002; Barrett, 2004), see faces in the clouds and hear voices in the wind (Guthrie, 1993), and infer mental states, goals, and intentions guiding otherwise-unpredictable behavior (Waytz, Morewedge, et al., 2010). In another case, the belief that nature was intentionally created by an anthropomorphic god may easily fall out of the human proclivity to reason about the intentional design behind observable phenomena, although this "teleological stance" initially evolved as a way to reason about human-made artifacts (Kelemen, 2004) and folk biology (Atran, 1995). Similarly, the belief that minds exist independently of bodies and continue to survive after death (a core tenet of many religious systems) may be a by-product of the mind-body dualism that naturally results from two distinct cognitive systems: psychological (which guides our expectations about spontaneous, goal directed motion driven by unseen mental processes) and physical (which guides expectations about mechanistic processes and how physical bodies respond to pressure from outside forces). Intuitive psychology and intuitive physics generate different expectations about behavior, rely on somewhat distinct neural processes, and show different developmental trajectories, and the difficulty in reconciling these intuitions when thinking about social agents may facilitate the belief that minds do not rely on, and can exist independently of, physical bodies (Bloom, 2005; Jack, 2013). In each of these cases, intuitive cognitive processes that evolved to help humans navigate their natural and social environments facilitate mental representations of supernatural beliefs, thereby making these supernatural beliefs intuitive and compelling.

This cognitive approach to religious beliefs makes several predictions about what recurrent forms these supernatural beliefs take, and what features of human thinking are most likely to support these beliefs. If supernatural beliefs rely on intuitive cognitive tendencies that

are shared by people around the world, this implies, first, that supernatural concepts that fit with these intuitions are likely to be prevalent around the world, and, second, that individual differences in supernatural belief can be predicted by individual differences in habitual reliance on these intuitive thinking strategies. Consistent with the first prediction, dualism, teleological thinking, and belief in anthropomorphic spirits and gods tend to be widespread around the world (Atran & Norenzayan, 2004; Purzycki, 2013). There is also growing evidence for the second prediction: In high powered samples as well as in meta-analytic studies, there is a reliable, though small, positive correlation between intuitive thinking and stronger belief in god, whereas those who tend to override their intuitions (for example, as indexed by the cognitive reflection task, Frederick, 2005) are less likely to believe in god (Baimel, 2018; Gervais et al., 2018; Pennycook, Ross, Koehler, & Fugelsang, 2016). This effect holds after controlling for a variety of covariates of religious belief, and, in one notable cross-national study, the effect was shown to interact with cultural exposure to religion, such that it reliably emerged in countries with moderate to high religiosity levels, but disappeared in highly secularized countries (where low average levels of belief may leave little room for analytical thinking to exert an effect, Gervais et al., 2018). In contrast, the experimental evidence that analytic thinking reduces religious belief (e.g., Gervais & Norenzayan, 2012, Study 2) has failed to replicate (see Camerer et al., 2018; Sanchez, Sundermeier, Gray, & Calin-Jageman, 2017), and further research is needed to establish the causal processes through which intuitive thinking might shape supernatural beliefs (as well as to evaluate alternative non-causal hypotheses).

        More specific cognitive tendencies theorized to underly supernatural beliefs have also been found to predict individual differences in belief, across a variety of cultural contexts. For example, individuals who struggle to understand human minds (i.e., low levels of theory of

mind) are less likely to believe in and have a personal relationship with God, in samples drawn from religious populations (e.g., Norenzayan et al., 2012; Baimel, 2018; but see Van Leeuwen & van Elk, 2018 for an alternative account). This link between mentalizing and belief in a personal god has been replicated in a high-powered preregistered study in both Christian and Hindu samples (Baimel, 2018), but has not been found in high-powered preregistered samples with very low religiosity levels (Maij et al., 2017). Moreover, mind-body dualism and teleological thinking also predict stronger belief in gods, as well as other paranormal beliefs (Willard & Cingl, 2017; Willard & Norenzayan, 2013; Willard, Cingl, & Norenzayan, in press).

Karma is an interesting test case for the generalizability of these hypotheses, as it also includes key elements that can plausibly be traced to broad cognitive tendencies underlying supernatural beliefs. Like engaging in teleological thinking, karma posits an intentional purpose for life events, as caused by past actions; mind-body dualism allows for the expectation that karmic consequences manifest after reincarnation in future lifetimes, when minds are reincarnated in new bodies; karma might be conceived of as an external agent, watching and remembering people's actions, thereby engaging believers' mentalizing abilities to think about karma (White, 2017). Another plausible intuitive foundation for belief in karma is the tendency to rely on simple cognitive heuristics, such that an experience is viewed as causally-connected to an action due to conceptual similarities that bring both easily to mind (i.e., an availability heuristic, Allen, Edwards, & McCullough, 2015; Tversky & Kahneman, 1974).

Existing evidence from samples in Canada ($n = 1000$), the USA ($n = 417$), and India ($n = 1325$), depicted in Figure 1a, confirms that belief in karma is positively correlated with trust in intuitions (USA: $r = .31$, 95% CI [.22, .39]; India: $r = .29$ [.23, .33], Canada: $r = .27$ [.21, .33], White et al., in press). Additionally, beliefs in a variety of supernatural entities – despite

apparent dissimilarities – tend to be positively intercorrelated, consistent with the cognitive

hypothesis that a variety of supernatural beliefs share similar underlying cognitive tendencies

and thereby make the same individuals inclined to believe in (or doubt) the existence of different

supernatural entities. For instance, belief in karma is higher among people who express stronger

belief in god (Figure 1b, Canada: $r = .30$ [.24, .35], USA: $r = .33$ [.24, .41]; India: $r = .34$ [.29,

.39]) and belief in witchcraft (Figure 1c, USA: $r = .56$ [.49, .62]; India: $r = .54$ [.46, .62]).

Karma may also reflect a preference for interpersonal justice, which is over-generalized

to the universe more broadly. In support of this, belief in karma is associated with belief in a just

world (Figure 1d, Canada: $r = .17$, 95% CI [.11, .23], USA: $r = .17$ [.08, .26]; India: $r = .38$ [.32,

.42]), the expectation of interpersonal punishment for misdeeds (Figure 1e, Canada: $r = .17$ [.11,

.23], India: $r = .22$ [.16, .28]), and the likelihood of making immanent justice attributions (Figure

1f, USA: $r = .49$ [.42, .56], India: $r = .30$ [.20, .40]). Importantly, these associations are only

moderate in size, supporting the view that belief in karma is not identical to more generalized

expectations of justice. But the associations are also robust across diverse cultural contexts,

implying that intuitions about justice provide one predictor of whether an individual accepts or

denies the principles of karmic causality.

[Insert Figure 1 here]

3.2. Mental Models of God and Karma

How do believers mentally represent supernatural entities such as god and karma? And

how do these mental representations shape how supernatural beliefs affect a variety of

behaviors? In the case of belief in god, a key distinction is whether god is viewed as a person-

like being or an abstract force (Johnson et al., 2018). This distinction has important

psychological consequences. For example, it has been found that mentalizing tendencies

specifically predict belief in a personal god (rather than belief in a distant, abstract god or

religious ritual participation per se, Baimel, 2018; Norenzayan et al., 2012). Also, more person-

like or anthropomorphic conceptions of god, rather than abstract conceptions, are stronger

predictors of harsh judgments of moral violations (Atkinson & Bourrat, 2011; Morewedge &

Clear, 2008), perhaps due to the increased ease of attributing moral concern to social agents with

minds than to non-agentic, abstract forces.

     Although god is believed to possess many superhuman qualities, believers who think

about a personal god recruit the same mentalizing abilities and social expectations that are

employed when thinking about human agents (Barrett & Keil, 1996; Heiphetz, Lane, Waytz, &

Young, 2016; Purzycki, 2013; Shtulman & Lindeman, 2016). For instance, just as people are

aware that they live in a human community with shared norms, social surveillance of behavior,

and social sanctions for norm violations (Chudek & Henrich, 2011), believers similarly think

about god as social agent that is watching, is interested in social and moral behavior, and will

punish behavior that violates norms (Purzycki et al., 2012). Therefore, norm compliance when

thinking about god is motivated by the same considerations as norm compliance elicited by

human monitoring and social sanctions for norm violations (Baumard et al., 2013; Fehr,

Fischbacher, & Gächter, 2002; Fehr & Gachter, 2002), the key difference being that perceived

supernatural surveillance has psychological repercussions even (and especially) in situations

where human surveillance is absent (Bering & Johnson, 2005; Johnson & Bering, 2006;

Norenzayan et al., 2016).

What about mental representations of belief in karma? Four theoretical possibilities present themselves. (1) *Personified karma:* It is thought of as a social agent similar to a personal god and recruits the same social expectations and concern for third-party monitoring that occurs when thinking about gods; (2) *Karma as a feature of actions*: It may be mentally represented as an inherent feature of human actions and character traits; (3) K*arma as a resource*: It be can accumulated, tabulated, and exchanged for certain experiences; (4) *Karma as an abstract principle:* It is thought of as a descriptive law or principle (perhaps like gravity) based on ideas of proportionality without positing supernatural agency as the mediating causal force.

In the *personified karma* mental model, karma is thought of as an agentic being with human-like features, such as memory, emotional states such as anger and compassion, and moral concern. In samples of Canadian students and non-student adults and Indian adults (White, 2017), many people who believe in karma were willing to endorse agentic descriptions of karma (e.g., "karma can remember things", "karma is forgiving"), although other participants rejected these agentic descriptions. Similarly-agentic descriptions of god, including attributions of mental states and benevolent personality traits, were endorsed at even higher rates, indicating that there was more consensus about god's agency and less consensus about whether karma is agentic. But there was a strong correlation between how participants described god and described karma, and explicit belief predicted more agentic descriptions of both targets, implying that similar expectations about social agents may be used to describe both god and karma, at least by some individuals some of the time.

In the *karma as a feature of actions* mental model, thinking about karma may rely on expectations about moral character (Goodwin, Piazza, & Rozin, 2014; Uhlmann, Pizarro, & Diermeier, 2015) and the tendency to make dispositional inferences from observed behavior and

then use these dispositions to make predictions about the future (i.e., the fundamental attribution error or correspondence bias in social judgment, Gilbert & Malone, 1995; Krull et al., 1999). Instead of viewing karma as a supernatural agent that watches people's actions and then causes them to have experiences commensurate to those actions, the causal mechanism of karma may be entirely inherent to a person's mental states and dispositions: Actions have congruent consequences because actions reflect (or create) underlying characteristics (personality traits, dispositions, virtues, and vices) that are stable across time and cause people to have future experiences that are congruent with those traits. For example, a single instance of honesty reflects (or engenders) a generally honest disposition, which other people perceive and respond to by being honest and trustworthy themselves, whereas a single instance of cheating reflects dishonest tendencies, which other people respond to by lying and cheating them in return. Dispositional judgments could even be used to explain misfortunes that are not received at the hands of other people, such as when a bad deed leads to illness because a person feels guilty (Carlisle, 2008; Raman & Gelman, 2004) or when immoral people are viewed as incompetent and therefore more likely to experience accidents or mishaps that smarter (i.e., more virtuous) people would have avoided (Khamitov, Rotman, & Piazza, 2016; Stellar & Willer, 2018; White & Schaller, 2018).

This conception of karmic causality—as operating across time due to the dispositions created by one's actions—is present in several schools of Buddhist philosophy (Allen et al., 2015, although existing alongside the contrasting belief that there is no stable, unchanging self, Nichols, Strohminger, Rai, & Garfield, 2018, a potential contradiction that may be worth investigating in future research). This provides one plausible way in which mental representations rely on more general tendencies of social cognition, without requiring that karma

be an autonomous supernatural agent. Instead of evoking reputational concerns due to the third-party monitoring by supernatural agents (as evoked when thinking about god, Johnson, 2015; Johnson & Bering, 2006), thinking about karma may instead emphasize the importance of being a moral person, independently of social surveillance. Just as external social surveillance can encourage norm adherence, the personal importance placed on moral character has similarly been found to predict the likelihood of prosociality (Hertz & Krettenauer, 2016). Viewing karma through the psychological processes of dispositional inference would also explain the focus on moral action (rather than morally-irrelevant action) and intentions (rather than actions per se) when thinking about karmic causality, given that moral character is especially central to person perception and intentional action is especially diagnostic of dispositions (Allen et al., 2015; Goodwin et al., 2014).

In the *karma as resource* mental model, it is conceived of as a process of exchange, through which actions produce merit, which can be accumulated, retained, and then spent through one's experiences. In this case, actions are not diagnostic of broader personality traits, but rather provide incremental costs and benefits to a person's karmic account, wherein bad actions can be compensated for through future prosocial actions, and suffering can be interpreted as a beneficial experience that makes up for past misdeeds and thereby mitigates the likelihood of future misfortune. The different expectations that follow from personified vs. resource-based representations of karma may be analogous to the expectations that follow from particular types of interpersonal relationships: believers may interact with supernatural agents according to principles of communal sharing (love, devotion, and care for dependents) or authority ranking (respect for hierarchy and the commands of authority figures, Fiske, 1992; Rai & Fiske, 2011), but non-agentic conceptions of karma may instead evoke the principles of equality matching

(relying on the principle of reciprocity) or market pricing relationships (exchange based on some kind of currency), and thereby lead to different expectations among believers. Viewing karma as a resource may also lead karmic consequences to be perceived as especially likely for giving-related moral behavior: Active generosity, charitable giving, volunteering, and helping others at a cost to oneself may be the most obvious way to accumulate karmic merit, whereas cheating and stealing what is not yours may be seen as the most likely source of misfortune.

A final possibility is that believers think about the karmic consequences for their actions in terms of *law-like cause-and-effect principles* that follow expectations about interpersonal fairness and reciprocity (e.g., similarity and proportionality between actions and outcomes, Baumard & Boyer, 2013; Baumard & Chevallier, 2012), without there being any supernatural agent, personal disposition, or magical substance that mediates this process. Instead of actions resulting in outcomes because they are pleasing or displeasing to a morally-concerned god, or reflective of an actor's stable character traits, actions can be thought of as part of a direct if-then causal chain.

Future research could investigate which of these accounts best describes how people think about karma, and whether different cultural groups, individuals, or situations tend to encourage particular representations of karmic causality. These alternatives are not mutually exclusive. A believer may switch between different mental representations based on what is afforded by a particular situation. For instance, when typically-good people suffer misfortune, the spontaneous, unexpected nature of the situation may encourage believers to think about karma as a social agent (like a god or human agent who can spontaneously elicit motion without external forces), whereas when misfortune follows directly after immoral action, the salient causality may lead believers to conceive of karma as a similarly law-like cause-and-effect

principle. Analogously, a resource-based or character-based metric for karma may be more helpful when believers think about the *karmic consequences* of actions, whereas karma as an agent or law-like causality may be more useful for understanding the *karmic causes* of experiences.

Each of these mental models also implies different predictions about *who* is more likely to believe in karma, and what the implication of karmic attributions might be. For example, the tendency to engage in mentalizing and make dispositional attributions may predict more agentic descriptions or virtue-based conceptions of karma, but be unrelated to the tendency to believe in karma as a resource that implements, maintains, and restores justice. Construing karma in a particular way may further influence subsequent inferences, such as if an observed bad deed is viewed as (a) potentially forgivable when karma is conceived of as a social agent, (b) not forgivable and indicative of immoral character traits when karma is conceived of as a disposition, or (c) non-forgivable and undiagnostic of traits, but able to be compensated through proportionate good deeds, if karmic merit acts as a type of resource to be exchanged. Mental representations of karma therefore provide an interesting test case for how cognitive processes might shape how believers make inferences and predictions about supernatural entities.

4. Motivational Accounts of Belief in Karma and Related Forms of Supernatural Justice

A second theoretical approach for the prevalence of supernatural justice beliefs, across individuals and cultures, is that these beliefs satisfy fundamental human motivations to see the world as comprehensible, orderly, controllable, and meaningful (Laurin & Kay, 2017; Park, Edmondson, & Hale-Smith, 2013; Vail et al., 2010). Supernatural justice beliefs provide a reliable and comprehensible structure to life events, thereby reducing uncertainty and providing a sense of control, which reduces anxiety and encourages the pursuit of long-term goals. This

perspective has received extensive attention in social psychology centered on just-world beliefs (Callan, Sutton, et al., 2014; Hafer & Rubel, 2015). Here, we outline briefly how this perspective would account for karmic beliefs.

