

THE COGNITIVE FOUNDATIONS AND PROSOCIAL CONSEQUENCES OF BELIEF IN
KARMA AND GODS

by

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Abstract

People worldwide believe that supernatural forces monitor and respond to human moral action, and determine who experiences good fortune and who suffers and struggles in life. This dissertation examines the psychological diversity of these by beliefs, by investigating beliefs about karma (morally-determined causality) and gods (powerful supernatural agents). Chapter 1 introduces these beliefs as psychological constructs, situated within cultural evolution theories of religion that have proposed that belief in morally-concerned supernatural entities facilitates large-scale cooperation among strangers. Chapter 2 investigates the cognitive foundations of these beliefs, by using path models to show how individual differences in karma and God beliefs can be predicted by a combination of (a) cognitive predispositions that are cross-culturally widespread but variable across individuals and (b) social learning that is highly variable across different cultural contexts. I then show how beliefs about karma and God are associated with social judgments and moral behavior. Chapter 3 asks whether belief in karma can affect social judgments, by moderating the association between moral character inferences and forecasts about the future, consistent with the explicitly endorsed belief in karmic causality through which bad things are more likely to happen to bad people. Chapter 4 describes how believers mentally represent karma and God's moral concerns—according to both open-ended free list questions and closed-ended psychological questionnaires. I examine how these supernatural beliefs partially reflect individuals' secular moral values and partially reflects the unique relationships that believers have with different supernatural entities. Chapter 5 provides experimental studies that investigate whether reminders of these morally laden supernatural beliefs cause decreased selfishness among believers, compares the prosocial effects of karma and God, and tests several boundary conditions of these effects. Throughout this research, I present high-powered, pre-

registered studies conducted with religiously-diverse samples from North America and Asia, to compare the psychology of karma beliefs in cultural contexts with a long history of karmic theology and in cultural contexts where karmic beliefs are present but less ubiquitous and exist outside of mainstream (Christian) religious doctrines. Finally, I conclude by discussing implications, remaining questions, and possibilities for future research that extends these findings.

Lay Summary

This dissertation investigates the causes and consequences of belief in karma and God, two diverse supernatural justice beliefs that have different cultural origins but are both intertwined with the moral beliefs of many people around the world. Chapter 1 introduces how people think about karma and God and describes how these diverse beliefs can arise through the evolution of culture. Chapter 2 investigates whether the strength of a person's belief can be predicted by the combination of their intuitive cognitive biases and information learned from their culture. I then investigate how beliefs about karma and God are associated with moral psychology, including expectations about the outcomes of moral transgressions (Chapter 3), beliefs about which actions deserve supernatural rewards and punishment (Chapter 4), and generosity towards strangers (Chapter 5). These studies demonstrate how a variety of culturally-diverse beliefs about supernatural justice have unique associations with social cognition and interpersonal behavior.

Preface

Large portions of the introduction (Chapter 1) and discussion (Chapter 6) of this dissertation were previously published as White, C. J. M., & Norenzayan, A. (2019). Belief in karma: How cultural evolution, cognition, and motivations shape belief in supernatural justice. In J. M. Olson (Ed.), *Advances in Experimental Social Psychology* (Vol. 60, pp. 1–63). doi: 10.1016/bs.aesp.2019.03.001. I was the primarily author responsible for writing this theoretical review chapter, in collaboration with Ara Norenzayan. This review chapter has been substantially edited and rearranged in order to frame the studies included in this dissertation

A version of Chapter 2 has been published as White, C. J. M., Willard, A.K., Baimel, A., & Norenzayan, A. (2021). Cognitive pathways to belief in karma and belief in God. *Cognitive Science*, 45(1): e12935. doi: 10.1111/cogs.12935. I was the primary author responsible for initiating, running, and analyzing the results for these studies, as well as writing the initial draft of this manuscript. This was a collaboration with Aiyana Willard, Adam Baimel, and Ara Norenzayan, who contributed to the design of these studies, interpretation of results, and edits to the manuscript.

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manuscript. Ara Norenzayan contributed to the interpretation of results and edits to the manuscript.

Chapter 4 has not been previously published. I was the primary author responsible for initiating, running, and analyzing the results for these studies, as well as writing the initial draft of this manuscript. Ara Norenzayan was also involved in generating the initial study concept, and for providing supervision throughout the project and feedback on the manuscript.

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Chapter 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? Throughout the world, people believe in a variety of supernatural forces that determine these type of life outcomes. For many people, such as the 3.8 billion devotees of Christianity, Islam, or Judaism (Pew Research Center, 2015), these forces take the form of an omniscient, morally concerned God, who believers can have a personal relationship with through appropriate religious devotion. For others, such as the 1.5 billion followers of Hinduism, Buddhism, and their offshoots such as Jainism, these forces take the form of impersonal laws of causality such as karma, which ensure that good acts cause good things to happen, and bad acts cause bad things to happen. Karma, like many gods, involves belief in supernaturally enforced causal connections between moral actions and their consequences. This belief in morally contingent causality is etched into the fabric of the universe over long timescales, and plays out even when no physical connection is discernible between actions and experiences. The idea that “what goes around, comes around” 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 this concept 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, especially compared to the extensive literature regarding the psychology of belief in God and devotion to theistic religious traditions. This

oversight of karma is not surprising, considering that only a fraction of the world's vast cultural diversity makes it into the psychological laboratory (Henrich, Heine, et al., 2010), a state of affairs that persists in psychology's treatment of religion (Norenzayan, 2016). In this dissertation, I present several studies describing the psychological similarities and differences between belief in karma and belief in God, to contribute to our understanding of the cultural diversity across religious traditions (Cohen, 2009; Norenzayan, 2016; Saroglou & Cohen, 2013).

In the introduction, I review existing literature on belief in God and belief in a Just World within a cultural evolutionary framework. I present several hypotheses for how belief in karma can be integrating into these existing frameworks. In Chapter 2, I present empirical evidence of the different ways that people conceptualize karma and God, and investigate the cognitive variables that predict who is most likely to hold these beliefs across different cultural contexts. Chapters 3 – 5 then present several studies examining how these beliefs about karma and God affect social judgments and interpersonal behavior, and I describe how similarities and differences in these effects can be traced to similarities and differences between mental models of karma and God. Finally, in Chapter 6 I discuss how this research broadens our understanding of the psychology of supernatural justice beliefs and I present several ideas for future studies that build on this line of research.

What is belief in karma?

Throughout this dissertation, I 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 et al., 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 et al., 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 et al., 2012; Ross et al., 2007).

To measure belief in karma as conceptualized above, I developed the “Belief in Karma Questionnaire” (White, Norenzayan, & Schaller, 2019). Using this questionnaire, I have found that this belief—combining elements of morality, causality, and reincarnation—reflects a meaningful and coherent individual difference, with good reliability and validity. I 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. 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.

Conceptual similarities between karma, god, and non-supernatural justice beliefs imply that these beliefs may be influenced by similar evolutionary processes, they may be rooted in similar cognitive mechanisms, and they 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. The following sections 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.

Karma in Relation to God

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. 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 also karma, are viewed 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).

Gods, on the other hand, 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 in the same way they would with other humans (e.g., viewing god as an attachment figure, Davis, Moriarty, & Mauch, 2013; Granqvist, Mikulincer, & Shaver, 2010). Karma, however, 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). 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. I present several empirical tests of this question in Chapters 2 and 4.

Karma, Justice, and Fairness

Karma is 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 et al., 2015, 2017; 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). Children also show an early-emerging preference for prosocial others (e.g., Hamlin, Wynn, & Bloom, 2007, for a meta-analysis see Margoni & Surian, 2018), and an understanding (and approval) of equitable rewards and third-party punishment (e.g., DesChamps et al., 2016; Hamlin et al., 2011; Meristo & Surian, 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). 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., 2019).

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 it reflects a person's moral character, even when these past actions and character traits are not specified or are 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 et al., 2006, 2010; M. J. Young et al., 2011). Even people who explicitly deny immanent justice attributions show evidence of intuitive reactions that are consistent with fairness principles (Baumard & Chevallier, 2012). Similar expectations appear among North Americans when making predictions about the future.

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 et al., 2012).

These previous results imply that immanent justice attributions (analogous to the concept of karma) may result from intuitions that are prevalent in many populations, regardless of their exposure to particular karmic religious doctrines. Past research has likewise hypothesized that belief in God can arise from basic features of cognitive intuitions that are independent of religious doctrine (Atran, 2002; Barrett, 2004; Kelemen, 2004; Pennycook, Ross, Koehler, & Fugelsang, 2016; Willard & Norenzayan, 2013; Willard, Cingl, & Norenzayan, 2020). Chapter 2 therefore begins by investigating the cognitive intuitions that may support belief in karma, and compares them to the cognitive predictors of belief in God.

Dual Process and Cognitive By-Product Accounts of Belief in Karma and Gods

Who believes that karma and god are real, active influences in their life, that deserve behavioral signals of commitment? In explaining the cross-cultural prevalence of supernatural justice beliefs, a good place to begin is the basic cognitive processes that make such beliefs intuitively compelling, and 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; J. L. 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 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 having two distinct cognitive systems to guide judgments about psychology and judgments about physics (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. Available evidence supports the claim that cognitive bias towards intuitive, mentalistic, dualistic, and teleological thinking styles predict belief in God (Baimel, 2019; Gervais et al., 2018; Norenzayan et al., 2012; Pennycook et al., 2016; Willard & Cingl, 2017; Willard & Norenzayan, 2013; Willard, Cingl, & Norenzayan, 2020).

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. Similar to 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. In Chapter 2, I present two studies, using four high-powered religiously diverse samples from Canada, the United States, India, and Singapore, that investigate whether individual differences in cognitive tendencies—including intuitive thinking styles, mentalizing, mind-body dualism, and teleological thinking—predict both belief in karma and belief in God.

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

Intuitions may encourage, and to some extent constrain, particular supernatural beliefs, but explicit beliefs do not follow from intuitions without additional factors. Intuitions cannot fully explain the exact form that an individual's explicit judgments will take, such as why people would believe in a personal, anthropomorphic, benevolent god rather than believe in non-agentic karmic forces as the source of their good fortune. 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). 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.

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 the cultural transmission and evolutionary selection pressures on religious information (Richerson & Boyd, 2005). Through cultural transmission and evolution, 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, 2015; Richerson & Christiansen, 2013). Therefore, to understand how this cultural evolutionary process applies to God and karma beliefs, it is necessary to understand how culturally-transmitted beliefs about karma and god manifest in social judgments and interpersonal behavior. Below, I review existing evidence for the cultural

evolution of belief in morally concerned gods, and describe how this perspective can be fruitfully applied to explain belief in karma. In Chapters 3 – 5, I test hypotheses derived from this account by documenting how beliefs about karma and God affect social judgments and interpersonal behavior.

The Cultural Evolution of Belief in Morally-Concerned Gods

There is substantial evidence that cultural learning, especially observing credible signals of religious beliefs (Gervais et al., 2011; Henrich, 2009; Lanman & Buhrmester, 2016), is a strong predictor of which supernatural concepts people hold and how committed they are to these beliefs (Gervais et al., 2010, specifically regarding belief in god: Gervais & Najle, 2015, Maij et al., 2017, Willard & Cingl, 2017; and regarding belief in karma: White, Norenzayan, et al., 2019). The prevalence of religious beliefs 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.

This type of cultural evolutionary argument has been thoroughly investigated regarding belief in morally-concerned gods as motivators of intragroup cooperation and solidarity (for

reviews of this “Big Gods” theory, see Norenzayan, 2013; Norenzayan et al., 2016; see also Atran & Henrich, 2010). 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). The hypothesis is that in the crucible of escalating intergroup competition and conflict through historical time, these features outcompeted rival cultural variants of deities with more limited omniscience and 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 are now called “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).

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; 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, Purzycki, Apicella, Atkinson, Alexander, et al., 2019; 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).

We have much less empirical evidence of whether reminders of karma have similar effects, but I hypothesize that the gradual intertwining of the supernatural and the moral, which shaped Abrahamic traditions over time, has similarly shaped karmic religious 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 entirely absent in the Abrahamic ones. The notion of rebirth—present in many small-scale societies, historical and contemporary—is not necessarily connected to morality, but instead is 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.

In Chapters 3 – 5 of this dissertation, I provide evidence of how karma reflects an explicitly-held belief that reflects the intertwining of beliefs about supernatural causality and moral values, such that interpersonal moral virtues and interpersonal transgressions are expected to result in rewards and punishments later in life. Finally, I present four experiments testing whether reminders of these morally laden beliefs about karma can decrease selfishness among karma believers, similar to how reminders of God decrease selfishness among God believers. Below, I review these hypotheses and the existing evidence available in previous literature.

Explicit Belief in Karma and Causal Attributions

Central to the concept of karma is the expectation of punishments and rewards for (im)moral behavior, even when these punishments and rewards do not come at the hands of human judges who are aware of the original transgressions. But are people who believe in karma actually more likely to make inferences consistent with karmic causality? That is, are karma believers more likely to perceive causal connections between moral behavior and misfortune in life?

Available evidence indicates that 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). However, 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).

Chapter 3 provides further evidence that belief in karma is associated with karma-consistent social judgments, in the context of predictions about the likelihood of future outcomes faced by moral transgressors. Among all participants, there is likely to be a general tendency to expect that moral transgressors will experience life outcomes commensurate with their immoral behavior. Chapter 3 tests whether this relationship is likely to be stronger among participants

who explicitly believe in the existence of karma. Together with past research on retrospective attributions for misfortune, these prospective forecasts about future outcomes would demonstrate that self-reported belief in karma is associated with inferences consistent with karmic retribution.

Moral Mental Models of Karma and God

Chapters 4 and 5 then test how these expectations about karmic causality are intertwined with moral values about what is right and wrong, and how this combination of beliefs can motivate prosocial behavior. A key prediction of cultural evolutionary accounts is that supernatural justice concepts can, at least under certain circumstances, elicit prosocial behavior. Specifically, reminders of the belief that there will be supernatural consequences (divine retribution, karmic payback) for a particular immoral action should decrease believers' willingness to engage in that action, especially in situations that would ordinarily result in immorality. But which actions are believed to elicit supernatural rewards and punishments?

The expectation that supernatural entities care about interpersonal morality is widespread, but not universal (Norenzayan et al., 2016; Purzycki & Sosis, 2011), and 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., 2019). 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.

Less research has investigated heterogeneity in beliefs about karma and whether the specificity of karma beliefs predicts specific behavior. Chapter 4 therefore tests this hypothesis that individuals who believe in karma perceive karma as rewarding and punishing interpersonal morality (e.g., generosity, fairness, and kindness to others), and how these beliefs are associated with interpersonal moral values and with the perceived moral concerns of gods. The expectation of karmic payback for immoral behavior (Chapter 3), combined with the expectation that generosity/selfishness is one of the immoral behaviors that is especially likely to elicit punishment from karma and gods (Chapter 4), leads to the prediction, tested in Chapter 5, that reminders of both karma and god will encourage generosity/decrease selfishness among believers.

Reminders of Supernatural Justice Beliefs Encourage Prosocial Behavior

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 11,000 participants from 93 studies (Shariff et al., 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).

In order to test whether thinking about karma increases prosocial behavior, Chapter 5 presents 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. For the sake of comparison, I also tested whether thinking about god encouraged prosociality in the same experimental paradigm. My 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. These studies replicate the behavioral effects of explicitly priming belief in God, and also provide the first demonstration that reminders of karma have similar prosocial consequences, thus supporting the claim that karma, like belief in a morally-concerned God, can be understood as a culturally-evolved supernatural punishment belief that encourages prosociality among groups of believers.

Overview of Studies

This dissertation presents a series of studies that describe the psychological causes and consequences of belief in karma and belief in God. Chapter 2 investigates the cognitive foundations of these beliefs, by using path models to examine whether individual differences in karma and God beliefs can be predicted by a combination of (a) cognitive predispositions that are cross-culturally widespread but variable across individuals and (b) social learning that is

highly variable across different cultural contexts. I then investigated how beliefs about karma and God are associated with social judgments and moral behavior. Chapter 3 investigates whether belief in karma can affect social judgments, by moderating the association between moral character inferences and forecasts about the future, consistent with the explicitly endorsed belief in karmic causality through which bad things are more likely to happen to bad people. Chapter 4 describes how believers mentally represent karma and God's moral concerns—according to both open-ended free list questions and closed-ended psychological questionnaires. I examine how these supernatural beliefs partially reflect individuals' secular moral values and partially reflect the unique relationships that believers have with different supernatural entities. Chapter 5 provides experimental studies that investigate whether reminders of these morally laden supernatural beliefs cause decreased selfishness among believers, compares the prosocial effects of karma and God, and tests several boundary conditions of these effects. Throughout this research, I present high-powered, pre-registered studies conducted with religiously-diverse samples from North America and Asia. This provides a comparison of the psychology of karma beliefs in cultural contexts with a long history of karmic theology and in cultural contexts where karmic beliefs are present but less ubiquitous and exist outside of mainstream (Christian) religious doctrines. Finally, in Chapter 6 I conclude by discussing implications, remaining questions, and possibilities for future research that extend these findings.

Procedures for all studies were approved by the Behavioral Research Ethics Board at the University of British Columbia (#H11-02441 and # H15-03085), and all participants provided written consent.

Chapter 2: Cognitive pathways to belief in karma and belief in God

All around the world people believe in a myriad of gods, spirits, and other supernatural forces that intervene in human affairs, cause misfortune, bring blessings, and maintain justice and order in the universe. One prominent explanation for the cross-cultural and historical ubiquity of these beliefs is that recurrent features of human cognition make these particular forms of supernatural beliefs intuitively compelling (Atran & Norenzayan, 2004; Barrett, 2000, 2010; Bering, 2010; Boyer, 2001; Guthrie, 1993). The tendency to consider unseen mental states as a source of observable behavior, the expectation that minds are fundamentally different and separate from physical bodies, and the attribution of function to natural phenomena make it easy to accept culturally-transmitted information about unseen, disembodied supernatural agents that intervene in life events and regulate human behavior. Conversely, there is some evidence that individuals who struggle to understand human minds, who do not espouse dualistic and teleological intuitions, or who tend to override their intuitive reactions in favor of more analytical thinking tend to be less committed to a variety of supernatural and religious beliefs (e.g., Gervais et al., 2018; Pennycook, Ross, Koehler, & Fugelsang, 2016; Riekkki, Lindeman, & Lipsanen, 2013; Willard, Cingl, & Norenzayan, 2020; Willard & Norenzayan, 2013; but see also Farias et al., 2017; Lindeman, Svedholm-Häkkinen, & Lipsanen, 2015; Majj et al., 2017; Sanchez, Sundermeier, Gray, & Calin-Jageman, 2017).

Past research regarding the cognitive foundations of religious beliefs has largely investigated the predictors of belief in God, especially in historically-Christian cultural contexts (for a recent exception comparing conceptions of Hindu gods and the Islamic God, see Shtulman, Foushee, Barner, Dunham, & Srinivasan, 2019; see also Baimel, 2019). In this chapter I investigate, in two studies of diverse samples, the applicability of cognitive theories of

supernatural beliefs to the culturally widespread belief in karma and compared these patterns to the cognitive predictors of belief in God. I investigate these associations through patterns of individual differences within four cross-cultural samples, including participants from Canada, the United States, India, and Singapore.

Intuitions supporting belief in God

There is mounting evidence that many supernatural beliefs partly draw on intuitive cognitive processes that are widespread among children and adults from many cultures, and that there are reliable associations between individual differences in these cognitive tendencies and individual differences in supernatural beliefs. Individuals who tend to trust their intuitions express somewhat stronger belief in God, while those more willing to engage in analytic thinking tend to be somewhat more skeptical. While these associations are small in magnitude (with a typical effect size of about $r = .18$), and there are lively debates about their robustness (e.g., Gervais et al., 2018; Maij et al., 2017; Stagnaro, Ross, Pennycook, & Rand, 2019), they have emerged in high-powered samples, in several cultural contexts, and are robust to demographic controls and various types of measurement (Baimel et al., in press; Gervais et al., 2018; Pennycook et al., 2016; Stagnaro et al., 2019). Additionally, belief in God is predicted by cognitive tendencies for mentalizing (perceiving and engaging with other *human* minds, Frith & Frith, 2012); mind-body dualism (thinking about minds as separate and independent from physical bodies, Astuti & Harris, 2008; Chudek, McNamara, Birch, Bloom, & Henrich, 2018; Cohen, Burdett, Knight, & Barrett, 2011; Järnefelt, Canfield, & Kelemen, 2015; Slingerland & Chudek, 2011); and teleological thinking (reasoning about the purpose and intentional design of artifacts and biological entities, Banerjee & Bloom, 2014; Heywood & Bering, 2014; Kelemen,

2004; Kelemen & Rosset, 2009; for comprehensive path models of these relationships, see Willard et al., 2020; Willard & Norenzayan, 2013).

A plausible theoretical explanation for why *these particular* cognitive variables predict belief in God is that believers prototypically view God as an intentional agent, and a willingness to engage in mentalizing facilitates commitment to this *particular conceptualization* of God, while not facilitating commitment to abstract and impersonal conceptualization of God (Baimel, 2019). Many of the same socio-cognitive processes used to understand interpersonal relationships are also used when believers think about God. Believers often mentally represent God as a personified social agent, with many of the same perceptual capabilities, personality traits, and moral values that humans possess (Barrett & Keil, 1996; Epley, Converse, Delbosc, Monteleone, & Cacioppo, 2009; Heiphetz, Lane, Waytz, & Young, 2016; Purzycki, 2013; Shtulman & Lindeman, 2016), and this anthropomorphic view of God coexists and interacts with, and may even interfere with, later-acquired beliefs about God's abstract and superhuman qualities (Barlev et al., 2017, 2018, 2019). Praying to God engages many of the same neural regions employed to think about other people's mental states (Schjoedt et al., 2009; van Elk & Aleman, 2017), and believers enter into personal relationships with God, with expectations and obligations analogous to those found in interpersonal relationships (Granqvist et al., 2010; Rai & Fiske, 2011).

If engaging with the mind of God utilizes the same mentalizing abilities used to engage with human minds, this implies that individuals who struggle to understand human minds will also struggle to believe in a personal God. Consistent with this prediction, self-reported mentalizing tendencies have been found to predict stronger belief, whereas the autistic spectrum predicts less belief in a personal God (Barnes & Gibson, 2013; Gray et al., 2011; Anthony Ian

Jack et al., 2016; Lindeman et al., 2015; Lindeman & Lipsanen, 2016; Łowicki & Zajenkowski, 2019; Norenzayan et al., 2012; Włodarski & Pearce, 2016). Mentalizing tendencies have also been found to predict endorsement of mind body dualism and teleological explanations, which in turn predict the belief in disembodied supernatural agents like God, theistic explanations for natural phenomena, and the perception that life events happen for a reason (Banerjee & Bloom, 2014; Riekkari et al., 2013; Willard & Cingl, 2017; Willard & Norenzayan, 2013, 2017). In this paper, I specifically measure the connection between mentalizing and belief by this last indicator, that, in the general neurotypical population, individuals who feel greater willingness and ease in thinking about other people's mental states will hold more dualistic conceptions of the mind-body relationship and be more likely to imbue natural phenomena and life events with intentionality and purpose, and that these tendencies will predict belief in God.

Do intuitions also predict belief in karma?

The evidence that mentalizing—and related cognitive intuitions such as dualism and teleological thinking—predicts belief in God is theoretically and empirically justified by evidence that God is often perceived as a social agent, thus requiring cognitive abilities for mind perception. However, this perspective makes it unclear what relationship—if any—exists between these same cognitive tendencies and belief in ostensibly non-theistic supernatural forces. Karma therefore provides a theoretically interesting test case for cognitive theories of supernatural belief because, like belief in God, karma is a culturally-widespread belief about a moralizing supernatural force that responds to human actions such that good people experience good outcomes and bad people bad outcomes in life (Bronkhorst, 2011). Both God and karma reflect belief in culturally-transmitted concepts about supernatural entities that justify why people have particular good and bad experiences (Harvey & Callan, 2014; White, Norenzayan, et

al., 2019; Young et al., 2011), and reminders of God and karma both encourage prosocial behavior in economic games (Chapter 5). From a cultural evolutionary theoretical perspective, both belief in theistic and non-theistic forms of supernatural norm-enforcement may have played a role in facilitating increased social complexity over historical time (Norenzayan et al., 2016; Watts et al., 2015).

But unlike God, karma is not obviously personified in religious texts or in the thoughts and actions of believers. Instead, karma is often depicted as an impersonal force or if-then law that summarizes the causal connection between actions and experiences (Bronkhorst, 2011; Daniel, 1983; Wadley, 1983). For example, practitioners of Hinduism tend to believe in both gods and karma, but interact with them in radically different ways. Though Hindu beliefs and practices are extremely diverse and difficult to summarize succinctly, visual depictions of gods with human-like bodies are prominent in a majority of Hindu worship. Devotees often have personal relationships with their gods, which they express through emotional attachment, gestures of respect, and sacrificial offerings; no analogous devotional relationship exists towards karma. Similarly, believers will pray to gods and bargain with them to obtain desired outcomes, while the effects of karma are revealed through divination and escaped through penitential actions (Aktor, 2012; Fuller, 2004; Young, Morris, Burrus, Krishnan, & Regmi, 2011).

While many Buddhist traditions do not require or even encourage belief in gods or other supernatural agents, Buddhism is also diverse, and many Buddhists also believe that the world is inhabited by a variety of supernatural agents worthy of respect and devotion, and some ascribe to Buddha many of the omniscient, punitive, moralistic traits that characterize gods (Berniūnas et al., 2020; Purzycki & Holland, 2018; Stanford & Jong, 2019). In contrast, karma is typically characterized as the consequences for one's actions that are unrelated to divine intervention

(Bronkhorst, 2011; Gowans, 2014; Willard, Baimel, et al., 2020). Unlike Abrahamic religions, afterlife beliefs in Buddhism become moralized through their association with karma, not the belief in a moralistic God (Obeyesekere, 2002).

Many Hindus and Buddhists clearly interact with gods as personified agents, but it is less clear how they interact with karma and if this engages the same intuitions. What is the relationship then, between intuitive cognitive tendencies, mentalizing, and belief in karma? Below I outline two theoretically possible relationships, and then present two studies testing these predictions alongside a replication of previously reported predictors of belief in God, in samples from Canada, the United States, India, and Singapore, which vary in their cultural exposure to God and karma beliefs.

Karma reflects unique intuitions about immanent justice, unrelated to the mind perception involved in God beliefs

One possibility is that belief in karma is the expression of an intuition that is distinct from the cognitive processes involved in perceiving minds. The central element of karmic belief systems—that life experiences are causally connected to conceptually-similar past actions—might reflect (1) a by-product of expectations about interpersonal fairness and justice (Baumard et al., 2013; Hallsson et al., 2018) applied outside the constraints of interpersonal relationships, or (2) an instance of the motivation to maintain belief in a just world (Hafer & Rubel, 2015; Lerner, 1980).

Immanent justice attributions, analogous to karmic causality within one lifetime, have been well-documented among Westerners who are willing to state that salient past misdeeds are the cause of current misfortune (e.g., Callan, Ellard, & Nicol, 2006; Young, Morris, Burrus, Krishnan, & Regmi, 2011) and who are willing to give away money to better their chance of

obtaining desired future outcomes (Banerjee & Bloom, 2017; Converse et al., 2012). These responses are intuitive: Eye movements anticipate outcomes that are congruent with past moral actions (Callan et al., 2013), reaction times slow down when participants report that a bad experience is *not* caused by a proportionate bad deed (Baumard & Chevallier, 2012), and immanent justice attributions are made more frequently when analytical thinking is inhibited by a cognitive load manipulation (Callan et al., 2010). The presence of intuitive karma-like judgments among these North American and European samples—who have little exposure to theological teachings about karmic forces operating across reincarnations and who often explicitly deny karmic causality (White, Norenzayan, et al., 2019)—implies that intuitions about karmic justice may be widespread across human populations and are not solely the product of cultural learning about socially-sanctioned supernatural concepts (see Baumard & Boyer, 2013). Therefore, one plausible hypothesis is that belief in karma will be predicted by intuitive thinking tendencies, regardless of whether or not karma is viewed as a purely non-agentic supernatural force or a personified supernatural agent, and regardless of whether karma is associated with the mentalizing tendencies that predict God beliefs. This claim would also predict that mentalizing tendencies will not predict belief in karma. That is, the underlying cognitive foundations of belief in karma may be fundamentally different from those supporting belief in God.

Mentalizing, dualism, and teleological thinking are implicated in belief in moralized reincarnation and the personification of karma

A second possibility is that mentalizing tendencies, mind-body dualism, and teleological thinking predict belief in karma because karmic causality is more than simply an intuition about immanent justice. Mental representations of karma also often involve beliefs about moralized

reincarnation or metaphorical depictions of karma as a social agent, and this additional content of culturally-reinforced explicit belief in karma may recruit mentalizing tendencies.

First, belief in karma is often intertwined with beliefs about reincarnation. In Hindu and Buddhist theology (Bronkhorst, 2011; Obeyesekere, 2002) and in the self-reports of beliefs about karma (White, Norenzayan, et al., 2019; Willard, Baimel, et al., 2020), karma is typically believed to operate over multiple lifetimes across the cycle of reincarnation, and to operate especially in the case of moral actions (see also Chapter 4). Thinking about moralized reincarnation requires (1) understanding human morality, including the human intentions and mental states that inform the morality of many actions (Gray et al., 2012; Willard, Baimel, et al., 2020; *cf.* McNamara et al., 2019), and (2) believing that human minds can continue to exist after death and persist through reincarnation in new bodies (C. White, 2015, 2017). Karma then provides a teleological structure for reasoning about one's own and others' life experiences. Mentalizing, dualism, and teleological thinking might therefore predict belief in karma-as-moralized-reincarnation regardless of whether karma—the causal mechanism behind this process—is viewed as a personified agent or a non-agentic causal principle.

Second, despite ambiguity in the theological and anthropological record, believers may, at least to some extent, actually conceptualize karma as a supernatural *agent* rather than an abstract force, due to the tendency for people to seek out agentic sources for their suffering (Gray & Wegner, 2010). Mind perception provides an intuitively compelling way to understand the world, especially for ambiguous stimuli and uncertain causal processes (Epley et al., 2007; Kay et al., 2010; Laurin & Kay, 2017; Waytz et al., 2010), and especially when seeking to understand the cause of misfortune: Witnessing suffering often leads to a spontaneous search for social or supernatural agents who are responsible for causing harm (Gray & Wegner, 2010; Schein &

Gray, 2018), and belief in supernatural entities' moral concerns and their other mentalistic qualities tend to co-occur (Purzycki et al., 2012; Purzycki, 2013). Therefore, when trying to explain events caused by karma or making predictions about how karma operates, believers may use agentic mental models of karma to understand it. To address this possibility, I asked participants to report whether karma possesses a variety of agentic characteristics (e.g., whether karma "can think" and personality traits like being "forgiving" and "vengeful") as well as non-agentic characteristics (e.g., whether karma "is impersonal" and "can be gained and lost"). This allowed me to test whether participants who believe in karma actually deny agentic, personified descriptions of karma, and how well the intuitive cognitive tendencies predict different conceptualizations of karma. Specifically, mentalizing and associated cognitive tendencies may be more relevant when predicting agentic mental representations of karma than non-agentic representations.

Rationale for analyses and overview of studies

In two studies, I investigated how intuitive thinking styles, mentalizing, mind-body dualism, and teleological thinking predict belief in karma and belief in God, and whether these relationships differ depending on if karma or God is viewed as relevant to human morality, agentic and personified, or non-agentic and impersonal. I used path models to test these hypotheses about the cognitive predictors of belief in karma and God. These path models apply structural equation modeling to map the hypothesized inter-relationships between multiple cognitive variables as predictors of supernatural beliefs, and test whether the hypothesized model is a good fit to the pattern of covariances observed in the data (Kline, 2010). Specifically, in each model, I test how various beliefs about karma or God are indirectly predicted by intuitive thinking and mentalizing tendencies, via individual differences in mind-body dualism,

teleological perceptions of life events, and teleological thinking about nature (i.e., individual differences that are intuitively compelling and supported by mentalizing tendencies, but are more directly relevant to God and karma beliefs than one's general intuitive and mentalizing tendencies). See Figure 2.1 for a diagram of this comprehensive model.

One advantage of this path modelling technique is that it allows me to simultaneously predict multiple outcome variables within a single model. I can therefore compare the cognitive predictors of belief in the existence of karma/God, beliefs about karma/God's agency, and beliefs about karma/God's non-agentic traits, all the while accounting for covariance between beliefs and these various traits. Through this, I can test the hypothesis that cognitive biases are specifically associated with agentic views of God (e.g., belief in a benevolent god, not a distant, impersonal god), and test whether cognitive biases are also especially predictive of agentic views of karma or whether they broadly predict a variety of conceptualization of karma (e.g., as a morally-relevant causal force). Path models also allow for hypothesis tests of *null* relationships between variables, by assessing whether the model fits the data reasonably well when *omitting* direct relationships between certain variables. For example, in Study 2 I omit paths from dualism and teleology in life to non-agentic trait descriptions, to provide a more stringent test of the hypothesis that mentalistic cognitive biases will predict agentic, but not non-agentic views of supernatural entities.

A further advantage of path models is that they can test for indirect, as well as direct, associations between variables, therefore documenting pathways that would be obscured in an ordinary multiple regression. Specifically, I test a previously-demonstrated indirect pathway between mentalizing and belief to see if the small relationship between these variables can be accounted for by their shared relationship with the tendency toward dualistic and teleological

thinking (a model shown to predict belief in God and in the paranormal in Willard, Cingl, et al., 2020; Willard & Norenzayan, 2013). I aim to replicate this model when predicting belief in God, and test whether the same model can predict belief in karma. I further expand on this previously-supported model by adding intuitive thinking as an additional indirect predictor of belief, and showing that these cognitive variables predict the traits ascribed to karma and God above and beyond their influence on belief in general. Finally, I test whether these indirect associations between intuitive thinking and belief, and mentalizing and belief, differs when predicting karma vs. God, and whether the predictors of karma remain when controlling for god beliefs, to assess whether unique intuitions underlie belief in karma.

Due to the important hypothesized role of cultural leaning in shaping both belief in God and karma (Gervais, Willard, Norenzayan, & Henrich, 2011; Lanman & Buhrmester, 2016; Maij et al., 2017; White, Norenzayan, et al., 2019), I investigated the predictors of beliefs in samples of participants from India and Singapore (one predominantly Hindu and one predominantly Buddhist country where social exposure to karma is common) and from Canada and the USA (where social exposure to karma is less common). In Study 2, I also collected self-reports of participants' social exposure to God and karma, which allowed me to directly investigate how learning about supernatural entities from family members predicts one's own beliefs. This allows me to test for an independent role of both cultural learning of belief—which would manifest in between-country differences in average karma belief, and within-country correlations between social exposure and belief commitments—and cognitive predictors of belief—which would manifest as additional unique predictors of belief within each country.

Study 1

Methods

These data were part of a larger project examining belief in karma, including the psychometric properties and cultural and demographic correlates of the belief in karma questionnaire.¹ Participant recruitment plans and materials were preregistered on the Open Science Framework (<https://osf.io/tg8ce/>), but analyses reported here were not preregistered. I reported how I determined sample sizes, disclose all data exclusions, manipulations, and measures (in the article and in the accompanying preregistrations), and made all data publicly available (<https://osf.io/sk6qt/>).

Participants

Canadian and Indian participants were recruited to complete an online survey, through Research Now's participant panels.² I aimed to recruit a sample of 1000 participants in each country, as this sample size has 90% power to detect relatively small relationships between variables of interest (i.e., $r \geq .10$). Following preregistered criteria, I included loose quotas for age and gender (and region, in Canada), to generate a sample that broadly resembled the larger Canadian/Indian populations, and I excluded and replaced any participants (221 Canadians and 616 Indians) who failed two attention check questions placed within the survey (e.g., "Please

¹ Results from this portion of the dataset are available in (White, Norenzayan, et al., 2019). Additional analyses regarding the zero-order association between intuitive thinking tendencies and belief in God and karma are reported in (Baimel et al., in press).

² Canadians chose to complete the survey in either English (83%) or French (17%). The French translation was generated by one bilingual research assistant (except for the mentalizing questionnaire, which was taken from the French translation by Gilet, Studer, Mella, Grünh, & Labouvie-Vief, 2013), then checked by a second, independent bilingual research assistant, and minor changes were made to ensure consistency. Indian participants were fluent in English and completed the English questionnaire.

select ‘Disagree’ as your answer”) or who failed one attention check question and had a completion time less than half the median completion time of participants who passed both attention checks. The final sample of 1000 Canadian participants and 1006 Indian participants (Table 2.1) were substantially different in their religious and cultural background: Canadian participants were primarily Caucasian and Christian or non-religious, whereas Indian participants were primarily Hindu, and substantially higher in religiosity, belief in God, and belief in karma than were Canadians, although the multi-item belief in karma questionnaire used here had similar psychometric properties in both countries (White, Norenzayan, et al., 2019).

Table 2.1 Demographic composition of each sample.

	Study 1		Study 2	
	Canada	India	USA	Singapore
<i>N</i>	1000	1006	1244	508
Gender				
Female	51 %	51 %	61%	59%
Male	49 %	49 %	39%	41%
Age <i>M (SD)</i>	46.69 (15.24)	38.62 (13.54)	45.79 (12.94)	37.47 (11.98)
Ethnicity				
Caucasian	82.9%	0.0%	80%	2%
Asian	9.3%	78.2%	6%	97%
Other or not provided	7.8 %	21.8 %	14%	1%
Religion				
Christian	58 %	7%	65%	--
Non-religious	31 %	1 %	24%	--
Hindu	1 %	78 %	1%	--
Buddhist	3%	0.2%	1%	100%
Other	7 %	13.8 %	9%	--
Religiosity <i>M (SD)</i>	2.44 (1.31)	3.84 (1.09)	2.69 (1.31)	2.75 (0.85)
Spirituality <i>M (SD)</i>	3.11 (1.29)	3.91 (1.05)	3.14 (1.25)	2.59 (0.93)
Belief in Karma <i>M (SD)</i>	2.71 (0.62)	3.69 (0.72)	2.87 (0.80)	3.73 (0.95)
Belief in God <i>M (SD)</i>	4.48 (2.27)	6.10 (1.51)	3.87 (1.17)	3.43 (0.73)

Note. Belief in God was measured on a 7-point scale in Study 1 and a 5-point scale in Study 2. Belief in karma, religiosity, and spirituality were measured on a 5-point scale in all studies.

Materials

Mentalizing. Individual differences in mentalizing—the willingness to think about and engage with other people’s mental states—were assessed through including seven items regarding a willingness to feel empathic concern for others (e.g., “I am often quite touched by things I see happen”) and seven items regarding a willingness to take the perspective of others (e.g., “I sometimes try to understand my friends better by imagining how things look from their perspective”), 5-point likert scale (Canada: $\alpha = .80$; India: $\alpha = .65$), drawn from the Interpersonal Reactivity Index (Davis, 1983). This scale was designed as a measure of an individuals’ self-reported cognitive and emotional empathic engagement with other people, and provides an index of an individual’s tendency to think about the mental states of others. This scale does not measure whether one is actually *accurate* in determining other people’s mental states, nor a more basic capacity to attribute any sort of agency or mental qualities to other people; rather, this measure captures variance within a general population in the willingness to consider the minds of others. This scale therefore captures observable variance in mentalizing tendencies in general samples (i.e., where everyone is likely to possess some capacity for general mental state attribution), which would be obscured by merely asking about the presence/absence of mind attribution capabilities.

Intuitive thinking style. A preference for intuitive thinking was assessed through 10 items from the *experiential* scale of the Rational-Experiential Inventory (Pacini & Epstein, 1999), e.g., “I like to rely on my intuitive impressions” (5-point scale ranging from *completely false* to *completely true*; Canada: $\alpha = .87$; India: $\alpha = .69$).

Mind-body dualism. Six items assessing mind-body dualism were taken from Riekkari et al. (2013). Participants indicated their agreement with statements that described the mind as

different, and separate, from the body, e.g., “Minds are in principle independent of bodies, to which they are only temporarily attached” (5-point likert scale; Canada: $\alpha = .78$, India: $\alpha = .70$). Four additional items regarding monism (the belief that the mind and body are the same thing) were removed from the analyses due to low reliability in a combined monism/dualism measure in the Indian sample (see Appendix A for further details).

Teleology in nature. Participants reported whether 12 statements, which described a purpose behind the existence of natural phenomena, were literally true, e.g., “The sun makes light so that plants can photosynthesize” and “Earthquakes happen because tectonic plates must realign” (Canada: $\alpha = .86$; India: $\alpha = .81$, taken from Kelemen & Rosset, 2009). Higher scores indicate a willingness to explicitly endorse natural phenomena as existing for a purpose.

Teleology in life events. Three items (adapted from Banerjee & Bloom, 2014) measured participants’ perception of purpose in life events: life events “happen for a reason,” “are predestined,” and include “signs and messages” (5-point likert scale; Canada: $\alpha = .75$; India: $\alpha = .72$).

Features of God and Karma. Participants reported whether several features were characteristic of God and characteristic of karma. Thirteen items described the target’s agentic, mental capabilities, including cognitive abilities (e.g., “can think”), perceptual abilities (e.g., “can see”), morally-relevant abilities (e.g., “can tell right from wrong”), and morally-irrelevant abilities (e.g., “knows the volume of the Atlantic Ocean”). The mean score across these thirteen items measured the degree of mind attributed to God and karma. I also assessed whether God and karma were seen to have personalities, including punitive traits (“punishing,” “vengeful,” “terrifying,” “fearsome,” “angry,” “judging,” “controlling”) and benevolent traits (“loving,” “forgiving,” “compassionate,” “peaceful,” “comforting”). (Composite α ’s ranged from .86 to

.98, across targets and countries.) To assess non-anthropomorphic descriptions of Karma, participants also reported whether God and karma were “impersonal,” and whether God and karma “can be gained and lost.”

In addition to describing the features of each target, participants reported the perceived relationships between God and karma through two items, including whether God is “responsible for enacting karma” (5-point scale, from *Karma operates independently of God* to *Karma occurs because of God’s will*), and whether God can “intervene to over-rule karmic consequences” (5-point scale, from *God never contradicts Karma* to *God often intervenes and over-rules Karma*).

Belief in God. Participants reported their belief in the existence of God through a single item ranging from 1 = *definitely does not exist* to 7 = *definitely does exist*.

Belief in Karma. Participants completed a 16-item measure of belief in karma (White, Norenzayan, et al., 2019), which both refers to karma explicitly, e.g., “Karma is a force that influences the events that happen in my life,” and assesses belief in karmic causal processes within one lifetime and across reincarnations, e.g., “If a person does something bad, even if there are no immediate consequences, they will be punished for it in some future time in their life,” “After people die, they are reborn in a new body” (Canada: $\alpha = .93$; India: $\alpha = .90$).

Demographics. Participants reported several general demographic variables, including their age, gender, education, income, ethnicity, and political orientation. Participants also reported their religious affiliation, frequency of religious attendance, level of religiosity and spirituality.

Results

Path model predicting beliefs about karma and God

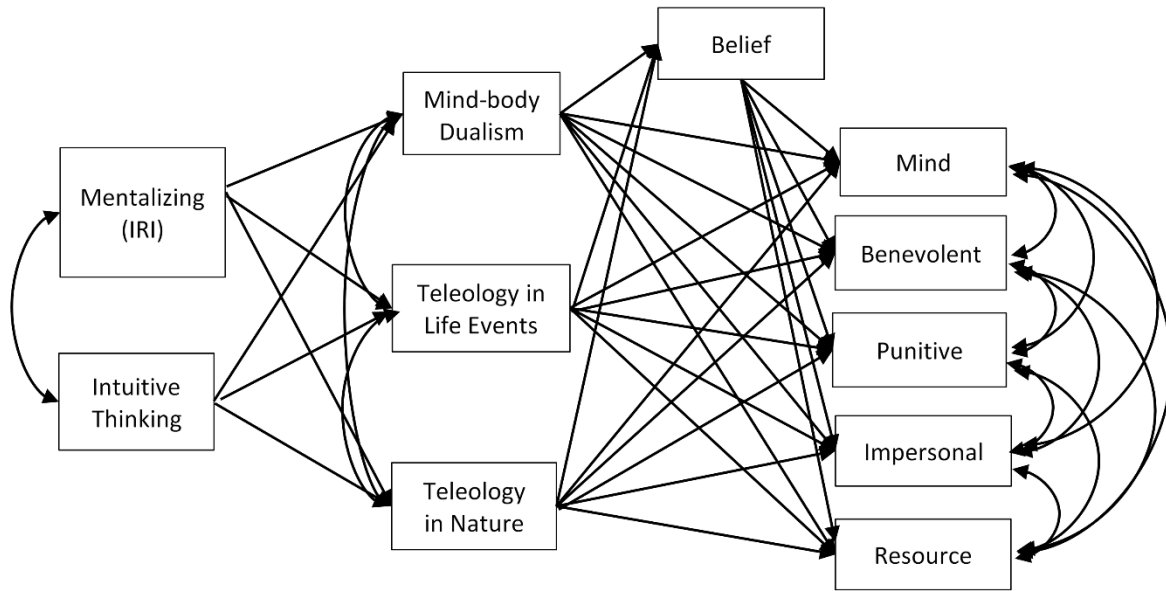
Replicating previous findings, in both countries belief in God was modestly but positively correlated with intuitive thinking (Canada $r = .07$ 95% CI [.004, .13], India $r = .14$ [.08, .20]) and with mentalizing (Canada $r = .19$ [.12, .24], India $r = .13$ [.07, .19]). Belief in karma was also positively correlated with intuitive thinking, with an even larger effect size (Canada $r = .27$ [.21, .33], India $r = .27$ [.22, .33]), and with mentalizing (Canada $r = .08$ [.02, .14], India $r = .19$ [.13, .25]).

To further investigate how these individual differences predict beliefs about supernatural forces, I created a path model using the lavaan package for structural equation modeling in R (Rosseel, 2012). Small amounts of missing data (0.3%) were accounted for using full information maximum likelihood ('fiml'). This path model allows me to simultaneously test the predictors of multiple dimensions of belief, and test the association between these beliefs, while also testing for hypothesized indirect relationships and hypothesized null relationships by omitting certain paths. Analyses were conducted separately predicting beliefs about karma and beliefs about God, and separately for the Canadian and Indian samples. In this study, the same model (depicted in Figure 2.1) was applied to each of these four conditions (karma and God, in Canada and India), meaning that model fit statistics presented below indicate whether the same pattern of relationships fits the data well in each of these four models. The relative size of these relationships is indicated by the path coefficient estimates and their confidence intervals, depicted in Table 2.2. (Bivariate correlations between all variables are available in the Appendix A.)

Drawing on theorizing in the cognitive science of religion, I tested a model (depicted in Figure 2.1) in which beliefs about karma or God were predicted by individual differences in mind-body dualism, teleological perceptions of life events, and teleological thinking about nature, which were in turn predicted by intuitive thinking and mentalizing tendencies.³ I omitted direct paths between mentalizing and belief, to test whether this bivariate relationship could be accounted for by mentalizing's relationship with dualism and teleology (consistent with Willard et al., 2020; Willard & Norenzayan, 2013). I likewise omitted direct paths between intuitive thinking and belief. In each model (predicting either karma or God), I simultaneously predicted both belief in karma/God and endorsement of various traits of karma/God, to assess how well these cognitive variables predict different conceptualization of karma/God. Belief in karma/God was added as an additional predictor for each trait to assess if these cognitive biases predict endorsement of traits beyond endorsement of belief. Residual correlations were added between each trait to account for any additional relationship they had with each other not accounted for by the cognitive biases and belief.

³ Variables were entered into the path model as composite scores, created by averaging the items in each scale. A similar pattern of path coefficients is found if I instead model these variables as latent variables (from their individual scale items), albeit with somewhat worse fit according to certain indicators (e.g., CFI) due to the increased complexity of the model.

Figure 2.1 Study 1: Path model predicting supernatural beliefs, in Canada and India.



In Canada, this model had a reasonably good fit to the data when predicting beliefs about karma, $\chi^2(12) = 33.94, p < .001$, CFI = .99, RMSEA = .043 [.026, .060], SRMR = .023, and beliefs about God, $\chi^2(12) = 58.51, p < .001$, CFI = .99, RMSEA = .062 [.047, .079], SRMR = .029. This model was also a reasonably good fit in India, when predicting beliefs about karma, $\chi^2(12) = 72.20, p < .001$, CFI = .98, RMSEA = .071 [.055, .087], SRMR = .031, and beliefs about God, $\chi^2(12) = 78.01, p < .001$, CFI = .97, RMSEA = .074 [.059, .090], SRMR = .032. Results of path coefficients for this model are displayed in Table 2.2.

The overall pattern of path coefficients was largely similar in Canada and India. This was confirmed by additional analyses, which demonstrated that a multigroup path model fit the data reasonably well when path coefficients were constrained to be equal across both countries, karma model: $\chi^2(53) = 166.34, p < .001$, CFI = .98, RMSEA = .046 [.038, .054], SRMR = .034; God model: $\chi^2(53) = 342.66, p < .001$, CFI = .95, RMSEA = .074 [.066, .081], SRMR = .064,

indicating approximately equivalent associations between variables in both countries. However, these similar paths exist alongside persistent mean differences in beliefs between the two countries (e.g., higher karma belief in India), as is indicated by the poor fit of a multigroup path model in which both the path coefficients and the intercepts were constrained to be equivalent across countries, karma model: $\chi^2(64) = 1079.72, p < .001, CFI = .82, RMSEA = .126$ [.119, .132], SRMR = .198; God model: $\chi^2(12) = 1255.41, p < .001, CFI = .79, RMSEA = .136$ [.130, .143], SRMR = .169. In other words, these results indicate that cognitive biases do not override or account for cultural differences in karmic beliefs, but rather found that the cognitive variables showed similar associations with belief *within* both countries despite between-country differences in mean belief levels.

For the sake of comparison, alternative models that reversed the direction of the association between beliefs and cognitive biases (i.e., mentalizing and intuitive thinking predict beliefs, which predict dualism and teleological thinking) provided a worse fit to the data in every case, karma in Canada: $\chi^2(6) = 105.05, p < .001, CFI = .97, RMSEA = .13$ [.11, .15], SRMR = .037, God in Canada: $\chi^2(6) = 149.20, p < .001, CFI = .96, RMSEA = .15$ [.13, .18], SRMR = .049, karma in India: $\chi^2(6) = 103.08, p < .001, CFI = .96, RMSEA = .13$ [.11, .15], SRMR = .038, God in India, $\chi^2(6) = 115.29, p < .001, CFI = .96, RMSEA = .14$ [.11, .16], SRMR = .041.

Table 2.2. Study 1: Standardized path model estimates predicting beliefs about karma and God.

	Karma				God			
	Canada		India		Canada		India	
	<i>b</i>	95% CI	<i>b</i>	95% CI	<i>b</i>	95% CI	<i>b</i>	95% CI
<i>Dualism</i>								
Intuition	0.26***	[0.20, 0.31]	0.14***	[0.08, 0.2]	0.26***	[0.20, 0.31]	0.14***	[0.08, 0.2]
Mentalizing	0.11***	[0.05, 0.17]	0.14***	[0.08, 0.2]	0.11***	[0.05, 0.17]	0.14***	[0.08, 0.2]
<i>Teleology in Life Events</i>								
Intuition	0.24***	[0.18, 0.3]	0.27***	[0.21, 0.33]	0.24***	[0.18, 0.3]	0.27***	[0.21, 0.33]
Mentalizing	0.16***	[0.10, 0.22]	0.17***	[0.11, 0.23]	0.16***	[0.10, 0.22]	0.17***	[0.11, 0.23]
<i>Teleology in Nature</i>								
Intuition	0.11***	[0.05, 0.17]	0.20***	[0.14, 0.26]	0.11***	[0.05, 0.17]	0.20***	[0.14, 0.26]
Mentalizing	0.12***	[0.06, 0.18]	0.14***	[0.08, 0.2]	0.12***	[0.06, 0.18]	0.14***	[0.08, 0.20]
<i>Belief in Karma/God</i>								
Dualism	0.29***	[0.23, 0.34]	0.18***	[0.12, 0.23]	0.04	[-0.02, 0.1]	0.01	[-0.06, 0.07]
Teleology in life	0.45***	[0.40, 0.50]	0.45***	[0.40, 0.5]	0.45***	[0.40, 0.51]	0.41***	[0.36, 0.47]
Teleology in nature	0.01	[-0.04, 0.06]	0.06*	[0.01, 0.12]	0.03	[-0.02, 0.09]	0.04	[-0.02, 0.1]
<i>Mind</i>								
Dualism	0.07*	[0.01, 0.12]	0.16***	[0.10, 0.22]	0.00	[-0.04, 0.04]	0.06*	[0.01, 0.11]
Teleology in life	0.08**	[0.02, 0.14]	0.09**	[0.02, 0.15]	0.12***	[0.08, 0.17]	0.24***	[0.19, 0.29]
Teleology in nature	0.02	[-0.03, 0.07]	0.12***	[0.06, 0.18]	0.00	[-0.04, 0.04]	0.03	[-0.02, 0.08]
Belief	0.53***	[0.48, 0.59]	0.28***	[0.22, 0.35]	0.74***	[0.70, 0.77]	0.50***	[0.45, 0.55]
<i>Benevolence</i>								
Dualism	0.06	[0.00, 0.12]	0.07*	[0.00, 0.13]	0.04	[0.00, 0.09]	0.08**	[0.02, 0.14]
Teleology in life	0.07*	[0.00, 0.14]	0.10**	[0.03, 0.16]	0.11***	[0.06, 0.16]	0.25***	[0.19, 0.3]
Teleology in nature	0.04	[-0.02, 0.09]	0.09**	[0.03, 0.15]	0.02	[-0.02, 0.06]	0.09**	[0.03, 0.14]
Belief	0.38***	[0.31, 0.44]	0.30***	[0.23, 0.36]	0.68***	[0.64, 0.72]	0.34***	[0.29, 0.4]
<i>Punitiveness</i>								
Dualism	-0.05	[-0.11, 0.02]	0.06	[0.00, 0.13]	-0.01	[-0.08, 0.06]	0.06	[-0.01, 0.12]
Teleology in life	0.13***	[0.06, 0.20]	0.06	[-0.01, 0.13]	0.08*	[0.00, 0.15]	0.09**	[0.02, 0.16]
Teleology in nature	-0.01	[-0.07, 0.05]	0.03	[-0.03, 0.09]	0.01	[-0.05, 0.07]	0.08*	[0.01, 0.14]
Belief	0.29***	[0.22, 0.36]	0.21***	[0.14, 0.28]	0.05	[-0.02, 0.12]	0.08*	[0.01, 0.15]

<i>Impersonal</i>								
Dualism	0.02	[-0.05, 0.08]	0.09**	[0.03, 0.16]	0.07*	[0.00, 0.14]	0.11**	[0.04, 0.18]
Teleology in life	0.06	[-0.01, 0.13]	0.02	[-0.05, 0.10]	0.06	[-0.01, 0.13]	0.07	[0.00, 0.14]
Teleology in nature	-0.04	[-0.10, 0.03]	0.03	[-0.03, 0.10]	-0.04	[-0.10, 0.02]	0.08*	[0.01, 0.14]
Belief	0.24***	[0.17, 0.32]	0.16***	[0.09, 0.24]	-0.10**	[-0.17, -0.03]	0.06	[-0.01, 0.13]
<i>Resource</i>								
Dualism	0.05	[-0.01, 0.11]	0.08*	[0.01, 0.14]	0.06	[-0.01, 0.12]	-0.01	[-0.07, 0.06]
Teleology in life	0.09**	[0.02, 0.15]	0.12***	[0.05, 0.19]	0.10**	[0.03, 0.17]	0.07	[0.00, 0.14]
Teleology in nature	0.02	[-0.04, 0.07]	0.09**	[0.02, 0.15]	0.01	[-0.05, 0.06]	0.10**	[0.04, 0.17]
Belief	0.39***	[0.32, 0.46]	0.22***	[0.15, 0.29]	0.32***	[0.26, 0.38]	0.15***	[0.08, 0.22]

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Do intuitive cognitive tendencies predict belief in God and karma?

In this model, participants' self-reported willingness to engage in mentalizing and intuitive thinking uniquely predicted greater mind-body dualism, teleological thinking about life events, and teleological thinking about nature, which in turn predicted supernatural beliefs. In Canada and India, respectively, this model accounted for 23% and 18% of the variance in God⁴ belief and 38% and 31% of the variance in karma belief. In India, this model predicted 18% of the variance of belief in God and 31% of the variance in belief in karma. Belief in God and karma was strongly predicted by teleological thinking about life events, while teleological thinking about nature was a much weaker predictor, and dualism only predicted belief in karma, not belief in God. This failed to replicate the previously-found association between belief in God and mind-body dualism (which was found using a different measure of dualism, Willard et al., 2020; Willard & Norenzayan, 2013), but it did replicate the finding that intuitive thinking, self-reported mentalizing, and teleological thinking predict belief in God, and also predict belief in karma.

This model also supports an indirect association between self-reported willingness to mentalize and beliefs about supernatural entities (as found by Willard et al., 2020; Willard & Norenzayan, 2013), and also provides the novel finding that the relationship between intuitive thinking tendencies and supernatural beliefs can be partly accounted for by shared covariance with dualism and teleological thinking, especially in the case of belief in God. Evidence for this

⁴ While I did not have any hypotheses about differences in the variance explained in God belief and karma belief, I note that the less variance explained in belief in God, compared to belief in karma, cannot merely be explained by unreliability of the single item used to measure belief in God. In Study 2 I find that a reliable 3-item measure of belief in God has similar levels of variance accounted for by cognitive variables in the USA (24%) and Singapore (11%).

comes from both the hypothesized model, which fits the data reasonably well while omitting direct paths between intuition/mentalizing and belief (i.e., specifying that there is no direct association between these variables) and from the residual errors, which depict the remaining associations between variables that are not accounted for by the hypothesized model. After accounting for the indirect relationships between intuition and beliefs (depicted in Figure 2.1), the residual association between intuitive thinking and God belief was essentially absent in India ($r < .001$) and negative in Canada ($r = -.076$), indicating that, outside of the modeled indirect relationships, intuitive thinking was *not* positively associated with God belief, even in the residual errors. In the case of karma, there remained a small positive residual association between intuitive thinking and belief in Canada ($r = .065$) and India ($r = .089$), consistent with the possibility that belief in karma may reflect aspects of intuitive thinking that are separate from cognitive biases in mentalizing accounted for in the model (see Appendix A for additional details of model residuals table).

In addition to the path models that separately investigated predictors of God beliefs and predictors of karma beliefs, I conducted additional multiple regression analyses to investigate possible covariation between belief in God and belief in karma. In Canada, belief in God predicted greater belief in karma, $b = 0.24$, 95% CI [0.19, 0.29], $p < .001$. However, belief in God was no longer a meaningful predictor when controlling for dualism, teleological thinking about nature and life events, intuitive thinking, and mentalizing (see Table 2.3). Similarly in India, the association between belief in God and karma, $b = 0.30$ [0.26, 0.34], $p < .001$, was cut in half when controlling for these cognitive biases – a remaining positive association that may be due to the shared cultural sources of both beliefs in India, but not in Canada. A second implication of these regression models is that they confirm that the cognitive variables uniquely

predict belief in karma even after controlling for belief in God, which justifies my presentation of separate models predicting karma beliefs and God beliefs. In other words, it is not the case that these cognitive variables solely predict belief in God, and God beliefs predict karma beliefs; rather, these cognitive variables independently predict beliefs about karma (see Appendix A for addition regressions that control for God beliefs when predicting karma's mind, benevolence, punitiveness, and non-agentic qualities).

Table 2.3 Study 1: Multiple regression predicting belief in karma from belief in God and cognitive variables

	Canada						India					
	β	[95% CI]	p	β	[95% CI]	p	β	[95% CI]	p	β	[95% CI]	p
Intercept	2.71	[2.66, 2.76]	<.001	2.72	[2.68, 2.76]	<.001	3.69	[3.65, 3.73]	<.001	3.69	[3.65, 3.73]	<.001
Belief in God	0.24	[0.19, 0.29]	<.001	0.04	[-0.01, 0.08]	.11	0.30	[0.26, 0.34]	<.001	0.17	[0.13, 0.21]	<.001
Intuition				0.07	[0.03, 0.12]	.001				0.08	[0.04, 0.12]	<.001
Mentalizing				-0.07	[-0.11, -0.02]	.002				0.02	[-0.02, 0.06]	.28
Dualism				0.22	[0.18, 0.27]	<.001				0.13	[0.09, 0.17]	<.001
Teleology in Life				0.35	[0.30, 0.40]	<.001				0.23	[0.19, 0.28]	<.001
Teleology in Nature				0.01	[-0.03, 0.05]	.59				0.02	[-0.02, 0.06]	.29
R^2_{adj}		0.09			0.39			0.17			0.36	

Are cognitive biases especially associated with agentic views of supernatural forces?

In addition to testing the predictors of beliefs in the existence karma and God, I also investigated how the cognitive variables predicted different conceptualizations of karma and God (i.e., whether karma/God has mental states, personality traits, or is impersonal), and how these beliefs were related to each other. This allowed us, first, to test whether karma is conceived of as an impersonal, non-agentic force, unlike the typically-agentic and personified views of God, and second, to test whether self-reported mentalizing tendencies and related cognitive biases are especially relevant to belief in agentic, but not non-agentic supernatural entities. Preliminary evidence in support of these hypotheses comes from believers' differential attribution of traits to karma and God (Figures 2.2 and 2.3). Further evidence comes from the pathways between general karma/God belief and trait attribution, included in the path models.

