

# The Prosocial Effects of Explicit and Implicit Reward-Related Religious Primes

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## RELIGIOUS REWARD PRIMES & PROSOCIALITY

### Abstract

There is a growing body of empirical literature exploring how the priming of religious concepts influences prosociality. While many studies have used broad sets of religious primes covering a wide range of religious concepts, many recent studies have demonstrated that *specific* categories of religious primes (e.g., forgiveness- and punishment-related) differentially influence prosociality. However, only one study (Harrell, 2012) has explored the prosocial effects of reward-related religious primes. I conducted three priming studies to further test Harrell's hypothesis that reward-related religious primes can positively influence prosociality (i.e., the *supernatural reward hypothesis* or SRH; see Saleam & Moustafa, 2016). Studies 1 and 2 explored the effects of generic and culturally-sensitive explicit reward-related religious primes, respectively, on the generosity of religious participants in the Dictator Game. Study 3 explored the effects of implicit reward-related religious primes on the generosity of religious participants in a charitable giving task. Neither explicit priming study yielded data supportive of the SRH; however, participants exposed to reward-related religious primes in Study 3, who expressed awareness of the reward-relevance of the primes, did exhibit greater generosity than participants who interpreted those same primes as being relevant to divine mercifulness. These participants also gave more generously than participants exposed to reward-related secular primes, neutral religious primes, or control primes. Collectively, these findings demonstrate the need to distinguish between concepts of divine reward and divine forgiveness/mercifulness when testing the SRH. However, given the results across these three studies, it is unclear whether reward-related religious concepts do effectively promote prosociality.

*Keywords:* religion, prosociality, morality, divine rewards, priming

## RELIGIOUS REWARD PRIMES & PROSOCIALITY

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## RELIGIOUS REWARD PRIMES & PROSOCIALITY

### Statement of Authentication

I declare that, to the best of my knowledge, all work contained within this thesis is my own, except when otherwise specified (i.e., with citation). None of the contents of this thesis have been submitted to any other institution, nor have any of the contents of this thesis been published elsewhere.

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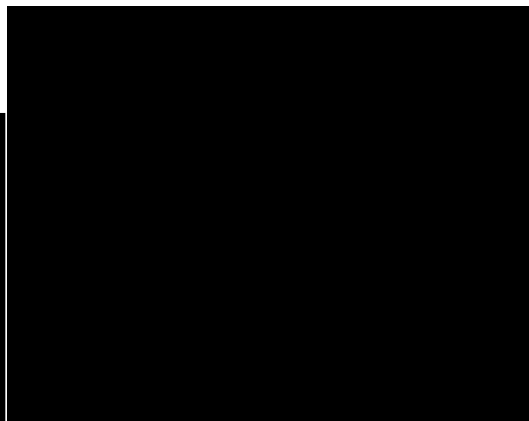
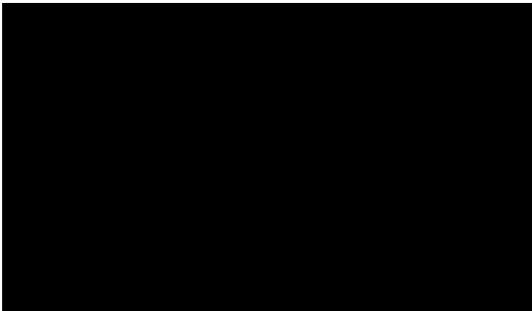


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# **Introduction and Literature Review**

### Introduction

There is a vast body of research exploring links between religiosity and prosociality (i.e., the tendency to think and behave in ways that prioritise and promote the well-being of others). Numerous studies have found a link between religious belief and attitudinal/behavioural prosociality (e.g., Ahmed, 2009; Stavrova & Siegers, 2014). This seems unsurprising, given that the religious texts of the main religions of today (e.g., the Bible, Qur'an, Mahabharata) all feature moral lessons, injunctions, prescriptions and proscriptions (Saleam & Moustafa, 2016). Moreover, many of the moral teachings of these religious texts are reinforced with promises of divine rewards for moral behaviour and divine punishments for immoral behaviour. This provides religious people with obvious incentives for conducting themselves morally, thereby making the religion-prosociality link even more explicable.