Belief in a powerful, controlling god or karmically-enforced moral causality provides a mental framework that both explains events and allows believers to predict future occurrences, thus recommending a strategy for current behavior that will ensure future success in life. Belief in unseen supernatural forces is a particularly potent way to satisfy this motivation to see the world as just, because it explains situations not easily attributable to more mundane causal frameworks and allows believers to feel in control of otherwise uncontrollable future events. This motivational account has been proposed as an explanation for ritualized actions (Hobson, Schroeder, Risen, Xygalatas, & Inzlicht, 2018), some aspects of magical thinking (Ofori, Tod, & Lavallee, 2017; Rudski & Edwards, 2007), belief in witchcraft (Singh, 2018a), belief in a powerful god (Laurin & Kay, 2017), and belief in a just world (Hafer & Rubel, 2015). The exact causal mechanism and recommended behavioral strategy differs in each case, but each provides a way to explain the present and control future circumstances. For instance, experiences construed through principles of sympathetic magic may recommend acquiring lucky objects or performing rituals that attract a desired future goal; powerful gods can help and offer salvation to believers who love and are devoted to them; and prosocial behavior and hard work ensure future success in a just world.

Motivational accounts generally propose that people need to feel a sense of control and meaning in their lives, and that people can adopt supernatural beliefs and attributions as a way to maintain psychological well-being when these motivations are threatened. This compensatory mechanism leads to the (seemingly counter-intuitive) prediction that experiences of misfortune,

and other situations that elicit uncertainty and undermine personal control, are especially likely

to increase supernatural beliefs, and that these beliefs subsequently improve psychological well-

being by increasing feelings of confidence, control, and restore optimism about the future. For

example, mortality salience manipulations have been found to induce a loss of meaning and

compensatory behavior like increased religiosity in Westerners (Vail et al., 2010), and among

Taiwanese students, mortality salience similarly increased belief in karma (Yen, 2013). Across

the United States, states with higher prevalence of suffering (such as infant mortality and

poverty) tend to be more religious (Gray & Wegner, 2010). Exposure to uncontrollable natural

disasters such as earthquakes has been found to increase religiosity in large cross-national

samples (even after many controls for alternative explanations, Bentzen, 2018). In one

remarkable study that compared religiosity before and after an earthquake, religiosity spiked in

New Zealand but only among those citizens who were directly affected by the devastating 2011

Christchurch earthquake (Sibley & Bulbulia, 2012). Rather than undermining confidence in a

loving god, increased commitment to religious beliefs allows people to better cope with suffering

and adversity in their lives.

In a more targeted study, survivors of the 2004 Sri Lankan tsunami who experienced

worse health also expressed stronger belief in karma, but karma was not associated with a

pessimistic explanatory style or PTSD (Levy, Slade, & Ranasinghe, 2009). In qualitative

interviews with Asian samples, karma is often invoked as a cause of illness, and these

attributions have been found to predict greater self-reported well-being (Kubotani & Engstrom,

2005; Liamputtong et al., 2012; Liamputtong & Suwankhong, 2016; Ross et al., 2007; Suchday,

Santoro, Ramanayake, Lewin, & Almeida, 2018; Wu & Liu, 2014). This association between

the experience of suffering and greater religious belief is consistent with the motivational

account that religious beliefs are strengthened by experiences of misfortune (and therefore

correlated with external indicators of suffering), and that these beliefs mitigate the negative

psychological consequences of bad experiences by restoring a sense of control and certainty.

Alternatively, this robust association can also be explained as the result of mind perception in

dyadic morality, such that the experience of anomalous harm to a human patient leads people to

attribute their experiences to god, the ultimate moral agent (Gray & Wegner, 2010).

In addition to coping with uncertainty induced by current experiences, supernatural

beliefs also recommend behavioral strategies that allow control over future circumstances (e.g.,

do good now to obtain good outcomes later), and these proactive behaviors have been found to

increase optimism about future successes. For example, among Americans, feeling uncertain

about future job opportunities elicited greater prosocial behavior than did feelings of control over

future prospects (Converse et al., 2012), and children who felt more uncertain about their ability

to win a game were similarly more likely to engage in prosocial actions (Banerjee & Bloom,

2017). In both cases, engaging in prosocial behavior increased subsequent optimism about

future circumstances. Similarly, among Thai adults, observance of the Five Precepts (guidelines

for ethical behavior in Buddhism) was positively associated with happiness (Ariyabuddhiphongs

& Jaiwong, 2010), and Thai sex workers who sent more money home to their families (an action

expected to generate karmic merit) were happier and more optimistic about their future

(Ariyabuddhiphongs & Li, 2016).

In this motivational framework, supernatural beliefs provide reassurance that personally-

costly current behavior will have valued pay-offs in the long term, implying that these beliefs are

especially likely to be endorsed and defended by individuals focused on long-term goal pursuit

(Callan, Harvey, Dawtry, & Sutton, 2013; Callan, Harvey, & Sutton, 2014; Hafer, 2000;

Khenfer, Roux, Tafani, & Laurin, 2017; Landau, Khenfer, Keefer, Swanson, & Kay, 2018).

Preliminary evidence suggests that reminders of karma also increase long-term orientation

among Indians (Kopalle, Lehmann, & Farley, 2010). Therefore, belief in a controlling god,

belief in karma, and a generalized belief in a Just World may all reflect ways of explaining and

predicting experiences in a manner that satisfies motivations to reduce uncertainty, imposes

structure on the world, enhances feelings of control and optimism about the future, and

encourages the pursuit of long-term goals.

Future research on the motivational underpinnings of supernatural beliefs should

investigate the psychological similarities and tease apart the differences among these constructs.

For example, we know little about how belief in rebirth – a hallmark of karma that is absent in

the other beliefs, alters the motivational calculus. Another important question is whether the

different mental models of karma have different implications as to how karmic beliefs are

harnessed to manage uncertainty and other existential concerns.

5. Limitations of the Cognitive and Motivational Accounts

Cognitive by-product and motivational accounts of supernatural beliefs can help explain

(1) the cross-cultural and historical recurrence of cognitive templates for belief in supernatural

agency, justice, and purpose in life, (2) individual differences in the strength of supernatural

beliefs, partly arising from individual differences in various cognitive biases and motivations,

and (3) effects in specific situations that elicit motivations for psychological control,

predictability, and immortality. However, cognitive by-product and motivational theories are not

equipped to explain the considerable variability of beliefs that exist across religious traditions,

cultures, and historical time. As we elaborate below, the cognitive perspective is only partially

successful in explaining why, for some people but not others, supernatural agents are perceived

to be real and relevant to daily life. Moreover, the cognitive perspective cannot explain heterogeneity in the content and specific features of supernatural entities.

Supernatural beliefs are more culturally-stable when they fit with existing intuitions, as cognitive theories have proposed; however, intuitions do not always result in explicitly-held supernatural beliefs. In the case of beliefs about god, for example, the tendency to think about human minds is an important precursor to thinking about god's mind, but this does not mean that perceiving human minds (or agency detection) inevitably results in the belief that gods exist and deserve our devotion (Andersen, 2017; Gervais, Willard, Norenzayan, & Henrich, 2011; van Leeuwen & van Elk, 2018; Willard & Cingl, 2017). The spontaneous feeling of an unseen presence may reflect an intuitive tendency to detect agency from environmental cues, but perceiving agency is not the same thing as perceiving god, and the ability to infer agency cannot explain the specific beliefs about gods that are held by believers. For instance, the same perception of agency may be interpreted by one person as the presence of a loving god, by another as the presence of a threatening ghost, and by another as a cognitive illusion, and current cognitive and motivational perspectives provide little insight into why these interpretations differ across individuals or situations.

Similarly, immanent justice attributions—which typically arise when moral violations and a transgressor's misfortune are salient—may reflect an intuitive preference for congruence between actions and outcomes, and an intuitive tendency to perceive causal connections between conceptually-similar occurrences. However, this intuition does not necessarily result in the explicit acceptance of such causality as a general principle that guides events in the world. In fact, studies that provide evidence of immanent justice intuitions have found that even under experimental conditions where immanent justice intuitions are strongest, acceptance of causal

connections is still, on average, below scale midpoint (Callan et al., 2006, 2010) or entirely

denied by participants and evident only in reaction times (Baumard & Chevallier, 2012). In

addition, even situations that elicit immanent justice intuitions in many people may, upon

reflection, result in a variety of interpretations: Where one person sees the hand of a wrathful

god, another may see karmic payback in an impersonal universe, and another may merely

perceive a poetic coincidence.

Intuitions may encourage, and to some extent constrain, particular supernatural beliefs,

but explicit beliefs do not follow from intuitions without additional factors. Nor can intuitions

fully explain the exact form that an individual's explicit judgments will take. Many different

supernatural beliefs fit equally well with human cognition, and may be equally successful at

fulfilling fundamental human motivations for control and predictability, but most people are only

committed to a subset of all possible supernatural beliefs (Gervais et al., 2011; Norenzayan et al.,

2016). For instance, most people understand and can mentally represent the concepts of "karma"

and "god," but only a subset of these people are actually concerned about karma or god in their

everyday lives. Put another way, there is a key psychological difference between mentally

representing supernatural entities and being committed to them in daily life. Exclusively

cognitive theories of supernatural beliefs do not easily account for this distinction. Moreover,

believers are selectively committed to some supernatural agents and forces but not others. Those

who are devoted to one particular god (e.g., the God of Christianity) do not seem to be compelled

to worship culturally-distant gods (e.g., Shiva of Hinduism), despite the latter's cognitive

plausibility. Similarly, the same god with the same cognitive features can be the subject of

intense devotion in one historical period, but seen as largely fictional in another – known as the

"Zeus Problem" in the cognitive science of religion (Gervais, Willard, et al., 2011).

Motivational accounts, as important as they are in explaining a wide range of observations about the form and prevalence of supernatural beliefs, similarly fall short of a complete account. The need to maintain psychological control when life is harsh, short, and unpredictable partly explains why, for example, conditions of existential insecurity are associated with a greater importance of religion in society (Kay, Gaucher, Napier, Callan, & Laurin, 2008; Norris & Inglehart, 2004) and why mortality salience increases religious commitment that offers meaning and immortality (Vail et al., 2010). Moreover, the motivational perspective helps explain why ideas of a controlling god are prevalent when threats to psychological control are salient to individuals or widespread in a society (Kay et al., 2008; Laurin & Kay, 2017). However, there remains substantial cross-cultural variability in the types and strength of supernatural beliefs that people hold, even after accounting for these cognitive and motivational factors.

Cognitive and motivational accounts are also silent about the anthropological record showing that there is considerable cross-cultural variability in the extent to which supernatural forces are concerned with human morality, and why, across cultures, this intertwining of the supernatural and the moral is correlated with greater societal complexity, greater ecological duress, increased prevalence of agriculture, and the expansion of cooperation (Botero et al., 2014; Norenzayan, 2013; Norenzayan et al., 2016; Purzycki et al., 2016, 2017; Purzycki & Sosis, 2011; Watts et al., 2015) – a non-arbitrary pattern of cross-cultural variation that we address in more detail below. Although there have been attempts to accommodate these observations in an exclusively cognitive perspective—such as seeing moralizing religions as the cognitive reflections of evolved moral intuitions such as proportionality and fairness, or as cultural by-products of increased material security (Baumard & Boyer, 2013; Baumard, Hyafil, Morris, &

Boyer, 2015)—these attempts fall short. In one large cross-cultural study, material security levels did not predict commitment to moralizing gods (Purzycki et al., 2018). Moreover, neither the cognitive nor motivational perspective easily explains why commitment to moralizing deities and forces such as karma increases prosociality towards distant coreligionists (Purzycki et al., 2016; White, Kelly, Shariff, & Norenzayan, 2019; for debates on these questions and alternative accounts, see Norenzayan et al., 2016, commentaries and response; see also Watts et al., 2015; Baumard & Boyer, 2013; Johnson, 2015).

These considerations point to the conclusion that cognitive and motivational accounts are important, and possibly necessary, but not sufficient for a comprehensive theoretical framework that explains the prevalence, forms, and variability in religious beliefs across cultures. Additional processes that could address this gap can be found in the human capacity for cultural learning, a hallmark of human psychology that is deep-rooted in our species' evolutionary trajectory.

6. Cultural Evolutionary Accounts of Belief in Karma and Related Forms of Supernatural Justice

The cultural evolutionary perspective to religion provides a synthetic explanation for the selective distribution and stability of supernatural beliefs around the world. Its strength lies in integrating research on cognitive processes and motivations with the cultural transmission of faith and cultural change over historical time and across populations (Atran & Henrich, 2010; Norenzayan et al., 2016). This perspective is rooted in the idea that, as a cultural species with a dual-inheritance system combining genetic and cultural pathways, cultural learning fundamentally shapes human thoughts and behavior and, in the process, facilitates the transmission of group-specific cumulative traditions (Henrich, 2015; Richerson & Boyd, 2005; Richerson & Christiansen, 2013).

Applied to the distribution of religious beliefs, this perspective holds that a substantial amount of variance in (1) which supernatural concepts are most likely to spread, and (2) the extent to which people are committed to these concepts in everyday life, can be explained by core cultural learning processes that are species-wide adaptations (Richerson & Boyd, 2005). Three key mechanisms that facilitate selective cultural learning are *conformist transmission* (adopting the beliefs of the majority), *prestige-based transmission* (adopting the beliefs of cultural models perceived to be skilled or of high status), and *credibility-enhancing displays* or CREDs (adopting the beliefs of cultural models who show evidence of sincere commitment to their advertised beliefs).

This cultural transmission process is itself the result of a novel evolutionary pathway that is separate from the more evolutionary-ancient genetic transmission pathway. Through cultural transmission, belief-behavior packages that are fitness-relevant to individuals and social groups are more likely to be adopted, retained, and spread throughout populations (e.g., Henrich, 2017; Richerson & Christiansen, 2013). Below, we elaborate on how this theoretical perspective offers a framework to explain the particular distribution and prevalence of supernatural justice beliefs around the world. We begin by describing evidence for the cultural transmission of supernatural justice beliefs, including how cultural factors influence whether intuitions develop into explicit beliefs about god or karma, how social factors shape believers' application of these concepts to everyday life, and the implications of these culturally-supported beliefs for causal judgments. We then review the consequences of these supernatural justice beliefs for prosocial behavior in economic games and discuss the implications of this evidence for the cultural evolutionary theories of religion.

6.1. Cultural learning and Psychological Commitment to Supernatural Beliefs

There is substantial evidence that cultural learning is a strong predictor of which supernatural concepts people hold and how committed they are to these beliefs (Gervais et al., 2010). This cultural learning depends on both the amount of social exposure to particular concepts, and whether this social information is accompanied by cues indicating genuine commitment (Henrich, 2015; Richerson & Boyd, 2005). Of particular importance to the transmission of religious beliefs, people tend to adopt the beliefs and behavior of people around them, especially when culturally-transmitted concepts are accompanied by *credibility enhancing displays* (CREDs, Henrich, 2009). Donating time and resources and, in extreme cases, costly sacrifice and martyrdom, are behaviors that reliably transmit sincerely held beliefs, because CREDs signal that a cultural model walks the walk, not just talks the talk. Because actions speak louder than words, beliefs that are backed up by CREDs are more likely to spread. For example, when Christian saints welcomed and even sought martyrdom, it triggered epidemics of Christian conversion in the early Roman Empire (Stark, 1997). This in turn explains why passionate displays of religious fervor are widespread in groups where supernatural beliefs are fused with group commitment through conversions, high fertility rates, and social solidarity.

In an experimental demonstration of the impact of CREDs, Willard, Henrich, and Norenzayan (2016) asked participants to read a series of news stories that were either true or fake, and bet money on which stories were true. Participants played with a confederate who either verbally stated that particular stories were true (i.e., a cultural source of information, but not a CRED) or themselves bet money on the stories (i.e., a credible signal of belief). Although the confederate's verbal endorsement had little effect on participants' bets, participants were much more likely to bet money on stories that the confederate had bet on.