Participants displayed a clear tendency to attribute a mind to God, and to view God as highly benevolent and generally non-punitive, whereas descriptions of God as “impersonal” or as something that can be “gained and lost” showed much less agreement and less agreement (Figure 2.2). This was especially true of Indian respondents, perhaps due to differences in which particular deity they had in mind when answering these items. Direct paths between belief and trait ratings indicated that participants with stronger belief in God were especially likely to ascribe mental capabilities and benevolent traits to God, especially in Canada, whereas punitive, impersonal, or resource-like descriptions were less associated with belief. The path model indicates that individual differences in dualism, teleological thinking, and belief account for substantially more variance in viewing God as a benevolent agent (mind attribution: $R^2_{\text{Canada}} = .64$, $R^2_{\text{India}} = .44$; benevolence: $R^2_{\text{Canada}} = .57$, $R^2_{\text{India}} = .31$), compared to the minimal variance for punitiveness ($R^2_{\text{Canada}} = .012$, $R^2_{\text{India}} = .045$), an impersonal God ($R^2_{\text{Canada}} = .014$, R^2_{India}

= .046) or a resource-like God ($R^2_{\text{Canada}} = .16$, $R^2_{\text{India}} = .054$). It also shows that teleological thinking and dualism predict additional variance in mind and benevolent trait ratings, even after controlling for general belief, consistent with the perspective that these cognitive tendencies specifically predict belief in an agentic God, not just *any* God belief. This pattern is consistent with past research showing that mainstream contemporary believers in North America prototypically view God as a benevolent supernatural agent (e.g., Johnson, Okun, Cohen, Sharp, & Hook, 2018), and extends this findings to an Indian sample.

Figure 2.2 Distribution of features attributed to God (believers only, $n = 526$ in Canada and $n = 878$ in India). Vertical lines indicate the mean level of trait attribution in Canada (solid) and India (dashed).

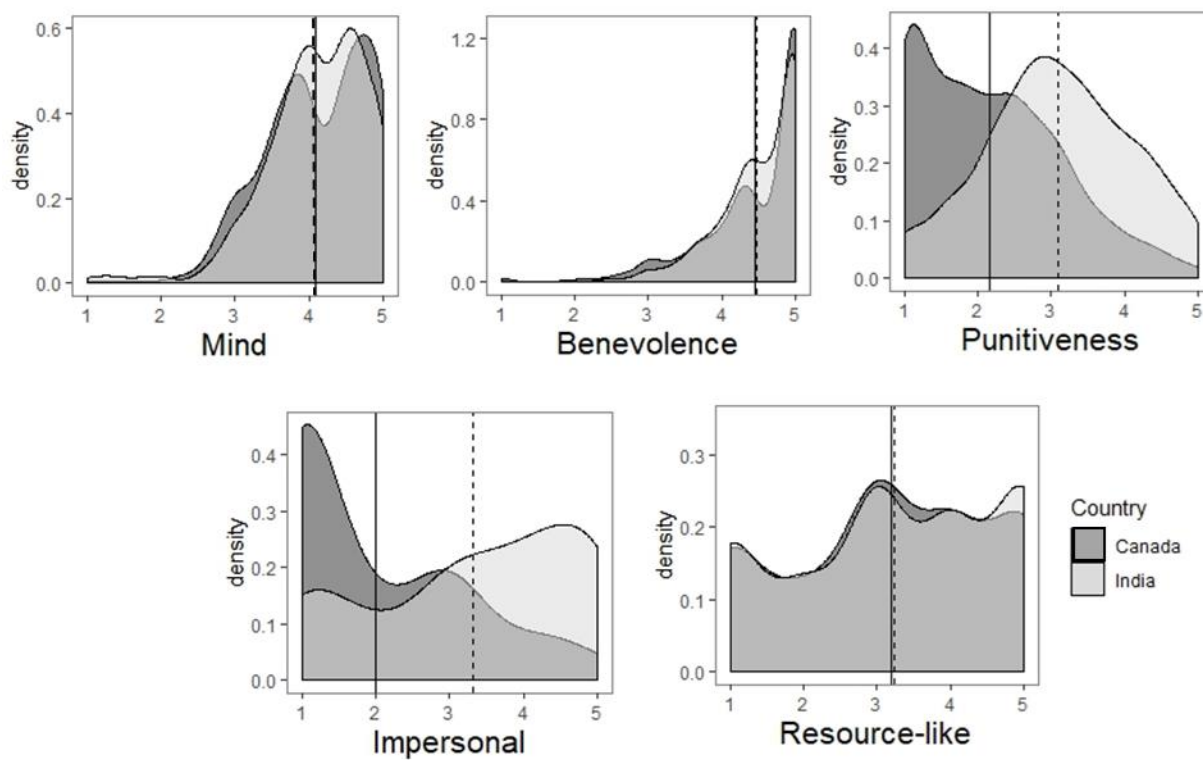
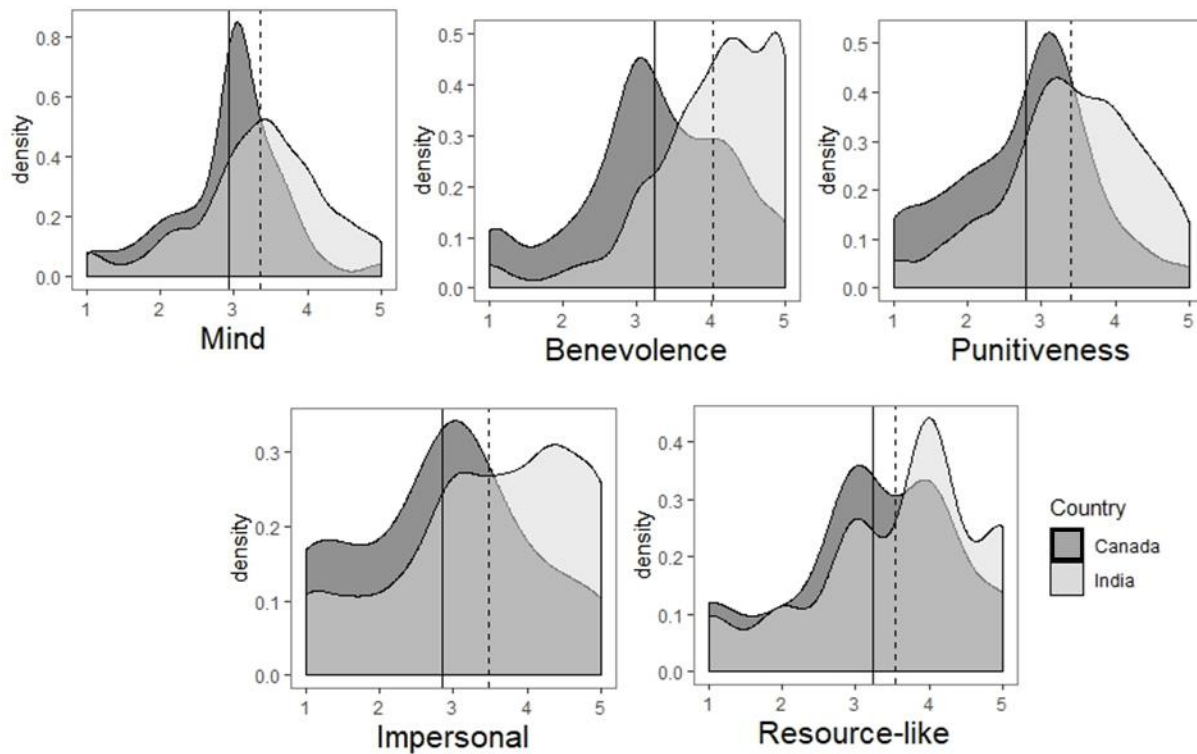


Figure 2.3. Distribution of features attributed to karma (believers only, $n = 384$ in Canada and $n = 834$ in India). Vertical lines indicate the mean level of trait attribution in Canada (solid) and India (dashed).



Does this pattern extend to beliefs about karma? The distributions of trait attributions to karma (by karma believers only, in Figure 2.3), indicated that descriptions of karma did not display the same benevolent agent prototype found for God: Ratings of karma's mental capabilities and benevolence were much less skewed towards strong agreement, compared to descriptions of God, and punitive traits were attributed to karma more often than God, especially by Canadians. But neither was karma described as clearly non-agentic, there was no strong tendency for believers to disagree that karma has mental states and personality traits, no consensus that karma is impersonal or resource-like, nor any evidence of subsets of believers who accept and who reject karma's agency. Rather, across all measures, responses showed a lack of consensus and tended to fall closer to the scale midpoint, implying less certainty about what

karma is or is not like. Further, belief in karma predicted greater mind attribution to karma, benevolent and punitive trait ascriptions, and descriptions of karma as impersonal and resource-like (traits which were positively intercorrelated with one another, estimates range from $r = 0.04$ to 0.65), indicating no clear dissociation between agentic and non-agentic descriptions of karma (see Appendix A for full details). However, after controlling for belief in karma, teleological thinking and dualism tended to be a stronger predictor of mind attribution and benevolent trait ratings, than punitive, impersonal, or resource-like trait ratings of karma, consistent with the pattern found for beliefs about God. Altogether, this model accounted for more variance in ratings of karma's mental capabilities ($R^2_{\text{Canada}} = .39$, $R^2_{\text{India}} = .23$) than ratings that karma is impersonal ($R^2_{\text{Canada}} = .083$, $R^2_{\text{India}} = .059$) or resource-like ($R^2_{\text{Canada}} = .23$, $R^2_{\text{India}} = .14$), and more variance in ratings of karma's benevolence ($R^2_{\text{Canada}} = .21$, $R^2_{\text{India}} = .18$) than punitiveness ($R^2_{\text{Canada}} = .12$, $R^2_{\text{India}} = .085$).

These results therefore indicate that intuitive thinking, mentalizing, and related cognitive tendencies predict both belief in God and belief in karma, in similar ways, and that part of the reason for this may be that believers are sometimes willing to think about karma as a personified agent, akin to how believers personify God.⁵ However, believers were less certain about whether karma was agentic or impersonal, and there was less divergence between different trait attributions and belief in karma, supporting a difference between beliefs about God—a prototypical supernatural agent—and beliefs about karma.

⁵ However, exploratory analyses indicated that the degree of mind attribution to karma did not moderate the association between mentalizing and belief (interaction in Canada: $\beta = 0.03$, $p = .17$, India: $\beta = 0.02$, $p = .30$), providing evidence that the relationship between cognitive variables and belief is not solely driven by people who see karma as an agent. The data are more consistent with the idea that believers were willing to see karma as both agentic and non-agentic, and cognitive variables predicted all of these beliefs about karma in similar ways.

Discussion

The path models tested in Study 1 replicated prior evidence of associations between intuitive thinking, willingness to engage in mentalizing, and belief in God, and provided novel evidence that (a) the intuitive thinking relationship is indirectly associated with supernatural belief due to other cognitive biases, like teleological thinking, and (b) these associations are unique to belief in a benevolent, agentic god. This pattern supports the theoretical claim that mentalizing tendencies are specifically predictive of belief due to the agentic features of God, such that people's reported ease and willingness in considering other people's mental states predicts their engagement in a personal relationship with an unseen deity using their socio-cognitive reasoning capacities.

These results also provide novel empirical evidence that willingness to mentalize and intuitive thinking independently predict belief in karma, in both Canada and India. Importantly, this highlights how belief in karma cannot be reduced to intuitions about immanent justice that are distinct from the mentalizing capacities that predict belief in God. Rather, karma is a multifaceted concept—that includes aspects of non-agentic causality, moralized reincarnation, and anthropomorphic personality traits—that are similarly predicted by the cognitive variables that predict belief in a prototypically agentic god.

Study 2

Study 2 tested the replicability and generalizability of the path model developed in Study 1 in a conceptually-similar model in which mentalizing, intuitive thinking, dualism, and teleological thinking predicted beliefs about God and karma in a general sample of Americans and in a sample of Singaporean Buddhists. The Buddhist sample allows me to test the generalizability of my results to another population where belief in karma is culturally

widespread. Buddhism, like Hindu traditions, has a long history of endorsing karma as part of the structure of the universe (Bronkhorst, 2011), but typically contains beliefs about a variety of supernatural agents (e.g., Bodhisattvas) and ritual practices that differ from both the Hindu sample recruited in Study 1 and Christian-dominated samples from Canada and the USA.

The variables included in this model were modified to include different measures of analytic thinking and self-reported mentalizing tendencies, which match other measures commonly used in past literature (the Cognitive Reflection Task and Empathy Quotient, e.g., used in Gervais et al., 2018; Pennycook, Ross, Koehler, & Fugelsang, 2016; Willard et al., 2020; Willard & Norenzayan, 2013). I also included more diverse measures of God and karma's agentic and non-agentic traits, to provide a more reliable test of how these cognitive tendencies predict specific beliefs about the features of supernatural entities. Finally, in addition to selecting participants from populations that were, a priori, expected to have different cultural exposure to karma, in Study 2 I directly measured participants' self-reported social exposure to beliefs about God and karma. Study 1 found that, although mean levels of karma belief are substantially higher in India than in Canada, cognitive variables predicted within-country variance in karma belief similarly in both contexts. Study 2 therefore allowed me to compare the relative contribution of cultural and cognitive factors to predicting the variability of belief that exists within each country.

Methods

Participant recruitment plans, all materials, and planned analysis models were preregistered on the OSF prior to data collection (<https://osf.io/sk6qt/>).

Participants

Participants completed the survey online and in English and were recruited by Qualtrics' participant panels. As in Study 1, I aimed to recruit a total sample of 1000 participants in the USA. I aimed to recruit 500 participants in Singapore who were fluent in English.⁶ Karma beliefs are widespread in Singapore, but can be heterogeneous among adherents to different religious denominations (e.g., Christians vs. Taoists vs. Buddhists; Willard, Baimel, et al., 2020). I specifically recruited participants who selected Buddhism as their religious affiliation, to provide a sample where karma belief is both theologically and culturally normative. Buddhists make up approximately 33% of the population of Singapore (Statistics Singapore, 2015), and provide a sample with a long cultural history of karma in religious doctrines, to compare to North American samples where exposure to karmic theology is less culturally common. Following preregistered criteria, I excluded and replaced participants who did not complete the survey (USA: $n = 13$, Singapore: $n = 137$), who failed an attention check question (USA: $n = 521$, Singapore: $n = 262$), who provided a nonsensical response to an open-ended question (Singapore: $n = 30$), who speeded through the task (i.e., took less than half the median completion time, Singapore: $n = 86$), or who (in the Singapore sample) reported religious affiliation other than Buddhist. As preregistered, I also included in the analyses extra participants in the sample (beyond the planned size) who completed the survey prior to data collection being terminated by Qualtrics panel managers. The final sample of 1244 participants in the USA was demographically similar to the Canadian sample from Study 1 (see Table 2.1),

⁶ The Singapore Buddhist sample was the most expensive to recruit, therefore I aimed for a smaller sample size that still retained >80% power to detect relatively small relationships ($r = .12$) between variables of interest. English is an official language in Singapore and the language most people are educated in.

being predominantly Christian or non-religious and expressing stronger belief in God than belief in karma. The 508 participants in Singapore were primarily-Asian Buddhists, thus providing a sample with a long cultural history of karmic religious beliefs.

Materials

Data was collected as part of a larger survey. This survey began with participants receiving instructions to think about karma or receiving neutral instructions while, in the USA, deciding how much money to share with a stranger in a dictator game (results reported in Chapter 5), or in Singapore, deciding how much blame and hypothetical help victims of misfortune should receive.⁷ Participants then completed the belief in karma questionnaire (USA: $\alpha = .92$, Singapore: $\alpha = .92$, White, Norenzayan, et al., 2019), followed by several measures of individual differences and personal beliefs (presented in a randomized order), and provided demographic information.

Mentalizing. Mentalizing tendencies were measured through a 22 item version of the Empathy Quotient (USA: $\alpha = .88$, Singapore: $\alpha = .87$, Wakabayashi et al., 2006). This scale measures an individual's willingness to engage in mentalizing through the self-perceived ease and accuracy in thinking about other people's mental states, e.g., "I find it easy to put myself in somebody else's shoes," "other people tell me I am good at understanding how they are feeling and what they are thinking." By using this measure, I am able to more closely replicate previously-documented associations between mentalizing and belief, which have used the Empathy Quotient questionnaire (e.g., Maij et al., 2017; Willard, Cingl, et al., 2020; Willard & Norenzayan, 2013).

⁷ Assignment to the karma prime vs. control condition had little association with the variables discussed here ($r_s < .10$), therefore I ignore this variable in the following analyses.

Analytic thinking ability. The ability to engage in analytic thinking was measured as the number of correct responses to the three-item Cognitive Reflection Task (CRT), in which the intuitive answer to the problem is incorrect and participants are required to override this intuition in order to come to the correct response (USA: $\alpha = .70$, Singapore: $\alpha = .65$, Frederick, 2005).

Mind-body dualism. Eight items were taken from Riekkari et al.'s (2013) mind-body dualism scale (USA: $\alpha = .85$, Singapore: $\alpha = .81$). Two additional reverse-scored items from this scale were also included, but removed from analyses due to low (negative) correlations with remaining scale items ($r < -.20$ after reverse scoring), which compromised scale reliability.

Teleology in life events. Three items, used in Study 1, measured perceptions of purpose in life events (USA: $\alpha = .82$, Singapore: $\alpha = .74$). (Teleological thinking about nature was not collected in this dataset to reduce survey length, and because it was the weakest predictor of beliefs in Study 1.)

Features of God and karma. Participants rated whether three different types of traits are characteristic of God and karma: *Non-moral agency* of God and karma ("is loving," "is forgiving," "can think," "has free will," "makes plans and works towards goals"), *moral knowledge* of God and karma ("rewards people for proper behavior," "punishes people for bad behavior," "can see what people are doing, even if they are far away in a foreign country," "can see into people's hearts and know their thoughts and feelings"), and *non-agentic traits* of God ("abstract," "impersonal," "incomprehensible," "distant," "unknowable," "limitless") and non-agentic traits of karma ("can be gained and lost," "can exist in different amounts," "is created by people's actions," "is balanced," "is cyclical," "is a positive force or energy"). (Composite α 's ranged from .71, .92 across targets.) Participants in Singapore were also asked which god they were describing when answering these questions: 25% specified that they were referring to a

Buddha or bodhisattva (primarily Guan Yin, the Goddess of Mercy), 9% referred to the Christian God or Jesus Christ, 2% specified another god unrelated to Buddhism and Christianity, and the remainder (64%) did not specify a particular god. Trait ascription to these different types of gods did not significantly differ, so all responses were analyzed together.

Belief in God. Three items measured belief in God (“I believe in God,” “I believe in a divine being who is involved in my life,” and “There is no God or higher power in the universe,” USA: $\alpha = .84$, Singapore: $\alpha = .69$).

Social exposure to God/karma. Participants completed 4-item measures of social exposure to God and social exposure to karma: “I hear about karma [God] while attending religious services or meeting,” “I saw people engage in volunteer or charity work, because of karma [God],” “I saw people avoid harming others, because of karma [God],” and “Most of my family believes in karma [God]” (USA: $\alpha_{\text{Karma}} = .82$, $\alpha_{\text{God}} = .77$, Singapore: $\alpha_{\text{Karma}} = .81$, $\alpha_{\text{God}} = .77$).

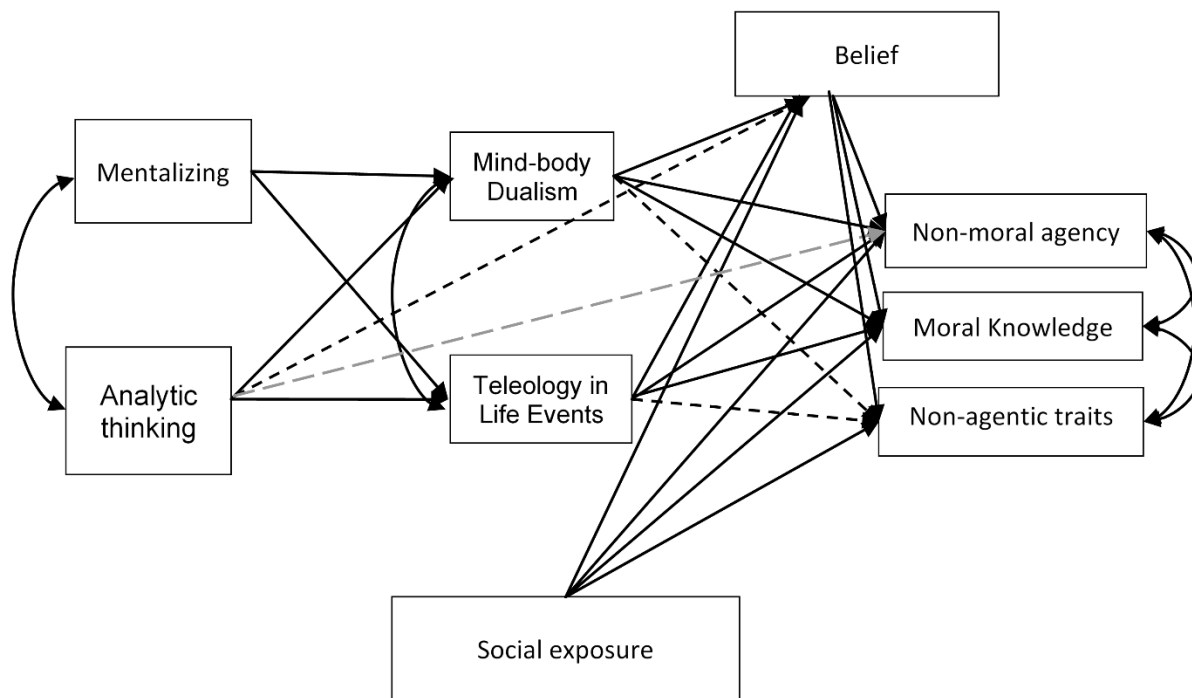
Results

Path model predicting beliefs about karma and God

We replicated the positive correlation between mentalizing and belief in God in the USA $r = .17$, 95% CI [.12, .23], $p < .001$, but not in Singapore $r = .04$ [-.04, .13], $p = .33$. I also replicated the same association for karma, USA $r = .25$ [.19, .30], $p < .001$, Singapore $r = .11$ [.02, .19], $p = .015$. The negative association between analytic thinking (CRT performance) and belief in God emerged in the USA $r = -.12$ [-.17, -.06], $p < .001$, but not in Singapore $r = -.07$ [-.16, .02], $p = .14$. Similarly, the negative association between analytic thinking and karma was found in the USA $r = -.28$ [-.33, -.22], $p < .001$, but not in Singapore $r = -.11$ [-.20, -.02], $p = .16$.

We next tested a preregistered path model (depicted in Figure 2.4) that mirrors the analytic strategy from Study 1, in which beliefs about karma or God were predicted by individual differences in mind-body dualism and teleological perceptions of life events, which were in turn were predicted by analytic thinking ability and mentalizing tendencies (omitting direct paths between mentalizing/analytical thinking and beliefs). To assess how well these cognitive variables predicted different conceptualization of karma/God, I tested a model that simultaneously predicted belief in karma/God and descriptions of karma/God as possessing moral knowledge, non-moral agency, and non-agentic traits (with correlated residuals added between these beliefs). I also omitted paths from dualism and teleology in life to non-agentic trait descriptions, to provide a more stringent test of the hypothesis that mentalistic cognitive biases will predict agentic, but not non-agentic views of supernatural entities. To this preregistered model, I also added an additional direct pathway between beliefs and trait ratings, to explore whether the cognitive variables predict trait ratings above and beyond their relationship with general belief in karma/God. Small amounts of missing data (0.4%) were accounted for using full information maximum likelihood ('fiml'). Further expanding on the model tested in Study 1, social exposure to belief in God/karma was also added as a predictor of all beliefs about God and karma, except for beliefs about karma's non-moral agency, to test whether culturally-shared depictions of karma specifically support moralistic-but-non-agentic views of karma.

Figure 2.4. Study 2: Path model predicting belief in karma. Also not depicted are included correlated residuals between social exposure to karma and cognitive predictor variables. Dashed arrows indicate paths added to the karma model that were omitted from the model predicting God. The path from analytic thinking to non-moral agency of karma was only included in Singapore.



Predicting beliefs about God.

When predicting beliefs about God, the hypothesized model was not a good fit for the data when social exposure was treated as independent from the cognitive predictors (as preregistered), $\chi^2(14) = 324.56, p < .001$, CFI = .93, RMSEA = .13 [.12, .15], SRMR = .11.

After correlated residuals were added between social exposure to God and other predictors of belief, this model provided a good fit to the data in the USA, $\chi^2(10) = 79.73, p < .001$, CFI = .98, RMSEA = .075 [.060, .091], SRMR = .03. This pattern thus suggests that social exposure to God not only predicts belief in specific supernatural entities, but may reflect a social environment that

encourages a broad range of intuitions that support supernatural beliefs. This revised model was applied to the Singapore sample, and was also a reasonably good fit for the data, Singapore, $\chi^2(10) = 22.30, p = .001, CFI = .99, RMSEA = .049 [.021, .077], SRMR = .03$.

Multigroup path analyses indicated that the pattern of path coefficients was roughly equivalent across countries, as is indicated by acceptable model fit when the path coefficients are constrained to be equal across countries, $\chi^2(37) = 257.31, p < .001, CFI = .96, RMSEA = .082 [.073, .092], SRMR = .067$, but additional mean differences remained between cultures in endorsement of these beliefs, as indicated by poor model fit when both the path coefficients and the intercepts were constrained to be equivalent across countries, $\chi^2(46) = 918.89, p < .001, CFI = .84, RMSEA = .147 [.139, .156], SRMR = .112$.

Results of this model are displayed in Table 2.4 (results of an analogous preregistered model that did not include social exposure, and is therefore more comparable to the results of Study 1, are available in the Appendix A). This model, depicted in Figure 2.4, accounted for substantial variance in belief in God ($R^2_{USA} = .37, R^2_{Singapore} = .20$), God's moral knowledge ($R^2_{USA} = .36, R^2_{Singapore} = .15$), and agentic views of God ($R^2_{USA} = .39, R^2_{Singapore} = .15$). As in Study 1, dualism was not a meaningful predictor of belief in God, but teleological thinking about life events and social exposure to belief in God were both strong predictors, supporting an indirect association between mentalizing tendencies, intuitive thinking, and beliefs about God, even in a sample, like Singapore, where no direct, bivariate association appears between mentalizing/intuitive thinking and belief. In addition to these cognitive variables, social exposure to belief in God was a large independent predictor of belief in God, God's moral knowledge, and God's non-moral agency, but was more weakly related to non-agentic views of God.

The omitted paths in this model also support the claim that these cognitive tendencies do not predict non-agentic (e.g., abstract, impersonal) views of God. Participants tended to describe God as high in agency and moral knowledge, and rather low in non-agentic traits, especially in the USA (Figure 2.5), and direct paths between beliefs and traits indicated that participants high in belief in God were especially likely to describe God as agentic and possessing moral knowledge, whereas belief in God had a smaller association with non-agentic trait ratings in Singapore and a negative association with non-agentic trait ratings in the USA.

Table 2.4. Study 2: Standardized path model estimates predicting beliefs about karma and God.

	Karma				God			
	USA		Singapore		USA		Singapore	
	<i>b</i>	95% CI	<i>b</i>	95% CI	<i>b</i>	95% CI	<i>b</i>	95% CI
<i>Dualism</i>								
Analytic thinking	-0.12***	[-0.17, -0.06]	-0.04	[-0.13, 0.05]	-0.12***	[-0.17, -0.06]	-0.04	[-0.13, 0.05]
Mentalizing	0.18***	[0.12, 0.23]	0.14***	[0.05, 0.22]	0.18***	[0.12, 0.23]	0.14**	[0.05, 0.22]
<i>Teleology in Life Events</i>								
Analytic thinking	-0.15***	[-0.21, -0.1]	-0.04	[-0.12, 0.05]	-0.15***	[-0.21, -0.10]	-0.04	[-0.13, 0.05]
Mentalizing	0.30***	[0.25, 0.35]	0.25***	[0.17, 0.33]	0.30***	[0.25, 0.35]	0.25***	[0.17, 0.33]
<i>Belief</i>								
Dualism	0.17***	[0.13, 0.22]	0.10*	[0.02, 0.18]	-0.02	[-0.07, 0.03]	0.06	[-0.02, 0.14]
Teleology in life	0.29***	[0.24, 0.34]	0.32***	[0.24, 0.39]	0.34***	[0.29, 0.39]	0.27***	[0.19, 0.35]
Social Exposure	0.35***	[0.31, 0.40]	0.24***	[0.16, 0.32]	0.39***	[0.34, 0.43]	0.28***	[0.20, 0.36]
Analytic thinking	-0.13***	[-0.17, -0.09]	-0.11**	[-0.19, -0.04]				
<i>Agency</i>								
Dualism	0.04	[-0.01, 0.09]	0.07	[-0.01, 0.16]	-0.02	[-0.06, 0.02]	0.01	[-0.05, 0.08]
Teleology in life	0.01	[-0.04, 0.07]	0.06	[-0.03, 0.16]	0.10***	[0.06, 0.14]	0.07*	[0.00, 0.13]
Social Exposure	0.28***	[0.22, 0.33]	0.09*	[0.00, 0.18]	0.22***	[0.18, 0.26]	0.19***	[0.11, 0.27]
Belief	0.35***	[0.30, 0.41]	0.19***	[0.10, 0.29]	0.59***	[0.55, 0.63]	0.39***	[0.31, 0.47]
Analytic thinking			-0.16***	[-0.22, -0.1]				
<i>Moral knowledge</i>								
Dualism	0.02	[-0.03, 0.07]	0.05	[-0.03, 0.13]	-0.02	[-0.06, 0.02]	0.06	[0.00, 0.13]
Teleology in life	0.08**	[0.03, 0.13]	0.19***	[0.11, 0.28]	0.16***	[0.11, 0.2]	0.07	[0.00, 0.14]
Social Exposure	0.21***	[0.16, 0.26]	0.13**	[0.05, 0.22]	0.20***	[0.16, 0.25]	0.19***	[0.11, 0.28]
Belief	0.39***	[0.33, 0.45]	0.29***	[0.2, 0.37]	0.50***	[0.46, 0.55]	0.33***	[0.25, 0.41]
<i>Non-agentic traits</i>								
Dualism	0.04	[-0.01, 0.09]	0.05	[-0.02, 0.13]				
Teleology in life	0.08**	[0.03, 0.14]	0.21***	[0.13, 0.29]				
Social Exposure	0.18***	[0.13, 0.24]	0.14***	[0.06, 0.22]	0.11**	[0.04, 0.17]	0.16***	[0.07, 0.25]
Belief	0.41***	[0.35, 0.46]	0.34***	[0.26, 0.42]	-0.08*	[-0.14, -0.01]	0.21***	[0.12, 0.30]

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 2.5. Distribution of features attributed to God, among God believers in the USA (light grey, $n = 929$) and Singapore (dark grey, $n = 347$). Vertical lines indicate the mean level of trait attribution in the USA (solid) and Singapore (dashed).

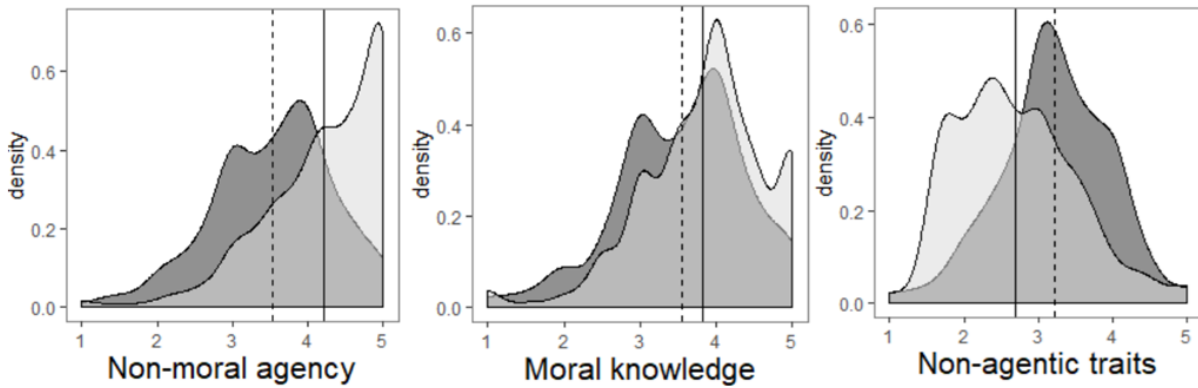
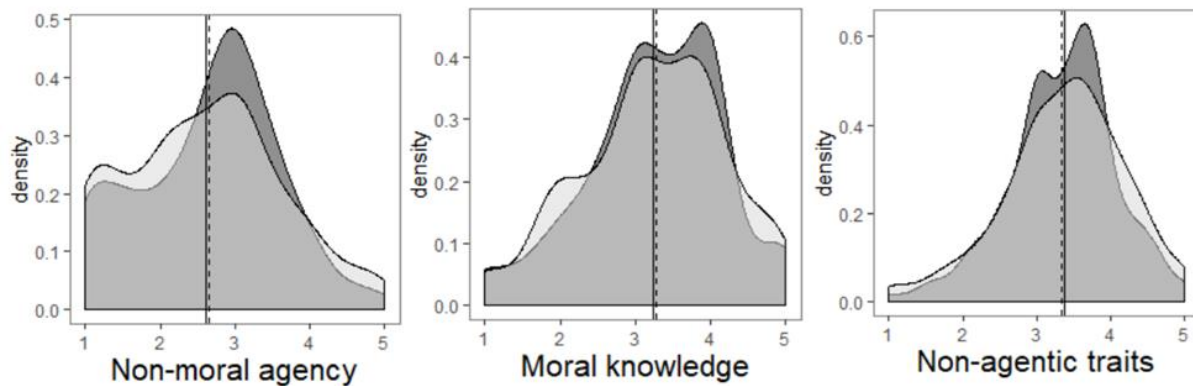


Figure 2.6. Distribution of features attributed to karma, among karma believers in the USA (light grey, $n = 562$) and Singapore (dark grey, $n = 429$). Vertical lines indicate the mean level of trait attribution in the USA (solid) and Singapore (dashed).



Predicting beliefs about karma.

When predicting beliefs about karma, the original preregistered model did not provide a good fit to the data in the USA sample, $\chi^2(15) = 487.33$, $p < .001$, CFI = .90, RMSEA = .16 [.15, .17], SRMR = .13. Further exploratory work was done to investigate the reasons for this misfit, and based on that, adjustments were made to improve model fit (given the exploratory nature of these analyses, these results should be interpreted with caution). Three changes were made to improve model fit, based on an inspection of model residuals in the USA sample. First,

the direct paths between dualism, teleology, and social exposure and beliefs that had previously been omitted were replaced; contrary to hypotheses, dualism and teleological thinking about life events predicted both non-agentic and agentic views of karma in similar ways. Second, as hypothesized model fit was improved by adding a direct path from intuitive thinking to belief in karma, consistent with the hypothesis that that belief in karma may reflect aspects of intuitive thinking that are separate from cognitive biases in mentalizing accounted for in the model. Third, correlated residuals were added between social exposure to karma and the other predictors of belief.

This revised model was a reasonably good fit to the data in the USA, $\chi^2(7) = 55.39, p < .001$, CFI = .99, RMSEA = .071 [.053, .090], SRMR = .022, and is depicted in Figure 2.4. This revised model was applied to the Singapore sample, with one additional path—between analytic thinking and non-moral agency of karma—added to bring model fit within an acceptable range: $\chi^2(6) = 27.20, p < .001$, CFI = .99, RMSEA = .083 [.053, .116], SRMR = .024. These models indicate that, in both samples, endorsement of mind-body dualism, teleological thinking about life events, and social exposure to karma were each unique predictors of beliefs about karma, while mentalizing was indirectly associated with belief via these other cognitive tendencies.

Multigroup path analyses indicated that the pattern of path coefficients was roughly equivalent across countries, as is indicated by acceptable model fit when the path coefficients are constrained to be equal across countries, $\chi^2(33) = 116.51, p < .001$, CFI = .99, RMSEA = .054 [.043, .065], SRMR = .047, but additional mean differences remained between cultures in endorsement of these beliefs, as indicated by poor model fit when both the path coefficients and

the intercepts were constrained to be equivalent across countries, $\chi^2(42) = 868.02, p < .001$, CFI = .86, RMSEA = .150 [.141, .159], SRMR = .170.

Additional multiple regression analyses indicated that these cognitive variables accounted for a substantial portion of the covariation between belief in God and belief in karma. Belief in God predicted greater belief in karma in the USA, $b = 0.17 [0.13, 0.21], p < .001$, and Singapore, $b = 0.16 [0.11, 0.21], p < .001$, but when controlling for dualism, teleological thinking about life events, intuitive thinking, and mentalizing, the relationship with belief in God was substantially reduced in Singapore and became *negatively* associated with belief in karma in the USA (Table 2.5). This indicates that the positive association between belief in God and karma can be statistically accounted for by shared cognitive intuitions that predict both beliefs. When controlling for this shared covariance, the remaining small negative relationship between God and karma may be due to religious/cultural contexts that encourage belief in God while inhibiting belief in karma, or vice versa (e.g., commitment to mainline Christian denominations vs. being spiritual-but-not-religious, see White, Norenzayan, et al., 2019). These multiple regressions again also confirm that the association between the cognitive variables and belief in karma exists independently of the covariation between these variables and belief in God.

Unlike in Study 1, where the path model accounted for minimal variance in non-agentic views of karma/God (i.e., less than 5% of the variance in impersonal descriptions and less than 14% of the variance resource-like descriptions), this model accounted for substantial variance in belief in karma ($R^2_{\text{USA}} = .45, R^2_{\text{Singapore}} = .26$), karma's moral knowledge ($R^2_{\text{USA}} = .26, R^2_{\text{Singapore}} = .19$), agentic views of karma ($R^2_{\text{USA}} = .27, R^2_{\text{Singapore}} = .09$), and non-agentic views of karma ($R^2_{\text{USA}} = .26, R^2_{\text{Singapore}} = .23$).

Karma was generally described as less agentic than God, but believers still endorsed agentic descriptions of karma at above floor levels (Figure 2.6). Agentic descriptions of karma were higher when pertaining to moral knowledge (e.g., “karma rewards people for proper behavior”), than non-moral features (e.g., “karma has free will”), suggesting that believers are especially willing to think about karma’s moral dimension using agentic language. But the positive associations between belief in karma (and social exposure to karma) and all trait ascriptions imply that both agentic and non-agentic views of karma tend to be compatible with belief. Teleological thinking also accounted for additional variance in ratings of karma’s moral knowledge and non-agentic traits (although not non-moral agency), even after controlling for general belief and social exposure to karma, although dualism did not. This pattern of simultaneous, independent predictors indicates that both cognition and culture play a role in predicting a variety of karma beliefs, even those thought to be theologically-incorrect like viewing karma as a social agent.

Table 2.5. Study 2: Multiple regression predicting belief in karma from belief in God and cognitive variables.

	USA						Singapore					
	β	[95% CI]	p	β	[95% CI]	p	β	[95% CI]	p	β	[95% CI]	p
Intercept	2.87	[2.83, 2.92]	<.001	2.87	[2.83, 2.91]	<.001	3.58	[3.53, 3.63]	<.001	3.58	[3.54, 3.63]	<.001
Belief in God	0.17	[0.13, 0.21]	<.001	-0.05	[-0.09, -0.01]	.025	0.16	[0.11, 0.21]	<.001	0.06	[0.01, 0.11]	.020
Analytic thinking				-0.14	[-0.17, -0.10]	<.001				-0.06	[-0.11, -0.01]	.017
Mentalizing				0.05	[0.01, 0.09]	.007				0.00	[-0.05, 0.05]	.97
Dualism				0.21	[0.17, 0.25]	<.001				0.08	[0.03, 0.13]	.001
Teleology in Life				0.31	[0.26, 0.35]	<.001				0.20	[0.15, 0.26]	<.001
R^2_{adj}		0.05			0.35			0.07			0.21	

Discussion

Study 2 provided a conceptual replication of the path models from Study 1 across two additional cultural contexts, the USA and Singapore. These path models replicated several key findings from Study 1: Reported willingness to engage in mentalizing and willingness to engage in intuitive thinking were specifically (indirectly) associated with belief in God as a personalized, morally-concerned agent, and unassociated with belief in god as an abstract, impersonal force. In contrast, mentalizing and intuitive thinking were indirectly associated with a variety of conceptualizations of karma (as agentic, morally-concerned, *and* as a non-agentic causal principle) that were held concurrently by believers. Thus, belief in karma cannot be solely explained as an intuition unrelated to mentalizing, nor is it identical to other supernatural beliefs. These patterns also hold after controlling for self-perceived cultural exposure to karma beliefs and god beliefs. This does not mean that cultural learning is unimportant. Social exposure to karma and God remains a strong predictor of belief within each country. Rather, the data show that cognitive variables explain an additional piece of the puzzle when predicting supernatural beliefs.

General Discussion

Across two studies including Christian, Hindu, Buddhist, and non-religious participants from Canada, the United States, India, and Singapore, I provide novel evidence that intuitive cognitive tendencies predicted the strength of both belief in God—a prototypically agentic and moralizing supernatural agent—and belief in karma—an ambiguously-agentic but also a morally-relevant supernatural entity. These path models cannot confirm the causal direction of relationships (further research using experimental or longitudinal methods would offer additional evidence of causal pathways), but they do provide preliminary support for theoretical arguments

regarding the cognitive capacities that support various supernatural beliefs: The tendency to trust one's intuitions and the self-reported willingness engage with others' mental states predicted endorsement of mind-body dualism and teleological perceptions of life events, which in turn predicted a variety of beliefs about God and karma. My results also indicate how believers mentally represent the concept of karma, and reveal that belief in karma possesses a distinct cognitive profile that distinguishes it from both belief in god and intuitive cognitive heuristics related to fairness. These findings contribute to a growing literature documenting how individual differences, such as cognitive tendencies or personality traits (e.g., Ashton & Lee, 2021; Gebauer et al., 2014; Saroglou, 2010), predict who is more vs. less committed to various religious beliefs and practices.

Our findings reveal the limited explanatory power of the hypothesis that belief in karma is a unique cognitive intuition that is unrelated to mentalizing and perceptions of supernatural agency. This is a plausible theoretical prediction based on theologically-correct depictions of karma as an impersonal law of nature. Such a unique karmic intuition (which is perhaps indexed by perceptions of immanent justice that are well-documented around the world, e.g., Baumard & Boyer, 2013; Baumard & Chevallier, 2012; Callan et al., 2010) would also help to explain why karmic beliefs are so prevalent across world cultures. Consistent with this perspective, I have found that karma beliefs are widespread in samples of Hindus and Buddhists, and also (at least at low levels) among Western samples who lack meaningful cultural reinforcement of karmic beliefs. As evidence that these karma beliefs are intuitive, this data reveals that people who tend to trust their intuition or think less reflectively are more likely to believe in karma, across several cultural contexts. In addition, a residual direct association between intuitive thinking tendencies and belief in karma remains after controlling for the other measured cognitive variables,

suggesting that intuitions not indexed in the present studies also play a role in karma belief. No such residual association remained between intuitive thinking and belief in God, indicating divergences between predictors of different types of beliefs.

Therefore, the present research indicates that such an intuition—that deserving misfortune translates into actually *causing* that misfortune to occur—may be *part* of the explanation for karma beliefs. However, the present research also documents several dimensions of karma beliefs that cannot be explained by intuitions about immanent justice. In Chapters 3 and 5, I provide further tests of the distinction between belief in karma and belief in a Just World by documenting how individual differences in these beliefs predict unique patterns of social judgments. These first two studies also provide evidence that belief in karma cannot be solely accounted for by intuitions about impersonal causality that are distinct from the predictors of God belief, given that mentalizing tendencies also predict belief in karma, including predicting the belief that karma possesses agentic traits similar to the traits of God.

Why do mentalizing tendencies predict belief in God and belief in karma? In the case of belief in God, this data supports the theoretical argument that because God is typically conceived as a morally concerned social agent, understanding minds is important also for belief in God's mind, thus making belief in a personal God less plausible and compelling to individuals who are less prone to mentalizing. Consistent with this view, cognitive tendencies predicted agentic beliefs about God substantially better than non-agentic beliefs about God. These cognitive variables likewise predict agentic beliefs about karma. In addition, mind attribution to karma was positively associated with belief, consistent with the perspective that mind attribution provides an effective and engaging way to understand unseen supernatural forces. However, this theoretical argument also provides an incomplete explanation for the results, given that, in every

sample, willingness to engage in mentalizing also predicted non-agentic beliefs about karma, and both agentic and non-agentic descriptions were associated with belief. In other words, the cognitive predictors of belief in karma are neither completely distinct from the predictors of God, nor identical to them.

This more general association between mentalizing and karma belief can be better understood by broadening our theoretical explanation for how mentalizing is recruited for supernatural beliefs, to consider the many dimensions of karma belief that might be understood through mental state reasoning. Belief in karma (as found in world religions and as indexed by the self-report measure used in these studies) (a) entails understanding human moral action and thinking about how moral behavior influences future outcomes, thereby engage mind perception processes that are intimately intertwined with much moral cognition (Gray et al., 2012); (b) involves the expectation of karmic repercussions even after death, and in future reincarnations, which reflects an expectation of mind-body dualism (C. White, 2017); and (c) implies that life events happen for a reason, thus relying on a teleological understanding of causal processes (Banerjee & Bloom, 2014). This belief in karma—as moralized causality across reincarnations—does not require that karma be a supernatural agent, and many believers were willing to ascribe both agentic and non-agentic characteristics to karma, perhaps indicating flexibility in how believers think about (or at least, talk about) what karma is like. This is consistent with previous evidence that mental state reasoning allows perceivers to make sense of otherwise ambiguous and unpredictable experiences (Epley et al., 2007; Kay et al., 2010; Laurin & Kay, 2017; Waytz et al., 2010). Neither agentic nor non-agentic views of karma are incompatible with belief, or incompatible with one another.

In contrast to the predictors of karma, the cognitive and cultural variables studied here did not predict non-agentic conceptualizations of God. This raises the question of which individual differences or social influences support non-anthropomorphic views of God, especially in populations (e.g., among Muslims) where agentic, personalized views of God are actively discouraged and low levels of God anthropomorphism is observed among adults and children (Richert et al., 2016, 2017). Further research is needed using both more diverse measures of beliefs about God (e.g., Johnson et al., 2018), and sampling from more diverse cultural and religious groups, to broaden our understanding of how cognitive factors predict specific beliefs about supernatural entities and how this might interact with cultural influences.

Our results provide one piece of this puzzle, across four different countries that vary in their religious histories of karma and god beliefs. I found that a similar pattern of cognitive predictors of belief is found among both Canadian and Indian participants (Study 1), despite differences in the cultural-prevalence and religious histories of karma beliefs in these two nations. Cognitive variables also indirectly predicted how much Americans and Singaporeans believed in karma, above and beyond the variability accounted for by an individual's social exposure to other people's beliefs (Study 2). That is, on average karmic beliefs are more prevalent in certain countries where the concept of karma is normative in cultural and religious discourse, and an individual's level of social exposure predicts their level of karmic beliefs. But cognitive variables accounted for additional variation in individuals' beliefs beyond these cultural factors, and the pattern of cognitive predictors was similar across cultural contexts. This pattern supports the role of both cultural learning and cognitive biases in shaping supernatural beliefs.

These studies partly replicate and extend past research regarding intuitive cognitive tendencies as predictors of supernatural beliefs, alongside robust cultural predictors of belief, but open questions remain about why these relationships exist and to what extent they are robust across different samples of participants and different types of beliefs. A willingness to engage with human minds does not always, automatically, or inevitably result in the perception of supernatural minds operating in the world, nor are agentic supernatural entities the only unseen causal forces that are intuitively compelling, but these cognitive factors can provide part of the explanation for the ubiquity and the variation in supernatural beliefs around the world.

Results in the present chapter provide preliminary evidence of how different supernatural beliefs can be associated with similar cognitive capacities, while also possessing distinct mental representations and patterns of cross-cultural variation. In the following chapters, I investigate how the unique content of diverse supernatural justice beliefs (including belief in karma, God, and a Just World) is associated with distinct patterns of social judgments (Chapter 3), moral values (Chapter 4), and interpersonal prosocial behavior (Chapter 5).

Chapter 3: How strongly do moral character inferences predict forecasts of the future?

Testing the moderating roles of belief in karma, gods, and a just world

One type of social judgment that is closely intertwined with supernatural justice beliefs involves forecasts that are made about the likely future experiences of people who transgress moral norms. Human beings make many types of judgments about people who transgress moral norms. We judge other individuals' actions to be good or bad and on the basis of those actions we also make inferences about those individuals' moral character—whether they are good or bad people. Furthermore, on the basis of our inferences about a person's moral character, we often forecast their future—predicting whether an individual will continue be good or bad in coming years, and also predicting the fortunes and misfortunes that they might experience over the course of their lives. Just how strongly do inferences about someone's current moral character guide forecasts about their future character and future fortunes? Although a large literature documents how people infer current dispositions from past behavior (Choi et al., 1999; Gilbert, 1998; Trope & Gaunt, 2007)—including inferences specifically about moral character (Goodwin et al., 2014; Khamitov et al., 2016; Uhlmann et al., 2015)—much less is known about how moral inferences inform forecasts about the future. In this chapter I present three studies that help fill this gap by testing plausible moderators of the relationships between moral inferences and moral forecasts, with a focus on the moderating role of individual differences in karmic beliefs.

A Rocky Road from Dispositions to Predictions?

Perceivers make dispositional inferences that serve a pragmatic purpose: They allow perceivers to forecast others' actions in the immediate and long-term future (Andrews, 2001; Haselton & Funder, 2006; Humphrey, 1976; Schaller, 2008). These forecasts may be especially important in the moral domain. Inferences made from subjectively-appraised good and bad

actions inform highly consequential interpersonal decisions—such as who to cooperate with and who should be avoided (Baumard et al., 2013). Moral inferences not only inform forecasts about a person’s future actions, but might also inform forecasts about their future outcomes: People who perform good behaviors may be expected to accrue the goodwill of others, enhancing the likelihood of future positive outcomes; whereas people who commit transgressions may experience retribution, social exclusion, and other future misfortunes, consistent with widespread intuitions about living in a just world (Callan et al., 2014; Hafer & Rubel, 2015; Lerner, 1980).

Ample evidence of lay dispositionalism (Gilbert, 1998) suggests that perceivers often assume that current behavioral dispositions are diagnostic of future dispositions and experiences (and confirmation bias in processing new information can reinforce these expectations; Costabile & Madon, 2019). But forecasts about the future depend tacitly on underlying assumptions about causality—including temporal consistency in behavioral dispositions and the expectation of immanent justice—which suggests that individual differences in beliefs about causality may moderate the extent to which perceivers use moral inferences to forecast the future.

People differ in their beliefs about immanent justice—whether they believe that, in the long run, good people experience good fortune and bad people experience misfortune. Ample evidence suggests that immanent justice beliefs influence retrospective explanations for others’ current misfortunes, such that a person’s current successes or misfortunes are used to infer their likelihood of past virtuous or immoral actions (Callan et al., 2014; Hafer & Rubel, 2015; Lerner, 1980). These beliefs may also influence whether perceivers forecast that future outcomes will be consistent with a person’s current moral character. Especially relevant may be an individual’s level of belief in *karma*—a supposed supernatural source of moral justice.

Karma is conceptually distinct from other types of justice in that it ensures that good and bad fortune befall those who deserve it even across long time scales that cannot plausibly be policed by human agents (e.g., across otherwise unrelated situations, or across reincarnations into a new body), and belief in karma is only moderately correlated with individual differences in other fairness and justice beliefs (e.g., belief in a just world). Belief in karma also uniquely predicts the attribution that current misfortunes are caused by past bad deeds, even after controlling for secular justice beliefs (White, Norenzayan, et al., 2019). Just as belief in karma impacts attributions about an individual's past misfortunes, it is likely to also influence forecasts about future outcomes: Among people who more strongly believe in karma, judgments about a person's current goodness or badness may be perceived as more diagnostic of that person's future good or bad outcomes. The empirical implication is that the correlation between inferences about current moral character and forecasts about future outcomes is likely to be stronger among people who more strongly believe in karma.

We tested whether karmic beliefs moderate forecasts about two different types of events: (a) Interpersonal misfortunes, events that are explicitly caused by the actions of other people (e.g., being cheated on or stolen from) and therefore can be explained by mundane social causes (i.e., the expectation that those with poor character traits will be treated unkindly in turn by the people around them); (b) accidental misfortunes that cannot be easily explained by mundane social or physical forces elicited by a target's moral character (e.g., getting injured in a car accident or getting a serious illness). Accidental misfortunes are likely to be uniquely moderated by belief in karma, due to the supernatural element of karma that ensures moral justice even when no human agents are involved (White, Norenzayan, et al., 2019), whereas the more general, more secular belief in a just world might be less relevant to forecasts about accidental

misfortunes. To test the unique contribution of belief in karma, I also measured individual differences in belief in God and belief in a Just World, although the primary preregistered analyses reported below were specifically designed to test the relationship between karma belief and moral forecasts.

Overview of Current Research

Three studies investigated how features of the perceiver and the perceived moderate the strength of the relationship between inferences about a person's current moral character (inferred from vignettes depicting specific actions) and forecasts about that person's future moral character and future outcomes. In each study I manipulated whether transgressions were performed by an adult or child, and measured inferences about their current moral character, probable future moral character, and likelihood of experiencing various misfortunes. I assessed whether relationships between inferences and forecasts were moderated by the target's age, and whether they were moderated by participants' belief in karma (measured as individual differences).

Each study assessed ratings of a variety of moral transgressions that vary in their intent to cause harm and the severity of the harmful consequences – variables which produce variation in the severity of moral evaluations transgressions (Ames & Fiske, 2013; Cushman, 2013; N. Klein & O'Brien, 2017; Siegel et al., 2018), and which I therefore expected to produce variance in current character inferences. This set of moral transgressions allowed me to test the replicability of the primary analyses across both scenarios where immoral character traits could be inferred from the transgressors' intentional action (harmful, helpful, or neutral; Studies 1 and 2), and scenarios where the transgressors' harmful intentions were held constant (Study 3). My primary analyses reported below focus on how moral character inferences, derived from these scenarios,

were used by participants to forecast the transgressor's future moral character and future life outcomes, and whether belief in karma moderates the strength of the relation between inferences and forecasts. Finally, I conducted an internal meta-analysis, to assess the overall pattern of effects across all studies. All studies were run concurrently in February and March of 2018.

Hypotheses, methods, and analysis plans were preregistered on the Open Science Framework prior to data collection

(https://osf.io/u5gde/?view_only=f8ceb52bb92d4749885b551b7def755d). Below I identify any deviations from preregistered analysis plans. All data is available at https://osf.io/9taex/?view_only=8e6e6f76ccc24035bf68381126bbdfd0.⁸

Study 1

Methods

Participants

As preregistered, I aimed to recruit a sample of approximately 300 participants through Amazon's Mechanical Turk (MTurk). This sample size would have 80% power to detect reasonably small correlations ($r = .16$) and within-subjects differences ($d = 0.16$). Based on power analyses conducted via simulation (Green & MacLeod, 2016), this sample size has approximately 80% power to detect interactions of $b = 0.18$, which is smaller than previously-observed interactions between transgressor age and other morally-relevant variables (e.g., intentionality and disgustingness of actions, $b > 0.26$, 18), between belief in karma and other factors of moral judgements (e.g.,

⁸ These studies were also designed to test whether the age of the transgressor (adult vs. child) and implicit theories about the stability of moral character moderated these relationships. For this dissertation, I only present analyses focusing on the moderating role of belief in karma. An expanded manuscript containing all preregistered analyses pertaining to the full set of research questions captured by these studies was published as White et al. (2020).

valence of past behavior, $b > .20$, 23), and between entity theorists and incremental theorists' judgments of children's transgressions (e.g., $\eta_p^2=0.03$, 21). Based on preregistered criteria, I excluded 30 participants who failed at least one of two attention check questions, resulting in a final sample size of 299. 42% of participants reported being parents (exploratory analyses indicated that parental status did not significantly moderate any of the effects reported below). All sample demographics are provided in Table 3.1.

Table 3.1 Demographic composition of each sample

	Study 1	Study 2	Study 3A	Study 3B
<i>N</i>	299	660	309	218
Gender				
Female	54%	64%	62%	67%
Male	46%	36%	38%	33%
Age <i>M (SD)</i>	36.89 (12.07)	36.91 (12.29)	36.22 (10.89)	33.98 (11.36)
Ethnicity	76%	79%	79%	76%
Caucasian	7%	5%	6%	3%
Asian				
Other or not provided	17%	16%	15%	21%
Median Income	\$40,000 - \$49,999	\$50,000 - \$59,999	\$50,000 - \$59,999	\$40,000 - \$49,999
Education				
% with post-secondary degree	70%	75%	66%	66%
Religion				
Christian	48%	51%	50%	51%
Non-religious, atheist, agnostic	44%	37%	42%	40%
Other	8%	12%	8%	9%
Parents	42%	47%	46%	--

Vignettes Describing Moral Transgressions

After giving written informed consent, participants read four vignettes that each described an event in which one individual (the transgressor) caused harm to another person (adapted from White & Schaller, 2018, Study 3). For example, participants read that “Two men, Alex and Mike, were at a party. There were lots of people there, and everyone was having a good time. It was very crowded and there was not very much room to walk through the crowd. Alex was sitting down and suddenly Mike turned and intentionally struck Alex in the face with his hand, severely bruising his eye.” Within this set of four vignettes, I orthogonally manipulated (1) whether the harmful action was intentional (e.g., “Mike turned and intentionally struck Alex in the face”) or accidental (e.g., “Mike tripped and fell forward and his hand accidentally struck Alex in the face”), to ensure that there was sufficient variability in moral character inferences (across participants and across targets) to use as a predictor of future forecasts, and (2) whether the transgressor was an adult (e.g., “an adult man”) or child (e.g., “a 3-year old boy”). Each vignette referred to a different transgressor (with name, age, and gender varied across vignettes) who performed a different action (hitting someone, cutting someone with shattered glass, not warning someone about a dangerous situation, making someone have an allergic reaction). Vignette presentation order was randomized and specific vignette content matched with each condition (i.e., adult/intentional, adult/accidental, child/intentional, child/accidental) was counterbalanced across participants. (All materials, used in all studies, are available in the preregistration documents.)

Moral Inferences and Moral Forecasts

After each vignette, participants provided various judgments of about the transgressor. All responses were made on 7-point scales. Mean composite scores were computed for each

measure, after reverse-scoring specific items so that higher values indicated more negative evaluations.

Moral wrongness of the action. Four items ($\alpha = .94$) assessed judgments about the extent which the transgressor's behavior was "bad", "unacceptable", should be "punished," or should be "forgiven."

Transgressor's current moral character. Four items assessed judgments about the transgressor's current dispositional tendency to be "kind," "fair," "dishonest," and "selfish"; four additional items assessed judgments about the likelihood that, within the next month, the transgressor would "harm other people," "lie to other people," "help others who are in need," and "share with others." Although superficially distinct, indices of trait ratings and action likelihoods were very highly correlated ($r = .88$, 95% CI [.86, .89]) across all targets, although the correlation was slightly smaller when evaluating child transgressors ($r = .84$) than adult transgressors ($r = .91$), showing preliminary evidence that inferences about children's character are less consistent than inferences about adults' character. All eight items were combined into a single composite index ($\alpha = .94$). Results showed the same pattern of findings (in both magnitude and statistical significance) when using only the four character trait items, dropping the action likelihood items, which could also be conceived of as a measure of the transgressor's future character, albeit in the very near future (the next month) rather than the more distant future (20 years from now, as measured in the future character measure).

Transgressor's future moral character. An index comprised of 16 items assessed forecasts about the transgressor's traits and actions "20 years from now" ($\alpha = .98$). I chose this timeframe to ensure that all targets would be adults by this future timepoint, even the targets who were currently children in the vignette descriptions, maximizing the opportunity for participants

to report that moral character can change across different life stages. Eight items were identical to those used to assess inferences about current moral character (see above); 8 additional items assessed forecasts about additional morality-relevant traits (“cooperative,” “compassionate,” “unprincipled,” “irresponsible”) and actions (“cheat on a test,” “betray their friends and family members,” “refuse to give to charity, even when they have enough money,” “talk about others behind their backs”). Results showed the same pattern of findings (in both magnitude and statistical significance) when using the full 16-item measure of moral character, and when using an 8-item measure of future moral character that drops the items that are duplicated in the current moral character and future moral character measures. The measure of future moral character was also very highly correlated with the measure of current moral character, $r = .91$ 95% CI [.90, .92]. Despite this high correlation, the analyses below focus on separate composite measures of current character and future character inferences (while aggregating across inferences and traits within each timepoint) as the most parsimonious way of testing the theoretically-derived hypotheses while encompassing both trait and action likelihood measures. (When analyzed separately, the two different indicators of character that show similarly-sized differences over time according to the transgressor’s age.)