Even some secular philosophers have defended religion as a major driving force for moral behaviour, and/or have argued that religion may be better positioned than 'science' to provide a foundation and framework for morality (e.g., Berlinski, 2009; Gould, 1997). Prominent voices in the 'atheist community' have also acknowledged the apparent relevance of religion to morality and have expressed concern as to what will become of society if it were to become completely disillusioned with religion (e.g., Harris, 2011; Molyneux, 2016). If all people were to suddenly lose their belief in an omniscient and omnipotent moral arbiter and the possibility of 'cosmic justice' (e.g., eternal salvation for the virtuous and eternal damnation for the wicked), what equivalent incentives would remain to promote moral behaviour (D'Souza, 2009)?

Despite all of this, several recent studies and a recent meta-analysis have cast some doubt upon the religion-prosociality link (namely Galen, 2012; van Elk, Matzke, Gronau, Guan, Vandekerckhove & Wagenmakers, 2016). And while many studies have focused on

exploring *whether* a link between religiosity and prosociality exists, less attention – in the form of empirical studies – has been devoted to uncovering *why* such a link has been observed (Saleam & Moustafa, 2016). Numerous hypotheses have been proposed (e.g., the ‘supernatural monitoring hypothesis’ and the ‘supernatural punishment hypothesis’) to account for the apparent link between religiosity and prosociality. However, many of the studies which have been conducted to specifically test these hypotheses have yielded findings that are open to multiple plausible interpretations (often due to methodological flaws/shortcomings) or have not been subjected to attempts at replication.

The ‘supernatural reward hypothesis’ (SRH) is a prime example of a partial explanation of the apparent link between religiosity and prosociality, which has been subjected to minimal empirical testing. The SRH posits that the divine rewards promised to religious adherents in their respective holy texts/traditions can promote prosocial behaviour because the receipt of these divine rewards is often said to be contingent upon the piety/righteousness of one’s conduct (Saleam & Moustafa, 2016; also see Harrell, 2012). That is, people who behave morally, in the context of a particular religious tradition (e.g., Islam), are those who can expect to receive divine rewards (e.g., an eternity in Heaven) for their deeds. Indeed, many of the supernatural rewards (e.g., eternal life) offered in the world’s religious traditions appeal directly to many of our Darwinian instincts (e.g., the survival instinct), and this makes them particularly alluring to people who subscribe to those traditions (Saad, 2011). However, while this account is plausible, only a single empirical study (Harrell, 2012) has tested it.

The main objective of this thesis is to explore whether or not reward-related religious concepts can effectively promote moral behaviour. To achieve this end, this thesis begins with a discussion of the nature of the apparent link between religious belief and prosociality. This is followed by an in-depth discussion of various hypotheses that have been proposed to

explain this religion-prosociality link, with a particular focus on the SRH. This discussion provides the rationale and basis for three studies (see below) conducted to empirically test the SRH.

### **Literature Review**

#### **The ‘Religion-Prosociality Link’**

Religious traditions are, and have tended to be, very deeply concerned with ethics and morality, and hence, it is unsurprising that many theorists and researchers have drawn a link between religious belief and morality/prosociality; a link which has received a great deal of attention in the psychological literature. There is now a vast literature devoted to the study of the so-called ‘religion-prosociality link’. Studies spanning many cultures and religious groups have often found that people who are more devoutly religious (e.g., as measured by church attendance or self-report data, etc.) tend to behave more prosocially than people who are less devout or are non-religious (Heineck, 2014; Regnerus, Smith & Sikkink, 1998; Shariff, Willard, Andersen & Norenzayan, 2016; Stavrova & Siegers, 2014). In the study conducted by Stavrova and Siegers, which included data from over 70 countries, it was found that the extent of peoples’ personal levels of religious devotion correlated positively with charitable giving (a common measure of prosociality) and correlated negatively with numerous measures of anti-sociality (e.g., number of traffic offenses committed, and willingness to buy stolen goods).