Religious traditions similarly include credible signals of commitment to the community's beliefs and values, and these CREDs encourage the cultural transmission of religious beliefs (Gervais, Willard, et al., 2011; Henrich, 2009; Lanman & Buhrmester, 2016). Religious activities can involve substantial expenditures of time and energy, when attending services, participating in rituals, donating time and resources, and refraining from proscribed dietary, sexual, and other behaviors that would otherwise benefit oneself.

Cultural exposure to religious commitment, especially during childhood, is one of the best predictors of individual and cross-national variation in belief in god. In one study drawing on cross-national data from the World Values Survey, being raised religiously, combined with living in a country where a majority of the older population attends religious services weekly, increased the odds of believing in god from 60% to 99% (Gervais & Najle, 2015). Among Americans, childhood exposure to caregivers who engage in behavioral signals of religious commitment (e.g., religious charity work, personal sacrifices to religion) strongly predicted belief in god, even when controlling for their caregiver's verbal expression of religious commitment (Lanman & Buhrmester, 2016). Exposure to religious CREDs can also explain substantial variance in cross-national differences in religious beliefs, such as between the USA and the Netherlands (Maij et al., 2017) or between Slovakia and the Czech Republic, which are otherwise culturally and geographically similar (Willard & Cingl, 2017).

Religious practices can similarly provide credible displays of belief in karma, and cultural exposure to karma beliefs is a strong predictor of an individual's endorsement of karmic causality. Religious stories, folktales, and films popular among Hindus and Buddhists often depict the karmic consequences for one's actions or describe the sequence of an individuals' past reincarnations that led to current circumstances (Chapple, 2017; Wright, 2014), providing

narrative evidence of karmic causality. Along with this verbal transmission, religious rituals that

are intended to provide karmic benefits provide credible evidence of karmic beliefs. Many

religious rituals and festivities prescribe personally-costly prosocial behavior (e.g., giving food to

monks) or substantial time commitments (e.g., going on religious pilgrimages) that are believed

to erase the karmic repercussion of past misdeeds (Shinohara, 2012; Toffin, 2012) or to earn

merit that ensures future success (Aulino, 2016; Cadge, 2005).

  Individual-level psychological data also show that cultural exposure to other people's

beliefs about karma is a strong predictor of one's own belief (White et al., in press). Indians and

Americans who reported greater social exposure to beliefs about karma (in religious services, in

the beliefs of family members, and in the actions of other people) were more likely to express

belief in karmic causality, compared to participants from the same country with less cultural

exposure. Belief in karmic causality at the individual level also exhibits substantial cross-

cultural variability that tracks dominant cultural traditions. Consistent with this, we found that

belief in karma was substantially higher in India ($M = 3.69$, $SD = 0.72$, on a 5-point scale) than

in Canada ($M = 2.71$, $SD = 0.82$) or the USA ($M = 2.74$, $SD = 0.89$), which can partially be

explained by religious affiliations of these samples: Indians were primarily (78%) Hindu,

whereas North American populations largely identify as Christian or non-religious (>85%).

Levels of belief in karma predictably vary across these religious traditions. Interestingly,

however, the prevalence of karmic beliefs in one's national culture (above and beyond one's

religious affiliation) uniquely predicts belief: Hindus, Sikhs, Christians, and Muslims in India

report significantly stronger belief in karma than members of these same religions in Canada. In

fact, the average level of belief in karma was significantly higher in India than Canada even after

controlling for indicators of religiosity (including affiliation, religiosity, spirituality, and belief in

god), indicators of other justice beliefs (e.g., belief in a just world for oneself, Lipkus, Dalbert, & Siegler, 1996), and other participant demographics (e.g., age, gender, education). Therefore, cultural exposure to karma is an important predictor of individual differences in belief in karma, just as cultural exposure to beliefs about god is an important predictor of god beliefs.

6.2. Explicit Beliefs and Causal Attributions

Cultural learning supports beliefs about supernatural forces. In turn, these culturally-supported beliefs inform how people make causal attributions in specific situations. Explicit belief in supernatural forces is not *required* for someone to feel that their experiences were "meant to be" or that a bad person deserved their misfortune; such intuitive reactions are arguably present even among nonbelievers who deny the existence of any supernatural forces (Banerjee & Bloom, 2014; Heywood & Bering, 2014). But explicit belief in supernatural forces has been found to substantially increase the likelihood of making causal judgments consistent with these beliefs. The perception that life events were fated to occur is more common among individuals who explicitly believe in supernatural forces that ensure such causal connections (e.g., god, Banerjee & Bloom, 2014; Heywood & Bering, 2014; Norenzayan & Lee, 2010). Immanent justice attributions are likewise more common among more religious individuals (Harvey & Callan, 2014; Kaplan, 2012; Maes, 1998; Pichon & Saroglou, 2009).

Explicit belief in karma is also a good predictor of whether people make causal judgments consistent with karmic causality. In one study of moral judgment (White et al., in press), Indian participants were on average more likely than American participants to report that bad experiences, uncaused by human forces, are the result of past antisocial actions, and, within each culture, individual differences in belief in karma were a strong predictor of these causal attributions, even after controlling for belief in god and generalized belief in a just world (which

were not themselves significant predictors). In another study, Americans' ratings of a target's

moral character predicted expectations about the future, with more immoral character traits

predicting a greater likelihood of future bad social experiences (e.g., "be treated rudely by other

people") and non-social experiences (e.g., "get injured in a car accident"), but this association

between moral character and the likelihood of future negative experiences was stronger among

participants who explicitly endorsed karmic causality (White, Schaller, et al., 2019). These

findings indicate that core intuitions about perceiving life events as purposeful and determined

by past moral behavior are moderated by explicit beliefs in supernatural causality, which vary

predictably across cultures.

6.3. Cultural Learning and Causal Attributions

In addition to supporting and sustaining belief in supernatural forces, cultural learning

may also play a role in the application of these beliefs to specific situations that might not

otherwise elicit supernatural attributions. Although this hypothesis has not yet been tested

through empirical psychological methods, anthropological studies suggest that shared narratives

may play an important role in confirming that particular situations are due to supernatural causes,

even in communities that accept supernatural causality as a general principle. In Indian

communities, Shweder et al. (1997) found that attributions of life events to karmic causes are

confirmed by local gossip and shared narratives. Among Thai Buddhists, Carlisle (2008)

similarly documented a culturally-shared script that is used to determine whether an experience

is attributable to karma, such as requiring a metaphorical connection and proportionality between

actions and events (e.g., piercing the eyes of crabs and developing a pain in your own eye).

Carlisle's informants also reported that the experience of punishment, shame, and guilt for past

misdeeds (actively encouraged in strict child-rearing practices) can strengthen the internalization

of general beliefs about karma, thereby fostering shared supernatural beliefs among community

members.

In these settings, people share an understanding of the general principles of karmic

causality, which are applied to specific life events as people discuss their experiences with one

another and seek consensus about causal explanations, thereby validating one's own "karmic"

experiences and reinforcing cultural consensus about general karmic principles.   In addition to

informal conversation, people may also actively seek advice from spiritual specialists, such as

shamans and astrologers, who are believed to be capable of determining the causes of misfortune

(e.g., illness), the likelihood of future success and misfortune, and confirming the particular

manifestation of karmic principles within a person's life (Babb, 1983; Shweder et al., 1997;

Young et al., 2011). Such practices may reflect deference to these prestigious individuals as a

further source of cultural information about supernatural attributions (see Singh, 2018b, for

further discussion of the cultural evolution of these spiritual specialists).

Through this social process, people who believe in karma as a general principle receive

validation that karma is operating in particular circumstances (perhaps especially circumstances

that elicit intuitive perceptions of immanent justice or purpose in life), and these personal

experiences may further reinforce the explicit belief in general karmic principles. A similar

process may occur for beliefs about god and god's intervention in human affairs, in cultural

contexts that support god, but not karma, as the relevant cause (Luhrmann, 2018; Van Leeuwen

& van Elk, 2018), or in situations that elicit intuitions about supernatural agency, rather than

karmic justice (Nuckolls, 1992). Further empirical research would shed light on the

psychological processes underlying this social validation of supernatural attributions.

6.4. The Cultural Specificity of Supernatural Justice Beliefs

In addition to encouraging the inference that negative life experiences are meant to be and the deserved retribution for past behavior, as opposed to interpreting misfortune as a coincidence or chance occurrence, cultural learning encourages belief in specific supernatural forces with specific features, which leads to attributions consistent with these specific beliefs. Cultural learning encourages certain beliefs while inhibiting others, thereby tailoring a person's cognitive repertoire to a particular culturally-sanctioned set of beliefs. For example, Christian doctrine promotes belief in an anthropomorphic god and allows the existence of certain other supernatural agents (e.g., demons, saints, and ghosts), but most forms of Christianity deny the broad anthropomorphism of nature and blanket acceptance of any and all supernatural forces. Subsequently, commitment to Christianity has been found to increase anthropomorphic attributions to god while inhibiting alternative supernatural attributions.

Living in more religious areas in the USA (Willard & Norenzayan, 2013) or having a deeper personal relationship with the Christian god (Baimel, 2018) is associated with a *decreased* tendency to promiscuously anthropomorphize non-human entities, such as saying that a car has free will or that the wind has intentions (Waytz, Cacioppo, & Epley, 2010). Additionally, life events that are perceived to happen for a reason lead Christians to make causal attributions that refer to God, whereas non-Christians (e.g., Hindus, the non-religious) tend to appeal to a broader set of supernatural explanations that do not necessarily include God (e.g., fate, luck, or karma, Weeks & Lupfer, 2000; Young et al., 2011). This pattern also appears to increase with age, reflecting increased adherence to culturally-supported causal models: Difficult to explain events (e.g., spontaneously recovering from an illness) were attributed to supernatural causes more often by adults than by 8- or 10-year-olds, and the specific type of

supernatural attribution depended on religious exposure, with religious children making more god attributions and non-religious children making other supernatural attributions (e.g., moral justice) or non-supernatural attributions (Woolley, Cornelius, & Lacy, 2011).

Commitment to a secular worldview or Christian worldview can also inhibit belief in karma, both by reducing exposure to ideas about karma and by encouraging commitment to alternative causal models that are directly incompatible with karmic causality. Karma typically refers to non-obvious causal connections between otherwise unrelated events, but secular worldviews often reject non-physical forms of causality. Compatible with this view, we have found that Canadians and Americans who identify as atheists scored lower on belief in karma than participants from any other religious group, including agnostics and the non-religious, demonstrating atheists' strong commitment to a non-supernatural worldview (White et al., in press). In general—across Canadian, American, and Indian samples—endorsement of karmic causality is stronger for items that do not refer to reincarnation (e.g., "When people are met with misfortune, they have brought it upon themselves by previous behavior in their life") than for items that reference past and future lifetimes (e.g., "If a person does something bad, even if there are no immediate consequences, they will be punished for it in a future life"), compatible with the developmental evidence that non-supernatural causality tends to be adopted more readily than explicitly-supernatural causal forces.

The concept of karma also traditionally entails causal connections across multiple lifetimes in a cycle of reincarnation, in contrast with Christian cosmologies that depict a single lifetime followed by an eternal afterlife. This suggests that exposure to Christianity could reduce acceptance of supernatural causality that plays out across multiple lifetimes. For instance, Hui, Chan, and Chan (1989) found that Chinese children who attended Protestant or Catholic schools

were less likely to endorse traditionally Buddhist and Taoist views of the afterlife, and more

likely to endorse traditionally Christian concepts. Similarly, among our adult samples, belief in

karma was weaker among Canadian Christians who reported being more religious ($r = -.08$, $p =$

.044) or attending more religious services ($r = -.22$, $p < .001$), but stronger among more religious

Hindus (r's $= .42$ and $.29$, p's $< .001$, White, Norenzayan, et al., 2018). Figure 2 provides a

summary of how religiosity differentially predicts belief in karma and belief in god across

different religious groups. These results are consistent with the perspective that cultural

exposure to particular supernatural beliefs encourages culture-specific causal frameworks while

inhibiting others.

[Insert Figure 2 here]

Additional evidence shows how these specific supernatural beliefs elicit particular

judgments not made under alternative causal models. A given situation (e.g., hearing about a

thief who gets a serious illness) may elicit attributions to god among god believers, karma among

karmic believers, and even vague, intuitive perceptions of causal connection among non-

believers. Which attribution is made can have important implications for how an individual

construes and reacts to this experience.

If someone believes that god is the causal mechanism controlling the course of life

events, this implies that life events are more likely to be viewed as fated to occur, rather than due

to chance (Norenzayan & Lee, 2010). Additionally, believers' anthropomorphic mental

representations of god (Heiphetz et al., 2016) imply that believers likewise view fate as more

anthropomorphic, fair, kind, and instructive, rather than impersonal (Banerjee & Bloom, 2014).

In contrast, if someone believes in karma as the causal mechanism, then karma's operation across multiple reincarnations implies that life events can be attributed to a past behavior even if past actions are unknown (in contrast to immanent justice intuitions, which are primarily evoked by salient past moral actions) or when experiences are due to status at birth (in contrast to Christian cosmologies that lack previous lifetimes). For example, Young et al. (2011) found that when making causal attributions for a harmful accident (being hit by a car while walking), karmic attributions were made more reliably by Hindus than Christians. Christians and Hindus were equally likely to report that the victim's misfortune was brought on by their past misdeeds when these misdeeds were specified by the researchers (consistent with traditional immanent justice effects found among Westerners, Callan, Sutton, Harvey, & Dawtry, 2014). However, when past misdeeds were not specified, Hindus still reported that misfortune was caused by past misdeeds, whereas Christians rejected this causal attribution.

Karmic causality across reincarnations provides a way to rationalize outcomes that depend on an individual's circumstances at birth, which cannot be justified through attributions to past actions in their current lifetime.   For example, karma can be used to justify caste-based inequality that is prevalent in India, as deserved rewards and punishments for actions in past lives. Consistent with this view, Cotterill, Sidanius, Bhardwaj, and Kumar (2014) found that belief in karma was stronger among individuals who were especially motivated to maintain this inequality (i.e., Indians high in right-wing authoritarianism and social dominance orientation). Subsequently, belief in karma predicted less willingness to help lower-caste members, even after controlling for prejudice towards these groups (although see Jogdand, Khan, & Mishra, 2016, for an alternative perspective on caste-based prejudices).

Therefore, although the intuitive perception that actions have morally-congruent outcomes may arise regardless of belief in supernatural forces or a cycle of reincarnation, explicit belief in karmic causality across lifetimes encourages causal attributions across an even broader range of situations. Explicit beliefs in alternative sources of supernatural justice (e.g., the Christian God) might constrain these attributions or shape them to be consistent with anthropomorphic god concepts, whereas strong commitment to a secular worldview may inhibit the perception of causal connections between moral actions and (mis)fortune in life.

6.5. Developmental Trajectories

Cross-cultural developmental trends in explanations for illness also support the important role of culture in shaping the use of supernatural causal frameworks.   Adults and children from many cultures are more likely to explain illness through biological causes than non-biological causes, such as witchcraft, the intervention of god, or karma-like punishment for past misdeeds. However, when non-biological explanations are endorsed, it is more often among adults than children (Legare & Gelman, 2008; Raman & Winer, 2002; Shweder et al., 1997). Adults are more likely than children to accept non-biological, but nonetheless culturally-appropriate, explanations for illness (Legare et al., 2012). For example, South African adults were more likely than children to accept that "bewitchment" by a jealous neighbor can cause AIDS (Legare & Gelman, 2008).   Moral justifications for misfortune (analogous to karmic attributions) have also been found more frequently among North American adults than children (Raman & Winer, 2004), and more among children in India than the USA (Raman & Gelman, 2004). This cultural difference was found to increase with age, with the highest endorsement of moral causality being among Indian college students. This developmental pattern is consistent with the hypothesis that cultural learning increases the prevalence of explicit beliefs about supernatural causality, which

encourage the application of specific causal explanations that are less common in non-supportive

cultural contexts. This is an important finding because other supernatural intuitions (e.g., mind-

body dualism, Chudek, McNamara, Birch, Bloom, & Henrich, 2018) do not show such

developmental trends, but rather emerge early in development and persist into adulthood.

