

Mysterious Ways: How Does Religion Priming Influence Prosociality?

by

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## ABSTRACT

Numerous published studies and a meta-analysis suggest that priming religion causes an increase in prosocial behaviors. However, mediating mechanisms of this purported causal relationship have not yet been formally tested. In line with cultural evolutionary theories and their supporting evidence, I test the proposition that public self-awareness mediates the effect of priming religion on prosociality. However, other theories of religion suggest that persons may feel small when perceiving God, and these feelings have predicted prosociality in published research. In line with this, I also test whether a sense of small self and, relatedly, self-transcendent connection, are possible mediators of the religion priming effect on prosociality. In this study, I implicitly prime religion and test whether the above constructs mediate a potential effect on prosocial intentions. Although self-transcendent connection predicted prosocial intentions, the implicit prime affected neither the mediating variables nor prosocial intentions, nor were any significant indirect effects evident. Thus, no causal evidence of mediation was found. In addition, I examined whether God representations moderate the path from implicit religion priming to each proposed mediator. The results suggest that a benevolent God representation moderates the effect of religion priming on self-transcendent connection and that an ineffable God representation moderates the effect of religion priming on sense of small self. Lastly, I tested for mediation with a cross-sectional path model containing religiosity and belief in God as predictors. The results suggest that religiosity, controlling for belief in God, predicts prosociality through self-transcendent connection but belief in God, controlling for religiosity, does not predict prosociality. Implications for the religion priming literature and, more generally, the psychology of religion, are discussed.

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## CHAPTER 1

### BACKGROUND

Religion has long been credited as the source of human morality, which contains sanctions to not only refrain from hurting others but to actively engage in helping others. The Mosaic Law required ancient Jewish farmers to leave vegetation on the edges of their fields for the poor to harvest and eat (Levit. 23:22). Christianity is largely based on the example of Jesus, who helped the poor and unfortunate and instructed his followers to do the same (Matt. 15:29-39; Matt. 25:34-40). Anecdotal evidence that religion is responsible for prosocial behaviors in the modern age abounds. Several of the largest charity organizations were founded upon and continue to operate through religious principles. Several branches of Christianity encourage their youth to complete missions in developing nations with a focus on improving the lives of the unfortunate. Well-wishers on social media frequently use religious terms such as “blessing” and “prayer” to convey their positive feelings toward others.

How religion might move individuals to prosociality is a question of broad interest to society and is a potentially contentious topic for debate. On one hand, religious prosociality might spring from a self-focused feelings such as being watched by an observant and moralizing God or feeling small in the presence of greatness. On the other hand, religious thoughts might diminish one’s self-concern and shift awareness outward, causing an altruistic urge toward generosity. Furthermore, an individual’s God representation could affect not only the religious prosociality mechanism, but whether religion drives that person toward prosociality at all. It is not hard to imagine that sensing a either a watchful, personal God or a nebulous, impersonal God would prime



two substantially different schemas, each with their own sets of expectations and obligations.

If we are to accept any theory of religious prosociality, the implied intermediary mechanisms must be demonstrated to work, especially when we consider that each theory suggests unique causal mediators. Precise knowledge of how religion increases prosociality is also important not just because it fills a scientific knowledge gap, but because it has implications for our social ecology. Knowledge of the mind's prosocial mechanism suggests a potentially universal key to enhanced cooperation that transcends the differences between religions and appeals to all. An understanding of the mechanism could result in finely tuned religious or secular messages that precisely stimulate the desire to think prosocially.

In the present research, two competing theories of religious prosociality are briefly summarized and then mediating mechanisms are proposed for each. These two theories alternatively support the separate notions of either self-concerned prosociality or other-concerned generosity in religious contexts. In support of self-concerned giving, the supernatural punishment hypothesis would predict that public self-awareness mediates religious prosociality. In support of other-concerned giving, positive emotions theory would predict that self-transcendent emotion, in this case a sense of vast connection or a sense of small self, respectively, mediate religious prosociality.

### **The Religion-Prosociality Connection**

There is abundant scientific evidence correlating religious membership with prosocial values such as virtue, altruism, and helping (Lam, 2002; Loveland, Sikkink, Myers, & Radcliff, 2005; Myers, 2012; Oviedo, 2016; Regnerus, Smith, & Sikkink,

1998; Ruiters & De Graff, 2006; Saroglou, Pichon, Trompette, Verschueren, & Dernelle, 2005; Saroglou, 2013). Quasi-experimental research has also demonstrated similar effects. For example, Ahmed (2009) found that Muslim theology students, compared to Muslim secularist students, gave more money to others in both the Dictator Game and the Public Goods Game. This study compared naturally occurring groups that differed on a concrete religious commitment signal, which importantly addressed the shortcomings inherent to self-report, such as self-delusion or lying (Saroglou et al., 2005). Projective measures and peer-reports of religiosity have also been found to predict prosociality (Saroglou et al., 2005). Overall, researchers across multiple disciplines have tended to posit that religion is the foundation of modern prosocial morality (Graham & Haidt, 2010; Norenzayan et al., 2016; Spilka, Hood, Hunsberger, & Gorsuch, 2009; Wilson, 2002). Various scientific methods implemented by many researchers among diverse populations have provided extensive evidence of religion's effects on prosociality.

**Priming.** The recent advent of religious priming has enabled a body of experimental studies that, overall, supports the notion that religious thoughts lead to prosociality (Oviedo, 2016; Shariff, Willard, Andersen, & Norenzayan, 2016; see Galen, 2012 for a critique). Priming occurs when exposure to a given stimulus activates a given schema, which is then demonstrated to be active by effects on a downstream variable (Bargh & Williams, 2006). Often, priming is done outside the participants' awareness to avoid the problems of hypothesis guessing and demand characteristics. Subliminal primes such as flashed words, implicit primes such as religion-infused sentence completion tasks, and contextual primes such as administering a survey in the presence of a religious building have demonstrated positive, arguably causal, effects on prosocial measures. This

body of work provides empirical evidence that religious thoughts can spur individuals to prosocial behavior.

**Mediating mechanisms.** The idea that religious cognition can increase prosociality leads naturally to wondering how such an effect might work. Is religiously motivated generosity mediated by concern for self or concern for the beneficiaries? Do religious givers act so as to reflect their God or appease their God? Although their scientific and societal implications abound, religious prosociality mechanisms have scarcely been studied. Hardy and Carlo (2005) found that religious prosociality among an adolescent sample was mediated by kindness. In a study of people having just attended a church service, Van Cappellen, Saroglou, and Toth-Gauthier (2016) found that love mediated religious prosociality. However, neither of these studies were true experiments, so causality claims are not entirely tenable. Though statistically controlling for many sources of variance can increase the plausibility of a causal relationship, even the most careful covariate selection is limited by theory and resources, so systematic relationships between outside variables and the dependent variable are bound to affect the researcher's findings. We can be reasonably sure that religion is responsible for much of the downstream variance, but we cannot claim that the effects are purely from religion. An experimental study, like that in the present research, can address how religious cognition itself affects prosociality by randomly assigning participants and theoretically equalizing all confounding variables among the test groups. Further, the aforementioned mediation studies did not directly test current cultural evolution theories regarding the roots of religious prosociality and thus did not address important metatheoretical connections.

The current research tests for mediation by the variable predicted by cultural evolutionary theory.

### **Increased Self-Concern**

The general premise of evolutionary religious psychology is that religion solidified the social construction by preventing actions harmful to the group's cohesion (Sosis & Alcorta, 2003). The idea that a concerned God was watching human actions from above and keeping a record of all acts good and bad controlled human behavior in an all-encompassing way that would have otherwise been impossible. Secret behaviors were now thought to be observed, perceived consequences of cheating behaviors increased, and therefore the cooperation to defection ratio increased.

Assuming that this watchful God framework is the basis of contemporary attitudes toward God, we might expect that reminders of God encourage prosocial behavior by introducing the thought of being watched. The Supernatural Monitoring Hypothesis forwarded by Norenzayan and colleagues (2016) posits that belief in a moralizing, observing God, along with costly signals and group rituals, served to control behavior by enforcing conformity to group norms, which almost always include acting benevolently toward other members of the group. Inherent to this hypothesis is a belief in an observing God, the reminders of whom would necessarily include the sense of being watched. Gervais and Norenzayan (2012) demonstrated that thoughts of God lead to feeling watched by implicitly priming participants with thoughts of God and then measuring situational self-awareness. Participants who had completed sentences that included religious words reported feeling more self-conscious and concerned with self-presentation. In a follow-up experiment, participants who were primed with the same

religious words engaged in more socially desirable responding, which indicates predisposition to prosocial behavior.

The feeling of being watched is strongly related to prosocial behavior. The presence of others inspires humans to manage their self-presentation so as to optimize their appearance to others (Leary & Kowalski, 1990; Schlenker, 1980). One way humans engage in impression management is by publically conforming to behavioral norms, among these prosocial behavior (van Bommel, van Prooijen, Elffers, & van Lange, 2014; Van Vugt, Roberts, & Hardy, 2007; Nettle et al., 2013). Given our current psychology and the historical record, humans likely evolved in an environment rich with social monitoring and came to adeptly look for norm violations in others and self (Bering & Johnson, 2005; Chudek & Henrich, 2011; Chudek, Zhao, & Henrich, 2013). Humans are attuned to social expectations, especially when under public observation (Fehr & Fischbacher, 2003; Markus, 1978). Indeed, humans frequently assume that their behaviors are being monitored (Gilovich, Medvec, & Savitsky, 2000) and are sensitive to even subtle cues that inform social monitoring (Chudek & Henrich, 2011; Fehr, Fischbacher, & Gächter, 2002). These subtle cues can increase compliance to norms that include fairness and prosociality (Haley & Fessler, 2005; Nettle et al., 2013; Rigdon, Ishii, Watabe, & Kitayama, 2009; van Bommel et al., 2014; Van Vugt et al., 2007; Zhong, Bohns, & Gino, 2010), especially among those who are chronically self-aware (Pfattheicher & Keller, 2015). Arguably, because reminders of God increase public self-awareness (Gervais & Norenzayan, 2012), persistent belief in a moralizing, observing God might create chronic self-awareness and this would increase norm compliance among believers in God.