Researchers have often explained these results by appealing to the moral prescriptions and proscriptions within today’s religious traditions (e.g., Johnson, 2016; Saleam & Moustafa, 2016; Stavrova & Siegers, 2014). If a person subscribes to a religion that instructs him/her to behave morally and believes that his/her behaviour is being monitored by morally-judgemental supernatural beings who have the power to reward or punish mortals, then it would be wise for that person to behave morally (Gervais & Norenzayan, 2012). Religious

rituals and gatherings may also promote trust and positive feelings towards coreligionists (i.e., people who belong to the same religion or religious sect), which may result in increased in-group prosociality (van Cappellen, Saroglou & Toth-Gauthier, 2016). Indeed, there are many plausible mechanisms through which religious belief may be exerting its apparent effect on prosociality.

But while many researchers in the field have focused on exploring what aspects of religious beliefs/traditions may underlie the religion-prosociality effect, there are also researchers in the field who question whether a clear link between religious belief(s) and prosociality exists at all. As was noted in the previous section, the religion-prosociality link is certainly not without its critics/sceptics. For example, Galen (2012) noted that while many studies have found that religious people behave more prosocially (e.g., display greater generosity in experimental settings) than nonreligious people (e.g., Ahmed, 2009; Sosis & Ruffle, 2003), many studies have failed to demonstrate a relationship between religiosity and prosociality (e.g., Ahmed & Salas, 2009; Bellemare & Kröger, 2007). Furthermore, the effects observed in many of the studies that have yielded findings supportive of the religion-prosociality hypothesis may be partly explainable by appealing to in-group bias (i.e., the tendency to favour others who share particular characteristics and/or beliefs with oneself, such as adherence to the same religious doctrine). For example, Ahmed (2009) found that highly religious students were more cooperative (in a ‘public goods’ game) and generous (in the ‘Dictator Game’) than nonreligious students, but noted that religious students were taking financial risks in *religious* school settings, while nonreligious students were not being tested in explicitly *nonreligious/atheistic* settings (e.g., at an atheists’ or secular club on a university campus). Hence, while religious students could safely expect the targets of their generosity to be coreligionists, nonreligious people had no assurances at all that the targets of their generosity would be ideologically similar to them.

Another issue confronting the religion-prosociality hypothesis is that while many studies have demonstrated positive correlations between religiosity and *self-reported* levels of prosociality, fewer studies have demonstrated that higher levels of religiosity correlate with higher levels of *actual* prosocial behaviour (Duhaime, 2015). Galen (2012) argued that part of the religion-prosociality effect may stem from socially-desirable responding. That is, religious people may simply claim to be more prosocial than they actually are, and there is some empirical support for this claim (e.g., see Gervais & Norenzayan, 2012). However, an interesting finding from the study conducted by Stavrova and Siegers (2014; summarised above) was that the religion-prosociality effect was most pronounced in *non-theocratic* contexts. That is, in societies wherein religious adherence is not enforced upon the population, the correlation between personal religious devotion and behavioural prosociality was the highest. As Stavrova and Siegers argued, if social-desirability was a significant underpinning of the religion-prosociality effect, then one would expect the effect to be *more* pronounced in theocratic contexts, as theocratic states tend to enforce moral norms more strictly than more liberal states, and hence, there would be a greater incentive to respond in ways that are consistent with these norms. And yet, the religion-prosociality effect is actually *less* pronounced in theocratic states.