We recently attempted to detect evidence that karmic intuitions were also early-emerging

in development, by investigating whether 14-month-old infants react differently when misfortune

(getting stuck under a falling tree) happens to a previously-helpful vs. previously-unhelpful

character (White, Woo, Norenzayan, & Hamlin, 2019). Past evidence has shown that infants

prefer helpful over unhelpful characters (Hamlin, Wynn, & Bloom, 2007), and that 8-month-old

infants preferred characters who hindered a previously-unhelpful character (Hamlin, Wynn,

Bloom, & Mahajan, 2011), showing some understanding of interpersonal justice at a very young

age. However, we found no evidence that infants looked longer or expressed different emotions

when observing helpers or hinderers who experienced misfortune. This null result may be due to

methodological issues with the particular stimuli used (a possibility worth testing in future

research), but it might also reflect further evidence that karma beliefs are more than simply the

manifestation of reliably-emerging intuitions about fairness.

7. How Supernatural Beliefs and Morality Converged in Cultural Evolution

Belief in morally-concerned gods is one of the central features of the culturally-

successful Abrahamic religions and one important aspect of religiously-motivated prosociality

(for reviews of this "Big Gods" theory, see Norenzayan, 2013; Norenzayan et al., 2016; see also

Atran & Henrich, 2010). In this section, we explain how this cultural evolutionary approach,

which has previously been applied to belief in moralizing gods, can also be fruitfully applied to

belief in karma and related supernatural justice beliefs.

The anthropological record shows that the spirits and deities of the smallest-scale societies have limited powers and circumscribed concerns about human morality (Norenzayan et al., 2016). Yet, in countries around the world with religious majorities, most people think that belief in god is necessary to be a moral person (Pew Research Center, 2014). Even in highly secular countries, moral violations are implicitly viewed as representative of atheists (Gervais et al., 2017), atheists are less likely to be voted for as a presidential candidate in the USA (Newport, 2015) and are distrusted more than members of various other religions (e.g., Muslims, Jews) and other stigmatized groups (e.g., homosexuals), at levels comparable to the distrust of rapists (Gervais, Shariff, & Norenzayan, 2011). Moreover, most people in the world today are affiliated with religions centered on belief in morally-concerned deities (e.g., Islam and Christianity, 55% of the world's population) or karmic causality (e.g., Hinduism and Buddhism, 22%, Pew Research Center, 2015), and, in world-wide surveys, religiosity predicts harsher judgments of a variety of moral transgressions (Atkinson & Bourrat, 2011). Moralizing supernatural forces and agents are now a widespread feature of human cultures, despite their rarity in small-scale societies or during most of our species' evolutionary history (Norenzayan, 2013).

According to the cultural evolutionary perspective, the prevalence of moralized supernatural beliefs is partly rooted in cognitive and motivational tendencies, but this prevalence is also importantly determined by the cultural selection of these beliefs over historical time periods. Cultural evolution can select for beliefs and practices that reduce selfishness and encourage cooperation, foster group solidarity, and subsequently enable increased societal complexity and differential success in cooperative ventures and intergroup conflict (Norenzayan et al., 2016; for alternative formulations of this argument that propose supernatural punishment

beliefs are rooted in genetic, rather than cultural, evolution, see Bering, 2012; Johnson, 2015; see

Schloss & Murray, 2011, for discussion). Although many different values, norms, beliefs, and

worldviews could expand cooperation and group solidarity—including secular institutions,

markets, interpersonal monitoring, and humanistic values (Kay et al., 2008; Norris & Inglehart,

2004)—religious beliefs and practices provide one historically-prevalent means to foster social

coordination.

Bringing insights from the cognitive science of religion and cultural evolution together, the

picture that emerges is a process of coevolution between societal size and complexity on the one

hand, and devotional practices to moralizing gods on the other. The hypothesis is that in the

crucible of escalating intergroup competition and conflict through historical time, these features

outcompeted rival cultural variants of morally-indifferent deities with limited omniscience and

limited powers to intervene in human affairs. As a result, moralizing gods, supported by

extravagant loyalty displays and intensely prosocial rituals and practices, culturally spread along

with expanding, cooperative groups, culminating in what we now call "world religions"

(Norenzayan, 2013). These religions thus forged anonymous strangers into imagined moral

communities glued together with sacred bonds and overseen by supernatural monitoring

(Graham & Haidt, 2010).

This perspective has been fruitfully applied to the beliefs and practices of the Abrahamic

world religions, but there has been far less investigation of world religions like Hinduism and

Buddhism, or their offshoots such as Jainism and Sikhism. We argue that the gradual

intertwining of the supernatural and the moral, which shaped Abrahamic traditions over time, has

similarly shaped these karmic traditions, but through a somewhat different pathway. Whereas in

Abrahamic traditions this process unfolded as God became increasingly interventionist and

moralizing (as well as unitary and singular), in the karmic traditions, it happened through beliefs about rebirth or reincarnation—a central feature of the karmic traditions that is wholly absent in the Abrahamic ones. The notion of rebirth—present in many small-scale societies, historical and contemporary—is not necessarily connected to morality, being instead often determined by where or how people die, is based on reincarnation within one's kin group, and is often dependent on the proper performance of funerary rites (Obeyesekere, 2002). Gradually, however, cultural evolution amalgamated the idea of rebirth and the idea of ethical causation across lifetimes, setting the stage for supernatural justice and morality without direct intervention by God or the gods.

Several lines of research support the above hypotheses regarding the Abrahamic faiths. Archaeological and historical evidence supports the hypothesis that moralizing gods and extravagant rituals and related practices coevolved with large, complex human societies (Norenzayan et al., 2016). Consistent with this, there is a robust association between the prevalence of moralizing gods in the ethnographic record and societal size and complexity (e.g., Roes & Raymond, 2003). In cross-cultural studies that capture a significant portion of the world's religious diversity and variation in social scale, commitment to such moralizing gods, and particularly belief in their punishing capacities, is associated with less self-interested behavior and more prosocial behavior towards co-religionist strangers (Lang et al., in press; Purzycki et al., 2016). Evidence from Austronesian societies also indicates that supernatural punishment beliefs preceded increases in societal complexity, rather than merely following increases in societal complexity that had occurred for other reasons (Watts et al., 2015). Further evidence regarding the influence of moralizing gods on prosocial behavior comes from experimental research in contemporary settings (Shariff et al., 2016). However, we know much

less about whether reminders of karma have similar effects. We begin by reviewing the evidence

that experimental reminders of a moralizing god and reminders of karma can both encourage

prosocial behavior, and we then describe several boundary conditions for this effect in light of

cultural evolutionary accounts of supernatural justice beliefs, while addressing alternative

psychological explanations.

7.1. Reminders of God and Karma Increase Prosocial Behavior

A key prediction of cultural evolutionary accounts is that supernatural justice concepts

can, at least under certain circumstances, elicit prosocial behavior in situations that would

ordinarily result in selfishness. The past decade has generated substantial research on religious

priming and prosociality, using implicit, explicit, and contextual priming of religious concepts to

elicit prosocial behavior. A recent meta-analysis of over 11000 participants from 93 studies

(Shariff, Willard, Andersen, & Norenzayan, 2016) found an average religious priming effect on

prosocial behavior that was consistent with evidentiary value in p-curves and robust to at least

one technique that corrected for publication bias. However, the reliability and boundary

conditions of religious priming effects are still matters of ongoing debate (for the limitations of

meta-analyses, see van Elk et al., 2015, and for failed replications, see Billingsley, Gomes, &

McCullough, 2018, Gomes & McCullough, 2015).

This religious priming research has traditionally relied on methodologies that prime

general religious concepts (e.g., conducting a study outside of a church, exposing participants to

religious words) rather than priming specific supernatural justice concepts, and has primarily

focused on belief in a moralizing god rather than studying a broader range of supernatural

beliefs. Moreover, the theoretical framework elaborated above generates several additional

hypotheses that have been previously overlooked, including that (1) prosocial behavior will be

encouraged by a variety of supernatural justice concepts, including god and karma, that share a concern with human morality despite different cultural histories; (2) supernatural justice concepts will exert their effects when baseline selfishness is high, but effects will diminish when other motivations are present that reduce selfishness; and (3) moralizing religious concepts will increase prosocial behavior for those who sincerely believe that moralizing supernatural entities are real and involved in one's life, but will have little effect among non-believers.

To test whether thinking about karma increases prosocial behavior, we recently conducted a series of pre-registered, high-powered experimental tests of how thinking about karma affects giving in the dictator game, among samples of American Hindus, Buddhists, and Christian or non-religious individuals (White, Kelly, et al., 2019). For the sake of comparison, we also tested whether thinking about god encouraged prosociality in the same experimental paradigm. Our manipulation explicitly asked participants to think about karma (or god) while making their anonymous dictator game decisions, thereby directly framing the task in the context of participants' supernatural beliefs. This supernatural framing method departed from traditional implicit priming paradigms, which are widely-used in religious priming research (due to reduced concern with experimental demand effects when using implicit manipulations) but which prove less reliable than explicit primes in high-powered replication attempts (Billingsley et al., 2018). Implicit primes also preclude manipulating a specific concept (e.g., "God"), but instead prime a disparate collection of religion-related words. In another significant departure from religious priming experiments, we manipulated supernatural concepts within-subjects, by having participants allocate money in several trials, both before and after being asked to "think about karma" or "think about god" while making their decisions. This within-subjects paradigm increased statistical power and also allowed us to test whether participants' baseline generosity

moderated the supernatural framing effect—something previously hypothesized but not tested in past between-subjects paradigms (Shariff & Norenzayan, 2015).

Results, displayed in Figure 3, replicated past findings that thinking about god increased giving in the dictator game, and also confirmed that thinking about karma similarly increased giving. Importantly, thinking about karma increased generosity across several religiously-diverse American samples of karma believers, including (1) primarily-White Christians and non-religious believers, (2) Hindus, who primarily came from ethnically-Asian and religiously-Hindu families, and (3) Buddhists, who included both Asian Buddhists from Buddhist families and converts to Buddhism who came from White, Christian, and non-religious families. Despite learning about karma from disparate sources—familial cultural sources in the case of Hindus and Asian Buddhists, religious teachings in the case of Hindus and Buddhists, and idiosyncratic cultural sources for non-religious White Americans—thinking about karma led to similarly-sized increases in generosity among all participants who claimed to believe in karma. This result was also robust when controlling for hypothesis guessing and familiarity with the dictator game, and a replication in a between-subjects design found similarly-sized effects, confirming that our results were not simply driven by acquiescence to experimental demands.

[Insert Figure 3 here]

The experimental evidence therefore confirms that thinking about supernatural justice beliefs (including god and karma) encourages prosocial behavior in believers. This does not mean that, in general, non-believers are less prosocial than religious believers; indeed, when not

thinking about religious concepts, believers and non-believers tend not to differ in behavioral indicators of prosociality (Kelly, Kramer, & Shariff, 2019), at least not in societies with high baseline levels of trust and prosociality towards strangers. Religious concepts and practices are only one of many different factors – such as policing and other secular institutions, markets, and norms – that can also motivate prosocial action. Moral sentiments that encourage prosociality also evolved independently of religion and appear in development before religious thinking. Therefore, religion cannot be a necessary condition for morality (Norenzayan, 2014). But through religious/supernatural framing, situations that lack alternative prosocial motivations— such as anonymous interactions (Engel, 2011; Rogers, Goldstein, & Fox, 2018), when the chance of interpersonal punishment is low (Balliet, Mulder, & Van Lange, 2011; Fehr & Gächter, 2000), and when secure (rather than uncertain) about future prospects (Converse et al., 2012)—can be turned into opportunities for prosociality.

The finding that *both* karma and god increase prosociality is also interesting because it is consistent with the religious prosociality hypothesis, while addressing alternative explanations for supernatural framing effects. Generalizability to both god and karma implies that these effects are applicable to both morally-concerned supernatural agents and non-agentic supernatural forces. These results also undermine the alternative possibility that priming manipulations encourage prosociality by encouraging participants to signal their religious identity (e.g., being a good Christian), because similar effects were found both in samples where karma is associated with participants' religion (Hindus and Buddhists) and in samples where karma is unrelated to participants' religion (Christians) and in participants who claim no religious affiliation at all. Participants who did not see karma as part of their social identity nevertheless increased their giving to a stranger when thinking about karma.

7.2. Situational and Individual Variability in Supernatural Morality

If supernatural framing elicits prosocial behavior by reminding individuals about the importance of prosocial behavioral norms (and the supernaturally-enforced consequences for moral actions), this implies that prosociality will be elicited most strongly by supernatural concepts that are tightly linked to expectations for human behavior. It also implies that particular beliefs about which actions have supernatural consequences will affect which actions are elicited. For instance, the belief that god rewards sharing and punishes selfishness should encourage sharing among believers, whereas the belief that god will reward selfishness in a particular instance should encourage selfishness, and the belief that god does not care whether someone is selfish or generous implies that thinking about god will not affect behavior. Below, we review several ways in which specific beliefs about supernatural entities elicit specific behaviors, and the role of cultural learning in shaping this process.

What predicts the particular moral concerns attributed to supernatural entities, like god and karma? One possibility is that believers expect supernatural entities to reward and punish whichever actions they themselves view as normative and virtuous. Consistent with this view, American believers reported that God's moral concerns were highly similar to their own (Epley, Converse, Delbosc, Monteleone, & Cacioppo, 2009), and personal opinions supported by moral convictions tend also to be supported by an individual's religious convictions (Skitka, Hanson, Washburn, & Mueller, 2018). In the case of karma, Canadian and Indian karma believers reported that domains of behavior that are relevant to morality (derived from the Moral Foundations Questionnaire, Graham et al., 2011) are also relevant to deciding whether an action has karmic consequences, whereas morally-irrelevant considerations were also considered irrelevant to karma (White, 2017).

Behavior in economic games also indicates that supernatural justice primes tend to increase adherence to behavioral norms found in non-religious contexts, rather than simply encouraging "generosity" or "prosociality" per se. Dictator games provide a useful test case of this hypothesis, because the normatively (modal) prosocial response (i.e., dividing the endowment equally between oneself and an anonymous other, Engel, 2011) is not actually the most prosocial response possible in that measure (i.e., giving everything away). Therefore, results can distinguish increased normative behavior from increases in generosity. If supernatural concepts encourage prosocial norm adherence, this implies that supernatural concepts will increase the level of giving among initially-selfish individuals, but not affect the behavior of individuals who would otherwise behave fairly.

This is exactly the pattern that we found in our within-subjects dictator games: Thinking about karma or god increased the level of giving among initially-selfish participants, but had no effect among participants who were initially fair. Fair participants merely continued behaving fairly, even though they could have also increased their level of giving to the same extent (White, Kelly, et al., 2019). This finding can help explain one noteworthy high-powered replication failure of religious priming effects (Gomes & McCullough, 2015), in which the average offer in the control condition, at 45%, was statistically no different than a fair split (although other explanations remain possible, see Shariff & Norenzayan, 2015). The hypothesis that supernatural priming encourages normative behavior could be confirmed in future studies where the normative response is not a fair split, such as giving all of one's endowment away to a recipient who is clearly in need of help, or shifting from fairness to selfishness when the recipient is viewed as undeserving of the reward.

This boundary condition for experimental religious priming effects is also compatible

with the broader hypothesis that religiously-motivated prosociality may be less evident in

situations or societies where prosociality is already prevalent, encouraged by other mechanisms.

For instance, supernatural justice beliefs may be less relevant in societies with strong secular

justice systems, compared to societies with weak institutions (Kay et al., 2008; Norris &

Inglehart, 2004). In addition, believing that there will be supernatural rewards or punishments for

cooperating with strangers may have a larger overall effect than for helping family members, due

to greater baseline tendencies towards selfishness when interacting with strangers (Burnstein,

Crandall, & Kitayama, 1994; Purzycki et al., 2016).

7.3. Cultural Variability in Supernatural Morality

The expectation that supernatural entities care about interpersonal morality is widespread,

but not universal; it varies substantially across cultures and over historical time (Norenzayan et

al., 2016; Purzycki & Sosis, 2011). If the association between morality and supernatural beliefs

is a key driver of religious priming effects on prosociality, then variability in beliefs about

supernatural entities should predict variability in prosocial behavior elicited by religious

concepts.