Transgressor’s future misfortunes. Participants forecast the likelihood that the transgressor would experience various negative outcomes “at some point in the future.” Five items referred to misfortunes resulting from actions taken by other people (“treated rudely by other people,” “betrayed by a friend,” “fired from [his/her] job,” “cheated on by a romantic partner,” and “have something valuable stolen”). Three other items referred to non-interpersonal, accidental misfortunes (“get injured in a car accident,” “have [his/her] home damaged by a natural disaster (e.g., hurricane, fire),” and “get a serious illness that requires

[him/her] to go to the hospital.”) For all studies I conducted separate analyses on indices assessing forecasts about *future interpersonal misfortunes* ($\alpha = .91$) and *future accidental misfortunes* ($\alpha = .89$). All of these items refer to somewhat common bad experiences that could befall any person, and include some experiences that may plausibly be caused by one’s own or another person’s actions, and some experiences that are more plausibly the result of natural circumstances beyond one’s control. These forecasts have conceptually distinct associations with moral character—interpersonal misfortunes (more so than accidental misfortunes) can be interpreted as the result of moral character via naturalistic (rather than supernatural) causal pathways—and were also empirically distinct: An exploratory factor analysis indicated that a one-factor solution was not a good fit for the data, $RMSEA = .27$, 90% CI [.26, .28], but a two-factor model was a good fit, $RMSEA = .061$ [.047, .075], and revealed two moderately correlated factors, $r = .49$, with no large cross-loading (all $< .27$). Accidental misfortunes were also judged far less likely overall than were interpersonal misfortunes, $d = 0.66$, $p < .001$. I therefore present separate analyses for forecasts about interpersonal and accidental misfortunes in all studies.

Individual Difference Measures

In addition to a questionnaire assessing demographic characteristics (e.g., gender, age, religious affiliation), participants completed the following individual difference measures.

Implicit personality theory (of moral character). An 8-item index (29; adapted from items previously used by [19]; $\alpha = .96$) assessed the extent to which participants believed that a person’s moral character is either stable or changeable over time (e.g., “A person’s moral character is something very basic about them and it can’t be changed much”). Higher values indicate greater perceived stability. This variable did not significantly moderate any of the

person perception judgments described below, in any study (see White, Norenzayan, & Schaller, 2020, for full details).

Belief in Karma. Belief in karma was assessed with a 16-item questionnaire (23; $\alpha = .94$) that has been validated across multiple cultural populations varying in ethnicity and religious beliefs. (Sample items: “When people are met with misfortune, they have brought it upon themselves by behavior in a past life”; “When someone does a good deed, even if there are no immediate consequences, they will be rewarded for it in some future time in their life.”) Higher values indicate stronger belief in karma.

Belief in a Just World. Participants also completed an 8-item measure that assesses belief in a just world, the expectation of fair treatment within one’s life (Lipkus et al., 1996) ($\alpha = .89$). This scale does not refer to any supernatural forces, and was included to explore whether forecasts of the future were moderated by beliefs about justice/fairness in general, or uniquely moderated by belief in karma, due to the expression of karmic causality over long timeframes (beyond that policed by secular sources of justice).

Belief in God. Three items measured belief in God (“I believe in God,” “I believe in a divine being who is involved in my life,” and “There is no God or higher power in the universe,” $\alpha = .89$).

Results

Analysis Strategy

Preliminary analyses assessed whether inferences about current moral character sensibly reflect features of the vignettes (e.g., intentional harms are worse than accidental harms). Primary analyses then examined relations between inferences about current character and

forecasts about future character and future misfortunes, and tested hypothesized moderators. Analyses were performed as mixed-effects models using the *lme4* package in R, including random intercepts and (when possible) slopes for moral character inferences nested within participant, to account for repeated measures (as a robustness check, I also conducted exploratory analyses that only analyzed the first vignette presented to participants; there was no evidence that trial order had an effect on responses, and this analysis produced similar effect sizes across studies to those presented below in the main preregistered analyses). Manipulated variables were dummy coded (transgressor age: 0 = child, 1 = adult; intentionality: 0 = accidental, 1 = intentional), and moral judgments and individual difference measures were standardized prior to analysis.

Inferences about Current Moral Character

Preliminary analyses confirmed that intentional transgressions, compared to accidental transgressions, were judged to be more wrong, $b = 2.93$ 95% CI [2.75, 3.12], and resulted in more negative inferences about current moral character, $b = 1.14$ [1.03, 1.25]. The effect of intentionality on wrongness and character inferences was weaker for child transgressors than adult transgressors (interaction b 's = 0.71 [0.45, 0.97] and 0.59 [0.44, 0.74], respectively; p 's < .001). The relationship between wrongness judgments and moral character inferences was also weaker for child transgressors (interaction $b = 0.12$ [0.07, 0.17], $p < .001$). These results replicate previous findings (White & Schaller, 2018), and show that the intentionality manipulation produced meaningful variability in current moral character inferences, allowing me to test the relationship between inferences and moral forecasts.

Forecasts about Future Misfortunes

There was a positive relationship between inferences of current moral character and forecasts about future interpersonal misfortunes, and (to a lesser extent) forecasts about future accidental misfortunes (Table 3.2). Did belief in karma moderate the size of these relationships? The results differed depending on the kind of misfortune: A stronger belief in karma predicted a significantly stronger relation between current character inferences and forecasts of accidental misfortunes; but for forecasts of interpersonal misfortunes the moderating effect was only marginally significant. There was also a main effect of belief in karma, such that karma believers expected that the targets (who all did a bad deed) would experience more negative accidental misfortunes overall than did non-believers. Additional exploratory analyses revealed that belief in a just world—a variable that does not necessarily entail justice outside the bounds of mundane physical/social causality (Table 3.3), and belief in God (Table 3.4) did not significantly moderate the size of either relation (b 's $< .04$, p 's $> .15$).

Table 3.2 Forecasts about future misfortunes (interpersonal and accidental) predicted by (a) inferences about current moral character, (b) individual differences in belief in Karma, and (c) the interaction between current moral character and belief in Karma.

Study 1				Study 2			Study 3A			Study 3B		
Interpersonal Misfortunes												
	<i>b</i> [95% CI]	<i>SE</i>	<i>p</i>	<i>b</i> [95% CI]	<i>SE</i>	<i>p</i>	<i>b</i> [95% CI]	<i>SE</i>	<i>p</i>	<i>b</i> [95% CI]	<i>SE</i>	<i>p</i>
Intercept	0.01 [-0.10, 0.11]	0.05	.91	0.00 [-0.07, 0.08]	0.04	.91	-0.01 [-0.10, 0.08]	0.05	.83	-0.01 [-0.12, 0.11]	0.06	.92
Current Moral Character	0.40 [0.36, 0.44]	0.02	<.001	0.35 [0.31, 0.39]	0.02	<.001	0.39 [0.34, 0.45]	0.03	<.001	0.39 [0.32, 0.45]	0.04	<.001
Belief in Karma	0.05 [-0.06, 0.15]	0.05	.40	-0.00 [-0.08, 0.07]	0.04	.93	0.08 [-0.01, 0.17]	0.05	.068	0.19 [0.08, 0.31]	0.06	.001
Current Moral Character × Belief in Karma	0.04 [-0.00, 0.08]	0.02	.061	0.05 [0.01, 0.09]	0.02	.012	0.00 [-0.05, 0.06]	0.03	.89	0.13 [0.06, 0.20]	0.03	<.001
Marginal R ² / Conditional R ²	.229 / .788			.198 / .726			.165 / .685			.174 / .716		
Accidental Misfortunes												
	<i>b</i> [95% CI]	<i>SE</i>	<i>p</i>	<i>b</i> [95% CI]	<i>SE</i>	<i>p</i>	<i>b</i> [95% CI]	<i>SE</i>	<i>p</i>	<i>b</i> [95% CI]	<i>SE</i>	<i>P</i>
Intercept	0.01 [-0.11, 0.13]	0.06	.88	0.00 [-0.08, 0.09]	0.04	.94	-0.01 [-0.12, 0.10]	0.06	.90	-0.00 [-0.14, 0.14]	0.07	.95
Current Moral Character	0.12 [0.09, 0.15]	0.01	<.001	0.07 [0.04, 0.11]	0.02	<.001	0.12 [0.08, 0.16]	0.02	<.001	0.16 [0.10, 0.21]	0.03	<.001
Belief in Karma	0.12 [0.00, 0.25]	0.06	.046	0.04 [-0.04, 0.12]	0.04	.36	0.16 [0.05, 0.27]	0.06	.005	0.19 [0.05, 0.33]	0.07	.007
Current Moral Character × Belief in Karma	0.03 [0.00, 0.06]	0.01	.044	0.03 [-0.00, 0.07]	0.02	.060	0.03 [-0.02, 0.07]	0.02	.24	0.12 [0.07, 0.18]	0.03	<.001
Marginal R ² / Conditional R ²	.034 / .836			.013 / .813			.036 / .820			.059 / .792		

Table 3.3 Forecasts about future misfortunes (interpersonal and accidental) predicted by (a) inferences about current moral character, (b) individual differences in belief in a just world, and (c) the interaction between current moral character and belief in a just world.

	Study 1		Study 2		Study 3A	
Interpersonal Misfortunes						
	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>
Current Moral Character	0.39 [0.35, 0.43]	<.001	0.35 [0.31, 0.39]	<.001	0.40 [0.34, 0.46]	<.001
Belief in a Just World	-0.10 [-0.20, 0.00]	.061	-0.11 [-0.18, -0.03]	.004	0.05 [-0.04, 0.15]	.24
Character × BJW	0.03 [-0.01, 0.06]	.15	0.05 [0.01, 0.09]	.009	0.06 [0.00, 0.11]	.035
Accidental Misfortunes						
	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>
Current Moral Character	0.12 [0.09, 0.15]	<.001	0.08 [0.04, 0.11]	<.001	0.12 [0.08, 0.16]	<.001
Belief in a Just World	-0.06 [-0.19, 0.06]	.30	0.00 [-0.08, 0.08]	.99	-0.05 [-0.17, 0.06]	.37
Character × BJW	-0.01 [-0.03, 0.02]	.72	0.00 [-0.04, 0.03]	.91	0.02 [-0.02, 0.06]	.38

Note. Mixed-effect models including random intercepts and random effect of character

Table 3.4 Forecasts about future misfortunes (interpersonal and accidental) predicted by (a) inferences about current moral character, (b) individual differences in belief in God, and (c) the interaction between current moral character and belief in God.

	Study 1		Study 2		Study 3A		Study 3B	
Interpersonal Misfortunes								
	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>
Current Moral Character	0.41 [0.39, 0.44]	<.001	0.35 [0.31, 0.39]	<.001	0.37 [0.33, 0.41]	<.001	0.39 [0.34, 0.44]	<.001
Belief in God	-0.01 [-0.11, 0.10]	.89	-0.03 [-0.11, 0.04]	.38	0.05 [-0.04, 0.14]	.24	-0.04 [-0.16, 0.08]	.55
Character × God	-0.00 [-0.03, 0.02]	.83	0.02 [-0.02, 0.06]	.34	0.07 [0.03, 0.11]	.001	-0.02 [-0.08, 0.03]	.41
Accidental Misfortunes								
	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>P</i>
Current Moral Character	0.13 [0.10, 0.15]	<.001	0.08 [0.04, 0.11]	<.001	0.11 [0.08, 0.14]	<.001	0.18 [0.13, 0.23]	<.001
Belief in God	-0.01 [-0.13, 0.11]	.86	-0.01 [-0.09, 0.07]	.77	-0.05 [-0.16, 0.06]	.38	-0.02 [-0.17, 0.12]	.76
Character × God	-0.01 [-0.03, 0.01]	.28	-0.01 [-0.05, 0.03]	.56	0.05 [0.01, 0.08]	.004	-0.07 [-0.11, -0.02]	.006

Note. Mixed-effect models including random intercepts and random effect of character.

Summary and Discussion

Moral character inferences were associated (very strongly) with forecasts about their future character and also (less strongly) with forecasts about future misfortunes. I also found that, as hypothesized, individual differences in belief in karma moderated forecasts of the future: Belief in karma was associated with a somewhat greater perceived likelihood that future misfortunes would befall individuals who were judged to have bad moral character. These findings extend previous research showing that belief in karma uniquely predicts attributions for past misfortunes (White, Norenzayan, et al., 2019), to show a similar pattern in forecasts of the

future. These forecasts were not significantly moderated by belief in God or belief in a just world, supporting the unique pattern of associations between belief in karma and moral forecasts, which is not captured by individual differences in other supernatural beliefs or other justice beliefs.

Study 2

Study 2 served as a conceptual replication of Study 1, using different vignettes and a different experimental manipulation to elicit variability in participants' moral judgments: Participants responded to vignettes depicting actions that were either harmful, helpful, or were neither harmful nor helpful to another person.

Methods

Participants

Following the same preregistered recruitment and data-exclusion criteria as in Study 1, 729 participants were recruited from MTurk and data from 69 participants were excluded prior to data analysis, leaving a final sample of 660. Given the addition of a between-subjects manipulation, I increased the planned sample size to 200 per condition to provide 80% power to detect small-to-medium between-condition differences ($d = 0.28$), in addition to retaining high (>90%) power to detect the small interaction effects (as predicted in Study 1).

Vignettes Describing Moral Actions

After providing informed consent, participants read two vignettes, one describing an action performed by a child and one describing an action performed by an adult. Participants were randomly assigned to read vignettes describing either (a) an adult and a child who perform harmful actions (e.g., "Emily noticed Olivia drop the money on the floor, and Emily reached down to take the money for herself"), (b) an adult and a child who perform helpful actions (e.g.,

“Emily noticed Olivia drop the money on the floor, so Emily picked it up and returned it to Olivia”), or (c) an adult and a child who perform morally neutral actions that were neither helpful nor harmful (e.g., “Emily saw Olivia notice that she had dropped the money, and saw Olivia pick it back up”). This set of scenarios was chosen to elicit an even greater range of inferences about moral character than were available in Study 1, by including both intentionally harmful actions, that signal immoral character traits, and explicitly helpful prosocial actions, that signal especially positive moral character traits (not merely the less-strongly-negative evaluations that were inferred from accidental transgressions in Study 1). Each vignette referred to a different transgressor performing a different action (e.g., causing [or preventing] someone from getting hurt; taking [or returning] someone’s money; not warning [or warning] someone about a dangerous situation; giving someone food they are allergic to [or a food they really like]), vignette presentation order was randomized, and specific vignette content was counterbalanced across participants.

Moral Inferences and Moral Forecasts

After reading each vignette, participants responded to measures that assessed the same judgments assessed in Study 1 (α ’s ranged from .88 to .95). The specific sets of items included in each measure were identical to those in Study 1, with two exceptions. An item assessing forgiveness was omitted from the composite index assessing judgments of the moral wrongness. (Also, for this study only, the endpoints of the moral wrongness response scale were altered to accommodate praise for helpful actions as well as condemnation of hurtful actions.) The index assessing forecasts of future moral character was comprised of 8 items, rather than 16 items (I omitted the 8 items from the future character measure in Study 1 that duplicated the traits and action likelihoods described in the current character measure).

Individual Difference Measures

Participants completed the same individual difference measures assessed in Study 1.

Results

Inferences about Current Moral Character

Preliminary analyses confirmed that harmful actions were judged to be more wrong than neutral actions ($b = 2.71$ [2.48, 2.94]) and resulted in more negative inferences about current moral character ($b = 0.66$ [0.54, 0.78]). Interactions with target age revealed that these effects were significantly weaker when judging children rather than adults (interaction $b = 0.99$ [0.72, 1.25] and $b = 0.73$ [0.60, 0.86], for judgments of moral wrongness and inferences about current character, respectively). Helpful actions were evaluated more positively than neutral actions ($b = -2.77$ [-3.00, -2.55]) and resulted in more positive inferences about current moral character ($b = -0.80$ [-0.92, 0.69]); the sizes of these effects were not significantly moderated by target age (interactions b 's = 0.21 [-0.05, 0.48] and = -0.02 [-0.14, 0.10], $p = .11$ and $.82$, respectively). These results again document meaningful variability in moral character inferences, which allowed me to test the relations between these inferences and moral forecasts.

Forecasts about Future Misfortunes

Inferences about current moral character were positively associated with forecasts about interpersonal misfortunes and (more weakly) with forecasts about accidental misfortunes.

Stronger belief in karma predicted a significantly stronger relation between current character inferences and forecasts of interpersonal misfortunes; but for forecasts of accidental misfortunes the moderating effect was only marginally significant (although of a similar magnitude to the effects observed in Study 1, Table 3.2). Belief in a just world also moderated the size of the relation with forecasts of interpersonal misfortunes ($b = 0.05$ [0.01, 0.09], $p =$

.009) but not the relation with forecasts of accidental misfortunes ($b = -0.00 [-0.04, 0.03]$, $p = .91$), and belief in God did not significantly moderate either relation (see Tables 3.3 and 3.4).

Summary and Discussion

Study 2 produced patterns of results similar to those observed in Study 1. Current moral character inferences very strongly predicted forecasts about future character, less strongly predicted forecasts about future interpersonal misfortunes, and even less strongly—but still positively—predicted forecasts about future accidental misfortunes. The magnitude of the relation with forecasts about misfortunes was also moderated (significantly, for interpersonal misfortunes, and marginally, for accidental misfortunes) by belief in karma: Negative moral character evaluations predicted a greater likelihood of negative future outcomes among participants with stronger beliefs in karma.

Study 3

Study 3 provided additional tests of the primary hypotheses, within a design that included another experimental manipulation to elicit variability in participants' moral judgments. All vignettes described transgressors who engaged in actions with harmful intent; in some versions of these vignettes the transgressor's actions actually had harmful consequences, whereas in other versions there were no harmful consequences.

We created two versions of Study 3, which varied the order in which materials were presented to participants. In Study 3A, participants completed all individual difference measures at the end of the procedures (consistent with the procedure used in Studies 1 and 2). In Study 3B, participants completed the belief in karma questionnaire first—a procedural change designed to make participants' karmic beliefs more salient while responding to vignettes. Study 3A was

preregistered, and Study 3B was not, but identical participant recruitment criteria and analyses were used in both samples, and data was collected concurrently.

Study 3A

Methods

Participants. Following the same preregistered criteria identified in Study 1, 327 participants were recruited from MTurk and data from 18 participants were excluded prior to data analysis, leaving a final sample of 309.

Materials. After providing informed consent, participants read four vignettes, each of which described an event in which one individual intended to cause harm to another person (e.g., “Megan gave Kate a peanut-butter cookie to eat. Megan thinks that Kate is allergic to peanut butter, but intentionally gave her the cookie anyways”). I orthogonally manipulated two variables within this set of four vignettes: The transgression had either a harmful outcome (e.g., “Kate had a severe allergic reaction from eating the cookie”) or a non-harmful outcome (e.g., “Kate is actually allergic to almonds, not peanuts, and she was not affected by eating the cookie”); and the transgressor was described as either an adult or a child. These scenarios allowed me to test the hypotheses in a context where all targets had potentially harmful intentions that could lead to inferences of immoral character traits, while retaining variability in evaluations across participants and across different targets (i.e., intentionally harmful actions tend to be judged more negatively when they cause more harmful outcomes, e.g., Cushman, 2013). Each vignette referred to a different transgressor performing a different action (e.g., succeeding or failing to cut someone with broken glass; succeeding or failing to take money from a stranger; not warning someone about a dangerous situation that causes an injury or does not cause an injury; succeeding or failing to give someone an allergic reaction), vignette

presentation order was randomized, and specific vignette content was counterbalanced across participants. After reading each vignette, participants responded to items that provided the composite indices of moral inferences and moral forecasts assessed in Study 2 (α 's ranged from .86 to .93). Finally, participants completed the same individual difference measures as in Studies 1 and 2.

Results

Inferences about current moral character. Preliminary analyses confirmed that actions with harmful outcomes (compared to identical actions with non-harmful outcomes) were judged to be more wrong ($b = 0.68$ [0.49, 0.88]) and resulted in more negative inferences about current moral character ($b = 0.13$ [0.02, 0.25]). Transgressor's age (adult or child) did not moderate the effect of harm on either wrongness judgments or moral character inferences (interaction b 's = -0.12 [-0.40, 0.16] and $b = 0.01$ [-0.15, 0.17], respectively; p 's = .39 and .92), nor did it moderate the association between wrongness judgments and character inferences ($b = -0.03$ [-0.09, 0.03], $p = .40$).

Forecasts about future misfortunes. Inferences about transgressor's current moral character were associated with forecasts about future interpersonal misfortunes and (more weakly) forecasts about accidental misfortunes. Results also show that, although there was a main effect of belief in karma on forecasts about future misfortunes (consistent with the findings from Study 1, where all targets had also committed some sort of bad deed), belief in karma did not moderate the relationship between inferences about current moral character and forecasts about future misfortunes (thus failing to replicate the previous two studies, although the magnitude of the moderation of accidental misfortunes was consistent across all studies, Table 3.2). Belief in a just world did moderate the relationship between character inferences and

forecasts about interpersonal misfortunes ($b = 0.06$ [0.00, 0.11], $p = .033$), but not accidental misfortunes ($b = .02$ [-0.02, 0.06], $p = .38$). In this study, for the first time, belief in God also showed a moderating effect on forecasts of interpersonal misfortunes ($b = 0.07$ [0.03, 0.11], $p = .001$) and accidental misfortunes ($b = 0.05$ [0.01, 0.08], $p = .004$).

Study 3B

Methods

230 participants were recruited from MTurk (this sample size is smaller than that in Study 3A due to an oversight that occurred during data collection). After excluding 12 participants (according to criteria preregistered for Study 3A), there was a final sample of 218 participants. The methods were identical to the methods of Study 3A, except for two elements. Participants completed the belief in karma questionnaire prior to completing all other measures—a procedure designed to bolster the psychological salience of participants’ beliefs about karma while completing the moral judgment tasks. Due to the small moderation by belief in karma observed in Study 1, I suspected that the moderating effect would be larger and/or more robust if karma beliefs were salient to participants. And, for the sake of procedural brevity, no additional individual difference measures were assessed (i.e., I did not include measures of belief in a just world or implicit personality theories, and only a single item measure of belief in God).

Results

Inferences about current moral character. Preliminary analyses again confirmed that actions with harmful outcomes were judged to be more wrong and resulted in more negative inferences about current moral character ($b = 0.44$ [0.21, 0.67] and $b = 0.14$ [0.00, 0.29],

respectively; p 's < .001 and .045). There was again no evidence that inferences about current character were moderated by transgressor's age, $b = 0.10 [-0.10, 0.30]$, $p = .33$.

Forecasts about future misfortunes. Inferences about transgressor's current moral character were positively related to forecasts about future interpersonal misfortunes and (more weakly) forecasts about accidental misfortunes. Statistically significant interactions (Table 3.2) showed that these relations were moderated by belief in karma: Among participants who more strongly believed in karma, inferences about current moral character were more strongly associated with forecasts about both interpersonal misfortunes ($b = 0.13 [0.06, 0.20]$, $p < .001$) and accidental misfortunes ($b = 0.12 [0.07, 0.18]$, $p < .001$). There was also again a main effect of belief in karma, such that believers expected that greater likelihood of future accidental misfortunes would befall these targets. Unlike in Study 3A, belief in God did not moderate the association between character inferences and forecasts about interpersonal misfortunes ($b = -0.02 [-0.08, 0.03]$, $p = .41$), and did significantly moderate forecasts about accidental misfortunes, but in the opposite direction from what had been found in Study 3A, $b = -0.07 [-0.11, 0.02]$, $p = .006$.

Summary and Discussion

Studies 3A and 3B confirmed that inferences about current moral character strongly inform forecasts about future character and also (less strongly) inform forecasts about future misfortunes. Study 3B replicated the moderating effect of belief in karma, which was associated with a stronger relationship between inferences about moral character and forecasts about future misfortunes. In general, belief in karma had stronger moderating effects in Study 3B than in any other study, perhaps due to a procedural change that made participants' karmic beliefs salient prior to responding to the moral vignettes. If there is merit to this explanation, it suggests that

these moderating effects might generally be stronger within Hindu and Buddhist populations, in which beliefs about karma are reinforced by cultural factors and are likely to be more chronically accessible. These studies provided inconsistent evidence of any moderating effect by belief in a just world, or belief in God, which again suggests that the relationship between character inferences and forecasts of misfortunes is uniquely moderated by belief in karma.

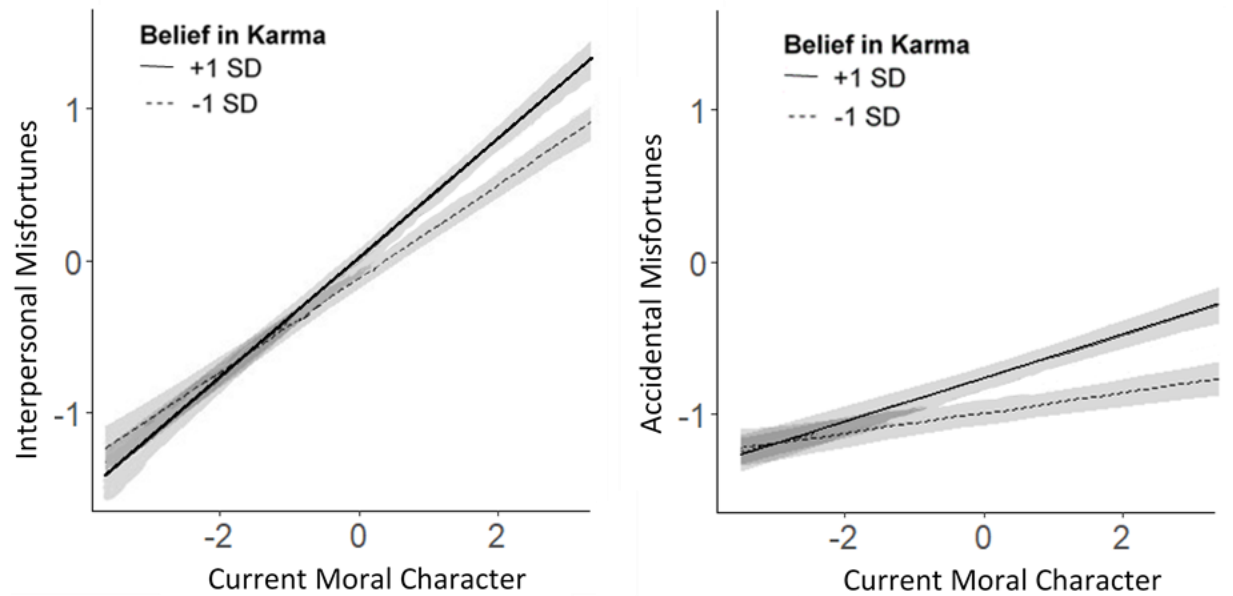
Meta-analytic summary

All studies showed that moral inferences predicted moral forecasts, and also provided some evidence of moderating variables. The magnitudes and statistical significance of these moderators varied across these studies (a plausible pattern even with real effects; Lakens & Etz, 2017). Therefore, I conducted an internal meta-analysis (using the *metafor* package in R) that estimated the effects of the hypothesized moderators across all studies.

As hypothesized, belief in karma moderated the extent to which inferences about current moral character were associated with forecasts about future misfortunes, as predicted, for both interpersonal misfortunes ($b = 0.054$, 95% CI [0.006, 0.10], $p = .029$) and accidental misfortunes ($b = 0.046$, 95% CI [0.011, 0.081], $p = .010$). These effects are depicted in Figure 3.1.

Belief in a just world also moderated the relation between inferences about current moral character and forecasts about interpersonal misfortunes ($b = 0.044$ [0.019, 0.069], $p = <.001$), but it did not moderate the relation with forecasts about accidental misfortunes ($b = -0.003$ [-0.020, 0.014], $p = .72$). In contrast, belief in God did not moderate the association between current moral character and forecasts about interpersonal misfortunes ($b = 0.019$ [-0.017, 0.055], $p = .31$), nor forecasts about accidental misfortunes ($b = -0.010$ [-0.056, 0.036], $p = .67$).

Figure 3.1 Regression, with 95% confidence bands, showing that participants' belief in karma moderated the relations between inferences about current moral character and forecasts about future misfortunes. Regression lines are plotted from data aggregated across all studies.



General Discussion

How strongly do inferences about individuals' current moral character predict forecasts about their future character and future misfortunes? Three studies tested which variables might moderate the strength of those relationships, by shaping assumptions about causality that determine the stability of character traits (and their consequences) across time.

Results produced clear evidence of the moderating effects of belief in karma: People who more strongly believed in karma were more strongly inclined to use inferences about moral character to inform forecasts about future misfortunes. This finding conceptually replicates and extends research showing that belief in karma amplifies the perceived causal connection between past misdeeds and current misfortunes (White, Norenzayan, et al., 2019), by revealing an analogous effect in forecasts about the future: In addition to showing an increased willingness to attribute *specific* bad experiences to *specific* past bad deeds, this study confirms that belief in karma reflects a more general tendency to expect that one's current character traits (determined by a collection of actions and dispositions) predict one's likelihood of a variety of future experiences. A subset of these effects were unique to the belief in karma: Although belief in a just world also moderated the relation between moral inferences and forecasts about interpersonal misfortunes, only belief in karma moderated the relation between moral inferences and forecasts about accidental misfortunes. This result extends previous research, suggesting that—compared to secular justice beliefs—belief in karma may influence forecasts about a wide range of future outcomes. These findings also highlight how people's understanding of karmic causality is deeply intertwined with how they understand moral character and how dispositions persist across time, not merely how they make consequentialist judgments about the just consequences of single actions. Despite the way that “karma” is sometimes used to explain a

specific instance of retribution for a specific bad deed, these results show how the general moral character traits (produced by committing moral transgressions) are also an important part of these expectations.

The studies presented in the chapter provide one window into how karmic beliefs shape psychological judgments about moral action, in the context of forecasts about the future. Chapters 4 and 5 aimed to further address the psychological implications of karma and God beliefs in two additional domains: judgments about what is right (deserving of rewards) and wrong (deserving of punishments), and decisions about whether to share money with strangers. Given that individuals who believe in karma are especially likely to expect good and bad deeds to result in commensurate good and bad future outcomes (this chapter), we predicted that believers should be more willing to behave generously towards strangers when thinking about karma, due to this threat of karmic payback. I provide an experimental test of this hypothesis in Chapter 5, but in Chapter 4 I first provide a more detailed investigation of which sorts of actions are believed to elicit supernatural rewards and punishment, using a free list task to capture explicit mental models of karma and God.

Chapter 4: Mental representations of supernatural norm enforcement

The previous chapter documented that people who believe in karma are more likely to make social inferences consistent with karmic causality, and that believing in God or merely expecting interpersonal justice did not show the same moderating pattern. The present chapter provides further evidence of the similarities and differences in mental representations of karma compared to God, which could help to explain the distinct psychological outcomes of each belief. The growing literature regarding how supernatural punishment beliefs are associated with prosociality has largely focused on understanding beliefs about gods, who are prototypically conceived of as powerful supernatural agents who monitor and police human moral behavior, and who enter into personal relationships with their devotees. But in many religious traditions, especially in non-Western contexts, the source of supernatural punishment comes not from gods but from karma—an ostensibly non-agentic causal process through which human actions beget morally-congruent consequences. While preliminary evidence indicates that both karma beliefs and God beliefs may be able to encourage prosociality towards strangers that sustains increasingly-complex societies (e.g., Watts et al., 2015), less is known about the mental representations of these different supernatural beliefs and whether they have unique associations with moral cognition. This chapter documents, in religiously diverse samples from the USA and India, differences between mental representations of karma and gods, and investigates whether these differences manifest in expectations about which human behaviors will elicit rewards/punishments from karma and from God.

God and karma share a concern in interpersonal morality

Belief in God and belief in karmic causality are widespread around the world (White, Norenzayan, et al., 2019). Cultural evolutionary theories of religion have proposed that beliefs

about God and karma are so widespread, in part, because they arise from similar intuitive cognitive biases in how people perceive the world (see Chapter 2) and also because they facilitate cooperation among large groups of anonymous strangers through the threat of supernatural punishments for moral transgressions and rewards for virtuous action (Norenzayan et al., 2016). These prosocial effects may be parochial, preferentially directed towards ingroup members, and religious traditions that encourage prosociality and moral norm adherence may also encourage a variety of ostensibly antisocial and immoral behaviors, such as intergroup animosity and interpersonal violence (Atran & Ginges, 2012). It is in fact under conditions of intergroup conflict that religion may be an especially effective motivator of intragroup cooperation (Bowles, 2008; Fletcher & Doebeli, 2009; Henrich, 2020; Henrich et al., 2019). For our purposes, I only wish to emphasize that belief in morally-concerned supernatural entities tends to encourage prosociality in some situations that would otherwise elicit more self-interested behavior (see Norenzayan et al., 2016, for further discussion).

In recent cross-cultural studies, interpersonal morality was central to descriptions of gods' desires (Lang, Purzycki, Apicella, Atkinson, Alexander, et al., 2019; Purzycki et al., 2016, 2012; Purzycki & Holland, 2018) and belief in morally-concerned gods predicted greater prosociality towards strangers in these samples (Lang et al., 2019; Purzycki et al., 2016). Recent research supports a broad association between supernatural punishment beliefs and prosociality, which is not limited to belief in gods per se. Experimental reminders of religion increase prosocial behavior (Shariff et al., 2016), and this prosocial effect has been found for both reminders of God and reminders of karma (Willard, Baimel, et al., 2020). Using a large database of historical information about Austronesian societies, Watts et al. (2015) found that social complexity is sustained by belief in a variety of supernatural punishments, not merely belief in morally-concerned high gods. These results support a general association between prosociality and both

god beliefs and karma beliefs, but do not directly address the moral content of these supernatural beliefs, or whether other differences between god beliefs and karma beliefs are evident in different expectations about how each entity enforces moral norms.

Differences between beliefs about karma and beliefs about God

In this chapter, I specifically test whether the different mental representations of God and karma—supernatural norm-enforcement beliefs that share different cultural histories and different patterns of religious devotion (White & Norenzayan, 2019)—result in as-yet-untested divergences between when karma and God are believed to monitor, reward, and punish interpersonal behaviors.

Believers typically view God as a social agent (Heiphetz et al., 2016; Shtulman & Lindeman, 2016). God has thoughts and motivations independent of human beings, and people can enter into a devotional relationship with God much as they would with other authorities (Rai & Fiske, 2011) or attachment figures (Davis, Moriarty, & Mauch, 2013; Granqvist, Mikulincer, & Shaver, 2010). By performing appropriate actions, including both prosocial behavior towards other people *and* appropriate deference and devotion to God, believers can have a loving, protective, personal relationship with God (K. A. Johnson, Okun, et al., 2015; K. A. Johnson, Cohen, et al., 2016). God's role as a creator, his undiscernible plan for human lives, petitionary prayers, devotional rituals, songs of praise, sacrificial offerings, and anthropomorphic depictions in literature and visual art all reinforce this view. It is because of this agentic representation of God that believers can fruitfully apply their socio-cognitive capacities to think about God (Epley et al., 2009; Grafman et al., 2020; van Elk & Aleman, 2017).

It is less evident that believers think about karma as a social agent. Karma is often depicted as a law-like cause-and-effect principle (i.e., actions lead to morally-congruent outcomes without the mediation of natural agents or supernatural agents, but through a non-

agentic cosmic force) or according to a resource-like metric (i.e., actions generate merit or demerit that is accumulated, quantified, and exchanged for particular experiences, Bronkhorst, 2011; Daniel, 1983). For example, in one study of Buddhist, Taoist, Christian and non-religious individuals in Singapore, karma was typically described in open-ended responses as the consequences of actions, like the Golden Rule, or, to a lesser extent, as rewards, punishments, and actions – with participants rarely, if ever, mentioning divine intervention, indicating that karma is perceived as distinct from moralizing gods (Willard, Baimel, et al., 2020). Hindus and Buddhists typically express both belief in karma and belief in a variety of gods-like supernatural agents (White, Norenzayan, et al., 2019), but whereas anthropomorphic visual depictions and devotional worship towards gods is common, no analogous depictions or worship is directed to karma, and karma is believed to operate independently of the will of the gods. Additionally, different behavioral scripts are used to ameliorate bad experiences believed to be caused by God and karma, with petitionary prayer and rituals being more effective when dealing with gods, and divination, penitential actions, and rituals for accumulating karmic merit being more effective for improving karmic outcomes (Aktor, 2012; Aulino, 2016; Cadge, 2005; Fuller, 2004; Nuckolls, 1991, 1992; Purzycki & Holland, 2018; Young et al., 2011).

Psychological studies that directly ask participants whether karma has agentic qualities—such as whether karma “can think,” “can see into people’s hearts and know their thoughts and feelings,” and “can communicate with people”—have found that believers are somewhat willing to endorse these personified descriptions, but they tend to do so much less strongly and less consistently than they do for God (Exline et al., 2021; Chapter 2). It therefore remains an open question how believers prototypically think about karma compared to God, which I investigate in the present studies.

Hypothesized divergences between salient norms enforced by karma and by God

To compliment this theological and anthropological evidence of divergences between karma and God beliefs, the present studies aim to examine whether mental representations of karma differ from mental representations of God. I also test the novel prediction that the different relationships that believers have with particular supernatural entities will manifest in which human actions are most often perceived to be rewarded and punished. While this is not the only domain where beliefs about God and karma may show different effects, the question of when (and how) these supernatural entities respond to human moral actions addresses key theoretical questions about the cultural evolution of diverse religious beliefs.

We specifically expect that if mental models of karma rely more on notions of exchange, then human actions reminiscent of giving or taking from others (e.g., sharing, helping, volunteering, and other personally-costly prosociality; greed and selfishness) may be especially salient in karmic rewards and punishments. Conversely, due to the personal relationships that believers have with agentic gods, descriptions of God are likely to emphasize acts of religious devotion (e.g., performing appropriate rituals, obeying religious guidelines for behavior, believing in and loving God), which are only minimally relevant when describing karma. Consistent with this prediction, Willard et al. (2020) recently documented in Singapore that Christians (a religious group centered on belief in God) reported that Piety/Impiety was the most salient action that leads to a good or bad afterlife, whereas Buddhists and Taoists (religious groups that endorse karmic causality as the determinant of one's afterlife) reported that charity, kindness, and harm were the most salient actions that determine a good or bad reincarnation. These patterns are also likely to appear in the appropriate way to escape supernatural punishments meted out by each entity, with prayer being viewed as an effective way to reconcile oneself with God, whereas good deeds being the best way to offset bad deeds policed by karma.

Overview of studies

In this chapter, I document mental representation of karma and God, and the implications for beliefs about supernatural norm enforcement, across seven religiously-diverse samples of Americans and Indians. Study 1 explores the general patterns of beliefs, and Study 2 provides a confirmatory preregistered test of focal hypotheses derived from Study 1. These samples test the replicability and generalizability of my key findings across both contexts where karma is long-entrenched in dominant cultural narratives—Indian, Hindu, and Buddhist samples—and contexts where belief in karma is more novel and is not entwined with one’s religious affiliation—a general sample of Americans (mostly White and from Christian and Non-religious families) who claim to believe in karma (Bronkhorst, 2011; White, Norenzayan, et al., 2019).

To capture mental representations of karma and God, I use an open-ended task in which participants freely listed the features of karma/God. Free list methodologies are widely used in anthropological and cross-cultural psychology studies to assess the salient features of people’s concepts, and have previously been used to examine beliefs about gods (Fincham et al., 2019; Purzycki & Holland, 2018), the afterlife (Willard, Baimel, et al., 2020), and characteristics of a good, moral person (e.g., Buchtel et al., 2015; Purzycki et al., 2018; Vaclair et al., 2014). By soliciting responses to open-ended questions, rather than using more specific questionnaires, researchers can capture whatever is most salient in participants’ mental models without biasing their responses to particular content. To investigate specific differences between mental representations of God and karma, I conducted targeted comparisons of responses consistent with an agentic/devotional representation—hypothesized to characterize God—and responses consistent with a moralized causality representation—hypothesized to characterize karma.

Study 1

Methods

Participants

Participants were recruited from MTurk and Qualtrics to complete a survey that began with an experimental test of how thinking about karma and God affects prosociality (results reported in Chapter 5), followed by the focal measures of this chapter.⁹ I recruited three samples of karma believers. The first sample consisted of 341 American participants recruited through Amazon’s Mechanical Turk (MTurk), in December 2016, who scored above scale midpoint in agreement with the statement, “Karma is a force that influences the events that happen in my life.” These participants were predominantly Christian or non-religious, therefore I also recruited two additional samples—200 American Hindus and 204 American Buddhists through Qualtrics’ online panels, in March 2017—to gain participants for whom karma is a central religious doctrine. I also recruited two samples of God believers, including 413 American MTurk participants who agreed with the statement “I believe that God exists,” and 203 Americans recruited through Qualtrics who selected “Christian” as their religious affiliation. These sample sizes (> 200) have at least 80% power to detect correlations of .20, between-subjects differences of $d = 0.28$ in a t-test, or an odds ratio >1.66 or < 0.60 in a logistic regression. Full demographic details are available in Table 4.1, and they largely echo the

⁹ Methods were preregistered on the OSF prior to data collection, although the analyses reported here were not preregistered and should be considered exploratory. Following pre-registered criteria, out of the total participants who completed the survey I excluded an additional 4 MTurk and 221 Qualtrics participants failed an attention check question, and 5 Qualtrics participants who took less than 1/3 the median time to finish the survey. MTurk samples: <https://osf.io/trnx7>, Qualtrics samples: <https://osf.io/2jyde>, all data and analysis code is available at <https://osf.io/8qkac>.

demographic patterns of karma belief and god belief reported in previous work (White, Norenzayan, et al., 2019).

Table 4.1. Demographic composition of samples

Recruitment Source	Study 1: Exploratory Sample					Study 2: Confirmatory Sample	
	MTurk		Qualtrics			MTurk	
Sample	Karma Believers	God Believers	Hindus	Buddhists	Christians	USA	India
N	341	413	200	204	203	340	798
Gender %							
Female	69	65	59	66	60	70	32
Male	31	35	41	34	40	30	68
Age <i>M (SD)</i>	36.76 (12.01)	38.05 (12.82)	39.92 (14.07)	48.85 (14.79)	53.12 (12.05)	37.30 (11.99)	32.03 (7.91)
Ethnicity %							
Caucasian	80	78	4	37	85	76	1
Asian	6	6	92	52	4	4	95
Other	14	19	4	11	11	20	4
Religion %							
Christian	54	83	--	--	100	74	11
Non-religious	35	11	--	--	--	10	0.3
Hindu	1	1	100	--	--	1	81
Buddhist	4	1	--	100	--	2	0.3
Other	6	4	--	--	--	13	7
Belief in karma <i>M (SD)</i>	3.39 (0.59)	2.76 (0.81)	3.73 (0.72)	3.63 (0.67)	2.77 (0.71)	3.66 (0.43)	3.86 (0.45)
Belief in God <i>M (SD)</i>	3.61 (1.40)	4.67 (0.48)	4.29 (1.02)	3.18 (1.27)	4.50 (0.97)	4.46 (0.54)	4.32 (0.58)
Religiosity <i>M (SD)</i>	2.49 (1.40)	3.53 (1.26)	3.02 (1.04)	2.53 (1.12)	3.38 (1.10)	3.35 (1.07)	3.82 (0.85)

Note. Confirmatory Sample demographics reflect only participants who scored above scale midpoint in both belief in karma and belief in God. See Appendix B for analyses regarding non-believers in these samples.

Materials and procedure

Each sample completed a larger survey designed to answer several loosely-related questions, which consisted of a brief demographic survey (e.g., age, gender, political orientation, and religious affiliation), followed by a multi-trial dictator game in which participants had the opportunity to share money with a stranger (results presented in Chapter 5), free list and moral

judgment tasks (the focal measures described below), and additional questions about demographics and supernatural beliefs (e.g., belief in karma, belief in the existence of God, religious commitment). Additional analyses utilizing a broader set of available measures are in Appendix B.

Free list descriptions of karma and God

Instructions. Participants provided free list descriptions of karma and God according to three prompts: (a) the features of God/karma, (b) actions eliciting supernatural rewards, and (c) actions eliciting supernatural punishments. MTurk God believers and Christians completed free list questions about God, and MTurk Karma believers, Hindus, and Buddhists completed free list questions about karma.

Participant were first asked, “We are interested in knowing what you think karma [God] is. Based on your personal beliefs, describe the features or abilities that karma [God] has. Write first those characteristics that are most important to describing karma, or those characteristics that come first to mind when you think about karma. Please list five characteristics of karma.” Participants were then asked, through analogous questions to describe things that a person could do “that would lead to good consequences because of karma [God]” (*supernatural rewards*) and “that would lead to bad consequences because of karma [God]” (*supernatural punishments*). The limit of 5 responses for each of these lists captures whichever traits were most salient to participants, but provides a conservative underestimate of how many participants think any given trait is descriptive of God or karma.

Coding strategy. Responses were coded into categories of semantically-similar words (e.g., “has mercy,” “forgiving,” and “forgives people” are all categorized into a single “forgiveness” category). Coding schemes were developed by the first author by coding a portion of the data in this study, and then applied to the data (including the entirety of the data in Study

2) by second, independent research assistants.¹⁰ The coding scheme applied in this project is not the only way in which these data could be analyzed (a topic I return to in the discussion), but they provide a first attempt to identify the likelihood of describing theoretically-interesting categories of responses. Importantly, coders were blind to the sample and cultural background of the participants who supplied the responses and whether they were describing God or karma in a given instance. This means that any idiosyncrasies created by the specific coding scheme that was applied might bias the assignment of responses to one category rather than another (e.g., “harm” vs. “greed”), but they would not bias comparisons made *within* a given category regarding descriptions of karma vs. God, or regarding descriptions made by participants from different samples. It is these within-category variations across targets and samples that I focus on in the analyses below.

Coders agreed on categorization of 55% - 97% of responses into each of the broad categories analyzed below (77% - 82% of the generosity/greed and religious devotion/violation categories that I focus on below). Any discrepancies between coders were resolved through discussion. These categories were grouped into broader categories of conceptual interest for analysis (e.g., categories for “giving to charity and volunteering,” “generosity,” “selflessness,” and “helping others” were grouped into a broad “generosity” category). Responses were re-coded as missing data if coders determined that they obviously did not answer the intended question, such as if instead of describing actions with good consequences, participants reported

¹⁰ Research assistants were undergraduate students attending a Canadian university. Although the coding scheme applied in this study was not verified by any experts in religion, theology, and morality, the research assistants coding the data did come from the same sorts of cultural backgrounds as the participants in these studies (e.g., being born in India, East Asia, and the United States, as well as Canada). The coding scheme developed on the exploratory data was refined in consultation with these research assistants, and research assistants used their best judgment about how to classify each response.

an obviously bad action (e.g., “murder”), a good consequence rather than the action that leads to those consequences (e.g., “eternal life in heaven”), something that is not a plausible action (e.g., “oceans”), or if they said that they do not know the answer.

Analyses presented below focus on comparing descriptions of God and karma on the following theoretically-relevant dimensions: For features of each entity, I focus on personality traits (e.g., forgiving, fair, kind, or mean); social roles (e.g., savior, teacher, protector, king, judge, helper, healer, father); supernatural powers (e.g., almighty, omniscient, omnipotent, eternal, creator); non-agentic attributes (e.g., balance, causality [without moral connotations], luck, fate; force-like, resources-like, or contagion-like features); and moralized causality (e.g., good actions lead to good outcomes, bad leads to bad outcomes, the Golden Rule, morality, or general goodness and badness). For actions eliciting supernatural rewards and punishments, analyses focus on two broad categories of responses: Religious devotion and violations of religious responsibilities (e.g., [lack of] religious behavior, [not] giving to the church/temple, confession, attendance at religious services, evangelizing, prayer, meditation, [lack of] devotion/belief/faith); and generosity (e.g., giving to charity or volunteering, generosity, selflessness, helping others) and greed (e.g., selfishness, greed, attachment to worldly things). Full details of the coding schemes are available in Appendix B.

Analysis strategy. Free list responses were first quantified as the salience of each action category. Salience scores for each item were computed for each response using the *AnthroTools* package in R (Purzycki & Jamieson-Lane, 2017), as the inverse order of responses listed divided by the total number of responses listed by each participants (Quinlan, 2005; Smith et al., 1995; Smith & Borgatti, 1997). All participants were asked to list five items (and listed more than 4 items on average, across all samples and question types), but the actual number of items listed differed across participants due to missing data (and nonsensical or inappropriate responses

which were recoded as missing data). I computed average salience scores for each category in each group, using the highest salience whenever participants listed multiple items fitting the same category. This provided a score for each response ranging from 0 to 1, with higher numbers associated with greater frequency and an earlier order on the free list.

Escape from supernatural consequences

Participants were asked to “Imagine that you did something bad, and you were worried that you will face negative consequences, because of karma [god]. What could you do to escape these bad consequences?” Participants’ open-ended responses were coded by a research assistant for whether they mentioned (1) doing a good deed to make amends (either directly to the person harmed, or a non-specific good deed unrelated to the victim) or (2) religious actions, such as praying, asking God for forgiveness, confession, repentance, or engaging in other religious rituals. This question revealed which actions are believed to be effective ways to prevent supernatural punishment.

Results

Analysis strategy

Analyses below, unless otherwise noted, combined God believers and Christians into a single sample that described God, Hindus and Buddhists into a single sample of participants from karmic religious traditions that described karma, and the general sample of American karma believers who described karma (free list results did not meaningfully differ between the Hindu and Buddhist samples, but analyses for these five separate subsamples are available in the Appendix B). Below, I first describe the overall patterns of the free listed features of karma and God, and the free listed actions punished and rewarded by karma and God, then present targeted comparisons that test whether agentic, devotional beliefs are more common in representations of God and whether moralized causality beliefs are more common in representations of karma.

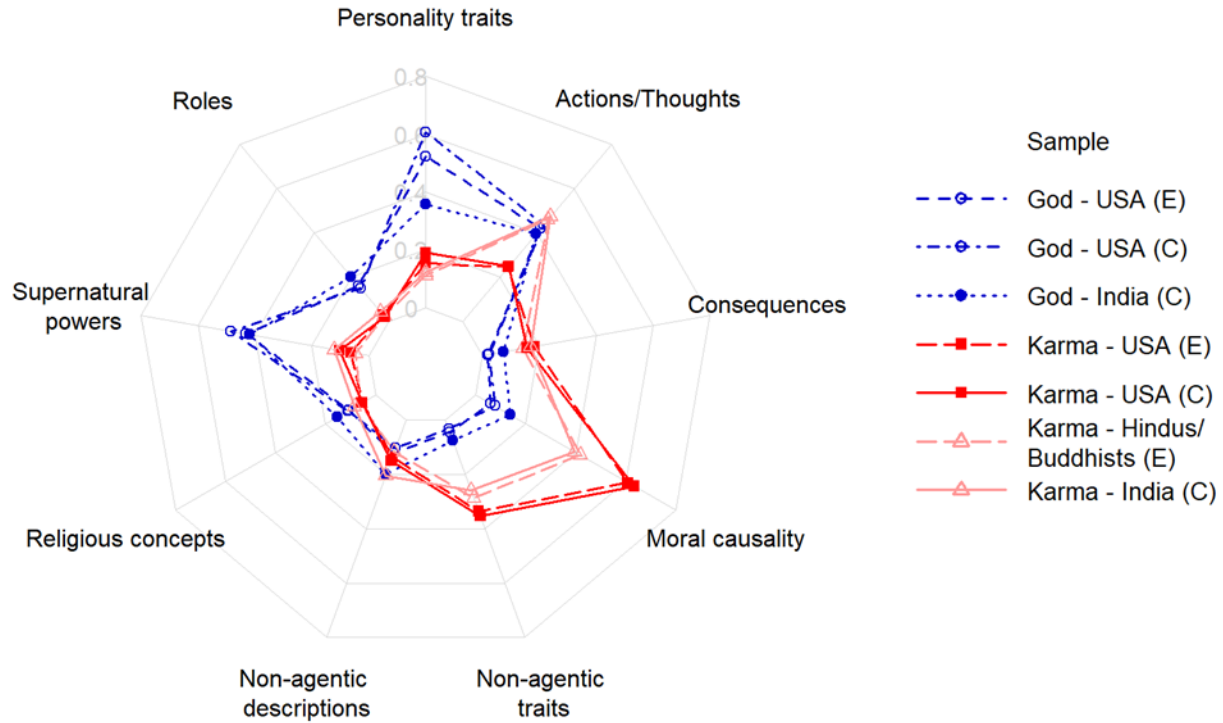


Figure 4.1. Group-averaged salience of features attributed to God (blue/circles) and karma (red/squares/triangles).

Note. Values range from 0 to 1, with higher scores indicating that the response was listed earlier in the list and by more participants. E = Study 1: Exploratory Sample, C = Study 2: Confirmatory Sample.

Overview of Features of God and karma

Figure 4.1 depicts the salience scores for free list descriptions of karma and God. In descriptions of God, all samples frequently listed personality traits (e.g., being loving and kind) and supernatural powers (e.g., being an almighty, omniscient, creator), with other social roles (e.g., father, teacher) and actions/thoughts also being quite often. Moralized causality, non-agentic traits and non-agentic descriptors were rarely mentioned. In contrast, when describing karma, all samples frequently listed moralized causality (e.g., good actions lead to good consequences) and non-agentic traits (e.g., balance, causality, or force), and rarely mentioned social roles or supernatural powers. (They also did not mention gods or Buddha when describing

karma.) Personality traits and actions/thoughts were listed moderately frequently for karma (especially by Hindus and Buddhists), as well as being present in descriptions of God, indicating that some amount of agentic mental representations are part of karma as well as God.

Overview of Actions rewarded and punished by God and karma

As displayed in Figure 4.2, in all samples generosity (e.g., giving to charity, sharing, helping others, and being selfless) and caring for others (e.g., love, kindness, compassion, friendliness, and not causing harm) were highly salient actions resulting in good consequences, and cheating, unkindness, harm, and greed were highly salient actions resulting in bad consequences – that is, prototypical examples of morality previously documented outside of religious contexts (Purzycki et al., 2018; Schein & Gray, 2015; Vauclair et al., 2014). Honesty, tolerance/intolerance and generally doing good or bad things were also listed quite often. Also showing up occasionally, in all groups, were items referring to hard work and dedication to fulfilling one's responsibilities – traits which are not obviously prosocial/antisocial, but are consistent with the idea that, as part of secular or supernatural justice, hard work will lead to successful achievement of long-term goals (Hafer & Rubel, 2015; Laurin & Kay, 2017).

(Dis)loyalty, (dis)respect for authority, and bodily or sexual (im)purity were mentioned much less often. This is true even though these samples contain American Christians and Hindus – groups who have been found, in past research to personally moralize issues of respect, loyalty, and purity, as much as they moralize harm and fairness concerns (Graham et al., 2013; Graham & Haidt, 2010; Hone et al., 2020; K. A. Johnson, Hook, et al., 2016; McCullough et al., 2012; Shweder et al., 1997; Weeden et al., 2008; Weeden & Kurzban, 2013). All participant groups responded very similarly, despite variability in their religion affiliations, ethnicities, and how

they learned about God/karma.¹¹ The only category that strikingly deviates from this pattern is religious devotion and religious violations, which were highly salient when describing God, but uncommon for karma. Additional analyses (available in Appendix B) confirmed that participants were listing actions that were perceived as morally relevant in general. Participants tended to report that actions with supernatural punishments were morally wrong and somewhat harmful to both the actor and to other people, while actions with supernatural rewards were morally good and somewhat helpful to both the actor and to other people.

¹¹ Additional analyses, available in Appendix B, tested whether individual differences in Moral Foundations or political orientation predicted free list responses, and failed to find any consistent relationships between these individual differences and descriptions of karma and God.

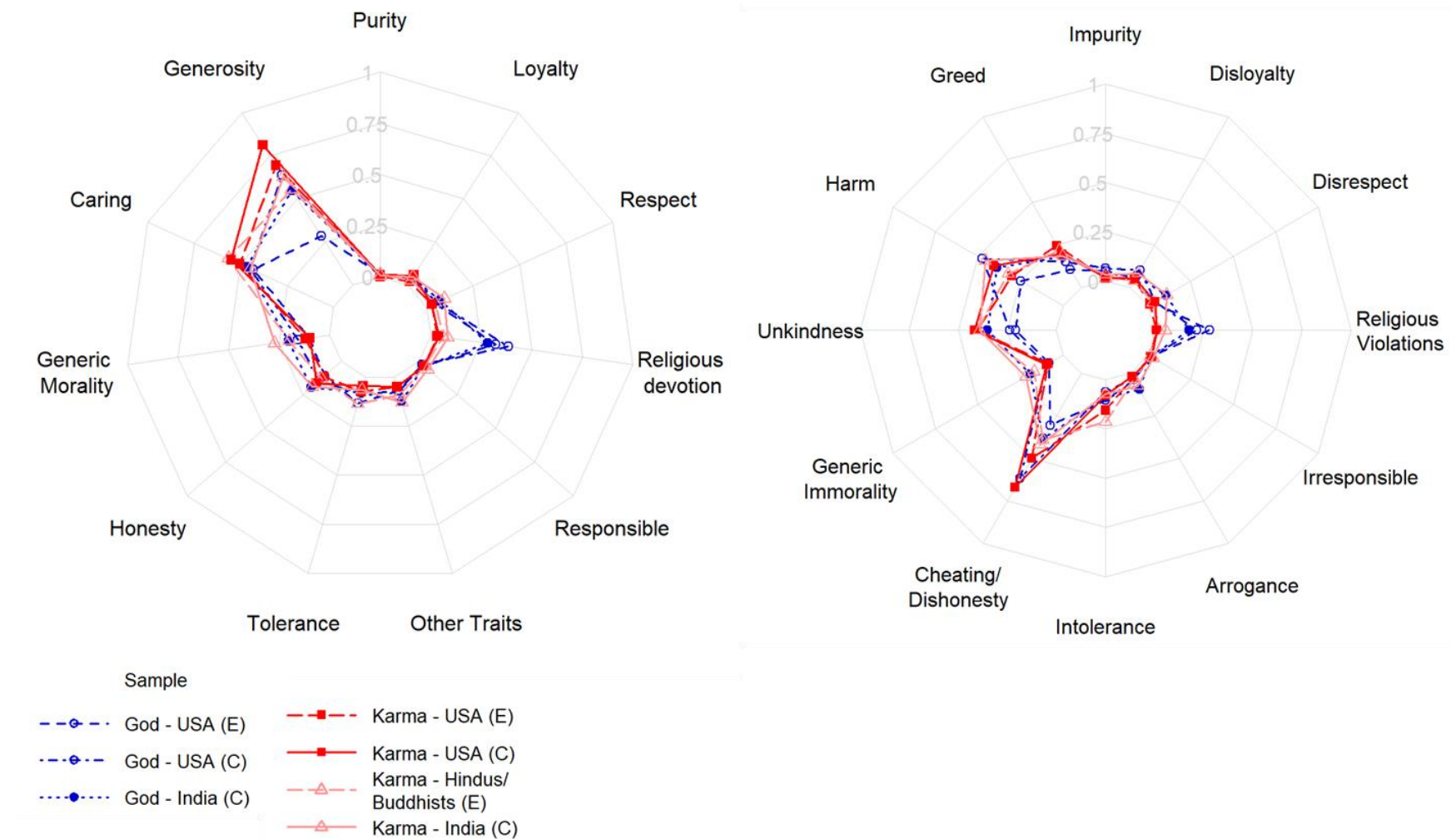


Figure 4.2. Group-averaged salience of actions leading to good consequences (left) and bad consequences (right), because of God (blue/circles) and karma (red/squares/triangles). Values range from 0 to 1, with higher scores indicating that the response was listed earlier in the list and by more participants. E = Study 1: Exploratory Sample, C = Study 2: Confirmatory Sample.

Agency and religious devotion as characteristic of God vs. karma

To further investigate specific differences between mental representations of God and karma, I used logistic regressions to predict the presence/absence of a given category in the free lists (0 = never mentioned, 1 = mentioned one or more times across any of the five possible responses) from participant group (dummy coded).

Feature free list: Personality traits vs. non-agentic traits

As depicted in Figure 4.1, Hindus/Buddhists were substantially less likely to describe karma as having personality traits, $OR = 0.09$ [0.06, 0.12], a role, $OR = 0.13$ [0.07, 0.21], or supernatural powers, $OR = 0.06$ [0.04, 0.09], and karma was much higher in non-agentic attributes, $OR = 8.76$ [6.00, 13.09], compared to descriptions of God. Karma believers were also substantially less likely to describe karma as having personality traits, $OR = 0.11$ [0.08, 0.15], a role, $OR = 0.15$ [0.09, 0.25], or supernatural powers, $OR = 0.09$ [0.06, 0.12], and karma was much higher in non-agentic attributes, $OR = 12.00$ [8.16, 18.04], all $ps < .001$. Hindus/Buddhists and karma believers did not significantly differ in ratings of karma's personality traits, roles, or supernatural powers, but Hindus/Buddhists were less likely to ascribe non-agentic qualities to karma than were karma believers, $OR = 0.73$ [0.54, 0.98].

Morality free list: Religious devotion

For all analyses of the reward and punishment free lists, analyses were performed separately for actions with good consequences (reward free list) and actions with bad consequences (punishment free list), because I had no specific hypotheses about valence differences and because including valence in the analysis led to convergence problems in several analyses. I also controlled for participants' religiosity (standardized) in these analyses, to ensure that it was not simply group-level differences in religiosity driving these relationships.

More religious participants were more likely to list religious morality in the free list responses, $OR_{reward} = 1.50 [1.29, 1.75]$, $OR_{punishment} = 1.80 [1.50, 2.18]$, $ps < .001$, but substantial differences remained between descriptions of God and karma even after controlling for religiosity. As depicted in Figure 4.2, free list responses broadly referring to religious devotion (e.g., faith, religiously-prescribed morality, attending religious services and engaging in rituals, prayer, and meditation, evangelizing, and giving money to church) were mentioned substantially less by karma believers, $OR = 0.12 [0.07, 0.18]$, $p < .001$, or Hindus/Buddhists describing karma, $OR = 0.21 [0.14, 0.29]$, $p < .001$, than by participants describing God. Likewise, responses referring to a lack of religious devotion (e.g., sinning, unbelief, lack of devotion, and failure to engage in religious rituals) were also mentioned substantially less by karma believers, $OR = 0.04 [0.02, 0.09]$, $p < .001$, or Hindus/Buddhists describing karma, $OR = 0.08 [0.04, 0.14]$, $p < .001$, than by participants describing God.

