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God Salience Increases Christians' Generosity to Both Ingroup and Outgroup Members

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God Salience Increases Christians' Generosity to Both Ingroup and Outgroup Members

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Psychological Science

by

John Michael Kelly

Dissertation Committee:
Professor Peter H. Ditto, Chair
Associate Professor Azim F. Shariff
Associate Professor Paul K. Piff

2022

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VITA

John Michael Kelly

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Pasek, M., Ginges, J., **Kelly, J. M.**, Shackleford, C., White, C.J., Vishkin, A., Smith, J., Norenzyan, A., & Shariff, A. (in prep). Despite ingroup bias, thinking about God encourages prosociality towards religious outgroups: Evidence from three cultures.

Schreiner, M. R., Mercier, B., Frick, S. Wiwad, D., Schmitt, M. C., **Kelly, J.M.**, & Pütter, J. Q. (2022, forthcoming). Measurement issues in the Many Analysts Religion Project. *Religion, Brain, & Behavior*.

Kenett, Y. N., Anderson, S., Chen, E., **Kelly, J. M.**, Christian, M., Patrick, J., ... & Gray, K. (2020). Clarifying what forward flow is (and isn't): Reply to Rossiter (2020). *The American Psychologist*, *75*(5), 727-728.

White, C. J., **Kelly, J. M.**, Shariff, A. F., & Norenzayan, A. (2019). Supernatural norm enforcement: Thinking about karma and God reduces selfishness among believers. *Journal of Experimental Social Psychology*, *84*, 103797.

Gray, K., Anderson, S., Chen, E. E., **Kelly, J. M.**, Christian, M. S., Patrick, J., ... & Lewis, K. (2019). "Forward flow": A new measure to quantify free thought and predict creativity. *American Psychologist*, *74*(5), 539.

Presentations

Kelly, J.M. & Shariff, A. (2022, February). *God salience increased Christians' donations to both Christians and atheists in a three-way dictator game*. Society for Personality and Social Psychology, San Francisco, CA.

Kelly, J.M. & Shariff, A. (2020, February). *Does redistribution advocacy 'crowd out' personal charity?* Society for Personality and Social Psychology, New Orleans, LA.

White, C. J., **Kelly, J.M.**, Shariff, A., & Norenzayan, A. (2019, February). *Thinking about Karma and God reduces believers' selfishness in anonymous dictator games.* Society for Personality and Social Psychology, Portland, OR.

Kelly, J.M., White, C. J., Shariff, A., & Norenzayan, A. (2019, February). *Christians increase generosity towards both atheists and fellow Christians following a religious cue*. Society for Personality and Social Psychology, Portland, OR.

Kelly, J.M. & Gray, K. (2017, January). *Forward flow: An LSA-based measure of imaginative thought.* Society for Personality and Social Psychology, San Antonio, TX.

Kelly, J.M. & Gray, K. (2016, January). *Forward flow: Quantifying imagination by means of latent semantic analysis.* Society for Personality and Social Psychology, New Methods Preconference, San Diego, CA.

ABSTRACT OF THE DISSERTATION

God Salience Increases Christians' Generosity to Both Ingroup and Outgroup Members

by

John Michael Kelly

Doctor of Philosophy in Psychological Science

University of California, Irvine, 2022

Professor Peter H. Ditto, Chair

While there is a large literature exploring the association between religiosity and prosocial behavior, several limitations in this literature prevent a full understanding of how religiosity and prosocial behavior relate. Among these limitations are an over-reliance on self-report measures, a lack of focus on the importance of religious cognitions, and a lack of consideration about who the prospective recipient of prosocial action is. Across six pre-registered studies (N = 8,181), I attempted to address these limitations using dictator game paradigms. In Studies 1-3, participants completed two dictator games separated by an instruction to think about God. As a between-subject manipulation, the recipient was either a member of the participant's religious ingroup or a member of a religious outgroup. In each dictator game, participants were granted a bonus monetary allotment and could give any amount to the recipient and keep the rest for themselves. In Studies 4-6, participants completed a single three-way dictator game in which they were paired with an ingroup member and an outgroup member. They were given a bonus monetary allotment and could disperse it among themselves and the two recipients as they saw fit. Half the participants were instructed to think about God and the other half were not. With these studies, I asked three primary questions: 1) Will participants be

more generous when God is salient than when he is not? 2) Will participants be more generous to ingroup members than outgroup members? and 3) Will the God cue affect generosity to the ingroup or outgroup more strongly? Consensus of the six studies found 1) Participants were more generous in the God salience condition than in the control, as hypothesized, 2) Participants were more generous to ingroup members than outgroup members, as hypothesized, and 3) Consistent with a "Universality Hypothesis", the God cue did not affect generosity to one group more strongly than it affected generosity to the other.

INTRODUCTION

There is a widespread assumption that religious beliefs support morality—and specifically prosocial behaviors. Indeed, for many, belief in a deity is seen as a requirement for one to be a moral person. Since at least the 17th century the term "atheist" has been used as a shorthand term to describe one lacking in moral principles or restraint (Hecht, 2004), and even today many people worldwide suggest that belief in God is not only conducive to moral behavior, but necessary (Pew Research Center, 2020). While few, if any, psychological theories suggest religious belief is a *necessity* for moral behavior, the notion that religion *promotes* prosocial behaviors (behaviors meant for the good of others, often at some cost to oneself) has long been held in the field. Theories as disparate as the psychodynamics of Freud to the behaviorism of Skinner acknowledged some utility of religion in promoting prosocial behavior. Even while calling God and religion "illusions" and promoting a future in which morality is tied to secular, humanistic causes, Freud acknowledged the role that belief in God has historically had in discouraging base, selfish behaviors (Freud, 1938). Similarly, Skinner recognized the systems of reward and punishment in religion, which can lead people to behave in more other-oriented ways (Skinner, 1969). The idea that religion can promote prosocial behavior persists in some modern theories of morality, as well. Social functionalists argue for the community-binding role of religion (Graham & Haidt, 2010), while a cultural evolutionary account makes a similar claim: That the development of beliefs in powerful, moralizing gods allowed for the rise of large-scale prosocial societies, and that these large-scale societies reinforced these religious beliefs (Norenzayan et al., 2016).

Empirical support for religiosity's association with prosociality exists across a range of disciplines. In a large body of research, associations have been shown between religiosity and

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self-reported charitable giving (Brooks, 2003; de Abreu et al., 2015; Eagle et al., 2018; Einolf, 2011; Ranganathan & Henley, 2008; Sibley & Bulbulia, 2015), as have associations between region-level religiosity and charitable giving (Brooks, 2006). Similarly, religious people report higher volunteering rates (Forst & Healy, 1991; Haggard et al., 2015; Hodgkinson et al., 1990; Yeung, 2018), helping behavior (Bennett & Einolf, 2017; Benson et al., 1980; Nelson, 1976), and general generosity (Brooks, 2006; Putnam & Campbell, 2010; Wiepking & Maas, 2009). Conversely, religion has been shown to negatively predict delinquency (Johnson et al., 2000; Kelly et al., 2015), crime (Baier & Wright, 2001), and rule breaking (Laird et al., 2011). In this dissertation, I will be exploring the effect of salient religious belief on generosity, with a specific focus on the question of to whom this generosity will be offered.

Meta-Analytic Findings on the Religion-Prosociality Relationship

To summarize and integrate the existing cross-disciplinary research on religiosity and prosocial behavior, my colleagues and I conducted a systematic review and meta-analysis of the religiosity-prosociality relationship (Kelly et al., 2022). We do identify a small correlation between religiosity and prosocial behavior across the literature, but the primary conclusion of this analysis concerns the limitations of the literature. We concluded that there are sources of heterogeneity across studies that complicate a firm conclusion about the strength of religiosity's association with prosocial behavior. In the analysis, we make a series of recommendations for future research. Here, I will introduce three of these issues, and I will discuss how this dissertation is designed to address these concerns.

Issue 1: Self-Report Versus Directly Measured Behavior

The meta-analysis revealed a moderation such that religiosity was more correlated with self-reported prosocial behavior than with directly measured behavior. This finding yields

quantitative support for this oft-raised concern (e.g., Batson, 1978, Galen, 2012, Tsang et al., 2021). One possible explanation for this moderation is that religious people are simply being dishonest about their prosociality or are deluded into thinking they are more prosocial than they are. Self-report measures are highly susceptible to self-enhancement and social desirability effects, which can lead to systematic error in the measurement of the construct of interest (John & Robins, 1994; Maccoby & Maccoby, 1954; Nederhof, 1985). As prosociality is highly socially desirable, it is a measure that is especially subject to self-enhancing responding effects. This is particularly troubling in the context of the psychology of religion, as some investigations have found religiosity to positively predict self-enhancement and socially desirable responding (Batson et al., 1978; Crandall & Gozali, 1969; Gebauer et al., 2017; Sedikides & Gebauer, 2010; Trimble, 1997). If true, this suggests the religiosity-prosociality association is at least partially mediated by socially-desirable responding.

These social desirability concerns can be eliminated, or at least strongly mitigated, by directly measuring behavior. While smaller than the literature of studies employing self-report measures, a literature of studies using behavioral measures nonetheless exists. Darley and Batson's (1973) famed "From Jerusalem to Jericho" study employed such a method by directly observing whether participants helped a shabbily dressed person on the street. Other studies have directly measured things like charitable giving (Malhotra, 2010) or commitment to help a fellow student (Blogowska et al., 2013). Many others have employed economic games (Ahmed & Salas, 2011; Anderson & Mellor, 2009; Gomes & McCullough, 2015; Shariff & Norenzayan, 2007; White et al., 2019). In studies employing games like the dictator game or the public goods game, participants are endowed some amount of money and have the opportunity to donate some of that money to benefit another person or the collective. While more artificial than the observation

of naturalistic prosocial behavior, a generous decision in such a game closely fits the definition of a prosocial behavior, as it is a behavior designed to help another, at a cost to oneself. Additionally, these games have been found to correlate with face-valid naturalistic measures of generosity (Barr & Zeitlin, 2010; Franzen & Pointner, 2013; and see Cartwright & Thompson, 2022 for discussion). Furthermore, these methods are valid measures across a wide range of contexts, including online studies (Amir & Rand, 2012). Economic games, therefore, are a common and useful behavioral measure of prosocial behavior, particularly in modern large, well-powered studies.

Issue 2: Religious Salience

Most studies assessing the religiosity-prosociality relationship employ measures of *dispositional* religiosity—that is, they use measures of how religious someone is day-to-day, rather than assessing anything about the present situation. Such dispositional measures tend to assess the "three B's" of religiosity: belonging, belief, and behavior (Marshall, 2002). Measures of dispositional belonging include questions about someone's religious affiliation or denomination (e.g. Ahmed & Salas, 2011; Yeung, 2018). Dispositional belief can be assessed by asking participants about their strength of belief in doctrines, principles, or agents of their religion (e.g. Hunsburger & Platonow, 1986; Galen et al., 2014). And one's tendency toward religious behavior may be asked by how often one attends religious services (e.g. Kim & Jang, 2017) or how often they pray (e.g. Sharp, 2019).

However, while the literature contains a multiplicity of measures of dispositional religiosity, it is likely that none fully capture the effect religion can have on behavior. It can be argued that it is not people's baseline, dispositional religiosity that impacts prosocial behavior, *per se*—that is, prosocial behavior is not *directly* impacted by things like patterns of religious

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attendance, affiliation with a religious organization, or belief in a higher power. Instead, some aspect of a person's religiosity needs to be cognitively activated to promote prosocial behavior. With the exception of some highly intrinsically religious exemplars, one's religiosity may have little bearing on their day-to-day behaviors, unless they are in a religious context. To put it crudely, the average person may be a person first and religious second. Under this hypothesis, religious people and non-religious people may not behave differently in a lab measurement of generosity because their cognitions are not notably different in that moment. However, if one's religious cognitions are made salient or are otherwise activated, the effect of religiosity in promoting prosocial behavior may come into play. One may think of religious cognitions as the actual actors upon behavior, but dispositional religiosity is the "scaffolding" on which these cognitions may work.

Most, if not all, religions contain teachings or practices that emphasize and promote the continued salience of the religion. One may consider the Deuteronomic command to "Tie [divine commandments] as symbols on your hands and bind them on your foreheads" (*New International Version Bible*, 1973, Deut. 6:8). The Islamic call to prayer serves as a daily reminder of one's religious beliefs and practice. Hindus engage in a variety of pujas. These are of course just a small sample of the many ways religion is kept salient within and across religions, and in many cases religious teachings are explicit about the claim that religious belief will guide behavior more strongly when it is kept salient (for examples in Judaism and Christianity, see Joshua 1:8 and Proverbs 6:21-22). Therefore, when studying the impact of religion on behavior, it is important to consider these potential salience effects, rather than dispositional religiosity alone.

The importance of religious salience on prosocial behavior has been found in a variety of naturalistic contexts. Research studying the "Sunday Effect" serves as one example. This line of research found that religious people were more likely to respond to calls for charity than the non-religious, but only on days when they had attended their place of worship (Malhotra, 2010). Further research found that people behaved more generously in a temple environment than in a secular environment (specifically a restaurant; Xygalatas, 2013). And shopkeepers were found to display more honesty when the Islamic call to prayer was audible than when it was not (Duhaime, 2015).

These types of studies are highly compelling and have high ecological validity, but they are, by their nature, difficult to incorporate into tightly controlled and scalable studies. It is therefore useful to have a procedure for activating religious salience in a more "portable" and scalable manner. "Religious priming" arose as a popular way of bringing religious salience into the lab. Groundbreaking research in this area conducted by Shariff and Norenzayan (2007) found that the implicit activation of God concepts through a sentence unscrambling task led to greater generosity in an anonymous dictator game. Around the same time, Pichon and colleagues (2007) found an effect of subliminal or subtle presentation of religious words on prosocial intentions and the accessibility of religious concepts. Since this early work, religious priming research has been extended to other areas and has found effects on prosocial and prosociality-adjacent concepts like cooperation (Cohen et al., 2014), self-regulation (Laurin et al., 2011), and honesty (Randolph-Seng & Nielson, 2007). Religious priming has also been shown to decrease moral hypocrisy (Carpenter & Marshall, 2009) and hostility after threat (Schumann et al., 2014). A meta-analytic synthesis of these studies and others found a significant relationship between religious priming and prosocial behavior that held

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robustly when correcting for publication bias (Shariff et al., 2016). Additionally, the meta-analysis found a more robust effect of religious primes on religious individuals than on the non-religious. This finding supports the hypothesis that one's religiosity provides a scaffolding for increased prosociality, but only through the activation of religious cognition is this increased prosociality realized.

These findings have been met with controversy, however. A critique of the meta-analysis argued that publication bias is likely to skew meta-analytic estimates, even when bias-correcting methods are employed (Van Elk et al., 2015). These critics further noted that well-powered, pre-registered studies are a better means of testing the relationship than are meta-analyses alone. And indeed, some pre-registered studies have failed to replicate the effect of subliminal or implicit primes on prosocial behavior (Gomes & McCullough, 2015; Billingsley et al., 2018). Coupled with uncertainty in subtle priming research in general (see for example, Simmons et al., 2011), there is no strong consensus on whether subliminal or implicit religious primes affect prosocial behavior—or any outcome for that matter.

Despite these valid criticisms of implicit priming, the underlying hypothesis—that religiosity promotes prosociality when activated—is not reliant on implicit primes as a source of religious cognition. In fact, most real-world religious cues are not subliminal, and need not even be particularly subtle (one may consider the Islamic call to prayer, a WWJD bracelet, or images of a crucifix, star of David, or Dharmachakra). Thus, *explicit* religious cues may in fact be a more externally valid test of the hypothesis. And, indeed, such explicit cues do appear to consistently lead to increases in prosocial behavior among believers. A registered report conducted by Billingsley and colleagues (2018) found a significant effect of explicit primes on generosity in economic games, even while finding no support for the effect of implicit cues. A

similar pre-registered project by White and colleagues (2019) found that explicit instructions to think about God or karma increased generosity, and that the effectiveness of these reminders depended on the participants' beliefs in these concepts. The aforementioned priming meta-analysis further supports the idea that explicit primes are more effective than are their subtler counterparts (Shariff et al., 2016).

Issue 3: Prosociality *to Whom*

The meta-analytic synthesis of the religiosity-prosociality literature revealed relatively few cases where the identity of the recipient (or the prospective recipient) of a prosocial action was made apparent. Yet *who* the recipient is likely matters a great deal. Prosocial behavior is fundamentally a dyadic action, as there is a giver and a recipient or recipients in any such behavior. While research certainly recognizes the importance of characteristics of the giver, the identity of the recipient has been less studied. Nonetheless, the recipient's identity is no doubt an important factor. To offer an obvious example, people are more likely to engage in prosocial behavior directed toward kin or a close friend than to a stranger. But there can be important differences between potential recipients beyond mere kin-selection effects. One important factor is the group identity of the recipient. People tend to behave more prosocially to ingroup members than to outgroup members (Balliet et al., 2014; Cuddy, Rock, & Norton, 2007; Fiedler et al., 2018; Levine et al., 2002).

The relevance of recipient group identity on prosocial behavior may be important in the context of religiosity. Even when religious salience increases prosocial behavior, there is some continued debate about the generalizability of this finding. Is it indicative of a general prosociality? Or is the evidence only indicative of an ingroup effect? Many have argued the latter: that prosociality brought on by one's religiosity or religious cognitions is given only to

members of the ingroup and is not extended to outgroup members. Saroglou (2006), despite being a defender of the hypothesis that religiosity promotes prosocial behavior, posited that religious prosociality is of this ingroup-favoring nature, dubbing this prosociality "minimal prosociality". The "minimal" view of religious prosocial behavior is held by many researchers in the field. McKay and Whitehouse (2015) suggested that, while the activation of religious concepts may lead to behavior that can reasonably be described as "prosocial," the characteristic patterns of behavior brought on in these contexts cannot be viewed as beneficial to the outgroup, and they may even be harmful to members of this outgroup. Galen (2012) concluded that what is described as "religious prosociality" perhaps should not even truly be called prosociality, and that it may better be considered an artefact of ingroup favoritism and other non-prosocial effects.

This "minimal prosociality" perspective has seen some empirical support. Ben-Ner and colleagues (2009) found that similar others were treated more favorably than dissimilar others across a wide range of domains, and that religious identity was a particularly potent form of similarity or dissimilarity. In another study, Ultraorthodox Jews showed a particularly high degree of cooperation with religious ingroup members, but they were substantially less cooperative with secular people or religious outgroup members (Fershtman et al., 2005). Religiosity predicted helping of strangers in various contexts when the stranger was displaying some signal of ingroup religious identity, but not when such a signal was lacking (Różycka-Tran, 2017). Dunkel and Dutton (2016) found both between-religion and within-religion effects that demonstrate a positive relationship between religiosity and ingroup favoritism. And a study of members of The Church of Latter-Day Saints found that religiosity predicted prosociality more highly in Utah (where recipients of potentially prosocial behavior could reasonably be expected to be in the religious ingroup) than in Oregon (where it was less likely the recipient would be in

the ingroup; Orbell et al., 1992). As Galen & Beahan (2013) noted, most studies of religious prosociality (and, indeed, most social psychology studies across all areas) tend to take place in areas where participants may reasonably expect the recipient to be religious (and, typically, members of the participant's *own* religion). Thus, findings of greater religious prosociality could merely be reflections of ingroup favoritism.

Additionally, some evidence points not only toward the lack of a religious effect on prosocial behavior, but towards the presence of a religious effect on antisocial behavior. Blogowska and colleagues (2013) found that, even while individual religiosity predicted helping behavior towards an ingroup stranger, it also predicted harmful aggression towards a disliked outgroup member (an openly gay person), while Ginges and colleagues (2009) found that greater religious attendance predicted greater support for suicide terrorist attacks. Some aspects of religiosity have also been shown to be related to racism and prejudice more broadly (for a meta-analysis see Hall, Matz, & Wood, 2010).

Looking at this research in aggregate, it is safe to say that there is convergent evidence that religious people behave more favorably toward co-religious ingroup members than towards non-religious people or religious outgroup members. However, this conclusion, in itself, is unsurprising and may not be reflective of a parochial effect of religiosity, *per se*. Religious identity can serve as a particularly potent form of identity, and people tend to act more favorably towards those who share their ingroup identity than towards those who do not across a wide range of domains—not only religion (Ben-Ner et al., 2009). A stronger test of the effect of religiosity (beyond religiosity's status as a mere group identifier) would be to test how the activation of religious concepts affects prosocial behavior toward the ingroup and outgroup. Specifically, researchers can employ the use of religious priming or cues, as in the studies

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described above. However, thus far, relatively few studies have employed such methods to test the minimal prosociality hypothesis directly.

One project that has employed priming methods to test this question found different effects depending on whether the concept of "religion" was primed or whether the concept of "God" was primed (Preston & Ritter, 2013). While the religion prime increased parochialism, leading to greater cooperation to the ingroup, the God prime led to greater prosociality to the outgroup. The authors argued that the "religion" aspect of one's religiosity is associated with group identity, while God is associated with universality and a broad moral concern. A similar study with a Filipino sample found that spiritual primes increased generosity, but no difference was found in generosity given to ingroups and outgroups (Batara et al., 2016). Both projects were heavily underpowered compared to the currently-accepted state of the art, however. Additionally, both employed subtle primes, putting them under the umbrella of the studies that have been met with skepticism in the field. These concerns should not be taken to fully invalidate these studies, but there is nonetheless room in the literature for high-powered studies that employ less subtle religious cues. In this vein, one large study that employed a more explicit frame instructed Palestinian participants to respond to moral dilemmas either from their own perspective or from Allah's perspective (Ginges et al., 2016). When left to their own devices, these Palestinians highly favored their ingroup members to Israeli Jews. However, the researchers found that thinking from Allah's perspective reduced this discrepancy, as participants believed Allah had a more universal moral standard. A similar study extended these findings to Fijians of various religions and Jewish Israelis (Pasek et al., 2020). To summarize, while consensus strongly points towards religious people acting more favorably towards ingroup members than outgroup members at baseline, the direct effect of religiosity on ingroup

favoritism is far less certain. Despite arguments that the prosocial effect of religiosity is minimal and parochial, this may simply be because religion is a source of group cohesion. While there is not yet enough evidence to reach a firm conclusion, it is not unreasonable to hypothesize that the unique effect of religiosity (beyond mere group identity) is more universal.

Overview of the Current Research

In this dissertation, I sought to address these three lingering issues across six studies. To address the issues with self-report measures, I used a dictator game paradigm in all studies. This paradigm allows a tightly-controlled assessment of prosocial generosity. In dictator games, participants are given an allotment of money and have the opportunity to donate as much, or as little, of this bonus as they see fit. There is no possibility of reciprocity on the part of the recipient, nor is there any direct reward or punishment for the participant's choice. From a neoclassical *homo economicus* perspective, the rational behavior is to give no portion of the allotment, keeping all of it for oneself (Yamagishi, et al., 2014). Therefore, generosity in this task closely fits the definition of prosocial behavior, an action meant to benefit another, at some cost to oneself (Batson & Powell, 2003).

To address the religious salience issue, I used a God salience induction paradigm across studies. In a paradigm I developed with White and colleagues (2019), participants were simply asked to think about God when making their dictator game decisions. Across studies, two techniques were used. In the first three studies, participants engaged in two iterations of the dictator game, being asked to think about God between these two games. Thus, God salience was a within-subject condition, and I was able to directly test generosity without God concepts being activated versus when God concepts were activated. In Studies 4-6, a God cue was given to some participants, but not others. Here, God salience was a between-subjects condition, and I tested

whether those who received the cue differed in generosity versus those that did not. Both allowed

me to test *Research Question 1*: Are participants more generous when thinking about God than

when they are not? I predicted that these God salience cues would indeed increase generosity. I

additionally assessed participants' belief in God in these studies. I hypothesized that this

dispositional belief would act as the scaffolding on which the God cue would act to produce

generosity. In statistical terms, I predicted a moderation of belief in God on the effect of the God

cue.

To address the question of parochiality *to whom*, I manipulated the group identity of

recipients in these dictator games. In Studies 1-3, recipient group identity was manipulated as a

between-subject variable. Participants either were paired with an ingroup member in both games

or with an outgroup member in both games. In Studies 4-6, participants were paired with both an

ingroup member and an outgroup member in the same dictator game. Participants in these

studies could keep as much of the allotment as they wanted, but they distributed any donation as

they saw fit between the recipients. These different paradigms both allowed me to assess

Research Question 2: Are Christians more generous to ingroup members than to outgroup

members? I hypothesized that participants would display some ingroup favoritism in their

generosity.

Finally, by combining the God salience and recipient group manipulations, I was able to

assess the most important research question of this dissertation, *Research Question 3*: Does God

salience have different effects on generosity to ingroup and outgroup members? In statistical

terms, I investigated whether there was a salience-by-recipient group interaction. Here, I entered

with competing hypotheses. While these hypotheses lie along a continuum, I will name and

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describe four potential hypotheses that can be used as useful signposts for discussing expectations and results (see Figure 0.1 for visual depictions).

1. One possibility is what I will call the "Strong Parochiality Hypothesis." God salience may increase generosity to ingroup members but decrease generosity to outgroup members.

2. Under the "Weak Parochiality Hypothesis", God salience may increase generosity to an ingroup member but have no effect on generosity to the outgroup.

3. In the "Universality hypothesis," God salience is expected to predict greater generosity to both ingroup and outgroup members, to comparable extents.

4. In the "Bias Reduction Hypothesis," God salience is expected to decrease ingroup favoritism by increasing giving more to the outgroup than the ingroup.

Figure 0.1.

Competing hypotheses of the effect of a religious cue on ingroup favoritism.
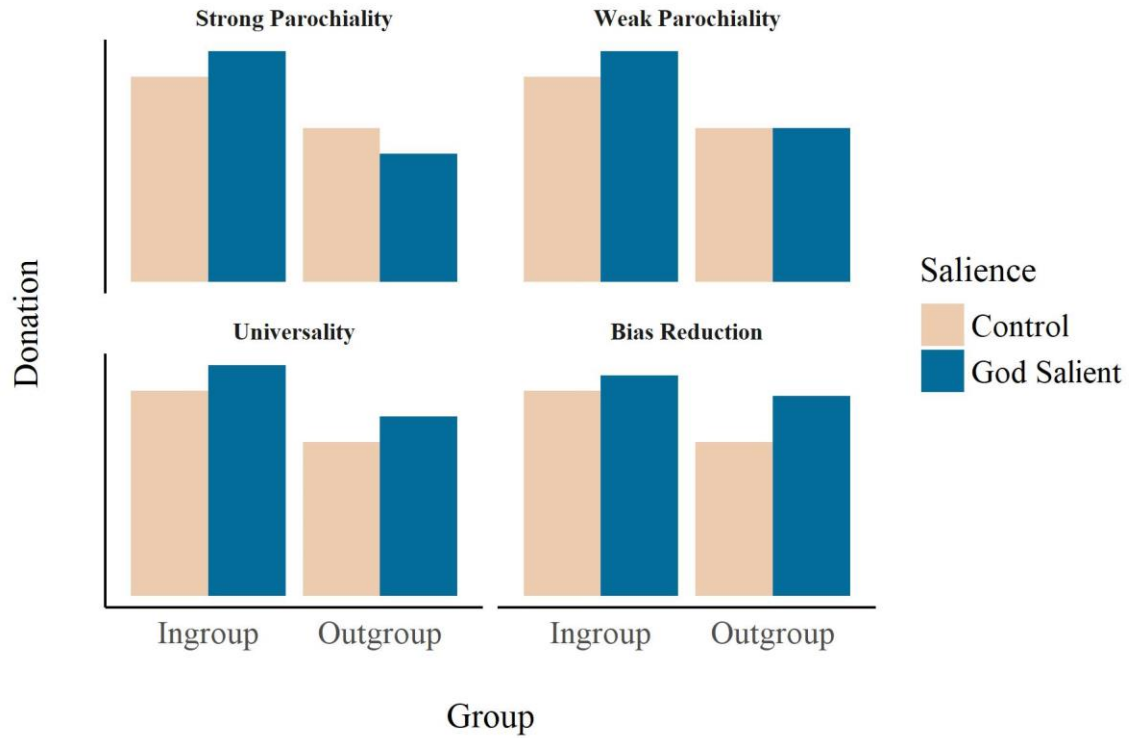
STUDY 1

Study 1 employs an explicit religious cue I validated with White and colleagues (2019) to test the effect of God salience on prosocial generosity in a dictator game. Participants who identified as Christian or atheist were tested in this study. Using a dictator game paradigm, participants were given a monetary allotment and were told they could give any amount of this allotment (or none at all) to the recipient. They completed two iterations of this dictator game, one before being asked to think about God and one after. Recipients in these dictator games were described as Christian or atheist, or no religious affiliation was offered. The recipients of both iterations were described as belonging to the same religious affiliation.

There were three primary aims of this study. First, it aimed to replicate the finding that a religious cue will increase generosity to an anonymous recipient, and that it will do so more strongly in Christian participants than in atheist participants. Second, it was designed to test and compare Christians' and atheists' giving to ingroup members and outgroup members at baseline. Finally, it was designed to directly test for a parochiality effect by investigating how the religious cue affects ingroup favoritism.

Method

Participants

A total of 2,092 self-described Christians and atheists recruited through Amazon's Mechanical Turk (MTurk; a crowdsourced research platform) completed the study. Of these, 62 people were excluded from analysis due to an incorrect response on an attention check item, leaving an analyzed sample of 2,030 participants (55.9% female, 43.4% Male, $M_{age} = 36.78$, $SD_{age} = 12.31$). Of the analyzed sample, 1,157 identified as Christians (58.5% female, 41.5%

male, $M_{age} = 38.77$, $SD_{age} = 12.70$) and 873 identified as atheists (52.3% female, 44.8% male, $M_{age} = 34.16$, $SD_{age} = 11.26$.

Procedure

This study was preregistered at https://osf.io/mzgk9/. However, some analytical decisions reported here vary from those that were registered. I will identify these changes and their justifications, when relevant.

This study was conducted online in English using Qualtrics, an online survey company. Participants were recruited on Amazon Mechanical Turk, and only those who reported living in the United States and who were at least 18 years of age were allowed to participate. Participants first completed a brief demographic screening questionnaire. Embedded in this questionnaire was an item about religious affiliation. Only those who reported being Christian or atheist were shown the rest of the study. Participants were not informed that this was the criterion for their inclusion.

Participants who qualified were next sent onto a page in which they were given the instructions for two dictator games in which they would be asked to participate. Participants were informed they would receive a bonus payment of $0.40 (a typical allotment for an MTurk economic game, and one that replicates well to larger allotments used in lab studies; Horton et al., 2011). They were further told they would be paired with two separate participants who ostensibly had completed the study and that they had the option to allocate any, all, or none, of their bonus to each of their partners. Finally, they were told that one of these decisions would randomly be selected to determine their donation.