Increased public self-awareness would reasonably increase concern for reputation and therefore one's desire to be observed acting in prosocial ways. Reputation has been cited as crucial for the development and viability of indirect reciprocal systems, where the exchanges are not always directly reciprocal (Fu, Hauert, Nowak, & Wang, 2008; Nowak, 2006; Nowak, Page, & Sigmund, 2000). Reputations act as a kind of credit rating in these indirect reciprocal networks, where exchanges are more complex than a well-monitored tit for tat between two mutually familiar actors. In a system of reciprocity among strangers, reputation is a crucial social heuristic which has been shown to be at least partially based on prosocial tendencies (Keltner, Van Kleef, Chen, & Kraus, 2008). Nowak and Sigmund (1998) ran computer simulations demonstrating that cooperation is a viable evolutionary strategy precisely because of reputation. The energy and resources invested in reputation-building repay the investor by increasing future receipt of cooperation from others. Further experiments in which players were more likely to engage with a person having a good reputation for cooperation supported this hypothesis (Milinski, Semmann, Bakker, & Krambeck, 2001; Milinski, Semmann, & Krambeck, 2002; Wedekind & Milinski, 2000). These benefits earned by reputation and status can act as strong motivation to act prosocially in spite of immediate costs and non-immediate material benefit (e.g., Milinski et al., 2002). In support of this notion, Hardy and Van Vugt (2006) found that group members who act prosocially are afforded greater status, while other work has shown that humans grant higher status to generous givers (Willer, 2009). Given that reminders of God increase public self-awareness (Gervais & Norenzayan, 2012), the effect of public self-awareness on reputational concern, the benefits to the collective afforded by reputational concern, and the importance of large

cooperative networks to the Big Gods hypothesis, the effect of God reminders on prosociality should be mediated by a sense of surveillance. In sum, reminders of an observing, moralizing God should increase public self-awareness of either supernatural or human surveillance, which should lead to increased displays of prosocial behavior. Reminders of God may motivate prosocial behavior by increasing public self-awareness and thus concern for the self.

**Small Self.** Although the small self measurement used in the present research was intended as a measurement of decreased self-concern, our factor analysis led to a single-item measure (I feel small or insignificant) which is ambiguous regarding self-concern. It would be reasonable for this sentiment to mean that one is self-consciously aware of feeling small or that one's normal self-concern is dwarfed by an expansive perception. Therefore, small self is included as a possible mediator of self-concerned and self-transcendent religious prosociality.

### **Decreased Self-Concern**

Reminders of God might increase prosociality by reducing self-concern. Though the deity might have the same Big God characteristics, including watching and moralizing, believers might attend more to the vastness of God than the omniscience or omnipotence, which potentially would lead to prosociality through a different mechanism than perceived surveillance. Alternatively, the perception of divine qualities such as love or benevolence, whether expressed through God or devout followers, may be activated by God reminders. Finally, a believer may hold entirely non-anthropomorphic God representations such that they believe in a limitless cosmic force that is often thought of as beyond human understanding. Thoughts of a God such as this would, theoretically,

distract one's attention away from self and direct it outward in direct opposition to the notion of increased public self-awareness. This reasoning leads us to now consider awe.

**Awe.** In his classic lecture, *The Reality of the Unseen*, William James quoted one believer's statement that, when contemplating God, "awe mingled with a delicious restfulness most nearly describes my feelings" (1985). Awe is often central to purported encounters with the divine, several of which were factored into Keltner and Haidt's (2003) conceptual analysis of this emotion. These researchers ultimately defined awe as the emotion resulting from perception of stimuli so vast as to require effortful accommodation. Religious experience is one elicitor of this emotion (Keltner & Haidt, 2003; Shiota, Keltner, & Mossman, 2007). Given that people commonly endorse words such as limitless, omnipotent, eternal, infinite, and cosmic to describe God (Johnson, 2016), awe induced by the thought of God is theoretically plausible. Though awe generally is generally a positive reaction to positive stimuli, (Keltner & Haidt, 2003; Shiota et al., 2007), negative stimuli may induce awe just as well. Piff and colleagues (2015) elicited awe by displaying threatening nature stimuli, which suggests that awe might partially explain a prosociality increase among certain believers in a watchful, authoritarian God. Given that nearly all descriptions of God include descriptors of incomprehensible vastness, reminders of God could induce a sense of awe. Alternatively, the implicit religion prime may remind people of their religion itself, independent of a deity. Religion frequently involves not only a large network of fellow believers, but a deep historical precedent. Reminders of one's religion might induce awe by a sense of populational and/or temporal vastness.



An established pathway between awe and prosocial behavior is the second leg of this mediational hypothesis. Awe appears to induce identification with a larger construct than the self, which is beneficial for putting group needs over one's immediate personal needs. People high in dispositional awe are more likely to describe themselves as part of a collective than with individualistic terms, as were participants exposed to awe-inducing stimuli (Shiota et al., 2007). Participants exposed to an awe-inducing video score higher on the Inclusion of Other in Self Scale (Aron, Aron, & Smollan, 1992), suggesting more closeness with others (Van Cappellen & Saroglou, 2012).

**Small Self.** Awe seems to increase prosociality by inducing a sense of small self. Campos and colleagues (2013) found that memories of awe-inducing experiences caused participants to feel smaller in relation to their environment. In another study, memories of awe increased feelings of being part of something larger than self, decreased occupation with small daily events, and increased feelings of smallness and insignificance (Shiota et al., 2007). Other studies have linked diminished self with prosocial tendencies and behavior (Boer & Fischer, 2013; Campbell, Bonacci, Shelton, Exline, & Bushman, 2004; Caprara, Alessandri, & Eisenberg, 2012; McCullough, Emmons, & Tsang, 2002). Closer to this study's religious theme, Krause and Hayward (2015) found that awe of God predicts more connectedness with and belongingness to one's congregation. Further, multiple studies have documented the connection between the experience of nature—a powerful elicitor of awe (e.g., Davis & Gatersleben, 2013; Griskevicius, Shiota, & Neufeld, 2010; Shiota et al., 2007)—and prosocial behavior. Generosity increases among participants placed in rooms with plants, as opposed to rooms without plants (Weinstein, Przybylski, & Ryan, 2009) and participants exposed to natural beauty may exhibit more

prosociality (Cohen, Gruber, & Keltner, 2010; Zhang, Piff, Iyer, Koleva, & Keltner, 2014).

Building on existing research, Piff et al. (2015) hypothesized that awe increases prosociality and that this effect is mediated by feelings of small self. They found that inductions of awe increased ethical decision making, generosity, and prosocial values, while those higher in dispositional awe exhibited more prosocial behavior as measured by an economic game. Feelings of small self partially mediated these relationships. These feelings of small self are important as diminished self-awareness and increased commitment to the group could be just as crucial for cooperation as increased self-awareness. Nature favors a defector unless there is pressure to cooperate, so the basic instinct of humans is to focus on self first until such time that cooperation is in self-interest. The predicted end result of either strategy is increased cooperation, so either could mediate the effect of religion on prosociality. These opposite strategies for achieving fitness related goals are incompatible in that individuals cannot effectively entertain both simultaneously. Given their separate natures, self-awareness and self-transcendence, if they explain any variance in religious prosociality, likely explain two uncorrelated sources of variance. The feeling of being watched, which would increase generosity by focusing attention on reputational concerns (Keltner, Kogan, Piff, & Saturn, 2014; Nowak, 2006; Sober & Wilson, 1998), would be an unlikely mediator of prosociality among the self-transcendent.

**Self-Transcendence.** Awe and small self both might be labeled self-transcendent emotions. Awe results from a powerful stimulus temporarily exceeding the scope of one's conceptual framework and the subsequent need to accommodate the new

information. In this moment of awe, the self may be temporarily shrunken relative to bigger concerns, causing a person to transcend their normal attentional limits. However, the self-transcendence construct (Cloninger, Svrakic, & Przybeck, 1993) also contains an element of connection to a larger being or collective, so the small self measurement would not necessarily capture the entire mediation of awe's effects on prosociality. Recent research has supported this notion by demonstrating that awe leads to self-transcendence (Johnson et al., 2017) and that self-transcendence mediates the relationship between self-reported religiosity and prosocial intentions (Scott, in preparation). Given my focus on self-perception as a mediator of religious prosociality and the time constraints of the experimental priming effect, the specific self-transcendence element—connection to something larger—is proposed as a mediating variable.

### **The Effect of God Representations**

Religious literature has abounded with numerous representations of God and personal beliefs that, within even the same religion, might be vastly different. Muslims may believe in a vengeful or benevolent version of Allah. Jews traditionally endorse a God who watches all with a keen eye for punishable transgressions but also seeks to protect his chosen people; modern Jews often feel free to believe in a non-anthropomorphized God or even none at all (Silverman, Johnson, & Cohen, 2016). Christians choose their God representations from both the Old and New Testaments, which include the authoritarian or benevolent Yahweh, the anti-establishment or compassionate Jesus, and traditionally a triune godhead which includes Father, Son, and Holy Spirit, each of whom possesses multiple different qualities. God representations come in a large range of permutations, each associated with different emotions and traits

in the believer (Johnson, Okun, & Cohen, 2015), and therefore these representations should affect different cognitive and behavioral responses.

Johnson, Okun, and Cohen (2015) have forwarded a set of distinct God representations that predict significant and differential cognitive variance, indicating that the way individuals perceive God has a unique affect on their thoughts and, presumably, actions. Participants who describe God with terms such as *wrathful* and *controlling* think of God as authoritarian. Terms such as *compassionate* and *tolerant* describe a benevolent representation. Terms such as *transcendent* and *vast* describe a mystical representation. So far as they think of God in different ways, individuals should be differently motivated by thoughts of God. Johnson et al. (2015) found that benevolent, but not authoritarian, God representations predict agreeableness and conscientiousness. Authoritarian God belief predicted higher endorsement of the social power value and lower endorsement of the benevolence value. An individual who perceives a wrathful, controlling God is likely to feel watched and intent on making a good impression. If this cognitive suite could lead to prosociality, it would likely be through self-conscious means such as public self-awareness. On the other hand, thoughts of a mystical God who transcends human cognition are likely to induce rapturous awe, resulting in a diminished self or a connection to something greater than the normal self. All of these proposed divine cognition effects have been shown to increase prosocial behavior and therefore are plausible mediational mechanisms in religious prosociality.

## CHAPTER 2

### PRESENT RESEARCH AND HYPOTHESES

The present research aims to discover the underlying mechanism(s) of religious prosociality. However, equally plausible competing theories necessitate the entertainment of several hypotheses.