How to escape supernatural punishments

As depicted in Figure 4.3, engaging in a religious action to escape supernatural punishment (such as asking God for forgiveness, prayer, or other rituals) was mentioned generally more by participants who were more religious, $OR = 1.72 [1.56, 1.90]$, $p < .001$, and significantly less by karma believers, $OR = 0.09 [0.07, 0.12]$, or Hindus/Buddhists describing karma, $OR = 0.16 [0.13, 0.20]$, $ps < .001$, than by participants describing God.

Individual-level consistency in descriptions of God

We conducted additional exploratory analyses to test whether, for each sub-sample, free listed descriptions of God predicted the presence of religious devotion in the reward/punishment free lists, and whether these feature and reward/punishment free lists predicted the view that prayer is an effective strategy to escape punishment from God. There was no consistent

evidence of individual-level associations between the features freely attributed to God and other aspects of god beliefs. Ascribing personality traits to God, or describing God non-agentially, did not predict the tendency to report that God would reward religious devotion, $OR_{\text{personality}} = 1.19 [0.84, 1.69]$, $OR_{\text{non-agentic}} = 1.09 [0.77, 1.57]$, $ps > .33$, and punish religious violations, $OR_{\text{personality}} = 0.57 [0.27, 1.15]$, $OR_{\text{non-agentic}} = 1.06 [0.52, 2.08]$, $ps > .13$. However, mental representations of God did predict open-ended descriptions of how to escape God's punishments: Participants who described God as possessing personality traits were more likely to report that transgressions can be escaped through prayer (open-ended question), $OR = 1.83 [1.27, 2.63]$, $p < .001$, and describing God as possessing non-agentic traits negatively predicted escape through prayer, $OR = 0.50 [0.25, 0.98]$, $p = .041$. Listing religious devotion in morality free list also positively predicted the perceived efficacy of prayer, $OR = 3.70 [2.51, 5.54]$, $p < .001$.

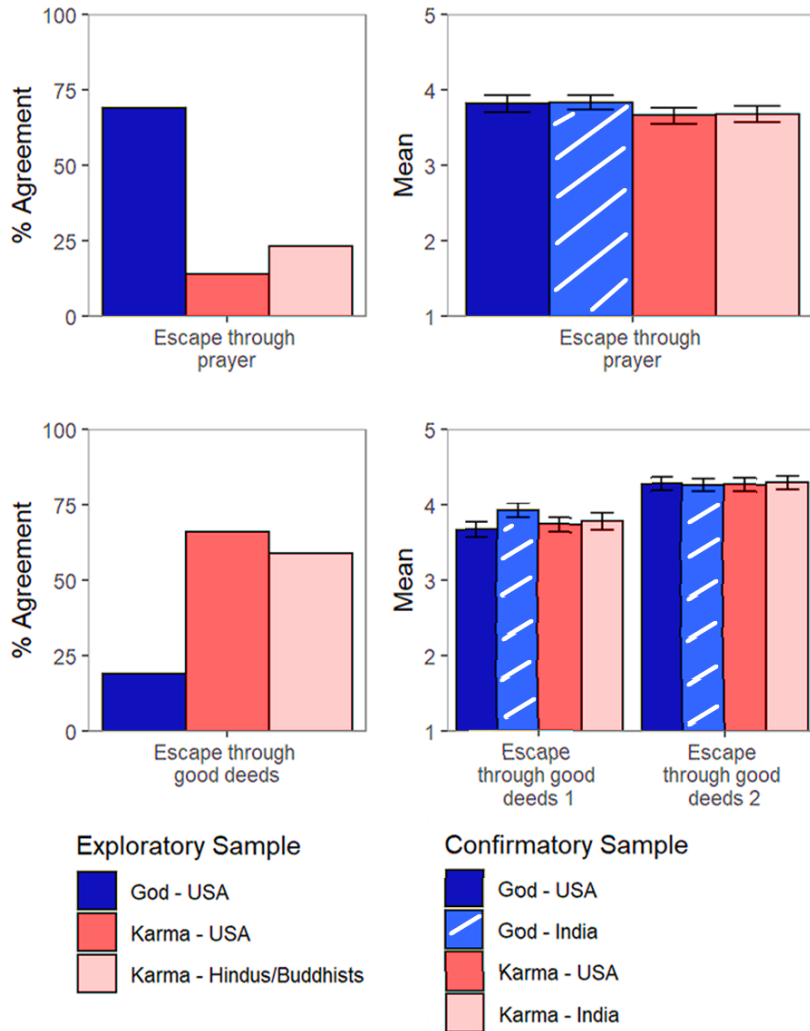


Figure 4.3. Effective strategies to escape supernatural punishments, according to open-ended descriptions in Study 1 (Exploratory Sample; left) and closed-ended responses in Study 2 (Confirmatory Sample; right).

Moralized causality and generosity as characteristic of karma vs. God

Feature free list: Moralized causality and actions

As depicted in Figure 4.1, Hindus/Buddhists were substantially more likely to describe karma as moralized causality, $OR = 9.71 [6.98, 13.70]$, or consequences, $OR = 7.22 [4.47, 12.16]$, than were participants describing God. Karma believers were also substantially more likely to describe karma as moralized causality, $OR = 19.91 [14.06, 28.62]$, or consequences, OR

= 10.62 [6.60, 17.88], and less likely to describe karma as action, $OR = 0.48$ [0.36, 0.63], $ps < .001$, compared to participants describing God. Compared to karma believers, Hindus/Buddhists were less likely to describe karma as moralized causality, $OR = 0.49$ [0.36, 0.66], $p < .001$, or consequences, $OR = 0.68$ [0.48, 0.95], $p = .026$, and more likely to describe karma as actions, $OR = 2.40$ [1.79, 3.23], $p < .001$.

Morality free list: Generosity and greed

As depicted in Figure 4.2, free list responses broadly referring to generosity (e.g., sharing, generosity, charitable giving, volunteering, helping others, and engaging in other selfless behavior) were mentioned substantially more by karma believers, $OR = 5.05$ [3.75, 6.87], $p < .001$, or Hindus/Buddhists describing karma, $OR = 3.04$ [2.34, 3.96], $p < .001$, than by participants describing God. Likewise, responses referring to greed (e.g., selfishness, attachment to worldly goods, and refusing to help others) were also mentioned substantially more by karma believers, $OR = 2.52$ [1.87, 3.39], $p < .001$, or Hindus/Buddhists describing karma, $OR = 2.24$ [1.69, 2.98], $p < .001$, than by participants describing God. Other cooperative actions, such as “honesty,” which lack connotations of giving and exchange, did not differ between descriptions of karma and God, in any sample (see Appendix B).

How to escape supernatural punishments

As depicted in Figure 4.3, open-ended descriptions of how to escape supernatural punishments for misdeeds revealed that doing a good deed was mentioned significantly more by karma believers, $OR = 8.34$ [6.75, 10.34], $p < .001$, and Hindus/Buddhists, $OR = 6.25$ [5.12, 7.64], $p < .001$, describing karma, than by participants describing God.

Individual-level consistency in descriptions of karma

Finally, I investigated consistency in individual differences in mental representation of karma, across the feature free list, reward/punishment free list, and means of effective escape questions. Exploratory analyses were conducted separately for each sub-sample. The presence of moral causality in the feature free list predicted the presence of generosity as something rewarded by karma, among Hindus/Buddhists, $OR = 1.55 [1.02, 2.37]$, $p = .042$, and was in the same direction but not statistically significant among Karma believers, $OR = 1.55 [0.91, 2.63]$, $p = .10$. Moral causality in karma's features also predicted the presence of greed in the morality free list, among Karma believers, $OR = 1.69 [1.05, 2.76]$, $p = .032$, and Hindus/Buddhists, $OR = 1.77 [1.17, 2.68]$, $p = .007$.

The efficacy of good deeds to escape from karmic consequences was not significantly associated with the presence of moral causality in the feature free list, in any sample except Karma believers, $OR = 1.76 [1.10, 2.17]$, $p = .036$. However, escape through good deeds was predicted by generosity in the free list of karma's rewards, among karma believers, $OR = 1.83 [1.08, 3.09]$, $p = .024$, and Hindus/Buddhists, $OR = 2.68 [1.75, 4.13]$, $p < .001$. Therefore, there is some consistency in the tendency for individuals who describe karma as moral causality to also list generosity and greed and the free list of karma's rewards/punishments, and to subsequently rate good deeds as efficacious to escape karmic punishments. This shows a consistent pattern in mental representations of karma, which is not clearly evident in mental representations of God.

Discussion

Results from these exploratory samples provide initial evidence that there is substantial overlap between mental representations of God and karma, despite differences in the cultural history of the two constructs. Nevertheless, there was also evidence for distinct mental

representations of karma and God. Most people described karma as moralized causality, and ascribe non-agentic features of karma, as well as describing karma as partially about actions and personality traits – consistent with the perspective that human actions initiate the process of karmic causality. In contrast, moralized causality is rarely mentioned in descriptions of God, which are more centrally about God’s personality traits, supernatural powers, and social roles. These differences also show up in different priorities when describing which human actions elicit supernatural rewards and punishments, with generosity being mentioned more frequently when thinking about karma than God, and religious devotion being highly salient when thinking about God as almost never mentioned for karma. Likewise, good deeds are more often listed as ways to escape karmic punishments, whereas prayer is more frequently listed as a means to escape God’s wrath. These results show similarities as well as clear differences in expectations about supernatural norm enforcement depending on whether God or karma is the focal supernatural entity.

Study 2

Study 2 provided a preregistered replication of the focal patterns of mental representations of karma and God, reported in Study 1. This confirmatory sample also addresses methodological limitations of the previous study: In Study 1, participants described either karma *or* God, meaning that observed differences might be due to differences between samples (e.g., Christians vs. Hindus) rather than differences between targets (God vs. karma). In Study 2, participants described both karma *and* God, to investigate whether the same individuals hold different mental models of karma and God. I also attempted to replicate patterns in the importance of religious devotion and the efficacy of prayer to escape supernatural punishment (found to be highly salient in open-ended descriptions of God but not karma), using closed-ended

questions. This tests whether observed differences between targets resulted only from certain features being especially salient in mental models or whether these differences persist after being brought to mind by direct questions.

Methods

Participants

Participants were recruited from the USA and India through MTurk, and also included participants who do not believe in God or karma, thus allowing me to explore the responses of non-believers. The sampling strategy, exclusion criteria, and measures were preregistered on the OSF prior to data collection,¹² and prior to data analysis, I also preregistered an analysis plan and hypotheses regarding targeted comparisons of interest in the free list data. In August 2017, I aimed to recruit a sample of approximately 1250 participants from each country. The final sample consisted of 1263 American and 1237 Indian participants. All surveys were conducted in English, meaning that Indian participants were likely wealthier and more educated than the general population, but, importantly, participants' religious affiliation matched general demographic trends in these countries, with American participants being primarily Christian or non-religious, and Indian participants being primarily Hindu.

Following preregistered criteria, analyses reported below focus on a subset of participants from this larger sample who (1) claimed to believe in karma and God (i.e., scored above scale

¹² Methods: https://osf.io/37xd6/?view_only=23dd99e5c8c643a88c41d2d3e7e4016de; Analysis plan: https://osf.io/nhev5/?view_only=87e963d0c09c4fc58e3df5f87adceb84. Following preregistered criteria, participants were excluded from the final sample if they did not complete all six dictator games ($n = 139$), failed to correctly answer a question testing English speaking ability ($n = 8$), or failed more than one of the other three attention checks placed within the survey ($n = 71$). I had initially required participants to pass all three attention checks, but preliminary analyses showed an extremely high exclusion rate, due to one question that participants were required to leave blank, but were not able to correct after clicking on it. I therefore altered the criteria to only require 2/3 correct attention checks.

midpoint in both belief in karma, according to a questionnaire developed by White, Norenzayan, et al., 2019, or a 1-item or 3-item measure of belief in the existence of God, adapted from Willard & Norenzayan, 2013); (2) reported that “I believe in karma, and I responded based on my personal beliefs about karma,” rather than reporting that they do not believe or were responding based on other people’s beliefs; and (3) provided an appropriate response to the first item listed in the relevant free list (i.e., provided a response that was coded as nonsense by the independent coders, using the procedure described below; patterns of results did not meaningfully differ when including these participants in the analyses). Participants were excluded on a case-by-case basis, according to whoever provided appropriate responses to relevant items used in each analysis reported below.

Following these criteria, the focal sample included 338 Americans and 780 Indians who believed in both God and karma, by whom appropriate responses were provided by 321 Americans and 499 Indians describing bad consequences from God, 319 Americans and 496 Indians describing bad consequences from karma, 316 Americans and 533 Indians describing good consequences from God, and 318 Americans and 528 Indians describing good consequences from karma. These samples sizes ($ns > 315$) have at least 80% power to detect correlations of $r = .15$, between-subjects differences of $d = 0.22$ in a t-test, or an odds ratio > 1.49 or < 0.67 in a logistic regression.

Materials and procedure

Participants in Study 2 completed the same type of survey as in Study 1, that included a demographic question, a multi-trial dictator game, free list and moral judgment task, followed by several measures of supernatural beliefs (a full set of materials completed by participants is available in the preregistration documents).

Free list descriptions of karma and God

The free list task was identical to that in Study 1 (and was coded and analyzed using the same method), but in Study 2 all participants answered free list questions about both God and karma (order randomly assigned). To make instructions intelligible to all participants included in this study, believers were instructed to answer these questions “based on your own personal beliefs and experiences” and participants who did not believe in the relevant target were asked to “think about how other people in your culture would answer these questions, if they believed in karma [god] (please describe what other people think about karma [god]).”

I chose to merely refer to “God” in both samples due to previous evidence that Hindus understand different gods to be specific manifestations of an over-reaching God concept (Fuller, 2004), which has a prototypically-structured mental representation (Fincham et al., 2019), analogous to that documented in Western conceptions of a monotheistic god. I also asked Indian participants if they were thinking of any particular god when answering these questions, and free list responses did not meaningfully differ depending on which god they chose to describe (see Appendix B).

Closed-ended questions about supernatural rewards/punishments

In addition to the open-ended questions used in Study 1, I attempted to replicate patterns in the importance of religious devotion using closed-ended questions. After listing and evaluating the free list actions participants reported whether someone who is “not very committed to their religion (e.g., they did not attend many religious services, they did not pray very much, or they did not have faith)” will experience bad consequences caused by God and bad consequences caused by karma (7-point scale, *definitely will not* to *definitely will*).

Escape from supernatural consequences

Means of escape from supernatural consequences were included as part of the evaluations of free list responses. For free listed actions resulting in bad consequences, participants reported whether (1) prayer and (2) good deeds could reduce the likelihood of the bad consequences for this action (1 = *more likely* to 5 = *less likely* to face bad consequences). Participants also reported whether doing good deeds to escape bad consequences makes someone a good person or a bad person. For actions resulting in good consequences, participants reported whether engaging in the free list behavior “could make up for something bad that they did in the past,” (1 = *more likely* to 5 = *less likely* to face bad consequences).

Results

Overview of Features of God and karma

The salience scores for free list descriptions of karma and God are depicted in Figure 4.1, and largely replicated the pattern of responses from Study 1. In descriptions of God, all samples frequently listed personality traits, supernatural powers, and social roles, whereas moralized causality, non-agentic traits, and non-agentic descriptors were rarely mentioned. In contrast, when describing karma, both samples frequently listed moralized causality and non-agentic traits, and rarely mentioned social roles or supernatural powers. Personality traits and actions/thoughts were listed moderately frequently for karma (especially by Indians), as well as being present in descriptions of God, indicating that some amount of agentic mental representations are part of karma as well as God.

In this sample I analyzed the overall similarity between descriptions of God and karma using a multi-level logistic regression model predicting descriptions of karma from descriptions of God (including random intercepts nested within participant, and random intercepts nested

within free list category). Americans' descriptions of God were not associated with their descriptions of karma, $OR = 1.06 [0.88, 1.28]$, $p = .53$, but Indians who listed a particular trait when describing God were 2.48 times, 95% CI $[2.20, 2.80]$, more likely to list that trait when describing karma, $p < .001$. This indicates an especially large association between descriptions of God and karma in India, interaction $OR = 2.33 [1.89, 2.89]$, $p < .001$, perhaps due to the prevalence of both karma and various Gods in Hinduism, in contrast to the place of karma as outside of American religious (Christian) doctrine.

Overview of Actions rewarded and punished by God and karma

The free list of actions rewarded and punished also replicated the patterns of findings from Study 1. As displayed in Figure 4.2, actions pertaining to interpersonal prosocial were highly salient in descriptions of God and descriptions of karma: In all samples generosity and caring for others were highly salient actions resulting in good consequences, and cheating, unkindness, harm, and greed were highly salient actions resulting in bad consequences. (Dis)loyalty, (dis)respect for authority, and bodily or sexual (im)purity were mentioned much less often. The only category that strikingly deviates from this pattern is religious devotion and religious violations, which were highly salient when describing God, but uncommon for karma.

We also analyzed the overall similarity between descriptions of God and karma, using a multi-level logistic regression model predicting descriptions of karma from descriptions of God. Americans who listed a particular item when describing God's punishment were 6.35 times, 95% CI $[4.30, 9.36]$, more likely to list items from that same category when describing karma's punishment, and Indians descriptions of God's punishments were 9.69 times, 95% CI $[6.70, 14.01]$, more likely to appear in descriptions of karma's punishments, $ps < .001$, indicating an especially large association between descriptions of God and karma in India, interaction $OR =$

1.53 [1.22, 1.91], $ps < .001$. Similarly, items present when describing God's rewards were 3.87 times [2.64, 5.68] more likely to appear in Americans' descriptions of karma's rewards, and 4.00 times [2.80, 5.72] more likely to appear in Indians' descriptions of karma's reward, $ps < .001$, an association that was similar in both countries, interaction $OR = 1.03$ [0.82, 1.30], $p = .78$.

Additional exploratory analyses (reported in Appendix B) indicated that both believers (i.e., the focal sample) and non-believers exhibited a nearly-identical pattern of free list responses, providing strong evidence of cultural consensus about "God" and "karma" concepts, regardless of whether or not participants believed these entities were real.

Agency and religious devotion as characteristic of God vs. karma

To further investigate specific differences between mental representations of God and karma, I used logistic regressions to predict the presence/absence of a given category in the free lists (0 = never mentioned, 1 = mentioned one or more times across any of the five possible responses) from participant group (dummy coded).

Feature free list: Personality traits vs. non-agentic traits

Americans were substantially less likely to describe karma as having personality traits, $OR = 0.07$ [0.05, 0.12], a role, $OR = 0.12$ [0.07, 0.21], or supernatural powers, $OR = 0.08$ [0.05, 0.12], and karma was much higher in non-agentic attributes, $OR = 10.44$ [6.43, 16.95] compared to Americans' descriptions of God, $ps < .001$. Likewise, compared to Indians describing God, Indians were substantially less likely to describe karma having personality traits, $OR = 0.17$ [0.12, 0.24], a role, $OR = 0.13$ [0.09, 0.20], supernatural powers, $OR = 0.19$ [0.14, 0.26], and more likely to describe karma as having non-agentic attributes, $OR = 4.09$ [2.95, 5.67], $ps < .001$. The difference between descriptions of God and karma was larger in the USA than India for personality traits, interaction $OR = 2.24$ [1.36, 3.96], $p = .001$, and supernatural powers,

interaction $OR = 2.43 [1.50, 3.96]$, $p < .001$, and non-agentic traits, interaction $OR = 0.39 [0.22, 0.69]$, $p = .001$, but was of a similar size for both countries for roles, interaction $OR = 1.11 [0.56, 2.20]$, $p = .77$.

Morality free list: Religious devotion

As preregistered I predicted the presence of religious devotion from the target, country, participants' level of religiosity (standardized), and all interactions between these variables (similar target differences are found when not including religiosity as a covariate). Results are depicted in Table 4.2, Models A and B. Free list responses referring to religious devotion and religious violations were mentioned substantially less when describing karma than when describing God, but as hypothesized there was a significant target by country interaction, such that God's and karma's concern for religious actions was more similar among Indians than Americans. Unlike in Study 1, religiosity was only a weak predictor of listing religious actions: Only American participants describing God were more likely to list religious actions if they were themselves more religious, $OR_{reward} = 1.88 [1.21, 3.06]$, $p = .007$, $OR_{punishment} = 2.77 [1.18, 8.12]$, $p = .036$, while this simple effect was not statistically significant among Indians or among either group describing karma.

In contrast to the large differences in free list frequency, a direct question about likely supernatural consequences revealed that *both* karma and God were believed to punish a lack of religious devotion, especially among participants who themselves were highly religious (see Table 4.2, Model C). In India, religious immorality was approximately equally likely to be punished by God, $M = 4.18$, $SD = 1.62$, or karma, $M = 4.42$, $SD = 1.59$, whereas in the USA, punishment was slightly more likely to come from God, $M = 3.73$, $SD = 1.44$, than karma, $M =$

3.50, $SD = 1.34$ –a difference that is statistically significant but remains substantially smaller than differences observed in free list responses.

How to escape supernatural punishments

As another indicator of whether God and karma are believed to respond to religious actions, participants reported whether prayer could help them to escape the bad supernatural consequences of the free list actions. As preregistered, prayer was viewed as a more effective way to escape bad consequences caused by God than karma, in the USA and in India (see Table 4.2, Model D, and Figure 4.3). Participants' religiosity did not predict the perceived efficacy of prayer.

Table 4.2. Regressions predicting the likelihood of rewards for religious devotion, punishment for religious violations and lack of religious commitment, and escape of punishment through prayer, believers only.

	Model A: Religious devotion in free list		Model B: Religious violations in free list		Model C: Punishment for lack of religious commitment		Model D: Escape through prayer	
	<i>OR</i> [95% CI]	<i>p</i>	<i>OR</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>
Target (0 = God, 1 = karma)								
USA	0.07 [0.04, 0.11]	<.001	0.04 [0.01, 0.09]	<.001	-0.23 [-0.36, -0.10]	.001	-0.15 [-0.28, -0.02]	.028
India	0.28 [0.22, 0.37]	<.001	0.34 [0.23, 0.49]	<.001	0.10 [-0.00, 0.21]	.06	-0.14 [-0.25, -0.03]	.014
Country (0 = USA, 1 = India)	0.58 [0.43, 0.77]	<.001	0.71 [0.51, 0.98]	.036	0.20 [-0.01, 0.41]	.056	-0.02 [-0.18, 0.14]	.83
Target*	4.12 [2.34, 7.50]	<.001	8.68 [3.41, 30.13]	<.001	0.33 [0.16, 0.50]	<.001	0.01 [-0.16, 0.19]	.90
Country Relig.	1.17 [0.96, 1.45]	.13	1.14 [0.91, 1.44]	.25	0.22 [0.07, 0.37]	.003	0.08 [-0.03, 0.20]	.15
Target*	1.60 [0.98, 2.71]	.069	2.42 [1.00, 7.26]	.076	0.02 [-0.10, 0.13]	.79	0.00 [-0.12, 0.12]	.99
Country*	0.75 [0.56, 0.99]	.042	1.01 [0.73, 1.40]	.97	0.24 [0.04, 0.45]	.022	-0.05 [-0.21, 0.10]	.50
Relig.	0.85 [0.46, 1.55]	.61	0.48 [0.15, 1.28]	.17	0.08 [-0.09, 0.24]	.34	-0.08 [-0.25, 0.09]	.37
Target*								
Country*								
Relig.								

Note. Relig. = Religiosity. Target: 0 = God, 1 = karma. Analyses of direct questions about religious immorality and prayer were conducted as mixed-effects models including random intercepts for each participant, to account for the within-subjects nature of the data. Random intercepts were not included in free list analyses due to model convergence problems, but were included in the other models. Primary analyses provide estimates with the USA as the reference group. To ease comparison across countries, this table also provides the simple effects of target in India.

Individual-level consistency in descriptions of God

We conducted additional exploratory analyses to test whether free listed descriptions of God predicted the presence of religious devotion in the reward/punishment free lists, and whether these feature and reward/punishment free lists predicted the view that prayer is an effective strategy to escape punishment from God. There was no consistent evidence of individual-level associations between the features freely attributed to God and other aspects of god beliefs. Ascribing personality traits to God, or describing God non-agentically, did not predict the tendency to report that God would reward religious devotion and punish religious violations, *ORs* range from 0.65 to 1.33, $p > .10$. There was also no association between God's personality traits or non-agentic traits and the efficacy of prayer, $bs < .22$, $p > .11$, but there was an association between the presence of religious devotion in the morality free list and the perceived efficacy of prayer, $b = 0.24$ [0.09, 0.39], $p = .001$, and Indians, $b = 0.30$ [0.15, 0.46], $p < .001$.

Moralized causality and generosity as characteristic of karma vs. God

Feature free list: Moralized causality and actions

Americans were substantially more likely to describe karma as moralized causality, *OR* = 20.00 [12.58, 31, 79], or consequences, *OR* = 5.85 [3.33, 10.26], and less likely to describe karma as action, *OR* = 0.39 [0.28, 0.55], $ps < .001$, than they were to describe God using these traits. Likewise, compared to Indians describing God, Indians were substantially more likely to

describe karma as moralized causality, $OR = 5.68 [4.18, 7.70]$, or consequences, $OR = 3.16 [2.14, 4.66]$, $ps < .001$, and equally likely to describe karma as action, $OR = 1.08 [0.84, 1.39]$, $p = .55$. The difference between descriptions of God and karma were larger in the USA than India for moralized causality, interaction $OR = 0.28 [0.17, 0.47]$, $p < .001$, and actions, interaction $OR = 2.73 [1.80, 4.16]$, $p < .001$, and not significantly different for consequences, interaction $OR = 0.54 [0.28, 1.05]$, $p = .068$.

Morality free list: Generosity and greed

Preregistered analyses depicted in Table 4.3 (and Figure 4.2) confirmed that free list responses broadly referring to generosity (Model A) were mentioned more often when describing karma than when describing God, by both Americans and Indians. Greed (Model B) was also mentioned slightly more often when Americans described karma compared to God, although there was no difference in greed between Indians' descriptions of karma and God.

How to escape supernatural punishments

A preregistered test of this hypothesis using closed-ended question did not replicate the pattern found in Study 1. Engaging in good deeds to escape the bad free list action, or engaging in the good free list action to escape past misdeeds, was rated as a highly effective (Figure 4.3), regardless of whether participants were describing God or karma, in the USA and India. Unlike the large target differences in Study 1's open-ended responses, these direct questions revealed that good deeds were generally perceived as efficacious, with few meaningful target differences (see Table 4.3, Model C and D).

Table 4.3. Regressions predicting the likelihood of generosity and greed in free lists, and the effectiveness of good deeds to escape supernatural punishment, believers only.

	Model A: Generosity in free list <i>OR</i> [95% CI] <i>p</i>		Model B: Greed in free list <i>OR</i> [95% CI] <i>p</i>		Model C: Good free list action to escape bad consequences <i>b</i> [95% CI] <i>p</i>		Model D: Good deed to escape from bad free list action <i>b</i> [95% CI] <i>p</i>	
Target (0 = God, 1 = karma)								
USA	5.19 [5.13, 28.87]	<.001	1.51 [1.02, 2.22]	.038	-0.01 [-0.10, 0.09]	.89	0.07 [-0.05, 0.19]	.25
India	1.46 [1.00, 2.13]	.048	1.19 [0.87, 1.64]	.27	0.06 [-0.02, 0.13]	.15	-0.07 [-0.36, 0.03]	.16
Country (0 = USA, 1 = India)	0.34 [0.19, 0.64]	.001	1.03 [0.69, 1.53]	.88	-0.04 [-0.17, 0.09]	.51	0.21 [0.06, 0.36]	.007
Target*	0.28 [0.13, 0.60]	.001	0.79 [0.48, 1.31]	.36	0.06 [-0.06, 0.18]	.31	-0.14 [-0.29, 0.01]	.076
Country								

Note. Analyses were conducted as mixed-effects models including random intercepts for each participant, to account for the within-subjects nature of the data. Primary analyses provide estimates with the USA as the reference group. To ease comparison across countries, this table also provides the simple effects of target in India.

Individual-level consistency in descriptions of karma

Finally, I explored the consistency in individual differences in mental representation of karma, across the feature free list, reward/punishment free list, and means of effective escape questions. The presence of moral causality in the feature free list predicted the presence of generosity as something rewarded by karma, among Indians, $OR = 1.99$ [1.53, 2.60], $p < .001$, and was in the same direction but not statistically significant among Americans, $OR = 1.67$ [0.91, 2.99], $p = .086$. The efficacy of good deeds to escape from karmic consequences was not significantly associated with the presence of moral causality in the feature free list. However, escape through good deeds was predicted by generosity in the free list of karma's rewards, among Americans, $b = 0.30$ [0.05, 0.55], $p = .017$, but not significantly among Indians, $b = 0.10$

$[-0.06, 0.26], p = .22$. Therefore, replicating the pattern from Study 1, there is some consistency in the tendency for individuals who describe karma as moral causality to also list generosity and greed and the free list of karma's rewards/punishments, and to subsequently rate good deeds as efficacious to escape karmic punishments. This shows a consistent pattern in mental representations of karma, which is not clearly evident in mental representations of God.

Discussion

Study 2 replicated the pattern, documented in Study 1, that karma and God are mentally represented in distinct ways and these representations are associated with differences in which actions are salient elicitors of supernatural rewards and punishment. Importantly, these results were found in a sample of people who believe in the existence of *both* karma and God, and who reported their beliefs about both entities, meaning that the observed differences between karma beliefs and God beliefs cannot be attributable to different groups of people projecting different moral values onto each entity. Responses rather reflect distinct perceptions of different supernatural entities, that appear across individual from a variety of cultural and religious backgrounds.

General Discussion

In several religiously-diverse samples from the United States and India, we have documented both similarities between mental representations of karma and God, and how divergences between the mental representations of karma and God are related to how these entities are believed to reward and punish human behavior.

What are God and karma?

Most participants described God as possessing human-like personality traits, and fulfilling social roles, in addition to possessing super-human powers as an omniscient, almighty

creator of the universe. This anthropomorphic view of God provides a mental representation that believers can enter into a personal relationship with, such as engaging in acts of religious devotion to gain God's favor and engaging in petitionary prayer to escape God's displeasure.

In contrast, karma was rarely ascribed supernatural powers or social roles, and was much more often described through non-agentic causal processes (e.g., balance, cycles) especially in moral contexts (e.g., do good things and get good outcomes, payback for bad deeds, see Willard et al., 2020, for a similar description of karma among participants from Singapore). Personality traits, actions, and thoughts were also listed at moderate rates by all groups describing karma, and actions were especially common among Hindus and Buddhists (consistent with a longer cultural history of perceiving karma as part of the general causal structure of the universe, not restricted to *moral* actions per se, Bronkhorst, 2011; Fuller, 2004; Kyabgon, 2015; Obeyesekere, 2002). These descriptions of karma might be a sign that believers are, at times, willing so think about karma as a social agent, similar to how god believers describe God. However, this does not mean that participants were simply describing gods when asked to think about karma: This view of karma was prevalent even among samples including participants who do not believe in the existence of God (e.g., Buddhists and non-religious karma believers in Study 1, non-believers in Study 2). Alternatively, this may be another indicator of the tendency to view human moral action as central to karma, such that humans who express these positive and negative personality traits are part of the operation of karmic processes.

Which actions are monitored by karma and God?

Both karma and God were believed to reward and punish interpersonal morality, consistent with cultural evolutionary theories about the role of supernatural justice beliefs in supporting human cooperation (Norenzayan et al., 2016). Actions pertaining to harm and

injustice were highly salient in all samples (consistent with a general moral relevance of harm and injustice, Baumard et al., 2013; Gray & Keeney, 2015; Schein & Gray, 2015; Sousa & Piazza, 2014). But karma and God do not care about all domains of action with equal relevance. When God was the target of judgment, actions relating to religious devotion (a purity-related behavior) appeared quite frequently, but when thinking about karma, acts of religious devotion were rarely mentioned. This was true even in Hindu samples, where participants are highly religious and karma is part of their religious belief system. Instead, acts relating to generosity and helping were especially salient when describing karma, compared to descriptions of God. This pattern is consistent with the evidence that believers hold different mental representations of God and karma, which may be analogous to different relationship models. Belief in God may reflect a relationship guided by communal sharing principles (love, devotion, and care for dependents) or authority ranking principles (respect for hierarchy and the commands of authority figures). In contrast, belief in karma may be analogous to relationships guided by principles of equality matching (relying on principle of reciprocity) or market pricing (exchange based on some kind of currency, Fiske, 1992; Rai & Fiske, 2011).

This pattern indicates the limited explanatory power of the hypothesis that supernatural norm enforcement beliefs merely arise from people projecting their own moral values onto supernatural entities (Baumard & Boyer, 2013; Epley et al., 2009). Rather, beliefs about God and karma's moral concerns are specifically tied to a broader network of mental representations of these supernatural entities, which can diverge from interpersonal moral values (see also divergences between God's and humans' attitudes towards prosocial lying, Heiphetz et al., 2018, and valuation of outgroup members, Ginges et al., 2016).

Closed-ended versus open-ended methodologies

Our findings highlight the advantages of using open-ended questions to reveal what is most salient in participants' mental representations. This method revealed robust differences between descriptions of karma and God, which persisted across samples with different cultural backgrounds. These differences between karma and God did not show up as consistently in closed-answered questions designed to address the same hypotheses (e.g., whether karma and God punish a lack of religious devotion). This does not mean that one method is inherently better or provides more accurate insight into psychological processes, but they are likely be relevant predictors of behavior in different contexts: Open-ended responses, by revealing what is most salient in the minds of believers, reveal the concepts that come spontaneously to mind. Closed-ended responses may reflect both these salient beliefs and other concepts that are less salient, but which nonetheless drive behavior when elicited by external forces, such as when making decisions in a particular context that emphasizes certain values, or when people remind others of certain concepts to persuade them to engage in certain behavior.

Our studies also only applied one possible method of quantifying open-ended data: relying on human coders to classify responses into different categories. This method is often used in psychological and anthropological research into mental models of supernatural entities and moral values (e.g., Buchtel et al., 2015; Fincham et al., 2019; Purzycki et al., 2018; Purzycki & Holland, 2018; Vauclair et al., 2014; Willard et al., 2020), and it has the advantage of allowing researchers to focus on classifying responses into categories that are theoretically-meaningful to a particular research question, especially when no pre-defined dictionary is available. However, this method is limited in its ability to quickly analyze large datasets and is potentially biased by the particular categories that were chosen to be coded in a given study. Future research may

therefore also wish to use other methods to address these hypotheses (e.g., counting the frequency of words according to alternative, independently developed dictionaries of concepts; or using machine learning and other natural language processing methods for an entirely data-driven approach), and could also attempt to replicate these patterns of mental representations of karma and God using other corpuses of qualitative data.

Conclusion

This chapter documented beliefs about God and karma in religiously-diverse samples of Americans and Indians, to illustrate the concepts that believers hold and bring to psychological surveys about religion, morality, and prosocial behavior. These findings add to the mounting evidence that beliefs about supernatural forces, like God and karma, reflect issues that are central to governing human social life, alongside other elements that are unique to the relationships that believers have with supernatural agents and causal processes that ensure cosmic justice. In Chapter 5, I investigate the behavioral consequences of these beliefs for generosity towards strangers.

Chapter 5: Behavioral effects of supernatural norm enforcement: Thinking about karma and God reduces selfishness among believers

Beliefs about karma and God possess many features that make them well-suited to provide a culturally-supported mechanism that can increase cooperation and support the long-term success of large groups of unrelated individuals (Norenzayan et al., 2016; Watts et al., 2015). God and karma beliefs could encourage the adoption of particular norms (by framing certain actions as especially valued by supernatural agents, Chapter 4) and provide incentives that should inhibit norm violation (by positing supernatural punishment for counter-normative behavior, Chapters 2-4), subsequently creating prosocial communities of believers.

Experimental tests of this hypothesis have found that reminders of God encourage prosociality among believers (Shariff et al., 2016; Yilmaz & Bahçekapili, 2016). There is also growing cross-cultural evidence that commitment to such gods is associated with adherence to social norms prescribing cooperation, honesty, and generosity towards strangers (Purzycki et al., 2016; Shariff & Norenzayan, 2011). But moralizing gods are only one instance of the world's religious diversity that could be relevant to norm adherence (Norenzayan, 2016), and karma provides an important test case for both the generalizability and the mechanisms underlying religiously-motivated norm adherence, yet psychological research on belief in karma remains scarce.

In four experiments, I address this gap by investigating how reminders of karma, like reminders of God, encourage prosocial norm adherence in anonymous dictator games, and I test several boundary conditions for this effect. Cultural evolutionary theories hypothesize that karma and God play similar roles in motivating prosocial behavior, which would then help explain how both karmic religions and theistic traditions have expanded and stabilized in

increasingly large communities (Norenzayan et al., 2016; White, Sousa, & Prochownik, 2016). The conceptual similarities between karma and moralizing gods imply that both of these beliefs will encourage adherence to prosocial norms in economic games. I therefore hypothesized that individuals who believe that karma is real will behave less selfishly when they are reminded of karma.

Given that karma is believed to be a moralizing, supernatural force that intervenes in human affairs, it may seem obvious that thinking about karma can foster prosociality. However, karma also provides a supernatural explanation for why people deserve the blessings and misfortune that they receive. Therefore, it is conceivable that karma could be used to rationalize selfish behavior: Endowments in economic games could be viewed as deserved karmic rewards, thereby justifying selfishness. Karma may operate as a system-justifying belief (Cotterill et al., 2014), rather than a motivator of norm adherence. The present experiments allowed me to test this alternative hypothesis.

Theory-relevant moderators and individual differences

Priming religious concepts has been found to increase prosociality in many experimental studies. In a series of meta-analyses, the religious priming effect was consistent with evidentiary value in p-curves and robust to at least one technique that corrected for publication bias (Shariff et al., 2016). However, meta-analyses are no substitute for high-powered replications (Nelson, Simmons, & Simonsohn, 2018; van Elk et al., 2015) and there have been notable replication failures (e.g., Billingsley, Gomes, & McCullough, 2018; Gomes & McCullough, 2015), making the efficacy of religious priming an ongoing debate.

Several studies have also found that individual differences in belief in a punitive god predicts greater prosociality, while a benevolent god, if anything, encourages less prosocial

behavior (DeBono, Shariff, Poole, & Muraven, 2017; Purzycki et al., 2016; Shariff & Norenzayan, 2011; Shariff & Rhemtulla, 2012; Watts et al., 2015). However, I expect individual differences to be only weakly predictive or unassociated with behavioral measures of prosociality when supernatural beliefs are not salient (Kelly, Kramer & Shariff, 2019). Prosocial behavior can be influenced by many considerations unrelated to supernatural belief, including the need to keep money to provide for oneself, the desire to help another person, and personal norms governing behavior towards strangers. Within a single population there is also likely to be variability in prosocial behavior but high cultural consensus about the traits of God and karma, limiting the ability to predict behavior from this restricted range (this limitation addressed by cross cultural studies; e.g., Lang et al., in press; Purzycki et al, 2016; Watts et al., 2015). I therefore expect that level of belief will be weakly or unassociated with generosity in general, but that situational reminders of karma and God will lead believers to be more prosocial.

The experimental paradigm

In high-powered, pre-registered experiments, I investigated how explicitly thinking about karma or God affected giving in a multi-trial dictator game. Participants first played dictator games without any supernatural reminders, then were explicitly asked to think about karma or God and play several more dictator games. I adapted and modified the experimental paradigm from Ginges, Sheikh, Atran, & Argo (2016), who asked participants to make moral decisions from their own perspective and from God's perspective, thus providing a within-subjects measure of how thinking about God affects moral judgments.

These reminders of karma and God provide an experimental manipulation that departs from traditional priming techniques in which the prime is subliminal, implicit, or presented as unrelated to the decision task. Instead, this procedure is more consistent with experimental

paradigms that explicitly reframe the meaning of the decision task, to see how task behavior is shifted according to different norms in different contexts. For example, cooperation decreases when a Prisoner's Dilemma is labelled the "Wall Street Game" rather than the "Community Game" (Lieberman, Samuels, & Ross, 2004, see also Cronk, 2007; Pillutla & Chen, 1999). The supernatural framing procedure therefore cannot speak to debates about the evidentiary value of implicit religious priming effects (see Gomes & McCullough, 2015; Shariff et al., 2016; van Elk et al., 2015), but it does experimentally investigate how thinking about karma and God affects normative behavior. This paradigm also allowed me to test several theoretically-relevant moderators of the supernatural framing effect, something that has been difficult to do with previous paradigms.

Overview of hypotheses and experiments

First, I hypothesized that baseline levels of generosity will moderate the effect of supernatural framing. If thoughts of karma and God discourage normatively-dubious behavior, then they should decrease selfishness (i.e., keeping all the money), but not affect individuals who are already behaving normatively (i.e., who divide the money in half), a previously-hypothesized but untested prediction (Norenzayan et al., 2016; Shariff & Norenzayan, 2015; Willard, Shariff, & Norenzayan, 2016). In American (N. Klein & Epley, 2014) and cross-cultural samples (N. Klein et al., 2015), fair behavior is judged more favorably than selfishness, but ultra-prosocial behavior is perceived no more favorably than fairness, and I hypothesize that God and karma are believed to have similarly-asymmetric social preferences.

Second, I hypothesized that supernatural framing would only increase prosociality among believers, while effects would be attenuated or absent for participants who explicitly reject the existence of God and karma. A recent meta-analysis found no reliable evidence that religious

priming increased prosociality among non-believers (Shariff et al., 2016). If religious priming affected behavior by simply priming prosocial norms, then religious priming should not depend on belief, because both believers and non-believers hold similar concepts about the association between prosociality and God, karma, and religion (Chapter 4, also see Gervais, 2013; White & Norenzayan, 2019). However, if concern about supernatural judgment is a key component, then supernatural reminders should only affect participants who actually believe that God or karma is real and relevant to their lives. In addition, I explored whether supernatural framing effects were stronger when generosity was more central to karma/God's moral concerns, and when karma/God was viewed as more punitive.

Finally, I investigated the generalizability of supernatural framing effects among participants with diverse religious backgrounds, including Hindus (who believe in both karma and God as distinct supernatural forces, Fuller, 2004), Buddhists (who prototypically believe in karma but not God), and nonreligious Westerners (who may or may not believe in God, and may believe in karma despite not learning this belief from their religious communities or family members). This diverse sampling addressed religious identity signaling as an alternative explanation for these results. According to this perspective, thinking about karma or God might remind participants about their religious identity, and prompt believers to signal their religious identities by acting prosocially. If this were the case, then karma and God should affect behavior most strongly for participants who associate karma/God with their religious affiliation. In contrast, if it is the supernatural beliefs themselves and not religious identities that motivate prosociality, then reminders of karma would be expected to affect the behavior of both believers associated with karma-centered religions (e.g., Hindus) and karma believers unaffiliated with these religious traditions (e.g., Christian and non-religious Americans).

Experiment 1 provided an initial test of whether thinking about karma and God both decrease selfishness among Americans who expressed belief in karma and God. Experiment 2 extended these effects to a different population of believers with different cultural histories of belief in karma and God: Hindus, Buddhists, and Christians. Experiment 3 compared believers and nonbelievers. In all three experiments I investigated whether the hypothesized effect is moderated by the generosity of baseline offers and participants' views of supernatural benevolence and punitiveness. In Experiment 4, I replicated these effects in a between-subjects design. I report how I determined sample sizes, disclose all data exclusions, manipulations, and measures (in the article and in the accompanying Appendices), and make all data publicly available.¹³

Experiment 1

Experiment 1 investigated whether individuals who believe in karma give away more money when thinking about karma in a repeated dictator game (DG) paradigm. Additionally, I investigated whether individuals who believe in God give away more money when thinking about God. I also included a control (or neutral) condition, to assess whether participants' behavior changed over the course of repeated dictator games without supernatural framing. Finally, I investigated whether individual differences in belief predicted baseline giving or moderated the effect of supernatural framing.

Methods

Participants completed a dictator game task (reported below) followed by a series of questions probing beliefs about karma and God (reported in Chapter 4, Study 1). Before

¹³ All data relevant to these analyses is available at <https://osf.io/32x5t>.

conducting this study, all methods, hypotheses, and analysis plans were pre-registered on the Open Science Framework (OSF), and can be accessed at <https://osf.io/trnx7>.

Participants

We recruited American participants who expressed belief in God or karma from Amazon's Mechanical Turk (MTurk), in December 2016, in return for a small monetary payment (recruitment materials did not mention God, karma, or religion). Before any data analyses, I conducted a power analysis based on the estimated effect of religious priming on prosociality among believers, corrected for publication bias ($d = 0.28$), according to a recent meta-analysis (Shariff et al., 2016; Willard et al., 2016). This indicated that a minimum sample size of 136 was required to detect a within-subjects effect with $>.90$ power. I recruited a sample of 250 participants per condition to account for the possibility of lower-than-expected effect sizes. A sensitivity power analysis indicated that this sample size has 80% power to detect an effect size as small as $d = 0.18$ in a two-tailed paired-samples t-test or to detect small correlations ($r = 0.18$) between variables of interest.

Given that previous studies have not found reliable religious priming effects among non-believers (Shariff et al., 2016), for this study I only recruited participants who expressed explicit belief in God or karma. As specified in the preregistration, I excluded from participating any individuals who said that they did not believe in God and/or karma (i.e., scored at or below scale midpoint) in a prescreening survey ($n = 507$) or who reported non-belief at a later point in the survey ($n = 55$). As preregistered, I also excluded individuals who failed an attention check question ($n = 4$) and those who were directed to the full-length survey, but failed to complete it, thus providing insufficient data to test for hypothesized moderators: 27 did not complete the DG questions, and 177 answered the DG questions but did not complete the entire survey (rate of

attrition did not significantly differ across conditions, $N_{God} = 54$, $N_{Karma} = 53$, $N_{Neutral} = 70$, $\chi^2(2) = 3.09$, $p = .21$). Primary findings remain unchanged when these excluded participants were included in the total sample (see Appendix C). See Table 5.1 for demographic details of the final sample of participants ($N = 754$, after exclusions). Additional analyses using this sample are also reported in Chapter 4 (Exploratory Sample).

Participants were randomly assigned to three conditions: Karma, God, and Neutral. As mentioned, however, I was not interested in the effect of priming on non-believers for this study. As a result, the Karma condition excluded Karma non-believers, the God condition excluded God non-believers, and the neutral condition excluded those who did not believe in either entity. This assignment resulted in demographic differences across conditions, with the Karma framing condition ($n = 250$) including more non-religious (Agnostic, Atheist, and unaffiliated) and fewer Christian participants, and more Karma believers and less God believers, than participants in the God framing condition ($n = 254$; consistent with previously-documented demographic correlates of Karma belief in North America, White et al., 2019). Participants in the Neutral condition ($n = 250$) fell in between these two extremes. Note that these demographic differences cannot explain the within-subjects supernatural framing effect, because each participant served as his or her own control.

Table 5.1 Demographic characteristics of participants in each experiment, after exclusions

	Experiment 1			Experiment 2			Experiment 3		Experiment 4	
N	754			607			986		1244	
Source	MTurk			Qualtrics Panels			MTurk		Qualtrics Panels	
Gender	67% female			62% female			42% female		61% female	
Age $M (SD)$	37.47 (12.47)			47.24 (14.72)			35.42 (11.66)		45.79	
Ethnicity										
Caucasian	79%			42%			73%		80%	
Asian	5%			49%			12%		6%	
Other	16%			9%			15%		14%	
Framing Condition	God (Believers)	Karma (Believers)	Neutral	God (Christians)	Karma (Hindus)	Karma (Buddhists)	God	Karma	Karma	Neutral
Religion										
Christian	81%	58%	70%	100%	--	--	49%	46%	66%	64%
Non-religious	12%	30%	24%	--	--	--	42%	43%	24%	25%
Hindu	0%	1%	1%	--	100%	--	1%	1%	1%	1%
Buddhist	2%	4%	1%	--	--	100%	2%	1%	1%	1%
Other	5%	7%	4%	--	--	--	6%	9%	8%	9%
Belief in God $M (SD)$	8.34 (0.97)	6.56 (2.72)	7.22 (2.38)	8.00 (1.93)	7.58 (2.04)	5.36 (2.54)	5.54 (3.30)	5.56 (3.17)	6.84 (2.26)	6.62 (2.41)
Belief in Karma $M (SD)$	4.60 (1.61)	5.78 (1.19)	4.90 (1.62)	4.54 (1.41)	6.47 (1.43)	6.27 (1.34)	4.10 (1.79)	4.17 (1.74)	4.80 (1.58)	4.70 (1.62)
Social exposure to belief $M (SD)$	5.28 (1.17)	3.81 (1.26)	--	5.37 (1.15)	4.91 (1.16)	4.15 (1.35)	--	--	3.30 (1.50)	2.77 (1.50)

Materials and Procedure

Prescreening Survey. After providing informed consent, participants completed a brief demographic questionnaire that included questions about age, gender, ethnicity, religious affiliation, political orientation, and nationality. Embedded in this were questions that assessed whether participants believe in the existence of karma (“Karma is a force that influences the events that happen in my life”) and believe in the existence of God (“I believe that god exists”) on a 9-point Likert scale (1 = *strongly disagree*, 5 = *neither agree nor disagree*, 9 = *strongly agree*).

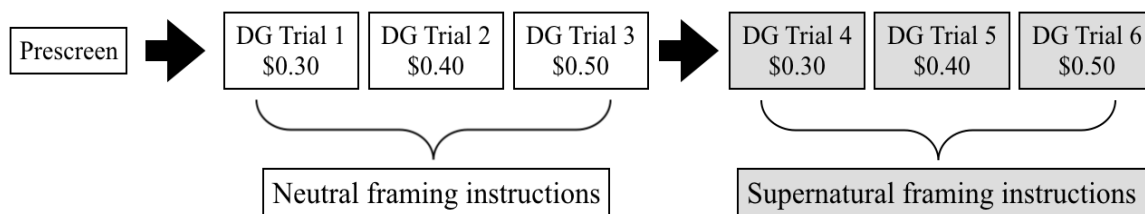
Supernatural Framing and Repeated Dictator Game. All participants who completed the prescreening survey received a small base payment, and participants directed to the full-length survey were also given the opportunity to receive a bonus payment determined by their dictator game responses. The dictator game is a common measure of prosociality that is also a valid predictor of cooperation in other real life situations (Benz & Meier, 2008; Franzen & Pointner, 2013; Peysakhovich, Nowak, & Rand, 2014, although see also Galizzi & Navarro-Martinez, 2018), and is widely used to study religious priming effects (e.g., Ahmed, 2009; Shariff & Norenzayan, 2007; Tan, 2006; Xygalatas, 2013).

Participants divided money between themselves and another anonymous participant in a 6-trial repeated dictator game task, depicted in Figure 5.1. For three trials (pre-framing), participants were instructed, without any mention of God or karma, to “indicate the amount of money that you want to take and keep for yourself, and the remainder will be given to another participant.” The identity of the recipient (e.g., Participant A, Participant B, and Participant C) and the amount of money (\$0.30, \$0.40, or \$0.50) varied across each trial, and presentation order was randomized. Although the amount of money was modest, it allowed participants to possibly

double their earnings. Participants were told that “After you complete this study, ONE of these decisions will be randomly selected, and you will be paid the amount of money that you chose to keep in that decision,” to make each individual decision meaningful and to deter any multi-trial response strategy (this payment for a subset of responses has been found to produce similar results as paying for every response, Charness, Gneezy, & Halladay, 2016).

Participants next completed three more DG trials (post-framing), in which participants in the God framing and Karma framing conditions were instructed to “make your decisions based on what your belief in God [your belief in the law of karma] would lead you to do.” Participants in the Neutral framing condition received the same non-supernatural instructions as before. I again varied the amount of money and recipient identity, and participants were reminded that they would only be paid for one decision. The money was real and was actually allocated according to participants’ decisions. I converted participants’ responses into scores indicating the proportion of money given away in each trial. In mixed-effects models, I predicted the proportion of money given away in each of the six trials. To summarize the results, I also created composite scores for the mean proportion of money given away in the first three trials (pre-framing giving, $\alpha = .94$) and in the final three trials (post-framing giving, $\alpha = .95$).

Figure 5.1 Repeated dictator game procedure



After completing the six DG trials, participants described the strategy used to make their DG decisions (“What were you thinking about, when you decided how much money to keep for yourself? What approach did you use to make that decision?”), reported whether they had

“previously participated in other studies like this one, that involved exchanging money with strangers or other anonymous participants in the study,” and reported their perception of the purpose and hypotheses of this experiment (“What do you think was the purpose of this study? What results do you think we expected to find?”). Analyses accounting for these questions do not meaningfully change the pattern of experimental effects (see Appendix C).

Religious Beliefs and Demographics. Participants next reported various aspects of their supernatural belief and religious commitment. Participants reported their view of God/karma as benevolent (“Loving,” “Forgiving,” and “Compassionate,” $\alpha = .92$) and punitive (“Punishing,” “Vengeful,” “Fearsome,” $\alpha = .81$). Belief in karma was assessed a second time through a previously-validated measure of karmic belief (White, Norenzayan, et al., 2019), that assesses participants’ agreement that people’s actions have morally-congruent consequences, both within one life and across lives ($\alpha = .91$). Embedded in this karma questionnaire was one attention check question (“Please select ‘Disagree’ as your answer to this question”) that was used to exclude inattentive participants from this experiment.

Participants also completed several open-ended questions about God and karma (depending on their assignment to God or Karma framing conditions). Of relevance, participants were asked to list five actions “that would lead to good consequences because of god [karma],” and five actions that would lead to bad consequences, thus providing a spontaneously-generated list of actions that elicit supernatural rewards and punishments. As described in Chapter 4, these free list responses were coded according to a scheme developed by the first author and applied by a second independent research assistant (both while blind to experimental condition and the remainder of the data). This coding grouped responses into categories of semantically-similar words, and below I focus on whether participants listed items from a broadly-defined generosity

category (including giving, generosity, charity, or helpfulness) as something with supernatural rewards, or items from a broadly-defined greed category (including selfishness, greed, or unhelpfulness) as something with supernatural punishments. Responses were coded as 1 if mentioned and 0 if never mentioned in the free list. Raters agreed on the classification of responses into these categories in 93% of the cases, and discrepancies were resolved through discussion.¹⁴ This open-ended data was collected to answer exploratory questions somewhat separate from the experimental supernatural framing effect, therefore these variables were not collected consistently across all datasets and analyses concerning these variables should be considered exploratory.

Finally, participants also described several elements of their religious background, including nine items,¹⁵ adapted from Lanman and Buhrmester (2016), that assessed the extent to which participants had learned about karma/God from other people, including from religious sources (e.g., “I heard about God [karma] while attending religious services or meetings”), from friends and family members (e.g., “When I was a child, my family taught me to believe in God [karma]”) and from observing the actions of other people (e.g., “I saw people make personal sacrifices, because of God [karma]”). The mean of these items provided a composite score of participants’ social exposure to credible displays of belief (Karma $\alpha = .79$, God $\alpha = .85$).

¹⁴ Analyses that use other methods of quantifying the free list responses are available in Appendix B. Other exploratory variables not discussed here are described in the pre-registration documents.

¹⁵ Due to a technical error in the programming of this survey, participants in the Karma condition only completed 7 of these items.

Results and Discussion

Confirmatory Analyses: Supernatural Framing Manipulation

In the Neutral condition, participants did not significantly change their pattern of giving between the first three trials and the final three trials of the dictator game, Cohen's $d = -0.05$, 95% CI $[-0.23, 0.12]$, $t(249) = 0.86$, $p = 0.39$ (see Figure 5.2), nor did giving change according to the trial number, $F(1, 249) = 0.53$, $p = .47$, or as a function of the money available in a given trial, $F(1, 249) = .75$, $p = .39$. This uniformity indicates that this repeated DG paradigm is an appropriate method to study the within-subjects effect of supernatural framing, without any general order effects across trials.

We used mixed-effects models¹⁶ to assess whether thinking about God and karma increased giving compared to participants' baseline levels of generosity. As pre-registered, this analysis focused on participants in the God and Karma conditions only (pre-frame giving did not differ from giving in the neutral condition). I predicted DG giving across all six trials from the presence of supernatural frame (0 = pre-framing, 1 = post-framing), the type of frame (0 = God, 1 = Karma), the interaction between frame presence and type of frame. I also included random intercepts and random effects of framing, nested within participant, to account for the nesting of trials within participants and variability in how supernatural framing affected participants based on their initial generosity. The estimates produced by this model indicate the change in the

¹⁶ I had initially intended, and pre-registered, the use of ANOVAs to investigate the framing effect across condition, but in all experiments, I instead used mixed-effects models (using the *lme4* and *lmerTest* packages in R). Mixed-effects models provide a more powerful analysis strategy that is equivalent to ANOVAs in assessing the influence of experimental conditions, but also allowed us to control for individual differences as possible moderators or alternative explanation for the effects. ANOVAs lead to an identical pattern of results, and are described in Appendix C. I also report Cohen's d for to summarize simple effects (calculated using the *effsize* package in R).

proportion of money given away due to each of the predictors (i.e., unstandardized effect sizes). I also report standardized effect sizes (Cohen's d) and t -tests of the focal comparisons throughout the results, to allow easy comparison with previous studies.

As can be seen in Figures 5.2 and 5.3, results supported the primary hypothesis: Participants were more generous when thinking about karma, $b = 0.11$, 95% CI [0.085, 0.136], $d = 0.56$ [0.38, 0.74], $t(249) = 8.86$, $p < .001$, or God, $b = 0.087$ [0.062, 0.112], $d = 0.42$ [0.24, 0.59], $t(253) = 6.63$, $p < .001$, than they were before thinking about these concepts. Giving was not significantly different in the God and Karma conditions, $b = -0.008$ [-0.049, 0.031], $p = .67$, nor was there any interaction between condition and framing, $b = 0.023$ [-0.014, 0.057], $p = .21$. The pattern of giving can also be seen in the distribution of giving (Figure 5.3), where fewer participants kept the money after supernatural framing.

Additional between-subjects analyses that compared post-frame giving across conditions further documented that participants thinking about God gave away significantly more money than participants who received neutrally-framed instructions, $d = 0.37$, 95% CI [0.19, 0.54], $t(483.53) = 4.13$, $p < .001$, and Karma framing resulted in greater giving than did neutral framing, $d = 0.47$ [0.29, 0.65], $t(497.04) = 5.23$, $p < .001$, while God and Karma framing did not lead to significantly different levels of giving, $d = -0.06$ [0.12, 0.23], $t(490.53) = 0.63$, $p = .53$. I also investigated several alternative models (presented in the Appendix C), and the supernatural framing effect remained the strongest predictor of giving when controlling for the amount of money distributed in each trial (pre- vs. post-frame effect: $b = 0.081$, $p < .001$), or controlling for participants' perceptions about the purpose of the experiment (including hypothesis-guessing) and their familiarity with DG tasks (frame effect: $b = 0.056$, $p = .008$). None of these factors were significant moderators. The pattern of results also remained unchanged if I included all

participants who provided DG responses (including those excluded based on preregistered criteria), indicating that the results were robust to data exclusion criteria.