Participants were next sent to a page in which they were shown demographic information that ostensibly belonged to one of their partners. These partners were said to be 1) either male or female (randomly selected), 2) a certain age between 30 and 50 years old (randomly selected), 3) American, and 4) residents of a ZIP code randomly selected from a pool of possible codes (selected because the areas represented by these ZIP codes were demographically similar to one another). Finally, and crucially, partners were described as either Christian or atheist, or no religious info was given about the partner. Recipient religion acted as a key variable in the analyses. On the same page, participants were given the opportunity to donate as much or as little of their bonus as they would like to their partner (in actuality, bonuses were randomly allocated to participants in the present study who matched the relevant recipient group).

Following this decision, participants were shown another page in which they were told that they would be making another donation decision, but they were told "Before you make this decision, please think about *God*." On the next page, participants were shown demographic info ostensibly belonging to a different partner. This information was determined in the same way as the first partner, but this second partner was always a member of the same religious group as the first partner (or, if no religious information was given about the first partner, no religious information was given about the second partner either). Here, participants were asked, "After considering God, how much of this $0.40 [bonus] would you like to donate to [this participant]?" and were given the opportunity to make a donation. A sample of this experimental manipulation can be seen in Appendix A.

Following the dictator games, participants were administered an attention check item. They then completed a battery of survey questions, including the items of interest described below. Finally, they were shown a debriefing page, explaining the purpose of the study.

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Primary Materials

Dictator game giving. Participants were administered two dictator games, as described above. Participants had the opportunity to donate anywhere from $.00 to all $.40 of their bonus to the recipient. Giving was operationalized as the percentage of the bonus donated (i.e., a donation of $.10 was scored as 25).

Religion. Participants were asked, "Which of the following best describes your religious affiliation?" with the options of "Christian", "Jewish," "Muslim," "Hindu," "Buddhist", "Atheist," and "Other." Only self-described atheists and Christians were allowed to participate in the rest of the survey.

Secondary Materials

God belief. God belief was assessed with a single item, in which participants answered how much the statement "I believe that God exists" describes them, with scale points from "Strongly disagree" (1) to "Strongly Agree" (9).

Attendance. Participants were asked how often they attended religious services, other than weddings and funerals. Options were "More than once a week," "Once a week," "Once a month," "Every few months," "Once a year," and "Less than once a year."

Punishing and rewarding God beliefs. Participants were asked how much they agree with various statements about God. Questions related to God's punishing nature included "God punishes theft," "God punishes deceit," and "God punishes selfishness," while the questions related to God's rewarding nature included "God rewards generosity," "God rewards helpfulness," and "God rewards kindness." Scale points ranged from "Strongly disagree" (1) to

"Strongly agree" (7). Punishing items were averaged to make a punish index, and rewarding items were averaged to make a reward index.

Study Research Questions and Hypotheses

In line with *Research Question 1*, the first goal of this study was to replicate White and colleagues' (2019) findings that an explicit God reminder will increase generosity to a participant of unspecified religion. For this analysis, I therefore limited the analysis to the condition with a neutral recipient. Furthermore, I hypothesized that the God cue would have a stronger effect on Christian participants than on atheist participants for a neutral recipient. I next broadened the exploration to all recipient conditions. I expected that the God cue would still increase generosity, and it would do so more for Christian participants than atheist participants.

I explored multiple moderators of the effect of the God cue. First, I expected that the God cue would act more strongly on those with stronger religiosity, and that this effect would act above and beyond the mere Christian/atheist split. I expected a moderation such that the God cue would act more strongly on those with stronger belief in God and on those who attend church more frequently. Furthermore, past research has found that it is specifically belief in a *punishing* God that leads people to behave more ethically (Shariff & Norenzayan, 2011). Therefore, I hypothesized a moderation such that the God cue would increase generosity more in those with stronger belief in a punishing God, controlling for belief in a rewarding God and an interaction between the God cue and belief in a rewarding God.

Next, in line with *Research Question 2*, I was interested in ingroup favoritism. Across God salience conditions, I expected that both Christians and atheists would show overall favoritism for members of their own group over members of the outgroup. No strong hypothesis

was made for how generosity to a neutral participant would compare to generosity toward the ingroup or outgroup.

I further explored how the God cue might differentially affect giving to ingroup and outgroup members (a test of *Research Question 3*). My analyses here focused predominantly on Christian participants. The Strong Parochiality Hypothesis, Weak Parochiality Hypothesis, Universality Hypothesis, and Bias Reduction Hypothesis were tested as competing predictions.

Analyses and Results

Analyses were conducted using a multilevel model framework in R (R Core Team, 2013) using the lme4 (Bates et al., 2015) and lmerTest packages (Kuznetsova et al., 2017). For all models, random intercepts were specified at the participant level. All other covariates were included as fixed effects. Estimates were optimized on the restricted maximum likelihood (REML) criterion.

The donation variable was treated as the proportion of the total allotment that was shared (e.g. a lack of donation was coded as 0, a 20 cent donation was coded as 50, and a donation of the total allotment was coded as 100). See Figure 1.1 for sample participants' donations as a function of participant religion, recipient religion and God salience (before or after God reminder).

Figure 1.1

Percentage of Bonus Donated as Function of Participant Group, Recipient Group, and Salience Condition (Study 1)
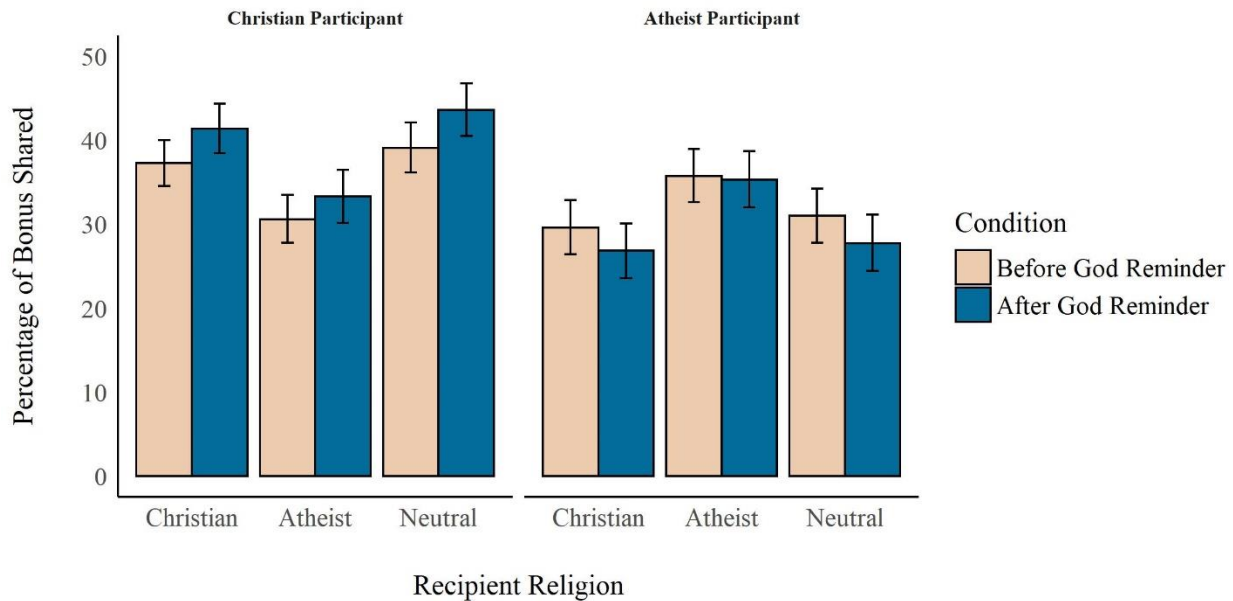
Note. Error bars represent 95% confidence intervals.

Effect of God Cue on Generosity

To test whether this study replicated prior findings (White et al., 2019), I first limited the sample to cases when participants were paired with a neutral recipient. Percent of bonus donated was regressed on salience condition (pre- or post-God cue). There was no overall effect of the God cue on giving, across participant religions. Therefore, my hypothesis for Research Question 1 was not supported by this analysis when participant religion was not taken into account (Table 1.1). I next included participant religion as a fixed effect, as well as an interaction term between participant religion and salience condition. As expected, there was a significant interaction

between participant religion and salience condition, such that the God cue increased donations more for Christian participants than for atheist participants. In fact, when the sample was split by participant religion, Christians significantly increased their giving by 4.54 percentage points following the cue, $t(374) = 4.83$, $p < .001$, 95% CI[2.70, 6.38], while atheists significantly *decreased* their giving by an estimated 3.25 percentage points, t(301) = -3.65, $p < .001$, 95% CI[-5.00, -1.51]. This decrease in atheist giving was not predicted *a priori*. Thus, my hypothesis appears to have only been unsupported due to this unanticipated reversal in atheist participants. This model also revealed that Christians were more generous to neutral targets at baseline than were atheists. These findings held consistently when controlling for demographics (age and gender).

I next expanded the sample to all recipient conditions and conducted the same analyses. Across all recipient conditions, God salience did increase generosity, but this model accounts for very little of the variance (Table 1.2). There still existed an interaction between recipient religiosity and the effect of the God cue. These findings held robustly when controlling for demographics.

Moderators of the God Cue

I tested whether the effect of the God cue is moderated by the strength of God belief, by including God belief and a salience-by-belief interaction in the model. A significant moderation was found, such that salience had a larger effect on those with stronger God belief (Table 1.3). This was consistent with my hypothesis. The finding held robustly when accounting for participant religious identity (Christian versus atheist) and other participant demographics. I next explored whether the effect of the God cue was moderated by religious attendance frequency. Indeed, the effect of the God cue was stronger for those that attended church more frequently,

but this effect did not hold robustly when accounting for participant religious identity and other

demographics.

Table 1.1

Effect of God Cue on Donation to Neutral Recipients (Study 1)

Predictors	Not accounting for participant religion Estimates (95% CI)	Accounting for participant religion Estimates (95% CI)	Accounting for demographics Estimates (95% CI)
Intercept	35.48 *** (33.18 – 37.78)	31.00 *** (27.63 – 34.38)	31.99 *** (27.99 – 35.99)
God salient	1.06 (-0.25 – 2.38)	-3.25 *** (-5.18 – -1.33)	-3.19 ** (-5.13 – -1.26)
Christian subj.		8.09 *** (3.55 – 12.62)	7.66 ** (2.97 – 12.35)
Salient:Christian subj.		7.79 *** (5.21 – 10.38)	7.76 *** (5.16 – 10.35)
Age (centered)			0.09 (-0.09 – 0.26)
Male participant			-1.62 (-6.04 – 2.80)
Other Gender			6.90 (-16.41 – 30.22)
Random Effects			
σ^2	152.71	145.41	145.88
τ_{00}	779.74 id	749.08 id	750.44 id
ICC	0.84	0.84	0.84
N	677 id	677 id	673 id
Observations	1354	1354	1346
Marginal R^2 / Conditional R^2	0.000 / 0.836	0.042 / 0.844	0.045 / 0.844

* p<0.05   ** p<0.01   *** p<0.001

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Table 1.2

Effect of the God Cue on Generosity to All Recipients (Study 1)

Predictors	Not accounting for participant religion Estimates (95% CI)	Accounting for participant religion Estimates (95% CI)	Accounting for demographics Estimates (95% CI)
Intercept	34.00 ***	32.02 ***	33.78 ***
	(32.71 – 35.29)	(30.06 – 33.98)	(31.46 – 36.09)
God salient	1.32 ***	-2.09 ***	-2.07 ***
	(0.62 – 2.03)	(-3.14 – -1.03)	(-3.13 – -1.01)
Christian subj.		3.47 **	2.38
		(0.87 – 6.07)	(-0.29 – 5.04)
Salient: Christian subj.		5.99 ***	5.93 ***
		(4.59 – 7.39)	(4.52 – 7.33)
Age (centered)			0.15 **
			(0.05 – 0.25)
Male participant			-2.32
			(-4.85 – 0.20)
Other Gender			-6.96
			(-18.33 – 4.40)
Random Effects			
σ^2	131.26	126.93	127.21
τ_{00}	753.96 id	746.28 id	743.10 id
ICC	0.85	0.85	0.85
N	2030 id	2030 id	2015 id
Observations	4060	4060	4030
Marginal R^2 / Conditional R^2	0.000 / 0.852	0.015 / 0.857	0.020 / 0.857

* p<0.05   ** p<0.01   *** p<0.001

Table 1.3

Effect of God Belief and Attendance on God Cue (Study 1)

Predictors	God belief without participant religion	God belief with participant religion and demographics	Attendance without participant religion	Attendance with participant religion and demographics
	Estimates (95% CI)	*Estimates (95% CI)*	*Estimates (95% CI)*	*Estimates (95% CI)*
Intercept	33.04 *** (31.47 – 34.61)	35.79 *** (32.81 – 38.77)	33.97 *** (32.68 – 35.26)	33.54 *** (31.01 – 36.07)
God salient	-0.65 (-1.43 – 0.13)	-0.59 (-1.90 – 0.72)	1.37 *** (0.68 – 2.07)	-1.43 * (-2.61 – -0.25)
God belief (centered)	0.68 * (0.14 – 1.22)	0.93 (-0.11 – 1.98)		
Salient: Belief	0.87 *** (0.60 – 1.14)	0.89 *** (0.37 – 1.41)		
Christian subj.		-2.93 (-9.39 – 3.53)		2.75 (-0.47 – 5.97)
Age (centered)		0.18 ** (0.05 – 0.30)		0.15 ** (0.05 – 0.25)
Male participant		-3.08 * (-6.16 – -0.00)		-2.34 (-4.87 – 0.18)
Other gender		-6.96 (-18.04 – 4.12)		-6.96 (-18.33 – 4.41)
Salient: Christian subj.		-0.27 (-3.48 – 2.93)		4.89 *** (3.20 – 6.57)
Attendance frequency (centered)			0.41 (-0.36 – 1.18)	-0.16 (-1.09 – 0.78)
Salient: Attendance			1.30 *** (0.88 – 1.71)	0.49 (-0.01 – 0.99)
Random Effects				
σ^2	100.64	100.32	126.50	124.71
τ_{00}	716.89 id	710.50 id	753.87 id	744.97 id
ICC	0.88	0.88	0.86	0.86
N	1275 id	1269 id	2029 id	2014 id
Observations	2550	2538	4058	4028
Marginal R^2 / Conditional R^2	0.015 / 0.879	0.023 / 0.879	0.005 / 0.857	0.020 / 0.859

* p<0.05   ** p<0.01   *** p<0.001

For the final moderator analysis, I tested whether the effect of the God cue is moderated by belief in a punishing God. Because items about specific beliefs about God's nature are not coherent for atheist participants, I limited this analysis to the Christian sample. For this analysis, I regressed donation on salience, belief in a punishing God, belief in a rewarding God, and salience's interaction with belief in a punishing God and belief in a rewarding God, respectively. Contrary to the findings of prior research, no effect was found of punishing God beliefs, neither directly nor as part of an interaction. Instead, belief in a rewarding God was a significant predictor. Higher belief in a rewarding God predicted greater generosity overall, and the God cue was more powerful with those high in belief in a rewarding God. These findings held robustly when accounting for participant demographics (Table 1.4).

Ingroup Favoritism

I tested whether participants showed favoritism for ingroup members across salience conditions. Recipients were coded as "Ingroup" when they belonged to the same religious group to the participant and "Outgroup" when they belonged to the other religious group. Recipients with unspecified religious affiliation were coded as neutral. I first simply regressed donation on this ingroup variable. As expected, participants showed greater generosity to ingroup members than to outgroup members (Table 1.5). There was no significant difference between generosity to ingroup members and neutral recipients. Next, I included participant religion and an interaction between participant religion and ingroup affiliation into the model. No difference was found in ingroup favoritism between Christian and atheist participants; however, an interaction was found such that Christians showed greater generosity to neutral participants than did atheists. These findings hold robustly when accounting for participant religious group.

Table 1.4

Effect of Belief in Punishing and Rewarding God on Donation (Study 1)

Predictors	Not accounting for participant religion Estimates (95% CI)	Accounting for participant demographics Estimates (95% CI)
Intercept	35.48 *** (33.75 – 37.21)	35.37 *** (33.14 – 37.61)
God salient	3.90 *** (2.90 – 4.90)	3.87 *** (2.86 – 4.87)
Rewarding God belief (centered)	1.76 * (0.22 – 3.30)	1.82 * (0.27 – 3.38)
Punishing God belief (centered)	-0.82 (-2.22 – 0.58)	-0.66 (-2.07 – 0.75)
Salient: Reward	1.84 *** (0.95 – 2.73)	1.85 *** (0.96 – 2.74)
Salient: Punish	-0.55 (-1.35 – 0.26)	-0.53 (-1.34 – 0.28)
Age (centered)		0.18 ** (0.04 – 0.31)
Male participant		0.28 (-3.14 – 3.70)
Random Effects		
σ^2	149.83	150.31
τ_{00}	747.67 id	745.36 id
ICC	0.83	0.83
N	1156 id	1145 id
Observations	2312	2290
Marginal R^2 / Conditional R^2	0.016 / 0.836	0.022 / 0.836

* p<0.05   ** p<0.01   *** p<0.001

Table 1.5

Generosity to Ingroup Members Versus Outgroup Members (Study 1)

Predictors	Ingroup favoritism	Accounting for Participant religion	Accounting for demographics
	Estimates (95% CI)	*Estimates (95% CI)*	*Estimates (95% CI)*
Intercept	37.69 ***	35.43 ***	37.15 ***
	(35.54 – 39.83)	(32.15 – 38.71)	(33.63 – 40.66)
Neutral recipient	-1.67	-6.05 **	-6.06 **
	(-4.71 – 1.36)	(-10.63 – -1.48)	(-10.64 – -1.49)
Outgroup recipient	-7.43 ***	-7.20 **	-7.13 **
	(-10.46 – -4.39)	(-11.83 – -2.56)	(-11.78 – -2.48)
Christian subj.		3.89	2.90
		(-0.42 – 8.19)	(-1.44 – 7.23)
Neutral recipient: Christian subj.		8.09 **	7.96 *
		(2.02 – 14.16)	(1.88 – 14.04)
Outgroup recipient.: Christian subj.		-0.37	-0.56
		(-6.46 – 5.73)	(-6.68 – 5.56)
Age (centered)			0.15 **
			(0.05 – 0.26)
Male participant			-2.34
			(-4.84 – 0.17)
Other gender			-5.91
			(-17.23 – 5.41)
Random Effects			
σ^2	132.07	132.07	132.24
τ_{00}	744.25 id	731.34 id	728.20 id
ICC	0.85	0.85	0.85
N	2030 id	2030 id	2015 id
Observations	4060	4060	4030
Marginal R^2 / Conditional R^2	0.011 / 0.851	0.027 / 0.851	0.033 / 0.851

* p<0.05   ** p<0.01   *** p<0.001

Does Religious Salience Have Parochial Effects?

I regressed donation on ingroup affiliation, salience, participant religion, and the two- and three-way interactions among these variables. Participant demographics (age and gender) were included in the model. Results can be seen in Table 1.6. To make these results more interpretable, separate analyses were also conducted for the Christian and Atheist participant samples. Consistent with prior results and my hypothesis, atheists displayed greater generosity to ingroup members than outgroup members. They also showed greater generosity to the ingroup than to neutral recipients. Furthermore, there was an effect of the God cue such that atheists became *less* generous, but only to neutral and outgroup recipients.

As expected, Christians were more generous to ingroup members than to outgroup members. There was no significant difference between giving to ingroup members and neutral recipients. The God cue had a significant positive effect on giving, and there was no significant interaction between the God cue and recipient group. Thus, this model does not provide significant evidence that God salience has differential effects on change in generosity to ingroup and outgroup members. However, as this question is of central importance, it is worth considering this estimate in more detail. For this, I turn to Bayesian analysis.

Table 1.6

Regression Results Testing Interaction of Salience and Recipient Group (Study 1)

Predictors	All participants Estimates (95% CI)	Christian participants Estimates (95% CI)	Atheist participants Estimates (95% CI)
Intercept	37.25 *** (33.62 – 40.89)	37.22 *** (33.94 – 40.49)	38.47 *** (34.61 – 42.33)
Neutral recipient	-4.57 (-9.32 – 0.18)	1.62 (-2.63 – 5.87)	-4.67 * (-9.31 – -0.03)
Outgroup recipient	-5.86 * (-10.69 – -1.03)	-7.23 *** (-11.44 – -3.02)	-6.01 * (-10.73 – -1.29)
God salient	-0.21 (-2.06 – 1.64)	4.03 *** (2.29 – 5.77)	-0.21 (-1.80 – 1.38)
Christian subj.	0.78 (-3.73 – 5.28)		
Age (centered)	0.15 ** (0.05 – 0.26)	0.17 * (0.04 – 0.30)	0.14 (-0.02 – 0.31)
Male participant	-2.34 (-4.84 – 0.17)	-0.39 (-3.76 – 2.98)	-4.86 * (-8.62 – -1.09)
Other gender	-5.91 (-17.23 – 5.41)		-7.08 (-18.30 – 4.14)
Neutral recipient: salient	-2.98 * (-5.57 – -0.40)	0.53 (-1.95 – 3.02)	-2.98 ** (-5.20 – -0.76)
Outgroup recipient: salient	-2.54 (-5.16 – 0.08)	-1.03 (-3.49 – 1.43)	-2.54 * (-4.78 – -0.29)
Neutral recipient: Christian subj.	6.21 (-0.11 – 12.52)		
Outgroup recipient: Christian subj.	-1.31 (-7.67 – 5.04)		
Christian subj.: salient	4.24 *** (1.80 – 6.68)		
Neutral recipient: Christian subj.: salient	3.52 * (0.08 – 6.95)		
Outgroup recipient: Christian subj: salient	1.51 (-1.94 – 4.96)		
Random Effects			
σ^2	126.97	152.35	93.47
τ_{00}	730.84 id	736.31 id	722.63 id
ICC	0.85	0.83	0.89
N	2015 id	1146 id	869 id
Observations	4030	2292	1738
Marginal R^2 / Conditional R^2	0.036 / 0.857	0.029 / 0.833	0.023 / 0.888

* p<0.05   ** p<0.01   *** p<0.001

Why Bayesian Analysis?

Because Bayesian analyses remain uncommon in the psychological literature, I will briefly discuss the benefits of a Bayesian approach. Bayesian linear regression seeks to accomplish roughly the same goal as frequentist linear regressions: Both fit a linear equation to the data using given covariates as closely as possible (specifically by minimizing the sum of the squared residuals). The difference is simply in their treatment of probability around the parameter estimates. It is worth first considering the assumptions used in frequentist approaches, like those I have used thus far. In a frequentist hypothesis test, a parameter of interest (e.g., a regression coefficient) is first assumed to be some fixed value, typically 0. The hypothesis test then considers infinite hypothetical repetitions of a study and outputs the proportion of those repetitions that would give a point estimate of this parameter that is at least as large as the point estimate found in the study (the p-value). From such a frequentist test, one can know a) the study-estimated value of the parameter point estimate, and b) how likely it is that the sample estimate would come from a null parameter. However, such a test reveals little other information about the distribution of possible parameters that could have yielded these data. A Bayesian approach, on the other hand, does grant this information.

Bayesian approaches use a different conceptualization of probability than do frequentist approaches. Unlike a frequentist approach, a Bayesian approach makes no assumptions about long-run repetitions of a study. Instead, the data collected in a study are assumed to be fixed, and a distribution of plausible parameters that could have yielded those data are output by the model. Put simply, rather than treating a parameter as fixed and the data as random (as a frequentist approach does), a Bayesian approach treats the data as fixed and the parameters as random.

Using such an approach, a researcher can explore which parameters are likely to have yielded the given data, and which are not.

Bayesian Regression

To get a better understanding of the potential parochial effects of religious salience, I conducted a Bayesian multi-level regression analysis. While not pre-registered, this test allows a better look at what parameter values are likely than do the registered analyses. Because Christians were the primary population of interest, I limited this analysis to the Christian sample. The model was fit using the brms package in R (Bürkner, 2017). This package uses an R-based syntax and interface to communicate with the probabilistic programming language STAN (Carpenter et al., 2017). Using a linear gaussian model, donation was regressed on recipient group identity, salience, and the interaction between these variables. Participant age and gender were also included as fixed effects. Random intercepts were specified at the participant level. Intercept and coefficient priors were specified to be weakly informative. Variance parameters were set to weakly informative defaults (see Appendix B for exact prior distributions and a robustness check). The model was fit using a Markov Chain Monte Carlo (MCMC) method using four independent chains of 5,000 iterations apiece (half of those used as warm-up), yielding 10,000 total post-warm-up draws. The model converged, with all R-hat values equal to 1.00.

Summary statistics of the posterior are available in Table 1.7. Complete posterior distributions with highest density intervals (HDIs) can be seen in Figure 1.2. 100% of the posterior distribution of the salience coefficient lies above 0, so it is overwhelmingly more likely than not that God salience increased generosity to ingroup members. Additionally, 99.95% of the posterior distribution of the outgroup coefficient lies below 0, so it is overwhelmingly likely that

Christians demonstrated greater generosity to the ingroup than the outgroup at baseline. Of particular interest to this analysis is the salience-by-atheist participant interaction. 78.76% of the posterior distribution lies above zero, so it is weakly more likely that the God cue had a stronger effect on ingroup members than it is that the God cue had a stronger effect on outgroup members. However, the central question is whether the God cue increased giving to both ingroup members and to outgroup members. A posterior distribution of predicted change scores can be computed using the posterior distributions of the salience and interaction coefficients. These change score posterior distributions are displayed in Figure 1.3. Out of 10,000 posterior draws, 0% yielded a parameter below 0 for the post-God cue change of giving to Christian and neutral recipients, and only 0.03% yielded a parameter below 0 for the post-God cue change of giving to atheist recipients. Therefore, it is overwhelmingly more likely than not that the God cue increased generosity across all recipient conditions.

Table 1.7

Bayesian Regression Posterior Estimates For Study 1

Predictors	Bayesian Posterior Estimates	
	Posterior Median	*90% Credibility Interval*
Intercept	37.56	34.80 – 40.26
God salient	4.03	2.59 – 5.49
Neutral recipient	1.57	-1.92 – 5.10
Atheist recipient	-7.22	-10.81 – -3.68
Age (centered)	0.17	0.06 – 0.28
Male participant	-0.41	-3.24 – 2.45
Neutral recipient: salient	0.54	-1.54 – 2.63
Outgroup recipient: salient	-1.03	-3.09 – 1.01
Random Effects		
σ^2	152.69	
$\tau_{00\ id}$	737.56	
ICC	0.83	
N_{id}	1146	
Observations	2292	
Marginal R^2 / Conditional R^2	0.031 / 0.833	

Figure 1.2

Study 1 Coefficient Posterior Distributions of the Bayesian Regression with Highest Density

Intervals (HDI)
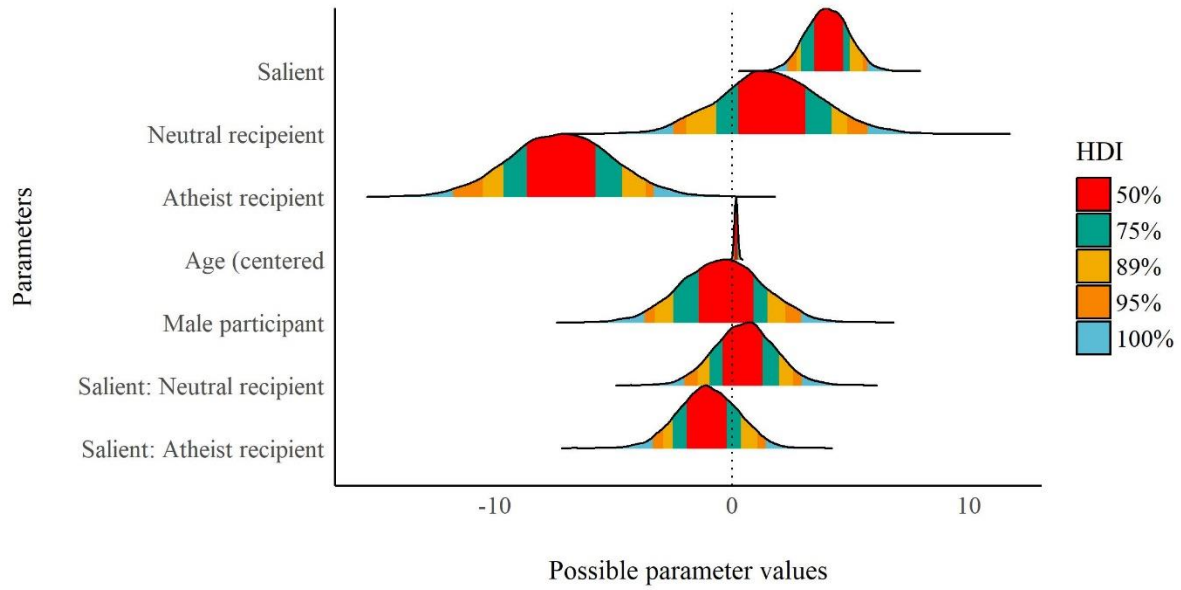
Figure 1.3

Study 1 Posterior Distributions of the Change in Generosity Post-God Cue to Each Recipient

Group
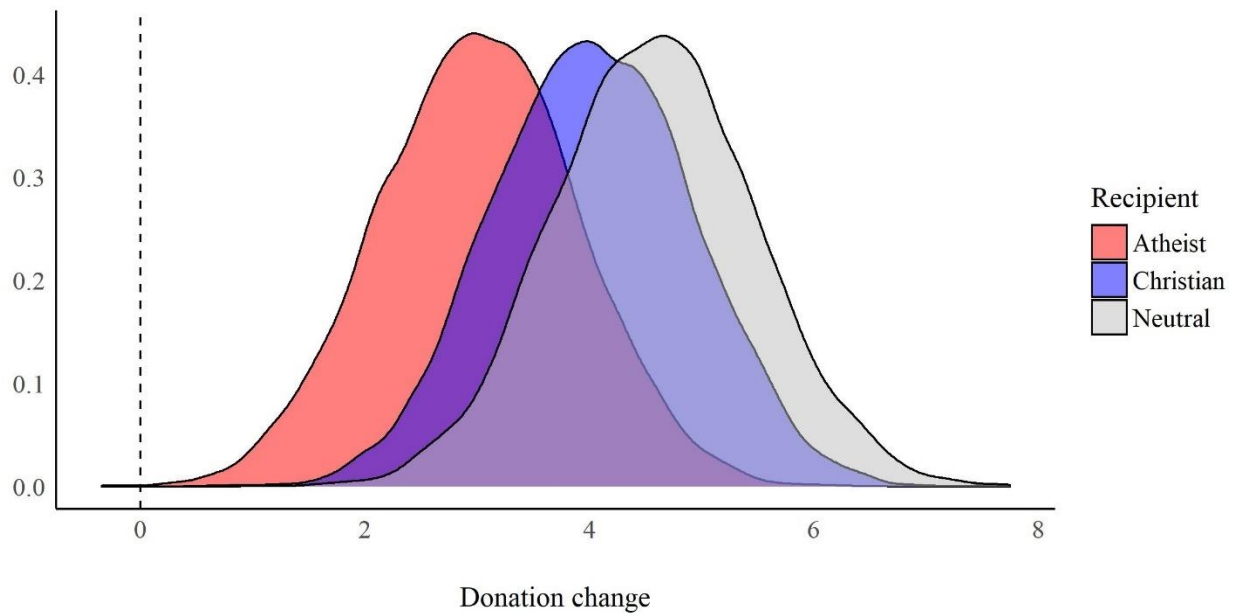
Discussion

Effect of God Salience and Its Dispositional Moderators

In Study 1, I first sought to replicate the finding that the explicit God cue used by White and colleagues (2019) would lead to increased generosity. As hypothesized (*Research Question 1*) Christians increased their generosity following the God cue both to neutral recipients (those for whom no religious identity was stated) and for an aggregated sample of Christian, atheist, and neutral recipients. This supports the hypothesis that salience of God increases generosity in a sample of believers. On the other hand, atheist participants *decreased* generosity to neutral recipients and an aggregated sample of Christian, atheist, and neutral recipients. This moderation by participant religious group supports the hypothesis that the God cue would increase generosity more in believers than in non-believers, but the specific finding that the God cue would decrease generosity in atheists was not hypothesized. Therefore, explanations of this decline in generosity are left predominantly in the domain of speculation. One possible explanation revolves around the fact that atheists are widely stereotyped as unethical and untrustworthy (Gervais et al., 2011). Perhaps making God salient activates concepts around this tension in the ethical domain, decreasing prosocial intentions towards religious or neutral recipients. With this potential explanation in mind, it is noteworthy that the decline in generosity was not exhibited to fellow atheists. Furthermore, the atheist sample here was exclusively sampled from those who explicitly identify as "atheist." There are important psychological differences between those who identify as atheist and other non-religious or non-believing people (see, for example, Scheitle et al., 2019), so it is unclear whether this decline in generosity would generalize to the larger population of non-religious and non-believing people. Nonetheless, while it is interesting to speculate on this atheist outcome, and this subject warrants

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further research, the primary interest of this dissertation concerns the effect of religious salience on those who believe in the concept or agent made salient. Thus, I focus predominantly here on the Christian sample.