**H1:** Public self-awareness mediates the effect of religious priming on prosocial behavior.

**H2:** Small self mediates the effect of religious priming on prosocial behavior.

**H3:** Self-transcendent connection mediates the effect of religious priming on prosocial behavior.

Another aim of the research is to ascertain whether individual God representations link to different mediational mechanisms. To test this, exploratory analyses of whether each representation moderates the A path for each mediator were performed. The literature and previous data sets indicate divergent outcomes for God representations (e.g., a benevolent God makes people less prosocial because they think all is forgiven), so hypotheses are tentative, but some are justified by the literature. First, I hypothesize that authoritarian God representations will positively moderate the path from religion prime to public self-awareness, since this sort of God is the basis of the supernatural punishment hypothesis. Second, I hypothesize that a mystical God representation will positively moderate the path from religious prime to self-transcendent connection, since this sort of God predicts awe and self-transcendence (Johnson et al., in press; Scott, in preparation).

## CHAPTER 3

### METHOD

#### **Design**

I conducted a two-condition between-subjects experiment in order to test mediated causal paths. The independent variable was implicit religious priming. The mediating variables were sense of small self, public self-awareness, and a selection of self-transcendence items inferring connection to something bigger. The dependent variable was the number of hours committed to volunteer work in the month following the experiment.

#### **Participants**

The sample was drawn from a pool of Arizona State University undergraduates who would complete the study for course credit. An *a priori* analysis to estimate the sample size needed for .8 power to detect each indirect effect with 1000 bootstrapped samples was conducted based on available published and pilot test effect sizes. Each effect size for each pathway ( $\alpha$  for  $x \rightarrow m$ ;  $\beta$  for  $m \rightarrow y$ ) was categorized according to a rubric from a highly cited paper (Fritz & MacKinnon, 2007), then the sample size for each mediated effect ( $\alpha\beta$ ) was taken from the recommendations in the same Fritz and Mackinnon (2007) paper. Both  $\alpha$  and  $\beta$  symbolized the standardized regression coefficients for their respective paths, but this statistic was not reported in any of the referenced publications, so the reported Pearson's  $r$  was used because this statistic is equal to a standardized regression coefficient.

The estimate for the God prime to public self-awareness path (Gervais & Norenzayan, 2012;  $r = .36$ ) and the estimate for the public self-awareness to prosocial

intention (to give up time helping the community in the next two weeks) path (pilot data;  $r = .07$ ) indicated a required sample size of 404 to detect a public self-awareness mediated effect. Combined with an assumed small priming effect ( $\alpha$ ), the self-transcendence items to prosocial intention path estimate (pilot data;  $r = .23$ ) suggested a sample size of 412. Also combined with an assumed small priming effect ( $\alpha$ ), the estimate for the small self to prosociality pathway (Piff et al., 2015;  $r = .30$ ) suggested a sample size of 412.

Based on the weakest hypothesized pathway and the suggestions from Fritz and MacKinnon (2007), I decided on a sample of 412 participants. Data collection went beyond 412 participants in order to avoid cancelling existing appointments and to compensate for potentially discarded participants. I obtained an initial sample of 446 complete survey responses. Participant inclusion, *a priori*, was based on correctly answering all of three attention check questions, spending at least seven minutes on the survey, and constructing passable sentences in the priming task. Based on an inspection of the data, I also removed participants whose responses included long strings of identical answers when such would be inappropriate, such as across two scales of different constructs. All of the above participants were deemed to have failed attention checks. Though several participants failed on multiple dimensions, each participant is counted once by the failure that was discovered first. In the end, 42 participants were removed for attention check failures, 16 were removed for poor sentence construction, and one was removed for completing the survey too quickly. Two participants were removed *post hoc* because of uninterpretable dependent variable responses. At this point, blank responses on the observed variables were coded as missing.

Following removal of untrustworthy data, I turned my attention to statistical outliers that would exert undue influence on the regression equations. Due to the unbounded open-response volunteering variable, there was a chance that some extremely high values would exert extremely high influence on the outlier threshold itself, so I calculated the raw mean and standard deviation and then inspected cases which were more than four standard deviations from the mean ( $> 96.02$  hours). Two cases (300 hours and 120 hours) were removed before the ensuing outlier check.

The analysis of regression outliers requires all of the predictor variables, some of which relied on factor analysis to be finalized. With the two most egregious outliers removed, I inspected the factor structure for the public self-awareness and self-transcendent connection scales, which were identical to that from the future smaller sample, so all of the mediating variables and the priming condition were included as predictors in this outlier search. Studentized deleted residuals are the indicator of choice for identifying regression outliers (Cohen et al., 2003), by which the residual error for the Y observation, as predicted by all of the independent variables simultaneously, is calculated with that particular case deleted. Nine cases with a studentized deleted residual greater than  $|3|$  were deleted.

The final sample included 374 participants ( $M$  age = 19.22,  $SD$  = 2.44, 160 Male, 213 Female) representing diverse religious beliefs (55 Atheist, 52 Agnostic, 176 Christian, 11 Jewish, 12 Muslim, 34 Spiritual but not religious, 34 Other) who completed the study in exchange for psychology course credit. Though this sample was smaller than originally intended, the power estimates were based on 1000 bootstrapped resamples, whereas the current analysis would use 5000 bootstrapped resamples, which should result



in smaller estimated confidence intervals. An effect size with a smaller confidence interval is less likely to contain zero, so I estimated that the additional bootstrapped samples would add virtual power to detect indirect effects and thus compensate for the deleted participants. There is, however, no guarantee of added power because additional bootstrapped samples do not necessarily shrink the confidence intervals.

### **Procedure**

Participants completed the survey in a non-descript psychology lab on individual desktop computers separated by partitions. After consenting to participate, they completed the God representations scale. In order to erase any inadvertent religion priming effects, the students completed a short personality measure and a longer socially desirable responding scale. After these measures, I administered the priming manipulation, followed immediately by the three randomized mediational variable measurements. After the main measurements described above, the students completed some exploratory measures and demographic questions, after which they received a funneled debriefing and gratitude for their time.

### **Materials**

**Independent variable.** I used the same ten-item sentence completion task found in Shariff and Norenzayan's (2007) well-cited religious priming paper. Participants were presented with 10 individual five-word strings, each of which were to be rearranged to form a coherent four-word sentence. For instance, "sky seamless blue is the" should be rearranged to form the sentence, "The sky is blue." Word strings in the control condition contained no religious words, but half of the word strings in the priming condition did

contain one religious word. Participants in the priming condition were implicitly exposed to religious words and thus should not have realized that they were primed.

**Mediating variables.** I administered three short scales immediately following the priming manipulation and immediately preceding the ultimate dependent variable. Each item was centered at zero in order to provide meaningful regression intercepts such that zero indicated neutrality on a given item. Participants responded to a pooled and randomized complete set of items from all scales. I then calculated a mean item score for each participant on each scale. Reliability coefficients reflect the Cronbach's alpha measured among the current sample.

**Small self.** A short scale from Piff et al. (2015) was intended to assess feelings of a small self. The items were *I feel small or insignificant*, *I feel the presence of something greater than myself*, *I feel part of some greater entity*, and *I feel like I am in the presence of something grand*. Responses were given on a Likert scale of -3 (*strongly disagree*) to 3 (*strongly agree*). An initial reliability test revealed low alpha (.63), so I conducted an unrotated principal axis factoring to check the latent variable structure. One major factor emerged, but the last three items hung together with factor loadings of .829, .806, and .874, respectively, while the flagship item, "I feel small or insignificant," had a factor loading of -.117. Based on this analysis, I chose this single non-loading item as the complete Small Self measure because it is the only item that directly assesses the precise construct that the title indicates. The other three items connoted the idea of connection with or perception of something greater, which is not the feeling of small self *per se*, and so did seem to mesh with the self-transcendence items. For that reason, these items were

ultimately folded into the self-transcendent connection measure following a factor analysis.

***Public Self-Awareness.*** The three public-oriented items of the Situational Self-Awareness Scale (Govern & Marsch, 2001), which served as Gervais and Norenzayan's (2011) dependent variable, measured immediate levels of perceived surveillance and self-awareness ( $\alpha = .83$ ). The three items were "Right now, I am concerned about the way I present myself", "Right now, I am self-conscious about the way I look", and "Right now, I am concerned about what other people think of me." Responses were given on a Likert scale of -3 (*strongly disagree*) to 3 (*strongly agree*).

***Self-Transcendent Connection.*** I initially selected ten items from the Temperament and Character Inventory Self-Transcendence subscale (Cloninger, Svrakic, & Przybeck, 1993) and adapted them from their original trait-measuring form to assess immediate levels of self-transcendence vis-à-vis perception of large, non-self phenomena. Item examples include "I have a clear, deep feeling of oneness with all that exists" and "I feel so connected to nature that everything seems to be part of one living organism." I included three items from the Piff et al. (2015) small self measure because they comprised a single factor quite different from the precise small self item and because the items describe perception of a larger reality (see measure above). I conducted an unrotated principal axis factoring of the 13 items in order to check the factor structure of this new item assembly. The three imported items showed impressive fit with the other items with loadings on the primary factor all above .600. However, five of the original self-transcendence items (see Appendix) loaded onto the scale poorly. After removing these items, another factor analysis on the eight remaining items revealed that they all

loaded strongly onto a primary factor we might label *self-transcendent connection* (eigenvalue = 4.06). A second factor (eigenvalue = 1.41) also emerged, but it provided little predictive value, had weak loadings, and defied reasonable substantive interpretation. The final bigger connection measure contained five original items and the three formerly “small self” items. All of these were selected because their factor loadings were .6 or above. Reliability of the final measure was acceptable ( $\alpha = .86$ ). Responses were given on a Likert scale of -3 (*strongly disagree*) to 3 (*strongly agree*). Inter-item correlations are displayed in *Table 4*.

**Dependent variable.** Participants were then presented a hyperlink through which they could navigate to a local university volunteering website. I asked them to peruse the possible volunteering opportunities and then report back with the charity that most interested them, then to manually enter how many hours they could commit to volunteering for that organization over the next two weeks. Open-ended response entry entailed significant data cleaning since the answers, overall, were somewhat unwieldy. Range entries were changed to the mean of that range, uninterpretable answers were entered as missing, and ambiguous answers (e.g., “a few hours per week”) were interpreted as the minimum possible value in that range (e.g. two). Means and standard deviations may be viewed in *Table 1*.

## CHAPTER 4

### RESULTS

All analyses were based on the coding scheme (0=Control, 1=Primed). Levene's Tests revealed that variances were equal among experiment groups for all of the dependent variables (all  $ps > .300$ ). The two groups did not differ significantly on the God representation pre-test (all  $ps > .40$ ); most importantly, the level of non-belief in God was not statistically different ( $p > .20$ ) between the two groups (Table 2). Means and standard deviations for all measured variables may be viewed in Table 3. An initial analysis of experimental group differences in committed volunteer time, without any mediating variables, revealed that the God prime did not significantly affect the participants' stated amount of volunteer time,  $\beta = .538$ ,  $SE = .975$ ,  $d = .064$ ,  $p = .582$ . Given the possibility of indirect effects even when no direct effect is present (Rucker et al., 2011; see also Hayes, 2018), I report the proposed mediational analyses below.