Figure 5.2 Mean proportion of money given away in Experiment 1, before and after supernatural framing. Error bars indicate 95% confidence intervals around the mean

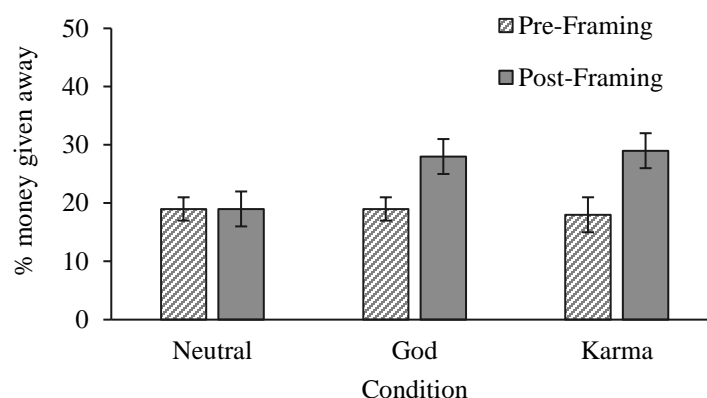
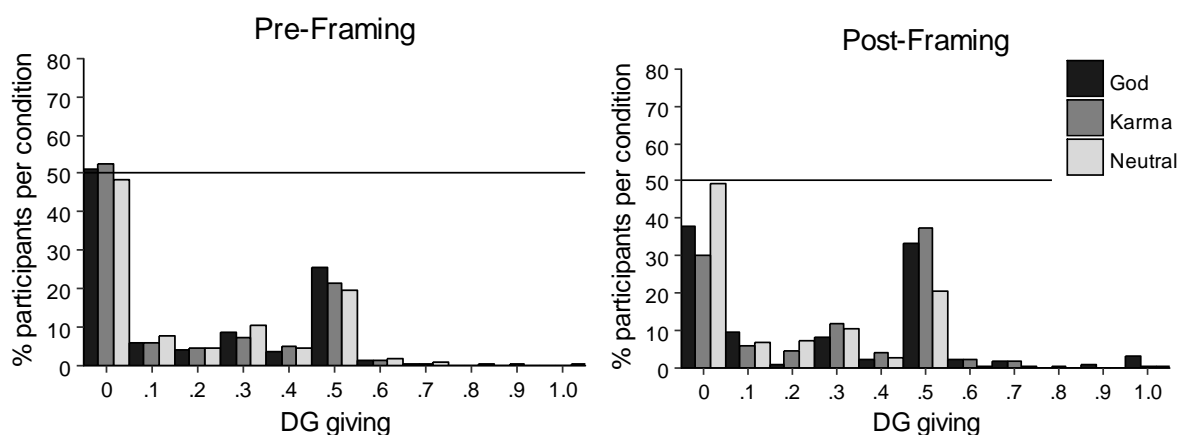


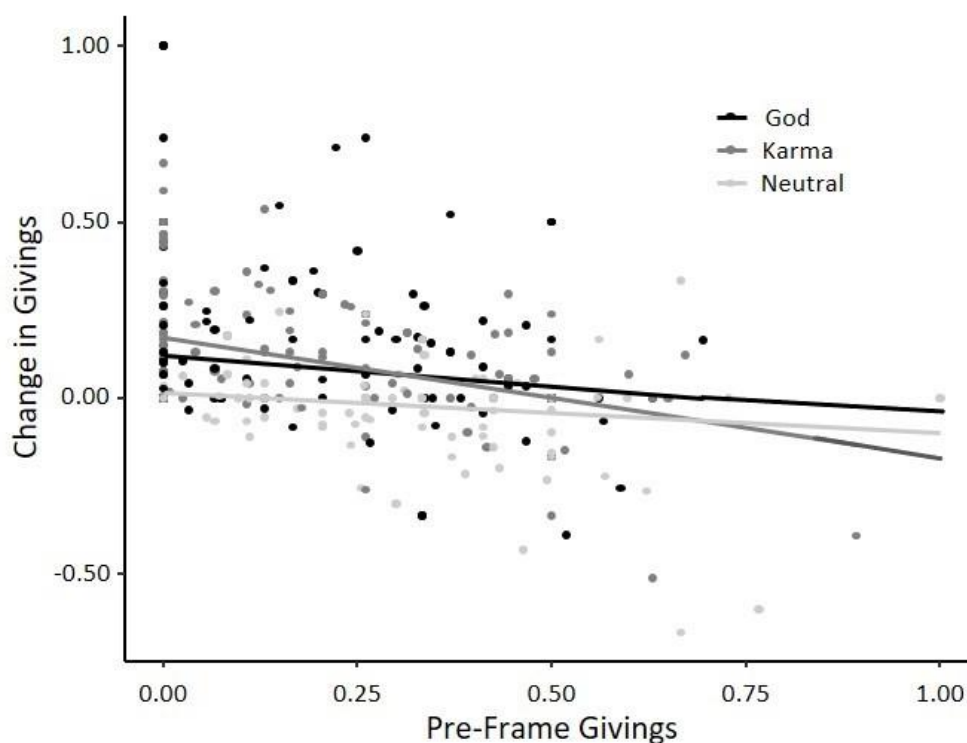
Figure 5.3 Distribution of dictator game giving in Experiment 1, before and after supernatural framing



We next investigated whether participants' baseline levels of generosity moderated the effect of supernatural framing on giving. As hypothesized, there was a negative association between participants' pre-frame giving and their change in giving (i.e., post-frame minus pre-frame giving) after supernatural framing, $r = -.26$, 95% CI $[-.33, -.19]$, $p < .001$. As can be seen in Figure 5.4, I found that participants who were initially selfish (i.e., gave nothing away) became more generous after thinking about karma ($M_{\text{change}} = 0.16$ [0.13, 0.21]) or God ($M_{\text{change}} =$

.11 [0.07, 0.16]), while participants who were initially fair (i.e., divided the money exactly in half) did not change their strategy, but remained fair after thinking about karma ($M_{change} = 0.0001$ [-0.02, 0.01]) or God ($M_{change} = 0.02$ [-0.002, 0.06]). Rather than increasing giving among all participants (which was possible, since giving away 50% does not actually reflect the ceiling on the scale), supernatural framing encouraged adherence to the normative (i.e., modal) prosocial response by increasing giving among initially-selfish participants and not affecting the behavior of initially-fair participants.

Figure 5.4 Initial giving (pre-framing) predicting change in giving after supernatural framing in Experiment 1. Dots reflect data points for each participant, with lines summarizing this relationship within each condition.



Exploratory Analyses: Beliefs about God and Karma

We used mixed-effects models to explore whether individual differences in beliefs about God and karma predicted DG giving or moderated the supernatural framing effect. I conducted

separate analyses for each potential moderator and each framing condition. As can be seen in Table 5.2, there was a small, marginally-significant association between belief in God and greater baseline giving (Model 1a), but belief in God did not significantly moderate the God frame effect. Belief in karma did not predict giving or moderate framing effects (Model 2a). In this sample the supernatural framing effect did not depend on participants' level of belief, which can be explained by the fact that I recruited only believers for this experiment.

Viewing God/karma as punitive (Models 1b and 2b) or benevolent (Models 1c and 2c) was also only weakly and non-significantly associated with giving and did not moderate the effect of either supernatural frame. It is also notable that participants tended to view God as highly benevolent ($M = 4.64$, $SD = 0.79$, on a 5-point scale) and not punitive ($M = 2.44$, $SD = 1.25$), providing evidence against the idea that belief in supernatural *punishment* is required for supernatural primes or frames to influence behavior. Views of karma's traits were less skewed towards benevolence ($M = 3.12$, $SD = 1.21$) or punitiveness ($M = 3.16$, $SD = 1.15$), but also did not significantly predict giving or moderate the framing effect. In contrast to these non-punitive trait ratings, in open-ended descriptions many participants did list greed/selfishness/unhelpfulness as something that would be punished by God (20% of God frame participants) or karma (38% of Karma frame participants). Even more participants reported that generosity would be rewarded by God (36%) or karma (78%), indicating that many participants do believe that selfishness or generosity can elicit supernatural consequences. But these ratings did not consistently predict giving. Participants who reported that karma punishes greed were slightly more likely to increase giving after framing (Model 2d), but participants who reported that God punishes greed were slightly *less* likely to increase giving after framing (Model 1d), and reports that God or karma rewards generosity did not predict greater giving (Models 1e and 2e).

Therefore, participants' belief in punishing supernatural forces, as indexed by trait ratings or freely generated statements that God/karma will reward and punish generosity and greed, did not clearly predict dictator game giving in this experiment.

Finally, I explored the hypothesis that the supernatural framing effect could have affected participants' responses because thinking about karma or God might have prompted believers to signal their religious identities by acting prosocially. If this were the case, then thinking about God and karma should affect behavior most strongly for participants who associate this concept with their religious affiliation. While 81% of participants in the God frame condition identified themselves as Christians (i.e., a religion associated with belief in God), most participants in the Karma frame condition reported either a religious affiliation unassociated with karma (e.g., Christianity, 58%) or reported no religious affiliation at all (atheists, agnostics and the non-religious, 30%). Further contrary to the religious signaling hypothesis, participants' history of learning about God/karma from social sources (e.g., religious sources, friends and family members) did not moderate the effect of the God frame (interaction $b = 0.004$, $p = .77$) or Karma frame (interaction $b = 0.013$, $p = .28$) on giving. Additionally, participants' religiosity did not significantly moderate the effect of the God frame (interaction $B = 0.013$, $p = .33$) or Karma frame (interaction $b = -0.021$, $p = .091$, see Appendix C for full models). Therefore, I found no evidence that the priming effect depended on the association between God/karma and participants' religious affiliation or group identities.

Table 5.2. Mixed-effects model predicting dictator game giving from individual differences in a variety of supernatural beliefs in Experiment 1.

God Frame Condition										
	Model 1a: Belief in God		Model 1b: God is Punitive		Model 1c: God is Benevolent		Model 1d: God Punishes Greed		Model 1e: God Rewards Generosity	
	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>
Intercept	0.193	<.001	0.193	<.001	0.193	<.001	0.198	<.001	0.191	<.001
	[0.165, 0.220]		[0.165, 0.220]		[0.165, 0.220]		[0.167, 0.229]		[0.157, 0.225]	
Pre- vs. Post-Frame	0.087	<.001	0.087	<.001	0.087	<.001	0.101	<.001	0.078	<.001
	[0.061, 0.112]		[0.061, 0.112]		[0.061, 0.112]		[0.073, 0.130]		[0.046, 0.110]	
Belief	0.025	.076	0.004	.77	0.021	.13	-0.027	.44	0.005	.86
	[-0.002, 0.052]		[-0.023, 0.032]		[-0.006, 0.049]		[-0.095, 0.041]		[-0.052, 0.062]	
Frame*Belief	0.014	.28	-0.004	.76	0.005	.71	-0.072	.027	0.025	.36
	[-0.011, 0.040]		[-0.030, 0.022]		[-0.021, 0.030]		[-0.136, -0.009]		[-0.029, 0.078]	
N	254		254		254		254		254	
AICc	-1505.06		-1499.95		-1502.58		-1509.84		-1503.69	
Karma Frame Condition										
	Model 2a: Belief in Karma		Model 2b: Karma is Punitive		Model 2c: Karma is Benevolent		Model 2d: Karma Punishes Greed		Model 2e: Karma Rewards Generosity	
	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>
Intercept	0.184	<.001	0.185	<.001	0.185	<.001	0.184	<.001	0.163	<.001
	[0.157, 0.212]		[0.157, 0.213]		[0.157, 0.212]		[0.149, 0.219]		[0.104, 0.222]	
Pre- vs. Post-Frame	0.109	<.001	0.110	<.001	0.110	<.001	0.090	<.001	0.092	<.001
	[0.085, 0.134]		[0.086, 0.134]		[0.086, 0.134]		[0.060, 0.121]		[0.040, 0.144]	
Belief	0.004	.79	-0.016	.27	0.027	.060	0.002	.96	0.027	.43
	[-0.024, 0.031]		[-0.043, 0.012]		[-0.001, 0.054]		[-0.056, 0.059]		[-0.040, 0.094]	
Frame*Belief	0.016	.20	0.003	.80	0.019	.12	0.050	.048	0.022	.46
	[-0.008, 0.040]		[-0.021, 0.027]		[-0.005, 0.043]		[0.001, 0.100]		[-0.037, 0.081]	
N	250		249		249		250		250	
AICc	-1602.44		-1590.39		-1599.00		-1607.70		-1605.54	

Note. Each model description specifies the particular belief included as a predictor in that model. Belief, punitiveness, and benevolence were standardized; free lists were coded as 1 if greed/generosity was mentioned at least once, and 0 if never mentioned.

Experiment 2

Experiment 1 found that thinking about karma or God led to decreased selfishness among believers who initially displayed selfish behavior, compared to when believers were not thinking about supernatural forces. In Experiment 2, I sought to replicate these findings in a new sample of participants, selected based on their religious affiliation rather than their expressed supernatural beliefs. Cultural evolutionary theories of prosocial religions highlight the importance of cultural linkages between the supernatural with the moral in the scaling up of human cooperation. Belief in karma has been proposed to play an important role in regulating prosocial behavior in groups dominated by karma-centred religious traditions (e.g., Hinduism and Buddhism through Asia, Norenzayan et al., 2016; White, Sousa, & Prochownik, 2016). In this study I therefore investigate whether thinking about karma can increase prosocial behavior among Hindus and Buddhists. For the sake of comparison, I also recruited a sample of Christians and reminded them of God using the same procedures.

Methods

Participants completed a dictator game task (reported below) followed by a series of questions probing beliefs about karma and God (reported in Chapter 4, Study 1). Before conducting this study, all methods, research questions, and analysis plans were pre-registered on OSF, and can be accessed at <https://osf.io/2jyde>.

Participants

We recruited participants from the USA, in March 2017, through Qualtrics's online panels. This recruitment method allowed me to target a sample with specific religious affiliations (recruitment materials did not mention God, karma, or religion). A power analysis

based on an estimated effect size of $d = 0.30$ (comparable to the effect sizes found in Experiment 1) indicated that a minimum sample size of 119 was required to detect a within-subjects effect with $>.90$ power. I increased the sample size to 200 participants per condition to account for the possibility of lower-than-expected effect sizes and to have sufficient statistical power for analyses of individual differences. A sensitivity power analysis indicated that this sample size had 80% power to detect an effect size as small as $d = 0.20$ in a two-tailed paired-samples t-test or to detect small correlations ($r = 0.20$) between variables of interest.

As specified in the pre-registration, I excluded individuals who reported a religious affiliation other than Hindu, Buddhist, or Christian in the prescreening survey ($n = 197$). As preregistered, I also excluded inattentive individuals who failed an attention check question placed within the survey ($n = 221$), took less than 1/3 the median time to complete the survey ($n = 5$), and those who were directed to the full-length survey, but failed to complete it: 51 did not complete the DG questions, 283 answered the DG questions but did not complete the entire survey (attrition rates did not significantly differ across affiliations, $N_{Hindu} = 117$, $N_{Buddhist} = 105$, $N_{Christian} = 116$, $\chi^2(2) = 0.79$, $p = .68$). Primary findings remain unchanged when these excluded participants are included in the total sample (see Appendix C for these additional analyses).

The final sample (Table 5.1) of Christians ($n = 203$) were primarily Caucasian (85%) and expressed strong belief in God and low belief in karma. Hindus ($n = 200$) were primarily Asian (92%) and expressed strong belief in both God and karma. Buddhists ($n = 204$) were primarily Asian (52%) or Caucasian (37%) and expressed greater belief in karma than belief in God. Additional analyses using this sample are also reported in Chapter 4 (Exploratory Sample).

Materials and Procedure

Participants completed the same prescreening, repeated dictator game, and supernatural belief and demographic questionnaires described in Experiment 1, with two differences. First, the Neutral condition was dropped. Experiment 1 did not show any evidence of order effects and participant recruitment was much more expensive for this sample, therefore I conserved resources by dropping the neutral frame condition. Second, participants were selected and assigned to framing conditions based on their religious affiliation, rather than their level of belief. Participants who identified themselves as Hindus and Buddhists in the prescreening survey were asked to think about karma during the second phase of the dictator game, and participants who identified themselves as Christians were asked to think about God. Second, the dictator game endowments (\$2.00, \$3.00, or \$4.00) were substantially larger than the endowments in Experiment 1, but the amount again allowed participants to approximately double their earnings from completing this survey. Patterns of giving were again very consistent across trials, before framing ($\alpha = .94$) and after framing ($\alpha = .96$). After the dictator game, participants completed various measures of beliefs, including belief in karma and God, ratings of supernatural benevolence and punitiveness, free list of actions with supernatural punishments and rewards, and exposure to social sources of belief (see pre-registration documents).

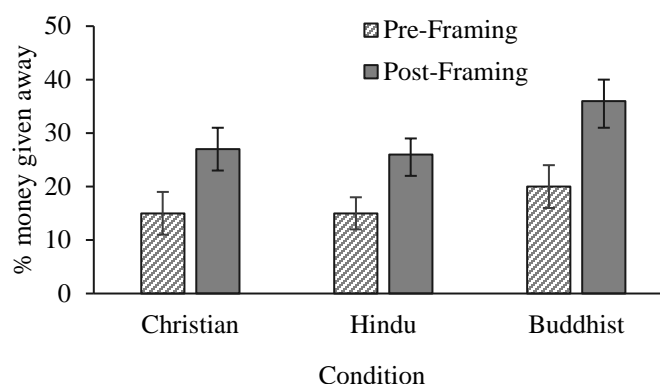
Results and Discussion

Confirmatory Analyses: Supernatural Framing Manipulation

We used mixed-effects models to assess whether supernatural framing (0 = pre-frame, 1 = post-frame) increased giving for each religious group (dummy coded with Christians as the reference group), compared to participants' baseline levels of generosity. I included random intercepts and random effects of framing nested within participant to account for the repeated-

measures design. Confirming the results of Experiment 1, participants gave more after thinking about karma or God, $b = 0.121$, 95% CI [0.085, 0.154], and this framing effect did not significantly differ across the different religious groups (Christian vs. Hindu frame effect: $b = -0.013$ [-0.066, 0.039], $p = .61$, Christian vs. Buddhist frame effect: $b = 0.040$ [-0.010, 0.092], $p = .13$). As can be seen in Figure 5.5, Hindus, $d = 0.48$ [0.28, 0.68], $t(199) = 6.83$, $p < .001$, and Buddhists, $d = 0.52$ [0.33, 0.73], $t(203) = 7.56$, $p < .001$, became gave more after thinking about karma. Similarly, Christians gave more after thinking about God, $d = 0.48$ [0.28, 0.68], $t(202) = 6.86$, $p < .001$. Additionally, Buddhists were slightly more generous overall than Hindus ($b = 0.052$, $p = .040$) and Christians ($b = 0.057$, $p = .025$), an effect that exploratory analyses revealed was driven by greater giving among Buddhist converts (although the extent of self-reported learning about God/karma from religious and social sources did not moderate the framing effect in any religious group). This supernatural framing effect remained when controlling for the amount of money distributed in each trial (pre- vs. post-frame effect: $b = 0.122$, $p < .001$), or participants' perceptions about the purpose of the experiment and their familiarity with DG tasks (frame effect: $b = 0.099$, $p = .011$). Moreover, the effect held even when including all data from participants initially omitted from the final sample due to exclusion criteria (see Appendix C for details of these alternative analyses).

Figure 5.5 Mean proportion of money given away in Experiment 2, before and after supernatural framing (God for the Christian sample, karma for the Hindu and Buddhist samples). Error bars indicate 95% confidence intervals around the mean.



We next investigated whether baseline selfishness moderated these effects. Replicating Experiment 1, there was an overall negative association between participants' initial giving and their change in giving after framing, $r = -.26$, 95% CI $[-.34, -.19]$, $p < .001$. Participants who were initially selfish became more generous when thinking about karma (Hindus: $M_{\text{change}} = 0.14$ [0.10, 0.19]; Buddhists: $M_{\text{change}} = 0.23$ [0.17, 0.29]) or God ($M_{\text{change}} = 0.15$ [0.11, 0.20]), while those who initially exhibited the normative, modal prosocial response (i.e., fairness) did not change their strategy, but remained equally fair when thinking about karma (Hindus: $M_{\text{change}} = 0.02$ [0.00, 0.06]; Buddhists: $M_{\text{change}} = 0.02$ [-0.04, 0.09]) or God ($M_{\text{change}} = 0.04$ [-0.04, 0.13]).

Exploratory Analyses: Beliefs about Karma and God

We used mixed-effects models to explore whether individual differences in beliefs about karma and God predicted DG giving or moderated the supernatural framing effect. As can be seen in Table 5.3, level of belief in karma or God was not associated with levels of giving and did not moderate the supernatural framing effect (Models 3a, 4a, and 5a). As in Experiment 1, this may be caused by the restricted range of belief that resulted from the present strategy of recruiting participants from religious groups where God and karma are relevant.

In this experiment, Christians who viewed God as more benevolent and less punitive were slightly *less* generous at baseline, but *more* likely to increase their giving when thinking about God (Models 3b and 3c), lending inconsistent evidence of how supernatural benevolence and punitiveness predicts giving. There was also high consensus among Christians that God is extremely benevolent ($M = 4.76$, $SD = 0.63$ on a 5-point scale) and non-punitive ($M = 2.24$, $SD = 1.12$), indicating that belief in a punishing God is not required for supernatural framing to affect behavior. Ratings of karma's benevolence ($M_{\text{Hindu}} = 3.82$, $SD = 1.13$; $M_{\text{Buddhist}} = 3.83$, $SD = 1.16$) and punitiveness ($M_{\text{Hindu}} = 2.79$, $SD = 1.15$; $M_{\text{Buddhist}} = 2.67$, $SD = 1.27$) were less skewed, but did not significantly predict giving or moderate the framing effect for Hindus or Buddhists.

Participants were much more willing to admit that God or karma will punish selfishness/greed and reward generosity. Selfishness/greed was mentioned by 22% of Christians, 33% of Hindus, and 38% of Buddhists, and generosity was mentioned by 49% of Christians, 67% of Hindus, and 71% of Buddhists. Supernatural punishments for greed did not predict nor moderate DG giving in these samples, but supernatural rewards for generosity did. Christians (Model 3e) and Hindus (Model 4e) who listed generosity were more likely to increase giving after framing, compared to those who did not mention generosity. Among Buddhists (Model 5e), listing generosity did not moderate the framing effect, but it was associated with greater baseline giving. Overall, these results support the general lack of an association between strength of belief and giving, but these exploratory analyses offered preliminary evidence that beliefs about God/karma's willingness to reward generous behavior may predict greater giving.

Table 5.3 Mixed-effects model predicting dictator game giving from individual differences in a variety of supernatural beliefs in Experiment 2.

Christians										
	Model 3a: Belief in God		Model 3b: God is Punitive		Model 3c: God is Benevolent		Model 3d: God Punishes Greed		Model 3e: God Rewards Generosity	
	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>
Intercept	0.145 [0.113, 0.177]	<.001	0.145 [0.113, 0.177]	<.001	0.145 [0.113, 0.177]	<.001	0.142 [0.106, 0.179]	<.001	0.144 [0.099, 0.189]	<.001
Pre- vs. Post-Frame	0.121 [0.086, 0.155]	<.001	0.121 [0.086, 0.155]	<.001	0.121 [0.086, 0.155]	<.001	0.118 [0.079, 0.157]	<.001	0.074 [0.027, 0.121]	.003
Belief	-0.019 [-0.051, 0.013]	.25	0.025 [-0.007, 0.057]	.13	-0.039 [-0.071, -0.007]	.017	0.012 [-0.066, 0.091]	.76	0.002 [-0.063, 0.067]	.95
Frame*Belief	0.017 [-0.018, 0.051]	.34	-0.037 [-0.071, -0.003]	.036	0.040 [0.006, 0.074]	.022	0.010 [-0.074, 0.094]	.81	0.096 [0.028, 0.163]	.006
N	203		203		203		203		203	
AICc	-796.16		-799.93		-803.34		-798.05		-805.07	
Hindus										
	Model 4a: Belief in Karma		Model 4b: Karma is Punitive		Model 4c: Karma is Benevolent		Model 4d: Karma Punishes Greed		Model 4e: Karma Rewards Generosity	
	<i>B</i> [95% CI]	<i>P</i>	<i>B</i> [95% CI]	<i>P</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>
Intercept	0.150 [0.117, 0.182]	<.001	0.150 [0.117, 0.182]	<.001	0.150 [0.117, 0.182]	<.001	0.133 [0.094, 0.173]	<.001	0.148 [0.092, 0.205]	<.001
Pre- vs. Post-Frame	0.107 [0.077, 0.138]	<.001	0.107 [0.076, 0.138]	<.001	0.107 [0.076, 0.138]	<.001	0.112 [0.075, 0.150]	<.001	0.060 [0.007, 0.113]	.026
Belief	-0.004 [-0.037, 0.028]	.79	-0.008 [-0.041, 0.025]	.64	0.006 [-0.026, 0.039]	.71	0.050 [-0.019, 0.119]	.16	0.002 [-0.067, 0.071]	.95
Frame*Belief	0.023 [-0.008, 0.053]	.15	0.004 [-0.027, 0.034]	.82	-0.004 [-0.035, 0.026]	.78	-0.016 [-0.081, 0.050]	.64	0.071 [0.006, 0.135]	.033
N	200		200		200		200		200	
AICc	-866.04		-864.22		-864.15		-869.00		-871.89	
Buddhists										

	Model 5a: Belief in Karma		Model 5b: Karma is Punitive		Model 5c: Karma is Benevolent		Model 5d: Karma Punishes Greed		Model 5e: Karma Rewards Generosity	
	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>	<i>B</i> [95% CI]	<i>p</i>
Intercept	0.202 [0.162, 0.241]	<.001	0.202 [0.162, 0.241]	<.001	0.202 [0.162, 0.241]	<.001	0.185 [0.135, 0.235]	<.001	0.122 [0.050, 0.195]	.001
Pre- vs. Post-Frame	0.160 [0.119, 0.202]	<.001	0.160 [0.119, 0.202]	<.001	0.160 [0.119, 0.202]	<.001	0.142 [0.089, 0.194]	<.001	0.169 [0.092, 0.247]	<.001
Belief	0.018 [-0.021, 0.058]	.37	-0.015 [-0.055, 0.024]	.45	0.000 [-0.039, 0.040]	.99	0.045 [-0.036, 0.127]	.28	0.112 [0.026, 0.198]	.012
Frame*Belief	0.012 [-0.030, 0.053]	.59	0.004 [-0.037, 0.046]	.84	0.027 [-0.015, 0.068]	.21	0.049 [-0.036, 0.135]	.26	-0.012 [-0.104, 0.079]	.79
N	204		204		204		204		204	
AICc	-546.59		-545.56		-546.79		-551.57		-554.89	

Note. Each model description specifies the particular belief included as a predictor in that model. Belief, punitiveness, and benevolence were standardized; free lists were coded as 1 if greed/generosity was mentioned at least once, and 0 if never mentioned.

Experiment 3

Experiments 1 and 2 found that thinking about God and karma decreased selfishness among believers. Individual differences in supernatural belief did not moderate this effect, potentially due to the restricted range of belief in these samples: I purposefully had excluded non-believers or asked participants to think about a supernatural concept that was relevant to their religious traditions, and the effectiveness of supernatural framing did not differ between those who somewhat agree or strongly agree that God/karma exists. In Experiment 3, I recruited a sample that included both believers and non-believers, to assess whether those who explicitly deny the existence of supernatural forces are also affected by the supernatural framing manipulation. Evidence that explicit beliefs moderate the supernatural framing effect would also speak against alternative explanations for these findings. Since believers and non-believers both understand that God and karma are entities that care about prosocial human norms (White & Norenzayan, 2019), they should be similarly influenced by experimenter demand and thoughts about morality primed by these supernatural concepts. Differential patterns of behavior for believers and non-believers would undermine the alternative explanation that supernatural framing effect are attributable to experimenter demand and instead supports the explanation that the culturally-learned belief in supernatural intervention for good and bad behavior is a key component of the supernatural framing effect.

Methods

Before conducting this study, all methods, research questions, and analysis plans were uploaded to OSF. However, as they were not correctly registered, this document was accidentally deleted after data collection. The original and unedited copy of the intended pre-registration was re-uploaded, and can be found at <https://osf.io/69b4n>. The recruitment method,

analysis plan, and hypotheses are consistent with those pre-registered for Experiments 1 and 2—which were designed, registered and conducted prior to this study—with the exception that non-believers were also included in the sample for Experiment 3.

Participants

We recruited American participants from MTurk to participate in an online survey, in March 2017, and, unlike in previous studies, participants were not pre-screened for supernatural beliefs or religious affiliations; everyone interested in completing the survey was allowed to participate. Given that in Experiment 1 approximately half of interested participants were screened out for being non-believers, in Experiment 3 I doubled the sample size per condition, in order to include approximately the same number of believers per condition as in Experiment 1. I aimed to recruit 500 participants for each of the two supernatural framing conditions (1000 participants total). Similar to Experiments 1 & 2, I followed preregistered criteria by excluding participants who did not complete the survey (i.e., did not reach the end of the survey or did not provide an answer to all six DG trials, $n = 48$), or who failed an attention check question placed within the survey ($n = 15$). Furthermore, I had initially proposed excluding participants who completed the study in less than 5 minutes, as I believed they would not be able to adequately read instructions and respond in that little time. However, the median completion time (6.5 minutes) was much shorter than anticipated. Therefore, this exclusion criterion was dropped. Primary analyses were not significantly changed if this criterion was kept (see Appendix C).

The final sample of participants ($N = 986$) was randomly assigned to either the God framing condition or the karma framing condition, regardless of belief. There was no difference across conditions in participants' belief in God or belief in karma. The God framing condition ($n = 498$) included 295 believers and 203 non-believers (according to a binary measure of belief in

God). The Karma framing condition ($n = 488$) included 248 individuals high in belief and 240 individuals low in belief (according to a median split of the belief in karma questionnaire scores). Further details of sample demographics can be found in Table 5.1. A sensitivity power analysis indicated that these sample sizes have 80% power to detect an interaction of $\eta_p^2 = 0.02$ (in an ANOVA) between the within-subject supernatural framing effect and between-subjects differences in supernatural belief.

Materials and Procedure

Participants completed the same repeated dictator game and supernatural belief and demographic questionnaires described in Experiment 1, except that in this experiment participants were not pre-screened prior to the dictator game, and were instead randomly assigned to either God or Karma framing conditions. I also slightly altered the supernatural framing instructions to make them meaningful to both believers and non-believers, by removing the reference to “your belief” and instead instructing participants: “Before you make these decisions, please think about God [karma].” After completing the dictator game, participants reported various aspects of their religious beliefs and other demographics, including measures of God/karma’s benevolent and punitive traits (although participants did not complete the free list task in this experiment). My analyses below focus on two measures of belief: a continuous measure of belief in God (1 item, “I believe that god exists,” 1 = *Strongly Disagree* to 9 = *Strongly Agree*) and a continuous composite measure of belief in karma (16-item scale, $\alpha = .94$, White, Norenzayan, et al., 2019). All materials are described in the pre-registration documents.

Results and Discussion

Confirmatory Analyses: Supernatural Framing Manipulation

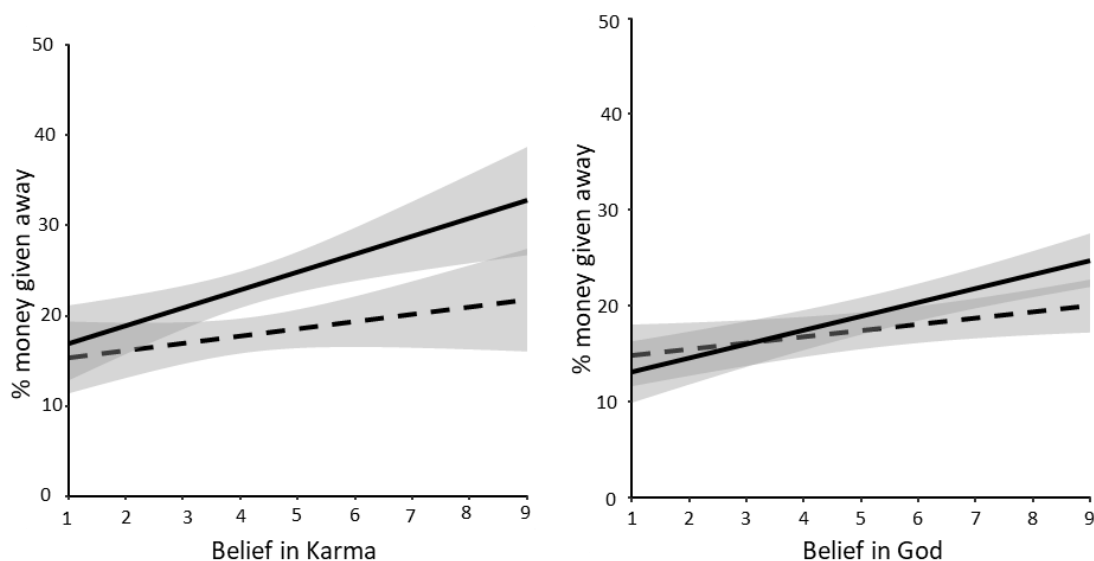
We used the same mixed-effect modeling strategy as in Experiments 1 and 2, but also included a continuous measure of belief in God or karma (standardized within each belief type) as possible moderator. A model including all possible interactions revealed no main effect of condition, $b = -0.006$, 95% CI $[-0.034, 0.026]$, $p = .68$, and a small association between level of belief and baseline giving in this sample, $b = 0.025$ $[0.004, 0.047]$, $p = .017$, which did not differ by condition, interaction $b = -0.004$ $[-0.035, 0.026]$, $p = .77$. There was also a small overall framing effect, $b = 0.022$ $[0.007, 0.037]$, $p = .003$, which did differ by condition such that karma caused greater increases in giving than God, $b = 0.039$ $[0.019, 0.060]$, $p < .001$; and the predicted interaction between level of belief and the supernatural framing effect, $b = 0.033$ $[0.018, 0.048]$, $p < .001$, which did not significantly differ between the God and karma framing conditions, $b = -0.012$ $[-0.033, 0.008]$, $p = .26$. The nature of this interaction is displayed in Figure 5.6.

Replicating the results of Experiments 1 and 2, those who believe in karma gave more when thinking about karma, although as predicted this increase in giving was greater for believers, $d = 0.46$, 95% CI $[0.28, 0.64]$, $t(233) = 7.04$, $p < .001$, than for non-believers, $d = 0.26$, 95% CI $[0.08, 0.43]$, $t(253) = 4.13$, $p < .001$. As can be seen in Figure 5.6, the Karma framing effect was virtually nonexistent for those who strongly deny the existence of karma. Additionally, those who believe in God gave more when thinking about God, $d = 0.26$, 95% CI $[0.10, 0.42]$, $t(294) = 4.46$, $p < .001$, but as predicted, non-believers did not. In fact, they gave slightly less when thinking about God, $d = -0.15$, 95% CI $[-0.34, 0.05]$, $t(203) = -2.10$, $p = .037$.

This interaction between belief and framing also remained when controlling for the amount of money distributed in each trial (belief*framing interaction: $b = 0.033$, $p < .001$),

participants' view of supernatural benevolence/punitiveness (belief*framing interaction: $b = 0.030, p < .001$), participants' perceptions about the purpose of the experiment, and when including all data from participants initially omitted from the sample (see Appendix C). The interaction between belief and framing also remained when using a single-item measure of belief in karma (Karma belief*framing interaction: $b = 0.03, p < .001$) or a binary measure of belief in God (God belief*framing interaction: $b = 0.05, p = .004$). Additionally, as in Experiment 1, the supernatural framing effect was not moderated by participants' view of God or karma's benevolence, $b = 0.005, p = .60$, or punitiveness, $b = -0.001, p = .90$. These results replicate the main supernatural framing results among believers from Experiments 1 and 2, and further demonstrate that explicit commitment to belief moderates this framing effect: The effect of thinking about God on giving disappeared and the effect of thinking about karma was greatly diminished for non-believers.

Figure 5.6 Proportion of money given away in Experiment 3, before (dashed line) and after (solid line) reminders of karma (left) and God (right), with 95% confidence bands.



Participants' initial generosity was again a moderator for these effects. As in Experiments 1 and 2, there was an overall negative association between participants' initial giving and their change in giving after framing, $r = -.29$, 95% CI $[-.34, -.23]$, $p < .001$. The supernatural framing manipulation only affected the behavior of believers who were initially selfish (Karma frame: $M_{\text{change}} = 0.13$, 95% CI $[0.10, 0.17]$; God frame: $M_{\text{change}} = 0.09$, 95% CI $[0.06, 0.12]$), not those who were initially fair (Karma frame: $M_{\text{change}} = 0.01$, 95% CI $[-0.004, 0.03]$; God frame: $M_{\text{change}} = -0.01$, 95% CI $[-0.04, 0.02]$).

Experiment 4

Experiment 3 replicated the supernatural framing effect and moderation by baseline giving among a new sample of believers, but found that this effect was substantially reduced among non-believers. Experiment 4 aimed to replicate the karma framing effect and the interaction with explicit karma belief in a more traditional one-shot, between-subjects dictator game. Replicating these effects in a between-subjects design provides further confidence that results are not simply due to experimental demand effects (which ought to be diminished in a between-subjects design). I also included additional measures of beliefs about karma and beliefs about a just world, to further explore potential moderators of these experimental effects.

Methods

Before conducting this study, all methods, research questions, and analysis plans were uploaded to OSF: <https://osf.io/m7w9t>.

Participants

We recruited participants from the USA, in February 2019, through Qualtrics's online panels. I aimed to recruit a sample of 1000 participants. According to power analyses conducted using the pwr package in R, a sample size of 596 participants would be required to have 80%

power to detect a small between-condition difference ($d = 0.23$, i.e., the lower-limit of the within-subjects effect detected in Experiment 3). Additional power analyses conducted using the *simr* package in R (based on data from Experiments 1 and 3), indicated that a sample of 1000 participants would be required to have approximately 80% power to detect a reasonably small between-subjects interaction (i.e., $b = 0.04$) between belief in karma and condition. I followed preregistered criteria by excluding participants who did not complete the survey ($n = 13$) or who failed an attention check question ($n = 521$). As preregistered, I also included extra participants in this sample (beyond the planned size) who completed the survey prior to data collection being terminated by Qualtrics panel managers. The final sample of participants was randomly assigned to either the Karma framing condition ($n = 629$) or a control condition ($n = 615$), regardless of belief. Further details of sample demographics can be found in Table 5.1. This sample also completed additional measures which were analyzed separately in Chapter 2, Study 2 (USA sample) to assess the cognitive predictors of belief in karma and belief in God.

Materials and Procedure

Participants were randomly assigned to complete a single trial of the dictator game, in which they were asked to divide \$2.00 between themselves and another participant, according to neutrally-framed instructions or according to instructions to “think about Karma.” For analysis, responses were transformed into the proportion of money given away. (Due to the expense of participant recruitment, I did not include a God framing condition, but rather focused on the more novel karma framing effect compared to neutrally-framed instructions.)

Participants then reported their familiarity with dictator game-type tasks, provided an open-ended guess about the experimental hypothesis, and then completed the 16-item belief in karma questionnaire ($\alpha = .92$). After the dictator game, participants completed various measures

of beliefs and demographics (see pre-registration documents), including additional questions about whether karma rewards and punishes behavior (mean of two items, $r = .72$, “Karma punishes people for their behavior,” “Karma rewards people for proper behavior”), whether karma is otherwise benevolent (mean of two items, $r = .68$, “Karma is loving,” “Karma is forgiving”), and karma’s knowledge (mean of two items, $r = .68$, “Karma can see what people are doing, even if they are far away in a foreign country,” “Karma can see into people's hearts and know their thoughts and feelings”).

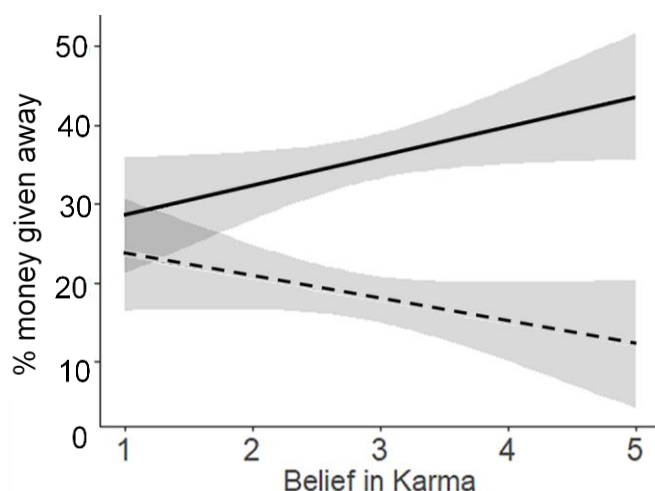
Results and Discussion

Confirmatory Analyses: Supernatural Framing Manipulation

Participants asked to think about karma were more generous overall than were participants in the control condition, who were not reminded of karma, $d = 0.48$, 95% CI [0.37, 0.60], $t(1218) = 8.51$, $p < .001$. Replicating the pattern from Experiment 3, a linear regression including experimental condition, participants’ level of explicit belief in karma (standardized), and their interaction, revealed that this experimental effect, $b = 0.17$ [0.13, 0.21], $p < .001$, was stronger among participants who believed in karma more, $b = 0.05$ [0.01, 0.09], $p = .010$. As depicted in Figure 5.7, although there was no main effect of belief in karma, the experimental reminder of karma increased giving among participants who expressed some belief in karma, but not among those who strongly denied the existence of karma. When reminded of karma, there was a small positive association between belief and giving, $b = 0.03$ [0.002, 0.06], $p = .038$, whereas belief in karma was not significantly associated with giving in the control condition, $b = -0.02$ [-0.05, 0.006], $p = .11$. This experimental effect was robust when controlling for hypothesis guessing, which was unassociated with giving, $b = 0.00$, $p = .95$, and did not moderate the framing effect, $b = 0.01$, $p = .68$. Moreover, game familiarity was not a factor as participants

overwhelmingly (94%) reported no prior exposure to economic games. It is also notable that this between-subjects experimental effect is as large as that found in the within-subjects design used in Experiments 1-3. Altogether, these factors suggest that participants' responses in each experiment are not solely driven by their acquiescence to (potential) experimental demand effects.

Figure 5.7 Proportion of money given away in Experiment 4, when thinking about karma (solid line) and when not thinking about karma (dashed line), with 95% confidence bands.



Exploratory Analyses: Alternative moderators

We further explored why belief in karma decreased selfishness, I examined several alternative individual differences as possible moderators of the supernatural framing effect. One possibility is that experimental reminders of karma simply primed ideas about justice, fairness, or reciprocity in participants. However, individual differences in belief in a just world (the expectation of fairness in secular, interpersonal contexts) did not predict giving, $b = 0.006$, 95% CI $[-0.02, 0.04]$, $p = .71$, nor moderate the karma framing effect, $b = 0.007$ $[-0.03, 0.05]$, $p = .74$, implying that beliefs about karma are not merely reducible to ideas about (non-supernatural) interpersonal fairness. Instead, the karma framing effect was associated with beliefs about karma's ability to reward and punish behavior: Among participants in the karma framing

condition (but not in the control condition), giving was weakly but significantly correlated with belief that karma rewards good behavior, $r = .12$ [.04, .19], $p = .003$, or punishes bad behavior, $r = .09$ [.01, .16], $p = .029$. Giving was not significantly associated with other aspects of karma that are less directly moralistic, such as the view that karma is loving and forgiving, $r = .03$ [-.05, .11], $p = .43$, or that karma merely knows people's thoughts and actions, $r = .06$ [-.02, .14], $p = .13$. When giving was simultaneously regressed on belief in karma, belief in karma's reward/punishment of behavior, karma's benevolence, karma's knowledge, experimental condition, and all interactions between beliefs and condition, the sole significant moderator was karma's reward/punishment of behavior, $b_{int} = 0.063$ [0.010, 0.117], $p = .020$ (see Appendix C for full models). Therefore, it is specifically belief in karma as a morally-concerned supernatural entity that predicted increased giving when thinking about karma, not mere exposure to the concept (among non-believers), belief in secular justice, or less-moralistic aspects of karma belief.

General Discussion

Across four high-powered, pre-registered experiments, I found that both karma and God encouraged adherence to prosocial norms in the dictator game. This effect was moderated by explicit religious belief implying that, beyond simply reminding people of fairness and generosity, supernatural beliefs provide a motivation for believers to adhere to prosocial norms. These results support the role of culturally-structured beliefs about supernatural forces in encouraging cooperation, which could have played an important role in the spread of prosocial religions around the world (Norenzayan et al., 2016; Watts et al., 2015; Johnson, 2015).¹⁷ I

¹⁷ Due to participant payment through quasi-random matching with other participants in Experiments 1 and 2, I was also able to test whether karma had real effects in these experiments. I found

assessed the robustness of the findings by running several alternative data analysis scenarios (Steege et al., 2016), and across all analytic approaches, samples, manipulations, and experimental designs I found similar moderately-sized effects of supernatural framing on giving among believers. These experiments also investigated theoretically-relevant boundary conditions that have not received adequate attention in the previous psychological literature.

The moderating role of baseline selfishness

One consistent moderator of the supernatural framing effect was participants' baseline selfishness vs. fairness: Supernatural framing had diminishing effects as baseline offers approached a fair split. In dictator games, an equal division of the money is the normative prosocial response, while giving away more than half is extremely uncommon in Western populations (Engel, 2011, also see Figure 5.3). If supernatural concepts encourage prosocial norm adherence, rather than encouraging generosity per se, this implies that supernatural framing should increase giving among initially-selfish participants, and not affect the behavior of those who initially divided the money evenly. I found this pattern found across all three within-subjects experiments where baseline offers could be assessed. This 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%—approached a fair split. Other explanations for differing effects (e.g., the efficacy of explicit vs. implicit primes) are also possible and are being further investigated (e.g., Billingsley et al., 2018; for further discussion

no evidence of karmic payback: participants who were more generous did not receive more money in return ($bs = -0.17$ to 0.04 , $ps > .06$), although these experiments were in no way designed to answer that particular question (for an alternative perspective of karma's veracity, see Allen, Edwards, & McCullough, 2015).

see Shariff & Norenzayan, 2015). Supernatural framing did not turn egalitarian fairness into ultrasociality. This pattern is consistent with interpersonal evaluations that view ultra-prosocial behavior no more favorably than fair behavior (N. Klein et al., 2015; N. Klein & Epley, 2014), and is also consistent with the hypothesis that moralizing religions curtail selfish tendencies, but that this effect may be crowded out when other mechanisms that encourage prosociality are already in place (Henrich, Ensminger, et al., 2010; Laurin et al., 2012; Norenzayan et al., 2016).

The moderating role of explicit belief

A second moderator was participants' explicit beliefs about karma and God. Supernatural frames reliably increased prosocial behavior among believers (Experiments 1 – 4), but had weak or inconsistent effects for non-believers (Experiments 3 and 4). This is consistent with meta-analyses of the previous literature that found no reliable effect of religious reminders for nonbelievers (Shariff et al., 2016; Willard et al., 2016) and extends this finding to belief in karma. The stronger effect among karma believers indicates that these results cannot be fully explained by acquiescence to a shared intuition (Risen, 2016) or simply primed ideas about fairness, which both believers and non-believers associate with karma (White & Norenzayan, 2019). Moreover, belief in a just world, unlike belief in karma, did not moderate the effect of karmic reminders on dictator-game giving. The belief that karma or God is real and willing to intervene in one's life appears to play an important role in incentivizing normative prosocial behavior in these experiments.

The role of supernatural punishment and benevolence

Several theories have pointed to the important role of supernatural punishment in encouraging prosociality (e.g., Johnson, 2015; Norenzayan et al., 2016; Watts et al., 2015). However, in these experiments I found no evidence that belief in supernatural punitiveness was

required for (or enhanced) the effectiveness of supernatural framing. God was described by most participants as extremely benevolent and non-punitive, but thinking about God still decreased selfishness in these samples. Karma's punitiveness also did not moderate the Karma framing effects in Experiments 1 – 3.¹⁸ If anything, this data supports a possible association between giving and belief in supernatural benevolence.

There are several other methodological reasons why these results may be inconsistent with previous studies of supernatural punishment. Past research has found supernatural punitiveness to be associated with reduced cheating and criminal behavior (DeBono et al., 2016; Purzycki et al., 2016, 2017; Shariff & Norenzayan, 2011; Shariff & Rhemtulla, 2012), but in the dictator game¹⁹ keeping money for oneself does not obviously involve cheating. Sharing might be perceived as nice, but not obligatory, which perhaps explains why giving is encouraged by the belief in benevolent and rewarding supernatural forces. Another possible explanation is that supernatural punitiveness beliefs were restricted in the American samples. My results are more consistent with recent work showing that supernatural benevolence can inspire prosocial behavior like volunteerism (Johnson, Cohen, & Okun, 2016; Johnson, Li, & Cohen, 2015). Further research is needed regarding what mechanism supports supernatural framing effects, and whether mechanisms differ between God and karma or between members of different religious groups.

¹⁸ The only case in which belief in supernatural punishment predicted greater giving at conventional levels of significance was among Experiment 1 participants who free listed that Karma would punish greed ($p = .048$) – an effect that I caution against overinterpreting.

¹⁹ Exploratory analyses of free list responses indicated that the belief that God/Karma will reward honesty or punish dishonesty/cheating did not predict dictator game giving or moderate the supernatural framing effect in Experiments 1 or 2.

Religious identity, signaling, and demand characteristics

These results speak against two alternative explanations for these findings. First, supernatural framing may have increased prosociality as a way for participants to signal their religious identity. However, this hypothesis cannot explain why thinking about karma led to similar effects even when karma was not associated with participants' self-expressed religious affiliation.

Second, the experimenter demand account argues that when participants were asked to think of karma or God, they sought to guess the experimenter's hypothesis, and participants thereby changed their behavior in line with their perception that the experimenters expected generosity. However, the effect of supernatural framing remained robust after controlling for hypothesis guessing, and non-believers were not reliably affected by the manipulation. Further, experimenter demand effects should be stronger in within-subjects designs, where the difference between experimental conditions is more readily apparent to participants, and weaker in between-subjects designs, but the supernatural framing effects were of similar magnitude in both cases (Experiment 3 vs. Experiment 4), implying that experimenter demand was not the driving factor.

Limitations, constraints on generalizability, and future directions

There are several limitations to these experiments. Our samples, despite their religious diversity, were all Americans, limiting our ability to generalize these results to other religious populations of Hindus, Buddhists, and Christians until the proper cross-cultural research is conducted (Henrich et al., 2010; Norenzayan, 2016; Simons et al., 2017). A second limitation of this procedure is that it does not capture many additional important aspects of religion in daily life, such as sacred values (Atran & Ginges, 2012) and extreme rituals (Xygalatas et al., 2013),

which are psychologically potent and may exert powerful influences on behavior. These continue to be important questions, that cannot be addressed using our supernatural framing manipulation.

Conclusion

The present manipulation reflects an ecologically meaningful aspect of thinking and behavior in religious life: Believers are often overtly reminded about the desires of God or about Karmic consequences in everyday religious life, such as in collective prayers in a church, “what would Jesus do” campaigns, repeated prostrations and other Buddhist rituals, extreme rituals in Hindu festivals, and the call to prayer in Muslim communities (e.g., Aveyard, 2014; Rand et al., 2014; “What would Jesus do?,” 2011; Xygalatas, 2013). In many ways, religious traditions explicitly remind adherents about morally-concerned supernatural forces. An important path for future psychological research is to investigate a broader selection of the world’s cultural and religious diversity (Norenzayan, 2016), which reveals a range of ways in which cultural concepts about supernatural forces are intertwined beliefs about social norms, and thereby encourage normative behavior among believers.

Chapter 6: Discussion

This dissertation has investigated the psychological profile of belief in karma, and how it compares to the psychological structure and function of secular, interpersonal beliefs about justice and beliefs in anthropomorphic and personified gods. These supernatural justice beliefs are only one part of the beliefs, practices, norms, and group identities that make up religious traditions (Saroglou et al., 2020), but even this narrow set of morally-relevant supernatural beliefs exhibits variation that is relevant to understanding cultural diversity in cognition and behavior. This research contributes to existing literature, first, by replicating several past findings regarding the correlates and consequences of belief in God (e.g., the correlation with intuitive thinking and mentalizing, the effect of religious primes on prosocial behavior) in high-powered preregistered studies conducted across several different cultures. Second, this research helps to extend past theories of supernatural justice beliefs to the specific domain of belief in karma. This inclusion of karma in a broader theory of supernatural and religious cognition is both practically important, given the prevalence of karma beliefs across world cultures, and theoretically important, given that karma provides the perfect testing ground for several questions about the form and function of supernatural beliefs. In this final chapter, I summarize this emergent body of evidence regarding belief in karma, I discuss the implications for broader theories of religion and moral cognition, and I suggest several possible avenues for future research building on these findings.

What is the psychological profile of karma?

First and foremost, these studies provide insight into the psychological content of laypeople's beliefs about karma, across several cross-cultural samples including Hindus, Buddhist, Christians, and non-religious individuals in North America and Asia. What do people

mean when they talk about karma? Answering this question is a vital first step in designing psychological research that meaningfully and accurately captures people's lived experiences. Available evidence from anthropological and theological studies of world religions provides many insights, but it is limited in its ability to document the heterogeneity of belief among individuals who are not religious specialists. My research therefore adds to this previous evidence by documenting how individual lay people across cultures reason about karma and how believers employ this concept to make social inferences.

My research documents several ways in which the concept of karma is a psychologically meaningful individual difference in a belief about the structure of the universe, which believers can apply when making attributions about the causes of misfortune, predictions about the likelihood of future outcomes, and judgments about the right course of action in interpersonal interactions. My research has also found important similarities and differences between karma and ostensibly similar concepts (belief in gods and belief in a just world) that situate karma as a unique element of previously well-studied constructs in the psychological literature.

How is karma distinct from beliefs about fairness that lack overt supernatural content and distinct from beliefs about gods?

The central logic of karmic causality – that people's moral actions exert a causal influence on their likelihood of experiencing good and bad fortune in the future – echoes intuitions about immanent justice that have been well-documented among samples of Western adults and children (Banerjee & Bloom, 2017; Callan et al., 2014; Converse et al., 2012). The fact that karma-like immanent justice intuitions have been reliably documented even in samples that lack widespread cultural norms encouraging karmic judgments, and even in the uncontrolled reaction times of individuals who explicitly deny karmic effects (e.g., Baumard & Chevallier,

2012), indicate that something akin to a karma-like intuition may be a cognitive universal present across cultures.

Such an intuition—that deserving misfortune (because of misdeeds) translates into actually *causing* that misfortune to occur—may be part of the reason why karmic beliefs are so prevalent across world cultures, and consistently present (at least at low levels) in my research among Western samples who lack meaningful religious support and cultural reinforcement of karmic beliefs. This may partly explain why belief in karma was consistently higher among individuals who tend to generally trust their intuitions (Chapter 2), in samples from India, Singapore, the USA, and Canada.

However, an intuition about immanent justice is not sufficient to explain belief in karma. My research reveals that belief in karma—as a psychological construct—is a multifaceted concept with features that are more than merely immanent justice intuitions, and which predict unique psychological effects that are not readily explainable by any low-level, culturally-ubiquitous intuition. Karma is an explicitly-endorsed supernatural belief that exists as a meaningful, culturally-shaped, individual difference (see also, White, Norenzayan, et al., 2019), with distinct features that differentiate it from belief in god as a source of supernatural justice and from belief in immanent and interpersonal justice. Below, I describe this unique psychological profile of belief in karma.

The concept of karma—as described by theological texts, described by my research participants, and measured in the present research—clearly distinguishes itself from beliefs about secular justice and interpersonal fairness by allowing just punishments and rewards to come at a distant point in time, far in the future across the cycle of reincarnations, thereby creating causal connections that could not possibly be policed by human agents and natural physical laws. Many

people who expect interpersonal fairness and who believe that the world is generally fair also reject the existence of this karmic causality across long timescales and reincarnations (White, Norenzayan, et al., 2019). Karma is also conceptually distinct from belief in gods, who are more easily and more frequently perceived as agentic, personified beings with whom believers can have social relationships and whose concerns and responsibilities extend beyond policing interpersonal morality. The present research confirms that these beliefs—ostensibly secular justice, agentic theistic justice, and karmic immanent justice—have unique manifestations in social judgments.

For instance, predictions about the future of moral transgressors, described in Chapter 3, show how “karma-like” judgments might depend on a combination of universal cognitive processes, expectations about interpersonal justice, and specific beliefs about supernatural entities. Among American participants, there is an overall trend to expect greater future misfortune to befall individuals who exhibit more immoral character traits. That is, most people think that bad people deserve bad things, and this association is evident even among individuals who explicitly deny karmic processes. Individual differences in belief in a just world (a measure that reflects the expectation of fairness in general but lacks any overt supernatural content) moderate this association, such that transgressors are rated as especially likely to receive future misfortunes *at the hands of other people* (e.g., to be betrayed by a friend or fired from one’s job). These expectations about interpersonal justice are likely to be more widespread across cultures and to emerge earlier in development (e.g., Hamlin et al., 2011; Meristo & Surian, 2014) than expectations about retribution when no human agents are involved. Belief in karma similarly moderates this relationship, but also uniquely predicts the likelihood that bad people will receive future misfortunes that were not obviously controllable by human action (e.g., to get injured in a

car accident or get a serious illness). This is not true of any supernatural belief: Belief in God, who is a potential source of supernatural retribution but whose core features do not require the punishment of transgressors (see Chapter 2 and Chapter 4), did not moderate the likelihood of future misfortunes. These findings show that karma uniquely moderates retrospective inferences about misfortune (White, Norenzayan, et al., 2019; Young et al., 2011), and show that belief in karma is associated with particular social judgments that are not produced by merely believing that the world is generally fair, or by believing in other morally-concerned supernatural entities.

The beliefs in karmic punishment across time is not identical to belief in interpersonal punishments across time. Also, the types of actions believed to be rewarded/punished by karma are not reducible to an individual's beliefs about interpersonal morality. In Chapter 4, multi-method, cross-cultural studies indicated different expectations about what karma rewards and punishes, compared to what God rewards and punishes. These differences were consistent with the different relationships that believers have with karma and God: Karma is a process of moralized causality through which helping and giving to others is a highly salient method of gaining karmic merit, whereas God is a social agent who expects devotion and religious commitment, in addition to interpersonal prosociality.

A final demonstration of how explicit belief in karma is important for social judgments comes from the Dictator Game studies of Chapter 5. Experimental instructions to think about karma consistently decreased selfishness among believers, just as thinking about God decreased selfishness (and religious primes have more broadly been shown to encourage prosociality, Billingsley et al., 2018; Shariff et al., 2016). Importantly, in both cases, the prosocial effect of thinking about karma/God was only apparent (or substantially larger) among participants who explicitly claim to believe that karma/God are real. Conversely, belief in a just world did not

moderate these experimental effects, showing further evidence that such an expectation of secular fairness is not sufficient to explain karma's effect on psychological processes.

This moderation by explicit belief cannot be explained by non-believers and believers having different understandings of what “karma” or “God” mean: Believers and nonbelievers both report that karma and God would reward generosity and punish selfishness (Chapter 4). Past research has also found that people who deny the existence of karma still associate karma with the concept of rewards for generosity and punishment for greed (Banerjee & Bloom, 2017; Baumard & Chevallier, 2012; Converse et al., 2012; Kulow & Kramer, 2016). 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*. Yet responses to experimental reminders of karma and God clearly depend on the explicit belief: 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.

Constraints on replicability and generalizability

The studies presented in this dissertation employed the best practices of contemporary Open Science (Open Science Collaboration, 2017; Wagenmakers et al., 2012; Wicherts et al., 2016). Each chapter includes high-powered, preregistered studies that confirm initial findings with further replications. These replications tested the robustness to results across multiple methods (e.g., within-subjects vs. between-subjects designs), across different cultural contexts and among people with different religious traditions (e.g., participants living in Canada, the USA, India, and Singapore), and across multiple analytic techniques (e.g., testing robustness to various covariates, weighing the evidence across studies using an internal meta-analysis).

Together, these techniques can give us confidence that the focal results are likely to replicate in future studies in the populations that we studied (Simons et al., 2017). We studied participants from diverse religious backgrounds (including primarily Christian, Hindu, Buddhist, and non-religious participants), but we focused on recruiting participants from only a few countries, and our use of online surveys meant that our samples were limited to well-educated, computer-using, English-speaking people within these countries. Due to this, the cultural groups that were compared throughout this dissertation were likely more culturally-similar to one another than representative samples from these countries/religions would be (for discussion see Henrich, Heine, et al., 2010; Muthukrishna et al., 2020), and there is certainly substantial diversity in supernatural beliefs that has not been captured in the present samples (Norenzayan, 2016).

The present sampling technique therefore allowed us to compare responses across members of different religious traditions, and religion is one important dimension of cultural variation within and across countries (White, Muthukrishna, et al., 2020). Further research is required to assess whether our results would replicate in other cultural groups, which may hold very different beliefs about karma or about gods. For example, while the general idea of karmic causality may be intuitive and widespread across different cultures (as determinant of life outcomes and a motivator of prosociality), there may be further variation in which actions are thought most likely to elicit karmic retributions and rewards (just as there is further variation in God's moral concerns, Purzycki et al., 2017), due to the unique historical and environmental pressures faced by different cultural groups.

The use of online samples throughout this dissertation also presents a potential limitation due to the heightened concerns over data quality when researchers do not directly interact with their participants. Past research has indicated that surveys administered to online participant

panels can often replicate findings that are also documented in-person, in controlled laboratory conditions (Behrend et al., 2011; Buhrmester et al., 2011, 2018; Casler et al., 2013; Kees et al., 2017). However, ensuring high-quality data from online surveys is an ongoing struggle that requires vigilance in every new study. Low-quality responses can come from factors like inattentiveness, which can also be problematic during in-person studies, as well as novel issues such as the inclusion of “participants” who provide responses to the survey despite not knowing how to speak English or being bots who do not correspond real people at all – a growing concern in online platforms such as MTurk (Bai, 2018; Chmielewski & Kucker, 2020).

The present studies employed multiple techniques to ensure that the focal datasets only included high-quality responses from participants who actually comprehended and were paying attention during our studies. I excluded participants who failed to correctly answer simple attention checks (e.g., “Select ‘Disagree’ as your answer to this question”) or who provided nonsensical or inappropriate responses to open-ended questions. In several studies, I also screened out participants who completed the survey in an implausibly short amount of time. Furthermore, I conducted psychometric checks of the measures used in each study (e.g., Cronbach’s alpha and factor analyses of multi-item scales), as well as sanity checks of the data to ensure that patterns which should be present, if the data reflected real people giving meaningful responses, were actually present in our datasets (e.g., participants who identify as Christian or Hindu should, on average, be substantially more religious and express stronger belief in God than non-religious or atheistic participants). Several of our studies also provide conceptual replications of effects that have been well-documented in other populations using different survey administration methods in other samples (e.g., the correlation between cognitive biases like intuitive thinking and supernatural beliefs, Chapter 2, or the effect of religious primes on

prosocial behavior, Chapter 5, which were initially documented in Canadian and American student samples (e.g., Pennycook et al., 2016; Shariff & Norenzayan, 2007).