As expected, the God cue more strongly predicted an increase in generosity as a function of belief in God. This moderator held even when accounting for participant religious group (i.e., Christian versus atheist). This supports the notion that the prosocial effect of God salience requires the scaffolding of dispositional belief in the concept or agent made salient. The God cue also more strongly increased generosity in those who attended church more frequently, but this finding did not hold robustly when accounting for religious group. It is unsurprising that the moderator that directly assesses belief in the agent made salient (i.e., belief in God) is more relevant to the strength of a cue than a less directly associated moderator (i.e., religious attendance).

Contrary to prior research (Shariff & Norenzayan, 2011) belief in a rewarding God predicted a stronger effect of God salience on generosity, while belief in a punishing God had no significant effect. The different nature of the behavioral measures used in this study versus those used by Shariff and Norenzayan may be important. Shariff and Norenzayan found that belief in a punishing God decreased an antisocial behavior (specifically cheating), which carries strong prohibitive norms. Here, the task explored a prosocial behavior. Perhaps punishing God concepts may act to discourage socially undesirable behaviors, while rewarding concepts may act to encourage desirable ones. Somewhat consistent with this explanation, Johnson and colleagues (2013) found a positive effect of benevolent God concepts on willingness to forgive, while authoritarian God concepts were associated with lower prosocial behavior. While the potential

for different effects of belief in God's punishing and rewarding aspects is not of central importance for this dissertation, this is nonetheless an area ripe for future research.

Ingroup Favoritism

As hypothesized, and consistent with abundant past research, both Christian and atheist participants were significantly more generous to ingroup members than outgroup members (*Research Question 2*). Ingroup favoritism is one of the oldest and best-replicated findings in social psychology and has been specifically shown to exist in an economic game paradigm (for a meta-analysis, see Balliet et al., 2014). While religious identity may be a particularly salient source of group identity, such ingroup favoritism is by no means limited to religious groups. Even a minimal group paradigm (a paradigm in which group membership is assigned based on very little relevant information, such as random assignment) reveals ingroup favoritism in such a dyadic economic task (Chen & Li, 2009).

While I hypothesized that generosity to ingroup members would be stronger than generosity to outgroup members, I had no firm hypotheses about how generosity to a neutral recipient would compare. Interestingly, both the Christian and atheist participant samples treated a neutral recipient similarly to how they treated a Christian recipient. This may suggest that both Christian and atheist participants implicitly assumed the neutral recipient to be a Christian, or, put another way, Christian and atheist participants associate Christians with the "neutral" American. This makes logical sense as most American adults identify themselves as Christians (65% as of 2020; Pew Research Center, 2021). On the other hand, only 5% of Americans in the same survey identified themselves to be atheist. The fact that "neutral" recipients were treated so similarly to Christians and so differently from atheists provides compelling evidence that

researchers should consider who an anonymous recipient is considered to be in such economic games.

Lastly, and importantly, I considered the interaction between God salience and ingroup favoritism, testing multiple competing hypotheses. For atheist participants, there was a significant interaction between God salience and recipient identity, such that the God cue decreased generosity toward neutral recipients and outgroup recipients, but not ingroup recipients. This finding was not hypothesized but may be explained by the activation of ethics and trust-relevant stereotypes about atheists, as discussed earlier. However, the Christian sample was the primary sample of interest for this analysis. Among Christians, no significant salience-by-recipient interaction was found. Therefore, this analysis provided no strong evidence that the God cue acted differently on ingroup and outgroup participants. That said, the absence of a significant effect is not, in itself, evidence of a true null parameter value. To better explore what parameter values are plausible, I conducted a Bayesian analysis.

Repeated draws from the posterior distribution strongly support the hypothesis that the God cue increased generosity to both ingroup Christian recipients and outgroup atheist recipients. This study therefore provides strong evidence against both the strong parochiality and weak parochiality hypotheses. Roughly three-quarters of the posterior distribution of the interaction term fell on the side of the cue having a stronger effect to ingroup members than to outgroup members. This provides weak evidence against the bias reduction hypothesis. The universality hypothesis is therefore best supported by this study. While it is not clear from this study alone that the increase in generosity was extended precisely *equally* to ingroup and outgroup recipients, the study provides overwhelming evidence that generosity was increased by

some degree to both groups. Later studies were designed to focus on this parochiality question

more specifically.

Study 2 was quite similar to Study 1, but a more direct focus was placed on the parochiality question. To focus more narrowly on this question, only Christian participants were recruited, and no neutral recipient condition was used. Instead, recipients belonged only to the participant's ingroup or outgroup. Furthermore, as a first step in assessing the generalizability of Study 1, I used a different outgroup for Study 2. Participants were led to believe they were part of a multi-national study, and recipients were described either as Christians from the United States (the ingroup) or Muslims from the United Arab Emirates (UAE; the outgroup).

Method

Participants

A total of 1,037 self-described Christians were recruited through MTurk and completed the survey. Of this sample, 47 participants incorrectly answered an attention check item and were excluded, leaving a sample of 990 (55.3% female, $M_{age} = 38.43$, $SD = 13.35$). I additionally pre-registered that I would exclude individuals who could not correctly identify the religious identity of their dictator game recipient. Following this exclusion, 828 participants remained (56.3% female, $M_{age} = 39.14$, $SD = 13.64$). To maintain comparability to other studies in this dissertation, I will primarily focus on analyses without this exclusion, but I also report analyses with the exclusion in Appendix C.

Procedure and Measures

This study was pre-registered at https://osf.io/g73tu/. Here, I report only those questions and analyses most relevant to the dissertation. The procedure and measures of Study 2 are nearly identical to those of Study 1, except for three key differences. First, only Christian participants were recruited for this study. Second, participants were led to believe that this was a multi-

national study, and recipients were randomly either described as American Christians or

Muslims from the UAE, rather than American Christians or American atheists, as was true in

Study 1. Finally, no neutral condition was employed in this study.

Study Research Questions and Hypotheses

This study was designed to narrowly ask the primary research questions of this

dissertation. I hypothesized that participants would be more generous following the God cue than

before. I further expected that this effect would be moderated by belief in God. I also

hypothesized that participants would be more generous to ingroup American Christians than to

outgroup UAE Muslims, at least at baseline (i.e., before the God cue). Finally, I aimed to test the

competing parochiality hypotheses. While I believed any of the four competing hypotheses could

be supported, I believed the universality hypothesis or weak parochiality hypothesis to be the

most likely, following the findings of Study 1.

Analyses and Results

As in Study 1, analyses were conducted using a multilevel model framework in R (R

Core Team, 2013) using the lme4 (Bates et al., 2015) and lmerTest packages (Kuznetsova et al.,

2017). For all models, random intercepts were specified at the participant level. All other

covariates were included as fixed effects. Estimates were optimized on the restricted maximum

likelihood (REML) criterion.

The donation variable was treated as the percentage of the total allotment that was shared.

See Figure 2.1 for sample participants' donations as a function of recipient religion and God

salience (before or after God reminder).

Figure 2.1

Percentage of Allotment Donated as Function of Recipient Religion and Salience
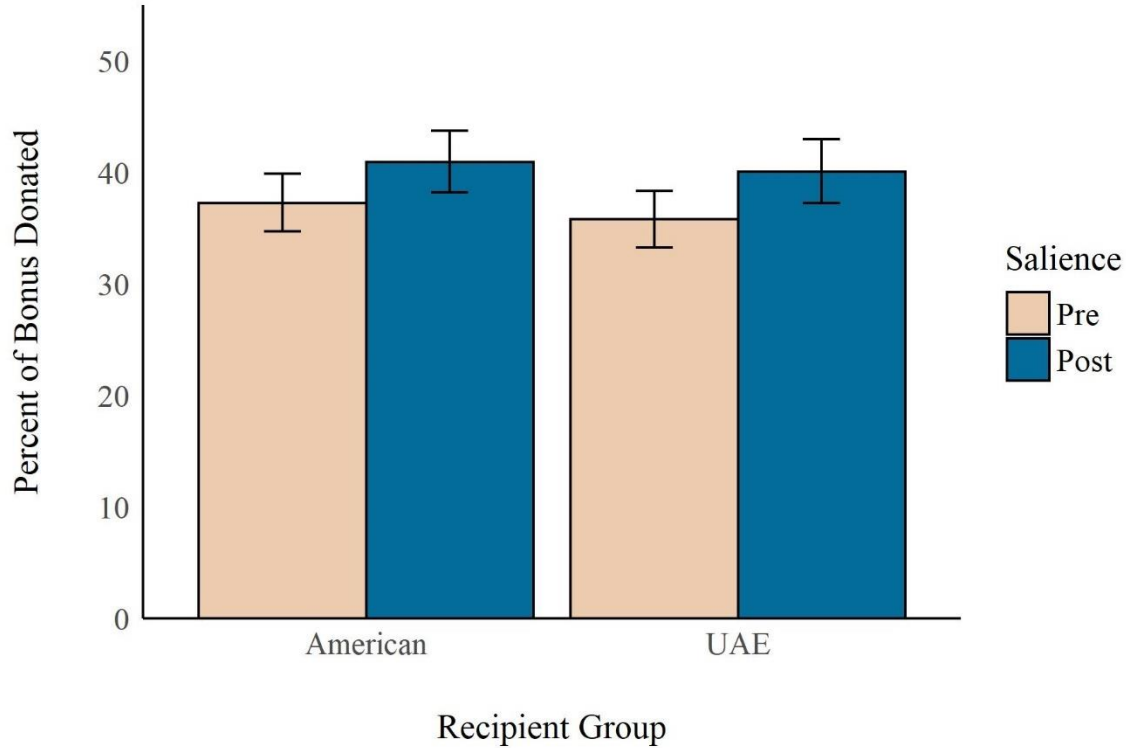
Note: Error bars represent bootstrapped 95% confidence intervals.

Effect of God Cue on Generosity

I first simply regressed generosity on the God cue across the complete sample. As hypothesized, God salience led to a significant increase in generosity (Table 2.1). As in study 1, the effect of the God cue was moderated by belief in God, but belief in God did not directly predict greater generosity. In this study, religious attendance also moderated the effect of the God cue, but like belief, it did not directly predict generosity.

I next regressed donation on salience, rewarding God beliefs, punishing God beliefs, and salience's interaction with rewarding and punishing God beliefs, respectively. No significant

effect of rewarding or punishing God beliefs was found. However, when the analysis was restricted to attentive participants (those that could recall the recipients' religious identity), a salience-by-rewarding God belief interaction was found, consistent with Study 1 (see Appendix C).

Table 2.1

Effect of God Cue and Religious Moderators on Donation (Study 2)

Predictors	Salience	God Belief	Attendance	Punishing and Rewarding God
	Estimates (95% CI)	*Estimates (95% CI)*	*Estimates (95% CI)*	*Estimates (95% CI)*
Intercept	36.54 *** (34.63 – 38.46)	36.54 *** (34.63 – 38.46)	36.54 *** (34.64 – 38.45)	36.54 *** (34.63 – 38.45)
God salient	3.97 *** (2.87 – 5.07)	3.97 *** (2.88 – 5.07)	3.97 *** (2.88 – 5.06)	3.97 *** (2.88 – 5.06)
God belief (centered)		0.04 (-1.19 – 1.27)		
Salience: Belief		0.96 ** (0.26 – 1.66)		
Attendance (centered)			0.67 (-0.45 – 1.80)	
Salience: Attendance			1.19 *** (0.55 – 1.83)	
Rewarding God (centered)				1.55 (-0.05 – 3.16)
Punishing God (centered)				-0.99 (-2.40 – 0.43)
Salience: Reward				0.67 (-0.25 – 1.59)
Salience: Punish				0.60 (-0.22 – 1.41)
Random Effects				
σ^2	155.19	154.22	153.31	154.01
τ_{00}	787.11 ParticipantID	787.81 ParticipantID	784.30 ParticipantID	784.22 ParticipantID
ICC	0.84	0.84	0.84	0.84
N	990 ParticipantID	990 ParticipantID	990 ParticipantID	990 ParticipantID
Observations	1980	1980	1980	1980
Marginal R^2 / Conditional R^2	0.004 / 0.836	0.005 / 0.837	0.010 / 0.838	0.010 / 0.838

* p<0.05   ** p<0.01   *** p<0.001

Ingroup favoritism

To test whether Christians demonstrated greater generosity to ingroup members than outgroup members across salience conditions, I first simply regressed generosity on recipient religion. Contrary to my hypothesis, recipient group was not a significant predictor of donation amount (Table 2.2). Because other demographic information was given about the recipient, other than just their group affiliation (age and gender), I next tested a model with these demographic characteristics entered as covariates. This did not substantially change the coefficient estimate. Finally, I added participants' age and gender. The coefficient estimate was still not substantially changed.

Next, I assessed the effects of God salience and recipient group together (Table 2.3). First, I tested a model with both factors as covariates, along with recipient gender and age. The only significant effect was God salience, which positively predicted generosity. Next, I accounted for the interaction between the God cue and religious salience. No interaction effect was found. These findings held robustly when controlling for participant demographics.

Table 2.2

Effect of Recipient Group Membership on Donation (Study 2)

Predictors	Recipient *Estimates (95% CI)*	Accounting for Recipient Demographics *Estimates (95% CI)*	Accounting for Participant Demographics *Estimates (95% CI)*
Intercept	39.97 *** (37.28 – 42.66)	39.38 *** (36.66 – 42.11)	38.45 *** (35.23 – 41.67)
UAE recipient	-3.78 (-7.74 – 0.18)	-1.16 (-4.83 – 2.51)	-1.28 (-4.96 – 2.40)
Male recipient		-0.52 (-2.07 – 1.03)	-0.48 (-2.04 – 1.07)
Recipient age (centered)		0.03 (-0.09 – 0.16)	0.04 (-0.09 – 0.16)
Male participant			1.81 (-1.90 – 5.52)
Participant age (centered)			0.04 (-0.10 – 0.18)
Random Effects			
σ^2	147.90	163.18	163.95
τ_{00}	764.04 ParticipantID	783.39 ParticipantID	783.12 ParticipantID
ICC	0.84	0.83	0.83
N	828 ParticipantID	990 ParticipantID	983 ParticipantID
Observations	1656	1980	1966
Marginal R^2 / Conditional R^2	0.004 / 0.838	0.000 / 0.828	0.002 / 0.827

* p<0.05   ** p<0.01   *** p<0.001

Table 2.3

Effect of God Cue, Recipient Group, and Salience-by-Group Interaction (Study 2)

	Salience and recipient demographics	Salience-by-group interaction	Accounting for participant demographics
Predictors	*Estimates (95% CI)*	*Estimates (95% CI)*	*Estimates (95% CI)*
Intercept	37.32 *** (34.54 – 40.10)	37.46 *** (34.63 – 40.29)	36.53 *** (33.22 – 39.84)
UAE recipient	-1.16 (-4.83 – 2.51)	-1.44 (-5.27 – 2.38)	-1.56 (-5.40 – 2.29)
God salient	3.96 *** (2.86 – 5.06)	3.67 *** (2.11 – 5.24)	3.67 *** (2.09 – 5.24)
Male recipient	-0.37 (-1.88 – 1.15)	-0.36 (-1.87 – 1.16)	-0.32 (-1.85 – 1.20)
Recipient age (centered)	0.01 (-0.11 – 0.14)	0.01 (-0.11 – 0.14)	0.01 (-0.11 – 0.14)
Male participant		0.57 (-1.63 – 2.77)	0.56 (-1.66 – 2.77)
Participant age (centered)			1.81 (-1.90 – 5.52)
Salience: UAE recipient			0.04 (-0.10 – 0.18)
Random Effects			
σ^2	155.47	155.59	156.40
τ_{00}	787.47 ParticipantID	787.40 ParticipantID	787.08 ParticipantID
ICC	0.84	0.84	0.83
N	990 ParticipantID	990 ParticipantID	983 ParticipantID
Observations	1980	1980	1966
Marginal R^2 / Conditional R^2	0.005 / 0.836	0.005 / 0.836	0.006 / 0.835

* p<0.05   ** p<0.01   *** p<0.001

Bayesian Regression

I fit a Bayesian regression using the same methods as in Study 1. Donation was regressed on God salience condition, recipient group, and their interaction. Recipient and participant gender and age were also included as fixed effects. Random intercepts were specified at the

participant level. The model converged, with all R-hat values equal to 1.00. Summary statistics

of the posterior are available in Table 2.4. Complete posterior distributions with highest density

intervals (HDIs) can be seen in Figure 2.2. 100% of the posterior distribution of the salience

coefficient is to the right of 0, providing overwhelming evidence that the God cue increased

generosity. 78% of the recipient group coefficient is to the left of 0. These data therefore are only

weakly supportive of a hypothesis that Christians display greater generosity to fellow American

Christians than to UAE Muslims. 69% of the posterior distribution of the interaction term is to

the right of 0, suggesting that it is weakly more likely that these data would have come from a

parameter showing a greater effect of the God cue toward UAE Muslims than to USA Christians.

Table 2.4

Bayesian Regression Posterior Estimates for Study 2

	Bayesian Posterior Estimates	
Predictors	*Posterior Median*	*90% Credibility Interval*
Intercept	40.22	34.88 – 45.57
God salient	3.66	2.31 – 5.03
UAE recipient	-1.54	-4.66 – 1.68
Subj. age (centered)	0.03	-0.08 – 0.15
Subj. gender	-1.81	-4.89 – 1.25
Recipient age	0.02	-0.09 – 0.12
Recipient gender	-0.33	-1.61 – 0.96
UAE recipient: salient	0.54	-1.37 – 2.43

Random Effects

σ^2	156.87	
$\tau_{00 \ \text{ParticipantID}}$	788.15	
ICC	0.83	
$N_{\text{ParticipantID}}$	983	
Observations	1966	
Marginal R^2 / Conditional R^2	0.008 / 0.835	

Figure 2.2

Study 2 Coefficient Posterior Distributions of the Bayesian Regression with Highest Density

Intervals (HDI)
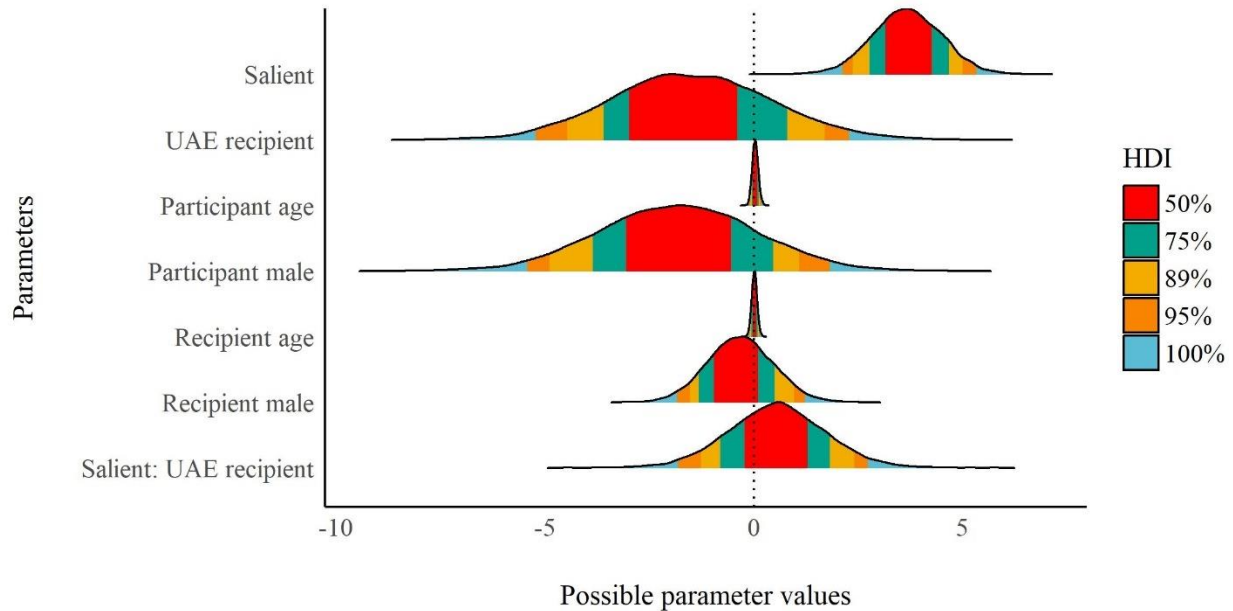
A posterior distribution of predicted change scores can be computed using the posterior distributions of the salience and interaction coefficients. These change score posterior distributions are displayed in Figure 2.3. Out of 10,000 posterior draws, 0% yielded a parameter below 0 for the post-God cue change of giving to either UAE Muslim or American Christian participants. Therefore, it is overwhelmingly more likely than not that the God cue increased generosity across both recipient conditions.

Figure 2.3

Study 2 Posterior Distributions of the Change in Generosity Post-God Cue to Each Recipient

Group

Donation change
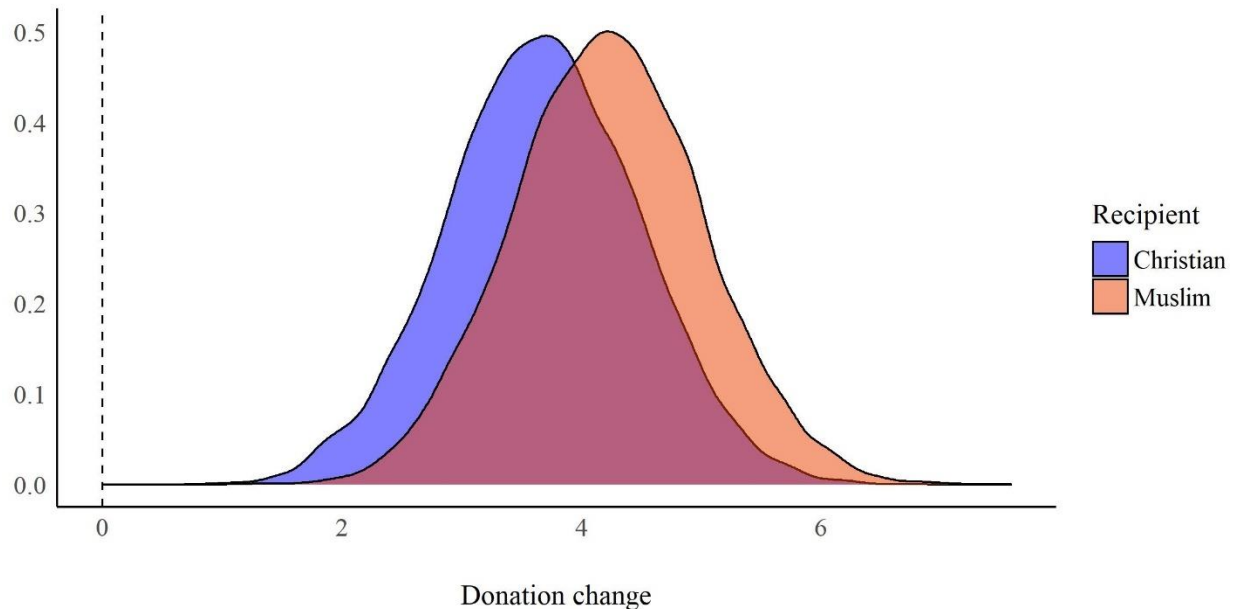
Discussion

As hypothesized, and consistent with Study 1, participants increased their generosity following the God cue, supporting the hypothesis that God salience increases generosity in believers. This effect was moderated by dispositional religiosity variables, specifically belief in God and religious attendance. This further supports the idea that God salience acts on top of dispositional religiosity and belief to promote prosocial behavior.

I further hypothesized that this American Christian sample would demonstrate greater generosity to fellow American Christians than they would to Emirati Muslim outgroup members. Surprisingly, no significant ingroup favoritism was found. It is worth considering why no ingroup favoritism was found against UAE Muslims, while ingroup favoritism was shown when the outgroup recipient was an American atheist. It is possible that this difference is due, at least

in part, to random sampling variance, but there may be theoretical explanations as well. According to the American Trends Panel (Pew Research Center, 2014), Christians have slightly warmer feelings towards Muslims than to atheists, but the difference is not terribly large, so it is unlikely that feelings of warmth alone explain this difference. Through causes like missionary work, calls to donate overseas are a common part of Christian religious life. Perhaps the foreign nationality of the outgroup recipient activated cognitions relevant to such common charitable giving. Additionally, while the UAE was selected as an outgroup due to its relatively high GDP per capita, it is possible that participants thought citizens of the UAE were in greater need than American citizens, and this could have motivated generosity. Finally, because most participants are unlikely to encounter many Muslims from the UAE, they may see this outgroup to be less threatening or hostile than they see domestic outgroups.

As in Study 1, no significant interaction was found between God salience and recipient group. Generosity to both American Christians and UAE Muslims increased following the God cue. This provides strong evidence against both the strong and weak parochiality hypotheses. While not significant, the point estimate of the interaction was consistent with a greater increase to outgroup members than to ingroup members. Therefore, the bias reduction hypothesis is not ruled out by these data (although this hypothesis name may be a misnomer for this study, as no initial bias was found). The universality hypothesis is also consistent with these data.

With the results of Studies 1 and 2 in mind, I had multiple goals for the next step in the research program. First, because Studies 1 and 2 found different results regarding baseline ingroup favoritism, I wanted to again use the same study paradigm to test for ingroup favoritism, using a different sample. Additionally, as one difference between the first two studies was the choice of religious outgroup (atheist versus Muslim), I wanted to test generosity to both

outgroups within the same sample. Finally, I wanted to make sure the sample used would

provide a strong test of God salience effects and ingroup favoritism. All these goals were

addressed in Study 3.

STUDY 3

Study 3 used a similar methodology to Studies 1 and 2 to test the same research questions. However, there were important differences in the procedure. First, I thought it important to test whether these findings would generalize to a non-MTurk sample. Economic games are quite common on MTurk, and participants who frequently participate in dictator games may display different behavior from those who do not (Arechar & Rand, 2022). Therefore, I sought a more naïve subject pool for this study. Second, Study 3 directly compared two distinct outgroups within the same participant sample: Muslims and atheists. As these two groups vary on a theoretically meaningful construct (belief in God), it was important to test whether the God cue predicted different outcomes for these groups. Third, from this study forward, I sought to avoid deception in studies as much as possible. In service of this goal, real recipients were used in this study. Finally, this study exclusively recruited participants who self-described as Evangelical Christians. Evangelicals are particularly strong believers in God (Pew Research Center, 2014), and, among all tested American religious groups, no group had less warm views of atheists or Muslims than do white Evangelicals. Thus, this population was selected as a particularly strong case: If no parochiality effect was found in an Evangelical sample, I reasoned that it is unlikely it would be found in any American Christian sample.

Method

Participants

The sample was recruited through a panel recruited by Qualtrics (an American survey company). Qualtrics continued recruitment until at least 1,800 self-described Evangelical Christians were recruited (those who did not self-report as Evangelical were screened out before

the rest of the survey was shown to them). Qualtrics additionally automatically screened out 115

participants for failing an attention check, and 86 for matching Qualtrics's criteria for "speeders"

(i.e. those who finished the survey implausibly quickly, suggesting inattention). Ultimately,

1,850 people matching the inclusion criteria were recruited. The sample was heavily female

(81.0%) and trended somewhat old compared to the average American ($M_{age} = 51.69$, $SD =$

16.19).

Procedure

This study was pre-registered at https://osf.io/asd4x/; however, here, I report only those

analyses most relevant to the questions of the dissertation. The study was conducted online using

Qualtrics's survey platform, and Qualtrics personnel handled recruitment for the survey. The

experimental procedure was very similar to those used in Studies 1 and 2 but had some notable

differences.

Participants who met eligibility criteria were directed to a page in which they were given

instructions for two dictator games they were to participate in. As in previous studies,

participants were informed they would receive a bonus payment and would be paired with two

partners. The bonus payments here were $3.00, rather than the $0.40 used in Studies 1 and 2, due

to the norms of higher payment in Qualtrics studies versus MTurk studies. Participants were told

they had the option to allocate any, all, or none, of their bonus to each of their partners, and that

only one of these decisions would randomly be selected to determine their donation.

Participants were next shown a page containing demographic information of one of their

partners (age, sex, religious group, and nationality). Unlike in Studies 1 and 2, this information

belonged to a real recipient whose information was collected from a prior survey, and who had

consented to be a recipient in the survey. The recipient with whom they were paired was randomly selected from a pool of Christian, Muslim or atheist recipients. On this page, participants were given the opportunity to donate as much or as little of their bonus as they would like to their partner.