There is cultural and individual variation in the belief that supernatural forces actively

intervene to regulate human actions (rather than being distant and uninvolved in human affairs),

as well as whether supernatural forces are viewed as benevolent or punitive (Johnson, Okun, &

Cohen, 2015; Johnson, Sharp, Okun, Shariff, & Cohen, 2018). Several studies have found that

belief in supernatural punishment for norm-violations is the most effective motivator of prosocial

behavior. For example, Yilmaz & Bahçekapili (2016) found among Turkish participants that

religious primes that were specifically about punishment (e.g., "sin," "hell") increased prosocial

behavior, but non-punitive religious words (e.g., "mercy," "spirit") did not. Correlational data

also indicate that belief in a punitive, authoritarian god is associated with increased honesty and

fairness, whereas belief in a benevolent god either does not predict prosociality or is sometimes

associated with *increased* cheating and ingroup favouritism, perhaps because a loving god will

forgive moral offences (DeBono, Shariff, Poole, & Muraven, 2016; McNamara, Norenzayan, &

Henrich, 2016; Shariff & Norenzayan, 2011). Cross-national data also support this pattern: In

World Values Survey data, the proportion of people in a country who believed in hell (compared

to heaven) predicted lower national crime rates, even after controlling for a variety of socio-

economic control variables (Shariff & Rhemtulla, 2012).

Individuals and cultures also vary in the extent to which supernatural forces are believed

to respond to human actions that are relevant to interpersonal morality and cooperation (e.g.,

treating other humans fairly), rather than only responding to actions that are not obviously

prosocial or antisocial, such as religious ritual or taboo violations (Purzycki, 2013; Purzycki et

al., 2017). In cross-cultural studies, the scope of gods' moral concerns has been found to predict

whether religious beliefs are associated with prosocial behavior. In a study of 15 diverse

populations around the world (Henrich, Ensminger, et al., 2010), controlling for a wide range of

variables, participants who were affiliated with Islam or Christianity (world religions centered on

belief in a moralizing god) gave larger offers in the dictator game and the ultimatum game,

compared to participants associated with no religion at all or with local tribal religions (where

gods are generally less concerned with interpersonal morality). In a more recent study of eight

field sites (Purzycki et al., 2016, 2017), participants who expressed greater belief in a moralizing

god (who knows about and punishes immoral behavior) behaved more fairly towards

anonymous, distant co-religionists in an economic game that measures impartiality – the random

allocation game (RAG). This finding was recently replicated in a larger sample of 15 diverse

societies and two different economic games (the RAG and the dictator game, Lang et al., in

press).   Among the same participants, belief in local deities (who were viewed as less interested

in moral behavior and less concerned with people living in distant locations) was unassociated

with economic game behavior. Therefore, it is not just any religious belief that is associated with

prosocial behavior; the belief that supernatural entities actively care about interpersonal morality

is associated with increased fairness in economic games, whereas belief in gods who lack such

moral concerns is not.

        In contrast to the cross-cultural data that capture a broad range of variation in such

beliefs, there is less evidence that supernatural beliefs are related to individual differences in

prosocial behavior when participants are drawn from within the same population, such as within

a sample of religious and non-religious Americans. In such samples, variability is constrained by

the fact that the vast majority of American believers think God is maximally benevolent, leading

to very low levels of belief in supernatural punishment. Although religiosity occasionally

predicts increased prosociality (e.g., among American MTurk workers, Everett, Haque, & Rand,

2016), a recent meta-analysis examining a variety of student and non-student samples failed to

find any reliable association between religiosity and prosocial behavior (Kelly et al., 2019).

There is likewise evidence from a religiously-diverse sample of Canadian students that belief in

karma is associated with self-reported prosocial tendencies (White, 2017), but belief in karma is

not associated with dictator game generosity among American adult samples (White, Kelly, et

al., 2019).

        Less research has investigated heterogeneity in beliefs about karma and whether the

specificity of karma beliefs predicts specific behavior, but existing evidence suggests a similar

pattern. Just as belief in a morally-concerned god reflects a particular constellation of concepts

(about agency, supernatural causality, and interpersonal morality) that is not present across all

individuals, cultures, or historical time periods, belief in karma also reflects a particular

constellation of concepts (about causality, reincarnation, and morality) that is not universal. For

instance, anthropological and historical evidence indicates that many people believe that their

status in future reincarnations depends on where they die, how they die, and the proper

performance of funeral rites, or that reincarnation merely results in rebirth into the same kin

group, rather than depending on moral actions during life (Obeyesekere, 2002). Reincarnation

beliefs may themselves rely on a variety of cognitive and cultural factors that are distinct from

those involved specifically in karma (White, 2017). Additionally, the term "karma" is a Sanskrit

word that literally means "action," and the causal impact of karma initially, in the oldest Indic

religious texts, referred to the efficacy of *ritual* actions (Bronkhorst, 2011; Obeyesekere, 2002).

Over time, beliefs about reincarnation became explicitly moralized, and the causal impact of

actions became tied to the moral quality of those actions, and it is this belief in karmic

consequences for moral actions that became widespread in Hinduism, Buddhism, Jainism, and

other world religions.

Today, most people view moral actions—including generosity, fairness, and kindness to

others—as central to the concept of karma; the proper observance of religious rituals, and

engaging in hard work that does not obviously benefit others, is less central to beliefs about

karmic causality (White & Norenzayan, 2019). But even in this case, there is preliminary

evidence that prosocial behavior like generosity towards strangers is especially likely when

generosity is central to participant's mental models of karma: In the dictator game, Hindus who

reported that karma rewards generosity, and Americans who reported that karma punishes greed,

were more likely to increase giving following reminders of karma, and Buddhists who reported

that karma rewards generosity were more generous overall, compared to participants who did not

report that karma responds to generosity and greed (White, Kelly, et al., 2019). Therefore, it is

especially when supernatural consequences are believed to follow immoral behavior that

reminders of supernatural concepts affect behavior.

7.4. The Relevance of Commitment to Explicit Supernatural Justice Beliefs

How does thinking about supernatural justice concepts increase normatively prosocial

behavior? There are two different mechanisms that could explain this effect. One possibility is

that these supernatural concepts prime ideas about prosociality, which encourage prosocial

actions through ideomotor processes (Bargh, 1994). This account implies that supernatural

priming should depend on whether supernatural entities are conceptually associated with

morality (as is supported by evidence described above), but it further implies that religious

priming should not depend on whether supernatural forces are believed to be *real*. Both atheists

and religious devotees should show similar ideomotor effects to the extent that they hold similar

concepts of god (e.g., "God dislikes selfishness").

The second possibility is that religious/supernatural priming affects behavior when it

encourages the normative prosocial response *and* motivates people to engage in this response,

through the promise of supernatural rewards and punishments. If these supernatural

consequences are a relevant motivating factor, then priming effects should depend on *both* a

conceptual association between supernatural concepts and prosociality and the belief that

supernatural forces are real and personally relevant.

Existing evidence supports the latter account: Individual differences in religiosity are a

substantial moderator of religious priming effects. The meta-analytic effect of religious priming

on prosociality is reliable among religious participants, Hedges' $g = 0.38$, 95% CI = [0.14, 0.62], but not among non-believers, $g = 0.12$, 95% CI = [−0.11, 0.35] (Shariff et al., 2016). In several recent pre-registered, high-powered experiments with Americans, explicit reminders of god significantly increased giving among people who believe in god, but had no effect or slightly decreased giving among non-believers (Billingsley et al., 2018; White, Kelly, et al., 2019). As depicted in Figure 4, thinking about karma also led to significantly larger increases in giving among participants who explicitly claimed to believe in karma, compared to those who denied that karma is real.

[Insert Figure 4 here]

One could argue that this difference between believer and non-believer effects is the result of different conceptions of "God" or "karma." However, data do not support this interpretation. In North American and cross-national samples, even nonbelievers associate religion with prosociality (e.g., expecting religious people to be more trustworthy than atheists, Gervais, 2013; Gervais et al., 2017) and report that generosity and selfishness are behaviors that people think God would reward and punish (White & Norenzayan, 2019). Similarly, even people who deny the existence of karma associate the concept of "karma" with rewards for generosity and punishment for greed (Banerjee & Bloom, 2017; Baumard & Chevallier, 2012; Converse et al., 2012; Kulow & Kramer, 2016; White & Norenzayan, 2019). If supernatural primes affected behavior simply by activating these concepts, there is no reason why these effects should depend on whether participants believe that God or karma is *real*.

The pattern of data therefore supports the hypothesis that supernatural intervention in human moral affairs is an important motivator of prosociality: Although religious concepts may stimulate ideas about fairness in all participants who hold similar cultural concepts, only individuals who believe that supernatural entities are real and actively concerned with human affairs may be sufficiently motivated to engage in prosocial behavior when primed. Existing evidence indicates that individuals who believe that supernatural forces do not exist, do not care about morality, or will forgive any transgressions, are more likely to discount any primed intuitions and continue behaving selfishly. Next, we discuss how belief in supernatural punishment and supernatural rewards may operate as an incentive structure that motivates this prosocial behavior among believers (but not non-believers).

7.5. The Relevance of Supernatural Rewards vs. Punishments

In cross-cultural samples, where there is ample variability in supernatural punishment beliefs, supernatural punishment (but not benevolence) predicts greater prosocial behavior (Purzycki et al., 2016, Lang et al., in press) and is associated with the increased societal complexity (Watts et al., 2015) that requires high levels of cooperation between anonymous ingroup members. However, in contemporary Western cultural contexts, there is substantial homogeneity in the belief that supernatural forces are extremely benevolent, rather then holding supernatural punishment as central to personal beliefs (Johnson et al., 2015, 2018). Yet, religious priming effects can still be elicited in these populations (Shariff et al., 2016; White, Kelly, et al., 2019), making it unclear whether a fear of supernatural punishment is really necessary to motivate prosocial behavior. A broader conceptualization of supernatural consequences for behavior—encompassing rewards and punishments—might better explain this puzzle. Supernatural rewards might be perceived directly (as immediate, concrete good

outcomes) or indirectly (as a perceived positive relationship with God or a positive balance of karmic merit that protects devotees from threats and uncertainty in life). The uncertainty of successes and struggles in life (e.g., receiving vs. losing a new job opportunity, recovering quickly from an illness vs. extended, severe medical problems) provides an incentive structure that could motivate prosocial actions in the hopes of obtaining the best positive outcome for oneself, without requiring the belief that supernatural forces are vengeful, punitive, or directly responsible for believers' misfortune.

Another possibility is that, although the fear of supernatural punishment can effectively deter antisocial behavior that violates proscriptive norms (i.e., things that you should not do), the expectation of supernatural rewards might be especially effective at motivating behavior that is actively prosocial and follows prescriptive norms (Janoff-Bulman, Sheikh, & Hepp, 2009). This means that supernatural punishment beliefs might be especially relevant in tasks where "prosocial behavior" is measured as lower rates of cheating or other selfish deviations from explicitly-stated rules for fair behavior (e.g., DeBono et al., 2016; Purzycki et al., 2016). Supernatural reward beliefs might be more relevant when the "prosocial" response is nice but not obligatory, such as dictator game giving (e.g., White, Kelly, et al., 2019) or volunteering (Johnson, Cohen, & Okun, 2016).

Future research could benefit from directly testing how construal of a task (as prescriptive or proscriptive morality) moderates the role of different supernatural beliefs on behavior. The desire to accumulate rewards from prosocial behavior may be more relevant for individuals or cultural groups who generally view fulfilling interpersonal duties as a moral issue, in addition to caring about the moral proscription against violating others' rights (e.g., Indian vs. North American samples, Clark, Bauman, Kamble, & Knowles, 2016; Miller, Akiyama, &

Kapadia, 2017; Miller, Bersoff, & Harwood, 1990; Miller & Luthar, 1989). In addition, the expectation of karmic consequences over extremely long timescales, including across reincarnations, provides a motivation to actively do good (in addition to avoiding bad), because this excessive good behavior is required for better prospects in the next life (Obeyesekere, 2002). In order to be reborn as wealthier, healthier, and luckier than in the current lifetime, people can actively engage in prosociality and meritorious ritual actions, beyond what might be required to simply avoid supernatural punishments, thus providing another context in which supernatural justice beliefs are uniquely effective at motivating prosocial action.

Taken together, the pattern of prosocial behavior encouraged by religious priming and supernatural belief is consistent with cultural evolutionary theories of religion (Norenzayan et al., 2016). The boundary conditions for these effects highlight several routes through which cultural learning plays an important role in this process, above and beyond cognitive intuitions and motivations. Cultural learning (1) creates a conceptual link between supernatural causality and morality, (2) encourages commitment to these beliefs as real and relevant to daily life, and (3) activates these beliefs through implicit, explicit, and situational reminders of supernatural concepts. Each of these factors, along with the presence of baseline selfishness, is an important contributor to the likelihood that supernatural justice beliefs will affect prosocial behavior.

8. Conclusion

In this chapter, we have described how belief in karmic causality can be studied as a psychological construct that is rooted in core cognitive, motivational, and cultural processes that are central to social psychology. We discussed karma alongside beliefs about morally-concerned gods and expectations about non-supernatural justice, to highlight how common cognitive tendencies and motivations can give rise to a variety of different beliefs. Individual differences

(e.g., reliance on intuitive thinking, being "spiritual but not religious") and situational factors (e.g., uncertainty, a need for structure, and salient past misdeeds followed by misfortune) could similarly encourage belief in karmic causality, morally-concerned gods, and secular justice. Similarly, different concepts can have comparable effects on behavior, such as when Christians reminded of God, or Hindus, Buddhists, and non-religious Americans reminded of karma, become more likely to engage in normative behavior. Karmic beliefs in non-Western, non-Christian cultural contexts provide an important testing ground of theories of religion, morality, and justice across different cultural contexts, extending prevailing research largely tested in Western samples.

Furthermore, many people believe only in a subset of all possible supernatural justice concepts. Cognitive biases and motivational factors are insufficient to explain this variability. The cultural transmission of commitment to particular beliefs is necessary to explain the intertwining of supernatural causality and morality, the presence of agentic vs. non-agentic supernatural entities, and whether causation is believed to happen within interpersonal relationships, within one lifetime, or across lifetimes. In this chapter, we have provided preliminary evidence that belief in karma reflects a unique constellation of these elements and that variability in supernatural justice beliefs can shape causal attributions and behavior in particular belief-consistent ways. Many open questions remain about how cognitive, motivational, and cultural factors interact to shape supernatural justice beliefs, and how the particular beliefs that people hold exert unique effects on cognition and behavior. Throughout this chapter, we have raised several novel hypotheses worthy of future research and described how existing theories of religion and justice can fruitfully be extended to explain a variety of worldviews that are prevalent in diverse cultures around the world.

References

Allen, P. M., Edwards, J. A., & McCullough, W. (2015). Does karma exist?: Buddhism, social

cognition, and the evidence for karma. *The International Journal for the Psychology of*

Religion, *25(1),* 1–17. doi: 10.1080/10508619.2013.879427

Andersen, M. (2017). Predictive coding in agency detection. *Religion, Brain & Behavior, 9(1),*

65-84. doi: 10.1080/2153599X.2017.1387170

Ariyabuddhiphongs, V., & Jaiwong, D. (2010). Observance of the Buddhist Five Precepts,

subjective wealth, and happiness among Buddhists in Bangkok, Thailand. *Archive for the*

Psychology of Religion, 32(3), 327–344. doi: 10.1163/157361210X533274

Ariyabuddhiphongs, V., & Li, J. (2016). Buddhist good karma of giving, optimism, and

happiness among Thai female sex workers. *Social Indicators Research, 127(2)*, 903–917.

doi: 10.1007/s11205-015-0973-y

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. doi: 10.1016/j.evolhumbehav.2010.07.008

Atran, S. (1995). Causal constraints on categories and categorical constraints on biological

reasoning across cultures. In D. Sperber, D. Premack, & A. J. Premack (Eds.), *Causal*

cognition: A multidisciplinary debate (pp. 205–233). New York, NY: Clarendon

Press/Oxford University Press.

Atran, S. (2002). *In gods we trust: The evolutionary landscape of religion*. New York: Oxford

University Press.

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. doi: 10.1162/BIOT_a_00018

Atran, S., & Norenzayan, A. (2004). Religion's evolutionary landscape: Counterintuition,

commitment, compassion, communion. *Behavioral and Brain Sciences, 27(6)*, 713–730.