Altogether, the use of these methods to screen out potentially low-quality data can give us confidence that the present results are based on the best quality data available from online surveys. An online context may even be preferable to in-person settings for certain studies, by ensuring that participants feel anonymous and able to freely provide their genuine responses, which may have been biases towards more socially-desirable responses were the studies conducted in the presence of the experimenter or fellow participants. However, online surveys are only amenable to certain types of methods (e.g., the self-report questionnaires, open-ended surveys, and strong experimental manipulations that were used in this dissertation) and to recruitment of certain types of participants (i.e., computer-using individuals who possess sufficient cognitive capacity and motivation to pass our attention checks and quality controls). Future research is therefore necessary to confirm the generalizability of the present findings across broader populations and other contexts, and to test other predictors or outcomes of supernatural justice beliefs that cannot be measured in a virtual environment. This dissertation takes a first step in this direction by identifying the prototypical psychological features of karma among online samples from North America, India, and Singapore, and showing the similarities and differences between karma beliefs, God beliefs, and belief in a just world.

Incorporating karma into culturally inclusive theories of moral psychology, social cognition, and the cultural evolution of religion

This investigation of when culturally-diverse justice beliefs have similar or different effects on psychological outcomes, has several implications for theoretical accounts of religion and moral psychology.

Common processes of cognition and cultural evolution can give rise to a variety of diverse supernatural beliefs.

My research contributes to theoretical claims about the psychological foundations of religion and supernatural beliefs, as a combination of both cross-culturally recurrent cognitive capabilities and intuitions, and culturally-transmitted information about specific entities that deserve commitment within a particular cultural/historical context (Norenzayan et al., 2016; White et al., 2021; Willard & Cingl, 2017). Specifically, my research supports the conclusion that neither cognition nor culture, on its own, is able to explain belief, but rather a combination of these two.

Cognitive by-product 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, and (2) individual differences in the strength of supernatural beliefs, partly arising from individual differences in various cognitive biases and motivations. In support of this claim, I have found consistent evidence that belief in both karma and gods is present across cultural contexts, with vastly different cultural histories and dominant religious traditions, and individual differences in cognitive tendencies (e.g., intuitive thinking, mind-body dualism, and teleological thinking) are associated with individual differences in beliefs within each of these cultures (Chapter 2).

However, cognitive by-product theories are not equipped to explain the considerable variability of beliefs that exist across religious traditions, cultures, and historical time. After accounting for cognitive dispositions (Chapter 2), there remains large cross-cultural differences in average levels of belief in karma and gods, and in the association between belief in karma and belief in God. The concepts of karma and God also have unique mental representations (Chapter

4) which cannot be well explained by pointing to shared cognitive intuitions underlying both beliefs.

Supernatural beliefs may be 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, 2019; 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.

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).

There is a key psychological difference between mentally representing supernatural entities and being committed to them in daily life. As documented in Chapter 2, cognitive

tendencies predict who is most likely to believe in God and belief in karma, in Canada, the USA, India, and Singapore, but substantial variance in who believes in God or karma, or both, or neither, is unaccounted for by the measured cognitive tendencies. Exclusively cognitive theories of supernatural beliefs do not easily account for this distinction.

Cognitive 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 to anonymous strangers (Botero et al., 2014; Norenzayan, 2013; Norenzayan et al., 2016; Purzycki et al., 2016, 2017; Purzycki & Sosis, 2011; Watts et al., 2015). These considerations point to the conclusion that cognitive 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. This perspective has previously been successfully used to explain meaningful variability in belief in God, which is more common among individuals who experienced credible signals of other people's commitment to God, even after controlling for a variety of other cognitive and demographic factors (e.g., Gervais et al., 2019; Gervais & Najle, 2015; Langston et al., 2020; Maij et al., 2017; Willard & Cingl, 2017). Chapter 2 also documented that cultural exposure to the concept of karma uniquely predict greater belief in karma, however future studies could investigate in greater detail how beliefs about karma are

spread and reinforced within communities of believers. However, less is known about the cultural pathways that encourage commitment to explicit beliefs about karma, which raises intriguing possibilities for future research.

Anthropological studies have suggested 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. For example, 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 then 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; M. J. 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, 2018, 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 a particular circumstance (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's intervention in human affairs, in cultural contexts that support God, but not karma, as the relevant cause (Luhmann, 2018; Van Leeuwen & van Elk, 2018), or in situations that elicit intuitions about supernatural agency, rather than karmic justice (Nuckolls, 1992). Further empirical research could identify the psychological processes underlying this social validation of supernatural attributions.

A variety of beliefs can solve similar adaptive problems across different cultural contexts

Our research results are most consistent with the perspective that culturally-supported beliefs about supernatural justice, including belief in karma and belief in morally-concerned deities, evolved as adaptive solutions to cross-culturally recurrent problems of human social life, such as how to motivate and sustain prosociality among ingroup members (Norenzayan et al., 2016). Previous evidence has documented patterns of cross-cultural prevalence in supernatural justice beliefs that indicate a role for these beliefs in sustaining increased societal complexity (Watts et al., 2015), by expanding the circle of cooperation. This dissertation highlights several features of karmic beliefs that are consistent with karma's role in encouraging interpersonal morality, including predicting greater perceived costs of engaging in moral transgressions and greater benefits of virtuous actions (Chapters 3 and 4), and causing believers to behave more prosocially when thinking about karma (Chapter 5). Karma, therefore, shares many of the

sample psychological elements and behavioral effects as belief in morally concerned gods, despite lacking the agentic qualities of most gods and arising historical pathways of culture. Altogether, these patterns of beliefs indicate how cultural evolution can give rise to a multitude of diverse supernatural beliefs that can sometimes serve similar functions in the lives of believers.

Unique beliefs can have unique effects on social judgments

In addition to the shared elements of god beliefs, karma beliefs, and interpersonal justice beliefs, these concepts are not identical, nor reducible to one another, therefore raising interesting questions about how unique elements of different supernatural beliefs might have unique effects on behavior. Below, I discuss several potential ways in which the consequences of supernatural beliefs could depend on their specific mental representation, and how this could be further investigated in future research.

Supernatural forces across reincarnations

Karma clearly diverges from beliefs about gods and secular sources of justice by its operation across multiple reincarnations. This reincarnation element means that if someone believes in karma as the causal mechanism then 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). As evidence of karma's unique effects, I have found that belief in karma uniquely predicts whether individuals perceive a causal connection between a persons' moral behavior and their experience of accidental misfortunes in life, in retrospective (Taylor et al., 2020; White, Norenzayan, et al., 2019; Young et al., 2011) and prospective judgments (Chapter 3), above and beyond the predictive power of belief in God and

belief in a just world. Belief in karma may therefore be particularly motivating in situations that lack other obvious incentives to behave well. The expectation of karmic rewards across long timescales may also provide a potent 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 (Willard, Baimel, et al., 2020).

In addition, 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).

Future studies showing that karma has unique effects that only can be explained by karmic causality across reincarnation, would confirm that culturally-supported explicit beliefs have important psychological consequences. This distinguishes these beliefs from cognitive intuitions about immanent justice or unseen agency, which are more uniformly present across

different cultural settings. The intuitive perception that actions have morally congruent outcomes may arise regardless of belief in supernatural forces or a cycle of reincarnation, but explicit belief in karmic causality across lifetimes encourages causal attributions across an even broader range of situations.

Karma as agent, trait, resource, or causal principle

A further untested prediction about karma is that believers may hold a particular mental model of what karma is (i.e., of how it carries out the enforcement of moral behavior across reincarnations), and different mental representations of karma may manifest in particular psychological effects.

Four different mental representations of karma are both theoretically plausible and consistent with available anthropological and psychological evidence. (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) *Karma 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 Chapters 2 and 4, I found that believers tend to endorse descriptions of karma that contain elements of all these representations, implying possible uncertainty or flexibility in how believers are willing to make sense of karma. Below I outline several predictions about the psychological consequences of each of these representations, which could be investigated in future research.

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. Many karma believers in Canada, the USA, India, and Singapore 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.

In the *karma as a feature of actions* mental model, thinking about karma may rely on expectations about moral character (Goodwin et al., 2014; Uhlmann et al., 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. This tendency towards dispositionalism is a recurrent feature of social cognition exhibited by both adults and children across cultures (Choi et al., 1999; Dunlea & Heiphetz, 2020; Gilbert, 1998; Heiphetz, 2019; Olson et al., 2008; Trope & Gaunt, 2007), and may be intensified when people think about karma.

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, karma 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 a particular representation 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.

Conclusion

In this dissertation, I 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. I 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. But these beliefs also differ in their mental representations, which predicts unique patterns of social judgment and prosocial behavior, meaning that studying a diversity of beliefs across cultural contexts is a necessary part of testing theories of religion, morality, and justice.

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Appendix A: Supplementary Results for Chapter 2

Bivariate correlations between variables

Table A 1. Bivariate correlations between all variables, Canadian participants, Study 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Intuition																
2. Mentalizing	.21															
3. Dualism	.28	.17														
4. Teleology in life	.28	.21	.36													
5. Teleology in nature	.14	.15	.20	.12												
6. Belief in Karma	.27	.08	.45	.55	.12											
7. Mind of Karma	.21	.04	.35	.41	.11	.61										
8. Benevolence of karma	.17	.08	.26	.31	.11	.45	.52									
9. Punitiveness of karma	.08	-.04	.13	.27	.03	.34	.46	.43								
10. Impersonal karma	.07	-.01	.14	.20	.01	.28	.35	.34	.58							
11. Resource-like karma	.20	.02	.26	.33	.09	.46	.74	.46	.32	.25						
12. Belief in God	.07	.19	.22	.47	.10	.30	.26	.22	.17	.12	.17					
13. Mind of God	.08	.14	.20	.47	.08	.29	.35	.24	.25	.14	.26	.80				
14. Benevolence of God	.07	.21	.23	.45	.10	.30	.30	.33	.24	.15	.23	.75	.75			
15. Punitiveness of God	-.03	-.11	.03	.10	.02	.15	.25	.23	.37	.26	.12	.09	.20	.15		
16. Impersonal God	-.01	-.09	.06	.03	-.03	.13	.21	.23	.23	.28	.15	-.06	.01	.03	.54	
17. Resource-like God	.07	.07	.16	.27	.06	.27	.32	.24	.22	.16	.28	.38	.52	.38	.19	.16

Note. Any correlations $> .06$ are statistically significant at $p < .05$.

Table A 2. Bivariate correlations between all variables, Indian participants, Study 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Intuition																
2. Mentalizing	.22															
3. Dualism	.18	.18														
4. Teleology in life	.31	.23	.33													
5. Teleology in nature	.23	.18	.33	.27												
6. Belief in Karma	.27	.19	.35	.53	.24											
7. Mind of Karma	.18	-.02	.33	.32	.27	.41										
8. Benevolence of karma	.16	.05	.23	.30	.21	.39	.42									
9. Punitiveness of karma	.05	-.08	.17	.20	.12	.27	.33	.39								
10. Impersonal karma	.02	-.02	.17	.15	.11	.22	.30	.36	.52							
11. Resource-like karma	.16	-.01	.22	.28	.20	.33	.61	.32	.25	.19						
12. Belief in God	.14	.13	.16	.43	.15	.42	.22	.24	.09	.07	.16					
13. Mind of God	.19	.15	.23	.48	.19	.43	.37	.26	.18	.13	.26	.62				
14. Benevolence of God	.24	.20	.24	.44	.23	.34	.17	.38	.18	.15	.13	.47	.49			
15. Punitiveness of God	.03	-.13	.13	.17	.13	.18	.30	.28	.52	.30	.17	.14	.21	.19		
16. Impersonal God	.01	-.08	.17	.15	.14	.16	.21	.23	.26	.40	.11	.12	.14	.17	.45	
17. Resource-like God	.11	-.01	.07	.16	.14	.12	.32	.17	.14	.11	.26	.19	.40	.13	.22	.11

Note. Any correlations $> .06$ are statistically significant at $p < .05$.

Table A 3. Bivariate correlations between all variables, American participants, Study 2

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Analytic thinking													
2. Mentalizing	-.12												
3. Dualism	-.14	.19											
4. Teleology in life	-.19	.32	.38										
5. Belief in karma	-.28	.25	.43	.51									
6. Agency of karma	-.22	.20	.30	.31	.53								
7. Moral knowledge of karma	-.13	.24	.29	.36	.55	.70							
8. Non-agentic karma	-.15	.28	.31	.37	.57	.69	.83						
9. Belief in God	-.12	.17	.19	.49	.21	.11	.12	.12					
10. Agency of God	-.14	.21	.21	.48	.22	.22	.24	.22	.75				
11. Moral knowledge of God	-.14	.19	.21	.49	.29	.26	.33	.28	.68	.87			
12. Non-agentic God	.01	-.05	.20	.05	.18	.22	.25	.28	-.02	.17	.20		
13. Karma Social Exposure	-.19	.23	.36	.36	.54	.49	.46	.45	.15	.19	.23	.17	
14. God Social Exposure	-.08	.22	.20	.41	.16	.15	.17	.16	.52	.56	.52	.07	.31

Note. Any correlations > .06 are statistically significant at $p < .05$.

Table A 4. Bivariate correlations between all variables, Singapore participants, Study 2

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Analytic thinking													
2. Mentalizing	.10												
3. Dualism	-.03	.13											
4. Teleology in life	-.02	.25	.27										
5. Belief in karma	-.11	.11	.26	.42									
6. Agency of karma	-.15	.06	.17	.20	.29								
7. Moral knowledge of karma	-.03	.23	.21	.37	.43	.67							
8. Non-agentic karma	.04	.22	.24	.41	.50	.64	.79						
9. Belief in God	-.07	.04	.19	.37	.27	.23	.29	.26					
10. Agency of God	0	.10	.21	.32	.33	.44	.49	.52	.48				
11. Moral knowledge of God	.02	.14	.24	.31	.31	.39	.52	.49	.44	.82			
12. Non-agentic God	.01	.09	.20	.22	.15	.37	.40	.41	.27	.67	.62		
13. Karma Social Exposure	.05	.14	.29	.31	.37	.20	.31	.35	.25	.25	.27	.15	
14. God Social Exposure	-.02	.15	.20	.28	.18	.17	.24	.24	.37	.35	.34	.24	.62

Note. Any correlations > .10 are statistically significant at $p < .05$.

Study 1: Dualism vs. Monism Measures

As a measure of individual differences in mind-body dualism, this survey included 10 items (draw from Riekki, Lindeman, & Lipsanen, 2013) that assessed two separate possibilities for the mind-body relationship: *dualism*, the belief that the mind is independent and fundamentally different from the body, and *monism*, the belief that the mind and body/brain are the same and fundamentally united. I had initially intended to combine these two into a single measure of mind-body dualism (after reverse-scoring the monism dimension), but, contrary to expectations, dualism and monism subscales were actually positively correlated with one another, and therefore could not be meaningfully combined into a single measure of dualism. Therefore, in all analyses reported in the main text I only used the six dualism items, because (1) these questions most directly address whether participants believe minds to be separate from bodies and (2) the dualism subscale is typically more strongly correlated with the modeled variables (see Table 5).

Table A 5. Bivariate correlations between mind-body dualism and mind-body monism and other variables, Study 1

	Canada		India	
	<i>Dualism</i>	<i>Monism</i>	<i>Dualism</i>	<i>Monism</i>
<i>Monism</i>	.15	--	.45	--
<i>Intuition</i>	.28	.12	.18	.21
<i>Mentalizing</i>	.17	.05	.18	.15
<i>Teleology in life</i>	.36	.02	.33	.24
<i>Teleology in nature</i>	.20	.20	.33	.36
<i>Belief in Karma</i>	.45	.10	.35	.22
<i>Mind of Karma</i>	.35	.15	.33	.30
<i>Benevolence of karma</i>	.26	.13	.23	.22
<i>Punitiveness of karma</i>	.13	.07	.17	.18
<i>Impersonal karma</i>	.14	.03	.17	.14
<i>Resource-like karma</i>	.26	.16	.22	.20
<i>Belief in God</i>	.22	-.05	.16	.05
<i>Mind of God</i>	.20	.03	.23	.18
<i>Benevolence of God</i>	.23	.01	.24	.18
<i>Punitiveness of God</i>	.03	.06	.13	.14
<i>Impersonal God</i>	.06	.10	.17	.09
<i>Resource-like God</i>	.16	.10	.07	.16

Note. Any correlations $> .06$ are statistically significant at $p < .05$.

Study 1: Model separately predicting different karma beliefs and God beliefs

Before creating the models described in the main text, I first analyzed the data through path models that separately predicted belief and each of the trait ascriptions from the cognitive variables. These models, depicted in Figure A1, included correlated residuals between various belief and trait ratings, which give a sense of the associations between various karma/God beliefs. Results are displayed in Tables A6 and A7. The models presented in the main text further modify these models to add a direct path between belief in karma/God and traits ascribed to karma/God, to more explicitly test whether (a) belief (in general) is associated with particular representations of karma/God, and (b) whether cognitive variables predict endorsement of these representations above and beyond their relationship with belief.

Figure A 1. Study 1: Path model predicting supernatural beliefs, in Canada and India

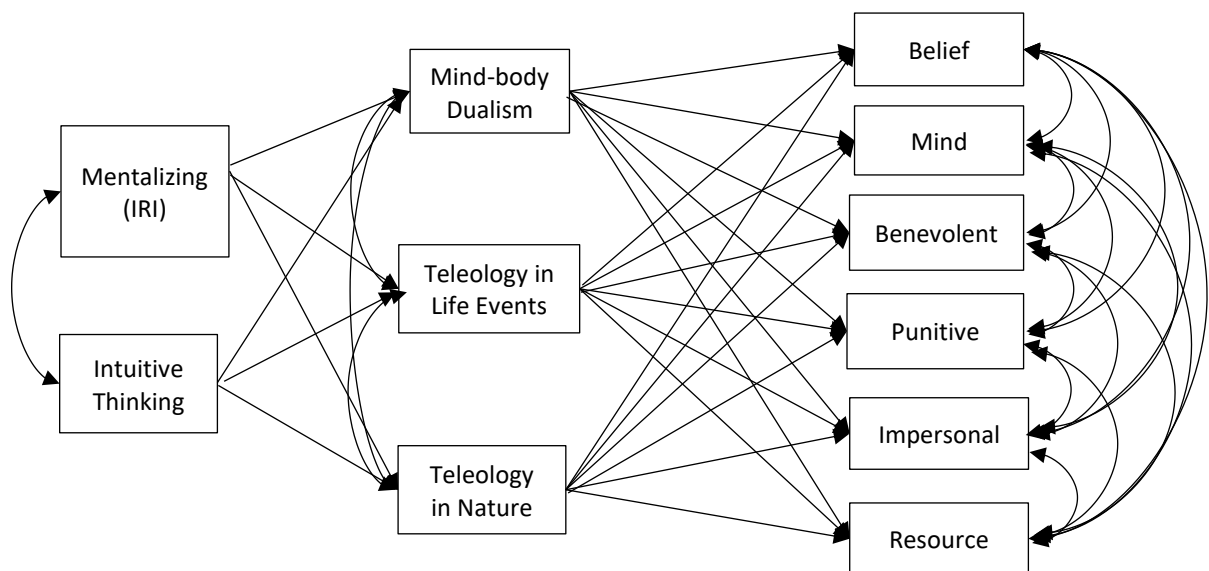


Table A 6. Study 1: Standardized path model estimates predicting beliefs about karma and God

	Karma				God			
	Canada		India		Canada		India	
	<i>b</i>	95% <i>CI</i>	<i>b</i>	95% <i>CI</i>	<i>b</i>	95% <i>CI</i>	<i>b</i>	95% <i>CI</i>
<i>Dualism</i>								
Intuition	0.26***	[0.20, 0.32]	0.14***	[0.08, 0.21]	0.26***	[0.20, 0.32]	0.14***	[0.08, 0.21]
Mentalizing	0.11***	[0.05, 0.17]	0.14***	[0.08, 0.21]	0.11***	[0.05, 0.17]	0.14***	[0.08, 0.21]
<i>Teleology in Life Events</i>								
Intuition	0.24***	[0.19, 0.30]	0.27***	[0.21, 0.33]	0.24***	[0.19, 0.30]	0.27***	[0.21, 0.33]
Mentalizing	0.16***	[0.10, 0.22]	0.17***	[0.11, 0.23]	0.16***	[0.10, 0.22]	0.17***	[0.11, 0.23]
<i>Teleology in Nature</i>								
Intuition	0.11***	[0.05, 0.17]	0.20***	[0.14, 0.26]	0.11***	[0.05, 0.17]	0.20***	[0.14, 0.26]
Mentalizing	0.12***	[0.06, 0.18]	0.14***	[0.08, 0.20]	0.12***	[0.06, 0.18]	0.14***	[0.08, 0.20]
<i>Belief in Karma/God</i>								
Dualism	0.29***	[0.24, 0.34]	0.18***	[0.12, 0.23]	0.04	[-0.02, 0.10]	0.007	[-0.06, 0.07]
Teleology in life	0.45***	[0.40, 0.50]	0.45***	[0.40, 0.50]	0.45***	[0.40, 0.51]	0.42***	[0.36, 0.47]
Teleology in nature	0.01	[-0.04, 0.06]	0.06*	[0.007, 0.12]	0.03	[-0.02, 0.09]	0.04	[-0.02, 0.10]
<i>Mind</i>								
Dualism	0.22***	[0.16, 0.28]	0.21***	[0.15, 0.27]	0.03	[-0.03, 0.09]	0.07*	[0.005, 0.12]
Teleology in life	0.32***	[0.27, 0.38]	0.22***	[0.16, 0.27]	0.46***	[0.41, 0.51]	0.45***	[0.39, 0.50]
Teleology in nature	0.03	[-0.03, 0.08]	0.14***	[0.08, 0.20]	0.02	[-0.03, 0.08]	0.05	[-0.01, 0.11]
<i>Benevolence</i>								
Dualism	0.17***	[0.11, 0.23]	0.12***	[0.06, 0.18]	0.07*	[0.008, 0.13]	0.08**	[0.02, 0.14]
Teleology in life	0.24***	[0.18, 0.30]	0.23***	[0.17, 0.29]	0.42***	[0.37, 0.48]	0.39***	[0.33, 0.44]
Teleology in nature	0.04	[-0.02, 0.10]	0.11***	[0.04, 0.17]	0.04	[-0.01, 0.10]	0.10***	[0.04, 0.16]
<i>Punitiveness</i>								
Dualism	0.04	[-0.03, 0.10]	0.10**	[0.04, 0.17]	-0.006	[-0.07, 0.06]	0.06	[-0.008, 0.13]
Teleology in life	0.26***	[0.19, 0.32]	0.16***	[0.09, 0.22]	0.10**	[0.03, 0.17]	0.13***	[0.06, 0.19]
Teleology in nature	-0.008	[-0.07, 0.05]	0.04	[-0.02, 0.11]	0.01	[-0.05, 0.07]	0.08*	[0.01, 0.14]
<i>Impersonal</i>								
Dualism	0.09*	[0.02, 0.15]	0.12***	[0.06, 0.19]	0.07	[0.00, 0.14]	0.11***	[0.04, 0.17]
Teleology in life	0.17***	[0.11, 0.24]	0.10**	[0.03, 0.16]	0.01	[-0.05, 0.08]	0.09**	[0.03, 0.16]

Teleology in nature	-0.03	[-0.10, 0.03]	0.04	[-0.02, 0.11]	-0.05	[-0.11, 0.02]	0.08*	[0.01, 0.14]
<i>Resource</i>								
Dualism	0.16***	[0.10, 0.23]	0.11***	[0.05, 0.18]	0.07*	[0.004, 0.13]	-0.007	[-0.07, 0.06]
Teleology in life	0.26**	[0.20, 0.32]	0.22***	[0.15, 0.28]	0.24***	[0.18, 0.31]	0.13***	[0.07, 0.20]
Teleology in nature	0.02	[-0.04, 0.08]	0.10**	[0.04, 0.16]	0.02	[-0.05, 0.08]	0.11***	[0.04, 0.17]

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table A 7. Study 1: Correlated residuals from path model (presented in main text) predicting beliefs about karma and God. All estimates > 0.06 are statistically significant at $p < .05$.

		Karma				God			
		Canada		India		Canada		India	
		estimate	95% CI	estimate	95% CI	estimate	95% CI	estimate	95% CI
Intuition	Mentalizing	0.21	[0.15, 0.27]	0.22	[0.16, 0.28]	0.21	[0.15, 0.27]	0.22	[0.16, 0.28]
Dualism	Teleo. in life	0.30	[0.24, 0.35]	0.28	[0.22, 0.33]	0.30	[0.24, 0.35]	0.28	[0.22, 0.33]
Dualism	Teleo. in nature	0.16	[0.10, 0.22]	0.29	[0.24, 0.35]	0.16	[0.10, 0.22]	0.29	[0.24, 0.35]
Teleo. in life	Teleo. in nature	0.07	[0.007, 0.13]	0.20	[0.14, 0.26]	0.07	[0.007, 0.13]	0.20	[0.14, 0.26]
Belief	Mind	0.47	[0.43, 0.52]	0.26	[0.20, 0.32]	0.74	[0.71, 0.77]	0.52	[0.47, 0.56]
Belief	Benevolence	0.32	[0.26, 0.37]	0.26	[0.21, 0.32]	0.68	[0.64, 0.71]	0.35	[0.29, 0.40]
Belief	Punitiveness	0.24	[0.18, 0.29]	0.18	[0.12, 0.24]	0.05	[-0.02, 0.11]	0.08	[0.01, 0.14]
Belief	Impersonal	0.20	[0.14, 0.26]	0.14	[0.08, 0.20]	-0.09	[-0.15, -0.03]	0.06	[-0.008, 0.12]
Belief	Resource	0.33	[0.28, 0.39]	0.19	[0.13, 0.25]	0.29	[0.24, 0.35]	0.14	[0.08, 0.20]
Mind	Benevolence	0.44	[0.39, 0.49]	0.32	[0.27, 0.38]	0.68	[0.65, 0.71]	0.35	[0.29, 0.40]
Mind	Punitiveness	0.40	[0.35, 0.45]	0.26	[0.20, 0.32]	0.17	[0.11, 0.23]	0.14	[0.08, 0.20]
Mind	Impersonal	0.29	[0.24, 0.35]	0.24	[0.18, 0.30]	-0.01	[-0.07, 0.05]	0.07	[0.004, 0.13]
Mind	Resource	0.69	[0.66, 0.73]	0.55	[0.51, 0.60]	0.46	[0.41, 0.51]	0.37	[0.31, 0.42]
Benevolence	Punitiveness	0.38	[0.33, 0.43]	0.34	[0.29, 0.40]	0.12	[0.06, 0.18]	0.11	[0.05, 0.18]
Benevolence	Impersonal	0.29	[0.23, 0.35]	0.32	[0.27, 0.38]	0.02	[-0.05, 0.08]	0.09	[0.03, 0.15]
Benevolence	Resource	0.38	[0.33, 0.44]	0.23	[0.17, 0.29]	0.29	[0.23, 0.35]	0.05	[-0.008, 0.12]
Punitiveness	Impersonal	0.56	[0.52, 0.61]	0.49	[0.45, 0.54]	0.54	[0.50, 0.59]	0.43	[0.38, 0.48]
Punitiveness	Resource	0.26	[0.20, 0.32]	0.19	[0.13, 0.25]	0.17	[0.11, 0.23]	0.19	[0.13, 0.25]
Impersonal	Resource	0.20	[0.14, 0.26]	0.13	[0.07, 0.20]	0.15	[0.09, 0.21]	0.08	[0.02, 0.14]

Study 1: Correlated residuals from main models

Table A 8. Study 1: Correlated residuals from path model (presented in main text) predicting beliefs about karma and God. All estimates > 0.06 are statistically significant at $p < .05$.

		Karma				God			
		Canada		India		Canada		India	
		estimate	95% CI	estimate	95% CI	estimate	95% CI	estimate	95% CI
Intuition	Mentalizing	0.21	[0.15, 0.27]	0.22	[0.16, 0.28]	0.21	[0.15, 0.27]	0.22	[0.16, 0.28]
Dualism	Teleo. in life	0.30	[0.24, 0.35]	0.28	[0.22, 0.33]	0.30	[0.24, 0.35]	0.28	[0.22, 0.33]
Dualism	Teleo. in nature	0.16	[0.10, 0.22]	0.29	[0.24, 0.35]	0.16	[0.10, 0.22]	0.29	[0.24, 0.35]
Teleo. in life	Teleo. in nature	0.07	[0.01, 0.13]	0.2	[0.14, 0.26]	0.07	[0.01, 0.13]	0.20	[0.14, 0.26]
Mind	Benevolence	0.35	[0.29, 0.40]	0.2	[0.15, 0.26]	0.36	[0.31, 0.42]	0.27	[0.21, 0.33]
Mind	Punitiveness	0.34	[0.28, 0.39]	0.12	[0.06, 0.18]	0.20	[0.14, 0.26]	0.23	[0.17, 0.29]
Mind	Impersonal	0.23	[0.17, 0.29]	0.04	[-0.02, 0.11]	0.08	[0.02, 0.14]	0.21	[0.15, 0.27]
Mind	Resource	0.65	[0.61, 0.68]	0.35	[0.29, 0.40]	0.37	[0.32, 0.42]	0.53	[0.49, 0.57]
Benevolence	Punitiveness	0.33	[0.28, 0.39]	0.09	[0.03, 0.16]	0.12	[0.06, 0.18]	0.31	[0.25, 0.36]
Benevolence	Impersonal	0.25	[0.19, 0.30]	0.08	[0.02, 0.14]	0.10	[0.04, 0.17]	0.30	[0.24, 0.36]
Benevolence	Resource	0.31	[0.26, 0.37]	0.01	[-0.06, 0.07]	0.13	[0.07, 0.19]	0.19	[0.13, 0.25]
Punitiveness	Impersonal	0.54	[0.50, 0.59]	0.43	[0.38, 0.48]	0.55	[0.51, 0.59]	0.48	[0.44, 0.53]
Punitiveness	Resource	0.20	[0.14, 0.26]	0.18	[0.12, 0.24]	0.16	[0.10, 0.23]	0.16	[0.10, 0.22]
Impersonal	Resource	0.14	[0.08, 0.20]	0.07	[0.01, 0.13]	0.18	[0.12, 0.24]	0.11	[0.05, 0.17]

Study 2: Alternative models

Predicting beliefs about God

We tested additional models that were identical to those reported in text but excluded the social exposure variable, thus being comparable to the models tested in Study 1. When predicting beliefs about God, this model was also a good fit for the data in the USA: $\chi^2(10) = 83.14$, $p < .001$, CFI = .98, RMSEA = .077 [.062, .092], SRMR = .04, and explained 24% of the variance in belief in God, 23% of the variance in God's moral knowledge, and 22% of the variance in agentic views. This model was also a good fit predicting belief in God in Singapore: $\chi^2(10) = 44.21$, $p < .001$, CFI = .97, RMSEA = .082 [.058, .11], SRMR = .07, and explained 11% of the variance in belief in God, 4% of the variance in God's moral knowledge, and 4% of the variance in agentic views.

For the sake of comparison, alternative models that reversed the direction of the association between beliefs and cognitive biases provided a worse fit to the data when predicting belief in God in the USA: $\chi^2(8) = 172.45$, $p < .001$, CFI = .96, RMSEA = .13 [.11, .15], SRMR = .052, and a similar (but no better) fit in Singapore: $\chi^2(8) = 47.32$, $p < .001$, CFI = .98, RMSEA = .085 [.059, .11], SRMR = .04.

Predicting beliefs about karma

When predicting belief in karma, the model omitting social exposure was also a good fit to the data in the USA: $\chi^2(7) = 76.32$, $p < .001$, CFI = .98, RMSEA = .09 [.072, .11], SRMR = .04, and explained 34% of the variance in belief in karma, 13% of the variance in karma's moral knowledge, 16% of the variance in agentic views, and 17% of the variance in non-agentic views of karma. This model was also a good fit predicting belief in karma in Singapore: $\chi^2(6) = 25.63$, $p < .001$, CFI = .98, RMSEA = .080 [.050, .11], SRMR = .03, and explained 21% of the variance in belief in karma, 15% of the variance in karma's moral knowledge, 8% of the variance in agentic views, and 19% of the variance in non-agentic views of karma.

For the sake of comparison, alternative models that reversed the direction of the association between beliefs and cognitive biases provided a fit that was similar or worse (depending on which fit statistic is considered) when predicting belief in karma in the USA: $\chi^2(4) = 64.71$, $p < .001$, CFI = .98, RMSEA = .11 [.09, .14], SRMR = .03, and a similar fit in Singapore: $\chi^2(4) = 16.62$, $p = .002$, CFI = .99, RMSEA = .08 [.04, .12], SRMR = .02.

Study 2: Model separately predicting different karma beliefs and God beliefs

Figure A 2. Study 2: Path model predicting belief in karma. Also not depicted are included correlated residuals between social exposure to karma and cognitive predictor variables. Dashed arrows indicate paths added to the karma model that were omitted from the model predicting God. The path from analytic thinking to non-moral agency of karma was only included in Singapore.

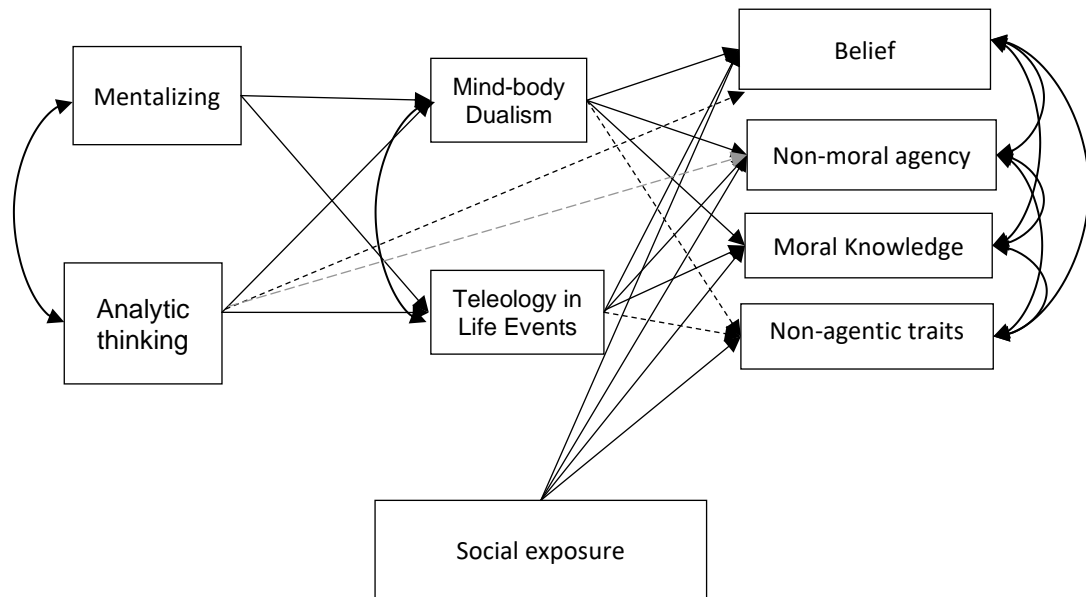


Table A 9. Study 2: Standardized path model estimates predicting beliefs about karma and God.

	Karma				God			
	USA		Singapore		USA		Singapore	
	<i>b</i>	95% CI	<i>b</i>	95% CI	<i>b</i>	95% CI	<i>b</i>	95% CI
<i>Dualism</i>								
Analytic thinking	-0.12***	[-0.17, -0.06]	-0.04	[-0.13, 0.05]	-0.12***	[-0.17, -0.06]	-0.04	[-0.13, 0.05]
Mentalizing	0.18***	[0.12, 0.23]	0.14**	[0.05, 0.22]	0.18***	[0.12, 0.23]	0.14**	[0.05, 0.22]
<i>Teleology in Life Events</i>								
Analytic thinking	-0.15***	[-0.21, -0.10]	-0.04	[-0.13, 0.05]	-0.15***	[-0.21, -0.10]	-0.04	[-0.13, 0.05]
Mentalizing	0.30***	[0.25, 0.35]	0.25***	[0.17, 0.33]	0.30***	[0.25, 0.35]	0.25***	[0.17, 0.33]
<i>Belief</i>								
Dualism	0.18***	[0.13, 0.22]	0.20*	[0.02, 0.18]	-0.004	[-0.05, 0.05]	0.04	[-0.04, 0.12]
Teleology in life	0.29***	[0.25, 0.34]	0.32***	[0.24, 0.39]	0.34***	[0.29, 0.39]	0.25***	[0.17, 0.33]
Social Exposure	0.36***	[0.31, 0.40]	0.24***	[0.16, 0.32]	0.38***	[0.34, 0.43]	0.29***	[0.22, 0.37]
Analytic thinking	-0.11***	[-0.15, -0.07]	-0.12**	[-0.20, -0.05]				
<i>Agency</i>								
Dualism	0.11***	[0.05, 0.16]	0.10*	[0.01, 0.18]	-0.02	[-0.07, 0.02]	0.03	[-0.04, 0.09]
Teleology in life	0.12***	[0.07, 0.18]	0.13*	[0.04, 0.21]	0.30***	[0.25, 0.35]	0.14***	[0.07, 0.20]
Social Exposure	0.41***	[0.36, 0.46]	0.14**	[0.05, 0.23]	0.45***	[0.40, 0.49]	0.31***	[0.24, 0.39]
Analytic thinking			-0.16***	[-0.22, -0.09]				
<i>Moral knowledge</i>								
Dualism	0.09***	[0.04, 0.14]	0.08	[-0.004, 0.16]	-0.022	[-0.07, 0.03]	0.07*	[0.003, 0.14]
Teleology in life	0.20***	[0.15, 0.25]	0.28***	[0.20, 0.37]	0.33***	[0.28, 0.38]	0.13***	[0.06, 0.20]
Social Exposure	0.36***	[0.31, 0.41]	0.20***	[0.12, 0.29]	0.39***	[0.35, 0.44]	0.30***	[0.22, 0.38]
<i>Non-agentic traits</i>								
Dualism	0.11***	[0.06, 0.17]	0.09*	[0.01, 0.17]				
Teleology in life	0.21***	[0.16, 0.26]	0.32***	[0.25, 0.40]				
Social Exposure	0.33***	[0.28, 0.38]	0.22***	[0.14, 0.30]	0.07*	[0.01, 0.12]	0.24***	[0.16, 0.32]

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table A 10. Study 2: Correlated residuals from path model predicting beliefs about karma and God. All estimates > 0.10 are statistically significant at $p < .05$.

		Karma				God			
		USA		Singapore		USA		Singapore	
		<i>estimate</i>	<i>95% CI</i>	<i>estimate</i>	<i>95% CI</i>	<i>estimate</i>	<i>95% CI</i>	<i>estimate</i>	<i>95% CI</i>
Analytic thinking	Mentalizing	-0.12	[-0.17, -0.06]	0.09	[0.01, 0.18]	-0.12	[-0.17, -0.06]	0.10	[0.01, 0.18]
Dualism	Teleology in life	0.33	[0.28, 0.38]	0.24	[0.16, 0.33]	0.33	[0.28, 0.38]	0.24	[0.16, 0.34]
Belief	Agency	0.30	[0.25, 0.35]	0.18	[0.10, 0.26]	0.60	[0.56, 0.63]	0.36	[0.28, 0.44]
Belief	Moral knowledge	0.34	[0.30, 0.39]	0.28	[0.19, 0.36]	0.50	[0.45, 0.54]	0.30	[0.22, 0.38]
Belief	Non-agentic	0.36	[0.31, 0.40]	0.35	[0.27, 0.42]	-0.08	[-0.14, -0.02]	0.16	[0.07, 0.25]
Agency	Moral knowledge	0.60	[0.56, 0.63]	0.65	[0.60, 0.70]	0.79	[0.77, 0.81]	0.78	[0.75, 0.82]
Agency	Non-agentic	0.58	[0.55, 0.62]	0.63	[0.58, 0.68]	0.17	[0.12, 0.23]	0.64	[0.58, 0.69]
Moral knowledge	Non-agentic	0.77	[0.75, 0.80]	0.74	[0.70, 0.78]	0.20	[0.14, 0.25]	0.58	[0.52, 0.64]
Dualism	Social Exposure	0.31	[0.26, 0.35]	0.28	[0.20, 0.36]	0.16	[0.11, 0.21]	0.18	[0.20, 0.26]
Teleology in life	Social Exposure	0.28	[0.23, 0.32]	0.29	[0.21, 0.36]	0.35	[0.31, 0.40]	0.25	[0.17, 0.33]
Mentalizing	Social Exposure	0.23	[0.17, 0.28]	0.14	[0.06, 0.23]	0.22	[0.17, 0.27]	0.15	[0.06, 0.23]
Analytic thinking	Social Exposure	-0.19	[-0.25, -0.14]	0.05	[-0.04, 0.14]	-0.08	[-0.14, -0.03]	-0.02	[-0.11, 0.06]

Study 2: Correlated residuals from main models

Table A 11. Study 2: Correlated residuals from path model predicting beliefs about karma and God. All estimates > 0.10 are statistically significant at $p < .05$.

		Karma				God			
		USA		Singapore		USA		Singapore	
		<i>estimate</i>	<i>95% CI</i>	<i>estimate</i>	<i>95% CI</i>	<i>estimate</i>	<i>95% CI</i>	<i>estimate</i>	<i>95% CI</i>
Analytic thinking	Mentalizing	-0.12	[-0.17, -0.06]	0.09	[0.01, 0.18]	-0.12	[-0.17, -0.06]	0.09	[0.01, 0.18]
Dualism	Teleology in life	0.33	[0.28, 0.38]	0.24	[0.16, 0.33]	0.33	[0.28, 0.38]	0.24	[0.16, 0.33]
Agency	Moral knowledge	0.55	[0.51, 0.59]	0.63	[0.58, 0.69]	0.70	[0.68, 0.73]	0.75	[0.72, 0.79]
Agency	Non-agentic	0.53	[0.49, 0.57]	0.62	[0.56, 0.67]	0.27	[0.22, 0.33]	0.63	[0.57, 0.68]
Moral knowledge	Non-agentic	0.74	[0.72, 0.77]	0.71	[0.67, 0.76]	0.27	[0.22, 0.33]	0.56	[0.50, 0.62]
Dualism	Social Exposure	0.31	[0.26, 0.35]	0.28	[0.20, 0.36]	0.16	[0.11, 0.21]	0.18	[0.10, 0.26]
Teleology in life	Social Exposure	0.27	[0.23, 0.32]	0.29	[0.21, 0.36]	0.35	[0.31, 0.40]	0.25	[0.17, 0.33]
Mentalizing	Social Exposure	0.23	[0.17, 0.28]	0.14	[0.06, 0.23]	0.22	[0.17, 0.27]	0.15	[0.06, 0.23]
Analytic thinking	Social Exposure	-0.19	[-0.24, -0.14]	0.05	[-0.04, 0.14]	-0.08	[-0.14, -0.03]	-0.02	[-0.11, 0.06]

Studies 1 and 2: Controlling for god variables when predicting karma

In addition to the path models that separately investigated predictors of God beliefs and predictors of karma beliefs, I conducted additional multiple regression analyses to investigate covariation between beliefs about God and beliefs in karma. Specifically, I conducted multiple regression models that predicted each of the beliefs about karma from the cognitive variables (included in the path models in the main text) and the beliefs about god that were analogous to the karma questions. These models, depicted in Table A12 and A13, show that beliefs about god predict analogous beliefs about karma (e.g., the degree of mind attributed to God predicts the degree of mind attributed to karma), indicating consistency in how individuals view different supernatural entities. However, this covariation between beliefs about God and karma cannot account for the similarities between the cognitive predictors of karma and God. The cognitive variables independently predict belief in karma even after controlling for belief in God, thereby confirming an independent association with belief in karma that cannot be accounted for by beliefs about God.

Table A 12. Study 1: Predicting beliefs about karma from cognitive tendencies and beliefs about God.

	Canada						India					
	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>
<i>Belief in karma</i>												
Intuition	0.09	0.03, 0.14	.001	0.09	0.04, 0.14	.001	0.10	0.04, 0.15	.001	0.11	0.05, 0.16	<.001
Mentalizing	-0.08	-0.13, -0.03	.003	-0.08	-0.13, -0.03	.002	0.04	-0.02, 0.09	.17	0.03	-0.02, 0.08	.28
Dualism	0.28	0.22, 0.33	<.001	0.27	0.22, 0.32	<.001	0.17	0.11, 0.23	<.001	0.17	0.12, 0.23	<.001
Teleology in life	0.44	0.39, 0.50	<.001	0.42	0.37, 0.48	<.001	0.42	0.36, 0.48	<.001	0.32	0.26, 0.38	<.001
Teleology in nature	0.01	-0.04, 0.06	.58	0.01	-0.04, 0.06	.59	0.04	-0.01, 0.10	.13	0.03	-0.02, 0.08	.29
Belief in God				0.05	-0.01, 0.10	.11				0.23	0.17, 0.29	<.001
<i>Mind</i>												
Intuition	0.07	0.01, 0.13	.016	0.09	0.03, 0.15	.003	0.07	0.01, 0.13	.015	0.07	0.01, 0.12	.025
Mentalizing	-0.08	-0.14, -0.02	.007	-0.09	-0.14, -0.03	.002	-0.15	-0.21, -0.09	<.001	-0.16	-0.21, -0.10	<.001
Dualism	0.21	0.15, 0.28	<.001	0.21	0.15, 0.27	<.001	0.22	0.16, 0.28	<.001	0.2	0.14, 0.26	<.001
Teleology in life	0.32	0.26, 0.38	<.001	0.23	0.16, 0.29	<.001	0.22	0.16, 0.28	<.001	0.11	0.04, 0.18	.001
Teleology in nature	0.03	-0.03, 0.09	.29	0.03	-0.03, 0.08	.35	0.14	0.08, 0.20	<.001	0.13	0.07, 0.19	<.001
Mind of God				0.20	0.14, 0.26	<.001				0.26	0.19, 0.32	<.001
<i>Benevolence</i>												
Intuition	0.06	0.00, 0.13	.049	0.09	0.02, 0.15	.007	0.06	-0.00, 0.12	.06	0.04	-0.02, 0.10	.25
Mentalizing	-0.02	-0.08, 0.04	.54	-0.05	-0.11, 0.01	.11	-0.06	-0.12, 0.00	.06	-0.08	-0.14, -0.02	.011
Dualism	0.16	0.09, 0.22	<.001	0.14	0.07, 0.20	<.001	0.12	0.06, 0.19	<.001	0.10	0.04, 0.17	.001
Teleology in life	0.23	0.16, 0.29	<.001	0.13	0.06, 0.20	<.001	0.23	0.16, 0.29	<.001	0.12	0.06, 0.19	<.001
Teleology in nature	0.04	-0.02, 0.10	.18	0.04	-0.02, 0.09	.23	0.10	0.04, 0.17	.001	0.08	0.02, 0.14	.012
Benevolence of God				0.24	0.18, 0.31	<.001				0.29	0.22, 0.35	<.001

	Canada						India					
	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>
<i>Punitiveness</i>												
Intuition	0.02	-0.05, 0.08	.57	0.03	-0.03, 0.09	.27	0.00	-0.07, 0.06	.98	0.01	-0.05, 0.06	.81
Mentalizing	-0.11	-0.17, -0.04	.001	-0.06	-0.12, 0.00	.053	-0.15	-0.22, -0.09	<.001	-0.05	-0.11, 0.00	.057
Dualism	0.04	-0.03, 0.11	.23	0.03	-0.03, 0.10	.28	0.11	0.05, 0.18	.001	0.08	0.02, 0.14	.008
Teleology in life	0.27	0.20, 0.34	<.001	0.23	0.17, 0.29	<.001	0.18	0.12, 0.25	<.001	0.10	0.04, 0.16	.001
Teleology in nature	0.00	-0.06, 0.07	.90	-0.01	-0.06, 0.05	.83	0.06	-0.01, 0.12	.075	0.01	-0.05, 0.07	.79
Punitiveness of God				0.34	0.28, 0.39	<.001				0.49	0.43, 0.54	<.001
<i>Impersonal</i>												
Intuition	0.01	-0.06, 0.07	.84	0.01	-0.05, 0.07	.74	-0.04	-0.10, 0.03	.28	-0.02	-0.08, 0.04	.51
Mentalizing	-0.06	-0.12, 0.00	.063	-0.03	-0.09, 0.03	.28	-0.07	-0.13, -0.01	.029	-0.02	-0.08, 0.04	.56
Dualism	0.09	0.02, 0.16	.009	0.08	0.01, 0.14	.02	0.13	0.06, 0.20	<.001	0.09	0.03, 0.15	.005
Teleology in life	0.18	0.11, 0.25	<.001	0.17	0.11, 0.23	<.001	0.12	0.05, 0.19	.001	0.07	0.01, 0.14	.023
Teleology in nature	-0.03	-0.09, 0.04	.42	-0.02	-0.08, 0.04	.54	0.05	-0.01, 0.12	.121	0.01	-0.05, 0.08	.65
Impersonal God				0.27	0.21, 0.33	<.001				0.37	0.31, 0.43	<.001
<i>Resource-like</i>												
Intuition	0.10	0.03, 0.16	.002	0.10	0.04, 0.16	.001	0.07	0.01, 0.14	.021	0.06	-0.00, 0.12	.054
Mentalizing	-0.08	-0.14, -0.02	.007	-0.09	-0.14, -0.03	.005	-0.12	-0.18, -0.06	<.001	-0.10	-0.16, -0.04	.001
Dualism	0.15	0.09, 0.22	<.001	0.14	0.08, 0.20	<.001	0.12	0.05, 0.18	<.001	0.12	0.06, 0.18	<.001
Teleology in life	0.26	0.19, 0.32	<.001	0.20	0.14, 0.27	<.001	0.22	0.15, 0.29	<.001	0.20	0.13, 0.26	<.001
Teleology in nature	0.03	-0.03, 0.08	.41	0.02	-0.04, 0.08	.48	0.10	0.04, 0.16	.002	0.08	0.01, 0.14	.016
Resource-like God				0.20	0.14, 0.26	<.001				0.20	0.14, 0.26	<.001

Table A 13. Study 2: Predicting beliefs about karma from cognitive tendencies and beliefs about God.

	USA						Singapore					
	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>
<i>Belief in karma</i>												
Analytic thinking	-0.17	-0.21, -0.12	<.001	-0.17	-0.22, -0.12	<.001	-0.1	-0.18, -0.02	.012	-0.10	-0.18, -0.02	.017
Mentalizing	0.07	0.02, 0.11	.008	0.07	0.02, 0.11	.007	0.00	-0.09, 0.08	.92	0.00	-0.08, 0.08	.97
Dualism	0.26	0.21, 0.31	<.001	0.26	0.21, 0.31	<.001	0.15	0.06, 0.23	.001	0.14	0.05, 0.22	.001
Teleology in life	0.36	0.30, 0.41	<.001	0.38	0.33, 0.44	<.001	0.38	0.29, 0.46	<.001	0.34	0.25, 0.43	<.001
Belief in God				-0.06	-0.11, -0.01	.025				0.10	0.02, 0.19	.02
<i>Non-moral agency</i>												
Intuition	-0.16	-0.21, -0.10	<.001	-0.15	-0.20, -0.10	<.001	-0.14	-0.23, -0.06	.001	-0.15	-0.23, -0.07	<.001
Mentalizing	0.09	0.04, 0.15	.001	0.09	0.03, 0.14	.002	0.01	-0.07, 0.10	.74	0.01	-0.08, 0.09	.90
Dualism	0.19	0.13, 0.25	<.001	0.19	0.13, 0.24	<.001	0.13	0.04, 0.22	.003	0.08	-0.00, 0.16	.06
Teleology in life	0.17	0.12, 0.23	<.001	0.14	0.08, 0.21	<.001	0.17	0.08, 0.26	<.001	0.05	-0.04, 0.14	.26
God's non-moral agency				0.07	0.01, 0.13	.018				0.41	0.33, 0.49	<.001
<i>Moral knowledge</i>												
Intuition	-0.04	-0.10, 0.01	.10	-0.04	-0.09, 0.02	.19	-0.04	-0.12, 0.05	.39	-0.04	-0.12, 0.03	.23
Mentalizing	0.13	0.07, 0.18	<.001	0.12	0.06, 0.17	<.001	0.15	0.06, 0.23	.001	0.13	0.05, 0.20	.001
Dualism	0.17	0.11, 0.23	<.001	0.16	0.11, 0.22	<.001	0.12	0.03, 0.20	.007	0.04	-0.03, 0.12	.26
Teleology in life	0.24	0.18, 0.30	<.001	0.16	0.10, 0.23	<.001	0.31	0.22, 0.40	<.001	0.20	0.11, 0.28	<.001
God's moral knowledge				0.18	0.12, 0.24	<.001				0.44	0.37, 0.52	<.001

	USA						Singapore					
	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>	<i>b</i>	<i>CI</i>	<i>p</i>
<i>Non-agentic traits</i>												
Intuition	-0.06	-0.11, -0.01	.025	-0.07	-.12, -.02	.007	0.04	-0.04, 0.12	.36	0.03	-0.04, 0.10	.42
Mentalizing	0.17	0.11, 0.22	<.001	0.19	.14, .24	<.001	0.11	0.03, 0.19	.008	0.10	0.03, 0.18	.009
Dualism	0.19	0.13, 0.24	<.001	0.13	.07, .18	<.001	0.13	0.05, 0.21	.002	0.08	0.01, 0.16	.034
Teleology in life	0.24	0.18, 0.30	<.001	0.24	.18, .29	<.001	0.37	0.28, 0.45	<.001	0.31	0.23, 0.39	<.001
God's non-agentic traits				0.26	.21, .31	<.001				0.33	0.25, 0.41	<.001

Appendix B: Supplementary Materials for Chapter 4

Demographics across all samples

Table B 1. Demographic composition of whole samples, including believers and non-believers

Sample	Study 1: Exploratory					Study 2: Confirmatory	
	MTurk		Qualtrics			MTurk	
	Karma Believers	God Believers	Hindus	Buddhists	Christians	USA	India
N	341	413	200	204	203	1263	1237
Gender %							
Female	69	65	59	66	60	63	29
Male	31	35	41	34	40	37	71
Age <i>M (SD)</i>	36.76 (12.01)	38.05 (12.82)	39.92 (14.07)	48.85 (14.79)	53.12 (12.05)	37.51 (12.86)	31.17 (7.78)
Ethnicity %							
Caucasian	80	78	4	37	85	78	1
Asian	6	6	92	52	4	5	95
Other	14	19	4	11	11	17	4
Religion %							
Christian	54	83	--	--	100	56	17
Non-religious	35	11	--	--	--	34	1
Hindu	1	1	100	--	--	1	72
Buddhist	4	1	--	100	--	2	0
Other	6	4	--	--	--	7	10
Belief in karma <i>M (SD)</i>	3.39 (0.59)	2.76 (0.81)	3.73 (0.72)	3.63 (0.67)	2.77 (0.71)	2.82 (0.87)	3.64 (0.61)
Belief in God <i>M (SD)</i>	3.61 (1.40)	4.67 (0.48)	4.29 (1.02)	3.18 (1.27)	4.50 (0.97)	3.61 (1.36)	4.08 (0.82)
Religiosity <i>M (SD)</i>	2.49 (1.40)	3.53 (1.26)	3.02 (1.04)	2.53 (1.12)	3.38 (1.10)	2.72 (1.41)	3.65 (1.01)

Detailed coding scheme for feature free list responses

Table B 2. Categories used to classify free list descriptions of karma's and God's features

Category	Sub-categories used for coding
Personality Traits	Forgiving, kind, fair/just, benevolent, mean, or other personality traits
Roles	Saviour, Teacher, Protector, King, Judge, Helper, Healer, Father, Comforter, Messages, Controller
Supernatural powers	A spiritual being, omnipotent, almighty, omniscient, creator, eternal, ever-present
Religious concepts	A religious concept or belief
Actions/Thoughts	Actions (good and bad), thoughts (good and bad)
Non-agentic descriptions	Balance, causality [non-moral], energy/force, resource-like, contagion-like, luck, fate
Non-agentic traits	Descriptions that apply to forces and physical objects (e.g., distant, mysterious, complex, [in]escapable, beautiful, heavy, wonderful)
Moral Causality	Good actions lead to good outcomes, bad leads to bad outcomes, the Golden Rule, morality, or general goodness and badness
Consequences	Future events, good consequences (blessings, good fortune), bad consequences (suffering, punishment)

Detailed coding scheme for reward/punishment free list responses

Free list responses were classified into one of the following categories (described in Table B3 and Table B4, along with examples of responses from each category) by two independent research assistants, who were blind to the remainder of the data while coding (i.e., whether participants were describing God or Karma). Any responses that fit into more than one category were placed into the most appropriate category, and any that listed more than one item in a single response (e.g., “Being a kind and respectful person”) were coded based on the first item mentioned in the response (i.e., “Kindness”). These more specific categories were then grouped into broader categories of conceptually similar responses (described in Table B5 and Table B6), for analyses reported in the main text.