After they had made their donation decision, participants were shown another page in which they were told that that they would be making another donation decision. Additionally, they were given one of two sets of instructions. In one condition, participants were given the same instructions used in Studies 1 and 2: "Before you make this decision, please think about God". In the other condition, they were given alternative instructions: "This time, please think about what God would want you to do when you make your decision." These alternative instructions were comparable to those used by Pasek and colleagues (2020). On the next page, participants were paired with a different recipient, but one belonging to the same religious group as in their first decision. Participants were then given the opportunity to donate to this recipient, again being reminded to think about God or to think about what God would want them to do. Participants then completed a short battery of survey items, including the items of interest described below.

Materials

Dictator game giving. Participants were administered two dictator games, as described above. Participants had the opportunity to donate anywhere from $0.00 to all $3.00 of their bonus to the recipient. Giving was operationalized as the percentage of the bonus donated (i.e. a donation of $1.50 was scored as 50).

God belief. God belief was measured with a single item: "I believe that God exists." Participants offered their level of agreement or disagreement on a 7-point scale from "Strongly disagree" to "Strongly agree."

Church attendance. Frequency of attendance at church services was assessed with the following item: "How often do you attend church?" This was measured on a seven-point scale with options "Once a year or less", "Several times a year", "About once a month", "About once a week", "Several times a week", "About every day", and "Several times a day".

Punishing and rewarding God. Belief in a punishing and rewarding God were measured with two single-item questions: "How often does God punish people when they do bad, immoral things throughout their lives?" and "How often does God reward people when they do good, moral things throughout their lives?". Each was measured on a five-point scale.

Study Research Questions and Hypotheses

As in the previous studies, I sought to answer three primary research questions. First, I aimed to test whether God salience would increase generosity (*Research Question 1*). I expected that generosity would indeed increase following the God salience cue. Next, I sought to test how generosity would compare across the three recipient groups (*Research Question 2*). I expected that generosity would be greater to ingroup Christians than it would be to either atheist or Muslim outgroup recipients. I had no firm hypotheses about how generosity would compare between the two recipient outgroup conditions. Finally, I aimed to test a salience-by-recipient group interaction to test whether the God cue had different effects depending on the recipient group (*Research Question 3*). I entered this study with a firmer hypothesis than I had for studies

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1 and 2. I expected that no significant interaction would be found, consistent with the Universality Hypothesis.

Analyses and Results

As in Studies 1-2, analyses were conducted using a multilevel model framework in R (R Core Team, 2013) using the lme4 (Bates et al., 2015) and lmerTest packages (Kuznetsova et al., 2017). For all models, random intercepts were specified at the participant level. All other covariates were included as fixed effects. Estimates were optimized on the restricted maximum likelihood (REML) criterion.

The donation variable was treated as the percentage of the total allotment that was shared. See Figure 3.1 for sample participants' donations as a function of recipient religion and God salience (before or after God reminder).

Figure 3.1

Percentage of Allotment Donated as Function of Recipient Religion and Salience (Study 3)
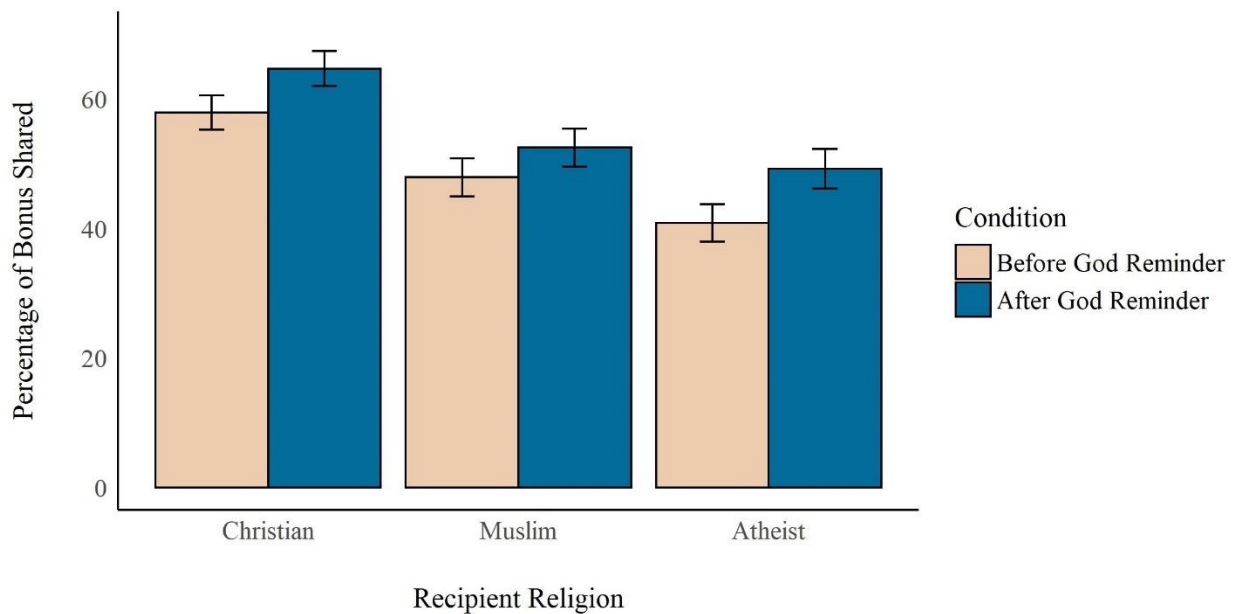
Note: Error bars represent bootstrapped 95% confidence intervals.

God Salience Effects

I first simply regressed the percentage of bonus donated on salience condition (before or after the God cue). As hypothesized, generosity was greater after the God cue (Table 3.1). Next, I accounted for the version of the God cue used by including this variable and the interaction with salience condition in the model. There was a significant interaction such that the more explicit "God's perspective" condition had a stronger positive effect on donations, but the "think about God" cue used in Studies 1 and 2 still significantly increased generosity. Neither belief in God ($b_{interaction} = -0.10$, $p = .87$) nor attendance ($b_{interaction} = 2.10$, $p = .36$) significantly moderated the effect of the God cue. Because this sample was recruited from a population that is high in religiosity, there may not have been sufficient variance to detect these effects. God belief displayed a clear ceiling effect, with 89% of the sample reporting God belief at the maximum point of the scale. Additionally, neither belief in a rewarding nor punishing God moderated the effect of the God cue. However, belief in a punishing God negatively predicted generosity in its own right (Table 3.1).

Table 3.1

Regression Results Assessing Effect of God Cue, Instruction Wording, and Punishing and

Rewarding God Beliefs on Generosity (Study 3)

Predictors	Basic Model	Accounting for Instructions	Reward and Punishment
	Estimates (95% CI)	*Estimates (95% CI)*	*Estimates (95% CI)*
Intercept	48.94 *** (47.26 – 50.62)	50.10 *** (47.72 – 52.47)	50.08 *** (47.71 – 52.45)
God salient	6.62 *** (5.51 – 7.73)	4.20 *** (2.63 – 5.76)	4.19 *** (2.62 – 5.75)
Alt. Instructions		-2.31 (-5.66 – 1.05)	-2.33 (-5.68 – 1.03)
Salience: Instructions		4.83 *** (2.62 – 7.04)	4.87 *** (2.66 – 7.08)
Rewarding God (centered)			0.21 (-1.37 – 1.79)
Punishing God (centered)			-1.54 * (-2.81 – -0.28)
Salience: Reward			0.96 (-0.08 – 2.00)
Salience: Runish			0.24 (-0.59 – 1.07)
Random Effects			
σ^2	296.40	293.63	293.41
τ_{00}	1059.39 ParticipantID	1061.49 ParticipantID	1058.60 ParticipantID
ICC	0.78	0.78	0.78
N	1850 ParticipantID	1850 ParticipantID	1849 ParticipantID
Observations	3699	3699	3697
Marginal R^2 / Conditional R^2	0.008 / 0.783	0.009 / 0.785	0.012 / 0.786

* p<0.05   ** p<0.01   *** p<0.001

Accounting for Group Membership

I next tested how generosity varied as a function of recipient religiosity. I first simply regressed donation percentage on recipient group identity. As hypothesized, participants were less generous to both outgroups than they were to fellow Christians (Table 3.2). Additionally, at baseline, prior to the salience manipulation, the sample showed more generosity to Muslims than to atheists (d = .19, 95% CI [.08, .31]). Because recipients varied across age and gender, as well as group identity, I next added recipient age and gender into the model. Participants showed significantly greater generosity to older participants and women. The effect of group identity remained significant. These findings held robustly when accounting for salience condition. Finally, I tested for a salience-by-group-interaction. No significant interaction was found. When the atheist condition is used as the reference group, there is a significant salience-by-Muslim condition interaction, such that the cue increased generosity more for atheists than for Muslims ($b_{interaction}$ = -3.74, 95% CI [-6.50, -0.98]).

Table 3.2

Regression Results Assessing Effect of Group, Salience, and Group-by-Salience Interaction

(Study 3)

Predictors	Basic Model *Estimates (95% CI)*	Accounting for Recipient Demographics *Estimates (95% CI)*	Accounting for Salience *Estimates (95% CI)*	Salience-by-Group Interaction *Estimates (95% CI)*
Intercept	61.28 *** (58.62 – 63.94)	61.92 *** (59.19 – 64.65)	59.64 *** (56.41 – 62.87)	59.50 *** (56.18 – 62.82)
Atheist recipient	-16.25 *** (-20.04 – -12.47)	-16.19 *** (-19.97 – -12.41)	-16.18 *** (-19.96 – -12.39)	-16.88 *** (-20.90 – -12.87)
Muslim recipient	-11.08 *** (-14.89 – -7.27)	-11.06 *** (-14.87 – -7.25)	-11.05 *** (-14.86 – -7.25)	-9.94 *** (-13.98 – -5.90)
Recipient age (centered)		0.06 * (0.00 – 0.12)	0.07 * (0.02 – 0.13)	0.07 * (0.01 – 0.13)
Male recipient		-1.65 * (-3.21 – -0.08)	-1.67 * (-3.18 – -0.15)	-1.65 * (-3.16 – -0.14)
God salient			4.20 *** (2.64 – 5.76)	4.47 *** (2.29 – 6.65)
Alt. Instructions			-2.09 (-5.38 – 1.21)	-2.07 (-5.37 – 1.22)
Salience: Instructions			4.90 *** (2.69 – 7.10)	4.87 *** (2.66 – 7.07)
Salience: Atheist				1.41 (-1.28 – 4.09)
Salience: Muslim				-2.23 (-4.93 – 0.48)
Random Effects				
σ^2	318.23	317.85	293.00	292.20
τ_{00}	1002.89 ParticipantID	1001.38 ParticipantID	1014.54 ParticipantID	1014.97 ParticipantID
ICC	0.76	0.76	0.78	0.78
N	1850 ParticipantID	1850 ParticipantID	1850 ParticipantID	1850 ParticipantID
Observations	3699	3699	3699	3699
Marginal R^2 / Conditional R^2	0.034 / 0.767	0.035 / 0.767	0.044 / 0.786	0.044 / 0.786

* p<0.05   ** p<0.01   *** p<0.001

Bayesian Regression

　　While not preregistered, I again computed a Bayesian regression using a similar procedure to Studies 1 and 2. I used a linear gaussian model and regressed donation on recipient group identity, salience, and the interaction between these variables. Participant age and gender were also included as fixed effects, as were recipient age and gender. I also included the instruction wording as a fixed effect, as well as its interaction with salience. Random intercepts were specified at the participant level. The model was otherwise fit in the same manner as those in Studies 1 and 2. It converged, with all R-hat values equal to 1.00.

　　Summary statistics of the posterior are available in Table 3.3. Complete posterior distributions with highest density intervals (HDIs) can be seen in Figure 3.2. Of note, 100% of the posterior distribution for the coefficients of each outgroup were to the left of 0, providing overwhelmingly strong evidence that participants were more generous to the ingroup than the outgroup. Additionally, 100% of the posterior distribution of the salience manipulation fell to the right of 0, providing overwhelming evidence that the God cue increased generosity, as hypothesized and consistent with Studies 1 and 2. Focusing on the salience-by-recipient interaction terms, a 0 parameter is consistent with each posterior distribution, but the distributions fall on opposite sides of 0; 87.3% of the distribution falling to the right of 0 for atheists and 93.3% falling to the left for Muslims.

Table 3.3

Bayesian Regression Posterior Estimates for Study 3

	Bayesian Posterior Estimates	
Predictors	*Posterior Median*	*90% Credibility Interval*
Intercept	60.17	57.31 – 63.03
Atheist recipient	-16.75	-20.07 – -13.40
Muslim recipient	-10.34	-13.68 – -6.88
God salient	4.42	2.54 – 6.29
Alt. instructions	-2.77	-5.53 – -0.04
Recipient age (scaled)	0.07	0.03 – 0.12
Male recipient	-1.62	-2.89 – -0.30
Participant age (scaled)	-0.35	-0.43 – -0.27
Male participant	-1.09	-4.48 – 2.31
Salience: Atheist	1.55	-0.73 – 3.73
Salience: Muslim	-1.99	-4.26 – 0.21
Salience: Alt. instructions	5.06	3.16 – 6.93

Random Effects

σ^2	294.15
$\tau_{00 \text{ ParticipantID}}$	986.53
ICC	0.77
$N_{\text{ ParticipantID}}$	1820
Observations	3639
Marginal R^2 / Conditional R^2	0.070 / 0.786

Figure 3.2

Study 3 Coefficient Posterior Distributions of the Bayesian Regression with Highest Density

Intervals (HDI)
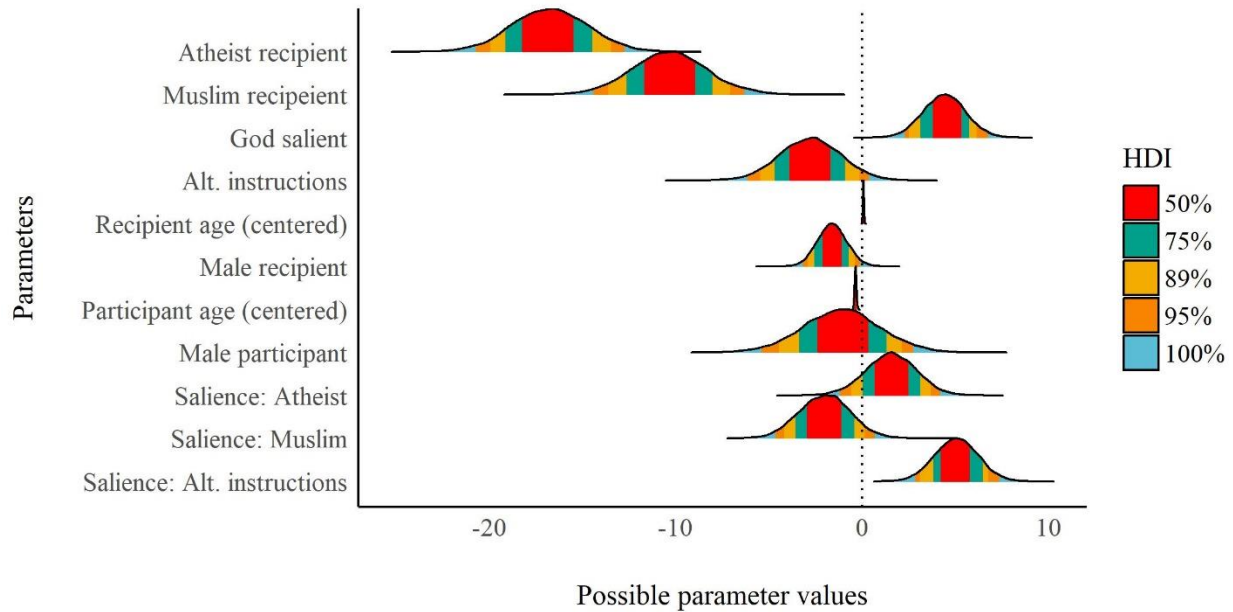
A posterior distribution of change scores can be computed using the posterior draws of these coefficients. These posteriors are shown in Figure 3.3. Out of 10,000 posterior draws, all revealed a positive change in generosity to Christian and atheist recipients, providing overwhelming evidence that the God cue increased generosity to members of these groups. On the other hand, only 98.2% of the posterior draws revealed a positive change in generosity for atheists following the God cue. This, however, is still strong evidence for a positive change in generosity, as opposed to the alternative.

Figure 3.3

Study 3 Posterior Distributions of the Change in Generosity Post-God Cue to Each Recipient

Group

Donation change
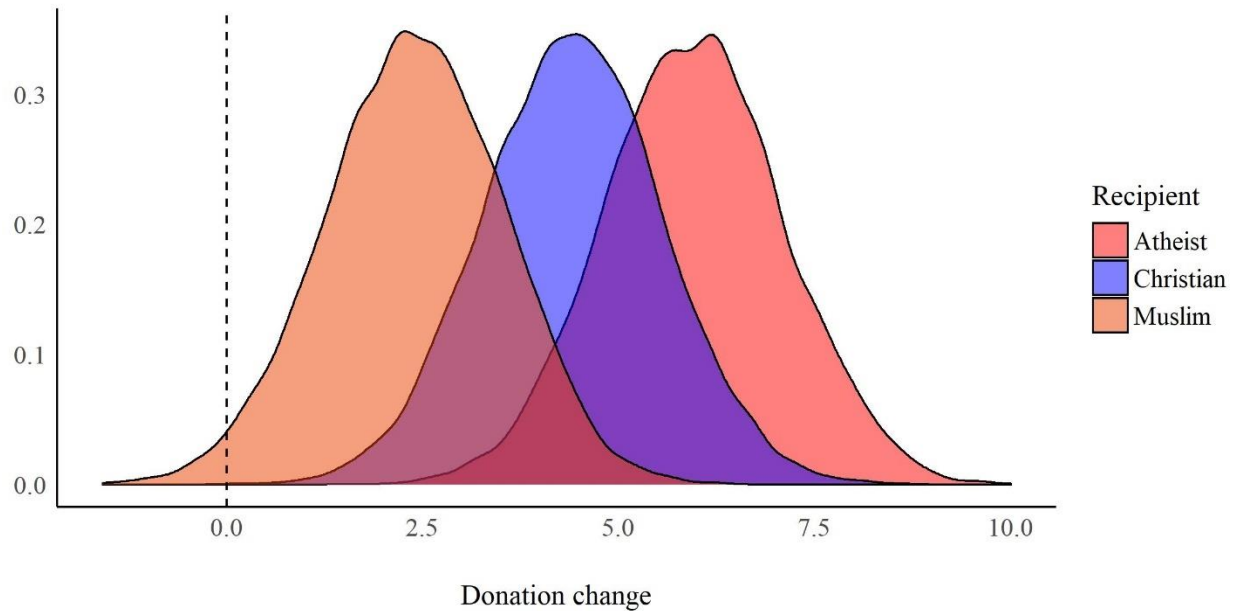
Discussion

A self-described Evangelical Christian sample was selected for Study 3. I was interested in this population because of their high degree of God belief and relatively high dislike for the outgroups being tested (Muslims and atheists). Both predictions about the sample were borne out by the data. Almost nine out of ten participants maxed out the God belief scale, and participants showed substantially higher generosity toward the ingroup than either outgroup. This latter finding is consistent with the first study and with my hypothesis but varies from the finding in Study 2. At baseline, participants were more generous to Muslims than to atheists. While I had no firm hypotheses about how generosity to outgroups would compare to each other, this is consistent with findings that Evangelical Christians feel slightly warmer towards Muslims than to atheists (Pew Research Center, 2017).

Across the sample, there was overwhelming evidence that generosity increased after the God cue, consistent with my hypothesis. Additionally, there was no significant evidence that the effect of the cue varied for either Muslim or atheist recipients when compared to Christians. A Bayesian analysis showed it was far more likely than not that the God cue increased generosity to members from each recipient group, consistent with the Universality Hypothesis. However, when one of the outgroups was used as the reference group, a salience-by-group interaction *was* seen, such that the cue had a greater effect on generosity to atheists than to Muslims. While I had no *a priori* hypotheses about how the effect of the cue would vary between outgroups, this finding was nonetheless surprising. Since Christians and Muslims share belief in God, it seemed more likely that God salience would increase generosity more to Muslims when compared to atheists than *vice versa*. One possible explanation for this finding is that, because initial generosity was higher to Muslims than to atheists, there was simply more room to increase generosity to atheists than to Muslims.

Discussion and Limitations of Studies 1-3

Across the three studies reported thus far, there is convergent evidence that God salience increases generosity (*Research Question 1*). Additionally, in two of the three studies, and in three of the four reported outgroups, participants demonstrated greater generosity to ingroup Christians than to outgroup members (*Research Question 2*). Finally, no evidence was found in any of the three studies for parochial effects of the God cue, consistent with the Universality Hypothesis (*Research Question 3*). However, there were some limitations to the paradigm used in these studies, which I wanted to address with more research.

The first limitation of this paradigm is that the God salience manipulation was a within-subjects design, where the salience condition always followed the non-salience condition. I therefore could not fully rule out that there was some time effect or confound that was leading to

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increased generosity. Encouragingly, the fact that atheists decreased generosity in Study 1 provides evidence against a mere time effect. Rather, it seems, something about the manipulation was important to this change. Still, there exists the possibility that participants would not show the same God salience effect had they not first completed an iteration of the dictator game without the God salience manipulation. I hoped to design my future studies to address this concern.

Second, it can be argued that the first three studies do not test ingroup favoritism or parochiality, *per se*. In all studies, a given participant was paired with ingroup members *or* outgroup members; in no situation did a given participant have a choice between donating to ingroup and outgroup members. It can therefore be argued that these studies do not provide the strongest test of parochiality. An alternative explanation of these findings is simply that God salience increases generosity, and that generosity is simply directed at whatever recipient is available. Since only one recipient was available in each game reported thus far, this generosity was directed to that recipient, regardless of whether they were part of the participant's ingroup or outgroup. I therefore wanted to explore ingroup favoritism more strongly and more directly in future studies.

STUDY 4

In Study 4, I continued to use a dictator game paradigm, but I sought to address the limitations of the first three studies by switching the within-subject and between-subject components of the study. In this new paradigm, participants completed only one iteration of the game. Half the participants were asked to think about God when making their decision (God salience condition), while the others were not (control condition). This new design was used to eliminate the potential for time effects or other confounds that may have explained the change in generosity after the God cue.

Additionally, this paradigm used a three-way dictator game design, as opposed to the two-way design that was used in the prior three studies. As before, participants were given a monetary allotment. However, here they had the choice to split it as they saw fit among themselves, an ingroup recipient, and an outgroup recipient (specifically an atheist in this study). Because ingroup members were placed in competition with each other, this allowed a more direct test of ingroup favoritism and whether the God cue had a parochial effect. Thus, this study asks a slightly different question than do the first three studies. Whereas the prior studies asked, "Does God salience increase generosity, regardless of the group identity of the recipient?", this study asks, "Does God salience effect the *choice* of to whom to donate between ingroup and outgroup recipients?"

Method

Participants

A total of 1,000 participants who had previously reported being Christian were recruited for this study from Prolific Academic. Of these participants, 63 reported a religious identity other than Christian in the survey and were excluded from analysis, leaving 937 analyzed cases. The

average age of the sample was 36.44 (SD = 13.51). 51.9% of the sample was female, 48.0% was male, and one participant reported a different gender identity.

Procedure

This study was pre-registered at https://osf.io/msjt9/. The sample was recruited from Prolific Academic, a crowd-sourced data collection platform. I targeted participants who were of at least eighteen years of age, from the United States, and, importantly, who had self-described as Christian to Prolific.

Participants who consented to participate completed an online experiment programmed in Qualtrics, similar to those used in the first three studies. Participants were first given some brief instructions for the dictator game they would be asked to complete. They were told they would be given a bonus of ten virtual tokens, each worth five real-world cents. They were further told that they would be paired with two recipients, and they could allocate the tokens as they saw fit between themselves and the two recipients, and that they would keep any tokens that they did not allocate. Recipients in this game were real people who had completed a prior survey, and this fact was emphasized to the participant. Participants were clearly told that this was a study with actual stakes. At the end of the instructions, half of the participants were instructed to "please think about God" (God salience condition). The other half was not (control condition).

After the instructions, participants were shown the dictator game. Participants were given the demographic information of two recipients (age, gender, religion, and nationality). One recipient was always a Christian and the other was always an atheist. Participants were again instructed to think about God. Participants then allocated the ten tokens across the three possible recipients (themselves, the Christian recipient, and the atheist). Complete wording of the instructions and the task are available in Appendix A. Following the dictator game task,

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participants then completed a short battery of survey questions, including the key items reported below. Finally, participants were shown a debriefing page explaining the hypothesis of the study.

Materials

Dictator game giving. Participants were administered a dictator game, as described above. Participants had the opportunity to allocate 10 tokens between themselves and two recipients (an ingroup member and an outgroup member).

Religion. Participants were asked, "Which of the following best describes your religious affiliation?" with the options of "Evangelical", "Mainline Protestant", "Catholic", "Orthodox Christian", "LDS", "Other Christian", "Jewish", "Muslim", "Hindu", "Buddhist", "Atheist", or "Other". Any participant who reported any of the latter six options were excluded from analysis.

Belief in God. God belief was assessed with a single item, in which participants answered how much the statement "I believe that God exists" describes them, with scale points from "Strongly disagree" (1) to "Strongly agree" (7).

Church attendance. Attendance at religious services was assessed with a single item. Participants were asked "How often do you attend church?" This was measured on a seven-point scale with options "Once a year or less", "Several times a year", "About once a month", "About once a week", "Several times a week", "About every day", and "Several times a day".

Study Research Questions and Hypotheses

Despite the slight change in methodology, this study asked essentially the same research questions as did the first three studies. First, I explored whether those participants in the God salience condition would be more generous overall than were those in the control condition

(*Research Question 1*). I hypothesized that those in the salience condition would indeed keep

fewer of the coins, giving more away to some combination of the recipients. Second, I tested

whether participants would choose to give a higher percentage of the allotment to the ingroup

Christian than the outgroup atheist with whom they were paired (*Research Question 2*). I

expected that this difference would be found. Finally, I explored an interaction between salience

condition and recipient group (*Research Question 3*). Here, I tested the competing hypotheses,

but I specifically expected the Universality Hypothesis to be supported, with some possibility of

the Weak Parochiality Hypothesis.

Analyses and Results

I first conducted Welch's two-sample t-tests to explore whether donations to each

potential class of recipient varied between the God salience condition and the control condition.

As hypothesized, participants kept less money for themselves in the God salience condition than

in the control condition, $t(934.41) = 4.06$, $p < .001$; d = .27, 95% CI[.14, .39]. Additionally, as

hypothesized, participants gave more to ingroup Christians in the God salience condition than in

the control condition, $t(934.78) = 4.21$, $p < .001$; d = .27, 95% CI[.15, .40]. Participants also gave

more to outgroup atheists in the God salience condition than in the control, $t(929.52) = 3.01$, p

=.002; d = .20, 95% CI[.07, .32].

I next tested multilevel models in R (R Core Team, 2013) using the lme4 (Bates et al.,

2015) and lmerTest packages (Kuznetsova et al., 2017). For all models, random intercepts were

specified at the participant level. All other covariates were included as fixed effects. Estimates

were optimized on the restricted maximum likelihood (REML) criterion.

In these analyses, the donation variable was treated as the proportion of the total allotment that was shared (e.g., a lack of donation was coded as 0, a 5 token donation was coded as 50, and a donation of the total allotment was coded as 100). See Figure 4.1 for sample participants' donations as a function of participant religion, recipient religion and God salience condition.

Figure 4.1

Donation to Recipient of Each Group as a Function of Salience Condition (Study 4)
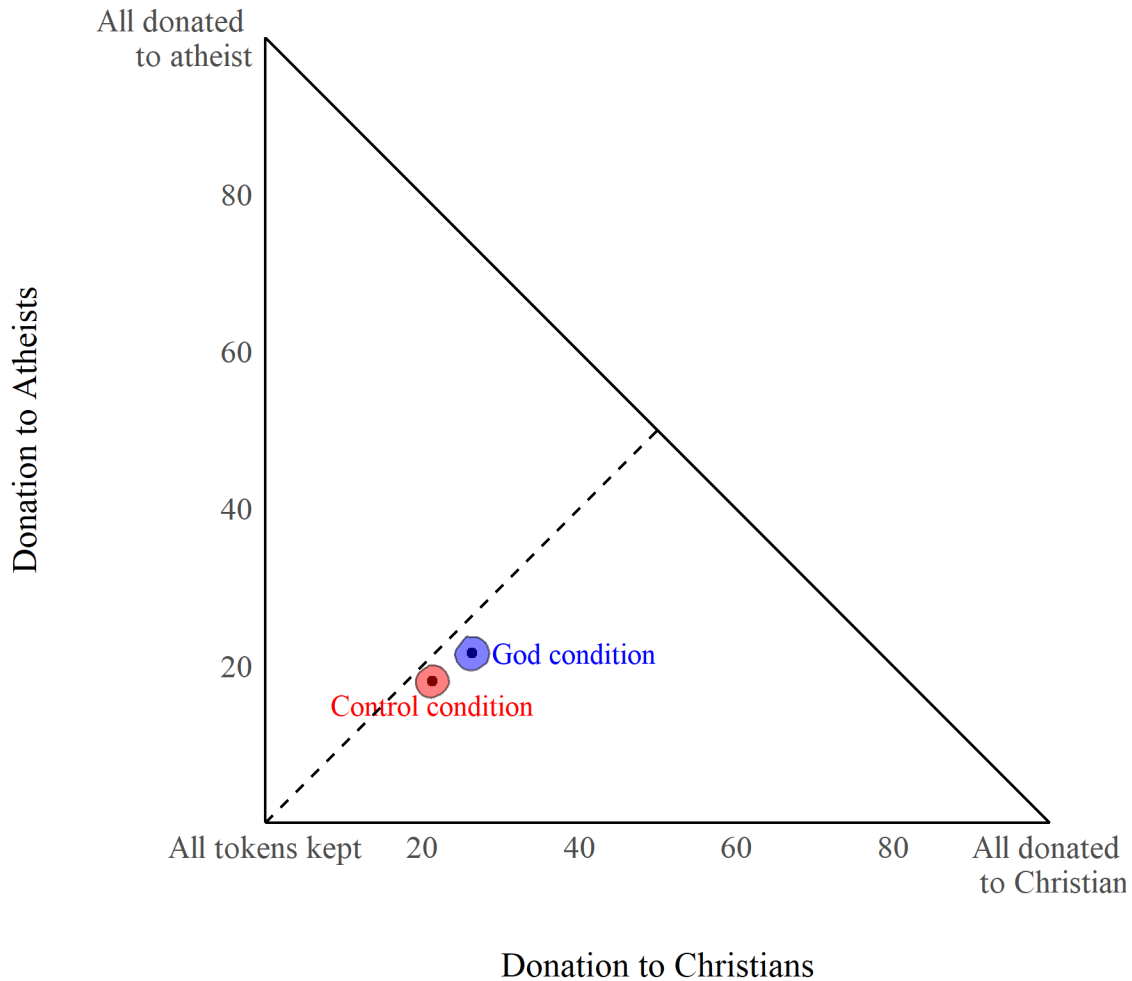
Donation to Christians

Note: 95% confidence regions were calculated from 10,000 bootstrapped draws from the sample.