#### **Single-Mediator Models**

In order to investigate whether each proposed mediating variable mediates the relation between religion priming and volunteering, single-mediator path models were tested using Mplus Version 8 (Muthen & Muthen, 1998-2017). Indirect effect confidence intervals were estimated with standard errors from 10000 bias-corrected bootstrapped samples. All results reflect unstandardized regression coefficients.

**Small self.** The priming manipulation (Figure 1) did not predict feelings of small self ( $b = -.216$ ,  $SE = .182$ , 95% CI [-.589, .109],  $ns$ ) and small self did not predict volunteering ( $b = .347$ ,  $SE = .269$ , 95% CI [-.183, .861],  $ns$ ). Unsurprisingly, the

confidence interval for the indirect effect ( $b = -.075$ ,  $SE = .100$ , 95% CI  $[-.365, .016]$ , *ns*) included zero.

**Public self-awareness.** Participants who had been primed (Figure 2) endorsed somewhat lower levels of public self-awareness ( $b = -.182$ ,  $SE = .163$ , 95% CI  $[-.498, .138]$ , *ns*), which trended opposite from the published findings. In turn, public self-awareness had a non-significant negative effect on volunteerism ( $b = -.224$ ,  $SE = .293$ , 95% CI  $[-.801, .328]$ , *ns*). The indirect effect was not different from zero ( $b = .041$ ,  $SE = .079$ , 95% CI  $[-.048, .323]$ , *ns*).

**Self-transcendent connection.** The priming manipulation (Figure 3) did not predict higher self-transcendence ( $b = .075$ ,  $SE = .120$ , 95% CI  $[-.156, .312]$ , *ns*), but self-transcendence did predict more time volunteered ( $b = .890$ ,  $SE = .359$ , 95% CI  $[.223, 1.634]$ ,  $p = .013$ ). The indirect effect, however, did not reach significance ( $b = .067$ ,  $SE = .118$ , 95% CI  $[-.116, .376]$ , *ns*).

### **Full Model**

Including all of the mediators in a path model commonly leads to different regression coefficients due to statistically controlling for other included effects. With this in mind, I ran a model with individual paths from the priming manipulation to each mediating variable and from each mediating variable to the volunteering measurement (Figure 4). Two significant paths emerged: That from self-transcendence to volunteering ( $b = 1.007$ ,  $SE = .358$ , 95% CI  $[.335, 1.752]$ ,  $p = .005$ ) and from small self to volunteering ( $b = .629$ ,  $SE = .273$ , 95% CI  $[.092, 1.167]$ ,  $p = .021$ ). The total indirect effect was negligible ( $b = .029$ ,  $SE = .183$ , 95% CI  $[-.340, .395]$ , *ns*) and no specific indirect effects approached significance (all  $ps > .32$ )

## Exploratory Analyses

**Prosocial intentions scale.** The open-response volunteer pledge responses were non-normally distributed, Skewness = 2.134 ( $SE = .138$ ), Kurtosis = 7.202 ( $SE = .276$ ),  $K-S(311) = .184$ ,  $p < .001$ , and plagued by a 16.8% missing data rate. In order to test a perhaps cleaner measure of a similar dependent variable, I assessed prosocial intentions over the next two weeks with a six-item scale (see appendix), which included offering money to a charity, donating clothes or goods to a charity, doing volunteer work for a charity, going out of one's way to help a friend in need, giving up one's time to do something for the community, and going out of one's way to help a stranger in need. This scale was administered after the open-response item, so results should be interpreted cautiously (see Discussion). Like the open-response item, this variable failed the normality test ( $K-S(374) = .086$ ,  $p < .001$ ), but the skewness and kurtosis values were both less than  $|1|$  and the distribution appeared normal, albeit with some minor lowest score inflation. A principal axis factor analysis revealed one factor (eigenvalue = 2.79) which explained 46.48% of the scale variance. Reliability of this measure was marginally acceptable ( $\alpha = .77$ ). I repeated the mediation tests described in the previous section.

An initial analysis revealed that the God prime did not significantly affect the participants' scale responses,  $b = .081$ ,  $SE = .071$ ,  $d = .117$ ,  $p = .258$ . Again, given the possibility of indirect effects even when no direct effect is present (Rucker et al., 2011; see also Preacher & Hayes, 2018), I report the mediational analyses below.

**Self-transcendent connection.** As with the open-response item, self-transcendent connection predicted two-week prosocial intentions ( $b = .237$ ,  $SE = .118$ , 95% CI [.176,

.299],  $p < .001$ ). There was no significant indirect effect of self-transcendent connection ( $b = .013$ ,  $SE = .028$ , 95% CI [-0.041, .070],  $ns$ ).

**Small self.** The small self item response did predict lower two-week prosocial intentions ( $b = -.059$ ,  $SE = .024$ , 95% CI [-.106, -.012],  $p = .012$ ). There was no significant indirect effect of small self ( $b = .007$ ,  $SE = .011$ , 95% CI [-.009, .036],  $ns$ ).

**Public self-awareness.** Public self-awareness had no significant association with two-week prosocial intentions ( $b = .011$ ,  $SE = .025$ , 95% CI [-.039, .061],  $ns$ ). There was no indirect effect of public self-awareness ( $b = -.001$ ,  $SE = .005$ , 95% CI [-.002, .005],  $ns$ ).

**Full model.** As with the open-response dependent variable, I ran a model with individual paths from the priming manipulation to each mediating variable and from each mediating variable to the two-week prosociality intention measure (Figure 5). Once again, two significant paths emerged. Self-transcendent connection predicted higher intended prosociality ( $b = .229$ ,  $SE = .031$ , 95% CI [.170, .290],  $p < .001$ ) and small self predicted lower intended prosociality ( $b = -.051$ ,  $SE = .023$ , 95% CI [-.096, -.004],  $p = .030$ ). Public self-awareness approached significant prediction of higher intended prosociality ( $b = .042$ ,  $SE = .024$ , 95% CI [-.005, .089],  $p = .076$ ). The total indirect effect was negligible ( $b = .020$ ,  $SE = .031$ , 95% CI [-.039, .085],  $ns$ ) and no specific indirect effects approached significance (all  $ps > .32$ ).

**Interaction of the prime and religion.** In Gervais and Norenzayan (2012), the implicit God prime affected the public self-awareness of high believers and low believers differently in one study, but not in the other. I explored the possibility that religiosity and strength of God belief, respectively, moderated the effect of the prime on the modeled



variables. Religiosity was measured with a six-item religiosity scale (Cohen, Malka, Rozin, & Cherfas, 2006;  $\alpha = .93$ ; see appendix). God belief was measured with a reversed item (*I do not believe God exists*). Both item responses ranged a scale from -3 (*strongly disagree*) to +3 (*strongly agree*).

***Open-response time pledge.*** All mediators and the time variable were regressed on priming group, religiosity, belief, Priming Group x Religiosity, and Priming Group x Belief. With this model, religiosity predicted higher self-transcendent connection ( $b = .322, SE = .070, 95\% CI [.173, .455], p < .001$ ) and the God prime predicted lower small self endorsement ( $b = -.435, SE = .219, 95\% CI [-.857, -.008], p = .047$ ). Interestingly, the interaction of religiosity and priming approached significant prediction of small self ( $b = -.259, SE = .152, 95\% CI [-.567, .028], p = .088$ ) and of public self-awareness ( $b = -.261, SE = .024, 95\% CI [-.539, .004], p = .058$ ). The main effect of priming and these interaction coefficients are negative, meaning that priming decreased both public self-awareness and small self and that religiosity interacted with the priming to downregulate these mechanisms even more. This directly contradicted Gervais and Norenzayan (2012) and thus ran contrary to my hypotheses. Obliquely supporting Hypothesis 3, there was a significant indirect effect of religiosity on the time pledge through self-transcendent connection ( $b = .256, SE = .119, bootstrapped 95\% CI [.067, .541], p = .031$ ).

***Prosocial intentions scale.*** All mediators and the two-week prosocial intentions measurement were regressed on priming group, religiosity, belief, Priming Group x Religiosity, and Priming Group x Belief. With this model, religiosity still predicted higher self-transcendent connection ( $b = .254, SE = .050, 95\% CI [.148, .349], p < .001$ ), which in turn predicted prosocial intentions ( $b = .192, SE = .033, 95\% CI [.129, .257], p <$

.001). Small self predicted lower prosocial intentions ( $b = .045$ ,  $SE = .023$ , 95% CI [- .090, .001],  $p = .048$ ). There was a significant indirect effect of religiosity through self-transcendent connection ( $b = .049$ ,  $SE = .013$ , 95% CI [.026, .079],  $p < .001$ ). No other noteworthy effects were found.

**Log-transformation.** The hours pledged data were zero-inflated and displayed a strong positive skew. While the bootstrapping techniques of the main analyses rested on no distributional assumptions, I wondered whether normal data would alter the results. As a strong test of the hypothesis that normal data would change the results, I transformed the data ( $\log_{10}$ ) and removed the zero hours cases. The resulting distribution still failed the normality test,  $K-S(243) = .108$ ,  $p < .001$ , but the skewness (.039,  $SE = .156$ ) and kurtosis (-.121,  $SE = .311$ ) were relatively small and the distribution visually approximated something like a bell curve. The simultaneous full mediation model was then applied to this transformed dependent variable. Self-transcendent connection predicted the  $\log_{10}$  of hours pledged ( $b = .037$ ,  $SE = .014$ , 95% CI [.010, .063],  $p = .007$ ). No other significant effects emerged, demonstrating that the dearth of indirect effects in the other models was likely not a function of the data non-normality.