Table B 3. Detailed coding scheme used for free list of actions leading to bad supernatural consequences, with example responses from each category

Category	Category summary and examples
Unknown	e.g., “I don't know,” “this question makes no sense to me”
Nonsense	Nonsense responses (meaningless responses, or other responses that are not (a) a good action or (b) a good consequence). e.g., "it change my life pretty" or "oceans" or "God doesn't care what day it is"
Bad actions	Anything that is obviously bad, rather than good (e.g., “murder”).
Good consequences	Good consequences for an action, rather than good actions, e.g., "good job", "good finances", "blessings", "eternal life"
Generic morality	Law-abiding/generic morality (non-specific), e.g., "always trying to do what is right", "being moral", "do unto others as you want them to do unto you"; non-specific goodness, e.g., "goodness", "being a good person in general", "Do good deeds", "doing good to others"
Good mental states	Good thoughts or intentions, e.g., "being positive", "hopefulness",
Mindfulness/awareness	Mindfulness, attention, awareness, appreciation, e.g., "being aware of all of your actions"
Conscientiousness	Being careful, being conscientious, e.g., "driving safely", "Self care"
Intelligence	Being intelligent, wise, making good choices, knowledge
Humility	Humility, e.g., "not boasting"

Category	Category summary and examples
Patience	Being patient, calm, peaceful, e.g., "slow to anger"
Confidence	Confidence, bravery, courage
Gratefulness	Being grateful, e.g., "being thankful", "Thanking God"
Other traits	Any other positive personality traits that don't fit another category
Forgiveness	Forgiveness, e.g., "Being forgiving", "Forgiving those who have wronged us", "showing mercy", "asking forgiveness"
Love	Love, e.g., "Be loving and caring to others", "Love one another"
Kindness (trait)	Kindness, e.g., "Be kind to others"
Kind actions	Other kind acts that don't fit into another category, e.g., "taking groceries to an elderly's car", "baking cookies for your next-door neighbor", "Doing a favor", "letting someone go ahead of you in line", "Returning lost items to their owner", "service", "don't gossip"
Caring	Being caring or benevolent, e.g., "take care of someone", "Taking care of the sick", "Supporting others", "Protecting the weak", "Adopt a pet", "raising animals humanely"
Compassion	Being compassionate or empathetic or altruistic, e.g., "compassion", "empathy", "sympathy", "comforting someone who is grieving", "being understanding", "listening to someone"
Being nice	Nice, e.g., "be nice to someone", "being especially nice when someone else is mean or wrong". Also include other positive trait descriptors here, e.g., "being pleasant", "being decent", "smiling", "Treat others how you want to be treated"
Friendliness	Friendliness, e.g., "Going out of your way to be friendly"
Not harming others	Do not cause harm to other people, e.g., "don't hurt others", "don't kill", "not being violent"
Care for the environment	Caring for the environment, e.g., "caring for and loving Mother Nature", "Doing good for the earth", "Picking up litter", "save water"

Category	Category summary and examples
Giving to charity/volunteering	Charity, volunteering, donation, giving or donating money or service, e.g., "giving a homeless person change", "giving money", "donate money", "feeding poor", "give to needy"
Generosity	Generosity and sharing, e.g., "being giving", "being generous"
Selflessness	Selfless or unselfishness, e.g., "be selfless", "put others first", "sacrificing for others"
Helping others	Help others, e.g., "assisting", "being helpful", "Helping someone without expecting anything in return"
Teaching	Teaching/nurturing another person
Honesty	Honesty/integrity, e.g., "always being truthful", "being completely honest with yourself and others", "being genuine", "putting integrity before money", "don't steal"
Fairness	Fairness, e.g., "Being fair", "equality", "Treating everyone as equals"
Justice	Justice, e.g., "Justice", "Judgment", "get even"
Loyalty	Loyalty, e.g., "be faithful/loyal", "being faithful", "commitment"
Relationship Loyalty	Being a good friend/parent/child etc., e.g., "Being a good daughter", "Being a good friend", "Being committed in relationship", "being part of a community", "Looking after our elders"
Obedience to authority	Being obedient or dutiful, e.g., "Obedience", "fulfilling one's obligations", "Honor Your Father and Mother"
Respectfulness	Being respectful, e.g., "respect", "Treating everyone with respect regardless of how they treat you"
Being considerate	Being considerate/thoughtful, e.g., "consideration", "being thoughtful"
Politeness	Polite, e.g., "Be polite when talking to others", "being courteous", "not being rude"
Openness	Openness, tolerance, and acceptance, e.g., "Not being prejudiced", "Not controlling others", "being non-judgmental", "being

Category	Category summary and examples
	openminded", "accept others", "ability to accept people, places & things as they are"
Being responsible	Responsible/Dependable, e.g., "being responsible", "Taking care of responsibilities", "Being reliable"
Hard Work	Being hard-working, e.g., "working hard", "working towards a goal"
Sexual purity	Sexual purity and chastity, e.g., "abstinence before marriage", "modesty", "don't commit adultery"
Bodily purity	Purity and health of body, e.g., "don't do drugs", "eat properly", "exercise"
Religious morality	Follow God's commandments (non-specific), e.g., "following scripture", "keeping the ten commandments", "Obedience to God's law", "Obey God"
Giving to the church/temple	Church donations, e.g., "give to God", "paying tithes"
Confession	Confession/remorse, e.g., "Confess your sins", "Genuinely feeling bad for your mistakes"
Attendance at religious services	Church attendance, e.g., "Church", "Going to church on a regular basis", "taking the sacrament", "puja"
Evangelizing	Evangelizing, e.g., "Being a representative of Christ's love", "leading others to Christ", "Preaching", "Spreading the word"
Prayer	Prayer
Meditation	Meditation or Yoga
Devotion/Belief/Faith	Devotion/dedication to god, e.g., "reading the Bible", "Devoutness", "Praising God", "Having a relationship with god", "Worshipping God", "Accepting Jesus", Faith, e.g., "Having Faith", "Faith in God", "Trust in God", Belief (in God/Jesus), e.g., "Belief in a higher power", "Believe in Jesus", "Believing in him"

Table B 4. Detailed coding scheme used for free list of actions leading to good supernatural consequences, with example responses from each category

Category	Category summary and examples
Unknown/Nonsense	Nonsense responses (meaningless responses, or other responses that are not (a) a bad action or (b) a bad consequence). E.g., "it change my life pretty", "oceans", "God doesn't care what day it is", "I don't know", "This question makes no sense to me"
Bad consequences	Bad consequences for an action, rather than a bad action (e.g., "going to hell")
Generic immorality	Generic Immorality (e.g., "Being immoral", "evilness", "doing bad things", "doing wrong")
Crime	Crimes, e.g., "Being a criminal", "arson", "breaking the law"
Other bad actions	Other bad actions, not covered by another category
Bad mental states	Bad thoughts or intentions; Bad attitude or bad state of mind, e.g., "negative outlook", "being bitter/grumpy", "resentment"
Ignorance	Ignorance or lack of knowledge/wisdom
Being unmindful	Not being mindful, e.g., "being reckless", "careless", or "lacking self control"
Bad driving	Bad driving, e.g., "road rage", "cutting someone off in traffic"
Being selfish	Being selfishness or self-centered, e.g., "selfishness", "only caring about yourself", "put yourself before others"
Arrogance	Being arrogant or proud, boasting or bragging
Being unrepentant	Being unrepentant, not seeking forgiveness
Greed	Greed, avarice, being cheap/stingy, not giving, not donating, not sharing, gluttony
Attachment	Attachment to worldly things
Cheating	Cheating (not cheating on a relationship partner)
Stealing	Stealing/theft

Category	Category summary and examples
Exploitation	Other exploitation of another person, e.g., "using people", "controlling people", "being manipulative", "sabotaging others", "scheming", "taking advantage"
Dishonesty	Being dishonest, deceitful, lying, fraud, hypocrisy
Unfairness	Being unfair
Injustice	Injustice
Being uncompassionate	Not being compassionate, not having empathy or love for others, not caring, unkindness
Unhelpfulness	Not helping others, e.g., "Not coming to aid in a time of need", "ignoring someone who needs you"
Ungratefulness	Being ungrateful
Anger	Anger, arguing, being mad, wrath
Hate	Hate, e.g., "being hateful", "maliciousness", "spiteful"
Cruelty/Unkindness	Being cruel, mean, or nasty, e.g., "Taking pleasure in other's pain", "treating someone badly"; Rudeness / unkindness, e.g., "being rude", "being unkind", "being a jerk", "being impolite/discourteous", "insulting someone"
Being inconsiderate	Inconsiderate, not thinking about others
Cursing	Cursing or swearing
Bullying	Bullying or teasing, e.g., "making fun of someone"
Being unforgiving	Being vengeful or unforgiving, e.g., "retribution", "revenge", "vengefulness"
Harm	Causing harm, e.g., "causing emotional or physical pain or suffering", "abuse", "neglect", "mistreatment of others", "torture", "aggression", "fighting", "violence", "war", "assault", "attacking others", "killing", "murder", "not caring for or abusing animals"
Destruction	Destruction, destroying, or vandalism
Not caring for the environment	Not caring for the environment, e.g., "littering", "Lack of respect for all living things and for the Earth", "wasting resources"

Category	Category summary and examples
Lack of work	Lack of direction/dedication, e.g., "aimlessness", "being lazy", "sloth"
Jealousy	Being jealous or envious
Gossip	Gossiping, slander, e.g., "Speaking ill of others", "starting a rumor"
Intolerance	Bigotry and intolerance, e.g., "Being prejudiced", "narrowmindedness", "racism", "rigidity"
Being judgemental	Being judgemental, contempt, disdain, e.g., "looking down on others"
Relationships disloyalty	Lack of family duty, e.g., "abandoning your family",
Adultery	Adultery, e.g., "being unfaithful", "cheating on a spouse", "infidelity"
Disloyalty	Disloyalty and betrayal
Being disrespectful	Being disrespectful
Disobedience	Disobedience, disobeying
Abortion	Abortion
Sexual immorality	Sexual Immorality, e.g., "sex", "promiscuity", "sex outside of marriage", "pornography", "masturbation", "lust", "homosexuality"
Rape	Rape
Addiction	Addiction, e.g., "alcohol", "drinking", "using drugs"
Food violations	Eating the wrong thing, e.g., "eating pork"
Religious violations	Breaking God's commands, disobeying God, e.g., "Breaking commandments", "Committing sins", "Disobedience or rebellion against God"
Lack of appropriate religious behavior	Lack of religious activities, e.g., "not attending church", "not giving money to the church", "not praying"

Category	Category summary and examples
Lack of appropriate religious belief	Lack of faith, e.g., “being an atheist”, “denying God”, “doubting God”, “not believing”, “not loving god”, “blasphemy”, “idolatry”, “worshiping other gods”, “using God”, “cursing God”, “saying bad things about god”, "using god to get money", "taking His name in vain"

Table B 5. Categories used to classify free list descriptions of actions with supernatural rewards

Category	Sub-categories used for coding
Generosity	Giving to charity/volunteering, generosity, selflessness, helping others
Caring	Good mental states, love, kindness, kind actions, caring, compassion, being nice, friendliness, not harming others, care for the environment, being considerate, politeness
Generic morality	Generic morality
Honesty	Honesty, fairness, justice
Tolerance	Patience, forgiveness, openness
Good Traits	Mindfulness/awareness, conscientiousness, intelligence, humility, confidence, gratefulness, teaching, other traits
Responsible	Being responsible, hard work
Religious devotion	Religious morality, giving to the church/temple, confession, attendance at religious services, evangelizing, prayer, meditation, devotion/belief/faith
Respect	Obedience to authority, being respectful
Loyalty	Loyalty in relationships, other loyalty
Purity	Sexual purity, other forms of bodily purity
Nonsense and missing data	Unknown, nonsense, bad actions, good consequences

Table B 6. Categories used to classify free list descriptions of actions with supernatural punishments

Category	Sub-categories used for coding
Cheating/ dishonesty	Cheating, stealing, exploitation, dishonesty, unfairness, injustice
Unkindness	Other bad actions, bad mental states, bad driving, lack of compassion, being unhelpful, anger, hate, cruelty/unkindness, being inconsiderate, cursing, bullying
Harm	Harm, destruction, not caring for the environment
Greed	Selfishness, greed, attachment to worldly things
Intolerance	Unforgiveness, jealousy, gossip, intolerance, being judgemental
Generic immorality	Generic immorality, crime, ignorance, being unmindful
Disloyalty	Relationship disloyalty, adultery, generic disloyalty
Arrogance	Arrogance, being unrepentant, ungratefulness
Irresponsible	Lack of hard work
Purity	Abortion, sexual immorality, rape, addiction, food violations
Disrespect	Being disrespectful, disobedience
Religious violations	Religious violations, lack of religious behavior, lack of religious belief/faith
Nonsense and missing data	Unknown or nonsense, bad consequences

Detailed results of salience score analyses

Study 1

Table B 7. Salience of actions leading to bad consequences across conditions, broad action categories

Category	God		Karma		
	God Believers	Christians	Karma Believers	Hindus	Buddhists
Greed	0.100	0.120	0.246	0.194	0.242
Harm	0.235	0.281	0.300	0.304	0.340
Unkindness	0.188	0.243	0.403	0.358	0.451
Generic immorality	0.077	0.095	0.088	0.190	0.150
Cheating/ Dishonesty	0.269	0.390	0.500	0.344	0.438
Intolerance	0.099	0.119	0.156	0.229	0.204
Arrogance	0.040	0.038	0.028	0.033	0.039
Irresponsible	0.020	0.015	0.015	0.020	0.009
Religious Violations	0.270	0.303	0.009	0.022	0.014
Disrespect	0.030	0.049	0.012	0.028	0.030
Disloyalty	0.054	0.066	0.048	0.037	0.044
Impurity	0.059	0.039	0.014	0.014	0.017

Table B 8. Salience of actions leading to good consequences across conditions, broad action categories

Category	God		Karma		
	God Believers	Christians	Karma Believers	Hindus	Buddhists
Generosity	0.251	0.354	0.695	0.560	0.549
Caring	0.424	0.454	0.504	0.498	0.632
Generic Morality	0.101	0.100	0.119	0.217	0.182
Honesty	0.098	0.125	0.114	0.129	0.130
Tolerant	0.124	0.160	0.075	0.122	0.152
Other Traits	0.068	0.071	0.050	0.060	0.119
Responsible	0.034	0.026	0.034	0.060	0.016
Religious devotion	0.275	0.413	0.033	0.070	0.051
Respect	0.037	0.052	0.028	0.042	0.049
Loyalty	0.036	0.048	0.019	0.023	0.030
Purity	0.011	0.013	0.002	0.008	0.014

Study 2

Table B 9. Salience of actions leading to bad consequences across conditions, broad action categories

Category	Non-Believers				Believers			
	God		Karma		God		Karma	
	USA	India	USA	India	USA	India	USA	India
Greed	0.138	0.148	0.220	0.187	0.153	0.181	0.197	0.185
Harm	0.475	0.332	0.471	0.372	0.477	0.387	0.406	0.457
Unkindness	0.200	0.360	0.349	0.441	0.237	0.353	0.417	0.392
Generic immorality	0.082	0.189	0.090	0.240	0.096	0.191	0.098	0.219
Cheating/ Dishonesty	0.523	0.376	0.656	0.346	0.618	0.382	0.670	0.419
Intolerance	0.068	0.100	0.102	0.139	0.061	0.091	0.080	0.074
Arrogance	0.033	0.038	0.017	0.055	0.032	0.095	0.020	0.076
Irresponsible	0.012	0.049	0.019	0.057	0.014	0.016	0.021	0.029
Religious Violations	0.345	0.268	0.013	0.076	0.216	0.175	0.012	0.056
Disrespect	0.028	0.110	0.014	0.067	0.041	0.106	0.040	0.109
Disloyalty	0.121	0.060	0.069	0.083	0.101	0.071	0.052	0.084
Impurity	0.096	0.034	0.046	0.021	0.065	0.035	0.020	0.033

Table B 10. Salience of actions leading to bad consequences across conditions, broad action categories. Includes all previously-excluded participants

Category	Non-Believers				Believers			
	God		Karma		God		Karma	
	USA	India	USA	India	USA	India	USA	India
Greed	0.127	0.092	0.209	0.108	0.149	0.119	0.188	0.119
Harm	0.433	0.207	0.448	0.218	0.454	0.261	0.388	0.298
Unkindness	0.186	0.242	0.333	0.287	0.229	0.258	0.404	0.285
Generic immorality	0.075	0.129	0.087	0.156	0.093	0.136	0.093	0.155
Cheating/ Dishonesty	0.475	0.232	0.619	0.203	0.587	0.249	0.637	0.268
Intolerance	0.063	0.062	0.097	0.080	0.061	0.063	0.076	0.051
Arrogance	0.029	0.027	0.017	0.037	0.031	0.061	0.019	0.051
Irresponsible	0.011	0.032	0.019	0.033	0.013	0.013	0.020	0.021
Religious Violations	0.317	0.173	0.012	0.048	0.205	0.122	0.013	0.039
Disrespect	0.026	0.068	0.013	0.040	0.039	0.070	0.038	0.071
Disloyalty	0.111	0.036	0.064	0.048	0.097	0.048	0.049	0.055
Impurity	0.087	0.021	0.043	0.014	0.061	0.024	0.021	0.023

Table B 11. Salience of actions leading to good consequences across conditions, broad action categories

Category	Non-Believers				Believers			
	God		Karma		God		Karma	
	USA	India	USA	India	USA	India	USA	India
Generosity	0.572	0.528	0.848	0.610	0.639	0.549	0.811	0.629
Caring	0.386	0.488	0.551	0.519	0.448	0.468	0.552	0.447
Generic Morality	0.106	0.186	0.113	0.246	0.156	0.204	0.098	0.273
Honesty	0.101	0.163	0.118	0.174	0.147	0.193	0.163	0.190
Tolerant	0.084	0.073	0.054	0.086	0.083	0.079	0.045	0.065
Other Traits	0.047	0.097	0.052	0.096	0.072	0.124	0.048	0.130
Responsible	0.016	0.053	0.029	0.069	0.024	0.031	0.033	0.060
Religious devotion	0.526	0.333	0.018	0.098	0.386	0.281	0.041	0.084
Respect	0.047	0.086	0.018	0.081	0.052	0.073	0.029	0.096
Loyalty	0.057	0.035	0.045	0.037	0.050	0.040	0.056	0.048
Purity	0.016	0.008	0.006	0.009	0.002	0.007	0.009	0.006

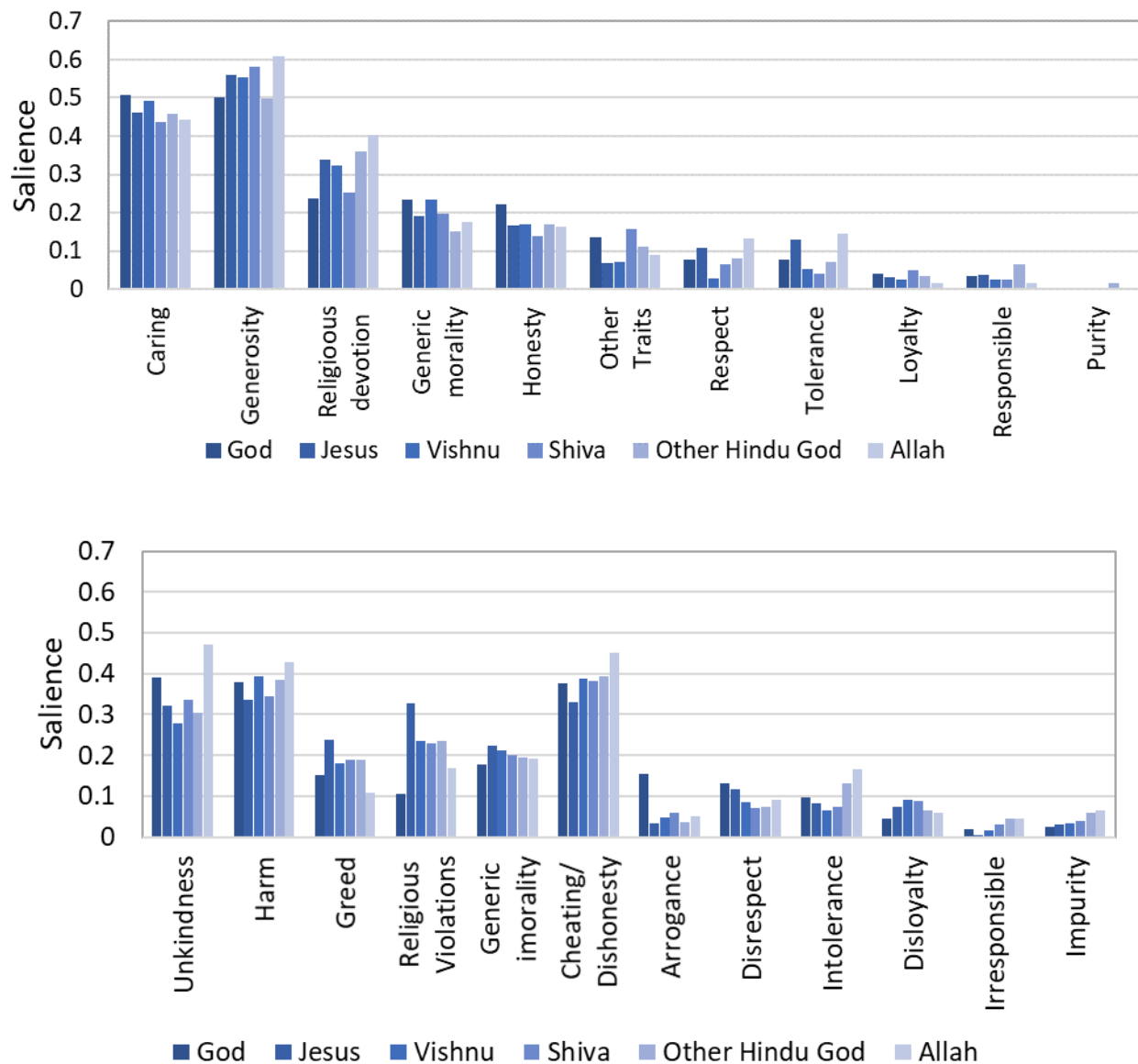
Table B 12. Salience of actions leading to good consequences across conditions, broad action categories. Includes all previously-excluded participants

Category	Non-Believers				Believers			
	God		Karma		God		Karma	
	USA	India	USA	India	USA	India	USA	India
Generosity	0.524	0.347	0.797	0.369	0.606	0.397	0.767	0.434
Caring	0.361	0.348	0.524	0.338	0.427	0.362	0.536	0.350
Generic Morality	0.101	0.136	0.111	0.169	0.148	0.160	0.094	0.200
Honesty	0.093	0.106	0.111	0.109	0.142	0.140	0.153	0.141
Tolerant	0.077	0.051	0.051	0.054	0.082	0.060	0.045	0.047
Other Traits	0.047	0.075	0.049	0.073	0.072	0.099	0.051	0.107
Responsible	0.014	0.034	0.029	0.045	0.023	0.023	0.032	0.043
Religious devotion	0.486	0.231	0.018	0.072	0.365	0.208	0.039	0.065
Respect	0.043	0.058	0.017	0.050	0.048	0.052	0.028	0.067
Loyalty	0.053	0.024	0.042	0.023	0.049	0.029	0.055	0.034
Purity	0.014	0.007	0.006	0.005	0.003	0.005	0.008	0.004

Saliency scores split by different gods

Given the diversity of Gods present in Hinduism (and in India more broadly), I asked Indian participants to indicate which God they had described: 33% reported that they had described a general, non-specific god, 17% Jesus, 11% a variant of Vishnu, 20% a variant of Shiva, 11% another Hindu god, 2% a Hindu goddess, 5% Allah (the Muslim God), and 1% other figures. As displayed in Figure B1, the pattern of free list responses was highly similar regardless of which God participants were describing.

Figure B 1. Actions leading to good (upper) and bad (lower) consequences because of God, split by which god participants were describing, believers only



Similarity in free list responses across groups

Study 1

As another indicator of the degree of similarity between the free lists of each group, I computed correlations between the group-averaged salience scores across all response categories in the coding scheme (i.e., salience scores for each category, rather than scores per participant, provided the level of analysis). As can be seen in Table B13, the results were not always precisely estimated, but they generally support the substantial similarity in the salience of different categories in participants' responses, regardless of the religious background of participants and whether they were describing God or Karma. However, the pattern of salience scores across categories was somewhat stronger for groups describing the same target (i.e., Hindus, Buddhists, and Karma believers describing Karma; Christians and God believers describing God) than for groups describing different targets, even when recruited from the same population (e.g., MTurk). These results provide preliminary evidence of target-specific effects on mental models, which were followed up with focused comparisons of particular response categories of interest.

Table B 13. Correlations [95% CI] of salience scores across categories, for of actions resulting in good consequences (below diagonal) and bad consequences (above diagonal)

	Karma Believers	Hindu	Buddhist	God Believers	Christians
Karma Believers		.84 [.70, .95]	.93 [.81, .97]	.73 [.38, .93]	.79 [.35, .96]
Hindu	.84 [.68, .96]		.89 [.80, .96]	.66 [.33, .88]	.70 [.36, .89]
Buddhist	.80 [.66, .91]	.92 [.88, .97]		.67 [.26, .94]	.79 [.37, .96]
God Believers	.43 [.35, .73]	.43 [.26, .82]	.39 [.15, .83]		.88 [.67, .99]
Christians	.50 [.27, .75]	.65 [.47, .85]	.64 [.37, .87]	.63 [.39, .97]	

Note. Correlations were based on the group average salience scores for each specific category in the coding scheme (relationships are even stronger if broad, aggregated categories are used as the unit of analysis). Grey cells indicate samples describing the same target, white cells indicate different targets.

Study 2

The correlations between group averaged salience scores (Table B14) did not show meaningful target effects: The association between descriptions of God and karma (within the same country or different countries) was as high as the association between descriptions of the same target in different countries, according to both similar point estimates and overlapping confidence intervals for these correlations. Overall, there was substantial similarity between descriptions of God and Karma, and descriptions of the USA and India. This was true despite

cultural differences, religious affiliation differences, and differences between the gods being described by participants.

Table B 14. Correlations of salience scores across categories, for of actions resulting in good consequences (below diagonal) and bad consequences (above diagonal), believers only

		Karma		God	
		USA	India	USA	India
Karma	USA		.77 [.60, .94]	.95 [.69, .98]	.76 [.52, .92]
	India	.85 [.46, .95]		.79 [.46, .93]	.97 [.87, .99]
God	USA	.86 [.45, .96]	.82 [.44, .93]		.83 [.55, .94]
	India	.79 [.31, .92]	.94 [.78, .99]	.88 [.67, .95]	

Does belief matter?

The non-believers recruited in Study 2 also allowed us to test whether believing God or karma is real affected these descriptions supernatural rewards and punishments. Believers, compared to non-believers, have been previously found to report that more actions are morally relevant and to judge moral transgressions more harshly (Atkinson & Bourrat, 2011), and only believers become more generous when thinking about God and karma in behavioral experiments (Shariff et al., 2016; Chapter 5). These differences in moral judgments may be due to different concepts of supernaturally-relevant morality, which should be evident in different free list responses.

We computed the degree of similarity between the free lists of each group as the correlations between the group-averaged salience scores across all response categories in the coding scheme (i.e., salience scores for each category, rather than scores per participant, provided the level of analysis). The pattern of free list responses provided by non-believers was remarkably consistent with the responses of participants who believe that both God and karma are real: The correlations between group averaged salience scores across free list categories was extremely high for Americans' descriptions of God, $r_{reward} = .95$ [.91, .97], $r_{punishment} = .97$ [.95, .98], Americans' descriptions of karma, $r_{reward} = .99$ [.98, .99], $r_{punishment} = .98$ [.97, .99], Indians' descriptions of God, $r_{reward} = .98$ [.96, .99], $r_{punishment} = .94$ [.90, .97], and Indians' descriptions of karma, $r_{reward} = .98$ [.97, .99], $r_{punishment} = .96$ [.94, .98]. This pattern provides strong evidence that free list responses reflect cultural consensus about the concepts "God" and "karma," independently of personal beliefs about the reality of these entities.

Salience of consequences in free list responses

Participants were asked to describe things that a person could do that would lead to good consequences because of karma or God. For MTurkers, this question only referred to “things that would lead to good consequences.” These instructions seemed to confuse several participants, who listed good/bad experiences and potential consequences of actions (e.g., losing a job, illness, blessings) rather than listing actions that precede these experiences. Interestingly, these consequences were mentioned in descriptions of God significantly more often than in descriptions of karma, $OR_{reward} = 4.18 [3.00, 5.89]$, $OR_{punishment} = 1.65 [1.15, 2.38]$, $p < .001$, suggesting that, in the presence of ambiguous wording, karma is construed in terms of actions preceding consequences more readily than God.

To avoid potential confusion, instructions for the Qualtrics sub-samples in the Exploratory Sample, and the Confirmatory Sample, were elaborated to refer to “things that a person could do that would lead to good consequences.” In the Qualtrics sample, Christians describing God did not list consequences at a higher rate than Hindus describing karma, $OR_{reward} = 1.10 [0.50, 2.43]$, $p = .81$, $OR_{punishment} = 1.84 [0.93, 3.76]$, $p = .083$, or Buddhists describing karma, $OR_{reward} = 0.91 [0.40, 2.06]$, $p = .83$, $OR_{punishment} = 0.70 [0.29, 1.59]$, $p = .40$. Confirmatory Sample results also suggests that comprehension problems led participants to list consequences rather than actions: Consequences were listed significantly more by Indian than American participants, $OR_{reward} = 12.98 [6.70, 25.14]$, $OR_{punishment} = 7.00 [5.14, 9.73]$, $ps < .001$, but listed consequences at similar rates for both God and karma, $OR_{reward} = 1.00 [0.51, 1.94]$, $p = 1.00$, $OR_{punishment} = 0.71 [0.28, 1.83]$, $p = .48$, at rates that did not significantly differ between countries.

Salience of honesty in free list responses

To test the specificity of the salience of generosity/greed in free list responses, I also tested how frequently honesty was mentioned in descriptions of something that god/karma will reward. Honesty is another prosocial action that was frequently listed in the free lists, but it lacks the connotations of giving and exchange that are hypothesized to be central to mental representations of karma. In the Exploratory Sample, honesty was not mentioned significantly more often by Karma believers, $OR = 1.12$ [0.79, 1.56], $p = .53$, or Hindus/Buddhists, $OR = 1.31$ [0.96, 1.80], $p = .087$, compared to participants describing God. In the Confirmatory Sample, as hypothesized, the presence of honesty did not significantly differ between descriptions of God and karma, $OR = 1.15$ [0.76, 1.74], $p = .52$, nor was there any target by country interaction, $OR = 0.86$ [0.51, 1.45], $p = .58$. nor did the presence of dishonesty/cheating reveal any target difference, $OR = 1.43$ [0.90, 2.27], $p = .13$, or target by country interaction, $OR = 0.92$ [0.52, 1.63], $p = .77$.

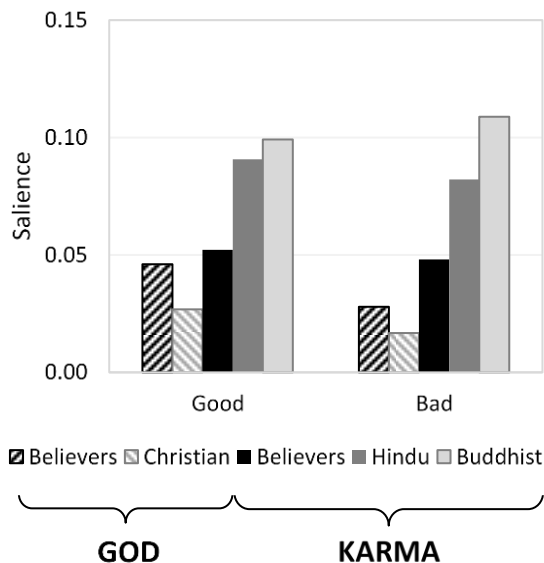
Salience of mental states in free list responses

Study 1

In addition to ideas about exchange and reciprocity, another common way to describe karma is as something inherent to people's mental states and dispositions: Moral and immoral actions create (or reflect) stable underlying characteristics (dispositions towards virtue and vice) that influence how someone is likely to behave and what they are likely to experience in the future. This conceptualization of karma is prevalent in several schools of Buddhist thought (Allen et al., 2015), and is reminiscent of the well-studied psychological tendency to make dispositional inferences from observing other people's behavior (Gilbert & Malone, 1995; Goodwin et al., 2014; Krull et al., 1999). God may be aware of people's mental states, but given that God is viewed as acting independently of human minds, mental states may be especially salient when describing karma, rather than God's, moral concerns.

Mental states (Figure B2) were listed at similar rates by God believers (9% for good and 5% for bad mental states) and Karma believers (11% and 8%, respectively), $OR_{good} = 1.27 [0.79, 2.07]$, $p = 0.33$, $OR_{bad} = 1.86 [1.02, 3.43]$, $p = .044$. Christians were also unlikely to list good (5%) and bad (4%) mental states, but mental states were listed substantially more often by Hindus (15% and 14%), $OR_{good} = 3.41 [1.67, 7.52]$, $p = .001$, $OR_{bad} = 3.80 [1.76, 9.17]$, $p = .001$, and Buddhists (19% and 16%), $OR_{good} = 4.42 [2.22, 9.62]$, $p < .001$, $OR_{bad} = 4.70 [2.22, 11.20]$, $p < .001$, while Hindus and Buddhists did not significantly differ from each other, $OR_{good} = 1.30 [0.77, 2.20]$, $p = .33$, $OR_{bad} = 1.24 [0.71, 2.16]$, $p = .45$.

Figure B 2. Salience of good and bad mental states



Study 2

Methods

Moralized thoughts. Participants reported whether it is “bad for someone to think negative thoughts (e.g., wishing someone harm), even if they never act on these thoughts,” and similarly, “good for someone to think positive thoughts (e.g., wishing good outcomes for someone else), even if they never act on these good thoughts,” on a 7-point scale ranging from *extremely bad* to *extremely good*.

Supernatural consequences for thoughts. Participants rated the likelihood that a bad thought (e.g., wishing someone harm), that is never acted on, will result in bad consequences caused by God and result in bad consequences caused by karma, on a 7-point scale ranging from *definitely will not* to *definitely will*. Participants answered analogous questions for good thoughts resulting in good consequences because of God or karma.

Results of targeted comparisons: Mental states, thoughts, and intentional action

We examined three different indicators of supernatural consequences for mental states: whether mental states (not classifiable into other actions categories) were present or absent in the free list, a direct question about whether thoughts will result in supernatural rewards and punishments, and whether intentional behavior is judged differently than accidental behavior. These items were largely unrelated to one another (correlations were $< .20$ across all targets and countries). I conducted multiple regressions predicting responses from the target, country, and target by country interaction. As a covariate I also included general moralization of thoughts (i.e., the badness of negative thoughts and the goodness of positive thoughts) and the moralization by target interaction, to explore the contribution of individual differences in non-supernatural moral judgments to supernatural beliefs. For each analysis, estimates of target effects were similar when moralization of thoughts was included or excluded from the model, therefore I present the full model below for simplicity.

Free List. The salience of free list responses classified as good mental states (e.g., “keeping positive,” “hopefulness,” “always thinking good”) and bad mental states (e.g., “negative outlook,” “think ill of others,” “pessimism,” and “wishing ill”) is displayed in Figure B3. Americans listed good and bad mental states more often when describing karma (13% and 9%, for good and bad respectively) than God (5%/5% see Table B15). The interaction between target and country revealed that Indians listed mental states at similar rates when describing Karma (17%/18%) and God (17%/16%), $OR_{good} = 0.95 [0.69, 1.31]$, $p = .75$, $OR_{bad} = 1.46 [0.81, 1.59]$, $p = .46$. Indians also listed mental states more often than Americans. This replicates the group difference between Hindus and God/karma believers in the Exploratory Sample, but also replicates the God/Karma difference among Americans.

In both countries, individual differences in general moralization of thoughts did not predict the salience of mental states in the free list. Additionally, God/karma’s perceived knowledge of thoughts was unassociated with free lists of mental states, and cannot explain the

God/karma difference, because mental states were more salient in free lists of karma, but karma was described as having less access to mental states. Americans strongly agreed that God knows thoughts ($M = 6.04$, $SD = 1.35$, on a 7-point scale), but were more ambivalent about whether Karma knows thoughts ($M = 4.24$, $SD = 2.02$), $d = 0.87$ 95% CI [0.71, 1.03], $p < .001$, and Indians also reported that God knows thoughts ($M = 6.3$, $SD = 1.05$) more than Karma knows thoughts ($M = 5.33$, $SD = 1.72$), $d = 0.56$ [0.46, 0.66], $p < .001$.

Direct questions. Indians were more likely than Americans to report, in a direct question, that supernatural forces will reward good thoughts and punish bad thoughts, but this did not differ between descriptions of God and karma in either country, thus failing to replicate the pattern of free list salience between targets (Figure B3 and Table B15). Individual differences in the moralization of thoughts predicted the likelihood of supernatural consequences, but this effect did not significantly differ between God and karma.

Intentions make actions better/worse. For free list actions resulting in bad consequences, the majority of participants reported that intentionally engaging in the action was worse than accidentally engaging in it, at similar rates (Table B15) for descriptions of God and karma among Americans (63%/60% for God and karma, respectively) and Indians (54%/53%). Participants were somewhat less likely to report that good actions are better if done intentionally (consistent with other asymmetries in the attribution of intentions to harmful vs. helpful actions, Clark, Bauman, Kamble, & Knowles, 2016; Robbins, Shepard, & Rochat, 2017). Americans judged intentions more relevant to Americans' descriptions of God (29%) than karma (26%), but this small difference was not present among Indians (30% for God, 31% for karma). General moralization of thoughts also predicted a reduced, rather than increased, relevance of intentions to evaluations of actions. Therefore, while intentions were somewhat relevant to moral evaluations of free list actions, there was little evidence of target differences or individual differences in this judgment.

Figure B 3. Salience of mental states in free list (left) and the likelihood of supernatural consequences for good and bad thoughts (right)

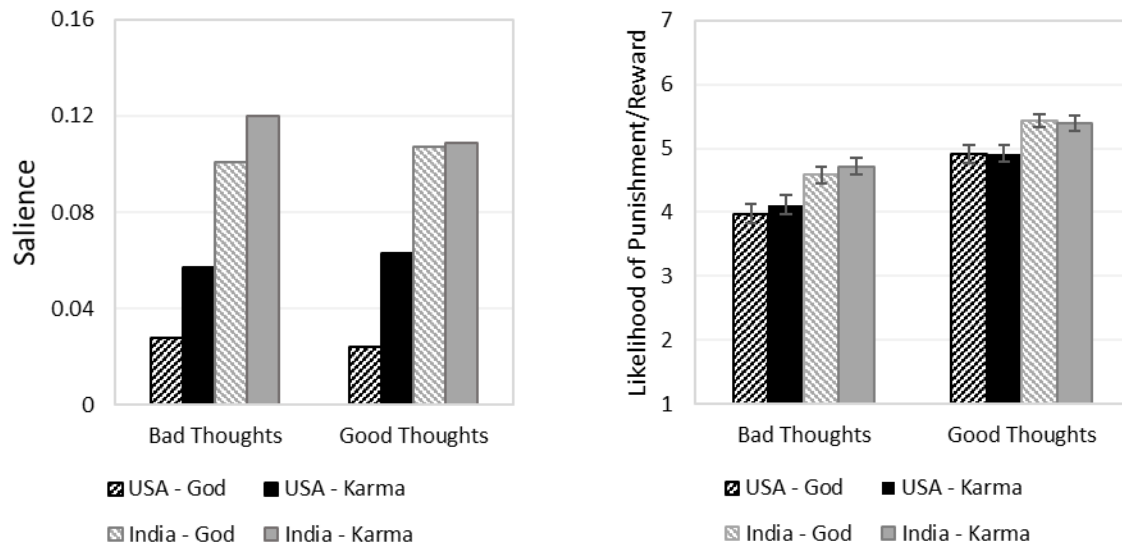


Table B 15. Regressions predicting the likelihood of mental states in free list, supernatural consequences for thoughts (direct question), and whether intentions make actions better or worse, believers only

	Free list: Good mental states		Free list: Bad mental states		Reward for good thoughts		Punishment for bad thoughts		Intentional good is better		Intentional bad is worse	
	OR [95% CI]	P	OR [95% CI]	P	b [95% CI]	P	b [95% CI]	P	OR [95% CI]	P	OR [95% CI]	P
Intercept	0.05 [0.03, 0.08]	<.001	0.06 [0.03, 0.09]	<.001	0.91 [0.78, 1.04]	<.001	-0.01 [-0.17, 0.15]	.93	0.00 [0.00, 0.00]	<.001	2.07 [1.53, 2.80]	<.001
Target (0 = God, 1 =Karma)	2.83 [1.56, 5.42]	.001	1.81 [0.98, 3.43]	.061	0.02 [-0.09, 0.12]	.77	0.14 [0.00, 0.27]	.046	0.67 [0.29, 1.53]	.34	0.84 [0.58, 1.22]	.37
Country (0 = USA, 1 = India)	4.41 [2.58, 8.06]	<.001	3.41 [2.02, 6.06]	<.001	0.51 [0.35, 0.67]	<.001	0.65 [0.45, 0.86]	<.001	1.15 [0.40, 3.31]	.80	0.61 [0.41, 0.89]	.01
Target* Country	0.33 [0.16, 0.66]	.002	0.63 [0.31, 1.26]	.20	-0.04 [-0.18, 0.09]	.54	-0.05 [-0.22, 0.13]	.61	1.98 [0.70, 5.63]	.20	1.13 [0.70, 1.83]	.61
Moralized thoughts in general	0.87 [0.72, 1.06]	.16	0.83 [0.69, 1.01]	.056	0.50 [0.42, 0.58]	<.001	0.10 [0.00, 0.20]	.044	0.70 [0.43, 1.14]	.15	0.65 [0.53, 0.78]	<.001
Target* moralized thoughts	1.04 [0.80, 1.35]	.77	1.11 [0.85, 1.45]	.45	-0.01 [-0.07, 0.06]	.88	0.05 [-0.04, 0.14]	.29	1.03 [0.65, 1.64]	.89	1.20 [0.94, 1.52]	.15

Note. General moralization of thoughts was coded such that lower numbers indicate more negative evaluations and positive numbers positive evaluations. Random intercepts were not included in free list analyses due to model convergence problems, but were included in the other models. Three-way interactions were non-significant across all models, thus are not presented here.

Evaluations of free list actions

Methods

After providing free list descripts of God and karma, participants made several evaluations of the actions which they had listed.

In the Study 1 (Qualtrics sub-samples only), participants were reminded of the first item that they listed as something rewarded/punished by God/karma, and were asked to evaluate whether the action is “morally wrong,” “deserving of punishment,” “unfair,” “disgusting,” “disloyal,” “disrespectful,” “harmful,” and “uncivilized” (or analogous positively-valenced terms, 7-point scales). These items provided a composite moral evaluation index (α s = .92 – .96 across valences and targets). Next, they provided an open-ended description of who would be helped (by the action with supernatural rewards) or harmed (by the action with supernatural punishments). A research assistant coded whether the action was harmful/helpful to (1) the person engaging in the action or (2) the victim or recipient of the action. These evaluations indicate whether the free listed actions are generally characterized as moral violations or virtuous moral actions, in addition to being something that elicits supernatural punishments/rewards.

In the Study 2, participants were reminded of the first item that they had listed in each free list and evaluated this action on several dimensions. (A) Their overall moral judgments of the free list actions were evaluated through three items: “how good or bad is the action,” whether people will think someone performing this action “is a good person or a bad person,” and whether “someone who engages in this behavior should be rewarded or punished” (α ’s range from .81 to .95 across targets and countries). All ratings were made on 7-point scales, with low scores indicating negative evaluations and high scores indicating positive evaluations. (B) Participants reported whether the action is harmful or helpful (7-point scale, *extremely harmful* to *extremely helpful*), and whether it is specifically harmful/helpful to “the person who performs the action” and “other people” (7-point scale, *strongly disagree* to *strongly agree*). (C) Participants reported whether the action was worse [better] if it is done on purpose: 0 = *this action is equally bad [good] no matter what*, 1 = *this action is worse [better] if it is done intentionally, and less wrong [less good] if it is done accidentally*.

Study 1

To confirm that participants were listing actions that were perceived as morally relevant in general, the Hindu, Buddhist, and Christian samples provided additional evaluations of their first free list response. As depicted in Table B16, actions with supernatural rewards were rated as morally good and very helpful, whereas actions with supernatural punishment were rated as morally bad and very harmful (evaluations did not differ significantly across groups). Additionally, when asked to describe who would be harmed or helped by the actions, many participants reported that the action had a recipient who would be harmed for helped by the action (as is prototypical in moral behavior, Schein & Gray, 2015), in addition to being harmful

or helpful to the person performing the action (as would be expected from actions that elicit supernatural rewards and punishments).

Table B 16. Moral evaluation of free list responses and the percent of participants who reported help/harm to actors and victims of the actions, Qualtrics sample only

	Good Actions				Bad Actions		
	Hindus	Buddhists	Christians		Hindus	Buddhists	Christians
Goodness	5.96	5.76	5.75	Badness	5.43	5.34	5.28
<i>M (SD)</i>	(0.94)	(1.08)	(1.16)	<i>M (SD)</i>	(1.36)	(1.44)	(1.58)
Helpfulness	6.06	6.11	5.79	Harmfulness	5.29	5.66	5.36
<i>M (SD)</i>	(1.21)	(1.17)	(1.45)	<i>M (SD)</i>	(1.673)	(1.62)	(1.80)
Help to self	36%	33%	32%	Harm to self	41%	44%	40%
Help to recipient	59%	63%	61%	Harm to victim	48%	57%	53%

Study 2

Additional moral evaluations of the free list items (Table B17) confirmed that actions with supernatural rewards were rated as morally good and actions with supernatural punishments were rated as morally bad. These evaluations were generally harsher among Americans than Indians, but were similar between descriptions of God and karma. Actions with supernatural punishments were rated as somewhat harmful to both the actor and to other people, while actions with supernatural rewards were rated as somewhat helpful to both the actor and to other people.

Table B 17. Mean (SD) moral evaluation of free list items, believers only

	Bad Actions				Good Actions			
	Karma		God		Karma		God	
	USA	India	USA	India	USA	India	USA	India
Evaluation	1.98 (0.92)	2.38 (1.64)	2.00 (1.03)	2.49 (1.67)	6.40 (0.66)	6.22 (0.94)	6.34 (0.72)	6.18 (0.90)
Harmfulness/ Helpfulness	1.90 (1.08)	2.43 (1.79)	1.91 (1.15)	2.61 (1.81)	6.54 (0.72)	6.22 (1.11)	6.36 (0.94)	6.14 (1.09)
Harm/Help to Actor	5.04 (1.67)	5.39 (1.57)	5.07 (1.69)	5.39 (1.54)	5.81 (1.16)	5.09 (1.21)	6.03 (1.08)	5.96 (1.10)
Harm/Help to Victim	6.08 (1.17)	5.59 (1.53)	5.85 (1.54)	5.54 (1.50)	6.51 (0.80)	6.14 (1.02)	6.32 (0.97)	6.07 (1.07)

Note. Moral evaluations and harmfulness/helpfulness ratings were on bipolar scales with low scored indicating more negative evaluations and high scores indicating positive evaluations. Harm/help to the actor and victim were rated on likert scales with higher scores indicating greater agreement.

Predicting reward/punishment of religious devotion from traits of God

Predicting free list religious devotion

Table B 18. Predicting the presence of religious devotion in free list of God's rewards/punishments from the presence of personality traits in God's features

	Reward for religious devotion								
	USA (Exploratory)			USA (Confirmatory)			India (Confirmatory)		
	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>
Intercept	0.63	0.47, 0.85	0.002	1.14	0.84, 1.55	0.395	0.49	0.40, 0.59	<0.001
God's personality traits	1.19	0.84, 1.69	0.335	1.33	0.94, 1.88	0.101	0.89	0.69, 1.16	0.405
	Punishment for religious violations								
	USA (Exploratory)			USA (Confirmatory)			India (Confirmatory)		
	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>
Intercept	0.54	0.40, 0.73	<0.001	0.67	0.49, 0.91	0.011	0.26	0.21, 0.33	<0.001
God's personality traits	1.09	0.77, 1.57	0.628	0.93	0.65, 1.32	0.671	0.9	0.66, 1.22	0.493

Table B 19. Predicting the presence of religious devotion in free list of God's rewards/punishments from the presence of non-agentic traits in God's features

	Reward for religious devotion								
	USA (Exploratory)			USA (Confirmatory)			India (Confirmatory)		
	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>
Intercept	0.74	0.63, 0.87	<0.001	1.46	1.26, 1.70	<0.001	0.47	0.41, 0.54	<0.001
God's non-agentic traits	0.57	0.27, 1.15	0.131	0.65	0.35, 1.21	0.173	0.78	0.51, 1.18	0.249
	Punishment for religious violations								
	USA (Exploratory)			USA (Confirmatory)			India (Confirmatory)		
	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>
Intercept	0.57	0.48, 0.68	<0.001	0.64	0.55, 0.74	<0.001	0.26	0.22, 0.30	<0.001
God's non-agentic traits	1.06	0.52, 2.08	0.864	0.75	0.38, 1.42	0.396	0.78	0.46, 1.25	0.314

Predicting closed-ended question about punishment for a lack of religious devotion

Table B 20. Predicting God's punishments for a lack of religious devotion from God's features

	USA (Confirmatory)			India (Confirmatory)		
	<i>b</i>	95% <i>CI</i>	<i>p</i>	<i>b</i>	95% <i>CI</i>	<i>p</i>
Intercept	-0.32	-0.54, -0.10	0.005	0.19	0.04, 0.33	0.014
God's personality traits	0.19	-0.06, 0.44	0.144	0.07	-0.14, 0.27	0.511
	USA (Confirmatory)			India (Confirmatory)		
	<i>b</i>	95% <i>CI</i>	<i>p</i>	<i>b</i>	95% <i>CI</i>	<i>p</i>
Intercept	-0.16	-0.27, -0.05	0.003	0.24	0.13, 0.34	<0.001
God's non-agentic traits	-0.19	-0.64, 0.26	0.411	-0.12	-0.44, 0.19	0.439

Predicting efficacy of prayer to escape God's punishment

Table B 21. Predicting the efficacy of prayer from God's features

	USA (Exploratory)			USA (Confirmatory)			India (Confirmatory)		
	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>b</i>	<i>95% CI</i>	<i>p</i>	<i>b</i>	<i>95% CI</i>	<i>p</i>
Intercept	1.51	1.13, 2.02	0.006	3.8	3.65, 3.96	<0.001	3.73	3.62, 3.83	<0.001
God's personality traits	1.83	1.27, 2.63	0.001	0.06	-0.11, 0.24	0.494	0.07	-0.07, 0.22	0.321
	USA (Exploratory)			USA (Confirmatory)			India (Confirmatory)		
	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>	<i>OR</i>	<i>95% CI</i>	<i>p</i>
Intercept	2.37	1.98, 2.83	<0.001	3.86	3.79, 3.94	<0.001	3.78	3.70, 3.86	<0.001
God's non-agentic traits	0.5	0.25, 0.98	0.041	-0.21	-0.53, 0.10	0.188	-0.11	-0.33, 0.12	0.349

Individual differences in moral concerns

To investigate whether individual differences in moral concerns predicted free list responses, I examined whether the relevance to morality of each domain in the Moral Foundations Questionnaire (Graham et al., 2011) predicted, in a logistic regression, whether participants' free list contained an analogous action category. Given the unique pattern of salience for religious morality in the free list, the single item referring to "Whether or not someone acted in a way that God would approve of" was analyzed separately, in addition to the composite purity score that also included this item.

Across most comparisons in all three samples (Table B22), there was very little association between relevance to morality and the likelihood of including a category in the free list. For several categories of action, there was a small positive association with moral relevance in the Christian sample, but there was overall only weak evidence that individual differences in moral concerns (as indexed by the MFQ) predicted free list responses.

Table B 22. Odds [95% CI] of listing a given free list category, predicted from the moral relevance of analogous MFQ domains, Study 1

MFQ domain	Free List	Hindu		Buddhist		Christian	
		Bad	Good	Bad	Good	Bad	Good
Harm	Harm/Help	1.15 [0.77, 1.72]	1.44 [0.94, 2.20]	2.07*** [1.40, 3.16]	1.93** [1.23, 3.10]	2.07*** [1.38, 3.24]	1.60* [1.12, 2.33]
	Unkindness/Kindness	1.27 [0.86, 1.90]	--	0.96 [0.65, 1.40]	--	1.26 [0.89, 1.84]	--
Fairness	Greed/Generosity	1.60* [1.04, 2.52]	1.28 [0.85, 1.94]	1.20 [0.85, 1.71]	1.46* [1.02, 2.11]	0.98 [0.66, 1.50]	1.64** [1.15, 2.38]
	Cheating/Honesty	1.21 [0.82, 1.81]	1.09 [0.69, 1.75]	1.41* [1.01, 2.01]	0.82 [0.55, 1.23]	1.77** [1.24, 2.60]	1.41 [0.91, 2.24]
Loyalty	Loyalty/Disloyalty	1.56 [0.68, 3.81]	1.66 [0.69, 4.31]	1.03 [0.59, 1.81]	1.62 [0.81, 3.42]	2.88*** [1.67, 5.25]	1.51 [0.84, 2.86]
Authority	Respect/Disrespect	1.09 [0.53, 2.29]	1.39 [0.77, 2.57]	1.89 [0.92, 4.17]	1.53 [0.82, 2.96]	0.92 [0.52, 1.70]	1.04 [0.56, 2.02]
Purity	Purity/Impurity	5.76 [1.17, 65.10]	1.17 [0.28, 5.84]	1.08 [0.42, 3.02]	1.56 [0.53, 5.14]	1.79 [0.89, 4.08]	0.91 [0.34, 3.38]
	Religious morality/immorality	0.67 [0.28, 1.62]	1.69 [0.96, 3.14]	1.69 [0.62, 5.06]	0.64 [0.37, 1.09]	1.20 [0.85, 1.70]	1.08 [0.78, 1.50]
What god would approve of	Purity/Impurity	5.85 [1.36, 99.99]	1.50 [0.54, 5.99]	0.63 [0.30, 1.20]	1.07 [0.54, 2.20]	1.06 [0.66, 1.86]	0.67 [0.32, 1.66]
	Religious morality/immorality	0.74 [0.41, 1.35]	1.31 [0.88, 2.01]	0.97 [0.51, 1.84]	0.95 [0.67, 1.35]	1.57** [1.17, 2.18]	1.45** [1.10, 1.93]

Predicting free list responses from political orientation

Past research has found a reliable association between individual differences in political orientation and endorsement of particular moral foundations, indexed by the Moral Foundations Questionnaire. Both in North America and around the world (Graham et al., 2009; R. A. Klein et al., 2018), political liberals are more likely to view issues regard harm and fairness as relevant to morality, while political conservatives are more likely to view issues regarding respect for authority, ingroup loyalty, and purity as relevant to morality.

In Study 1, logistic regressions predicting the presence of action categories from political orientation (Table B23) failed to find any consistent association between political orientation and free list responses. Study 2 also failed to find any consistent relationships between political orientation and frequency of free list items. Although, across all analyses, a few relationships reached conventional levels of statistical significance, I caution against meaningful interpretations of these relationships due to the large number of tests performed increasing the risk of Type I errors. For instance, although political orientation predicted the likelihood of listing religious actions as something rewarded by God in the Exploratory Sample, the Confirmatory Sample did not replicate this association in the USA, $OR_{Reward} = 1.15$ [0.93, 1.44], $p = .20$, $OR_{Punishment} = 1.03$ [0.81, 1.30], $p = .83$, or in India, $OR_{Reward} = 0.86$ [0.72, 1.02], $p = .09$, $OR_{Punishment} = 0.95$ [0.77, 1.17], $p = .63$, suggesting a lack of robustness in this effect.

Table B 23. Odds [95% CI] of listing a given free list category, predicted from political orientation (standardized)

Free List	God believers		Karma Believers		Hindu		Buddhist		Christian	
	Bad	Good	Bad	Good	Bad	Good	Bad	Good	Bad	Good
Harm/ Help	0.77* [0.62, 0.94]	0.86 [0.70, 1.05]	0.92 [0.74, 1.14]	0.81 [0.63, 1.02]	0.85 [0.64, 1.13]	0.92 [0.68, 1.24]	0.92 [0.69, 1.21]	0.86 [0.61, 1.23]	0.94 [0.71, 1.24]	0.66** [0.48, 0.89]
Unkindness /Kindness	0.91 [0.74, 1.12]	--	0.90 [0.73, 1.12]	--	1.03 [0.78, 1.36]	--	1.27 [0.95, 1.70]	--	1.04 [0.78, 1.38]	--
Greed/ Generosity	0.85 [0.66, 1.09]	0.88 [0.72, 1.07]	0.79* [0.63, 0.99]	0.86 [0.67, 1.11]	0.77 [0.56, 1.04]	0.80 [0.59, 1.07]	0.89 [0.67, 1.18]	1.03 [0.76, 1.39]	0.83 [0.59, 1.16]	0.77 [0.58, 1.02]
Cheating/ Honesty	0.83 [0.67, 1.01]	0.71* [0.54, 0.92]	1.04 [0.84, 1.31]	1.15 [0.88, 1.50]	0.74* [0.56, 0.99]	0.71 [0.50, 1.00]	1.21 [0.91, 1.60]	0.97 [0.69, 1.36]	1.07 [0.81, 1.42]	1.24 [0.88, 1.78]
Loyalty/ Disloyalty	1.13 [0.83, 1.56]	0.75 [0.51, 1.08]	1.02 [0.70, 1.48]	0.95 [0.58, 1.52]	0.98 [0.52, 1.79]	1.28 [0.68, 2.42]	0.96 [0.57, 1.57]	1.27 [0.69, 2.34]	0.96 [0.65, 1.44]	0.73 [0.44, 1.20]
Respect/ Disrespect	1.08 [0.69, 1.72]	1.08 [0.81, 1.66]	1.44 [0.77, 2.71]	1.14 [0.70, 1.85]	0.56 [0.27, 1.04]	1.06 [0.66, 1.70]	0.53 [0.25, 1.00]	0.97 [0.57, 1.60]	1.19 [0.71, 2.06]	1.64 [0.92, 3.14]
Purity/ Impurity	1.00 [0.72, 1.39]	1.45 [0.71, 3.23]	1.00 [0.48, 2.01]	1.08 [0.23, 4.41]	0.42 [0.09, 1.27]	0.57 [0.12, 1.87]	0.79 [0.32, 1.79]	0.89 [0.33, 2.16]	0.96 [0.57, 1.65]	0.86 [0.31, 2.41]
Religious morality/ immorality	1.38** [1.12, 1.70]	1.39** [1.14, 1.72]	0.80 [0.32, 1.80]	1.42 [0.92, 2.21]	0.92 [0.43, 1.87]	1.01 [0.65, 1.55]	0.70 [0.27, 1.61]	0.76 [0.47, 1.21]	1.78*** [1.31, 2.46]	1.40* [1.06, 1.88]

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Study 2: Moral licencing and moral compensation effects

The confirmatory sample was collected, in part, as an experimental test of moral licensing and moral compensation effects, and how these effects might be moderated by supernatural beliefs. I investigated whether belief in karma moderated two different behaviors that have been found in previous psychological literature: moral compensation and moral licensing. *Moral compensation* refers to increased prosocial behavior after recall of one's own previous moral failings, while *moral licensing* refers to decreased prosocial behavior after recall of one's own previous virtue. Past research has found mixed evidence for these effects. While some researchers have documented moral licensing effects, others have found that recall of past good behavior leads to consistently moral behavior (Conway & Peetz, 2012; L. Young et al., 2012). Moderators that might explain why different effects appear in different contexts have also found little consistent support (see Blanken, Ven, & Zeelenberg, 2015, for a recent meta-analysis).

We investigated whether participants explicit beliefs about ethical causality moderate these moral licencing and moral compensation effects. Many people believe that their past behavior has implications for their future well-being, through mechanisms of secular justice, karmic forces, or the intervention of a morally-concerned god. I expected that, insofar as participants explicitly believe that their moral actions result in morally-congruent consequences, they will be more likely to regulate their own behavior across events in a way that would be personally advantageous. Participants who believe in ethical causation and recall a past bad behavior may be inclined to do a good deed, in order to offset the negative implications of their prior misdeed, thus showing moral compensation effects. Additionally, participants who believe in ethical causation may view current opportunities for self-beneficial behavior (even at the expense of others) as just rewards for their prior good behavior. Therefore, I hypothesized that participants will be more likely to show moral compensation and moral licensing effects when they explicitly believe in universal forces of ethical causation, such as karma.

Methods

Participants played a 6-trial dictator game. In between trials 3 and 4 of the dictator game, participants were randomly assigned to describe either a past good deed ("something good that you have done recently. For example, try to recall a time when you acted in a way that was helpful or caring"), a past bad deed ("something bad that you have done recently. For example, try to recall a time when you acted in a way that was hurtful or uncaring"), or a neutral experience ("please describe what you had for breakfast this morning"). After completing the dictator game task, participants completed various measures of their religious beliefs, including belief in Karma, belief in God, belief in a Just World, and three items indicating what good deeds can help alleviate karmic punishments for misdeeds ("Could they escape these bad consequences if they do good deeds (e.g., donate money to charity)?", "If someone does a good deed to escape the negative consequences caused by karma, will people think that they are a good person or a bad person?", and whether the action listed as leading to karmic rewards "could this make up for something bad that they did in the past?").

Results

As expected, there was no difference in the average amount of money given before and after writing about what participants had for breakfast, in the USA, $t(500) = -0.06$, $p = .95$, $d = -0.005$, 95% CI [-0.18, 0.17], or India, $t(455) = 0.56$, $p = .57$, $d = 0.05$ [-0.13, 0.24]. There was also no difference in the amount of money given after writing about a previous good deed (Table B24) or after writing about a previous bad deed (Table B25). Contrary to our hypotheses, I failed to find any evidence of moral licencing (increased selfishness after describing a good deed) or moral compensation (increased giving after describing a bad deed), and these effects were not moderated by participants' level of belief in Karma. Including belief in God and belief in a Just World in the model (Model 2 in Table B25), or participants' belief that good deeds can help them escape the bad consequences of past actions (Model 3), also revealed no significant priming effects or any moderators of the priming effects.

Table B 24. Dictator game giving before and after describing a good deed, moderated by indicators of belief in karma

	Model 1				Model 2			
	USA		India		USA		India	
	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>
Intercept	0.19 [0.17, 0.21]	<.001	0.26 [0.24, 0.28]	<.001	0.19 [0.17, 0.21]	<.001	0.26 [0.24, 0.28]	<.001
Pre- vs. Post-Prime	0.01 [-0.00, 0.02]	.078	0.00 [-0.00, 0.01]	.32	0.01 [-0.00, 0.02]	.061	0.00 [-0.00, 0.01]	.31
Belief in Karma	0.01 [-0.01, 0.03]	.40	-0.00 [-0.02, 0.02]	.88	-0.00 [-0.02, 0.02]	.93	0.01 [-0.02, 0.03]	.65
Karma *Prime	-0.01 [-0.02, 0.00]	.078	0.00 [-0.01, 0.01]	.70	-0.01 [-0.02, 0.00]	.052	0.00 [-0.01, 0.01]	.44
Belief in God					0.03 [0.01, 0.05]	.003	-0.02 [-0.04, 0.01]	.15
Belief in a Just World					-0.00 [-0.02, 0.02]	.89	-0.01 [-0.03, 0.02]	.57
God *Prime					0.00 [-0.00, 0.01]	.34	-0.01 [-0.01, 0.00]	.17
BJW *Prime					0.00 [-0.01, 0.01]	.82	-0.00 [-0.01, 0.01]	.76

Table B 25. Dictator game giving before and after describing a bad deed, moderated by indicators of belief in karma

	Model 1				Model 2				Model 3			
	USA		India		USA		India		USA		India	
	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>	<i>b</i> [95% CI]	<i>p</i>
Intercept	0.22 [0.20, 0.24]	<.001	0.28 [0.26, 0.30]	<.001	0.22 [0.20, 0.24]	<.001	0.28 [0.26, 0.30]	<.001	0.22 [0.20, 0.24]	<.001	0.28 [0.26, 0.30]	<.001
Pre- vs. Post-Prime	0.00 [-0.01, 0.01]	.71	-0.01 [-0.02, 0.01]	.31	0.00 [-0.01, 0.01]	.71	-0.01 [-0.02, 0.01]	.33	0.00 [-0.01, 0.01]	.71	-0.01 [-0.02, 0.01]	.32
Belief in Karma	-0.00 [-0.02, 0.02]	.78	-0.00 [-0.02, 0.02]	.80	-0.01 [-0.03, 0.01]	.43	-0.00 [-0.03, 0.02]	.83				
Karma *Prime	0.01 [-0.00, 0.01]	.27	0.00 [-0.01, 0.01]	.61	0.00 [-0.01, 0.01]	.56	0.00 [-0.01, 0.02]	.45				
Belief in God					0.01 [-0.01, 0.03]	.29	-0.02 [-0.04, 0.00]	.082				
Belief in a Just World					0.01 [-0.01, 0.03]	.19	0.02 [-0.00, 0.04]	.082				
God *Prime					0.01 [-0.00, 0.01]	.26	-0.00 [-0.01, 0.01]	.78				
BJW *Prime					0.00 [-0.01, 0.01]	.60	-0.00 [-0.01, 0.01]	.61				
Escape through good deed									0.00 [-0.02, 0.02]	.81	-0.01 [-0.03, 0.01]	.52
Escape *Prime									0.00 [-0.01, 0.01]	.79	0.00 [-0.01, 0.01]	.78

Appendix C: Supplementary Results for Chapter 5

Experiment 1 Supplementary Results

Preregistered Analyses

Possible moderators: Beliefs about God and karma

We examined several alternative mixed-effects models that predicted DG giving from features of the experiment (pre- or post-framing, God or karma condition, endowment in each trial) and individual differences in belief (level of belief in God and karma, view of God/karma as benevolent or punitive). I also investigated whether any of these variables moderated the supernatural framing effect. Features of the experiment were dummy coded: Frame (0 = pre-framing, 1 = post-framing), Condition (0 = God, 1 = Karma), Trial_{D1} (0 = \$.30, 1 = \$.40), and Trial_{D2} (0 = \$.30, 1 = \$.50). Belief in God, belief in karma, benevolence, punitiveness, familiarity, and hypothesis guessing were standardized prior to analysis.