Translucent regions around each point represent the 95% of bootstrapped draws closest to the

centroid of these draws.

I first regressed donation on salience condition. Consistent with the t-test results,

participants in the God condition donated an average of 4.3 percentage points more to each

recipient than did those in the control condition (Table 4.1). This effect was moderated by God belief, such that the cue had a stronger effect among those who believed in God more strongly. The effect was not significantly moderated by church attendance.

Table 4.1

Effect of Salience on Donation and Moderation by Belief and Attendance (Study 4)

Predictors	Salience Effect Estimates (95% CI)	Belief Moderation Estimates (95% CI)	Attendance Moderation Estimates (95% CI)
Intercept	19.62 *** (18.14 – 21.11)	19.52 *** (18.06 – 20.98)	19.64 *** (18.16 – 21.13)
God salience	4.32 *** (2.23 – 6.41)	4.33 *** (2.27 – 6.38)	4.24 *** (2.15 – 6.32)
God belief		0.97 (-0.25 – 2.18)	
Salient: belief		2.26 * (0.53 – 3.99)	
Church attendance			0.97 (-0.03 – 1.97)
Salient: attendance			-0.23 (-1.62 – 1.16)
Random Effects			
σ^2	149.05	143.81	143.87
τ_{00}	191.07 $_{id}$	184.85 $_{id}$	191.85 $_{id}$
ICC	0.56	0.56	0.57
N	937 $_{id}$	935 $_{id}$	936 $_{id}$
Observations	1874	1870	1872
Marginal R^2 / Conditional R^2	0.014 / 0.568	0.038 / 0.579	0.019 / 0.580

* p<0.05   ** p<0.01   *** p<0.001

Next, I accounted for recipient identity, first by simply regressing donation on recipient group. As expected, participants were less generous to atheists than to Christians (Table 4.2). This result held when accounting for the other ways in recipients varied (i.e. their age and gender). Next, I included salience and the salience-by-recipient group interaction as fixed effects. No significant interaction was found. These findings held robustly when accounting for participant demographics.

Table 4.2

Effect of Recipient Group and Salience-by-Group Interaction on Generosity (Study 4)

Predictors	Recipient Group *Estimates (95% CI)*	Recipient Group and Demographics *Estimates (95% CI)*	Salience-by-Group Interaction *Estimates (95% CI)*	Accounting for Participant Demographics *Estimates (95% CI)*
Intercept	23.82 *** (22.64 – 25.00)	24.34 *** (22.98 – 25.70)	21.77 *** (19.97 – 23.57)	22.91 *** (20.85 – 24.98)
Atheist recipient	-4.03 *** (-5.10 – -2.95)	-3.93 *** (-5.01 – -2.84)	-3.16 *** (-4.70 – -1.63)	-3.42 *** (-4.94 – -1.90)
Recipient age (centered)		0.02 (-0.04 – 0.08)	0.02 (-0.04 – 0.08)	0.02 (-0.04 – 0.07)
Male recipient		-1.16 (-2.53 – 0.20)	-1.12 (-2.48 – 0.25)	-1.02 (-2.38 – 0.35)
God salient			5.05 *** (2.70 – 7.40)	5.15 *** (2.79 – 7.51)
Salient: Atheist			-1.51 (-3.66 – 0.64)	-1.42 (-3.57 – 0.73)
Participant age (centered)				0.12 ** (0.04 – 0.20)
Male participant				-2.39 * (-4.50 – -0.29)
Random Effects				
σ^2	141.09	140.26	140.11	136.50
τ_{00}	199.44 id	200.18 id	195.92 id	195.00 id
ICC	0.59	0.59	0.58	0.59
N	937 id	937 id	937 id	917 id
Observations	1874	1870	1870	1830
Marginal R^2 / Conditional R^2	0.012 / 0.591	0.013 / 0.593	0.027 / 0.594	0.040 / 0.605

* p<0.05   ** p<0.01   *** p<0.001

Bayesian Regression

As with the previous studies, I computed a Bayesian version of the interaction model. While not a pre-registered hypothesis test, this method allows a better look at the plausible parameter values that could have given rise to these data. I used a linear gaussian model and regressed donation on recipient group identity, salience, and the interaction between these variables. Participant age and gender were also included as fixed effects, as were recipient age and gender. Random intercepts were specified at the participant level. The model was otherwise fit in exactly the same way as in the previous studies. The model converged, with all R-hat values equal to 1.00.

Summary statistics of the posterior are available in Table 4.3. Complete posterior distributions with highest density intervals (HDIs) can be seen in Figure 4.2. Of note, 100% of the posterior distribution for the atheist recipient coefficient was to the left of 0, suggesting there is very strong evidence that participants showed less generosity to atheists than to Christians. Additionally, 100% of the posterior distribution of the salience manipulation fell to the right of 0, providing overwhelming evidence that the God cue increased generosity, as hypothesized and consistent with the first three studies. While a 0 parameter value is contained within the 90% credible interval of the salience-by-recipient interaction, most of the distribution falls to the left of zero, suggesting it is somewhat more likely that the God cue increased generosity more to Christians than atheists than it is that the opposite is true.

Table 4.3

Bayesian Regression Posterior Estimates for Study 4

	Bayesian Posterior Estimates	
Predictors	*Posterior Median*	*90% Credibility Interval*
Intercept	22.91	21.17 – 24.69
God salient	5.14	3.16 – 7.14
Atheist recipient	-3.41	-4.70 – -2.14
Recipient age (centered)	0.02	-0.03 – 0.06
Male recipient	-1.02	-2.16 – 0.13
Participant age (centered)	0.12	0.05 – 0.18
Male participant	-2.40	-4.20 – -0.63
Salient: Atheist recipient	-1.45	-3.22 – 0.40
Random Effects		
σ^2	137.01	
$\tau_{00\ id}$	195.11	
ICC	0.59	
N_{id}	917	
Observations	1830	
Marginal R^2 / Conditional R^2	0.042 / 0.603	

Figure 4.2

Study 4 Coefficient Posterior Distributions of the Bayesian Regression with Highest Density

Intervals (HDI)
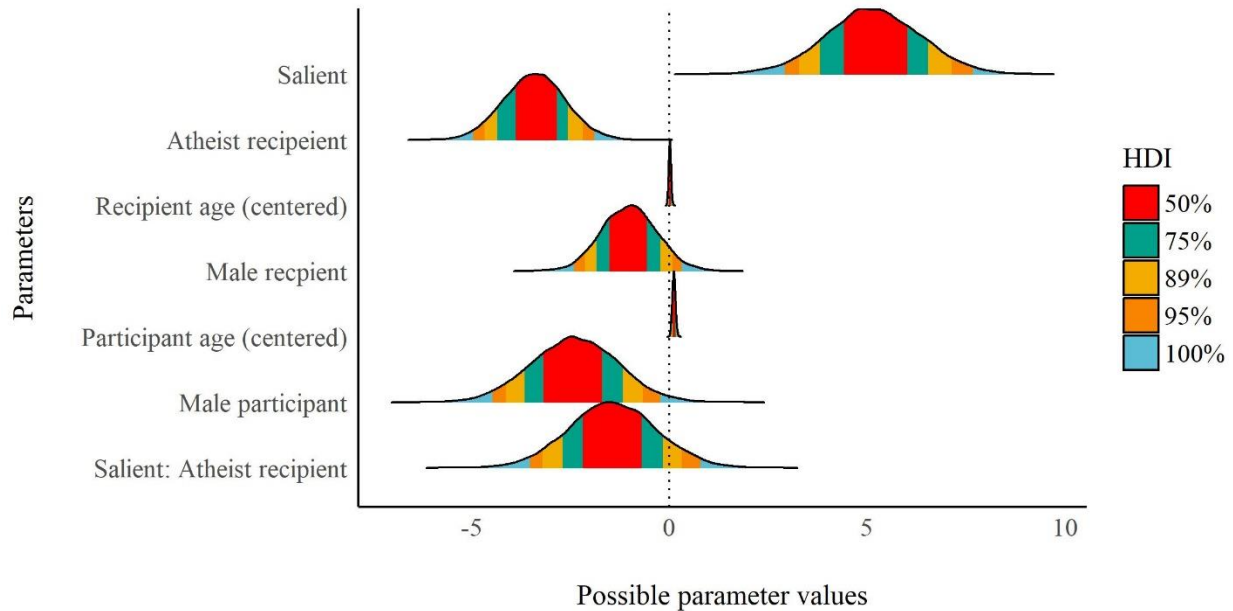
As in Studies 1-3, predictive posterior distributions can be created using posterior draws from the model (Figure 4.3). However, it should be noted that whereas in Studies 1-3, these distributions represented change scores, here they represent difference scores across conditions, due to the between-subject nature of the God salience manipulation used here. Every posterior draw suggested that Christian recipients received a larger donation in the God salience condition. Additionally, 99.9% of the atheist distribution falls to the right of 0, providing strong evidence that atheists also received a larger donation in the God salience condition than in the control.

Figure 4.3

Study 4 Posterior Distributions of the Change in Generosity Post-God Cue to Each Recipient

Group

Donation change
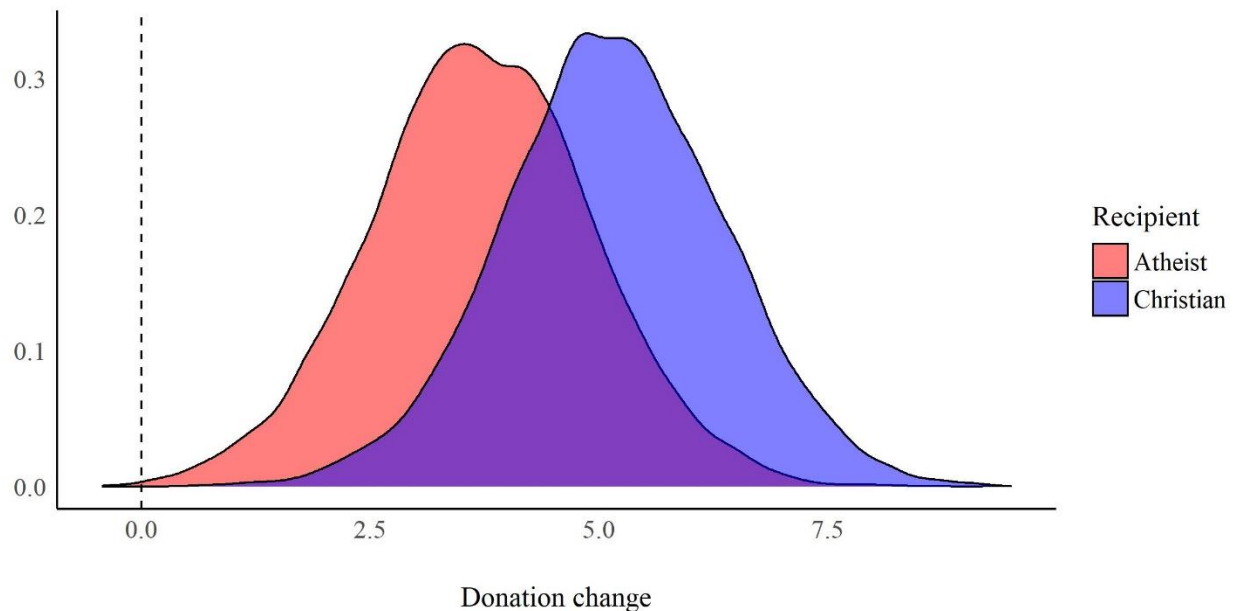
Discussion

Study 4 had two substantial methodological differences from the dictator game used in Studies 1-3. First, God salience was manipulated between subjects. With this method, any effect found could not be attributed to time effects, and I therefore can be more confident that the effect is due to the salience manipulation, *per se*. Second, participants were paired with two recipients (one ingroup member and one outgroup member). In other words, the recipient conditions followed a within-subject methodology. This allowed a more direct test of ingroup favoritism, as there were tradeoffs between giving to ingroup versus outgroup members.

Despite this different methodology, the study findings were quite similar to those found in the prior studies. Participants who were asked to think about God were more generous than those who were not, and this effect was moderated by belief in God. Furthermore, participants

were more generous to ingroup members than to outgroup members. Finally, no significant

interaction between salience condition and recipient group was found. In other words, there was

not a significant difference in the degree of ingroup favoritism between those in the God

condition and those in the control condition. Generosity to both Christians and atheists was

greater in the God condition than in the control condition, consistent with the Universality

Hypothesis.

STUDY 5

Study 5 was conducted to replicate the findings of Study 4 with a different recipient outgroup, Muslims. Additionally, I wanted to test this effect in a sample that was demographically representative of Christians in the United States. I therefore conducted a study with quota sampling, with participant gender, ethnicity, age ranges, and income ranges matched to the population of American Christians.

Method

Participants

Qualtrics was contracted to sample for participants in this study. I sought 1,000 self-reported Christians eighteen years old or older and from the United States. Participants were quota sampled based on gender, ethnicity, age, and income to approximately match the demographics of Christians in the United States. In total, 1,272 self-described Christians completed the study. Of these, 178 participants were screened out for failing an attention check, leaving an analyzed sample of 1,096. The sample was 53.3% female, with a mean age of 50.42 (SD = 17.07).

Procedure and Materials

This study was pre-registered at https://osf.io/yfsgm/. The study was conducted online using Qualtrics's survey platform, and Qualtrics personnel handled recruitment for the survey. The experimental procedure and materials were identical to those of Study 4 except for some minor changes. Here, I will outline only the changes from Study 4. Participants were matched with Muslim outgroups, as opposed to atheists. As before, these recipients were real recipients who had completed a prior study and who had consented to be a recipient in this experiment.

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Ingroup Christians were still included as recipients, as well. Additionally, the bonus amount was altered to $.25 per token, to account for the norms of higher payments when conducting a panel survey, as opposed to an MTurk survey.

Analyses and Results

A Welch's t-test revealed that participants were more generous in the God condition than in the control condition, keeping less of the money for themselves, $t(1075.2) = 2.63$, $p = .01$; $d = .16$, 95% CI [.04, .28]. Participants donated more to ingroup Christians in the God condition than in the control, $t(1068.9)$, $p < .001$; $d = .21$, 95% CI [.09, .33]. However, no significant difference was found in generosity to Muslims between the conditions, $t(1084.1) = 0.91$, $p = .42$; $d = .05$, 95% CI [-.07, .17].

I next tested multilevel models in R (R Core Team, 2013) using the lme4 (Bates et al., 2015) and lmerTest packages (Kuznetsova et al., 2017). For all models, random intercepts were specified at the participant level. All other covariates were included as fixed effects. Estimates were optimized on the restricted maximum likelihood (REML) criterion. In these analyses, the donation variable was treated as the proportion of the total allotment that was shared. See Figure 5.1 for sample participants' donations as a function of participant religion, recipient religion and God salience condition.

Figure 5.1

Donation to Recipient of Each Group as a Function of Salience Condition (Study 5)
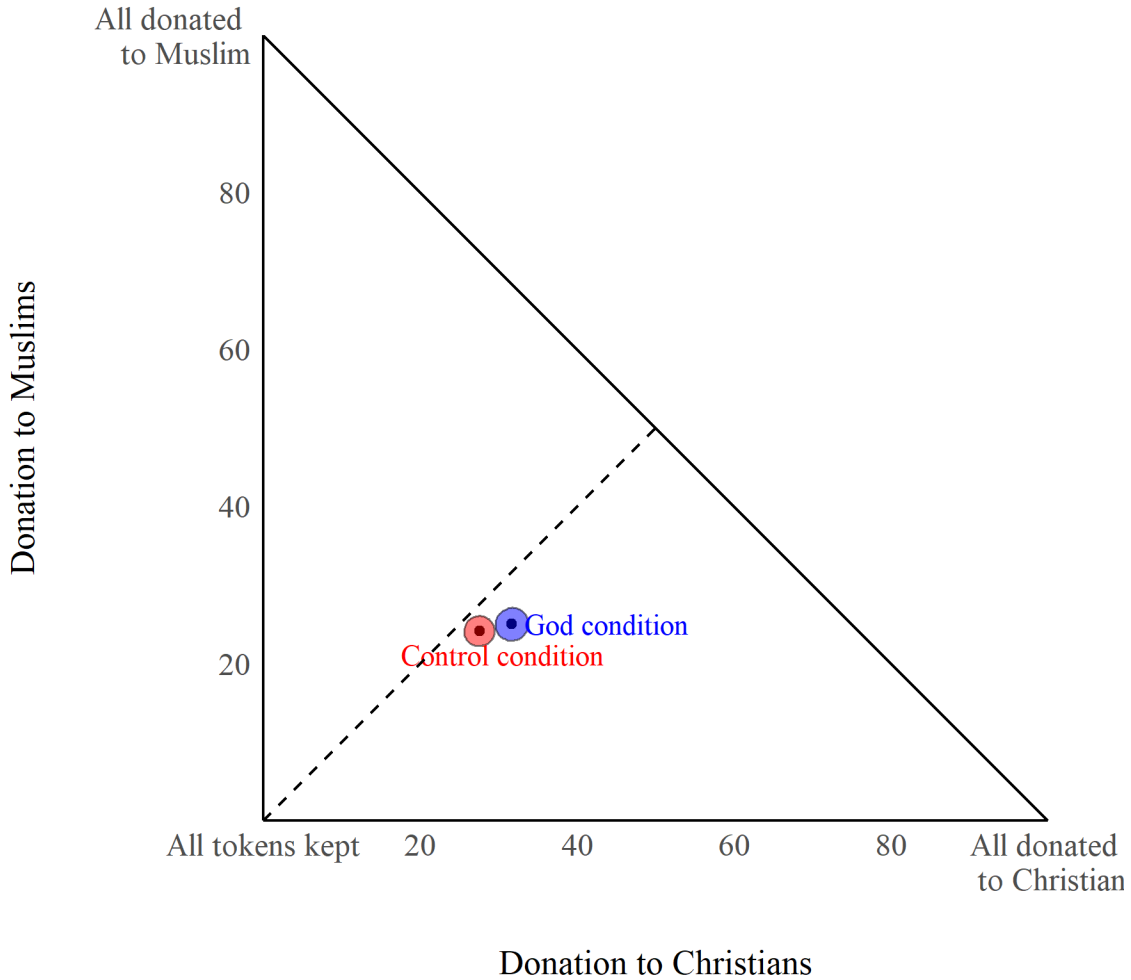
Note: 95% confidence regions were calculated from 10,000 bootstrapped draws from the sample. Translucent regions around each point represent the 95% of bootstrapped draws closest to the centroid of these draws.

I first regressed donation on salience condition. Consistent with the t-test results, participants in the God condition donated an average of 2.5 percentage points more to each recipient than did those in the control condition (Table 5.1). This effect was not moderated by

God belief; however, there may have been a ceiling effect and insufficient variance in God belief to detect an effect (mean God belief was 6.52 out of 7). The salience effect was also not significantly moderated by church attendance.

Table 5.1

Effect of Salience on Donation and Moderation by Belief and Attendance (Study 5)

Predictors	Salience Effect	Belief Moderation	Attendance Moderation
	Estimates (95% CI)	*Estimates (95% CI)*	*Estimates (95% CI)*
Intercept	25.82 *** (24.52 – 27.13)	25.91 *** (24.61 – 27.22)	25.88 *** (24.58 – 27.18)
God salience	2.52 ** (0.65 – 4.40)	2.41 * (0.53 – 4.29)	2.38 * (0.52 – 4.25)
God belief		0.82 (-0.45 – 2.08)	
Salient: belief		-0.50 (-2.53 – 1.54)	
Church attendance			0.90 * (0.02 – 1.78)
Salient: attendance			0.31 (-0.94 – 1.57)
Random Effects			
σ^2	255.26	255.31	255.26
τ_{00}	121.81 id	121.84 id	119.74 id
ICC	0.32	0.32	0.32
N	1094 id	1093 id	1094 id
Observations	2188	2186	2188
Marginal R^2 / Conditional R^2	0.004 / 0.326	0.005 / 0.327	0.011 / 0.327

* p<0.05   ** p<0.01   *** p<0.001

Next, I accounted for recipient identity, first simply regressing donation on recipient group. As expected, participants were less generous to Muslims than to Christians (Table 5.2).

This result held when accounting for the other ways in which recipients varied (i.e. their age and gender). Next, I included salience and the salience-by-recipient group interaction as fixed effects. A significant interaction was found, such that the ingroup favoritism was greater in the salience condition than in the control. I performed exploratory demographic analyses and found that this interaction was moderated by participant gender, such that the greater ingroup favoritism in the God condition was only found in male participants. Model-predicted donations by gender can be seen in Figure 5.2.

Table 5.2

Effect of Recipient Group and Salience-by-Group Interaction on Generosity (Study 5)

Predictors	Recipient Group *Estimates (95% CI)*	Recipient Group and Demographics *Estimates (95% CI)*	Salience-by-Group Interaction *Estimates (95% CI)*	Accounting for Participant Demographics *Estimates (95% CI)*
Intercept	29.52 *** (28.38 – 30.67)	29.75 *** (28.40 – 31.11)	27.71 *** (25.96 – 29.45)	28.42 *** (26.14 – 30.70)
Muslim recipient	-4.96 *** (-6.27 – -3.66)	-4.72 *** (-6.12 – -3.33)	-3.09 ** (-4.98 – -1.21)	-4.40 *** (-6.92 – -1.89)
Recipient age (centered)		0.02 (-0.04 – 0.09)	0.03 (-0.04 – 0.09)	0.03 (-0.04 – 0.10)
Male recipient		-0.72 (-2.24 – 0.80)	-0.74 (-2.25 – 0.77)	-0.64 (-2.15 – 0.87)
God salient			4.21 *** (1.93 – 6.50)	1.56 (-1.57 – 4.69)
Salient: Muslim			-3.28 * (-5.90 – -0.67)	1.12 (-2.45 – 4.68)
Participant age (centered)				-1.69 (-4.88 – 1.50)
Male participant				-0.04 (-0.09 – 0.02)
Salient: Male				5.78 * (1.20 – 10.35)
Muslim: Male				2.83 (-0.79 – 6.46)
Salient: Muslim : Male participant				-9.38 *** (-14.59 – -4.17)
Random Effects				
σ^2	243.16	243.27	242.12	239.65
τ_{00}	129.21 id	129.18 id	128.34 id	129.95 id
ICC	0.35	0.35	0.35	0.35
N	1094 id	1094 id	1094 id	1093 id
Observations	2188	2188	2188	2186
Marginal R^2 / Conditional R^2	0.016 / 0.358	0.017 / 0.358	0.023 / 0.361	0.028 / 0.370

* p<0.05   ** p<0.01   *** p<0.001

Figure 5.2

Study 5 Model-Predicted Donations by Gender, Controlling for Recipient Demographics
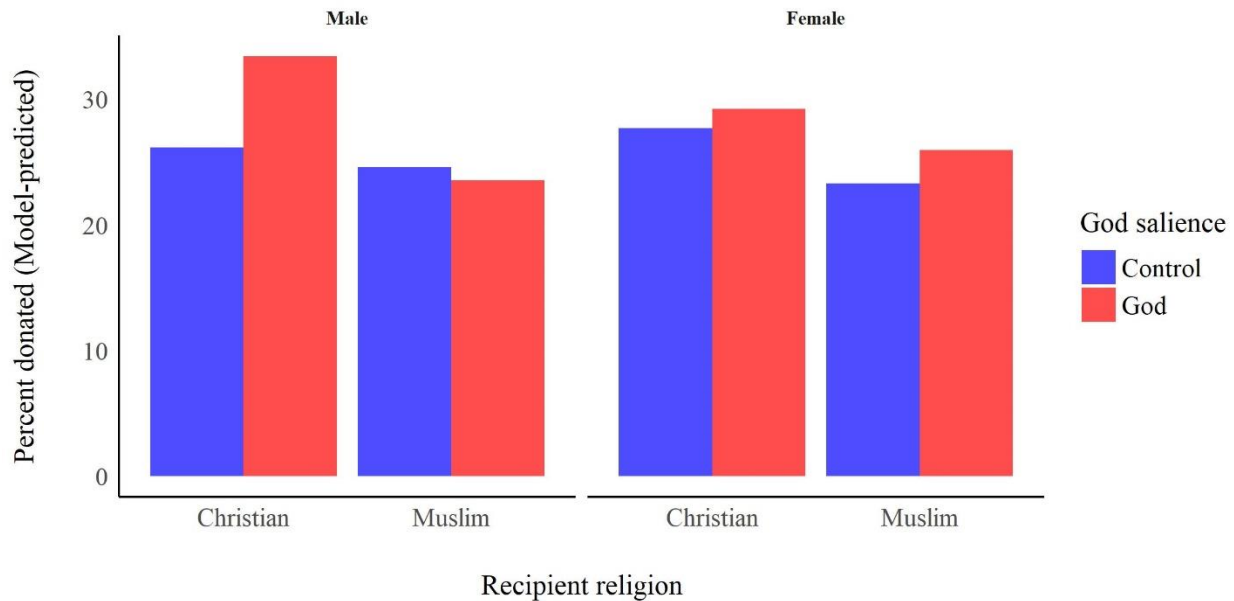
Bayesian Regression

I again computed a Bayesian version of the interaction model. I used a linear gaussian model and regressed donation on recipient group identity, salience, and the interaction between these variables. Participant age and gender were also included as fixed effects, as were recipient age and gender. Random intercepts were specified at the participant level. The model was otherwise fit in the same manner as the prior studies. It converged, with all R-hat values equal to 1.00.

Summary statistics of the posterior are available in Table 5.3. Complete posterior distributions with highest density intervals (HDIs) can be seen in Figure 5.3. 100% of the posterior distribution of the salience manipulation fell to the right of 0, providing overwhelming evidence that the God cue increased generosity, as hypothesized. A very large majority (99.94%)

of the posterior distribution of the Muslim coefficient fell to the left of 0, providing strong evidence that Muslims were given less of a donation than were Christians. Additionally, 99.52% of the interaction term falls to the left of 0, suggesting it is far more likely that the God cue acted more strongly on generosity to Christians than to Muslims.

Table 5.3

Bayesian Regression Posterior Estimates for Study 5

	Posterior Distribution Estimates	
Predictors	*Posterior Median*	*90% Credible Interval*
Intercept	27.55	25.88 – 29.16
God salient	4.25	2.32 – 6.21
Muslim recipient	-3.08	-4.65 – -1.48
Recipient age (centered)	0.03	-0.02 – 0.09
Male recipient	-0.69	-1.96 – 0.58
Participant age (centered)	-0.04	-0.08 – 0.01
Male participant	0.25	-1.33 – 1.88
Salient: Muslim recipient	-3.30	-5.53 – -1.09

Random Effects

σ^2	242.77
$\tau_{00\ id}$	128.22
ICC	0.35
N $_{id}$	1093
Observations	2186
Marginal R^2 / Conditional R^2	0.027 / 0.362

Figure 5.3

Study 5 Coefficient Posterior Distributions of the Bayesian Regression with Highest Density

Intervals (HDI)
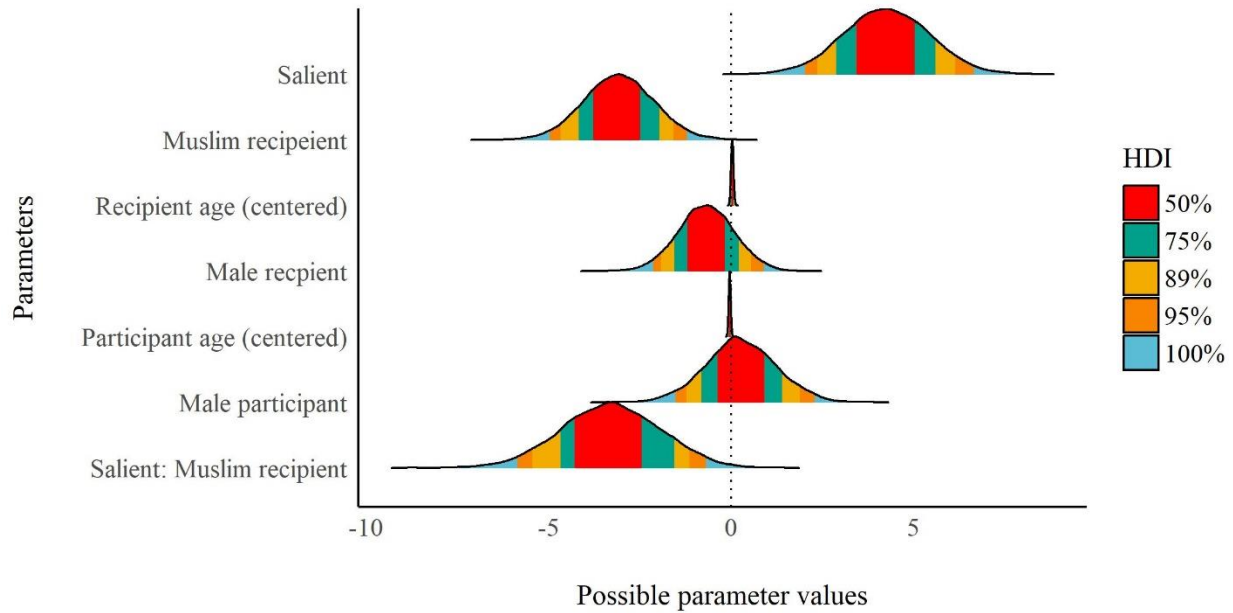
Predictive posterior distributions for difference scores across conditions were created using posterior draws from the model (Figure 5.4). Every posterior draw suggested that Christian recipients received a larger donation in the God salience condition. Additionally, 79.8% of the Muslim distribution falls to the right of 0, suggesting it is more likely that the God cue increased generosity to Muslims than decreased it, however, a negative or null parameter is plausible.