**Moderated A path.** Different representations of God should prime different psychological states. For instance, picturing an authoritarian, wrathful God might induce feelings of self-consciousness whereas picturing a benevolent, forgiving God might induce feelings of self-transcendence. Different God representations may predict different pathways from divine contemplation to prosociality. With this in mind, I explored the possibility of moderated mediation for each combination of single God representation and single mediator. The model included main effects of each of the five God

representations, a main effect of experimental group, and interactions of the group and respective God representations (see Figure 6 for the general “Moderated A Path” diagram). Further, I looked for indirect effects from a given Group x God Representation interaction through the included mediators to the dependent variable using 10,000 bias-corrected bootstrapped samples. There were effects of benevolent God representation ( $b = .218$ ,  $SE = .162$ , 95% CI [.041, .392],  $p = .013$ ), mystical God representation ( $b = .267$ ,  $SE = .092$ , 95% CI [.107, .465],  $p = .004$ ), and ineffable God representation ( $b = -.158$ ,  $SE = .064$ , 95% CI [-.283, -.034],  $p = .013$ ) on self-transcendent connection. The interaction of priming and benevolent God representation predicted lower levels of self-transcendent connection ( $b = -.249$ ,  $SE = .125$ , 95% CI [-.499, -.011],  $p = .046$ ). Ineffable God representation predicted higher feelings of small self ( $b = .382$ ,  $SE = .100$ , 95% CI [.187, .574],  $p < .001$ ). The interaction of priming and mystical God representation predicted less public self-awareness ( $b = -.465$ ,  $SE = .188$ , 95% CI [-.827, -.098],  $p = .014$ ). No significant indirect effects were present.

I repeated this analysis with the prosocial intentions scale as the dependent variable. A marginal indirect negative effect of the Prime x Benevolent God representation on prosocial intentions through self-transcendent connection emerged ( $b = -.057$ ,  $SE = .030$ , 95% CI [-.122, -.004],  $p = .059$ ). It is worth mentioning that this same negative indirect effect emerged with the time pledge dependent variable, but the p-value was .101.

**Moderated mediation.** While moderation of the A path suggests a form of moderated mediation, a more stringent test is whether moderating variables significantly change the indirect effect itself. I tested whether the indirect effects of the prime on

pledged volunteer time—through small self, public self-awareness, and self-transcendent connection—were moderated by a given God representation. Coding such a test in MPlus was prohibitively difficult, but the SPSS PROCESS module made such a test possible (Hayes, 2018). The downside here was that PROCESS does not approach missing values with FIML, so the moderated mediation tests were performed on the volunteer time dependent variable with its 16.8% missing data rate. However, since FIML uses existing variables to predict the missing values, I reasonably expected that the SPSS-obtained coefficients would not differ too much from the ones that Mplus would have provided.

The results of the moderated mediation analyses are found in *Table 5*. All confidence intervals were calculated from 5,000 bootstrapped samples. The “Prime x Moderator” column set contains the unstandardized regression coefficient and confidence interval for the effect of each Prime x God Representation interaction on a given mediator variable, quantifying whether a given  $X \rightarrow M$  pathway is moderated by a given God representation. The *Mod.  $\rightarrow$  Med* column set contains the unstandardized regression coefficient and confidence interval for the independent relationship of each God representation and mediator. Though this statistic does not directly predict moderated mediation, it does shed light on potentially interesting cross-sectional relationships. The final column set, *Mod. Med*, displays the moderated mediation index and confidence intervals. The moderated mediation index is the slope of the line representing the change in the indirect effect (mediation) as the moderator variable changes. This slope is equal to the change in the indirect effect for each additional unit of the moderator variable (Hayes, 2018, p.455). If the confidence interval for this line does not include zero, we may conclude that the indirect effect of the mediator changes in response to the moderator

and, thus, moderated mediation exists. This analysis revealed no evidence that any indirect effects were moderated by God representations.

**Cross-sectional mediation.** The implicit prime failure effectively negated the possibility of finding experiment-driven results, but the dataset did contain sufficient measures to analyze cross-sectional variables for mediation of religious prosociality. These variables also allow for the parsing of whether religiosity or belief in God, controlling one another, predict prosociality. Preston and Ritter (2011) found that religion is associated with religious ingroup giving and God cognition relates to religious outgroup giving, so there is reason to predict differences in prosocial intentions. Given the association of self-transcendent connection and prosocial intentions in the current dataset, along with previous cross-sectional work in support of this hypothesis, I predicted that self-transcendent connection would mediate the association of religiosity and prosocial intentions. I included a measure of belief in God to parse religiosity from belief in the divine, but expected that both predict prosociality and that self-transcendent connection would explain the associations.

I ran two structural equation models. Both had the previously used religiosity and belief in God measures as predictors, the hypothesized three mediators, and either pledged volunteer time (Figure 7) or two-week prosocial intentions (Figure 8) as the dependent variable. I will use the accepted terms *direct effect* and *indirect effect*, but these do not imply causation in these cross-sectional analyses. In the two-week prosocial intentions model, the only significant A path was from religiosity to self-transcendent connection,  $b = .285$  [.189, .372],  $SE = .047$ ,  $p < .001$ , controlling for divine belief. In terms of B paths, small self predicted lower prosocial intentions,  $b = -.047$  [-.091, -.002],

$SE = .023$ ,  $p = .039$ , and self-transcendent connection predicted higher prosocial intentions,  $b = .190$  [.128, .254],  $SE = .033$ ,  $p < .001$ . One significant indirect effect—from religiosity (controlling for divine belief) to self-transcendent connection to prosocial intentions—emerged ( $b = .054$ ,  $SE = .013$ , bootstrapped 95% CI [.032, .083],  $p < .001$ ). Controlling for one another, there was a direct effect of religiosity  $b = .086$  [.028, .143],  $SE = .029$ ,  $p < .01$ , but not of divine belief ( $p = .497$ ), on prosocial intentions. In the volunteer time pledged model, a similar pattern emerged, though small self predicted more hours pledged ( $b = .604$  [.039, 1.162],  $SE = .282$ ,  $p = .032$ ), in spite of having predicted lower two-week intentions in the previous model. In line with the last model, self-transcendent connection predicted more time pledged ( $b = .972$  [.202, 1.823],  $SE = .411$ ,  $p = .018$ ), and the indirect effect from religiosity, controlling for divine belief, was significant ( $b = .277$ ,  $SE = .127$ , bootstrapped 95% CI [.064, .574],  $p = .029$ ). There was no direct effect of religiosity or divine belief on number of hours pledged ( $ps > .48$ ), though that particular dependent variable had several problems.

## CHAPTER 5

### DISCUSSION

Overall, I found no experiment-based support for mediation of religious prosociality by the tested variables: small self, self-transcendent connection, and public self-awareness. The results indicate that self-transcendent connection predicts prosocial intentions, but the religious prime did not positively affect this mediator or the dependent variable, which points to a possible problem with the experimental manipulation. The most obvious reason for this manipulation failure is that I administered the God representations measurement to all participants early in the study, with the goal of saving resources by completing the study in one session. The implicit prime is a relatively subtle manipulation that exposes participants to a five separate, singular religious words embedded in sentences that have no direct religious connotations. If this subtle manipulation can prime religion, then asking participants to make 27 (including the non-belief items) responses by thinking about God, which requires conscious and deliberate cognition, could easily mask the effect. All participants may have been strongly primed with God — and therefore religion due to the high correlation — rendering the subtle downstream implicit prime of little manipulative value. The strong likelihood of this event suggests that the current research should not be brought to bear on whether implicit religion priming affects prosociality or whether it even works overall. This experiment was not a true replication of previous methods by which participants were primed having not seen any other religious stimuli. In fact, participants had to think extensively about God, which was probably a stronger religion schema prime than the intended

manipulation, so no conclusions about how this work fits into the priming literature, other than as a cautionary tale, are appropriate.

Priming woes aside, the findings contradict existing theory and experimental work that suggest public self-awareness as a mediator of religious prosociality. The supernatural punishment hypothesis, which suggests that humans cooperate because they sense that a judgmental God—who demands prosociality—is watching their thoughts and behavior, has been partially supported by published experiments showing that priming religion makes people feel more public self-consciousness, which we might conceive as a feeling of being watched. Although the current research cannot address the veracity of the above finding due to a design flaw, it can address whether public self-consciousness increases prosociality and whether it mediates the relationship between prosociality and religion. The suggestion from this and previous work (Scott, Cohen, & Johnson, 2017) is a resounding “no” because both studies revealed a non-significant, but negative, correlation between public self-consciousness and prosocial behavior and intentions. Furthermore, I have unpublished data documenting that the implicit prime used in the current work, but without an unfortunate design flaw, non-significantly decreased public self-awareness (Scott, 2016). Although the Supernatural Punishment Hypothesis and Big Gods Theory powerfully suggest that public self-awareness should mediate religious prosociality, I see no convincing evidence.

However, the failure to demonstrate that public self-awareness mediates religious prosociality does not necessarily contradict the Supernatural Punishment Hypothesis or Big Gods Theory because these ideas have been forwarded as descriptions of our evolutionary past that explain current behavior. According to the Big Gods Theory, the



idea of a watchful and judging God increased cooperation among certain groups, which increased group and individual fitness, resulting in the natural selection of genes that worked well in such a culture and thus our current propensity to be good at thinking religiously. Whether current humans feel compelled to prosociality now because they feel watched by God bears little on the theory because there is no need for ancient God concepts to match current God concepts. It is entirely possible that humans conceived God(s) as compelling prosociality through punishment in the ancient past, setting the cultural evolution precedent that led to modern religion and prosociality, but perceive much kinder and gentler God(s) now. Given the speed and totality with which cultural evolution shapes our psychology (Henrich, 2015), it may be unfair to test an anthropological theory with modern participants who possess religious concepts radically different from their ancestors. Even if we prime certain facets of God (e.g., authoritarian), can we be sure that the activated schema matches that of the ancients, who were entrenched in a different and vastly less scientific culture that interacted with God(s) in probably unreproducible ways? The point of this argument is not to disparage current efforts to understand our evolved religious concepts, but to indicate that failure to confirm a Big Gods hypothesis with a modern human sample does not necessarily falsify it. Perhaps better testing is to be found among non-Western, pre-industrial cultures who share religious and cultural concepts with ancestral humans. It could be that WEIRD samples (Henrich, Heine, & Norenzayan, 2010) do not conceive of the same punishing and watchful God as those who were first moved to prosocial behaviors centuries ago. This could be seen as a boon or a deal breaker, or neither, for the testing of Big Gods hypotheses. Given the importance of the knowledge we seek and that the current

paradigm is the best one we have, I favor continued experimentation and theorizing with a view toward overcoming the temporal and cultural generalization obstacles.