Aulino, F. (2016). Rituals of care for the elderly in northern Thailand: Merit, morality, and the

everyday of long-term care. *American Ethnologist, 43(1),* 91–102. doi:

10.1111/amet.12265

Babb, L. (1983). Destiny and responsibility: Karma in popular Hinduism. In C. F. Keyes & E. V.

Daniel (Eds.), *Karma: An anthropological inquiry* (pp. 163–181). Berkeley: University of

California Press.

Baimel, A. S. (2018). *Reasoning about the supernatural: A cross-cultural examination of how

and when intuitions shape belief.* Unpublished doctoral dissertation.

Balliet, D., Mulder, L. B., & Van Lange, P. A. M. (2011). Reward, punishment, and cooperation:

A meta-analysis. *Psychological Bulletin, 137(4),* 594–615. doi: 10.1037/a0023489

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. doi:

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), e12442. doi: 10.1111/desc.12442

Bargh, J. A. (1994). The four horsemen of automaticity: Awareness, intention, efficiency, and

control in social cognition. In R. S. Wyer, Jr. & T. K. Srull (Eds.), *Handbook of social*

cognition: Basic processes; Applications (pp. 1-40). Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.

Barrett, J. L. (2004). *Why would anyone believe in God?* Walnut Creek, CA: AltaMira Press.

Barrett, J. L., & Keil, F. C. (1996). Conceptualizing a nonnatural entity: Anthropomorphism in god concepts. *Cognitive Psychology, 31(3)*, 219–247. doi: 10.1006/cogp.1996.0017

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

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

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. doi: 10.1163/156853712X633938

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. doi: 10.1016/j.cub.2014.10.063

Bender, C. (2010). *The new metaphysicals: Spirituality and the American religious imagination*. Chicago: University of Chicago Press.

Bentzen, J. S. (2018). *Acts of God? Religiosity and natural disasters across subnational world districts.* Working Paper. doi: 10.2139/ssrn.2595511

Bering, J. (2012). *The belief instinct: The psychology of souls, destiny, and the meaning of life*. New York: WW Norton.

Bering, J. M., & Johnson, D. D. P. (2005). "O Lord... You perceive my thoughts from afar":

Recursiveness and the evolution of supernatural agency. *Journal of Cognition & Culture,*

5(1-2), 118–142. doi: 10.1163/1568537054068679

Bhangaokar, R., & Kapadia, S. (2009). At the interface of 'Dharma' and 'Karma': Interpreting

moral discourse in India. *Psychological Studies, 54(2),* 96–108. doi: 10.1007/s12646-009-

0018-1

Billingsley, J., Gomes, C., & McCullough, M. (2018). *Implicit and explicit influences of*

religious cognition on dictator game transfers. PsyArXiv. doi: 10.31234/osf.io/6amfe

Bloom, P. (2005). *Descartes' baby: How the science of child development explains what makes*

us human. New York: Basic Books.

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, 111(47)*,

16784–16789. doi: 10.1073/pnas.1408701111

Bronkhorst, J. (2011). *Karma*. University of Hawai'i Press. Retrieved from

http://muse.jhu.edu/book/1739

Burnstein, E., Crandall, C., & Kitayama, S. (1994). Some neo-Darwinian decision rules for

altruism: Weighing cues for inclusive fitness as a function of the biological importance of

the decision. *Journal of Personality and Social Psychology, 67(5),* 773–789. doi:

10.1037/0022-3514.67.5.773

Cadge, W. (2005). *Heartwood: The first generation of Theravada Buddhism in America.*

Chicago: University of Chicago Press.

Callan, M. J., Ellard, J. H., & Nicol, J. E. (2006). The belief in a just world and immanent justice reasoning in adults. *Personality and Social Psychology Bulletin, 32(12)*, 1646–1658. doi: 10.1177/0146167206292236

Callan, M. J., Harvey, A. J., Dawtry, R. J., & Sutton, R. M. (2013). Through the looking glass: Focusing on long-term goals increases immanent justice reasoning. *The British Journal of Social Psychology, 52(2),* 377–385. doi: 10.1111/bjso.12022

Callan, M. J., Harvey, A. J., & Sutton, R. M. (2014). Rejecting victims of misfortune reduces delay discounting. *Journal of Experimental Social Psychology, 51,* 41–44. doi: 10.1016/j.jesp.2013.11.002

Callan, M. J., Sutton, R. M., & Dovale, C. (2010). When deserving translates into causing: The effect of cognitive load on immanent justice reasoning. *Journal of Experimental Social Psychology, 46(6)*, 1097–1100. doi: 10.1016/j.jesp.2010.05.024

Callan, M. J., Sutton, R. M., Harvey, A. J., & Dawtry, R. J. (2014). Immanent justice reasoning. In J. M. Olson & M. P. Zanna (Eds.), *Advances in Experimental Social Psychology* (Vol. 49, pp. 105–161). San Francisco, CA: Academic Press. doi: 10.1016/B978-0-12-800052-6.00002-0

Camerer, C. F., Dreber, A., Holzmeister, F., Ho, T.-H., Huber, J., Johannesson, M., … Wu, H. (2018). Evaluating the replicability of social science experiments in Nature and Science between 2010 and 2015. *Nature Human Behaviour, 2(9)*, 637. doi: 10.1038/s41562-018-0399-z

Carlisle, S. G. (2008). Synchronizing karma: The internalization and externalization of a shared, personal belief. *Ethos, 36(2),* 194–219. doi: 10.1111/j.1548-1352.2008.00011.x

Carlsmith, K. M., & Darley, J. M. (2008). Psychological aspects of retributive justice. In M. P.

    Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 40, pp. 193–236). San

    Francisco, CA: Academic Press. doi: 10.1016/S0065-2601(07)00004-4

Chapple, C. K. (2017). Reincarnation: Mechanics, narratives, and implications. *Religions, 8(11),*

    236. doi: 10.3390/rel8110236

Chudek, M., & Henrich, J. (2011). Culture–gene coevolution, norm-psychology and the

    emergence of human prosociality. *Trends in Cognitive Sciences, 15(5)*, 218–226. doi:

    10.1016/j.tics.2011.03.003

Chudek, M., McNamara, R. A., Birch, S., Bloom, P., & Henrich, J. (2018). Do minds switch

    bodies? Dualist interpretations across ages and societies. *Religion, Brain & Behavior, 8(4),*

    354-368. doi: 10.1080/2153599X.2017.1377757

Clark, C. J., Bauman, C. W., Kamble, S. V., & Knowles, E. D. (2016). Intentional sin and

    accidental virtue? Cultural differences in moral systems influence perceived intentionality.

    Social Psychological and Personality Science, 8(1), 74–82. doi:

    10.1177/1948550616663802

Converse, B. A., Risen, J. L., & Carter, T. J. (2012). Investing in karma: When wanting promotes

    helping. *Psychological Science, 23(8)*, 923–930. doi: 10.1177/0956797612437248

Cotterill, S., Sidanius, J., Bhardwaj, A., & Kumar, V. (2014). Ideological support for the Indian

    caste system: Social dominance orientation, right-wing authoritarianism and karma.

    Journal of Social and Political Psychology, 2(1), 98–116. doi: 10.5964/jspp.v2i1.171

Daniel, S. B. (1983). The tool box approach of the Tamil to the issues of moral responsibility and

    human destiny. In C. F. Keyes & E. V. Daniel (Eds.), *Karma: An anthropological inquiry*

    (pp. 27 – 62). Berkeley: University of California Press.

Davis, E. B., Moriarty, G. L., & Mauch, J. C. (2013). God images and god concepts: Definitions, development, and dynamics. *Psychology of Religion and Spirituality, 5(1),* 51–60. doi: 10.1037/a0029289

DeBono, A., Shariff, A. F., Poole, S., & Muraven, M. (2017). Forgive us our trespasses: Priming a forgiving (but not a punishing) god increases unethical behavior. *Psychology of Religion and Spirituality, 9,* S1 – S10. doi: 10.1037/rel0000105

Dundes, A. (Ed.). (1992). *The evil eye: A casebook.* Madison, WI: University of Wisconsin Press.

Engel, C. (2011). Dictator games: A meta study. *Experimental Economics, 14(4),* 583–610. doi: 10.1007/s10683-011-9283-7

Epley, N., Converse, B. A., Delbosc, A., Monteleone, G. A., & Cacioppo, J. T. (2009). Believers' estimates of God's beliefs are more egocentric than estimates of other people's beliefs. *Proceedings of the National Academy of Sciences, 106(51),* 21533–21538. doi: 10.1073/pnas.0908374106

Fehr, E., Fischbacher, U., & Gächter, S. (2002). Strong reciprocity, human cooperation, and the enforcement of social norms. *Human Nature, 13(1),* 1–25. doi: 10.1007/s12110-002-1012-7

Fehr, E., & Gächter, S. (2000). Cooperation and punishment in public goods experiments. *The American Economic Review, 90(4),* 980–994.

Fehr, E., & Gachter, S. (2002). Altruistic punishment in humans. *Nature, 415(6868),* 137–140. doi: 10.1038/415137a

Fiske, A. P. (1992). The four elementary forms of sociality: Framework for a unified theory of social relations. *Psychological Review, 99(4),* 689–723.

Frederick, S. (2005). Cognitive reflection and decision making. *The Journal of Economic Perspectives, 19(4)*, 25–42.

Fuller, C. J. (2004). *The camphor flame: Popular Hinduism and society in India.* Princeton, N.J: Princeton University Press.

Gershman, B. (2015). The economic origins of the evil eye belief. *Journal of Economic Behavior & Organization, 110,* 119–144. doi: 10.1016/j.jebo.2014.12.002

Gershman, B. (2016). Witchcraft beliefs and the erosion of social capital: Evidence from Sub-Saharan Africa and beyond. *Journal of Development Economics, 120*, 182–208. doi: 10.1016/j.jdeveco.2015.11.005

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

Gervais, W. M., van Elk, M., Xygalatas, D., McKay, R. T., Aveyard, M., Buchtel, E. E., … Bulbulia, J. (2018). Analytic atheism: A cross-culturally weak and fickle phenomenon? *Judgment and Decision Making, 13(3)*, 268–274.

Gervais, W. M., & Najle, M. B. (2015). Learned faith: The influences of evolved cultural learning mechanisms on belief in Gods. *Psychology of Religion and Spirituality, 7(4)*, 327–335. doi: 10.1037/rel0000044

Gervais, W. M., & Norenzayan, A. (2012). Analytic thinking promotes religious disbelief. *Science, 336(6080),* 493–496. doi: 10.1126/science.1215647

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. doi: 10.1037/a0025882

Gervais, W. M., Willard, A. K., Norenzayan, A., & Henrich, J. (2011). The cultural transmission of faith: Why innate intuitions are necessary, but insufficient, to explain religious belief. *Religion, 41(3)*, 389–410. doi: 10.1080/0048721X.2011.604510

Gervais, W. M., Xygalatas, D., McKay, R. T., van Elk, M., Buchtel, E. E., Aveyard, M., … Bulbulia, J. (2017). Global evidence of extreme intuitive moral prejudice against atheists. *Nature Human Behaviour, 1(8),* 0151. doi: 10.1038/s41562-017-0151

Gilbert, D. T. (1998). Ordinary personology. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 89–150). New York, NY: McGraw-Hill.

Gilbert, D. T., & Malone, P. S. (1995). The correspondence bias. *Psychological Bulletin, 117(1)*, 21–38. doi: 10.1037/0033-2909.117.1.21

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. doi: 10.1037/xge0000027

Goodwin, G. P., Piazza, J., & Rozin, P. (2014). Moral character predominates in person perception and evaluation. *Journal of Personality and Social Psychology, 106(1),* 148–168. doi: 10.1037/a0034726

Graham, J., & Haidt, J. (2010). Beyond beliefs: Religions bind individuals into moral communities. *Personality and Social Psychology Review, 14(1)*, 140–150. doi: 10.1177/1088868309353415

Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S. P., & Ditto, P. H. (2013). Moral Foundations Theory: The pragmatic validity of moral pluralism. In P. Devine and A. Plant (Ed.), *Advances in Experimental Social Psychology* (Vol. 47, pp. 55–130). Academic Press. doi: 10.1016/B978-0-12-407236-7.00002-4

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the

   moral domain. *Journal of Personality and Social Psychology, 101(2),* 366–385. doi:

   10.1037/a0021847

Granqvist, P., Mikulincer, M., & Shaver, P. R. (2010). Religion as attachment: Normative

   processes and individual differences. *Personality and Social Psychology Review, 14(1)*,

   49–59. doi: 10.1177/1088868309348618

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. doi:

   10.1177/1088868309350299

Guthrie, S. (1993). *Faces in the clouds: A new theory of religion.* New York: Oxford University

   Press.

Hafer, C. L. (2000). Investment in long-term goals and commitment to just means drive the need

   to believe in a just world. *Personality and Social Psychology Bulletin, 26(9),* 1059–1073.

   doi: 10.1177/01461672002611004

Hafer, C. L., & Bègue, L. (2005). Experimental research on just-world theory: Problems,

   developments, and future challenges. *Psychological Bulletin, 131(1),* 128–167. doi:

   10.1037/0033-2909.131.1.128

Hafer, C. L., & Rubel, A. N. (2015). The why and how of defending belief in a just world. In J.

   M. Olson & M. P. Zanna (Eds.), *Advances in Experimental Social Psychology* (Vol. 51, pp.

   41–96). Academic Press. doi: 10.1016/bs.aesp.2014.09.001

Hamlin, J. K., Wynn, K., & Bloom, P. (2007). Social evaluation by preverbal infants. *Nature,

   450(7169)*, 557-559. doi: 10.1038/nature06288

Hamlin, J. K., Wynn, K., Bloom, P., & Mahajan, N. (2011). How infants and toddlers react to antisocial others. *Proceedings of the National Academy of Sciences, 108(50),* 19931–19936. doi: 10.1073/pnas.1110306108

Harvey, A. J., & Callan, M. J. (2014). The role of religiosity in ultimate and immanent justice reasoning. *Personality and Individual Differences, 56*, 193–196. doi: 10.1016/j.paid.2013.08.023

Heiphetz, L., Lane, J. D., Waytz, A., & Young, L. L. (2016). How children and adults represent god's mind. *Cognitive Science, 40(1),* 121–144. doi: 10.1111/cogs.12232

Henrich, J. (2009). The evolution of costly displays, cooperation and religion: Credibility enhancing displays and their implications for cultural evolution. *Evolution and Human Behavior, 30(4)*, 244–260. doi: 10.1016/j.evolhumbehav.2009.03.005

Henrich, J. (2015). *The secret of our success: How culture is driving human evolution, domesticating our species, and making us smarter.* Princeton: Princeton University Press.

Henrich, J., Ensminger, J., McElreath, R., Barr, A., Barrett, C., Bolyanatz, A., … Ziker, J. (2010). Markets, religion, community size, and the evolution of fairness and punishment. *Science, 327(5972)*, 1480–1484. doi: 10.1126/science.1182238

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33(2–3)*, 61–83. doi: 10.1017/S0140525X0999152X

Hertz, S. G., & Krettenauer, T. (2016). Does moral identity effectively predict moral behavior?: A meta-analysis. *Review of General Psychology, 20(2)*, 129–140. doi: 10.1037/gpr0000062

Heywood, B. T., & Bering, J. M. (2014). "Meant to be": How religious beliefs and cultural religiosity affect the implicit bias to think teleologically. *Religion, Brain & Behavior, 4(3)*, 183–201. doi: 10.1080/2153599X.2013.782888

Hiebert, P. G. (1983). Karma and other explanation traditions in a South Indian villiage. In C. F. Keyes & E. V. Danie (Eds.), *Karma: An anthropological inquiry* (pp. 119–130). Berkeley: University of California Press.

Hobson, N. M., Schroeder, J., Risen, J. L., Xygalatas, D., & Inzlicht, M. (2018). The psychology of rituals: An integrative review and process-based framework. *Personality and Social Psychology Review, 22(3)*, 260–284. doi: 10.1177/1088868317734944

Hui, C. H., Chan, I. S. Y., & Chan, J. (1989). Death cognition among Chinese teenagers: Beliefs about consequences of death. *Journal of Research in Personality, 23(1),* 99–117. doi: 10.1016/0092-6566(89)90036-6

Jack, A. I. (2013). A scientific case for conceptual dualism: The problem of consciousness and the opposing domains hypothesis. In J. Knobe, T. Lombrozo, & S. Nichols (Eds.), *Oxford Studies in Experimental Philosophy* (Vol. 1, pp. 1–32). Oxford: Oxford University Press.