Figure 5.4

Study 5 Posterior Distributions of the Change in Generosity Post-God Cue to Each Recipient Group
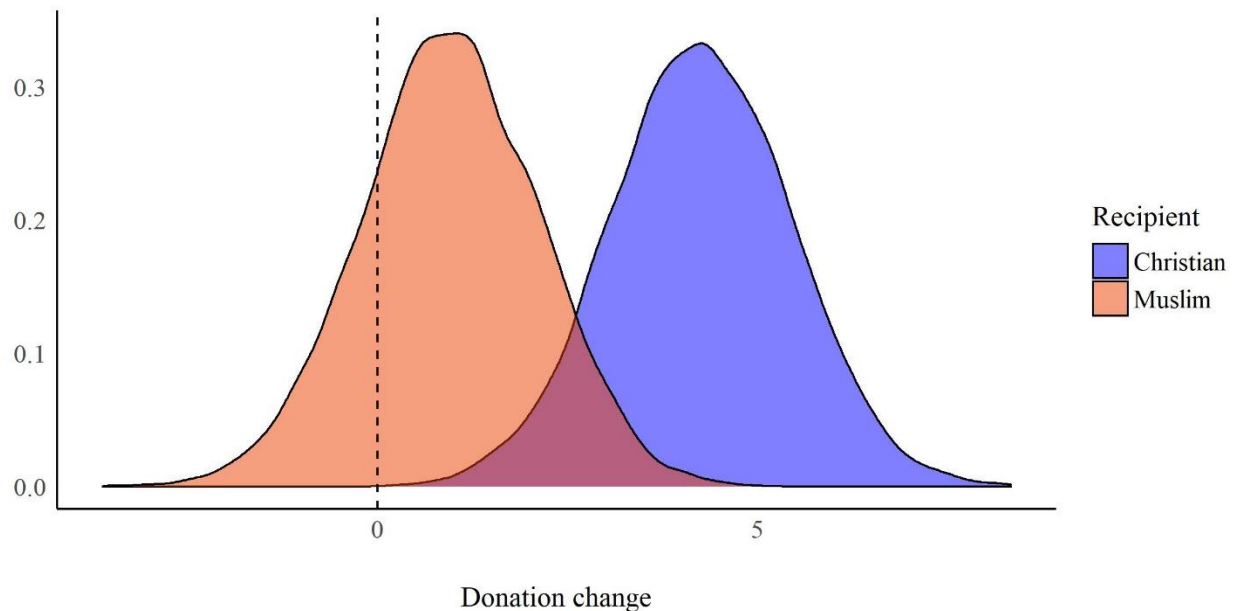
Discussion

As hypothesized and consistent with Studies 1-4, participants were more generous in the God salience condition than in the control. Additionally, as anticipated, participants displayed ingroup favoritism, donating more money to ingroup Christians than to outgroup Muslims. However, unlike previous studies, an interaction was found between these variables, such that ingroup favoritism was stronger in the God salience condition than in the control. This finding is consistent with the Weak Parochiality hypothesis.

It is not entirely clear why this study yielded an interaction, while no other study did. Exploratory analyses of the data showed one third-order interaction by gender, such that this greater ingroup favoritism in the God condition was found in men, but not in women. It is possible that this is a true gender difference, but no hint of such an interaction was found in any

other study reported here, so this seems unlikely. Instead, I suspect that the men and women participants in this study varied systematically outside of gender. Qualtrics typically has an easier time recruiting Christian women than Christian men (see, for example, the very heavily female demographics of Study 3). Thus, Qualtrics may have had to go to other sources to acquire male participants. Consistent with this explanation, there were blocks of time where only men were recruited, presumably to catch up on the gender quota (Figure 5.4). Unfortunately, as the sampling techniques of panel surveys are not always transparent, it is not clear how the men and the women in this survey may have differed, but there may be a hidden moderator here that warrants more consideration. An additional potential explanation for the differences between Studies 4 and 5 was the different outgroups used in each study. To test this possible explanation, I conducted a final Study 6 that used both atheist and Muslim outgroups.

Figure 5.4

Study 5 Male Participants by Order Sampled
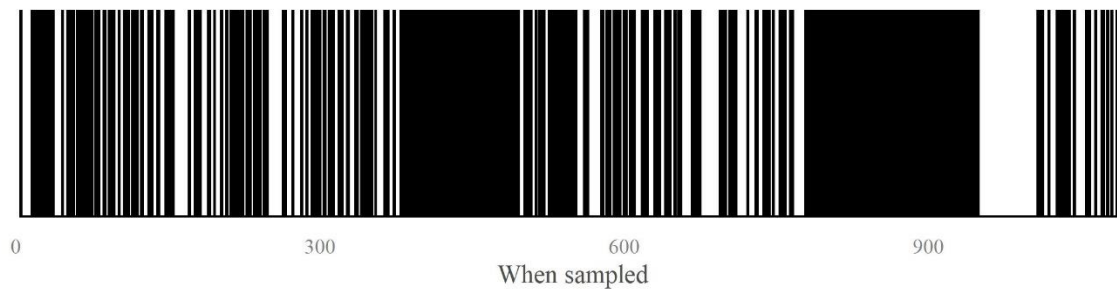
Note. Each black line of width 1 is a male participant. Each white line of width 1 is a female participant.

STUDY 6

As Studies 4 and 5 yielded inconsistent results, the primary goal of Study 6 was to again use the three-way dictator game paradigm to provide more evidence of its effects. While Studies 4 and 5 varied in their sample compositions, one of the few methodological differences between the two studies was the choice of outgroup recipients: Study 4 used an atheist outgroup, while Study 5 used a Muslim outgroup. To explore whether this methodological difference could have given rise to the different findings between the studies, Study 6 used both outgroups.

Method

Participants

I aimed for a sample of 1,500 self-described Christians. Most of the sample was recruited from a population of "CloudResearch approved" MTurk workers. This population was created by the CloudResearch platform to screen out bots and server farms (a recent and growing issue in crowd-sourced research) and to assure attentive participants (Moss & Litman, n.d.). A total of 840 participants were recruited from this population. Of these, 29 reported a religious affiliation other than Christianity in the survey and were excluded from analysis. An additional 16 participants failed an attention check, leaving 795 analyzed participants from this sample.

Sample collection eventually slowed with the CloudResearch approved sampling method, so I opened recruitment to the broader MTurk worker population. To screen out bots and to ensure participants were able to read and understand the survey, two simple English comprehension checks were placed at the beginning of the survey. Those who failed these comprehension checks were screened out and not permitted to take the rest of the study. A total of 1,378 unique attempts to take the survey were recorded. A majority of these were screened out

by the English comprehension items, and only 570 participants completed the full study (most failed survey attempts are assumed to be bots or server farm attempts). Of those who completed the study, 25 reported a religious affiliation other than Christianity and were not included in the analysis. An additional 60 failed an attention check and were excluded from the analysis. Between the two sampling methods, 1,280 participants were included in the analysis. The sample averaged 42.81 years of age (SD = 13.83) and was 58.4% female (three participants reported a gender of "other" and the rest were male).

Procedure and Measures

This study was pre-registered at https://osf.io/x2rd3/. Participants were recruited from MTurk using the CloudResearch platform, as described above. Sampling was targeted at American Christians who were at least 18 years old. The design and procedures of this study were very similar to those used in Studies 4 and 5 and should be assumed to be identical, unless otherwise stated.

Three recipient groups were recruited for this study. Recipients were either Christian, atheist, or Muslim. Participants completed a three-way dictator game in which they were paired with two participants randomly selected from the pool of Christian, atheist, or Muslim recipients. This task was designed such that the two recipients would be from different groups. In other words, participants were in one of three conditions: 1) The prospective recipients were one Christian and one atheist, 2) The prospective recipients were one Christian and one Muslim, or 3) The prospective recipients were one atheist and one Muslim. Consistent with Study 4, the tokens being allocated were worth five cents apiece.

Analyses and Results

First, I conducted some checks to test whether responses varied between the two sampling methods. Welch two-sample t-tests revealed that participants kept more of the allotment for themselves in the CloudResearch sample than in the general MTurk sample, $t(1108) = 7.71$, $p < .001$; $d = .43$, 95% CI [.32, .55]. This greater generosity in the MTurk sample was demonstrated across recipient groups, as MTurk workers were more generous than the CloudResearch approved participants to Christians, $t(737.78) = 4.45$, $p < .001$, $d = .30$, 95% CI [.16, .45], to atheists, $t(704.85) = 7.61$, $p < .001$; $d = .53$, 95% CI [.39, .67], and to Muslims, $t(733.05) = 4.57$, $p < .001$; $d = .32$, 95% CI [.18, .45]. Because the two samples varied meaningfully along the dependent variable, I accounted for this variable in all models.

Models were conducted using a multi-level framework in R using the lme4 (Bates et al., 2015) and lmerTest packages (Kuznetsova et al., 2017). For all models, random intercepts were specified at the participant level. All other covariates were included as fixed effects. Estimates were optimized on the restricted maximum likelihood (REML) criterion. As with other studies, donation was operationalized as the percentage of the total allotment donated.

I first simply regressed donation on salience condition and sampling method. As expected, participants donated more money in the God condition than in the control (Table 6.1). The salience effect was not significantly moderated by belief in God nor by attendance. However, in this study there was again a heavily restricted range of God belief (Mean = 6.57, with a maximum value of 7). Therefore, there may have been insufficient variance to detect a moderation.

Table 6.1

Effect of Salience on Donation and Moderation by Belief and Attendance (Study 6)

Predictors	Salience Effect	Belief Moderation	Attendance Moderation
	Estimates (95% CI)	*Estimates (95% CI)*	*Estimates (95% CI)*
Intercept	17.82 *** (16.59 – 19.06)	21.17 *** (10.75 – 31.59)	13.09 *** (10.73 – 15.45)
God salience	4.27 *** (2.75 – 5.79)	-0.90 (-15.21 – 13.41)	4.42 ** (1.08 – 7.76)
MTurk sample	6.07 *** (4.50 – 7.63)	6.04 *** (4.44 – 7.64)	4.11 *** (2.46 – 5.76)
God belief		-0.51 (-2.08 – 1.06)	
Salient: belief		0.79 (-1.38 – 2.95)	
Church attendance			1.62 *** (0.99 – 2.26)
Salient: attendance			-0.09 (-0.96 – 0.78)
Random Effects			
σ^2	116.30	116.30	116.30
τ_{00}	133.33 id	133.55 id	127.17 id
ICC	0.53	0.53	0.52
N	1280 id	1280 id	1280 id
Observations	2560	2560	2560
Marginal R^2 / Conditional R^2	0.050 / 0.557	0.050 / 0.558	0.075 / 0.558

* p<0.05   ** p<0.01   *** p<0.001

Next, I regressed donation on recipient identity. As expected, participants were less

generous to atheists and to Muslims than to Christians (Table 6.2). These findings held when

accounting for recipient age and gender. Next, I tested for an interaction between recipient and

salience condition. No significant interaction was found. Additionally, no significant difference was found in generosity between the two outgroup conditions, nor on the effect of the God cue to the two outgroup conditions.

I then aggregated the two outgroup recipient groups into a joint "outgroup" factor, and I limited the analysis to the conditions in which a Christian was one of the recipients (i.e., I removed the dictator games with two outgroup recipients from the analysis). Average giving to ingroup and outgroup members by condition can be seen in Figure 6.1. The same basic findings were replicated in this analysis: Participants were more generous in the salience condition; participants were more generous to ingroup Christians than outgroup recipients; and no significant interaction was found between the recipient condition and salience condition.

Table 6.2

Effect of Recipient Group and Salience-by-Group Interaction on Generosity (Study 6)

Predictors	Recipient Group	Recipient Group and Demographics	Selience-by-Group Interaction	Accounting for Participant Demographics
	Estimates (95% CI)	Estimates (95% CI)	Estimates (95% CI)	Estimates (95% CI)
Intercept	22.56 *** (21.40 – 23.73)	22.50 *** (21.20 – 23.80)	20.39 *** (18.76 – 22.02)	20.83 *** (19.11 – 22.56)
Atheist recipient	-4.43 *** (-5.54 – -3.32)	-4.36 *** (-5.50 – -3.21)	-4.44 *** (-6.03 – -2.85)	-4.44 *** (-6.03 – -2.85)
Muslim recipient	-3.26 *** (-4.37 – -2.15)	-3.10 *** (-4.24 – -1.96)	-3.23 *** (-4.82 – -1.63)	-3.23 *** (-4.83 – -1.63)
MTurk sample	6.08 *** (4.51 – 7.66)	6.08 *** (4.50 – 7.65)	6.09 *** (4.53 – 7.65)	6.13 *** (4.54 – 7.72)
Recipient age (centered)		0.04 (-0.00 – 0.09)	0.04 (-0.00 – 0.09)	0.04 (-0.00 – 0.09)
Male recipient		-0.02 (-1.13 – 1.10)	-0.04 (-1.16 – 1.07)	-0.03 (-1.15 – 1.08)
God salient			4.21 *** (2.22 – 6.20)	4.25 *** (2.26 – 6.24)
Salient: atheist			0.13 (-2.10 – 2.36)	0.13 (-2.09 – 2.36)
Salient: Muslim			0.18 (-2.04 – 2.39)	0.18 (-2.03 – 2.40)
Male participant				-1.18 (-2.73 – 0.38)
Other gender				4.14 (-11.54 – 19.81)
Participant age (centered)				-0.02 (-0.08 – 0.04)
Random Effects				
σ^2	111.62	111.69	111.84	111.83
τ_{00}	138.64 id	138.21 id	133.66 id	133.68 id
ICC	0.55	0.55	0.54	0.54
N	1280 id	1280 id	1280 id	1280 id
Observations	2560	2560	2560	2560
Marginal R^2 / Conditional R^2	0.046 / 0.575	0.047 / 0.574	0.065 / 0.574	0.066 / 0.575

* p<0.05   ** p<0.01   *** p<0.001

Table 6.3

Regression with Aggregated Outgroups and a Christian Recipient (Study 6)

Predictors	Ingroup-Outgroup Model Estimates (95% CI)
Intercept	20.37 ***
	(18.42 – 22.31)
Outgroup recipient	-3.89 ***
	(-5.42 – -2.35)
God salient	4.94 ***
	(2.80 – 7.07)
MTurk sample	6.02 ***
	(4.07 – 7.98)
Recipient age (centered)	0.08 **
	(0.02 – 0.13)
Male recipient	0.20
	(-1.21 – 1.60)
Male participant	-0.57
	(-2.47 – 1.33)
Other gender	-1.29
	(-20.32 – 17.75)
Participant age (centered)	0.02
	(-0.04 – 0.09)
Salient: outgroup	0.79
	(-1.34 – 2.92)

Random Effects

σ^2	123.69
$\tau_{00 \, id}$	123.90
ICC	0.50
N_{id}	838
Observations	1676
Marginal R^2 / Conditional R^2	0.073 / 0.537

* p<0.05   ** p<0.01   *** p<0.001

Figure 6.1

Donation to Recipient of Each Group as a Function of Salience Condition (Study 6)
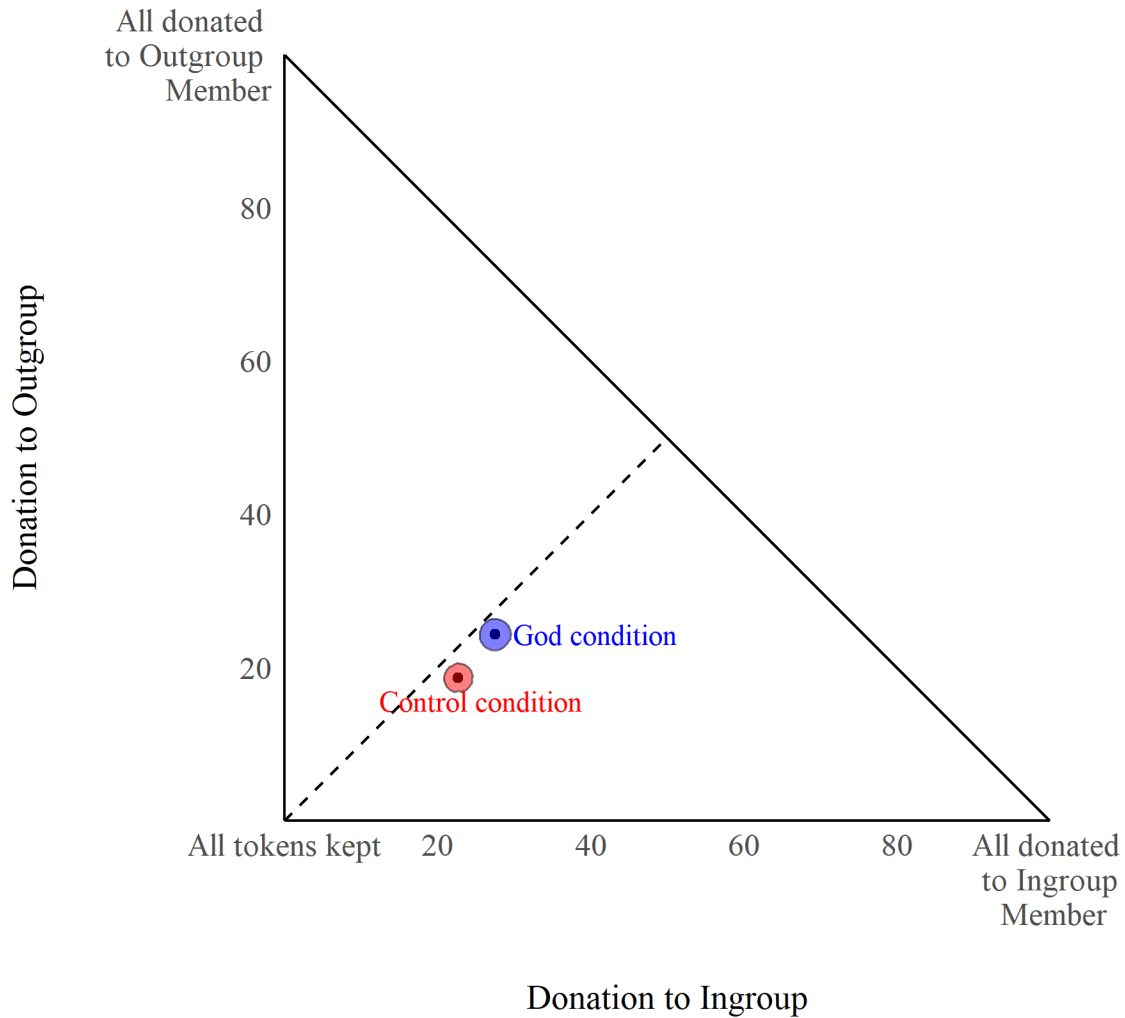
Note: 95% confidence regions were calculated from 10,000 bootstrapped draws from the sample.

Translucent regions around each point represent the 95% of bootstrapped draws closest to the

centroid of these draws.

Bayesian Regression

As with the other studies, I used a Bayesian regression framework to attempt to make better sense of these coefficients. For this analysis, I limited the sample to conditions in which one of the recipients was an ingroup member. I left atheist and Muslim recipients disaggregated as separate levels of the recipient variable. Using a linear gaussian model, I regressed donation on recipient group identity, salience, and the interaction between these variables. Participant age and gender were also included as fixed effects, as were recipient age and gender. Random intercepts were specified at the participant level. The model was otherwise fit in the same manner as the other studies. The model converged, with all R-hat values equal to 1.00.

Summary statistics of the posterior are available in Table 6.4. Complete posterior distributions with highest density intervals (HDIs) can be seen in Figure 6.2. Notably, 100% of the posterior distributions for the atheist and Muslim recipient coefficients were to the left of 0, suggesting there is very strong evidence that participants showed less generosity to atheists than to Christians. Additionally, 100% of the posterior distribution of the salience manipulation fell to the right of 0, providing overwhelming evidence that the God cue increased generosity, as hypothesized. The posterior distributions for both interaction terms were centered near 0, providing no strong evidence for a hypothesis that God salience acts more strongly on ingroup or outgroup members.

Table 6.4

Bayesian Regression Posterior Estimates for Study 6

Predictors	donation	
	Posterior Median	*CI (90%)*
Intercept	20.84	19.40 – 22.28
God salient	4.25	2.57 – 5.95
Atheist recipient	-4.47	-5.81 – -3.14
Muslim recipient	-3.25	-4.60 – -1.90
Recipient age (centered)	0.04	0.01 – 0.08
Male recipient	-0.02	-0.96 – 0.91
Mturk sample	6.12	4.77 – 7.45
Participant age (centered)	-0.02	-0.07 – 0.03
Male participant	-1.18	-2.49 – 0.14
Salient: atheist recipient	0.15	-1.71 – 2.04
Salient: Muslim recipient	0.19	-1.71 – 2.06

Random Effects

σ^2	112.37
$\tau_{00\ id}$	133.56
ICC	0.54
N_{id}	1277
Observations	2554
Marginal R^2 / Conditional R^2	0.069 / 0.574

Figure 6.2

Study 6 Coefficient Posterior Distributions of the Bayesian Regression with Highest Density

Intervals (HDI)
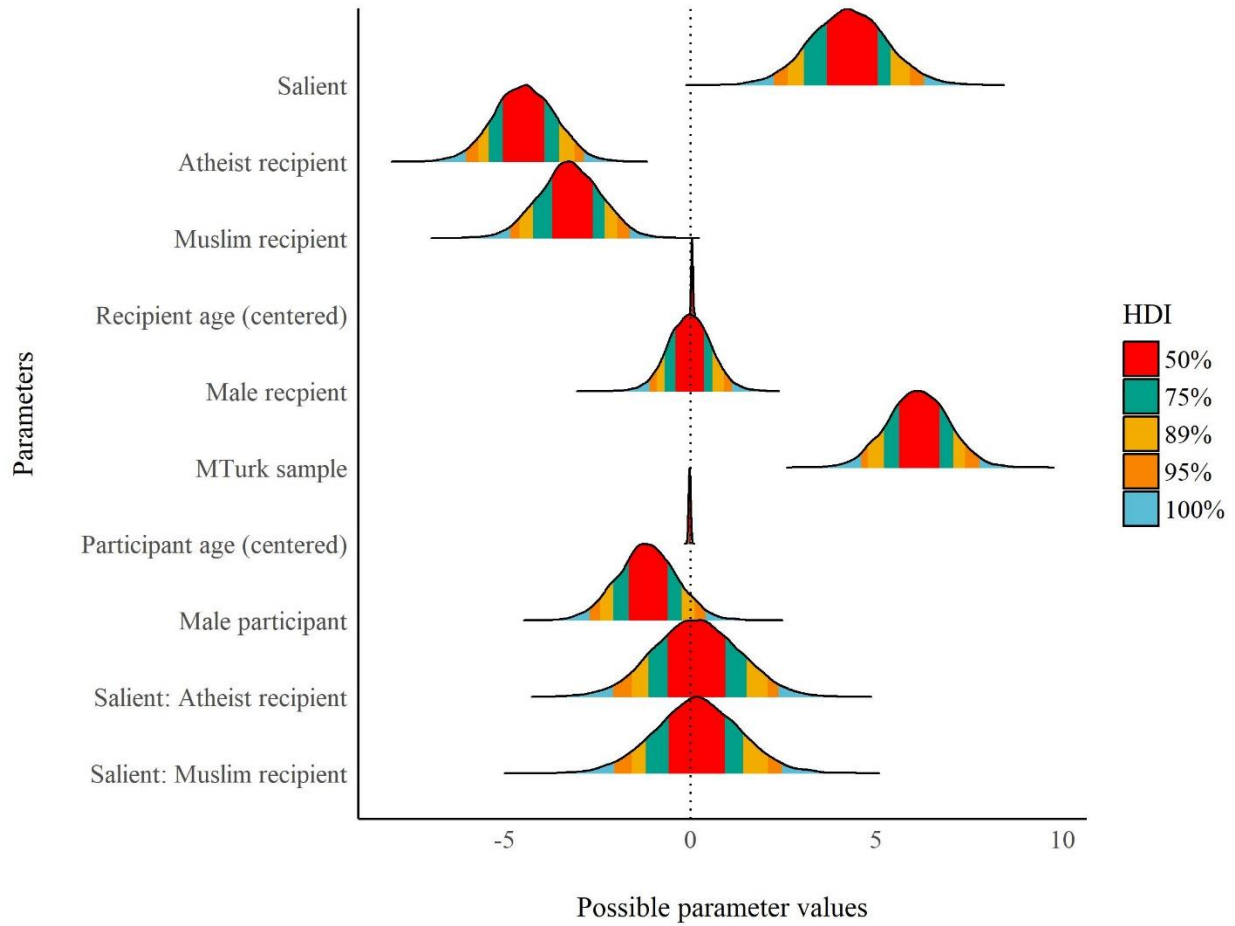
Lastly, I used posterior draws to compute posterior distributions for the difference in

giving between salience conditions for each recipient group (Figure 6.3). These posterior

distributions overlapped with each other very heavily, and every draw in each distribution was

above 0, providing strong evidence that participants were more generous in the God condition than in the control for every recipient group.

Figure 6.3

Study 6 Posterior Distributions of the Change in Generosity Post-God Cue to Each Recipient Group
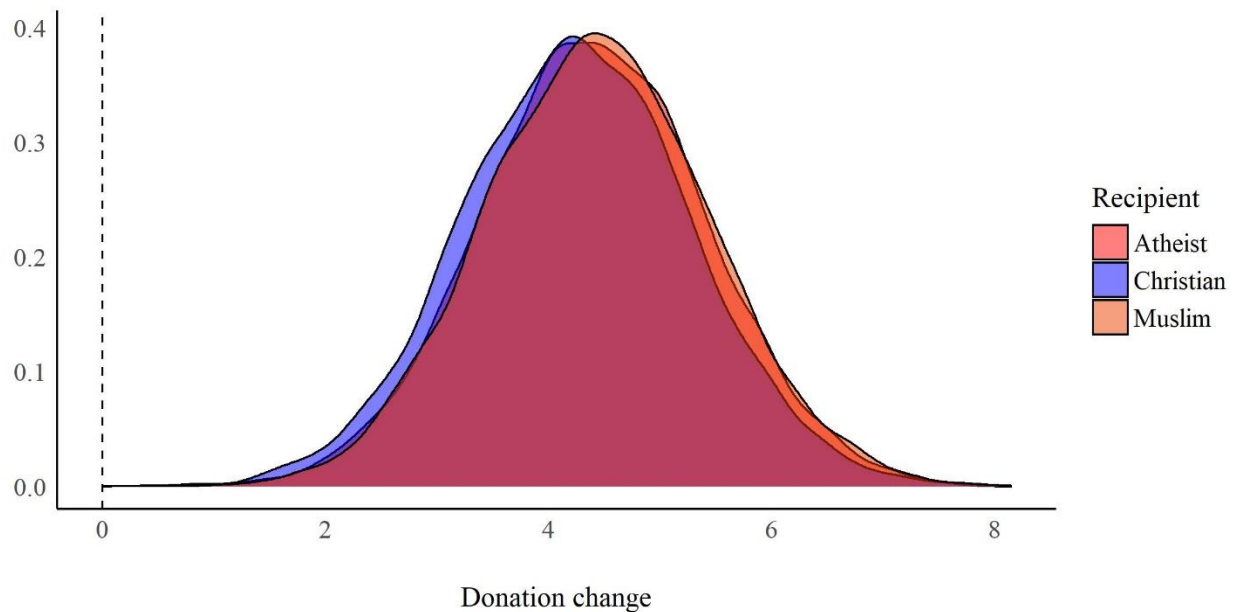
Discussion

Study 6 again used the three-way dictator game paradigm. Outgroup recipients were atheists or Muslims. Consistent with all previous studies, participants were more generous in the God salience condition than in the control condition. Furthermore, consistent with most prior findings, participants were significantly more generous to ingroup members than to either outgroup condition. However, no significant salience-by-group interaction was found, providing no evidence that ingroup favoritism varied as a function of salience condition. Furthermore, there

was strong evidence that generosity was higher for each recipient group in the salience condition than in the control. These findings best support the Universality Hypothesis.

An additional purpose of this study was to test whether participants would give differentially to atheist and Muslim outgroup members. In Study 4, no salience-by-group interaction was found with an atheist outgroup, but in Study 5, which used a Muslim outgroup, a salience-by-group interaction *was* found. I sought to test whether the differences between these studies could be attributed to the choice of outgroup. However, I did not find any significant differences in generosity between outgroup conditions in this study.

GENERAL DISCUSSION

Across six studies, I used dictator game paradigms to test Christians' generosity to ingroup members (fellow Christians) and various outgroup members, when participants were thinking about God versus when they were not. In the first three studies, the recipient group affiliation varied between participants, while God salience was manipulated within participants. In the latter three studies, God salience was manipulated between participants, while recipient group was a within-participant factor (Participants had the choice of to whom to donate). All six studies were designed to answer the same three research questions. Here I will bring the findings of all six studies together to answer each question.

Research Question 1: Are participants more generous when thinking about God than when they are not?

I hypothesized that Christian participants would be more generous when God was salient than in a control condition. Because most Christians believe God to be an all-powerful, all-knowing agent who cares about the morality of behavior (Pew Research Center, 2017), it is reasonable to assume that Christians would behave in a more prosocial manner when God concepts are activated. In all six studies, God salience was indeed a significant predictor of generosity, consistent with this hypothesis.

I further hypothesized that God salience would only increase generosity in those who held a dispositional belief in God. Across the literature, the association between dispositional religiosity and prosocial behavior is inconsistently found (Kelly, 2022). However, the primary manner dispositional religiosity may act on prosocial behavior may not be the direct route. Instead, dispositional religious belief may serve as a sort of cognitive "scaffolding" upon which

religious cognitions can act. In one study (Study 1), I directly tested the God salience manipulation both in Christians and in atheists. Consistent with the moderation-by-belief hypothesis, the God salience manipulation increased generosity for Christians, but not for atheists. In fact, atheist participants *decreased* generosity following the manipulation. Additionally, consistent with this hypothesis, a scale measure of belief in God was found to be a moderator of the salience manipulation in Studies 1, 2, and 4. In the other three studies, the absence of evidence of a moderation should not be seen as evidence of absence. As samples in these were limited to self-described Christians, there was a heavily restricted range of belief in God, such that most participants reported maximum belief. Thus, there may have been insufficient variance to detect the moderation in these other studies.

The effect of God salience on the prosociality of believers is consistent with a large literature. A program of research in religious priming found positive effects of activated God concepts on prosocial behavior. Additionally, these effects were found to be strongest in people who believed in the primed concept or agent (Shariff et al., 2016). While criticisms of the religious priming literature (and implicit priming procedures more generally) have been raised (e.g. Van Elk et al., 2015), even critics of the religious priming literature concede that explicit cues like those used in these studies are effective (Billingsley et al., 2018; Shariff et al., 2016). Because real-world religious cues need not be subtle (and indeed are frequently quite explicit), such explicit cues can reasonably be considered ecologically valid manipulations of religious salience.

Research Question 2: Are Christians more generous to ingroup members than to outgroup members?

Because people tend to act more generously toward those they consider group members than those outside the group, both in religious contexts (Blogowska et al., 2013) and outside religious contexts (Ben-Ner et al., 2009), I hypothesized that participants would be more generous to ingroup members than to outgroup members. Eight outgroup conditions were tested across the six studies. In four of these conditions, the recipient was an American atheist, and, in three, the recipient was an American Muslim. In these seven conditions, a significant difference was found in generosity to ingroup Christians and outgroup members, as hypothesized. The remaining outgroup condition was composed of Muslims from the UAE. Here, no difference in generosity was found between ingroup and outgroup members. Additionally, in Study 1, an atheist sample displayed greater generosity to fellow atheists than to outgroup Christians.

Thus, the consensus of this research is that Christians favored fellow Christians over outgroup members. Despite the fact that ingroups and outgroups are defined by religious identity, this ingroup favoritism cannot be inferred to be an effect of religiosity, *per se*, however. Ingroup favoritism shows up in a wide range of domains; participants even show favoritism towards ingroup members when group membership is randomly assigned (Diehl, 1990). Nonetheless, religious identity may be a particularly salient and powerful form of group affiliation.