Self-transcendent connection predicted prosocial intentions, and it seems like thinking about God or religion should increase it, so we might hypothesize that this construct mediates religious prosociality. The evidence I currently have is mixed as to whether that is the case. In the current work, the prime did not affect self-transcendent connection and in past experiments the same prime non-significantly decreased self-transcendent connection, so we have no experiment-derived evidence that religion or divine belief causes self-transcendent connection. However, this thesis' exploratory cross-sectional analysis suggests that religiosity predicts self-transcendent connection and prosocial intentions, but belief in God, controlling for religiosity, does not. This means that the religion/God prime, like that used in numerous studies including the current one, might exert its most powerful effects on the religious, for whom the prime activates the associated thoughts of a communal religion along with those of God. Unfortunately, the current study design prevents me from testing this hypothesis in spite of having measured all of the pertinent variables, but previous research has shown that religiosity predicts higher volunteering and spirituality predicts lower volunteering (Okun et al., 2014).

It is important to note that these findings do not necessarily contradict previous work that detailed relationships between belief in God and prosociality, they merely call attention to the need for granularity. For instance, Preston and Ritter (2013) found that people associate God cognition with outgroup giving, and people primed with the word "God" donated more to the religious outgroup than to the religious ingroup. However, the mean donation for each experimental group, collapsed across ingroup and outgroup, was

not reported, so we do not know whether priming God or priming religion causes more generosity. Furthermore, priming the word “religion” among a sample with individual differences in divine belief and religiosity is not the same as measuring religiosity as an independent variable. The word “religion” can prime any number of vastly divergent schemas ranging in effect from repulsive to enchanting. As an extreme example, this prime among a sample of militant atheists would likely manipulate uncomfortable anti-religious sentiments. The same prime among a group of faithful religion devotees would elicit warm prosociality, at least toward religious ingroup members. Though it does not assess causality, the religiosity measurement runs along a continuum from zero to high positive religious association, so it does not capture variance in anti-religiosity and thus is more capable of quantifying religion-based prosociality. After all, the population of interest to these studies is the religious or at least theistic crowd, not atheists, so perhaps confining ourselves to religious believers is wise.

That religiosity, but not pure belief in God, might predict prosociality has some notable implications for psychology beyond the small circle of affected experimentalists and for society at large. The study of the psychology of religion could benefit from this delineation in designing future research questions and re-examining filed data, though the scope of this topic is too broad for the current thesis. Similarly, given the current exodus of Westerners from organized religion, and toward independent forms of spirituality, perhaps individual members of society would benefit from taking pause before making the generalized assumption that organized religion is an inferior form of spirituality. Perhaps the mass rejection of organized religion in all its forms is a case of “throwing the baby out with the bath water” in terms of maintaining a cooperative society. Obviously,

some are leaving religion for ethical reasons based on perceived social crimes of the church leadership, but concluding that all religion is bad and an isolated relationship with God is better based on the misbehavior of some may be premature. One need not believe in a supernatural realm to become more prosocial by organized means, either. If religiosity, but not belief in God, predicts prosociality, then perhaps it is devoted membership in a pro-prosocial group that is driving the effect of religion on prosociality.

Also notable is that a benevolent God representation interacted with the prime to reduce self-transcendent connection, which is surprising but does mesh with recent research by Debono and colleagues (2017), who found that priming a benevolent God increased unethical behavior (decreased prosociality). The current work suggests that Debono et al.'s effect was at least partially mediated by decreased self-transcendent connection. This relationship between a benevolent God and lowered self-transcendent connection is interesting because, at least on the surface, it appears one should be inspired to charity and human connection in the presence of a loving and giving God. The available evidence suggests that perhaps the perceived generosity of God exerts a self-focusing effect on the perceiver, who thinks about all the blessings he can get and all the sins he can commit before receiving guaranteed forgiveness. Such a finding would surely raise some hackles among researchers and worshippers alike, but such is the pursuit of truth.

### **Limitations**

The measurement of belief in God for the exploratory studies was a single, reverse-coded item, while the religiosity measure was a reliable six-item scale. The belief measure may have been unreliable for these reasons and because it may only measure

belief in “God” as opposed to something like “God, a universal spirit, or a divine power.” It is possible that participants believing in the latter construct could not strongly endorse the former construct, so the measure did not capture all of the divine belief in the sample. I may have insufficiently measured the latent variable, “belief in God,” and thus pitting it against a more reliable measure of religiosity may have been unfair.

Generalization of the current findings should perhaps be limited to undergraduates who attend a public American university. More importantly, the findings should not automatically be applied to actual prosocial behavior, since the dependent variable was prosocial intentions as reported online to an unfamiliar researcher. Whether one should expect higher or lower prosocial intentions by different means of inquiry, and that they would correlate strongly with prosocial behavior, is debatable. Likely, most prosocial behavior occurs in one’s normal, interactive, physical timespace with familiar others, so what we measure online with imperfect scales might not reflect the intended construct.

### **Future Directions**

The time is ripe for testing whether membership in a religion creates prosociality over and above what a secular prosocial group might create. Such work could really start to parse whether religion is indeed a special kind of force for good or if it can be matched by other, less controversial motivations. Galen (2012) argued that religion does not cause prosociality because its effects can be explained by impression formation, stereotyping, and ingroup favoritism, so it does not differ from secular social groupings and thus religion is not responsible for prosocial motivations. Saroglou (2012), commenting on Galen (2012), responded that this mediation by mundane means does not invalidate the causal effect of religion because inquiry into the mechanisms by which different stimuli

exert their effects is the focus of psychological research. For example, if we found that seeing a great work of art and climbing the Swiss Alps both induced prosociality through a sense of awe, we should not conclude that they are indistinguishable, nor that one is more important than the other. It is not clear whether more tests will ever settle this debate for those on the extremes of this topical spectrum, but they probably should be performed.

Pursuit of the interaction of God primes and religiosity appears to be an important avenue of future research. Past research has explored whether belief in God (e.g., Gervais & Norenzayan, 2012; Shariff & Norenzayan, 2007) affected the impact of the implicit sentence completion prime, but the results have been mixed, so we cannot say for sure whether belief in God affects the prime's impact. I myself have seen this prime affect non-members of religion significantly more than members of a religion (Scott, 2016), so we cannot say whether religious membership, by itself, changes the priming effect. Perhaps religiosity—the fervor with which one endorses personal involvement with a religion—is the best predictor of the religious priming effect if religiosity is the construct moving self-transcendent connection and prosociality. This hypothesis is justified by the finding that religiosity, controlling for belief in God, predicts prosocial intentions but belief in God, controlling for religiosity, does not. The religious prime, or even a God prime, might only increase prosociality among those for whom the manipulation primes a schema that includes other people and proscription to give charitably to others. This idea dovetails with the unpredictable relationship of belief in God with the prime (some believers are religious and some are not) and with the similar unpredictable relationship with religion membership (some members are fervent and others are not). Religiosity

captures variance in both membership itself and intensity of attachment to the religious belief system which usually involves proscriptions toward prosocial behavior.

In this future research, care must be taken in measuring religious concepts for a study that involves sensitive and subtle implicit priming techniques. There is no cut and dried answer to the dilemma regarding when to measure these associated constructs. One solution is to measure religiosity several days in advance of the priming study, but this ignores the possibility that self-reported religiosity varies from day to day. A participant's religiosity on the day of the experiment might not match that from previous measurement. Measuring at a time near the experiment helps with this problem, but introduces two new possibilities. If religiosity is measured closely preceding the experiment, it may pre-prime the control group. If it is measured closely preceding the experiment, the manipulation could be affecting the religiosity measurement. From the available evidence, which includes the notions that implicit primes are both sensitive and short-lived, while explicit measures might have strong priming effects that last longer, it might be best to measure religiosity as long as possible after the priming manipulation and the dependent variable within the experimental session. In support of this, the manipulation is priming whatever stimuli-related schema the participant brings to the study, so the religiosity variable, inasmuch as it would moderate the priming effect, is linked substantively to the priming manipulation, so the priming manipulation should not affect the religiosity profile.

## **Conclusions**

The evidence presented here suggests that we can rule out public self-awareness and small self as mediators of religious prosociality. Self-transcendent connection bore a

consistently strong positive relationship with prosociality and with religiosity, so this work suggests it as a potential mediator of the religion priming effect on prosociality. Further, when controlling for one another, religiosity, but not belief in God, predicted prosociality and this relationship was mediated by self-transcendent connection. The implication here is that embeddedness in a religious group drives prosocial behavior. That belief in God, controlling for religiosity, does not predict prosociality is not to say that there is no relationship between the two constructs, but that the relationship may be complex. All together, these findings suggest that researchers need to increase the granularity of religious and spiritual prosociality research and that current theories of these relationships merit continued careful testing. Though the path is long and winding, we are moving toward a better understanding of religious prosociality.



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APPENDIX A  
MEASUREMENT ITEMS

## **LAMBI Scale (God Representations)**

Using a wide range of the scale below, please rate how well each word describes your conception of God, the divine, or a higher power. (*strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree*).

### **Authoritarian**

Wrathful

Punishing

Strict

Stern

Commanding

### **Benevolent**

Forgiving

Compassionate

Gracious

Tolerant

Merciful

### **Mystical**

Nature

Energy

Cosmic

Consciousness

Universe

### **Limitless**

Limitless

Vast

Boundless

Infinite

**Ineffable**

Unknowable

Unimaginable

Inconceivable

Incomprehensible

## **Public Self-Awareness**

Please respond to each statement based on how you feel RIGHT NOW, AT THIS INSTANT—not how you feel in general, or at this point in your life. There are no “right” or “wrong” answers—just be honest. (*strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree*).

I am concerned about the way I present myself.

I am self-conscious about the way I look.

I am concerned about what other people think of me.

**Self-Transcendent Connection (adapted from the TCI Self-Transcendence Scale and the Small Self Scale)**

Please respond to each statement based on how you feel RIGHT NOW, AT THIS INSTANT—not how you feel in general, or at this point in your life. There are no “right” or “wrong” answers—just be honest (*strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree*).

I feel a clear, deep feeling of oneness with all that exists

I feel so connected to nature that everything seems to be part of one living organism.

I feel like I am part of something with no limits or boundaries in time and space

I feel a strong sense of unity with all the things around me

I feel so connected to the people around me that it is like there is no separation between  
us

I feel the presence of something greater than myself\*

I feel part of some greater entity\*

I feel like I am in the presence of something grand\*

I would do things to protect animals and plants from harm or extinction\*\*

I would gladly risk my own life to make the world a better place\*\*

I am feeling a “sixth sense” that allows me to know what is going to happen\*\*

I would make real personal sacrifices to make the world a better place, like trying to  
prevent war, poverty, and injustice\*\*

I am experiencing unexpected flashes of insight or understanding\*\*

*\*Items originally from small self scale      \*\*Discarded items*

## **Small Self**

Please respond to each statement based on how you feel RIGHT NOW, AT THIS INSTANT—not how you feel in general, or at this point in your life. There are no “right” or “wrong” answers—just be honest. (*strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree*)

I feel small or insignificant

I feel the presence of something greater than myself\*

I feel part of some greater entity\*

I feel like I am in the presence of something grand\*

*\*Discarded items, sent to self-transcendent connection scale*

## **Religiosity Scale**

To what extent do the following statements describe your religion and spirituality?