Janoff-Bulman, R., Sheikh, S., & Hepp, S. (2009). Proscriptive versus prescriptive morality: Two faces of moral regulation. *Journal of Personality and Social Psychology, 96(3)*, 521–537. doi: 10.1037/a0013779

Jogdand, Y. A., Khan, S. S., & Mishra, A. K. (2016). Understanding the persistence of caste: A commentary on Cotterill, Sidanius, Bhardwaj and Kumar (2014). *Journal of Social and Political Psychology, 4(2)*, 554–570. doi: 10.5964/jspp.v4i2.603

Johnson, D. (2015). *God is watching you: How the fear of God makes us human.* New York: 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)*, 147470490600400130. doi:

10.1177/147470490600400119

Johnson, K. A., Cohen, A. B., & Okun, M. A. (2016). God is watching you...but also watching

over you: The influence of benevolent God representations on secular volunteerism among

Christians. *Psychology of Religion and Spirituality, 8(4),* 363–374. doi:

10.1037/rel0000040

Johnson, K. A., Okun, M. A., & Cohen, A. B. (2015). The mind of the Lord: Measuring

authoritarian and benevolent God representations. *Psychology of Religion and Spirituality,*

7(3), 227–238. doi: 10.1037/rel0000011

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. doi: 10.1080/10508619.2018.1445893

Kanngiesser, P., & Warneken, F. (2012). Young children consider merit when sharing resources

with others. *PLOS ONE, 7(8)*, e43979. doi: 10.1371/journal.pone.0043979

Kaplan, H. (2012). Belief in a just world, religiosity and victim blaming. *Archive for the*

Psychology of Religions, 34(3), 397–409. doi: 10.1163/15736121-12341246

Kay, A. C., Gaucher, D., Napier, J. L., Callan, M. J., & Laurin, K. (2008). God and the

government: Testing a compensatory control mechanism for the support of external

systems. *Journal of Personality and Social Psychology, 95(1)*, 18–35. doi: 10.1037/0022-

3514.95.1.18

Kelemen, D. (2004). Are children "intuitive theists"? Reasoning about purpose and design in nature. *Psychological Science, 15(5),* 295–301. doi: 10.1111/j.0956-7976.2004.00672.x

Kelly, J. M., Kramer, S. R., & Shariff, A. F. (2019). *Religiosity predicts prosociality (at least when measured with self-reports): A meta-analysis.* Manuscript in Preparation.

Khamitov, M., Rotman, J. D., & Piazza, J. (2016). Perceiving the agency of harmful agents: A test of dehumanization versus moral typecasting accounts. *Cognition, 146*, 33–47. doi: 10.1016/j.cognition.2015.09.009

Khenfer, J., Roux, E., Tafani, E., & Laurin, K. (2017). When God's (not) needed: Spotlight on how belief in divine control influences goal commitment. *Journal of Experimental Social Psychology, 70*, 117–123. doi: 10.1016/j.jesp.2017.01.005

Kopalle, P. K., Lehmann, D. R., & Farley, J. U. (2010). Consumer expectations and culture: The effect of belief in karma in India. *Journal of Consumer Research, 37(2)*, 251–263. doi: 10.1086/651939

Krull, D. S., Loy, M. H.-M., Lin, J., Wang, C.-F., Chen, S., & Zhao, X. (1999). The fundamental fundamental attribution error: Correspondence bias in individualist and collectivist cultures. *Personality and Social Psychology Bulletin, 25(10),* 1208–1219. doi: 10.1177/0146167299258003

Kubotani, T., & Engstrom, D. (2005). The roles of Buddhist temples in the treatment of HIV/AIDS in Thailand. *Journal of Sociology and Social Welfare, 32*, 5–22.

Kulow, K., & Kramer, T. (2016). In pursuit of good karma: When charitable appeals to do right go wrong. *Journal of Consumer Research, 43(2),* 334–353. doi: 10.1093/jcr/ucw018

Landau, M. J., Khenfer, J., Keefer, L. A., Swanson, T. J., & Kay, A. C. (2018). When and why

    does belief in a controlling God strengthen goal commitment? *Journal of Experimental*

    Social Psychology, 75, 71–82. doi: 10.1016/j.jesp.2017.11.012

Lang, M., Purzycki, B. G., Apicella, C., Atkinson, Q. D., Bolyanatz, A., Cohen, E., … Henrich,

    J. (in press). Moralizing gods, extended prosociality, and religious parochialism across 15

    societies. *PROC-B*.

Lanman, J. A., & Buhrmester, M. D. (2016). Religious actions speak louder than words:

    Exposure to credibility-enhancing displays predicts theism. *Religion, Brain & Behavior,*

    7(1), 3–16. doi: 10.1080/2153599X.2015.1117011

Laurin, K., & Kay, A. C. (2017). The motivational underpinnings of belief in god. In J. M. Olson

    (Ed.), *Advances in Experimental Social Psychology* (Vol. 56, pp. 201–257). Academic

    Press. doi: 10.1016/bs.aesp.2017.02.004

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. doi: 10.1111/j.1467-8624.2012.01743.x

Legare, C. H., & Gelman, S. A. (2008). Bewitchment, biology, or both: The co-existence of

    natural and supernatural explanatory frameworks across development. *Cognitive Science,*

    32(4), 607–642. doi: 10.1080/03640210802066766

Lerner, M. J. (1980). *The belief in a just world: A fundamental delusion*. New York: Plenum

    Press.

Levy, B. R., Slade, M. D., & Ranasinghe, P. (2009). Causal thinking after a tsunami wave:

    Karma beliefs, pessimistic explanatory style and health among Sri Lankan survivors.

    Journal of Religion and Health, 48(1), 38–45.

Liamputtong, P., Haritavorn, N., & Kiatying-Angsulee, N. (2012). Living positively: The

experiences of Thai Women living with HIV/AIDS in Central Thailand. *Qualitative Health

Research, 22(4),* 441–451. doi: 10.1177/1049732311421680

Liamputtong, P., & Suwankhong, D. (2016). Living with breast cancer: The experiences and

meaning-making among women in southern Thailand. *European Journal of Cancer Care,

25(3)*, 371–380. doi: 10.1111/ecc.12321

Lipkus, I. M., Dalbert, C., & Siegler, I. C. (1996). The importance of distinguishing the belief in

a just world for self versus for others: Implications for psychological well-being.

Personality and Social Psychology Bulletin, 22(7), 666–677. doi:

10.1177/0146167296227002

Luhrmann, T. M. (2018). The faith frame: Or, belief is easy, faith is hard. *Contemporary

Pragmatism, 15(3),* 302–318. doi: 10.1163/18758185-01503003

Maes, J. (1998). Immanent justice and ultimate justice. In L. Montada & M. J. Lerner (Eds.),

Responses to Victimizations and Belief in a Just World (pp. 9–40). Boston, MA: Springer.

doi: 10.1007/978-1-4757-6418-5_2

Maij, D. L. R., Harreveld, F. van, Gervais, W., Schrag, Y., Mohr, C., & van Elk, M. (2017).

Mentalizing skills do not differentiate believers from non-believers, but credibility

enhancing displays do. *PLOS ONE, 12(8)*, e0182764. doi: 10.1371/journal.pone.0182764

McAuliffe, K., Blake, P. R., Steinbeis, N., & Warneken, F. (2017). The developmental

foundations of human fairness. *Nature Human Behaviour, 1(2),* 0042. doi:

10.1038/s41562-016-0042

McAuliffe, K., Jordan, J. J., & Warneken, F. (2015). Costly third-party punishment in young

children. *Cognition, 134*, 1–10. doi: 10.1016/j.cognition.2014.08.013

McNamara, R. A., Norenzayan, A., & Henrich, J. (2016). Supernatural punishment, in-group

biases, and material insecurity: Experiments and ethnography from Yasawa, Fiji. *Religion,*

Brain & Behavior, 6(1), 34–55. doi: 10.1080/2153599X.2014.921235

Meristo, M., & Surian, L. (2014). Infants distinguish antisocial actions directed towards fair and

unfair agents. *PLOS ONE, 9(10),* e110553. doi: 10.1371/journal.pone.0110553

Miller, J. G., Akiyama, H., & Kapadia, S. (2017). Cultural variation in communal versus

exchange norms: Implications for social support. *Journal of Personality and Social*

Psychology, 113(1), 81–94. doi: 10.1037/pspi0000091

Miller, J. G., Bersoff, D. M., & Harwood, R. L. (1990). Perceptions of social responsibilities in

India and in the United States: Moral imperatives or personal decisions? *Journal of*

Personality and Social Psychology, 58(1), 33–47. doi: 10.1037/0022-3514.58.1.33

Miller, J. G., & Luthar, S. (1989). Issues of interpersonal responsibility and accountability: A

comparison of Indians' and Americans' moral judgments. *Social Cognition, 7(3),* 237–261.

doi: 10.1521/soco.1989.7.3.237

Morewedge, C. K., & Clear, M. E. (2008). Anthropomorphic god concepts engender moral

judgment. *Social Cognition, 26(2),* 182–189. doi: 10.1521/soco.2008.26.2.182

Murayama, A., & Miura, A. (2016). Two types of justice reasoning about good fortune and

misfortune: A replication and beyond. *Social Justice Research, 29(3)*, 331–344. doi:

10.1007/s11211-016-0269-7

Nemeroff, C., & Rozin, P. (2000). The makings of the magical mind: The nature and function of

sympathetic magical thinking. In K. S. Rosengren, C. N. Johnson, & P. L. Harris (Eds.),

Imagining the impossible: Magical, scientific, and religious thinking in children (pp. 1–

34). Cambridge: Cambridge University Press. doi: 10.1017/CBO9780511571381.002

Newport, F. (2015). Six in 10 Americans Would Say "Yes" to Muslim President. *Gallup News.*

Retrieved January 26, 2019, from https://news.gallup.com/opinion/polling-

matters/185813/six-americans-say-yes-muslim-president.aspx

Nguyen, H. T., Yamada, A. M., & Dinh, T. Q. (2012). Religious leaders' assessment and

attribution of the causes of mental illness: An in-depth exploration of Vietnamese

American Buddhist leaders. *Mental Health, Religion & Culture, 15(5),* 511–527. doi:

10.1080/13674676.2011.594037

Nguyen, S. P., & Rosengren, K. S. (2004). Causal reasoning about illness: A comparison

between European- and Vietnamese-American children. *Journal of Cognition & Culture,*

4(1), 51–78. doi: 10.1163/156853704323074750

Nichols, S., Strohminger, N., Rai, A., & Garfield, J. (2018). Death and the self. *Cognitive*

Science, 42(S1), 314–332. doi: 10.1111/cogs.12590

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

Princeton University Press.

Norenzayan, A. (2014). Does religion make people moral? *Behaviour, 151* 365-384. doi:

10.1163/1568539X-00003139

Norenzayan, A. (2016). Theodiversity. *Annual Review of Psychology, 67(1)*, 465–488. doi:

10.1146/annurev-psych-122414-033426

Norenzayan, A., Gervais, W. M., & Trzesniewski, K. H. (2012). Mentalizing deficits constrain

belief in a personal god. *PLOS ONE, 7(5),* 1–8. doi: 10.1371/journal.pone.0036880

Norenzayan, A., & Lee, A. (2010). It was meant to happen: Explaining cultural variations in fate

attributions. *Journal of Personality and Social Psychology, 98(5)*, 702–720. doi:

10.1037/a0019141

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, e1*. doi: 10.1017/S0140525X14001356

Norris, P., & Inglehart, R. (2004). *Sacred and secular: Religion and politics worldwide*. New York: Cambridge University Press.

Nuckolls, C. W. (1991). Culture and causal thinking: Diagnosis and prediction in a South Indian fishing village. *Ethos, 19(1)*, 3–51.

Nuckolls, C. W. (1992). Divergent ontologies of suffering in South Asia. *Ethnology, 31(1)*, 57–74. doi: 10.2307/3773442

Obeyesekere, G. (2002). *Imagining karma: Ethical transformation in Amerindian, Buddhist, and Greek rebirth*. Berkeley, CA: University of California Press.

Ofori, P. K., Tod, D., & Lavallee, D. (2017). Predictors of superstitious beliefs. *Journal of Psychology in Africa, 27(1),* 1–12. doi: 10.1080/14330237.2016.1185909

Park, C. L., Edmondson, D., & Hale-Smith, A. (2013). Why religion? Meaning as motivation. In *APA handbook of psychology, religion, and spirituality (Vol 1): Context, theory, and research*. (pp. 157–171). Washington, DC: American Psychological Association. doi: 10.1037/14045-008

Pennycook, G., Ross, R. M., Koehler, D. J., & Fugelsang, J. A. (2016). Atheists and agnostics are more reflective than religious believers: Four empirical studies and a meta-analysis. *PLOS ONE, 11(4),* e0153039. doi: 10.1371/journal.pone.0153039

Pew Research Center. (2014). *Worldwide, many see belief in god as essential to morality*. Retrieved October 31, 2016, from http://www.pewglobal.org/2014/03/13/worldwide-many-see-belief-in-god-as-essential-to-morality/

Pew Research Center. (2015). *The future of world religions: Population growth projections, 2010–2050.* Retrieved from http://www.pewforum.org/2015/04/02/religious-projections-2010-2050/

Pichon, I., & Saroglou, V. (2009). Religion and helping: Impact of target thinking styles and just-world beliefs. *Archive for the Psychology of Religion, 31(2)*, 215–236. doi: 10.1163/157361209X424466

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

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. doi: 10.1111/j.1551-6709.2012.01242.x

Purzycki, B. G., Henrich, J., Apicella, C., Atkinson, Q. D., Baimel, A., Cohen, E., … Norenzayan, A. (2017). The evolution of religion and morality: A synthesis of ethnographic and experimental evidence from eight societies. *Religion, Brain & Behavior, 8(2),* 101–132. doi: 10.1080/2153599X.2016.1267027

Purzycki, B. G., Pisor, A. C., Apicella, C., Atkinson, Q., Cohen, E., Henrich, J., … Xygalatas, D. (2018). The cognitive and cultural foundations of moral behavior. *Evolution and Human Behavior, 39(5),* 490–501. doi: 10.1016/j.evolhumbehav.2018.04.004

Purzycki, B. G., Ross, C. T., Apicella, C., Atkinson, Q. D., Cohen, E., McNamara, R. A., … Henrich, J. (2018). Material security, life history, and moralistic religions: A cross-cultural examination. *PLOS ONE, 13*(3), e0193856. doi: 10.1371/journal.pone.0193856

Purzycki, B. G., & Sosis, R. (2011). Our gods: Variation in supernatural minds. In U. J. Frey, C.

    Störmer, & K. P. Willführ (Eds.), *Essential Building Blocks of Human Nature* (pp. 77–93).

    Berlin: Springer Berlin Heidelberg. doi: 10.1007/978-3-642-13968-0_5

Purzycki, B. G. (2013). The minds of gods: A comparative study of supernatural agency.

    Cognition, 129(1), 163–179. doi: 10.1016/j.cognition.2013.06.010

Rai, T. S., & Fiske, A. P. (2011). Moral psychology is relationship regulation: Moral motives for

    unity, hierarchy, equality, and proportionality. *Psychological Review, 118(1)*, 57–75. doi:

    10.1037/a0021867

Raman, L., & Gelman, S. A. (2004). A cross-cultural developmental analysis of children's and

    adults' understanding of illness in South Asia (India) and the United States. *Journal of

    Cognition & Culture, 4(2)*, 293–317. doi: 10.1163/1568537041725088

Raman, L., & Winer, G. A. (2002). Children's and adults' understanding of illness: Evidence in

    support of a coexistence model. *Genetic, Social, And General Psychology Monographs,

    128(4),* 325–355.

Raman, L., & Winer, G. A. (2004). Evidence of more immanent justice responding in adults than

    children: A challenge to traditional developmental theories. *British Journal of

    Developmental Psychology, 22(2)*, 255–274. doi: 10.1348/026151004323044609

Riany, Y. E., Cuskelly, M., & Meredith, P. (2016). Cultural beliefs about autism in Indonesia.