It is worth noting that the only study that did not demonstrate ingroup favoritism was Study 2, which used group affiliation based on nationality (USA versus UAE), rather than religiosity alone. I did not hypothesize that the degree of ingroup favoritism would look different in this study than in the other studies, so I can only speculate why no ingroup favoritism was found when the outgroup was foreign. Perhaps because the participant was unlikely to encounter anyone (or at least many people) from a UAE recipient's group, fewer feelings of threat or

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hostility were activated than were when the outgroup member was part of a domestic outgroup. Furthermore, despite the fact that the UAE was chosen as an outgroup because the country is relatively wealthy, it is possible that participants did not know this about the country and believed the outgroup recipient to have been in greater need than ingroup recipients. Finally, charitable giving overseas is a common part of the Christian religious experience (for example, donating to missionary work), so perhaps Christians are more inclined to donate to foreign outgroups than domestic ones. It is worth exploring generosity to more foreign outgroups in future research to explore whether this finding replicates.

Research Question 3: Does God salience have different effects on generosity to ingroup and outgroup members?

In each study, I tested for an interaction between the salience condition and the recipient condition. The interaction term can be interpreted in two equivalent ways: 1) a test of whether God salience had different effects to ingroup and outgroup members and 2) a test of whether ingroup favoritism varied depending on whether God was salient or not. I thought multiple patterns were possible for this research question, and I outlined four plausible hypotheses.

The "*Strong Parochiality Hypothesis*" suggests that ingroup favoritism effects would be amplified by God salience, resulting in greater generosity to the ingroup, alongside *decreased* generosity to the outgroup. The "*Weak Parochiality Hypothesis*" posits that God salience would lead to increased generosity, but that this generosity will be of the "minimal prosociality" variety (Saroglou, 2006). Specifically, this hypothesis would predict that participants would increase their generosity to ingroup members while not substantially changing their generosity to outgroup members. The "*Universality Hypothesis*" predicts that God salience would lead to increased generosity, and this would not be a group-specific effect. Participants would be more

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generous when God is salient, and this would take the form of increased generosity to both ingroup and outgroup members. Finally, the "*Bias Reduction Hypothesis*" suggests that God salience would act more strongly on generosity to the outgroup than to the ingroup, reducing the ingroup favoritism gap.

Eight ingroup-outgroup comparisons were made across six studies. In only one of these comparisons was an interaction found, such that the God salience effect was stronger toward ingroup members than outgroup members. Among the other seven comparisons, the point estimates fell on both sides of zero, not consistently supporting a greater effect of God salience in either direction. For each study, I computed a Bayesian regression to assess what parameter estimates were plausible for these interaction terms. Posterior distributions for the interaction terms of all studies can be seen in Figure 7.1.

Furthermore, I calculated Bayesian posterior estimates of the predicted change in generosity to both ingroup and outgroup members in Studies 1-3 and the difference in generosity between salience conditions for ingroup and outgroup members in Studies 4-6. All studies favored the hypothesis that God salience led to greater generosity to both ingroup and outgroup members, and aside from Study 5, all studies very strongly supported this hypothesis (Figure 7.2). Therefore, these studies together best support the Universality Hypothesis.

Figure 7.1

Posterior Distributions of the Interaction Terms Across Studies

Interaction Term Posterior
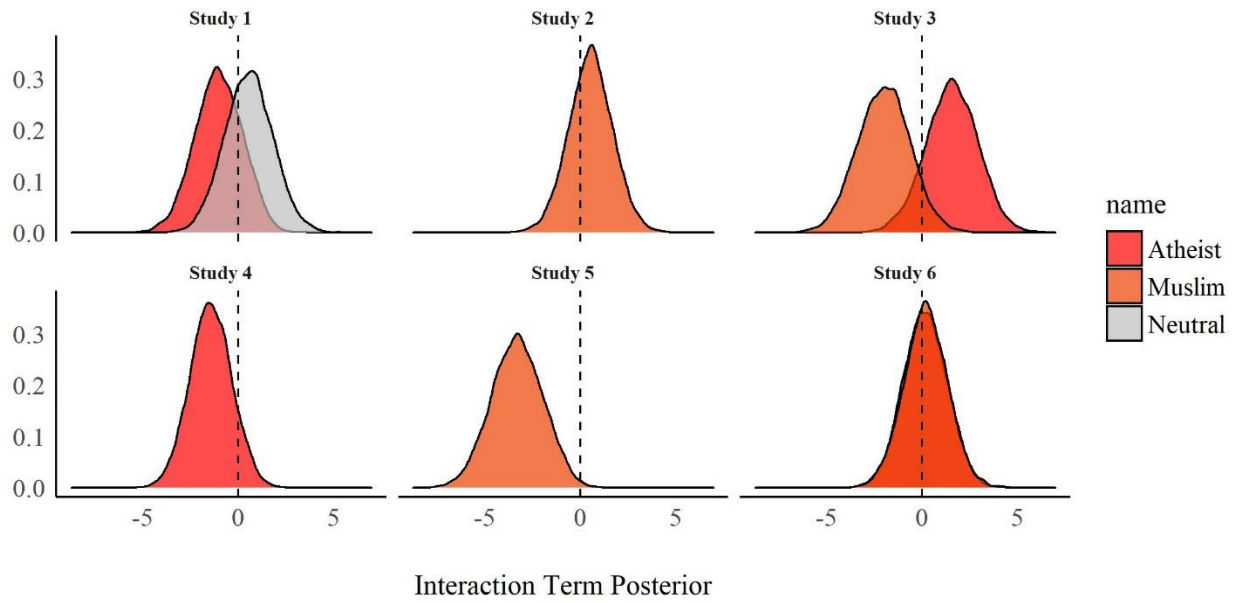
Figure 7.2

Posterior Distribution Plots of Change/Difference Scores by Recipient Group Across Studies

Donation change/difference
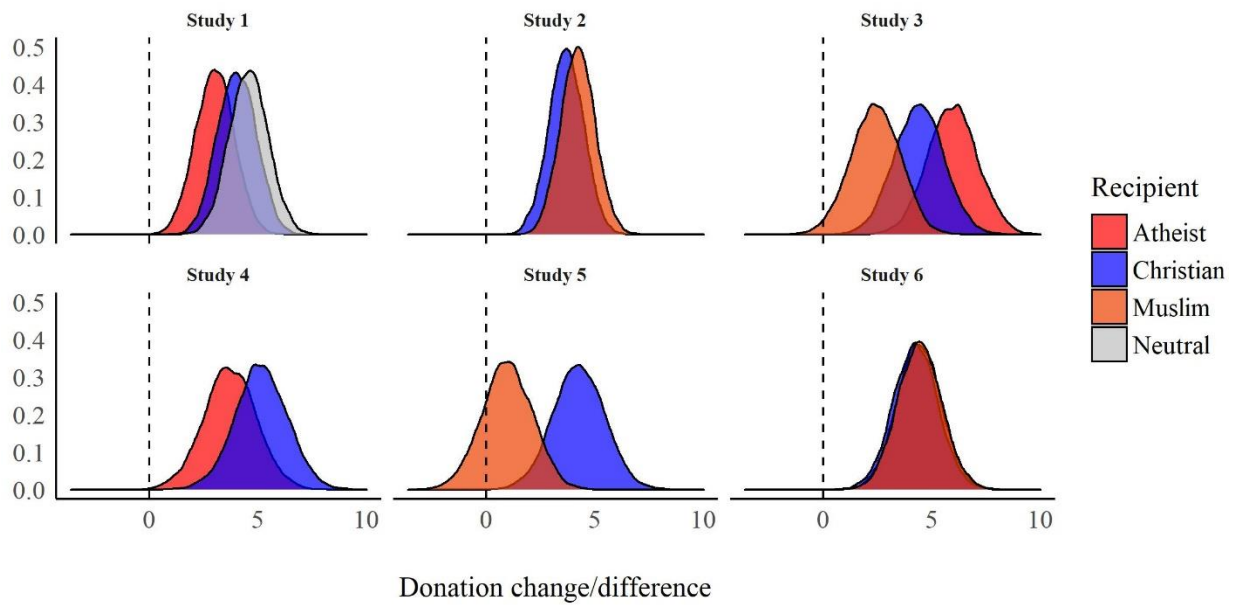
It is worth considering the one study that did reveal an interaction: Study 5. In this study, the effect of the God cue acted more strongly on ingroup members than outgroup members, and there was only weak, nonsignificant evidence that generosity to the outgroup was greater in the salience condition than in the control. In isolation, this study appears to provide better support for the Weak Parochiality Hypothesis than the Universality Hypothesis. So why did this study produce a different pattern of results than did the other studies? Methodologically, this study was very similar to Study 4, but one way these studies varied was in their choice of outgroup: Study 4 used an atheist outgroup while Study 5 used a Muslim one. Therefore, my first thought was that the choice of the outgroup might matter. However, I directly tested this explanation in Study 6 and found no evidence for it. Study 5 also varied from other studies because I deliberately quota sampled for representative demographics in this study. Therefore, I thought it possible that this interaction was attributable to a demographic group that was well-represented in Study 5 but poorly represented elsewhere. One candidate explanation was a gender effect: Male participants showed no difference in generosity to Muslims between the salience and control conditions, while women followed the pattern seen in other studies. However, no hint of this moderation by gender was found in any other study, so this explanation seems unlikely. In the end, I am not fully able to explain why Study 5 varied from other studies, and part of this may be explained simply by random variance. Still, it may be valuable to explore potential demographic effects more purposefully in future research.

Despite the heterogeneity provided by Study 5, the research in aggregate best supports the Universality Hypothesis. While it is difficult to conclude if the effect of salience was *precisely* equivalent for ingroup and outgroup members, the research does not converge towards a group-by-salience interaction in favor of one direction over the other. Thus, it does not appear

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that the salience effect on generosity is strongly impacted by the group affiliation of the recipient.

Theoretical Implications

A large and still-growing literature has explored the relationship between religiosity and prosocial behavior. However, this literature is filled with sources of heterogeneity, and no satisfactory conclusion about the relationship between these constructs has been found. One potential reason behind this heterogeneity is that many studies simply measure one's dispositional religiosity and use this as their variable of interest. Among these studies that simply measure dispositional religiosity, religious cognitions may, or may not, be activated in the moment. However, religious cognitions, rather than mere religious dispositions, are important in guiding behaviors. A literature on religious priming found that the subtle manipulation of religious cognitions could increase prosociality (Shariff et al., 2016), and more explicit manipulations of religious salience have found even stronger effects (Billingsley et al., 2018). In the studies reported here, I find further evidence of the effects of religious cognitions on prosocial behavior. In every study, God salience led to increased generosity when compared to a control. This lends further credence to the argument that religious cognitions, and not simply disposition, must be considered to fully understand the effect of religiosity on behavior.

Even when religious cognition does produce greater generosity, there remains a question of *to whom* that generosity is granted. Some researchers have promoted what is occasionally known as the "minimal prosociality" hypothesis of a religious effect (Saroglou, 2006). Specifically, this hypothesis suggests that religiosity does promote prosociality, but in a manner that prefers the ingroup over the outgroup. The research presented in this dissertation supports the argument that religious people tend to favor ingroup members. In five of six studies,

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Christian participants were more generous to members of the ingroup than the outgroup. However, this is not definitive evidence that the religious effect on prosociality is parochial. People tend to favor their own ingroup, regardless of how the ingroup and outgroup is determined (Balliet et al., 2014). Therefore, the mere evidence of favoritism for a religious ingroup is not evidence of a group favoritism effect *caused* by religiosity. A better test of the unique religious effect is the interaction between salience and group affiliation. Here, I found little evidence of such interactions, supporting the Universality Hypothesis. This research therefore provides evidence that, while religious people may favor the ingroup over the outgroup, religion itself may have no effect on group parochialism. Future research should be careful to conceptually disentangle baseline group favoritism effects from the unique effects of religiosity on groupishness.

Limitations and Future Research

Religion and Culture

While I have spoken broadly about religious psychology through this dissertation, it is important to recognize that all religious samples in the research reported here were composed of American Christians. Therefore, care should be taken to avoid over-generalizing these findings to all populations, particularly because this is an especially "WEIRD" population (Western, Educated, Industrialized, Rich, and Democratic; Henrich et al., 2010). Future research should consider questions about religious salience and parochiality in other cultures and religions to assess cultural and religious generalizability. Fortunately, there already exists some research asking these questions in populations with different religions and nationalities. Pasek and colleagues (2022) have used a very similar paradigm to the ones reported in this dissertation to explore these questions in Israel, Palestine, and Fiji. While there is some variance across the sites

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(for example, notably large baseline favoritism among Israeli Jews and Palestinian Muslims), the primary effects reported here are replicated across the sites: The God cue increased generosity; participants displayed ingroup favoritism; and the God cue did not increase this favoritism.

Additionally, while not all research has directly addressed the parochialism question of religious prosociality, religious effects on prosociality have been tested in a wide range of national contexts, including China (Xia et al., 2021), the Czech Republic (Lang et al., 2016), Japan (Miyatake & Higuchi, 2017), Mauritius (Xygalatas et al., 2016), Singapore (Ramsay et al., 2014), and a variety of small-scale societies (Lang et al., 2019). Among these various contexts, few strong cultural moderators have been found, increasing confidence in generalizability. However, one cultural moderator of importance concerns the normativity of religion. Stavrova and Siegers (2014), found that dispositional religiosity is more strongly correlated with prosociality in places where religion is *not* normative than where it is. A potential explanation for this lies in the fact that people who call themselves religious in a non-religious context are more likely to be intrinsically religious, and therefore more likely to be motivated by their beliefs. It is therefore possible that this cultural context acts something like a religious cue. Their distinctive religiosity motivates them to act more in line with their beliefs. It is reasonable to suspect, therefore, that an experimental religious cue would have less of an effect on such people, because their baseline religious cognitions are stronger. However, there are few studies that test the effect of religious cognitions on behavior in such contexts. Future work should explore these questions among religious people in less religious cultures.

The Paradigm and Behavior

Second, all studies reported here use a dictator game paradigm. Dictator games test behavior that closely fits the definition of a prosocial behavior (behavior for the good of another

at some cost to oneself), and they are predictive of prosocial behavior outside the lab (Barr & Zeitlin, 2010; Cartwright & Thompson, 2022; Franzen & Pointner, 2013). Nonetheless, it is still worth considering whether these findings would generalize to other tasks or behaviors. Fortunately, other research has tested similar questions with very highly ecologically valid measures. Duhaime (2015) found that Muslim shopkeepers were more honest in their business dealings while religion was made salient through the Islamic call to prayer. And Malhotra (2010) found that religious people bid more for charitable causes on days when they visited a house of worship. Such ecologically valid measures can be challenging, however, and the challenge becomes even greater when the additional variable of recipient group membership must be factored in. Still, future research can explore the questions asked in this dissertation with some other measures. Potential studies may explore such behaviors as donations to charitable causes targeted toward the ingroup versus outgroup, hostility to ingroup and outgroup members, or dishonesty coming at the expense of an ingroup or outgroup member.

Nature of Outgroup

A further limitation of this research is that all outgroups were based, at least in part, on religious affiliation. Only one study used a qualification beyond religious affiliation to determine group affiliation (Study 2, which incorporated national identity). In this research I focused specifically on religious group identity under the belief that religious group affiliation would be a particularly salient form of group identity within a religious context. If religious cognitions *were* to lead to parochiality, I reasoned that religious outgroups would be the most likely to be affected by this. Nonetheless, this supposition should not be taken fully for granted. Future research should explore other classes of group identity.

The Aspect of Religiosity Made Salient

Finally, all studies here manipulated salience in God. It is worth considering whether salience of other aspects of religious beliefs would have different effects. White and colleagues (2019) used a method that manipulated salience in karma and found similar effects in promoting prosocial behavior, so it appears the effect is not unique to God cues. Additionally, the call to prayer (Malhotra, 2010), religious location (Xygalatas et al., 2016), and sacred music (Lang et al., 2016) have all been found to increase religious cognitions, and thereby prosocial behavior. However, few of these studies explicitly test these effects in the context of group membership. One study did directly test the effect of different cues on prosociality to ingroup and outgroup (Preston & Ritter, 2013). Whereas a God prime led to similar results to those given in this dissertation, a "Religion" prime had a more parochial effect. While this study was underpowered, these findings nonetheless make a compelling case that future research should explore the effect of different types of religious cognitions on prosocial behavior and parochiality.

Conclusion

Despite a large literature on the topic, a firm conclusion about the effect of religiosity on prosocial behavior is lacking. Among the limitations of the existing literature are an overreliance on self-report measures, a lack of emphasis on the importance of religious cognitions, and a lack of focus on to whom prosociality might be granted. I sought to address these limitations in this dissertation to explore whether religious salience promotes generosity, and to whom this generosity is granted. Across six studies, I found that religious salience does increase generosity, and that this generosity is extended to ingroup members and outgroup members alike. While this religious salience does not eliminate baseline ingroup favoritism, the unique contribution of religious cognitions on generosity was not found to be parochial.

REFERENCES

Ahmed, A. M., & Salas, O. (2011). Implicit influences of Christian religious representations on dictator and prisoner's dilemma game decisions. *The Journal of Socio-Economics*, *40*(3), 242-246.

Amir, O., & Rand, D. G. (2012). Economic games on the internet: The effect of $1 stakes. *PloS one*, *7*(2).

Anderson, L. R., & Mellor, J. M. (2009). Are risk preferences stable? Comparing an experimental measure with a validated survey-based measure. *Journal of Risk and Uncertainty*, *39*(2), 137-160.

Arechar, A. A., & Rand, D. G. (2022). Learning to be selfish? A large-scale longitudinal analysis of Dictator games played on Amazon Mechanical Turk. *Journal of Economic Psychology*, *90*, 102490.

Baier, C. J., & Wright, B. R. (2001). "If you love me, keep my commandments": A meta-analysis of the effect of religion on crime. *Journal of Research in Crime and Delinquency*, *38*(1), 3-21.

Balliet, D., Wu, J., & De Dreu, C. K. (2014). Ingroup favoritism in cooperation: a meta-analysis. *Psychological bulletin*, *140*(6), 1556.

Barr, A., & Zeitlin, A. (2010). *Dictator games in the lab and in nature: External validity tested and investigated in Ugandan primary schools* (No. 2010-11). Centre for the Study of African Economies, University of Oxford.

Batara, J. B. L., Franco, P. S., Quiachon, M. A. M., & Sembrero, D. R. M. (2016). Effects of religious priming concepts on prosocial behavior towards ingroup and outgroup. *Europe's Journal of Psychology*, *12*(4), 635-644.

Bates, D., Maechler, M., Bolker, B., Walker, S., Christensen, R. H. B., Singmann, H., ... & Bolker, M. B. (2015). Package 'lme4'. *Convergence*, *12*(1), 2.

Batson, C. D., & Powell, A. A. (2003). Altruism and Prosocial Behavior. *Handbook of Psychology*, 463-484.

Batson, C. D., Naifeh, S. J., & Pate, S. (1978). Social desirability, religious orientation, and racial prejudice. *Journal for the Scientific Study of Religion*, *17*(1), 31-41.

Ben-Ner, A., McCall, B. P., Stephane, M., & Wang, H. (2009). Identity and in-group/out-group differentiation in work and giving behaviors: Experimental evidence. *Journal of Economic Behavior & Organization*, *72*(1), 153-170.

Bennett, M. R., & Einolf, C. J. (2017). Religion, altruism, and helping strangers: A multilevel analysis of 126 countries. *Journal for the Scientific Study of Religion*, *56*(2), 323-341.

Benson, P. L., Dehority, J., Garman, L., Hanson, E., Hochschwender, M., Lebold, C., ... & Sullivan, J. (1980). Intrapersonal correlates of nonspontaneous helping behavior. *The Journal of Social Psychology*, *110*(1), 87-95.

Billingsley, J., Gomes, C. M., & McCullough, M. E. (2018). Implicit and explicit influences of religious cognition on Dictator Game transfers. *Royal Society open science*, *5*(8), 170238.

Blogowska, J., Lambert, C., & Saroglou, V. (2013). Religious prosociality and aggression: It's real. *Journal for the Scientific Study of Religion*, *52*(3), 524-536.

Brooks, A. C. (2003). Religious faith and charitable giving. *Policy Review*, (121), 39-51.

Brooks, A. C. (2006). *Who Really Cares.* Basic Books (AZ).

Bürkner, P. C. (2017). brms: An R package for Bayesian multilevel models using Stan. *Journal of statistical software*, *80*, 1-28.

Carpenter, B., Gelman, A., Hoffman, M. D., Lee, D., Goodrich, B., Betancourt, M., ... & Riddell, A. (2017). Stan: A probabilistic programming language. *Journal of statistical software*, *76*(1).

Carpenter, T. P., & Marshall, M. A. (2009). An examination of religious priming and intrinsic religious motivation in the moral hypocrisy paradigm. *Journal for the Scientific Study of Religion*, *48*(2), 386-393.

Cartwright, E., & Thompson, A. (2022). Using Dictator Game Experiments to Learn About Charitable Giving. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 1-7.

Chen, Y., & Li, S. X. (2009). Group identity and social preferences. *American Economic Review*, *99*(1), 431-57.

Cohen, E., Mundry, R., & Kirschner, S. (2014). Religion, synchrony, and cooperation. *Religion, Brain & Behavior*, *4*(1), 20-30.

Crandall, V. C., & Gozali, J. (1969). The social desirability responses of children of four religious-cultural groups. *Child Development*, 751-762.

Cuddy, A. J., Rock, M. S., & Norton, M. I. (2007). Aid in the aftermath of Hurricane Katrina: Inferences of secondary emotions and intergroup helping. *Group Processes & Intergroup Relations*, *10*(1), 107-118.

Darley, J. M., & Batson, C. D. (1973). " From Jerusalem to Jericho": A study of situational and dispositional variables in helping behavior. *Journal of Personality and Social Psychology*, *27*(1), 100-108.

de Abreu, M. E., Laureano, R. M., da Silva, R. V., & Dionísio, P. (2015). Volunteerism, compassion and religiosity as drivers of donations practices. *International Journal of Nonprofit and Voluntary Sector Marketing*, *20*(3), 256-276.

Diehl, M. (1990). The minimal group paradigm: Theoretical explanations and empirical findings. *European Review of Social Psychology*, *1*(1), 263-292.

Duhaime, E. P. (2015). Is the call to prayer a call to cooperate? A field experiment on the impact of religious salience on prosocial behavior. *Judgment and Decision Making*, *10*(6), 593-596.

Dunkel, C. S., & Dutton, E. (2016). Religiosity as a predictor of in-group favoritism within and between religious groups. *Personality and individual differences*, *98*, 311-314.

Eagle, D., Keister, L. A., & Read, J. N. G. (2018). Household charitable giving at the intersection of gender, marital status, and religion. *Nonprofit and Voluntary Sector Quarterly*, *47*(1), 185-205.

Einolf, C. J. (2011). Gender differences in the correlates of volunteering and charitable giving. *Nonprofit and Voluntary Sector Quarterly*, *40*(6), 1092-1112.

Fershtman, C., Gneezy, U., & Verboven, F. (2005). Discrimination and nepotism: The efficiency of the anonymity rule. *The Journal of Legal Studies*, *34*(2), 371-396.

Fiedler, S., Hellmann, D. M., Dorrough, A. R., & Glöckner, A. (2018). Cross-national in-group favoritism in prosocial behavior: Evidence from Latin and North America. *Judgment & Decision Making*, *13*(1).

Forst Jr, E., & Healy, R. M. (1991). Correlations among religion, commitment, and volunteer participation. *Psychological Reports*, *69*, 1224-1224.

Freud, S. (1938). *Totem and taboo: Resemblances between the psychic lives of savages and neurotics*. Harmondsworth, Middlesex: Penguin Books.

Franzen, A., & Pointner, S. (2013). The external validity of giving in the dictator game. *Experimental Economics*, *16*(2), 155-169.

Galen, L. W. (2012). Does religious belief promote prosociality? A critical examination. *Psychological Bulletin*, *138*(5), 876-906.

Galen, L., & Beahan, J. (2013). A Skeptical Review of Religious Prosociality Research. *Free Inquiry*, *33*(4), 1-19.

Galen, L. W., Sharp, M., & McNulty, A. (2014). Nonreligious group factors versus religious belief in the prediction of prosociality. *Social Indicators Research*, *122*(2), 411-432.

Gebauer, J. E., Sedikides, C., & Schrade, A. (2017). Christian self-enhancement. *Journal of Personality and Social Psychology*, *113*(5), 786-809.

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

Ginges, J., Hansen, I., & Norenzayan, A. (2009). Religion and support for suicide attacks. *Psychological Science*, *20*(2), 224-230.

Ginges, J., Sheikh, H., Atran, S., & Argo, N. (2016). Thinking from God's perspective decreases biased valuation of the life of a nonbeliever. *Proceedings of the National Academy of Sciences*, *113*(2), 316-319.

Gomes, C. M., & McCullough, M. E. (2015). The effects of implicit religious primes on dictator game allocations: A preregistered replication experiment. *Journal of Experimental Psychology: General*, *144*(6), 94-108.

Graham, J., & Haidt, J. (2010). Beyond beliefs: Religions bind individuals into moral

    communities. *Personality and Social Psychology Review*, *14*(1), 140-150.

Haggard, M. C., Kang, L. L., Rowatt, W. C., & Shen, M. J. (2015). Associations among

    religiousness and community volunteerism in national random samples of American

    adults. *Journal of Prevention & Intervention in the Community*, *43*(3), 175-185.

Hall, D. L., Matz, D. C., & Wood, W. (2010). Why don't we practice what we preach? A meta-

    analytic review of religious racism. *Personality and Social Psychology Review*, *14*(1),

    126-139.

Hecht, J. M. (2004). *Doubt: a History*. New York: HarperCollins.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the

    world?. *Behavioral and Brain Sciences*, *33*(2-3), 61-83.

Hodgkinson, V. A., Weitzman, M. S., & Kirsch, A. D. (1990). From commitment to action: How

    religious involvement affects giving and volunteering. *Faith and Philanthropy in*

    America: Exploring the Role of Religion in America's Voluntary Sector, 93-114.

Horton, J. J., Rand, D. G., & Zeckhauser, R. J. (2011). The online laboratory: Conducting

    experiments in a real labor market. *Experimental Economics*, *14*(3), 399-425.

Hunsberger, B., & Platonow, E. (1986). Religion and helping charitable causes. *The Journal of*

    Psychology, *120*(6), 517-528.

John, O. P., & Robins, R. W. (1994). Accuracy and bias in self-perception: individual differences

    in self-enhancement and the role of narcissism. *Journal of Personality and Social*

    Psychology, *66*(1), 206-219.

Johnson, B. R., De Li, S., Larson, D. B., & McCullough, M. (2000). A systematic review of the

    religiosity and delinquency literature: A research note. *Journal of Contemporary*

    Criminal Justice, *16*(1), 32-52.

Johnson, K. A., Li, Y. J., Cohen, A. B., & Okun, M. A. (2013). Friends in high places: The

    influence of authoritarian and benevolent god-concepts on social attitudes and

    behaviors. *Psychology of Religion and Spirituality*, *5*(1), 15-22.

Kelly, J.M., Kramer, S., & Shariff, A. (2022). Religiosity predicts prosociality, especially when

    measured by self-report: A meta-analysis of almost sixty years of research. Unpublished

    manuscript.

Kelly, P. E., Polanin, J. R., Jang, S. J., & Johnson, B. R. (2015). Religion, delinquency, and drug

    use: A meta-analysis. *Criminal Justice Review*, *40*(4), 505-523.

Kim, Y. I., & Jang, S. J. (2017). Religious service attendance and volunteering: A growth curve

    analysis. *Nonprofit and Voluntary Sector Quarterly*, *46*(2), 395-418.

Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2017). lmerTest package: tests in

    linear mixed effects models. *Journal of statistical software*, *82*(13).

Laird, R. D., Marks, L. D., & Marrero, M. D. (2011). Religiosity, self-control, and antisocial

    behavior: Religiosity as a promotive and protective factor. *Journal of Applied*

    Developmental Psychology, *32*(2), 78-85.

Lang, M., Mitkidis, P., Kundt, R., Nichols, A., Krajčíková, L., & Xygalatas, D. (2016). Music as

    a sacred cue? Effects of religious music on moral behavior. *Frontiers in psychology*, *7*,

    814.

Lang, M., Purzycki, B. G., Apicella, C. L., Atkinson, Q. D., Bolyanatz, A., Cohen, E., ... & McNamara, R. A. (2019). Moralizing gods, impartiality and religious parochialism across 15 societies. *Proceedings of the Royal Society B*, *286*(1898), 20190202.

Laurin, K., Kay, A. C., & Fitzsimons, G. M. (2012). Divergent effects of activating thoughts of God on self-regulation. *Journal of Personality and Social Psychology*, *102*(1), 4.

Levine, M., Cassidy, C., Brazier, G., & Reicher, S. (2002). Self-categorization and bystander non-intervention: Two experimental studies 1. *Journal of Applied Social Psychology*, *32*(7), 1452-1463.

Maccoby, E. E., & Maccoby, N. (1954). The interview: A tool of social science. *In G. Lindzey (Ed.), Handbook of social psychology* (pp. 449–488). Cambridge, MA: Addison-Wesley.

Malhotra, D. (2010). "Sunday Effect" on pro-social behavior. *Judgment and Decision Making*, 5(2), 138-143.

Marshall, D. A. (2002). Behavior, belonging, and belief: A theory of ritual practice. *Sociological Theory*, *20*(3), 360-380.

McKay, R., & Whitehouse, H. (2015). Religion and morality. *Psychological bulletin*, *141*(2), 447-473.

Miyatake, S., & Higuchi, M. (2017). Does religious priming increase the prosocial behaviour of a Japanese sample in an anonymous economic game?. *Asian Journal of Social Psychology*, *20*(1), 54-59.

Moss, A., & Litman, L. (n.d.). *After the Bot Scare: Understanding What's Been Happening with Data Collection on MTurk and How to Stop It*. Blog Post.

Nederhof, A. J. (1985). Methods of coping with social desirability bias: A review. *European Journal of Social Psychology*, *15*(3), 263-280.

Nelson, L. D., & Dynes, R. R. (1976). The impact of devotionalism and attendance on ordinary and emergency helping behavior. *Journal for the Scientific Study of Religion*, 47-59.

New International Version Bible. (1973).

Norenzayan, A., Shariff, A. F., Gervais, W. M., Willard, A. K., McNamara, R. A., Slingerland, E., & Henrich, J. (2016). The cultural evolution of prosocial religions. *Behavioral and Brain Sciences*, 1-65.

Orbell, J., Goldman, M., Mulford, M., & Dawes, R. (1992). Religion, context, and constraint toward strangers. *Rationality and Society*, *4*(3), 291-307.