*(strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree)*

I am a religious person.

I am a spiritual person.

I believe in the teachings of my faith tradition.

My religion and spirituality is an important part of my identity.

If someone wanted to understand me as a person, my faith would be very important for  
that.

I often and regularly practice the requirements of my faith tradition.

APPENDIX B  
SUPPLEMENTARY TABLES



Table 1.

*Descriptive Statistics of the Major Study Variables*

Group	n*	Dependent Variable Mean (SD)				
		Small Self	Self Aware	Connect	Pledge	Intent
Control	188	-.04 (1.81)	.41 (1.53)	-.35 (1.16)	8.18 (7.51)	.26 (.68)
Primed	186	-.26 (1.67)	.23 (1.60)	-.27 (1.16)	8.72 (9.62)	.34 (.70)

*Note: Scale of all measurements except Hours Pledged (Pledge) is -3 (strongly disagree) to +3 (strongly agree);*

*\*n for Hours Pledged: Control = 155, Primed = 156.*

Table 2.

*God Representation Means (SD)*

Representation	Group		Total
	Control	Primed	
Authoritarian	-.11 (1.24)	-.18 (1.22)	-.14 (1.23)
Benevolent	1.09 (1.40)	1.20 (1.48)	1.15 (1.44)
Mystical	.84 (1.22)	.73 (1.33)	.79 (1.28)
Limitless	1.16 (1.36)	1.10 (1.42)	1.13 (1.39)
Ineffable	.10 (1.33)	.13 (1.30)	.12 (1.31)
Non-Existent	-.60 (1.81)	-.83 (1.84)	-.71 (1.83)

*Note: Scale of all measurements is -3 (strongly disagree) to +3 (strongly agree)*

Table 3.

*Pearson Correlations Among Moderators, Mediators, and Dependent Variables*

	AGod	BGod	MGod	LGod	IGod	NoGod	Sm	SA	Conn	Intent
B God	.104*									
M God	.099	.555**								
L God	.189**	.728**	.666**							
I God	.277**	-.211**	.055	.096						
No God	.017	-.729**	-.356**	-.585**	.365**					
Small Self	.099	-.032	-.019	.001	.182**	.113*				
Self-Aware	.038	.065	.050	.061	.103*	.005	.380**			
Connect	-.085	.277**	.323**	.233**	-.153**	-.218**	-.153**	-.060		
Pro. Intent	-.050	.251**	.185**	.147**	-.103*	-.136**	-.153**	.021	.399**	
Hours Pledged	-.026	.027	.063	-.018	-.110	.055	.068	-.043	.122*	.233**

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

n = 374 (n = 311 for Hours Pledged)

Table 4.

*Pearson Correlations of Self-Transcendent Connection Items*

Scale Item	1	2	3	4	5	6	7
1. Oneness with all							
2. One living organism	.616**						
3. No limits	.390**	.413**					
4. Strong sense of unity	.591**	.578**	.521**				
5. No separation	.416**	.466**	.394**	.614**			
6. Something greater	.323**	.232**	.363**	.305**	.188**		
7. Greater entity	.404**	.333**	.428**	.364**	.284**	.669**	
8. Something grand	.387**	.324**	.427**	.398**	.333**	.732**	.697**

\*\* Correlation is significant at  $p < .01$ ;  $n = 374$ ;

Non-abbreviated items are the following:

1. I have a clear, deep feeling of oneness with all that exists.
2. I sometimes feel so connected to nature that everything seems to be part of one living organism.
3. I feel like I am part of something with no limits or boundaries in time and space.
4. I feel a strong sense of unity with all the things around me.
5. I feel so connected to the people around me that it is like there is no separation between us.
6. I feel the presence of something greater than myself.
7. I feel part of some greater entity.
8. I feel like I am in the presence of something grand.

Table 5.

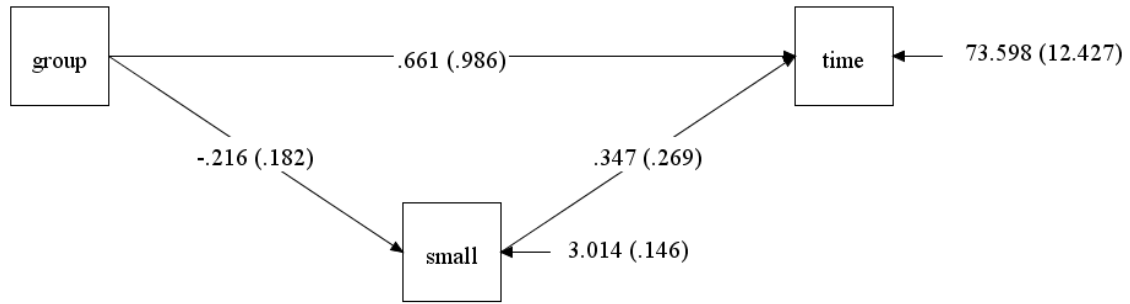
*Moderated Mediation Tests*

Mediator	Moderator	Prime x Moderator			Mod→Med			Mod. Med.		
		<i>b</i>	95% C.I.		<i>b</i>	95% C.I.		Index	95% C.I.	
			LL	UL		LL	UL		LL	UL
Small Self	Author.	.02	-.17	.22	.01	-.09	.11	.02	-.18	.22
	Benev.	-.19*	-.34	-.04	.34*	.27	.42	-.14	-.40	.06
	Mystical	-.15	-.33	.03	.28*	.19	.37	-.10	-.37	.07
	Limitless	-.03	-.19	.12	.34*	.26	.42	-.02	-.20	.13
	Ineffable	.15	-.03	.33	-.09	-.18	.01	.11	-.06	.40
Self Trans	Author.	.00	-.16	.17	-.05	-.13	.04	.00	-.48	.47
	Benev.	-.07	-.21	.07	.08*	.01	.15	-.18	-.63	.20
	Mystical	-.03	-.19	.12	.18*	.11	.26	-.08	-.60	.39
	Limitless	.05	-.10	.19	.06	-.01	.13	.12	-.30	.53
	Ineffable	.12	-.03	.27	-.05	-.12	.03	.31	-.12	.82
Self Aware	Author.	.09	-.17	.34	.05	-.08	.18	.01	-.10	.15
	Benev.	-.03	-.25	.18	.06	-.04	.17	.00	-.08	.09
	Mystical	-.23	-.48	.01	.08	-.05	.20	-.02	-.22	.16
	Limitless	.01	-.21	.23	.07	-.05	.17	.00	-.08	.09
	Ineffable	.05	-.19	.28	.12*	.01	.24	.00	-.08	.13

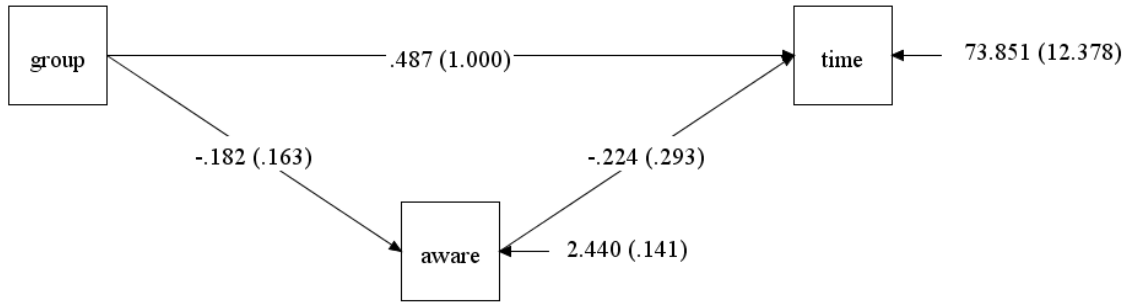
*Note:* Prime x Moderator = Mediator regressed on Prime x Moderator interaction; *b* = unstandardized coefficient; Author. = Authoritarian; Benev. = Benevolent; Mod→Med = Mediator regressed on moderator; Mod. Med. = Moderated Mediation; \**p* < .05

APPENDIX C

SUPPLEMENTARY FIGURES

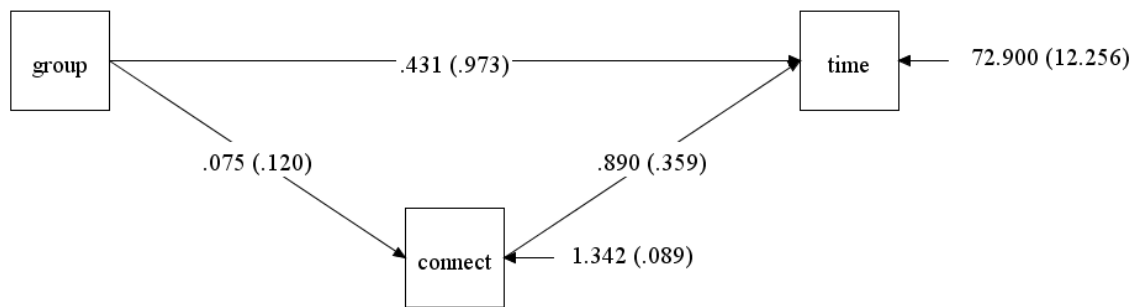


*Figure 1.* Path diagram of implicit prime through small self to volunteer hours pledged. Coefficients and standard errors are unstandardized.