    International Journal of Disability, Development and Education, 63(6), 623–640. doi:

    10.1080/1034912X.2016.1142069

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

    evolution*. Chicago: University of Chicago Press.

Richerson, P. J., & Christiansen, M. H. (2013). *Cultural evolution: Society, technology, language, and religion*. Cambridge, MA: MIT Press.

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

Rogers, T., Goldstein, N. J., & Fox, C. R. (2018). Social mobilization. *Annual Review of Psychology, 69(1)*, 357–381. doi: 10.1146/annurev-psych-122414-033718

Ross, R., Sawatphanit, W., & Suwansujarid, T. (2007). Finding peace (Kwam Sa-ngob Jai): A Buddhist way to live with HIV. *Journal of Holistic Nursing, 25(4),* 228–235. doi: 10.1177/0898010106297711

Rudski, J. M., & Edwards, A. (2007). Malinowski goes to college: Factors influencing students' use of ritual and superstition. *The Journal of General Psychology, 134(4)*, 389–403. doi: 10.3200/GENP.134.4.389-404

Sanchez, C., Sundermeier, B., Gray, K., & Calin-Jageman, R. J. (2017). Direct replication of Gervais & Norenzayan (2012): No evidence that analytic thinking decreases religious belief. *PLOS ONE, 12(2)*, e0172636. doi: 10.1371/journal.pone.0172636

Schloss, J. P., & Murray, M. J. (2011). Evolutionary accounts of belief in supernatural punishment: A critical review. *Religion, Brain & Behavior, 1(1),* 46–99. doi: 10.1080/2153599X.2011.558707

Shariff, A. F., & Norenzayan, A. (2011). Mean gods make good people: Different views of god predict cheating behavior. *The International Journal for the Psychology of Religion, 21(2)*, 85–96. doi: 10.1080/10508619.2011.556990

Shariff, A. F., & Norenzayan, A. (2015). A question of reliability or of boundary conditions?

    Comment on Gomes and McCullough (2015). *Journal of Experimental Psychology:*

    General, 144(6), e105–e106. doi: 10.1037/xge0000111

Shariff, A. F., & Rhemtulla, M. (2012). Divergent effects of beliefs in heaven and hell on

    national crime rates. *PLOS ONE, 7(6),* 1–5. doi: 10.1371/journal.pone.0039048

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. doi: 10.1177/1088868314568811

Sherrill, M. (2000). *The Buddha from Brooklyn.* New York: Random House.

Shinohara, K. (2012). Removal of sins in esoteric Buddhist rituals: A study of the Dafangdeng

    Dharani scripture. In P. E. Granoff & K. Shinohara (Eds.), *Sins and sinners: Perspectives*

    from Asian Religions (pp. 243–275). Boston: Brill.

Shtulman, A., & Lindeman, M. (2016). Attributes of god: Conceptual foundations of a

    foundational belief. *Cognitive Science, 40(3),* 635–670. doi: 10.1111/cogs.12253

Shweder, R. A., Much, N. C., Mahapatra, M., & Park, L. (1997). The "big three" of morality

    (autonomy, community, divinity) and the "big three" explanations for suffering. In A. M.

    Brandt & P. Rozin (Eds.), *Morality and Health* (pp. 119–169). New York: Routledge.

Sibley, C. G., & Bulbulia, J. (2012). Faith after an earthquake: A longitudinal study of religion

    and perceived health before and after the 2011 Christchurch New Zealand earthquake.

    PLOS ONE, 7(12), e49648. doi: 10.1371/journal.pone.0049648

Singh, M. (2018a). *Magic, explanations, and evil: On the origins and design of witches and*

    sorcerers. SocArXiv. doi: 10.31235/osf.io/pbwc7

Singh, M. (2018b). The cultural evolution of shamanism. *Behavioral and Brain Sciences, 41*.

    doi: 10.1017/S0140525X17001893

Skitka, L. J., Hanson, B. E., Washburn, A. N., & Mueller, A. B. (2018). Moral and religious

    convictions: Are they the same or different things? *PLOS One, 13(6),* e0199311. doi:

    10.1371/journal.pone.0199311

Sørensen, J. (2007). Acts that work: A cognitive approach to ritual agency. *Method & Theory in*

    the Study of Religion, 19(3-4), 281–300.

Stark, R. (1997). *The rise of Christianity: How the obscure, marginal Jesus movement became*

    the dominant religious force in the Western world in a few centuries. San Francisco, Calif.:

    Harper One.

Stellar, J. E., & Willer, R. (2018). Unethical and inept? The influence of moral information on

    perceptions of competence. *Journal of Personality and Social Psychology, 114(2)*, 195–

    210. doi: 10.1037/pspa0000097

Suchday, S., Santoro, A. F., Ramanayake, N., Lewin, H., & Almeida, M. (2018). Religion,

    spirituality, globalization reflected in life beliefs among urban Asian Indian youth.

    Psychology of Religion and Spirituality, 10(2), 146 - 156. doi: 10.1037/rel0000161

Surian, L., & Franchin, L. (2017). Infants reason about deserving agents: A test with distributive

    actions. *Cognitive Development, 44*, 49–56. doi: 10.1016/j.cogdev.2017.08.009

Tang, P.-L., Mayer, D. K., Chou, F.-H., & Hsiao, K.-Y. (2016). The experience of cancer stigma

    in Taiwan: A qualitative study of female cancer patients. *Archives of Psychiatric Nursing,*

    30(2), 204–209. doi: 10.1016/j.apnu.2015.08.015

Thi Ho, H., & Maher, L. (2008). Có vay có trá; (what goes around comes around): Culture, risk and vulnerability to blood-borne viruses among ethnic Vietnamese injecting drug users. *Drug and Alcohol Review, 27(4)*, 420–428. doi: 10.1080/09595230801914743

Toffin, G. (2012). Sin and expiation in Nepal: The Makar Mela Pilgrimage in Panuti. In P. E. Granoff & K. Shinohara (Eds.), *Sins and sinners: Perspectives from Asian Religions* (pp. 324–356). Boston: Brill.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185(4157),* 1124–1131.

Uhlmann, E. L., Pizarro, D. A., & Diermeier, D. (2015). A person-centered approach to moral judgment. *Perspectives on Psychological Science, 10(1),* 72–81. doi: 10.1177/1745691614556679

Vail, K. E., Rothschild, Z. K., Weise, D. R., Solomon, S., Pyszczynski, T., & Greenberg, J. (2010). A terror management analysis of the psychological functions of religion. *Personality and Social Psychology Review, 14(1)*, 84–94. doi: 10.1177/1088868309351165

van Elk, M., Matzke, D., Gronau, Q. F., Guan, M., Vandekerckhove, J., & Wagenmakers, E.-J. (2015). Meta-analyses are no substitute for registered replications: A skeptical perspective on religious priming. *Frontiers in Psychology, 6.* doi: 10.3389/fpsyg.2015.01365

Van Leeuwen, N., & van Elk, M. (2018). Seeking the supernatural: The interactive religious experience model. *Religion, Brain & Behavior, 8,* 1–31. doi: 10.1080/2153599X.2018.1453529

Vauclair, C.-M., Wilson, M., & Fischer, R. (2014). Cultural conceptions of morality: Examining laypeople's associations of moral character. *Journal of Moral Education, 43(1),* 54–74. doi: 10.1080/03057240.2013.873365

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, 282(1804),* 20142556. doi: 10.1098/rspb.2014.2556

Waytz, A., Cacioppo, J., & Epley, N. (2010). Who sees human? The stability and importance of individual differences in anthropomorphism. *Perspectives on Psychological Science, 5(3),* 219–232.

Waytz, A., Morewedge, C. K., Epley, N., Monteleone, G., Gao, J.-H., & Cacioppo, J. T. (2010). Making sense by making sentient: Effectance motivation increases anthropomorphism. *Journal of Personality and Social Psychology, 99(3)*, 410–435. doi: 10.1037/a0020240

Weeks, M., & Lupfer, M. B. (2000). Religious attributions and proximity of influence: An investigation of direct interventions and distal explanations. *Journal for the Scientific Study of Religion, 39(3),* 348–362.

White, C. (2017). Who wants to live forever? *Journal of Cognition and Culture, 17(5),* 419–436. doi: 10.1163/15685373-12340016

White, C. J. M. (2017). *Belief in karma: The content and correlates of supernatural justice beliefs across cultures* (Master's Thesis). University of British Columbia. doi: 10.14288/1.0353174

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.* Under Review. doi: 10.31234/osf.io/w4dfp

White, C. J. M., & Norenzayan, A. (2019). *Mental models of supernatural morality*. Manuscript in Preparation.

White, C. J. M., Norenzayan, A., & Schaller, M. (In press). The content and correlates of belief in Karma across cultures. *Personality and Social Psychology Bulletin*. doi: 10.1177/0146167218808502

White, C. J. M., & Schaller, M. (2018). Are children perceived to be morally exceptional? Different sets of psychological variables predict adults' moral judgments about adults and young children. *Personality and Social Psychology Bulletin, 44(8),* 1147–1162. doi: 10.1177/0146167218760800

White, C. J. M., Schaller, M., & Norenzayan, A. (2019). *Consistency and disruptions in character inferences made from adults and children's moral actions*. Manuscript in Preparation.

White, C. J. M., Woo, B. M., Norenzayan, A., & Hamlin, J. K. (2019). *Infants' understanding of interpersonal and immanent justice.* Unpublished Data.

Willard, A. K., & Cingl, L. (2017). Testing theories of secularization and religious belief in the Czech Republic and Slovakia. *Evolution and Human Behavior, 38(5)*, 604 - 615. doi: 10.1016/j.evolhumbehav.2017.01.002

Willard, A. K., Cingl L., & Norenzayan, A. (in press). Cognitive biases and religious belief: A path model replication in the Czech Republic and Slovakia with a focus on anthropomorphism. *Social Psychological and Personality Science*.

Willard, A. K., Henrich, J., & Norenzayan, A. (2016). Memory and belief in the transmission of

    counterintuitive content. *Human Nature, 27(3),* 221 - 243. doi:10.1007/s12110-016-9259-6

Willard, A. K., & Norenzayan, A. (2013). Cognitive biases explain religious belief, paranormal

    belief, and belief in life's purpose. *Cognition, 129(2),* 379–391. doi:

    10.1016/j.cognition.2013.07.016

Willard, A. K., & Norenzayan, A. (2017). "Spiritual but not religious": Cognition, schizotypy,

    and conversion in alternative beliefs. *Cognition, 165,* 137–146. doi:

    10.1016/j.cognition.2017.05.018

Woolley, J. D., Cornelius, C. A., & Lacy, W. (2011). Developmental changes in the use of

    supernatural explanations for unusual events. *Journal of Cognition and Culture, 11(3–4),*

    311–337. doi: 10.1163/156853711X591279

Wright, N. S. (2014). The soul gets typecast: The reincarnation film in popular Hindi cinema.

    New Cinemas: Journal of Contemporary Film, 12(1-2), 113–132. doi: 10.1386/ncin.12.1-

    2.113_1

Wu, C., & Liu, Y. (2014). Religious coping in life difficulties: A case study of Taiwanese folk

    religion female believers. *Mental Health, Religion & Culture, 17(2)*, 210–218. doi:

    10.1080/13674676.2013.787976

Yen, C. L. (2013). It is our destiny to die: The effects of mortality salience and culture-priming

    on fatalism and karma belief. *International Journal of Psychology, 48(5)*, 818–828. doi:

    10.1080/00207594.2012.678363

Yeo, S. S., Meiser, B., Barlow-Stewart, K., Goldstein, D., Tucker, K., & Eisenbruch, M. (2005).

    Understanding community beliefs of Chinese-Australians about cancer: Initial insights

    using an ethnographic approach. *Psycho-Oncology, 14(3)*, 174–186. doi: 10.1002/pon.831

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. doi: 10.1016/j.evolhumbehav.2015.09.005

Young, M. J., Morris, M. W., Burrus, J., Krishnan, L., & Regmi, M. P. (2011). Deity and

    destiny: Patterns of fatalistic thinking in Christian and Hindu Cultures. *Journal of Cross-*

    Cultural Psychology, 42(6), 1030–1053. doi: 10.1177/0022022110381123

Figures

Figure 1. Faith in intuition, supernatural beliefs, and justice beliefs predicting belief in Karma across countries, with 95% confidence bands. Adapted from data reported in White et al. (in press), with Indian samples from Studies 1 and 3 grouped into a single sample. All relationships are significant at p < .001.
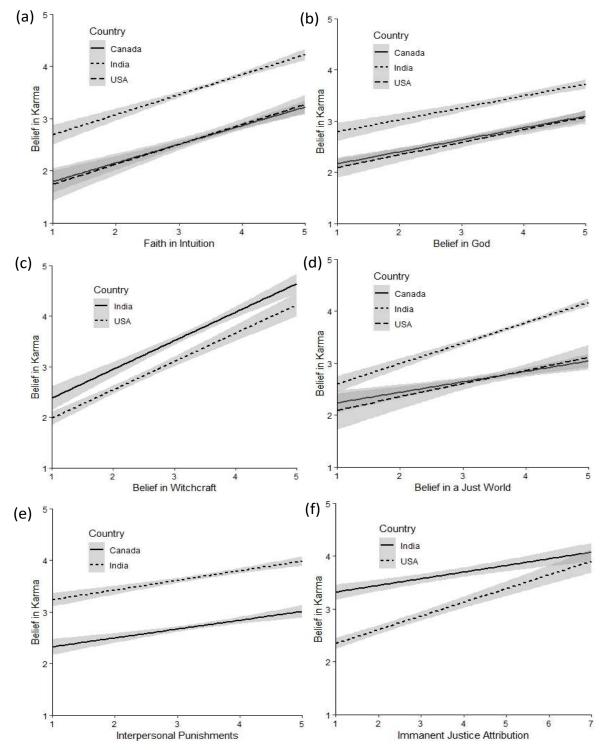
Figure 2. Religiosity predicting belief in Karma (left) and belief in God (right) among Canadian students (n = 1664), across religious affiliations. Omits participants who reported being atheists, agnostic, or non-religious, due to ambiguity about what level of religiosity means for these samples. Adapted from data reported in White et al. (in press), Study 1.
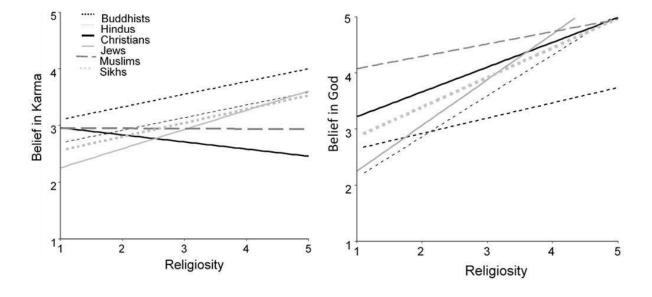
Figure 3. Mean dictator game giving before (pre-framing) and after (post-framing) instructions to think about God or Karma. Thinking about God reduced selfishness among God believers and Christians, and thinking about karma reduced selfishness among karma believers, Hindus, and Buddhists. Among comparable participants who received control (neutrally-framed, non-supernatural) instructions, the rate of giving did not change across trials. Redrawn from data reported in White, Kelly, et al. (2019), Experiments 1 and 2.
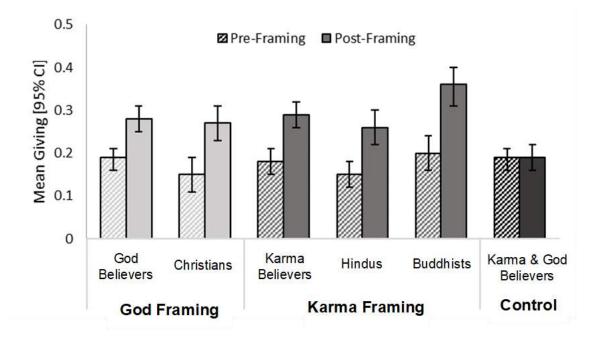
Figure 4. Mean dictator game giving before (pre-framing) and after (post-framing) instructions to think about God or Karma, among believers and non-believers. Redrawn from data reported in White, Kelly, et al. (2019), Experiment 3.