Pasek, M. H., Shackleford, C., Smith, J. M., Vishkin, A., Lehner, A., & Ginges, J. (2020). God values the lives of my out-group more than I do: Evidence from Fiji and Israel. *Social Psychological and Personality Science*, 1948550620904516.

Pasek, M. H., Kelly, J. M., Shackleford, C., White, C. J. M, Vishkin, A., Smith, J. M., Norenzayan, A., Shariff, A., & Ginges, J. (2022). Thinking about God encourages prosociality towards religious outgroups. Unpublished Manuscript.

Pew Research Center. (2014) Religious landscape study.

Pew Research Center. (2017). Americans Express Increasingly Warm Feelings Toward Religious Groups.

Pew Research Center. (2017). When Americans Say They Believe in God, What Do They Mean?

Pew Research Center (2020). The Global God Divide.

Pew Research Center (2021).   About Three-in-Ten U.S. Adults Are Now Religiously Unaffiliated.

Pichon, I., Boccato, G., & Saroglou, V. (2007). Nonconscious influences of religion on

        prosociality: A priming study. *European Journal of Social Psychology*, *37*(5), 1032-1045.

Preston, J. L., & Ritter, R. S. (2013). Different effects of religion and God on prosociality with

        the ingroup and outgroup. *Personality and Social Psychology Bulletin*, *39*(11), 1471-

        1483.

Putnam, R., & Campbell, D. E. (2010). American grace: How religion is reshaping our civic and

        political lives.

Ramsay, J. E., Pang, J. S., Shen, M. J., & Rowatt, W. C. (2014). Rethinking value violation:

        Priming religion increases prejudice in Singaporean Christians and

        Buddhists. *International Journal for the Psychology of Religion*, *24*(1), 1-15.

Randolph-Seng, B., & Nielsen, M. E. (2007). Honesty: One effect of primed religious

        representations. *The international journal for the psychology of religion*, *17*(4), 303-315.

Ranganathan, S. K., & Henley, W. H. (2008). Determinants of charitable donation intentions: a

        structural equation model. *International Journal of Nonprofit and Voluntary Sector*

        Marketing, *13*(1), 1-11.

Różycka-Tran, J. (2017). Love thy neighbor? The effects of religious in/out-group identity on

        social behavior. *Personality and Individual Differences*, *115*, 7-12.

Saroglou, V. (2006). Religion's role in prosocial behavior: Myth or reality. *Religion*, *31*(2), 1-66.

Scheitle, C. P., Corcoran, K. E., & Hudnall, E. B. (2019). Adopting a stigmatized label: Social

        determinants of identifying as an atheist beyond disbelief. *Social Forces*, *97*(4), 1731-

        1756.

Schumann, K., McGregor, I., Nash, K. A., & Ross, M. (2014). Religious magnanimity:

    Reminding people of their religious belief system reduces hostility after threat. *Journal of*

    Personality and Social Psychology, *107*(3), 432-453.

Sedikides, C., & Gebauer, J. E. (2010). Religiosity as self-enhancement: A meta-analysis of the

    relation between socially desirable responding and religiosity. *Personality and Social*

    Psychology Review, *14*(1), 17-36.

Shariff, A. F., & Norenzayan, A. (2007). God is watching you: Priming God concepts increases

    prosocial behavior in an anonymous economic game. *Psychological science*, *18*(9), 803-

    809.

Shariff, A. F., & Norenzayan, A. (2011). Mean gods make good people: Different views of God

    predict cheating behavior. *The International Journal for the Psychology of*

    Religion, *21*(2), 85-96.

Shariff, A. F., Willard, A. K., Andersen, T., & Norenzayan, A. (2016). Religious priming: A

    meta-analysis with a focus on prosociality. *Personality and Social Psychology*

    Review, *20*(1), 27-48.

Sharp, S. (2019). Prayer and helping. *Social Currents*, *6*(2), 141-162.

Sibley, C. G., & Bulbulia, J. (2015). Charity explains differences in life satisfaction between

    religious and secular New Zealanders. *Religion, Brain & Behavior*, *5*(2), 91-100.

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). Falsepositive psychology: Undisclosed

    flexibility in data collection and analysis allows presenting anything as significant.

    Psychological Science, 22, 1359-1366.

Skinner, B. F. (1969). *Contingencies of reinforcement: A theoretical analysis*. Englewood Cliffs,

    N.J: Prentice Hall.

Stavrova, O., & Siegers, P. (2014). Religious prosociality and morality across cultures: How

      social enforcement of religion shapes the effects of personal religiosity on prosocial and

      moral attitudes and behaviors. *Personality and Social Psychology Bulletin*, *40*(3), 315-

      333.

Trimble, D. E. (1997). The religious orientation scale: Review and meta-analysis of social

      desirability effects. *Educational and Psychological Measurement*, *57*(6), 970-986.

Tsang, J. A., Al-Kire, R. L., & Ratchford, J. L. (2021). Prosociality and religion. *Current*

      Opinion in Psychology, *40*, 67-72.

Van Elk, M., Matzke, D., Gronau, Q., Guang, M., Vandekerckhove, J., & Wagenmakers, E. J.

      (2015). Meta-analyses are no substitute for registered replications: A skeptical

      perspective on religious priming. *Frontiers in Psychology*, *6*, 1365.

White, C. J., Kelly, J. M., Shariff, A. F., & Norenzayan, A. (2019). Supernatural norm

      enforcement: Thinking about karma and God reduces selfishness among

      believers. *Journal of Experimental Social Psychology*, *84*, 103797.

Wiepking, P., & Maas, I. (2009). Resources that make you generous: Effects of social and

      human resources on charitable giving. *Social Forces*, *87*(4), 1973-1995.

Xia, W., Guo, X., Luo, J., Ye, H., Chen, Y., Chen, S., & Xia, W. (2021). Religious identity,

      between-group effects and prosocial behavior: Evidence from a field experiment in

      China. *Journal of Behavioral and Experimental Economics*, *91*, 101665.

Xygalatas, D. (2013). Effects of religious setting on cooperative behavior: A case study from

      Mauritius. *Religion, Brain & Behavior*, *3*(2), 91-102.

Xygalatas, D., Klocová, E. K., Cigán, J., Kundt, R., Maňo, P., Kotherová, S., ... & Kanovsky, M. (2016). Location, location, location: effects of cross-religious primes on prosocial behavior. *The International Journal for the Psychology of Religion*, *26*(4), 304-319.

Yamagishi, T., Li, Y., Takagishi, H., Matsumoto, Y., & Kiyonari, T. (2014). In search of Homo economicus. *Psychological Science*, *25*(9), 1699-1711.

Yeung, J. W. (2018). Religion, Volunteerism and Health: Are Religious People Really Doing Well by Doing Good?. *Social Indicators Research*, *138*(2), 809-828.

APPENDIX A: STUDY INSTRUCTIONS AND MANIPULATIONS

Study 1

Instructions

- In addition to the base reward for participating in this study ($0.50), you will also be able to receive a bonus of up to $0.40 for your participation.

- You will be paired with another participant who has completed this study. You can allocate some or all of this bonus money to that participant or keep it all for yourself.

- You will receive some demographic information about the partner that you are paired with, taken from the demographic survey at the beginning of this study.

- You will be paired with two different participants during the course of this study, and will make two giving decisions. However, we will randomly select only one of these decisions as your payment, and as the donation you give to your partner.

- In the future, another participant will have the opportunity to give some of their $0.40 bonus to you. The only information they will have about you will come from the demographic information you provided.

Dictator Game 1

Recipient gender, age, and Zip code were randomly assigned. Recipient religion was randomly assigned to be Christian or atheist, or was not given.

You have been paired with participant **#242**.

Participant **#242** is:
Female
40 years old
American
Christian
From Zip Code 60645

You have been given $0.40.
How much of this $0.40 would you like to **donate to participant #242?**

Please enter an amount from .00 to .40

God Cue

You will now be asked to make another giving decision to another participant.

Before you make this decision, please think about *God.*

Dictator Game 2

Recipient gender, age, and Zip code were randomly assigned. Recipient religion was the same as in Dictator Game 1.

You have been paired with participant **#256**.

Participant **#256** is:
Female
50 years old
American
Christian
From Zip Code 02118

You have been given $0.40.
After considering God, how much of this $0.40 would you like to **donate to participant #256?**

Please enter an amount from .00 to .40

Study 2

Instructions

- Participants from specific countries have been selected to participate in this section of the study

- In addition to the base reward for participating in this study ($0.50), you will also be able to receive a bonus of up to $0.40 for your participation.

- You will be paired with another participant who has completed this study. You can allocate some or all of this bonus money to that participant or keep it all for yourself.

- You will receive some demographic information about the partner that you are paired with, taken from the demographic survey at the beginning of this study.

- You will be paired with two different participants during the course of this study, and will make two giving decisions. However, we will randomly select only <u>one</u> of these decisions as your payment, and as the donation you give to your partner.

- In the future, another participant will have the opportunity to give some of their $0.40 bonus to you. The only information they will have about you will come from the demographic information you provided.

Dictator Game 1

Recipient age and gender were randomly assigned. Recipient was either said to be from the United States of America and Christian or from the United Arab Emirates and Muslim.

You have been paired with participant **#242**.

Participant **#242** is:
Female
44 years old
From the United States of America
Christian

You have been given $0.40.
How much of this $0.40 would you like to **donate to participant #242?**

Please enter an amount from .00 to .40

⬚

God Cue

You will now be asked to make another giving decision to another participant.

Before you make this decision, please think about *God.*

Dictator Game 2

Recipient age and gender were randomly assigned. Recipient age and nationality were the same as in Game 1.

You have been paired with participant **#256**.

Participant **#256** is:
Female
32 years old
From the United States of America
Christian

You have been given $0.40.
After considering God, how much of this $0.40 would you like to **donate to participant #256?**

Please enter an amount from .00 to .40

Study 3

Instructions

In addition to the base for participating in this study, you will also be able to receive a bonus of up to $3.00 for your participation.

- On the next few pages, you will be asked to make two separate decisions about this $3.00 bonus payment. Your task is to decide how much of this $3.00 allotment you would like to give away to a randomly-selected recipient.

- You will complete this task twice, with two different recipients. One of the decisions that you make will be randomly selected, and the money that you chose to share in that decision will be given to the recipient. The money that you do not share will be given to you.

- You will receive some demographic information about the other participants that you are paired with.

- Please note that at the conclusion of the study, the amount you choose to donate in one of your decisions will actually be given to the participant you are paired with. The rest will be given to you. So please take this decision seriously.

Dictator Game 1

The recipient here was randomly selected from a real pool of Christian, atheist, and Muslim recipients.

You have been paired with participant **#125**.

Participant **#125** is:
Female
58 years old
American
Christian

You have been given $3.00.
How much of this $3.00 would you like to **donate** to this participant?

Please enter an amount from 0.00 to 3.00

[   ]

God Cue

You will now be asked to make another giving decision to another participant.

Before you make this decision, please think about God.

Dictator Game 2

The recipient here was randomly selected from a pool of recipients who were of the same religious group as the Game 1 recipient.

You have been paired with participant **#130**.

Participant **#130** is:
Male
25 years old
American
Christian

You have been given $3.00.
After thinking about God, how much of this $3.00 would you like to **donate** to this participant?

Please enter an amount from 0.00 to 3.00

[   ]

Study 4

Introduction

The final row of these instructions was only shown to those in the God salience condition.

In addition to your base payment for participating in this study, you will also be given 10 "tokens" worth 5 cents apiece.

- In the task to follow, you have been assigned the role of **"giver,"** and you will be paired with two participants who were given the role of **"receivers."**
- You will be given some brief demographic information about each receiver.
- You may allocate as many or as few of the tokens as you would like to the receivers. You will keep any you do not allocate.
- We would like to emphasize that this is a decision with actual stakes. At the conclusion of the study, any money you kept will be given to you as a bonus payment. Any money you allocated to receivers will be given to them.
- While making your allocation decision, **please think about *God*.**

Dictator Game

One recipient was randomly drawn from a real pool of Christian recipients and the other was randomly drawn from a real pool of atheist recipients. The "after thinking about God" portion of the instructions was only shown to those in the God salience condition.

Please consider how many of your **10 tokens** you would like to give to Receiver A and how many you would like to give to Receiver B.

Receiver A is:
Participant # 379
Female
78 years old
American
Christian

Receiver B is:
Participant # 404
Female
52 years old
American
Atheist

After thinking about God, how many tokens would you like to give to each receiver, and how many would you like to keep for yourself?
(*Please note these values must add up to 10.*)

	Tokens donated
Tokens donated to Receiver A	0
Tokens donated to Receiver B	0
Tokens kept for yourself	0
Total	0

Study 5

Instructions

The final row of these instructions was only shown to participants in the God salience condition.

In addition to your base payment for participating in this study, you will also be given 10 virtual quarters, each worth 25 real-world cents.

- In the task to follow, you have been assigned the role of "**Giver**," and you will be paired with two participants who were given the role of "**Receivers**."
- Givers (like you) are given a bonus payment. Receivers are not. However, Givers have the opportunity to give some or all their bonus to receivers, if they so choose.
- You will be given some brief demographic information about each Receiver with whom you are paired.
- You may give as many or as few of the quarters as you would like to the Receivers. You will keep any you do not give.
- We would like to emphasize that this is a decision with actual stakes. At a later date, any money you kept will be given to you as a bonus payment. Any money you allocated to Receivers will be given to them. (*Please note that these bonus payments are dependent on your fully and accurately completing the survey, as determined by the survey company*)
- While making your allocation decision, **please think about *God*.**

Dictator Game

One recipient was randomly drawn from a real pool of Christian recipients and the other was randomly drawn from a real pool of Muslim recipients. The "after thinking about God" portion of the instructions was only shown to those in the God salience condition.

Please consider how many of your **10 quarters** you would like to give to Receiver A and how many you would like to give to Receiver B.

Receiver A is:
Participant 1113: A 45 year-old, female American Christian.

Receiver B is:
Participant 1211: A 31 year-old, female American Muslim.

After thinking about God, how many quarters would you like to give to each Receiver, and how many would you like to keep for yourself?
(*Please note these values must add up to 10.*)

	Quarters donated
Quarters donated to Receiver A	0
Quarters donated to Receiver B	0
Quarters kept for yourself	0
Total	0

Study 6

Instructions

The final row of these instructions was only shown to participants in the God salience condition.

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In addition to your base payment for participating in this study, you will also be given 10 virtual tokens, each worth 5 real-world cents.

- In the task to follow, you have been assigned the role of "**Giver**," and you will be paired with two participants who were given the role of "**Receivers**."
- Givers (like you) are given a bonus payment. Receivers are not. However, Givers have the opportunity to give some or all their bonus to receivers, if they so choose.
- You will be given some brief demographic information about each Receiver with whom you are paired.
- You may give as many or as few of the tokens as you would like to the Receivers. You will keep any you do not give.
- We would like to emphasize that this is a decision with actual stakes. At a later date, any money you kept will be given to you as a bonus payment. Any money you allocated to Receivers will be given to them.
- While making your allocation decision, **please think about *God*.**

Dictator Game

Recipients were randomly selected from a pool of Christian, atheist, and Muslim recipients. The "After thinking about God…" section of the instructions were only shown to those in the God salience condition.

Please consider how many of your **10 quarters** you would like to give to Receiver A and how many you would like to give to Receiver B.

Receiver A is:
Participant 1018: A 32 year-old, male American Muslim.

Receiver B is:
Participant 1151: A 58 year-old, male American Christian.

After thinking about God, how many quarters would you like to give to each Receiver, and how many would you like to keep for yourself?
(*Please note these values must add up to 10.*)

	Quarters donated
Quarters donated to Receiver A	0
Quarters donated to Receiver B	0
Quarters kept for yourself	0
Total	0

APPENDIX B: BAYESIAN PRIORS AND ROBUSTNESS CHECKS

I used the same parameters for specifying priors across all studies. Here, as a robustness check, I will compare model results with these specifications to results produced by models with default, non-informative priors. Note that some parameter values reported here may vary from those reported in the body of the manuscript. This is due to an element of randomness in the MCMC algorithm. The exact prior distributions used across studies can be seen in Table B.1. Default prior distributions can be seen in Table B.2.

Table B.1

Prior distributions used across studies

Parameter	Distribution Class	Distribution Argument 1	Distribution Argument 2	Distribution Argument 3
Intercept	Uniform	$\alpha = 0$	$\beta = 100$	
Fixed Effect Coefficients (b)	Normal	$\mu = 0$	$\sigma = 30$	
Residual Variance (σ)	Student t	$\nu = 3$	$\mu = 0$	$\sigma = 37.1$
Intercept Variance	Student t	$\nu = 3$	$\mu = 0$	$\sigma = 37.1$

Note. For uniform distributions, α represents the minimum of the distribution and β represents the maximum. For normal distributions μ represents the location of the distribution and σ represents the standard deviation. For Student t distributions, ν represents degrees of freedom, μ represents the location of the distribution and σ is the scale parameter.

Table B.2

Default prior distributions used in robustness checks

Parameter	Distribution Class	Distribution Argument 1	Distribution Argument 2	Distribution Argument 3
Intercept	Student t	$\nu = 3$	$\beta = 50$	$\sigma = 37.1$
Fixed Effect Coefficients (b)	Flat			
Residual Variance (σ)	Student t	$\nu = 3$	$\mu = 0$	$\sigma = 37.1$
Intercept Variance	Student t	$\nu = 3$	$\mu = 0$	$\sigma = 37.1$

Note. For Student t distributions, ν represents degrees of freedom, μ represents the location of the distribution and σ is the scale parameter.

Table B.3

Robustness Check for Study 1 Bayesian Regression

	With Researcher-Specified Priors		With Default Priors	
Predictors	*Posterior Median*	*90% Credible Interval*	*Posterior Median*	*90% Credible Interval*
Intercept	37.56	34.80 – 40.26	37.59	34.82 – 40.30
God salient	4.03	2.59 – 5.49	4.04	2.56 – 5.51
Neutral recipient	1.57	-1.92 – 5.10	1.64	-2.01 – 5.23
Atheist recipient	-7.22	-10.81 – -3.68	-7.20	-10.80 – -3.59
Age (centered)	0.17	0.06 – 0.28	0.17	0.06 – 0.28
Male participant	-0.41	-3.24 – 2.45	-0.44	-3.24 – 2.31
Neutral recipient: salient	0.54	-1.54 – 2.63	0.53	-1.57 – 2.57
Outgroup recipient: salient	-1.03	-3.09 – 1.01	-1.05	-3.11 – 1.01
Random Effects				
σ^2	152.69		152.62	
τ_{00}	737.56 $_{id}$		737.29 $_{id}$	
ICC	0.83		0.83	
N	1146 $_{id}$		1146 $_{id}$	
Observations	2292		2292	
Marginal R^2 / Conditional R^2	0.031 / 0.833		0.031 / 0.833	

Table B.4

Robustness Check for Study 2 Bayesian Regression

Predictors	With Researcher-Specified Priors		With Default Priors	
	Posterior Median	*90% Credible Interval*	*Posterior Median*	*90% Credible Interval*
Intercept	40.13	34.79 – 45.42	40.14	34.74 – 45.49
God salient	3.67	2.38 – 4.98	3.67	2.36 – 4.98
UAE recipient	-1.62	-4.81 – 1.72	-1.49	-4.63 – 1.60
Subj. age (centered)	0.04	-0.08 – 0.16	0.04	-0.08 – 0.15
Subj. gender	-1.78	-4.75 – 1.33	-1.81	-4.95 – 1.34
Recipent age	0.01	-0.09 – 0.12	0.01	-0.10 – 0.12
Recipient gender	-0.34	-1.64 – 0.94	-0.33	-1.60 – 0.96
UAE recipient: salient	0.55	-1.30 – 2.40	0.54	-1.30 – 2.39

Random Effects

σ^2	156.98		156.74	
τ_{00}	788.76 $_{ParticipantID}$		787.85 $_{ParticipantID}$	
ICC	0.83		0.83	
N	983 $_{ParticipantID}$		983 $_{ParticipantID}$	
Observations	1966		1966	
Marginal R^2 / Conditional R^2	0.008 / 0.835		0.008 / 0.835	

Table B.5

Robustness Check for Study 3 Bayesian Regression

Predictors	With Researcher-Specified Priors		With Default Priors	
	Posterior Median	*90% Credible Interval*	*Posterior Median*	*90% Credible Interval*
Intercept	60.17	57.31 – 63.03	60.22	57.38 – 63.07
Atheist recipient	-16.75	-20.07 – -13.40	-16.84	-20.16 – -13.52
Muslim recipient	-10.34	-13.68 – -6.88	-10.45	-13.80 – -7.06
God salient	4.42	2.54 – 6.29	4.42	2.58 – 6.24
Alt. instructions	-2.77	-5.53 – -0.04	-2.78	-5.58 – -0.07
Recipient age (scaled)	0.07	0.03 – 0.12	0.07	0.03 – 0.12
Male recipient	-1.62	-2.89 – -0.30	-1.59	-2.89 – -0.34
Participant age (scaled)	-0.35	-0.43 – -0.27	-0.35	-0.43 – -0.27
Male participant	-1.09	-4.48 – 2.31	-1.11	-4.48 – 2.26
Salience: Atheist	1.55	-0.73 – 3.73	1.58	-0.70 – 3.83
Salience: Muslim	-1.99	-4.26 – 0.21	-2.00	-4.27 – 0.29
Salience: Alt. instructions	5.06	3.16 – 6.93	5.07	3.17 – 6.90

Random Effects

σ^2	294.15		294.15	
τ_{00}	986.53 ParticipantID		985.94 ParticipantID	
ICC	0.77		0.77	
N	1820 ParticipantID		1820 ParticipantID	
Observations	3639		3639	
Marginal R^2 / Conditional R^2	0.070 / 0.786		0.071 / 0.786	

Table B.6

Robustness Check for Study 4 Bayesian Regression

Predictors	With Researcher-Specified Priors		With Default Priors	
	Posterior Median	*90% Credible Interval*	*Posterior Median*	*90% Credible Interval*
Intercept	22.91	21.17 – 24.69	22.91	21.16 – 24.64
God salient	5.14	3.16 – 7.14	5.12	3.17 – 7.10
Atheist recipient	-3.41	-4.70 – -2.14	-3.43	-4.71 – -2.13
Recipient age (centered)	0.02	-0.03 – 0.06	0.02	-0.03 – 0.06
Male recipient	-1.02	-2.16 – 0.13	-0.99	-2.17 – 0.13
Participant age (centered)	0.12	0.05 – 0.18	0.12	0.05 – 0.18
Male participant	-2.40	-4.20 – -0.63	-2.36	-4.15 – -0.64
Salient: Atheist recipient	-1.45	-3.22 – 0.40	-1.42	-3.26 – 0.42
Random Effects				
σ^2	137.01		137.03	
τ_{00}	195.11 $_{id}$		194.99 $_{id}$	
ICC	0.59		0.59	
N	917 $_{id}$		917 $_{id}$	
Observations	1830		1830	
Marginal R^2 / Conditional R^2	0.042 / 0.603		0.042 / 0.603	

Table B.7

Robustness Check for Study 5 Bayesian Regression

Predictors	With Researcher-Specified Priors		With Default Priors	
	Posterior Median	*90% Credible Interval*	*Posterior Median*	*90% Credible Interval*
Intercept	27.55	25.88 – 29.16	27.52	25.86 – 29.15
God salient	4.25	2.32 – 6.21	4.28	2.38 – 6.23
Muslim recipient	-3.08	-4.65 – -1.48	-3.05	-4.67 – -1.48
Recipient age (centered)	0.03	-0.02 – 0.09	0.03	-0.02 – 0.09
Male recipient	-0.69	-1.96 – 0.58	-0.69	-1.97 – 0.60
Participant age (centered)	-0.04	-0.08 – 0.01	-0.04	-0.08 – 0.01
Male participant	0.25	-1.33 – 1.88	0.27	-1.32 – 1.86
Salient: Muslim recipient	-3.30	-5.53 – -1.09	-3.30	-5.52 – -1.11
Random Effects				
σ^2	242.77		242.94	
τ_{00}	128.22 $_{id}$		127.92 $_{id}$	
ICC	0.35		0.34	
N	1093 $_{id}$		1093 $_{id}$	
Observations	2186		2186	
Marginal R^2 / Conditional R^2	0.027 / 0.362		0.027 / 0.362	

Table B.8

Robustness Check for Study 6 Bayesian Regression

Predictors	With Researcher-Specified Priors		With Default Priors	
	Posterior Median	*90% Credible Interval*	*Posterior Median*	*90% Credible Interval*
Intercept	20.84	19.40 – 22.28	20.85	19.38 – 22.29
God salient	4.25	2.57 – 5.95	4.25	2.60 – 5.94
Atheist recipient	-4.47	-5.81 – -3.14	-4.48	-5.81 – -3.14
Muslim recipient	-3.25	-4.60 – -1.90	-3.26	-4.59 – -1.88
Recipient age (centered)	0.04	0.01 – 0.08	0.04	0.00 – 0.08
Male recipient	-0.02	-0.96 – 0.91	-0.02	-0.98 – 0.93
Mturk sample	6.12	4.77 – 7.45	6.12	4.79 – 7.45
Participant age (centered)	-0.02	-0.07 – 0.03	-0.02	-0.07 – 0.03
Male participant	-1.18	-2.49 – 0.14	-1.19	-2.47 – 0.12
Salient: atheist recipient	0.15	-1.71 – 2.04	0.17	-1.73 – 2.03
Salient: Muslim recipient	0.19	-1.71 – 2.06	0.17	-1.70 – 2.03

Random Effects

σ^2	112.37		112.27	
τ_{00}	133.56 $_{id}$		133.61 $_{id}$	
ICC	0.54		0.54	
N	1277 $_{id}$		1277 $_{id}$	
Observations	2554		2554	
Marginal R^2 / Conditional R^2	0.069 / 0.574		0.069 / 0.575	

APPENDIX C: STUDY 2 WITH ADDITIONAL DATA EXLUSIONS

In study 2, I pre-registered that I would exclude participants who could not correctly recall the religious identity of their dictator game recipient. In the main text of the paper, I did not use this exclusion in order to maintain comparability to the other studies. Here, I report the regression results with that exclusion.

Table C.1

Effect of God Cue and Religious Moderators on Donation (With Exclusions)

Predictors	Salience *Estimates (95% CI)*	God Belief *Estimates (95% CI)*	Attendance *Estimates (95% CI)*	Punishing and Rewarding God *Estimates (95% CI)*
Intercept	36.43 *** (34.37 – 38.49)	36.54 *** (34.63 – 38.46)	36.43 *** (34.38 – 38.48)	36.43 *** (34.38 – 38.48)
God salient	3.58 *** (2.44 – 4.73)	3.97 *** (2.88 – 5.07)	3.58 *** (2.44 – 4.72)	3.58 *** (2.44 – 4.72)
God belief (centered)		0.04 (-1.19 – 1.27)		
Salience: Belief		0.96 ** (0.26 – 1.66)		
Attendance (centered)			-0.93 (-2.13 – 0.26)	
Salience: Attendance			-1.16 *** (-1.83 – -0.50)	
Rewarding God (centered)				1.66 (-0.09 – 3.40)
Punishing God (centered)				-1.29 (-2.79 – 0.21)
Salience: Reward				1.30 ** (0.32 – 2.27)
Salience: Runish				0.02 (-0.81 – 0.86)
Random Effects				
σ^2	141.65	154.22	139.84	140.28
τ_{00}	769.71 ParticipantID	787.81 ParticipantID	764.91 ParticipantID	765.01 ParticipantID
ICC	0.84	0.84	0.85	0.85
N	828 ParticipantID	990 ParticipantID	828 ParticipantID	828 ParticipantID
Observations	1656	1980	1656	1656
Marginal R^2 / Conditional R^2	0.004 / 0.845	0.005 / 0.837	0.012 / 0.847	0.013 / 0.847

* p<0.05   ** p<0.01   *** p<0.001

Table C.2

Effect of Recipient Group Membership on Donation (With Exclusions)

Predictors	Recipient *Estimates (95% CI)*	Accounting for Recipient Demographics *Estimates (95% CI)*	Accounting for Participant Demographics *Estimates (95% CI)*
Intercept	39.97 *** (37.28 – 42.66)	40.29 *** (37.48 – 43.11)	39.76 *** (36.43 – 43.08)
UAE Recipient	-3.78 (-7.74 – 0.18)	-3.79 (-7.75 – 0.16)	-4.09 * (-8.07 – -0.12)
Male Recipient		-0.62 (-2.24 – 1.00)	-0.58 (-2.21 – 1.05)
Recipient Age (centered)		0.04 (-0.10 – 0.17)	0.04 (-0.09 – 0.17)
Male Participant			1.07 (-2.92 – 5.07)
Participant Age (centered)			0.06 (-0.09 – 0.20)
Random Effects			
σ^2	147.90	148.15	148.76
τ_{00}	764.04 ParticipantID	763.67 ParticipantID	762.21 ParticipantID
ICC	0.84	0.84	0.84
N	828 ParticipantID	828 ParticipantID	822 ParticipantID
Observations	1656	1656	1644
Marginal R^2 / Conditional R^2	0.004 / 0.838	0.004 / 0.838	0.005 / 0.838

* p<0.05   ** p<0.01   *** p<0.001

Table C.3

Effect of God Cue, Recipient Group, and Salience-by-Group Interaction (With Exclusions)

Predictors	Salience and recipient demographics Estimates (95% CI)	Salience-by-group interaction Estimates (95% CI)	Accounting for participant demographics Estimates (95% CI)
Intercept	38.46 *** (35.58 – 41.33)	38.38 *** (35.46 – 41.30)	37.85 *** (34.44 – 41.26)
UAE recipient	-3.79 (-7.75 – 0.17)	-3.63 (-7.75 – 0.50)	-3.91 (-8.05 – 0.23)
God salient	3.57 *** (2.42 – 4.73)	3.72 *** (2.15 – 5.30)	3.72 *** (2.14 – 5.30)
Male recipient	-0.53 (-2.12 – 1.06)	-0.53 (-2.12 – 1.06)	-0.49 (-2.09 – 1.11)
Recipient age (centered)	0.00 (-0.13 – 0.13)	-0.00 (-0.13 – 0.13)	0.00 (-0.13 – 0.13)
Male participant		-0.32 (-2.63 – 1.98)	-0.36 (-2.68 – 1.96)
Participant age (centered			1.07 (-2.92 – 5.07)
Salience: UAE recipient			0.06 (-0.09 – 0.21)
Random Effects			
σ^2	141.89	142.05	142.75
τ_{00}	767.25 ParticipantID	767.18 ParticipantID	765.64 ParticipantID
ICC	0.84	0.84	0.84
N	828 ParticipantID	828 ParticipantID	822 ParticipantID
Observations	1656	1656	1644
Marginal R^2 / Conditional R^2	0.007 / 0.845	0.007 / 0.845	0.009 / 0.844

* p<0.05   ** p<0.01   *** p<0.001