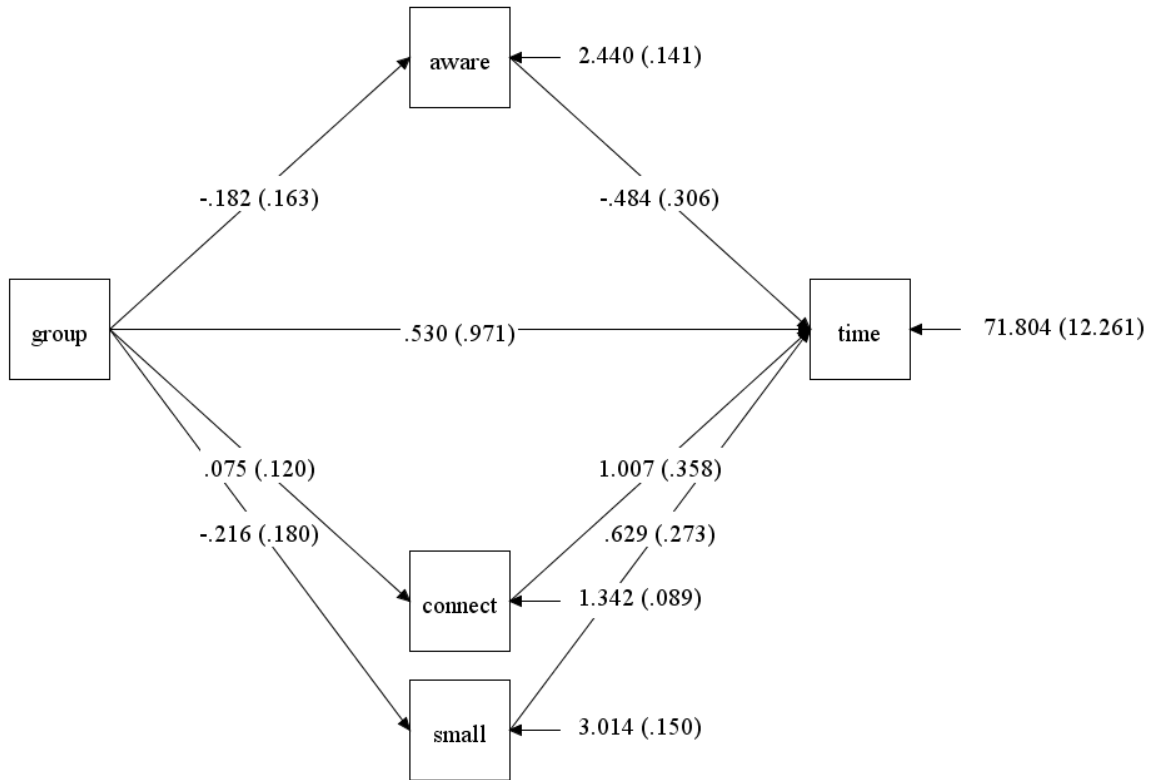


*Figure 2.* Path diagram of implicit prime through public self-awareness to volunteer hours pledged. Coefficients and standard errors are unstandardized.





*Figure 3.* Path diagram of implicit prime through self-transcendent connection to volunteer hours pledged.



*Figure 4.* Path diagram of implicit prime through simultaneous mediators to volunteer hours pledged. Coefficients and standard errors are unstandardized.

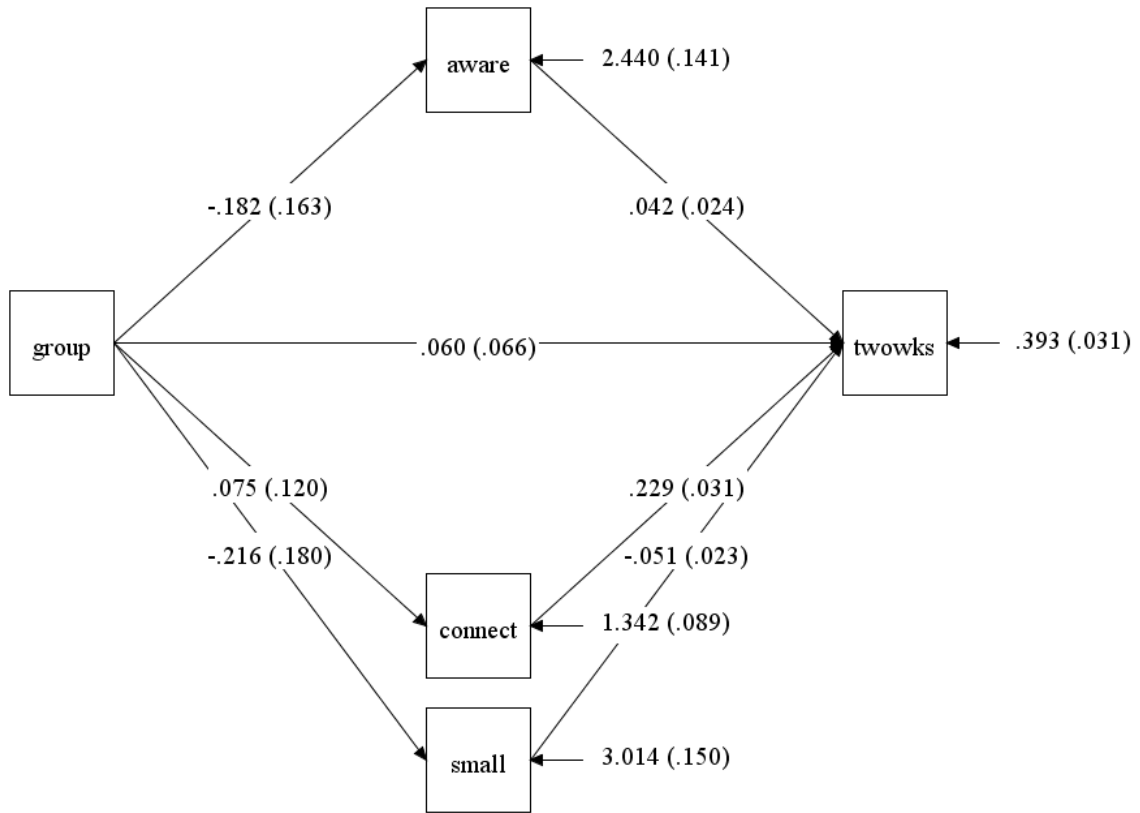
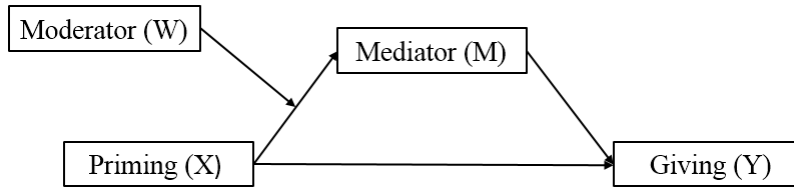
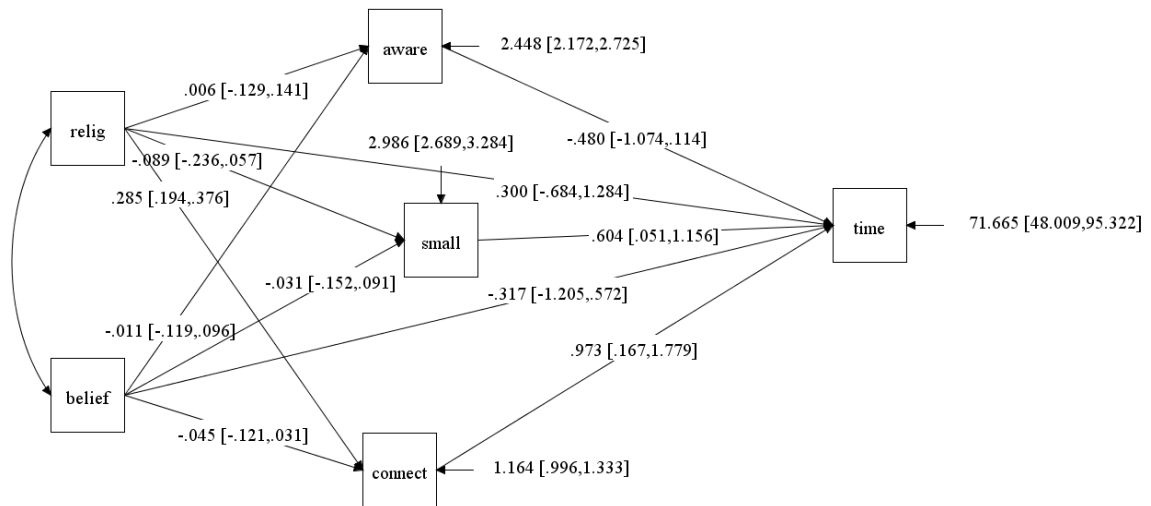


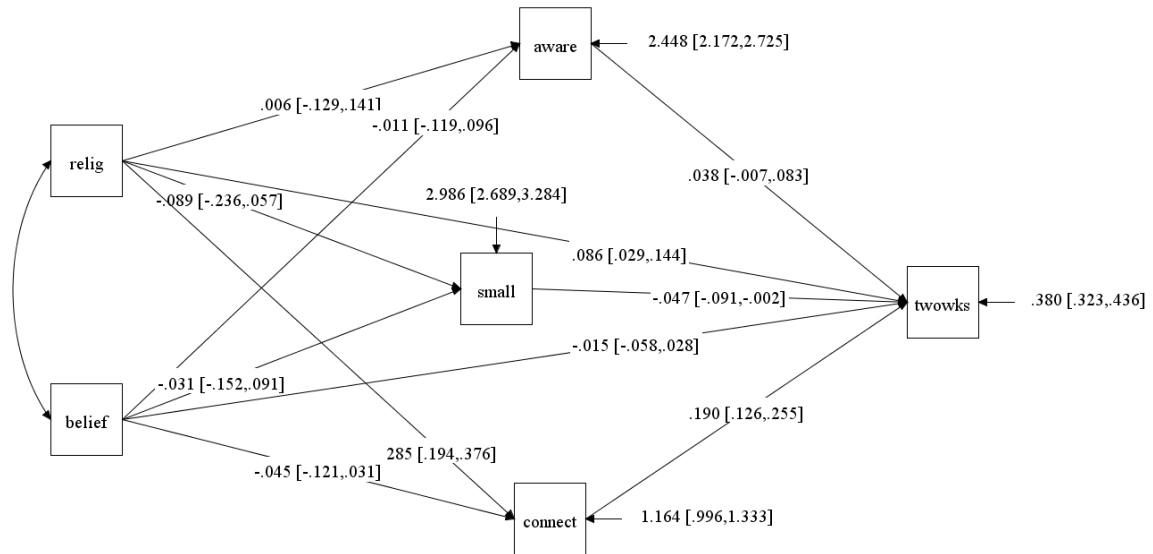
Figure 5. Path diagram for the implicit prime through all simultaneous mediators to two-week prosocial intentions.



*Figure 6.* Path diagram of mediated moderation models. Moderators include the five God representations, respectively.



*Figure 7.* Path diagram for mediation of religiosity and divine belief effects on pledged volunteer hours by public self-awareness, small self, and self-transcendent connection. Unstandardized coefficients and confidence intervals are displayed.



*Figure 8.* Path diagram for mediation of the effects of religiosity and divine belief on two-week prosocial intentions through public self-awareness, small self, and self-transcendent connection. Unstandardized coefficients and confidence intervals are shown.