Bivariate relationships between supernatural belief and giving can be seen in Table C1 and result of these comprehensive regression models can be seen in Table C2. There was a small positive association between DG giving and belief in God, thinking about God, and perceptions of supernatural benevolence. However, the strongest predictor of DG giving in every case, as hypothesized, was the supernatural framing manipulation. Individual differences in supernatural belief did not significantly moderate the strength of the supernatural framing manipulation in these more comprehensive models or if each facet of belief was analyzed separately (Table 3 in the main text). These results confirm the primary experimental findings: participants became more generous when thinking about God or karma than they were initially, and the effectiveness of this framing manipulation did not differ according to the identity of the supernatural concept (God vs. karma) or other individual differences in supernatural belief.

Table C 1. Experiment 1 correlations [95% CI] between beliefs about God and karma and dictator game giving. Excludes participants in the neutral framing condition.

	Pre-frame giving	Post-frame giving
Belief in God	.12** [.03, .20]	.05 [-.04, .13]
Belief in karma	.03 [-.06, .12]	.12 [-.07, .11]
Benevolence (overall)	.10* [.01, .18]	.10* [.01, .18]
God frame condition	.10 [-.03, .22]	.10 [-.03, .22]
Karma frame condition	.12 [-.005, .24]	.19** [.08, .31]
Punitiveness (overall)	-.03 [-.11, .06]	-.01 [-.10, .07]
God frame condition	.02 [-.10, .14]	.0002 [-.12, .12]
Karma frame condition	-.07 [-.19, .05]	-.05 [-.18, .07]
Thinking about God	.16*** [.07, .24]	.09 [-.002, .17]
Thinking about karma	.08 [-.01, .17]	.07 [-.02, .15]

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table C 2. Experiment 1 dictator game giving predicted from features of the experiment, individual differences in participant belief, and hypothesis guessing and familiarity with task.

	Model S2a: Experimental Conditions			Model S2b: Experimental Conditions and Individual Differences			Model S2c: Experimental Conditions, Individual Differences, and Hypothesis Guessing		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.187	0.014	<.001	0.161	0.017	<.001	0.158	0.017	<.001
Trial _{D1}	0.007	0.006	.19	0.007	0.006	.19	0.007	0.006	.21
Trial _{D2}	0.008	0.006	.17	0.008	0.006	.17	0.008	0.006	.18
Pre- vs. Post-Frame	0.081	0.013	<.001	0.056	0.021	.007	0.056	0.021	.008
Condition	-0.008	0.020	.67	0.046	0.028	.10	0.048	0.028	.087
Trial _{D1} *Frame	0.012	0.008	.13	0.012	0.008	.13	0.012	0.008	.13
Trial _{D2} *Frame	0.004	0.008	.66	0.004	0.008	.66	0.004	0.008	.66
Condition*Frame	0.023	0.018	.21	0.048	0.027	.080	0.047	0.028	.088
Belief in God				0.031	0.011	.005	0.032	0.011	.003
Belief in karma				0.010	0.011	.37	0.015	0.011	.16
Benevolence				0.027	0.012	.03	0.026	0.012	.036
Punitiveness				-0.007	0.010	.49	-0.006	0.010	.55
God*Frame				0.030	0.030	.31	0.034	0.030	.24
Karma*Frame				-0.022	0.012	.074	-0.022	0.013	.083
Benevolence*Frame				0.009	0.020	.64	0.007	0.020	.74
Punitiveness*Frame				-0.003	0.012	.78	-0.003	0.012	.81
God*Frame*Condition				-0.046	0.031	.13	-0.051	0.032	.10
Karma*Frame*Condition				0.035	0.020	.084	0.033	0.021	.10
Benevolence*Frame*Condition				0.009	0.023	.69	0.013	0.024	.60
Punitiveness*Frame*Condition				0.009	0.018	.63	0.007	0.018	.71
Familiarity							0.010	0.010	.31
Hypothesis Guess							0.022	0.010	.026
Familiarity*Frame							-0.004	0.009	.70
Hypothesis Guess*Frame							0.007	0.009	.43
<i>N</i>	504			503			495		
AICc	-3105.09			-3015.48			-2910.36		

Note. Bolded estimates are statistically significant at $p < .05$.

Alternative analyses

Rather than mixed-effects models, dictator game giving can also be analyzed through a 2 (Framing) x 2 (Condition: God vs. Karma) mixed ANOVA. This showed a main effect of framing, $F(1, 502) = 118.85, p < .001, \eta_p^2 = .19$, but no difference between giving in the God and Karma conditions, $F(1, 502) = .02, p = .88, \eta_p^2 = .00$, and no interaction between framing and condition, $F(1, 502) = 1.59, p = .21, \eta_p^2 = .003$.

We can also analyze the effect of framing between subjects, rather than within-subjects. Participants reminded of God during the second round of dictator games gave away more money than did participants who received neutrally-framed instructions during the second round, $d = 0.37, 95\% \text{ CI } [.19, .54], t(483.53) = 4.13, p < .001$. Karma framing also resulted in greater generosity than did neutral framing, $d = 0.47, 95\% \text{ CI } [.29, .65], t(497.04) = 5.23, p < .001$. God framing and Karma framing did not lead to significantly different levels of generosity, $d = -0.06, 95\% \text{ CI } [.12, .23], t(490.53) = 0.63, p = .53$.

The God and Karma framing effects can also be directly compared to giving in the neutral condition in a mixed-effects model, in which all three conditions are dummy coded with the neutral condition as the reference group. This indicated that, before supernatural framing, giving did not differ across conditions, but participants were significantly more generous after reminders of God or Karma than in the neutral condition (see Table C3). The change in giving was not significantly different in response to the God frame compared to the Karma frame ($B = 0.023, SE = 0.016, p = .15$).

Table C 3. Mixed-effects model predicting dictator game giving, across all three conditions (God, Karma, and Neutral framing) in Experiment 1

	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.193	0.014	<.001
Pre- vs. Post-Frame	-0.006	0.011	.62
Condition _{D1} (God vs. Neutral)	-0.000	0.020	.98
Condition _{D2} (Karma vs. Neutral)	-0.009	0.020	.66
Frame*Condition _{D1}	0.092	0.016	<.001
Frame* Condition _{D2}	0.115	0.016	<.001
<i>N</i>	754		
<i>AICc</i>	-4583.911		

Note. Bolded estimates are statistically significant at $p < .05$.

Exploratory Analyses

Excluded sample

The primary pattern of results remains unchanged when I included data from everyone who answered the dictator game questions: There remained a significant effect of framing in the God condition, $d = 0.40$, 95% CI [0.24, 0.56], $t(313) = 7.15$, $p < .001$, and Karma condition, $d = 0.55$, 95% CI [0.39, 0.70], $t(331) = 9.99$, $p < .001$, but no difference between rounds in the neutral condition, $d = -0.03$, 95% CI [-0.17, 0.13], $t(332) = 0.46$, $p = .65$.

Decision-making strategy

Participants responded to an open-ended question about the strategy that they used to make their dictator game decisions. I coded these responses for (1) whether participants mentioned God or karma, (2) if God or karma made them give more, less, or did not affect their giving, and (3) other reasons for their decision. A coding scheme for participants' reasons was developed by the first author by reading 150 participant responses, distributed across conditions. This coding scheme was then used by a research assistant to categorize participants' reasons for sharing money.

In their open-ended descriptions of how they made their dictator game decisions, participants generally (81%) did not mention God or karma. Many participants mentioned sharing/fairness/norms of giving (36.2%, post-frame giving: $M = 0.44$, $SD = 0.15$). Only 8.2% of participants mentioned religious or supernatural motives for sharing, such as God wanting them to share, the obligation of tithing, or wanting future good consequences for themselves (post-frame giving: $M = 0.40$, $SD = 0.22$). Reasons for keeping the money were primarily participants' needing the money for themselves or their families (19.1%, post-frame giving: $M = 0.09$, $SD = 0.19$), just wanting to keep the money for themselves (14.4%, post-frame giving: $M = 0.07$, $SD = 0.19$), or not wanting to share because they do not know the person receiving the money (9.0%, post-frame giving: $M = 0.07$, $SD = 0.14$).

Karma was mentioned by 28% of participants in the Karma framing condition, one participant in the God framing condition and one participant in the Neutral framing condition. God was mentioned by 26% of participants in the God condition, two participants in the Karma framing condition, and no participants in the Neutral framing condition. Of those who mentioned karma, 58% said that karma led them to give more money, 6% said that karma led them to keep the money, and 36% did not say how karma affected their giving. Of those who mentioned God, 57% said that God led them to give more money, 26% said that God led them to keep the money, while 17% did not say how God affected their giving. Mentioning God or karma was associated with greater giving after supernatural framing ($M = 0.24$ vs. 0.32 , $t(193) = -3.07$, $p = .002$), and those who said that God/karma made them give more money did give away more than those who said God/karma caused them to keep money, $r = .67$, $p < .001$, which confirms that participants' explicit consideration of God or karma did encourage them to give away more money.

Possible moderators

Hypothesis Guessing

Participants responded to an open-ended question about what hypothesis was investigated in this experiment. A research assistant coded how close these responses were to the experimenters' hypotheses. The coding scale range included: -2 = other or incorrect hypothesis, -1 = unsure, 0 = decision making²⁰, 1 = generosity/sharing/fairness, 2 or 3 = how religion/God/karma influences behavior with no prediction of results, 4 = how religion/God/karma makes people give away more money. This provided us with an approximately-continuous measure of closeness to hypotheses which was used to investigate whether participants' perceptions of the purposes of the experiment affected their DG giving. I also investigated participants' familiarity with DG-type tasks as another possible predictor of DG giving.

Hypothesis guessing, examined as a continuous measure of closeness to experimental hypotheses, did predict slightly higher giving after framing, $r = .15$, 95% CI [.08, .22], $p = <.001$. Additionally, 56% of participants had previously participated in anonymous economic game like the one used in this experiment, but there was no association between familiarity and giving (pre-framing: $r = .05$, 95% CI [-.02, .12], $p = .19$, post-framing: $r = .03$, 95% CI [-.04, .10], $p = .45$). When both familiarity and hypothesis giving were included in the model predicting DG giving (Model 2c, Table C2), supernatural framing remained the strongest predictor of giving, and the supernatural framing effect was not moderated by either familiarity or hypothesis guessing.

Social exposure to belief

We used mixed-effects models to explore whether the supernatural framing effect could have affected participants' responses by reminding them of their religious identity. If this were the case, then the supernatural framing effects may be stronger among participants who associate God/karma with their religious affiliation, who associate God/karma with the prosocial behavior of other people, or who are more personally committed to their religion. I assessed whether learning about God/karma from these social sources moderated the framing effect. Social sources of learning about God/karma were analyzed aggregated together (Table C4) and split into separate measures of religious influences, family influences, and action influences (Table C5), standardized prior to analysis. None of these variables moderated the effect of reminders of God or karma.

²⁰ The MTurk advertisement said that the study was about personal beliefs and decision making.

Table C 4. Social exposure to belief (composite) as a moderator of the God and Karma framing effects in Experiment 1

	God Frame Condition			Karma Frame Condition		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.193	0.014	<.001	0.185	0.014	<.001
Pre- vs. Post-Frame	0.087	0.013	<.001	0.110	0.012	<.001
Social exposure	0.028	0.014	.046	0.027	0.014	.056
Frame*Social exposure	0.004	0.013	.77	0.013	0.012	.28
N	254			249		
AICc	-1504.33			-1596.801		

Table C 5. Social exposure to belief as moderators of the God and Karma framing effects in Experiment 1

God Frame Condition												
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.193	0.014	<.001	0.193	0.014	<.001	0.193	0.014	<.001	0.193	0.014	<.001
Pre- vs. Post-Frame	0.087	0.013	<.001	0.087	0.013	<.001	0.087	0.013	<.001	0.087	0.013	<.001
Religion	-0.008	0.014	.58									
Frame*Religion	0.015	0.013	.25									
Family				0.013	0.014	.36						
Frame*Family				0.003	0.013	.83						
Actions							0.043	0.014	.002			
Frame* Actions							-0.000	0.013	.98			
Religiosity										0.001	0.014	.97
Frame*Religiosity										0.013	0.013	.33
AICc	-1501.251			-1500.777			-1509.568			-1500.82		
Karma Frame Condition												
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.186	0.014	<.001	0.185	0.014	<.001	0.185	0.014	<.001	0.184	0.014	<.001
Pre- vs. Post-Frame	0.109	0.012	<.001	0.110	0.012	<.001	0.110	0.012	<.001	0.109	0.012	<.001
Religion	0.008	0.014	.57									
Frame*Religion	-0.001	0.012	.93									
Family				0.025	0.014	.076						
Frame*Family				0.015	0.012	.22						
Actions							0.025	0.014	.078			
Frame* Actions							0.010	0.012	.43			
Religiosity										0.032	0.014	.023
Frame*Religiosity										-0.021	0.012	.091
AICc	-1583.105			-1596.703			-1594.933			-1606.00		

Salience of Giving in Mental Models of God and Karma

Participants were given the opportunity to list up to 5 things that God/karma would reward and 5 things that God/karma would punish. I explored whether the supernatural framing effect was stronger among participants who listed greed/generosity in their free lists, using two separate methods of quantifying participants' open-ended responses. "Presence" indicates a variable that was coded as 1 if participants listed greed/generosity one or more times in their free list responses, and 0 if greed/generosity was never listed in any of participants' 5 free list responses. "Salience" indicates a variable for which participants' responses were scaled based on that response's position in the free list. This variable ranges from 0 (never mentioned) to 1 (the first item listed), with intermediate values assigned to values listed later in the free list. Thus, higher scores indicate that the response was more central to participants' mental models of God and karma (see Purzycki & Jamieson-Lane, 2017, for full details). If participants listed more than one item that was coded as generosity/greed, the highest salience score was used for this variable. As can be seen in Table C6, the pattern (size and direction) of effects is similar for both methods of quantifying free list responses. Overall, the strongest predictor of giving in these models is the supernatural framing effect, with free list responses having only a weak and inconsistent influence on giving.

Table C 6. Free list of supernatural punishment for greed and supernatural reward for generosity as moderators of the God framing (top) and Karma framing (bottom) effects in Experiment 1

	God Punishes Greed						God Rewards Generosity					
	Presence			Salience			Presence			Salience		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.198	0.02	<.001	0.194	0.02	<.001	0.191	0.02	<.001	0.186	0.02	<.001
Pre- vs. Post-Frame	0.101	0.01	<.001	0.098	0.01	<.001	0.078	0.02	<.001	0.079	0.02	<.001
Belief	-0.027	0.03	.44	-0.018	0.06	.74	0.005	0.03	.86	0.027	0.04	.47
Frame*Belief	-0.072	0.03	.027	-0.102	0.05	.051	0.025	0.03	.36	0.030	0.04	.40
<i>N</i>	254			254			254			254		
AICc	-1509.84			-1509.63			-1503.69			-1505.32		

	Karma Punishes Greed						Karma Rewards Generosity					
	Presence			Salience			Presence			Salience		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.184	0.02	<.001	0.184	0.02	<.001	0.163	0.03	<.001	0.172	0.03	<.001
Pre- vs. Post-Frame	0.090	0.02	<.001	0.098	0.02	<.001	0.092	0.03	<.001	0.107	0.02	<.001
Belief	0.002	0.03	.96	0.001	0.04	.98	0.027	0.03	.43	0.018	0.03	.61
Frame*Belief	0.050	0.03	.048	0.044	0.03	.18	0.022	0.03	.46	0.003	0.03	.92
<i>N</i>	250			250			250			250		
AICc	-1607.69			-1606.16			-1605.54			-1604.03		

Table C 7. Descriptive statistics and bivariate correlations between all variables, Experiment 1

	God Frame Condition										
	Mean	SD	1	2	3	4	5	6	7	8	9
1. Pre-frame giving	0.19	0.22									
2. Post-frame giving	0.28	0.27	.66***								
3. Belief in karma	2.80	0.80	.08	-.03							
4. Belief in God	8.34	0.97	.10	.14*	-.13*						
5. Benevolence	4.64	0.79	.10	.10	.15*	.18**					
6. Punitiveness	2.44	1.25	.01	-.00	-.08	.04	-.00				
7. Familiarity	2.37	1.52	-.02	-.01	-.12	.04	-.06	-.07			
8. Hypothesis Guessing	1.25	2.22	.10	.13*	-.13*	-.10	.08	-.04	.07		
9. God punishes greed	0.20	0.40	-.04	-.14*	.03	.10	.05	-.01	.07	.11	
10. God rewards generosity	0.36	0.48	.03	.06	-.01	.08	.20**	-.03	.07	.10	.24***

Karma Frame Condition											
	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Pre-frame giving	0.18	0.22									
2. Post-frame giving	0.29	0.23	.63***								
3. Belief in karma	3.39	0.60	.01	.07							
4. Belief in God	6.56	2.72	.15*	.06	-.12						
5. Benevolence	3.12	1.21	.12	.20**	.12	-.02					
6. Punitiveness	3.16	1.15	-.07	-.06	.06	.19**	-.12				
7. Familiarity	2.18	1.43	.11	.09	-.08	-.06	-.05	-.14*			
8. Hypothesis Guessing	1.09	2.12	.11	.11	-.03	.00	.03	-.03	.15*		
9. Karma punishes greed	0.38	0.49	-.01	.10	-.01	.01	.14*	-.08	-.01	.09	
10. Karma rewards generosity	0.78	0.41	.04	.09	-.07	.01	.06	.02	-.10	.13*	.28***
Neutral Frame Condition											
	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6	7		
1. Pre-frame giving	0.19	0.22									
2. Post-frame giving	0.19	0.22	.89***								
3. Belief in karma	2.95	0.81	.08	.11							
4. Belief in God	7.22	2.38	.01	-.01	-.21**						
5. Benevolence	4.14	1.16	-.03	-.09	-.33***	.47***					
6. Punitiveness	2.70	1.19	.04	.04	.13*	-.12	-.24***				
7. Familiarity	2.30	1.48	.07	.05	-.09	-.03	.01	-.04			
8. Hypothesis Guessing	-0.19	1.50	.07	.03	-.03	-.09	-.05	-.07	.07		

* $p < .05$, ** $p < .01$, *** $p < .001$

Experiment 2 Supplementary Results

Supplementary Figures

Figure C 1. Distribution of dictator game giving in Experiment 2, before and after supernatural framing

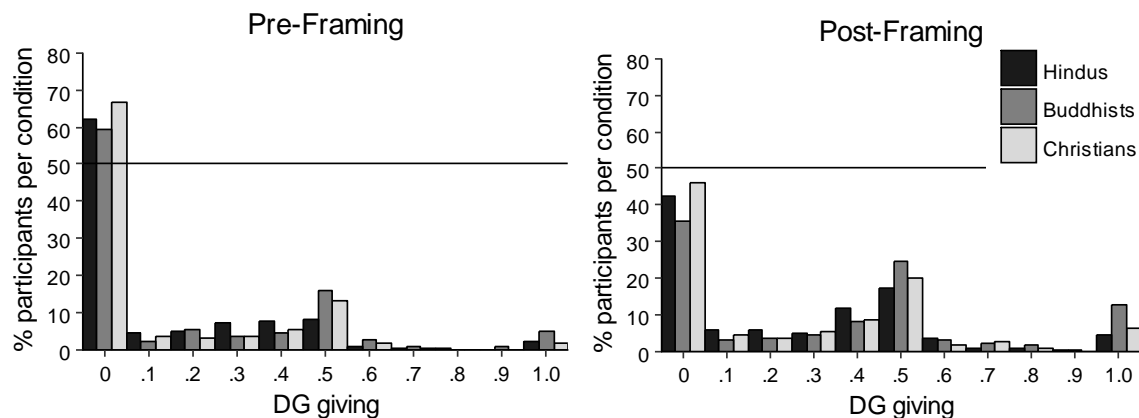
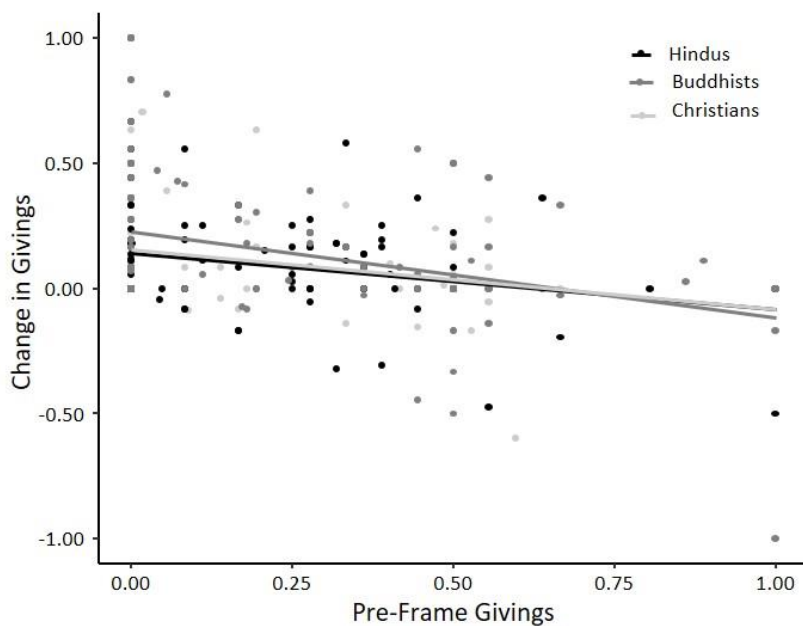


Figure C 2. Initial giving predicting change in giving after supernatural framing in Experiment 2 Dots reflect data points for each participant, with lines summarizing this relationship within each condition.



Preregistered Analyses

Possible moderators: Beliefs about God and karma

We examined several alternative mixed-effects models that predicted DG giving from features of the experiment (pre- or post-framing, trial amount), individual differences in belief (level of belief in God and karma, view of God/karma as benevolent or punitive). Features of the experiment were dummy coded: Frame (0 = pre-framing, 1 = post-framing), Trial_{D1} (0 = \$2.00, 1 = \$3.00), and Trial_{D2} (0 = \$2.00, 1 = \$4.00). Religious affiliation was dummy coded with Christians as the reference group. Belief in God, belief in karma, benevolence, punitiveness, and familiarity were standardized prior to analysis.

Result of these models can be seen in Table C9, and bivariate relationships between supernatural belief and giving can be seen in Table C8. Overall, there was also a small negative correlation between giving and belief in God, which was mirrored by a negative association between giving and frequency of thinking about God. This can be explained by the generally high generosity and low belief in God among Buddhists in this sample. Consistent with this hypothesis, this negative relationship disappears when participants' religious affiliation was accounted for in the model. There was no association between giving and belief in karma or frequency of thinking about karma. There was no association between giving and views of supernatural benevolence/punitiveness (indexed either through trait attribution or through belief in supernatural rewards and punishments for one's actions). When all individual differences and experimental conditions are accounted for in the model (Model S9b), the largest, and only statistically significant, predictor of DG giving was supernatural framing: participants were more generous after reminders of God or karma than they were on previous trials.

Table C 8. Experiment 2 correlations [95% CI] between beliefs about God and karma and dictator game giving.

	Pre-frame giving	Post-frame giving
Belief in God	-.07 [-.14, -.01]	-.12** [-.20, -.04]
Belief in karma	.03 [-.05, .11]	.08 [-.003, .16]
Benevolence (overall)	-.04 [-.12, .04]	.01 [-.08, .09]
Hindu (Karma)	.03 [-.11, .16]	-.01 [-.12, .14]
Buddhist (Karma)	.001 [-.14, .14]	.08 [-.06, .21]
Christian (God)	-.17* [-.30, -.03]	.002 [-.13, .14]
Punitiveness (overall)	.01 [-.07, .09]	-.02 [-.10, .06]
Hindu (Karma)	-.03 [-.17, .11]	-.02 [-.15, .12]
Buddhist (Karma)	-.05 [-.19, .08]	-.03 [-.17, .11]
Christian (God)	.11 [-.03, .24]	-.04 [-.18, .10]
Thinking about God	-.07 [-.15, .01]	-.09 [-.17, -.01]*
Thinking about karma	-.003 [-.08, .08]	.05 [-.03, .13]

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table C 9. Experiment 2 dictator game giving predicted from features of the experiment, individual differences in participant belief, and hypothesis guessing and familiarity with task

	Model S9a: Experimental Conditions			Model S9b: Experimental Conditions and Individual Differences			Model S9c: Experimental Conditions, Individual Differences, and Hypothesis Guessing		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.147	0.018	<.001	0.155	0.023	<.001	0.153	0.023	<.001
Trial _{D1}	-0.003	0.006	.66	-0.003	0.006	.66	-0.003	0.007	.69
Trial _{D2}	-0.003	0.006	.64	-0.003	0.006	.64	-0.003	0.007	.69
Pre- vs. Post-Frame	0.122	0.019	<.001	0.098	0.031	.002	0.099	0.031	.011
Hindu	0.005	0.025	.85	-0.005	0.032	.89	0.001	0.032	.97
Buddhist	0.057	0.025	.025	0.043	0.034	.20	0.048	0.034	.16
Trial _{D1} *Frame	0.001	0.009	.92	0.001	0.009	.92	0.001	0.009	.94
Trial _{D2} *Frame	-0.004	0.009	.66	-0.004	0.009	.66	-0.003	0.009	.76
Hindu*Frame	-0.013	0.026	.61	-0.001	0.038	.99	-0.002	0.038	.81
Buddhist *Frame	0.040	0.026	.12	0.032	0.039	.41	0.032	0.039	.39
Belief in God				-0.005	0.013	.67	-0.003	0.013	.84
Belief in karma				0.003	0.013	.80	0.004	0.013	.73
Benevolence				-0.005	0.012	.65	-0.007	0.012	.54
Punitiveness				0.000	0.011	.99	0.001	0.011	.93
God*Frame				-0.006	0.029	.82	-0.007	0.028	.80
Karma*Frame				0.010	0.021	.61	0.011	0.021	.60
Benevolence*Frame				0.047	0.040	.24	0.046	0.040	.25
Punitiveness*Frame				-0.025	0.020	.21	-0.024	0.020	.22
God*Frame*Hindu				-0.020	0.037	.59	-0.019	0.037	.62
God*Frame* Buddhist				-0.040	0.034	.23	-0.035	0.034	.30
Karma*Frame*Hindu				0.026	0.031	.39	0.026	0.031	.39
Karma*Frame* Buddhist				0.021	0.030	.49	0.025	0.031	.41
Benevolence *Frame* Hindu				-0.051	0.044	.25	-0.053	0.044	.23
Benevolence *Frame* Buddhist				-0.012	0.043	.78	-0.010	0.043	.83
Punitiveness *Frame* Hindu				0.024	0.027	.38	0.024	0.027	.39
Punitiveness *Frame* Buddhist				0.024	0.026	.35	0.021	0.026	.43
Hypothesis Guess							0.018	0.011	.080
Hypothesis Guess *Frame							0.008	0.011	.46
<i>N</i>	607			607			597		
AICc	-2192.16			-2079.52			-2026.59		

Note. Bolded estimates are statistically significant at $p < .05$.

Alternative analyses accounting for religious affiliation differences

Dictator game giving can also be analyzed through a 2 (Framing) x 3 (Religious Group: Hindu, Buddhist, Christian) mixed ANOVA. This analysis showed a main effect of framing, $F(1, 604) = 149.25, p < .001, \eta_p^2 = .20$, and no interaction between framing and religious group, $F(2, 604) = 2.27, p = .10, \eta_p^2 = .01$. The ANOVA also revealed a main effect of religious group, such that Buddhists were more generous overall than were Hindus or Christians, $F(2, 604) = 6.42, p = .002, \eta_p^2 = .02$. Exploratory follow-up analyses indicated that it was specifically Buddhist converts who were more generous than other participants. Only 50% of Buddhist participants came from Buddhist families, whereas 92% of Christians and 96% of Hindus came from Christian and Hindu families, respectively, and it was specifically Buddhist converts (pre-framing: $M = .23$, 95% CI [.18, .29], post-framing: $M = .42$, 95% CI [.36, .49]) who were more generous than Hindus and Christians. Buddhists from Buddhist families (pre-framing: $M = .17$, 95% CI [.13, .23], post-framing: $M = .30$, 95% CI [.24, .36]) did not significantly differ from Hindus and Christians.

Exploratory Analyses

Excluded sample

The primary pattern of results remains unchanged when I included data from everyone who answered the dictator game questions: there remained a significant effect of framing for Christians, $d = 0.57$, 95% CI [0.41, 0.73], $t(318) = 10.22, p < .001$, Hindus, $d = 0.48$, 95% CI [0.33, 0.64], $t(316) = 8.63, p < .001$, and Buddhists, $d = 0.56$, 95% CI [0.38, 0.74], $t(308) = 8.78, p < .001$.

Decision-making strategy

Participants responded to an open-ended question about the strategy that they used to make their dictator game decisions. Using the coding scheme developed in Experiment 1, I coded (1) whether participants mentioned God or karma, (2) if God or karma made them give more, less, or did not affect their giving, and (3) other reasons for their decision.

In their open-ended descriptions of how they made their dictator game decisions, participants generally (90%) did not mention God or karma. Many participants mentioned sharing/fairness/norms of giving (25.9%, post-frame giving: $M = 0.49, SD = 0.17$). Only 7.5% of participants mentioned religious or supernatural motives for sharing, such as God wanting them to share, the obligation of tithing, or wanting future good consequences for themselves (post-frame giving: $M = 0.45, SD = 0.32$). Reasons for keeping the money were primarily participants' thinking that they deserve the money (13.9%, post-frame giving: $M = 0.06, SD = 0.16$), needing the money for themselves (8.3%, post-frame giving: $M = 0.19, SD = 0.30$), or not wanting to share because they do not know the person receiving the money (10.9%, post-frame giving: $M = 0.08, SD = 0.19$).

Karma was mentioned by 8% of Hindus, 8% of Buddhists, and by no Christians. God was mentioned by 14% of Christians, 1% of Hindus, and no Buddhists. Of those who mentioned karma, 52% said that karma led them to give more money, 15% said to karma led them to keep

the money, and 33% did not say that karma affected their giving. In contrast, of those who mentioned God, approximately equal numbers of people said that God led them to give more money (30%) or led them to keep the money (27%), while 43% did not say that God affected their giving. Mentioning God or karma was not associated with greater giving after supernatural framing ($M = 0.29$ vs. 0.32 , $t(76) = -.69$, $p = .49$). However, those who said that God/karma made them give more money did give away more than those who said God/karma caused them to keep money, $r = .51$, $p < .001$.

Possible moderators

Hypothesis Guessing

Participants responded to an open-ended question about the hypotheses investigated in this experiment, which were coded by a research assistant using the same coding scheme as in Experiment 1. In their open-ended estimates of the purpose of this experiment, only 12% of participants mentioned God, karma, or religiosity. Hypothesis guessing, examined as a continuous measure of closeness to experimental hypotheses, did predict slightly higher giving after framing, $r = .09$, 95% CI [.01, .17], $p = .027$. However, when hypothesis guessing was included in the model predicting DG giving (Model S9c, Table C9), supernatural framing remained the strongest predictor of giving, and this effect was not moderated by hypothesis guessing. In this sample, 97% of participants had never participated in an economic game task like the one used in the experiment. Therefore, I did not examine whether familiarity with this type of task predicted dictator game giving.

Social exposure to belief

We used mixed-effects models to explore whether the supernatural framing effect could have affected participants' responses by reminding them of their religious identity. I assessed whether learning about God/karma from various social sources moderated the framing effect. Social sources of learning about God/karma were analyzed aggregated together (Table C10) and split into separate measures of religious influences, family influences, and action influences (Table C11) standardized prior to analysis. None of these variables moderated the effect of reminders of God or karma. Participants' personal religiosity also did not moderate the supernatural framing effect.

Table C 10. Social exposure to belief as a moderator of the God and Karma framing effects in Experiment 2

	Christians			Hindus			Buddhists		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.145	0.017	<.001	0.150	0.017	<.001	0.202	0.020	<.001
Pre- vs. Post-Frame	0.121	0.018	<.001	0.107	0.016	<.001	0.160	0.021	<.001
Social exposure	-0.003	0.017	.88	0.016	0.017	.33	-0.006	0.020	.76
Frame*Social exposure	-0.006	0.018	.75	0.021	0.016	.17	-0.003	0.021	.88
<i>N</i>	203			200			204		
AICc	-794.4768			-867.6102			-545.1474		

Table C 11. Social exposure to belief as moderators of the God and Karma framing effects in Experiment 2

Christians												
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.144	0.017	<.001	0.145	0.017	<.001	0.145	0.017	<.001	0.145	0.017	<.001
Pre- vs. Post-Frame	0.122	0.018	<.001	0.121	0.018	<.001	0.121	0.018	<.001	0.121	0.018	<.001
Religion	-0.002	0.017	.88									
Frame*Religion	0.006	0.018	.72									
Family				-0.012	0.017	.47						
Frame*Family				0.009	0.018	.59						
Actions							0.006	0.017	.70			
Frame* Actions							-0.021	0.018	.23			
Religiosity										-0.004	0.017	.80
Frame*Religiosity										0.017	0.018	.32
AICc	-804.53			-795.00			-795.77			-795.28		
Hindus												
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.150	0.017	<.001	0.150	0.017	<.001	0.150	0.017	<.001	0.150	0.017	<.001
Pre- vs. Post-Frame	0.107	0.016	<.001	0.107	0.016	<.001	0.107	0.016	<.001	0.107	0.016	<.001
Religion	-0.022	0.017	.19									
Frame*Religion	0.027	0.016	.081									
Family				0.009	0.017	.58						
Frame*Family				0.021	0.016	.18						
Actions							0.029	0.017	.078			
Frame* Actions							0.013	0.016	.39			
Religiosity										0.010	0.017	.55
Frame*Religiosity										0.028	0.016	.075
AICc	- 867.93			-866.63			-868.84			-868.17		

Table C 11 (continued). Social exposure to belief as moderators of the God and Karma framing effects in Experiment 2

	Buddhists											
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.202	0.020	<.001	0.202	0.020	<.001	0.202	0.020	<.001	0.202	0.020	<.001
Pre- vs. Post-Frame	0.160	0.021	<.001	0.160	0.021	<.001	0.160	0.021	<.001	0.160	0.021	<.001
Religion	-0.035	0.020	.086									
Frame*Religion	0.013	0.021	.54									
Family				0.009	0.020	.67						
Frame*Family				-0.015	0.021	.48						
Actions							-0.009	0.020	.67			
Frame* Actions							0.003	0.021	.87			
Religiosity										0.006	0.020	.78
Frame*Religiosity										0.006	0.021	.79
AICc	-547.94			-545.51			-545.16			-545.20		

Salience of Giving in Mental Models of God and Karma

Participants were given the opportunity to list up to 5 things that God/karma would reward and 5 things that God/karma would punish, and these scores were quantified by either the presence/absence of each category or the maximum salience of each category, as in Experiment 1. As can be seen in Table C12, the pattern (size and direction) of effects is generally similar for both methods of quantifying free list responses, with the exception that among Buddhists salience (but not presence) of greed in free list responses predicted greater giving, and the presence (but not salience) of generosity in free list responses predicted greater giving. Together, these results provide some support for an association between belief in supernatural rewards for generosity and greater giving in our experiment, although this effect was not consistent across samples and studies so should be interpreted with caution.

Table C 12. Free list of supernatural punishment for greed and supernatural reward for generosity as moderators of the supernatural framing effects in Experiment 2

Christians												
	God Punishes Greed						God Rewards Generosity					
	Presence			Salience			Presence			Salience		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.142	0.019	<.001	0.144	0.018	<.001	0.144	0.023	<.001	0.141	0.022	<.001
Pre- vs. Post-Frame	0.118	0.020	<.001	0.119	0.019	<.001	0.074	0.024	.003	0.082	0.023	<.001
Belief	0.012	0.040	.76	0.009	0.059	.89	0.002	0.033	.95	0.012	0.041	.76
Frame*Belief	0.010	0.043	.81	0.015	0.063	.81	0.096	0.035	.006	0.106	0.043	.014
<i>N</i>	203			203			203			203		
AICc	- 798.05			-799.53			- 805.07			- 804.74		

Hindus												
	Karma Punishes Greed						Karma Rewards Generosity					
	Presence			Salience			Presence			Salience		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.133	0.020	<.001	0.132	0.019	<.001	0.148	0.029	<.001	0.161	0.027	<.001
Pre- vs. Post-Frame	0.112	0.019	<.001	0.118	0.018	<.001	0.060	0.027	.026	0.061	0.026	.018
Belief	0.050	0.035	.16	0.085	0.049	.084	0.002	0.035	.95	-0.019	0.038	.61
Frame*Belief	-0.016	0.033	.64	-0.051	0.047	.27	0.071	0.033	.033	0.082	0.036	.024
<i>N</i>	200			200			200			200		
AICc	- 869.00			- 871.85			- 871.90			- 872.45		

Buddhists												
	Karma Punishes Greed						Karma Rewards Generosity					
	Presence			Salience			Presence			Salience		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.185	0.026	<.001	0.173	0.024	<.001	0.122	0.037	.001	0.155	0.033	<.001
Pre- vs. Post-Frame	0.142	0.027	<.001	0.140	0.026	<.001	0.169	0.040	<.001	0.161	0.035	<.001
Belief	0.045	0.042	.28	0.118	0.055	.033	0.112	0.044	.012	0.084	0.047	.078
Frame*Belief	0.049	0.044	.26	0.082	0.058	.16	-0.012	0.047	.79	-0.001	0.050	.98
<i>N</i>	204			204			204			204		
AICc	- 551.57			-558.77			- 554.89			- 551.87		

Table C 13. Descriptive statistics and bivariate correlations between all variables, Experiment 2

	Christians										
	Mean	SD	1	2	3	4	5	6	7	8	9
1. Pre-frame giving	0.15	0.23									
2. Post-frame giving	0.27	0.30	.59***								
3. Belief in karma	2.77	0.71	-.04	.02							
4. Belief in God	4.50	0.97	-.08	-.01	.05						
5. Benevolence	4.76	0.63	-.17*	.00	.10	.60***					
6. Punitiveness	2.24	1.12	.11	-.04	-.06	-.07	-.25***				
7. Familiarity	1.06	0.37	.23**	.10	.02	.06	-.20**	.13			
8. Hypothesis Guessing	-0.11	1.79	.03	.13	-.04	.05	.08	-.07	-.10		
9. God punishes greed	0.22	0.41	.02	.03	-.06	-.01	.01	-.08	-.08	-.05	
10. God rewards generosity	0.49	0.50	.00	.16*	.10	.09	.21**	-.10	-.10	.12	.13

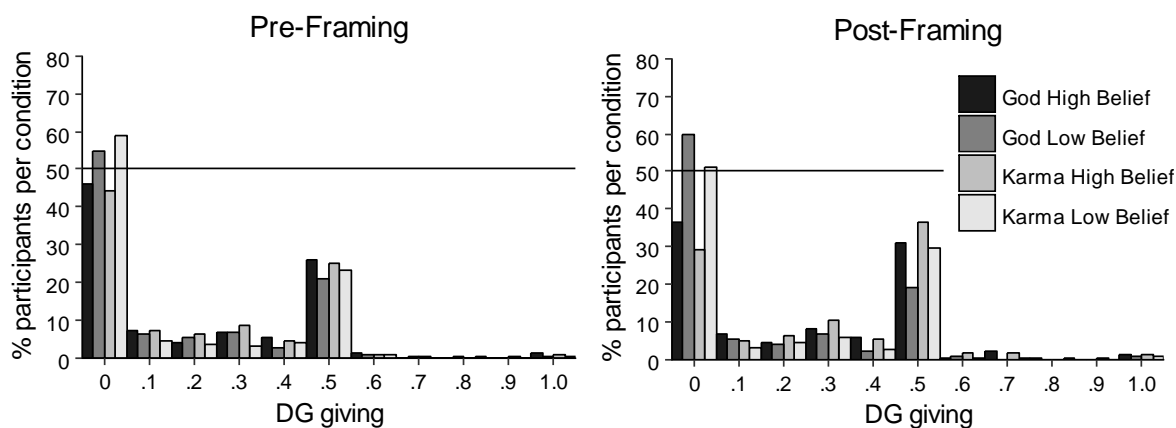
Hindus											
	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Pre-frame giving	0.15	0.23									
2. Post-frame giving	0.26	0.28	.65***								
3. Belief in karma	3.73	0.72	-.01	.07							
4. Belief in God	4.29	1.02	-.00	-.04	.44***						
5. Benevolence	3.82	1.13	.02	-.01	.24***	.23**					
6. Punitiveness	2.79	1.15	-.03	-.01	.12	.08	-.11				
7. Familiarity	1.07	0.39	.22**	.06	.04	-.07	-.14	-.02			
8. Hypothesis Guessing	-0.62	1.58	-.06	-.03	-.10	-.09	-.00	-.03	-.01		
9. Karma punishes greed	0.33	0.47	.10	.06	.08	.08	.09	-.13	.13	.18*	
10. Karma rewards generosity	0.66	0.47	.00	.11	.01	-.06	-.03	-.02	-.02	.14	.30***
Buddhists											
	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Pre-frame giving	0.20	0.29									
2. Post-frame giving	0.36	0.34	.55***								
3. Belief in karma	3.63	0.67	.06	.10							
4. Belief in God	3.18	1.27	.01	-.08	.25***						
5. Benevolence	3.83	1.16	-.00	.08	.08	.21**					
6. Punitiveness	2.67	1.27	-.06	-.04	.24***	.22**	.14				
7. Familiarity	1.05	0.34	-.02	-.02	.05	-.14	-.06	-.03			
8. Hypothesis Guessing	-0.31	1.77	.20**	.14	-.09	-.14	-.02	-.07	.10		
9. Karma punishes greed	0.38	0.49	.08	.13	-.03	-.04	.06	-.15*	.04	.05	
10. Karma rewards generosity	0.71	0.45	.17*	.14*	.05	.06	.14	.05	-.01	.06	.12

* $p < .05$, ** $p < .01$, *** $p < .001$

Experiment 3 Supplementary Results

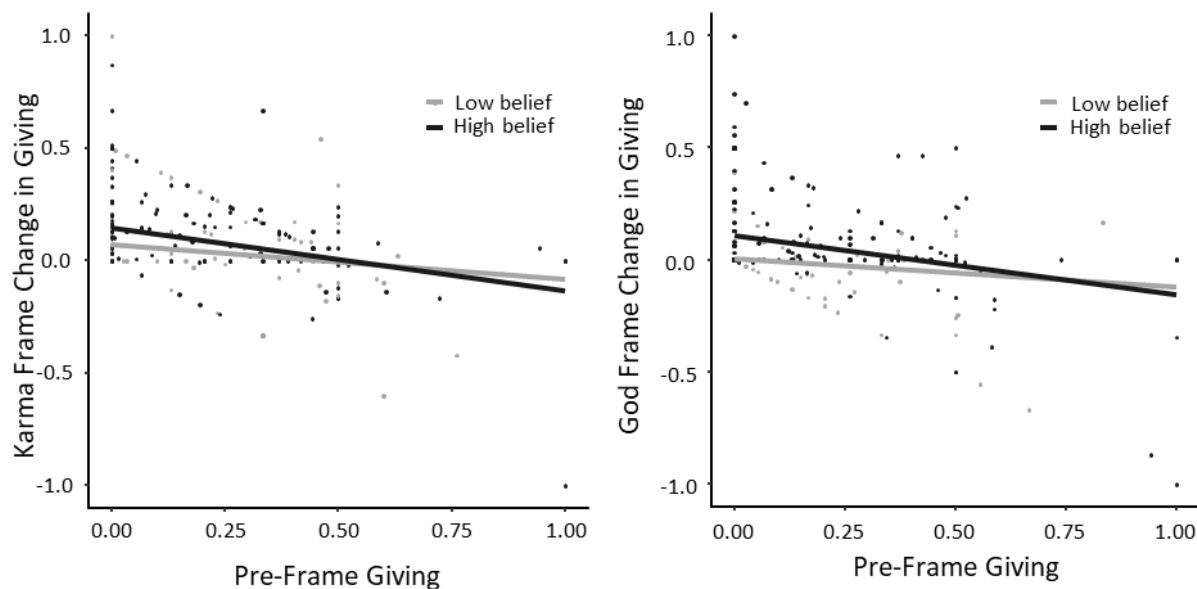
Supplementary Figures

Figure C 3. Distribution of dictator game giving in Experiment 3, before and after supernatural framing



Note. Participants were split into high and low belief based on a binary measure of belief in God and a median split of belief in karma.

Figure C 4. Initial giving predicting change in giving after thinking about Karma (left) and God (right) in Experiment 3. Dots reflect data points for each participant, with lines summarizing this relationship within each condition.



Preregistered Analyses

Possible moderators: Beliefs about God and karma

We examined how participants' views of God/karma moderated the framing effect. Variables were dummy coded and standardized as in Experiment 1. As can be seen in Table C14 and Table C15 (Model S15b), there was an overall association between views of supernatural benevolence and giving (and no association with punitiveness). Perceptions of supernatural benevolence and punitiveness did not moderate the effect of supernatural framing on giving. There was also an overall association between belief in God and karma and giving, and a significant interaction between participants' level of belief and the supernatural framing effect: Believers increased giving after framing more so than non-believers, an interaction that did not differ between the God and karma framing conditions.

Table C 14. Experiment 3 correlations [95% CI] between beliefs about God and karma and dictator game giving.

	Pre-frame giving	Post-frame giving
Belief in God	.10 [.04, .16]**	.15 [.08, .21]***
Belief in karma	.09 [.02, .15]**	.16 [.10, .22]***
Benevolence (overall)	.14 [.08, .20]***	.15 [.09, .21]***
God frame condition	.08 [-.005, .17]	.18*** [.09, .26]
Karma frame condition	.22*** [.13, .30]	.23*** [.15, .31]
Punitiveness (overall)	-.06 [-.12, .002]	-.08 [-.14, -.02]*
God frame condition	-.07 [-.16, .02]	-.11* [-.19, -.02]
Karma frame condition	-.04 [-.13, .04]	-.08 [-.16, .01]
Thinking about God	.12 [.06, .18]***	.17 [.11, .23]***
Thinking about karma	.11 [.05, .17]***	.15 [.09, .21]***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table C 15. Experiment 3 dictator game giving predicted from features of the experiment, individual differences in participant belief

	Model S15a: Experimental Conditions			Model S15b: Experimental Conditions and Individual Differences		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.197	0.011	<.001	0.179	0.012	<.001
Trial _{D1}	0.009	0.004	.024	0.009	0.004	.024
Trial _{D2}	0.006	0.004	.15	0.006	0.004	.15
Pre- vs. Post-Frame	0.023	0.008	.004	0.021	0.009	.028
Condition	-0.006	0.015	.68	0.030	0.017	.091
Trial _{D1} *Frame	-0.005	0.005	.37	-0.005	0.005	.37
Trial _{D2} *Frame	0.001	0.005	.80	0.001	0.005	.80
Condition* Frame	0.039	0.011	<.001	0.044	0.012	<.001
Belief	0.023	0.008	.002	0.009	0.008	.25
Belief*Frame	0.033	0.007	<.001	0.030	0.009	<.001
Belief*Frame* Condition	-0.013	0.010	.720	-0.009	0.011	.40
Benevolence				0.035	0.010	<.001
Punitiveness				-0.004	0.008	.57
Benevolence* Frame				0.005	0.010	.60
Punitiveness* Frame				-0.001	0.007	.90
Benevolence* Frame*Condition				-0.004	0.013	.78
Punitiveness* Frame*Condition				-0.006	0.011	.57
N	986			986		
AICc	-6942.12			- 6912.45		

Note. Bolded estimates are significant at $p < .05$.

Alternative analyses

In an alternative analysis, I split participants into those high and low in belief and conducted a 2 (framing) x 2 (Condition: God vs. Karma) x 2 (Belief: low belief vs. high belief) mixed ANOVA. There was a main effect of framing, $F(1, 982) = 53.02, p < .001, \eta_p^2 = .05$, and a main effect of belief, $F(1, 982) = 25.38, p < .001, \eta_p^2 = .03$, that was qualified by a significant interaction between framing and condition, $F(1, 982) = 17.91, p < .001, \eta_p^2 = .02$, and between framing and belief, $F(1, 982) = 25.46, p < .001, \eta_p^2 = .03$. There was no main effect of condition, $F(1, 982) = 1.96, p = .16, \eta_p^2 = .002$, no interaction between condition and belief, $F(1, 982) = 0.20, p = .65, \eta_p^2 = .00$, and no interaction between framing, condition, and belief, $F(1, 982) = 1.18, p = 0.28, \eta_p^2 = .001$.

Exploratory Analyses

Excluded sample

The primary pattern of results remains unchanged when I included data from everyone who answered the dictator game questions. When reminded of God, those who believe in God became more generous, $d = 0.25$, 95% CI [0.10, 0.42], $t(300) = 4.48, p < .001$, while non-believers became slightly less generous, $d = -0.15$, 95% CI [-0.34, 0.05], $t(206) = -2.10, p = .037$. In contrast, when reminded of karma all participants became more generous, although this increase in giving was greater for those who believe in karma, $d = 0.45$, 95% CI [0.27, 0.63], $t(243) = 7.09, p < .001$, than for non-believers, $d = 0.26$, 95% CI [0.09, 0.43], $t(261) = 4.21, p < .001$.

The primary pattern of results also remains unchanged when I exclude participants who completed the study in less than 5 minutes (as was initially proposed, in addition to other exclusion criteria). When reminded of God, those who believe in God became more generous, $d = 0.31$, 95% CI [0.13, .049], $t(239) = 4.77, p < .001$, while non-believers became slightly less generous, $d = -0.18$, 95% CI [-0.41, 0.05], $t(145) = 2.22, p = .028$. In contrast, when reminded of karma all participants became more generous, although this increase in giving was greater for those who believe in karma, $d = 0.49$, 95% CI [0.28, 0.71], $t(171) = 6.44, p < .001$, than for non-believers, $d = 0.27$, 95% CI [0.05, 0.48], $t(173) = 3.52, p < .001$.

Decision-making strategy

We asked participants in the God frame condition whether thinking about God affected how much they gave. 76.7% of participants responded that thinking about God did not affect how much they gave (40.1% responded that they believe in God, but thinking about God did not affect their response; 36.6 % responded that they did not believe in God and thinking about God did not affect their response). Consistent with their responses, those who said that thinking about God did not affect their decision-making did not significantly change their giving in response to the frame: Believers $d = -0.03$, 95% CI [-0.23, 0.16], $t(199) = -0.48, p = .63$, Nonbelievers $d = -0.12$, 95% CI [-0.33, 0.08], $t(181) = 1.68, p = .096$.

The remaining 23.3% of participants said that thinking about God did affect their donations (17.4% said they believe in God and it affected their response; 5.6% said they did not

believe in God but it affected how they responded). Believers who said they were affected by the God frame significantly increased their donations in response to the frame, $d = 0.69$, 95% CI [0.38, 1.00], $t(85) = 6.43$, $p < .001$. Nonbelievers who said they were affected gave less, although this change was not statistically significant, $d = -0.15$, 95% CI [-0.67, 0.37], $t(29) = 0.83$, $p = .41$.

Additionally, I analyzed the direction of change in giving (i.e. increase vs. decrease) as a function of belief. Among believers, 27.2% gave more than they originally did after being asked to think about God, while only 7.1% gave less (the remaining 65.7% gave exactly the same amount). Among non-believers, 8.7% gave more after being told to think about God, while 14.6% gave less (the remaining 76.7% gave exactly the same amount). In general, reminding believers about God tended to increase giving, but reminding non-believers about God tended to decrease giving or fail to change it at all.

In contrast to participants reminded of God, a smaller percentage of participants (64.0%) reported being unaffected by thinking about karma (29.7% reported believing but not being affected; 34.3% reported not believing and not being affected). Consistent with their responses to this question, giving did not change across trials among believers, $d = 0.08$, 95% CI [-0.15, 0.31], $t(144) = 0.98$, $p = .33$, or non-believers, $d = -0.07$, 95% CI [-0.28, 0.15], $t(166) = 0.88$, $p = .38$, who reported being unaffected by reminders of karma.

The remaining 36.0% of participants reported being affected by the frame (26.7% said they believed and were affected; 9.3% said they did not believe and were affected). Giving significantly increased among both believers, $d = 0.84$, 95% CI [0.58, 1.09], $t(131) = 9.54$, $p < .001$, and non-believers, $d = 0.81$, 95% CI [0.38, 1.24], $t(45) = 5.49$, $p < .001$, who said that they were affected by reminders of karma.

We again analyzed the direction of change in giving as a function of belief. Among those high in belief in karma, 6.7% decreased their giving when thinking about karma, while 41.3% increased their giving (the remaining 52.0% did not change their pattern of giving). Among those low in belief in karma, only 7.5% decreased their donation amount when thinking about karma, while 19.1% increased their donations (the remaining 73.4% did not change their pattern of giving). Therefore, thinking about karma and God seem to have similar effects on generosity among believers, but divergent effects on the generosity of non-believers, with karma increasing and God slightly decreasing non-believers' giving.

Possible moderators: Hypothesis guessing

Participants completed an open-ended question regarding the purpose of the study. These responses were coded using the same coding scheme used in Experiments 1 and 2. Here, hypothesis guessing did not predict post-frame giving, $r = -.05$, 95% CI [-.11, .01], $p = .11$. This was true both for those in the God condition ($r = -.07$, 95% CI [-.16, .02], $p = .12$) and those in the karma condition ($r = -.02$, 95% CI [-.11, .07], $p = .63$). Therefore, consistent with results from Experiments 1 and 2, participants' perception of the hypotheses of the experiment cannot explain the supernatural framing effect described above.

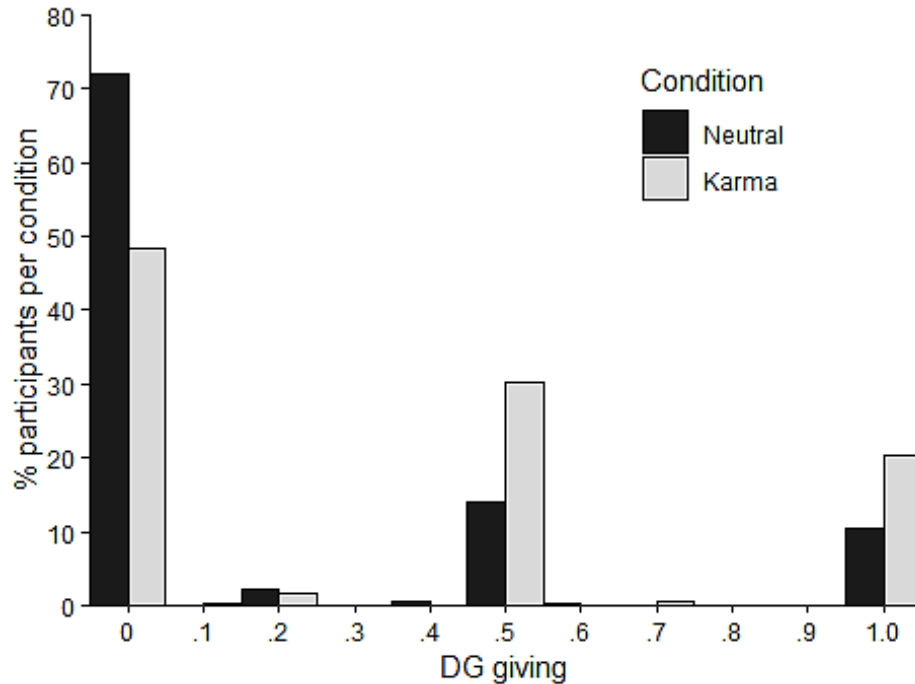
Table C 16. Descriptive statistics and bivariate correlations between all variables, Experiment 3

God Frame Condition							
	<i>Mean</i>	<i>SD</i>	1	2	3	4	5
1. Pre-frame giving	0.20	0.24					
2. Post-frame giving	0.22	0.25	.77***				
3. Belief in karma	2.55	0.89	.08	.15***			
4. Belief in God	5.54	3.30	.11*	.23***	.45***		
5. Benevolence	4.20	1.07	.08	.18***	.24***	.53***	
6. Punitiveness	2.75	1.21	-.07	-.11*	-.22***	-.26***	-.26***
Karma Frame Condition							
	<i>Mean</i>	<i>SD</i>	1	2	3	4	5
1. Pre-frame giving	0.20	0.23					
2. Post-frame giving	0.26	0.25	.75***				
3. Belief in karma	2.59	0.87	.09	.17***			
4. Belief in God	5.56	3.17	.10*	.05	.38***		
5. Benevolence	2.96	1.16	.22***	.23***	.31***	.06	
6. Punitiveness	3.15	1.09	-.04	-.08	-.04	.11*	-.26***

* $p < .05$, ** $p < .01$, *** $p < .001$

Experiment 4 Supplementary Results

Figure C 5. Distribution of dictator game giving in Experiment 4



Exploratory Analyses

Excluded sample

The primary pattern of results remains unchanged when I included data from everyone who answered the dictator game questions: Participants asked to think about karma gave away more money than did participants not reminded of karma, $d = 0.40$, 95% CI [0.31, 0.50], $t(1747.8) = 8.53$, $p < .001$, but this experimental effect interacted with participants' level of belief in karma, with a greater difference between the karma framing and control condition when participants were higher in belief in karma, $b = 0.044$, 95% [0.011, 0.076], $p = .008$.

Possible moderators

Hypothesis Guessing

Participants responded to an open-ended question about the hypotheses investigated in this experiment, which were coded by a research assistant using the same coding scheme as in Experiment 1. Hypothesis guessing, examined as a continuous measure of closeness to experimental hypotheses, was unassociated with giving in the karma framing condition, $r = .02$, 95% CI $[-.06, .10]$, $p = .62$, and the control condition, $r = .004$, $[-.08, .08]$, $p = .93$, and when hypothesis guessing was included in the model predicting DG giving (Model S17c, Table C17), hypothesis guessing did not moderate the supernatural framing effect. In this sample, 94% of participants had never participated in an economic game task like the one used in the experiment. Therefore, I did not examine whether familiarity with this type of task predicted dictator game giving.

Beliefs about karma

We explored whether holding specific views of karma as morally-concerned predicting giving. Among participants in the karma framing condition (but not in the control condition), giving was significantly correlated with stronger belief that karma rewards good behavior or punishes bad behavior (Table C18). Giving was not significantly associated with other aspects of karma that are less directly moralistic, such as the view that karma is loving and forgiving or that karma merely knows people's thoughts and actions. Similarly, when giving was predicted from belief in karma, belief in karma's reward/punishment of behavior, karma's benevolence, karma's knowledge, experimental condition, and all interactions between beliefs and condition, it was belief in karma's reward/punishment of behavior that was the strongest (and only statistically significant) moderator of the karma framing effect (Table C17, Model S17b).

Table C 17. Experiment 4 dictator game giving predicted from features of the experiment, individual differences in participant belief, and hypothesis guessing

	Model S17a: Experimental Conditions			Model S17b: Experimental Conditions and Individual Differences			Model S17c: Experimental Conditions, Individual Differences, and Hypothesis Guessing		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	0.183	0.015	<0.001	0.182	0.015	<0.001	0.183	0.016	<0.001
Karma vs. Control Condition	0.174	0.020	<0.001	0.173	0.020	<0.001	0.173	0.022	<0.001
Belief in Karma	-0.023	0.014	0.12	-0.025	0.017	0.16	-0.025	0.017	0.16
Condition*Karma	0.053	0.020	0.010	0.043	0.025	0.088	0.043	0.025	0.086
Karma Rewards/Punishes				-0.021	0.020	0.29	-0.022	0.020	0.28
Karma's Benevolence				0.015	0.019	0.45	0.015	0.019	0.44
Karma's Knowledge				0.012	0.023	0.62	0.012	0.023	0.62
Condition *Rewards/Punishments				0.063	0.027	0.020	0.063	0.027	0.023
Condition *Benevolence				-0.028	0.027	0.29	-0.028	0.027	0.30
Condition *Knowledge				-0.013	0.031	0.67	-0.012	0.031	0.69
Hypothesis Guess							0.001	0.011	0.90
Condition *Hypothesis Guess							0.004	0.015	0.80
<i>N</i>		1244			1241			1241	
AICc		994.53			993.62			997.31	

Table C 18. Descriptive statistics and bivariate correlations between all variables, Experiment 4

	Karma Condition								
	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Giving	0.36	0.39							
2. Belief in karma	2.90	0.79	0.08						
3. Belief in a just world	3.31	0.72	0.03	0.36***					
4. Punishment	2.97	1.37	0.09*	0.43***	0.17***				
5. Rewards	2.97	1.37	0.12**	0.43***	0.26***	0.73***			
6. Benevolence	2.19	1.13	0.03	0.46***	0.23***	0.36***	0.47***		
7. Knowledge	2.46	1.25	0.06	0.52***	0.20***	0.53***	0.55***	0.61***	
8. Hypothesis guessing	-0.15	1.54	0.02	-0.08*	0.06	-0.00	0.01	-0.09*	-0.10**
	Control Condition								
	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Giving	0.18	0.33							
2. Belief in karma	2.85	0.81	-0.07						
3. Belief in a just world	3.32	0.67	0.02	0.27***					
4. Punishment	2.92	1.41	-0.06	0.48***	0.16***				
5. Rewards	2.82	1.42	-0.04	0.46***	0.22***	0.71***			
6. Benevolence	2.14	1.14	0.00	0.44***	0.20***	0.38***	0.53***		
7. Knowledge	2.35	1.22	-0.02	0.50***	0.16***	0.59***	0.65***	0.66***	
8. Hypothesis guessing	-0.64	1.29	0.00	-0.01	-0.00	0.10*	0.05	-0.05	0.00

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.