Another striking problem with any simplistic account of a link between religious belief and prosociality is the fact that religious beliefs can inspire thoughts and behaviours that appear to be explicitly antisocial (Galen; 2012; Harris, 2006). For example, a Pew Research survey found that 86% of Egyptian Muslim respondents, 79% of Afghani Muslim respondents, 76% of Pakistani Muslim respondents, and 62% of Malaysian Muslim respondents approved of the death penalty as a punishment for apostasy (Pew Research Center, 2013). In a meta-analysis of studies conducted (at least predominantly) in the United States, exploring the relationship between religiosity and racism, Hall, Matz and Wood

(2010) found that while certain aspects of religiosity (e.g., ‘quest religiosity’ and agnosticism) were conducive to racial tolerance, the more collectivistic/group-oriented elements (e.g., religious fundamentalism) were associated with higher levels of racial prejudice. Additionally, an empirical study with a predominantly Christian sample found that subliminally priming participants with Christian concepts (e.g., ‘bible’, ‘Christ’, ‘Jesus’) resulted in increased scores (relative to a control group) on measures of covert and overt racial prejudice towards African-Americans (Johnson, Rowatt & LaBouff, 2010). Collectively, these findings are somewhat unsurprising as many religious texts often overtly promote prejudices, sometimes even promoting hatred and violence against particular groups (e.g., 1 Timothy 2:9-15; 2 Nephi 5:21-23<sup>1</sup>; Leviticus 20:13; Qur’an 7:80-81).

Given that religion appears to promote antisocial behaviour, just as it often promotes prosocial behaviour (e.g., Ephesians 4:32; John 8; Qur’an 2:274, 16:91), the notion of a religion-prosociality link seems misleading. Religions may promote antisocial behaviours in some instances, and prosocial behaviours in others, and which behaviours are promoted in particular circumstances will vary across different religious traditions and contexts (Saleam & Moustafa, 2016). Furthermore, what is considered to be antisocial or prosocial also differs across religions and contexts. Clearly, the relationship between religious belief and behaviours/thoughts is highly complex, and there is much debate regarding how religion influences believers.

This thesis specifically explores the ways in which religious beliefs influence people to behave in prosocial ways, rather than how religion can influence people to behave antisocially. Although the literature linking religious belief to attitudinal and behavioural prosociality is flawed, researchers in recent times have utilised *priming* paradigms to explore whether the subtle activation of religious concepts in the mind is enough to promote prosocial

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<sup>1</sup> 2 Nephi is one of the scriptural books contained within the Book of Mormon.



behaviour (Batara, Franco, Quiachon & Sembrero, 2016; Shariff et al., 2016). Despite his clear and justified reservations about the state of the religion-prosociality literature, even Galen (2012) noted that studies utilising priming paradigms have tended to offer more reliable support for the religion-prosociality hypothesis. The proceeding sections explore and critique the religion-prosociality priming literature.

### **Religious Priming Studies**

Given the difficulty involved in accounting for and controlling the many extraneous variables which may influence the results of correlational studies exploring the religion-prosociality link, researchers have regularly turned to the use of priming techniques (Shariff et al., 2016). Priming involves exposing participants to a particular stimulus (or series of stimuli) and exploring whether exposure to that stimulus (or series of stimuli) influenced their performance and/or responses in a subsequent task (Molden, 2014).

In a typical religious priming study, participants will be randomly assigned to one of several groups. The simplest religious priming study will involve one group of participants being exposed to a religious prime (e.g., a religious image, text, sound, or word), and a control group of participants being exposed to a control prime (e.g., a random image, text, sound, or word) or no prime at all. The majority of studies in the religious priming literature involve the use of *explicit* priming techniques and/or *implicit* priming techniques; although, *subliminal* priming techniques have also been utilised for several studies in the psychology of religion field (e.g., see Harrell, 2012; Pichon et al., 2007).

Explicit primes are conspicuous, and participants' active and conscious contemplation of the prime is assured. Consequently, however, there is an increased risk that participants will become aware of what the researcher is investigating, and this may affect the results (e.g., by introducing *demand characteristics*). One major advantage that explicit priming techniques have over implicit techniques (explained below) is that they allow researchers to

prime participants with more specific and complex concepts, as there is no need to simplify or conceal complex concepts in an effort to reduce the likelihood of participants becoming aware of the study's aims (Shariff et al., 2016). An example of an explicit priming study could involve a researcher exploring how the glorification of violence by religious authorities influences moral attitudes. The researcher could simply have participants read a long passage of scriptural text outlining God's condoning of violent acts by believers (e.g., in Numbers 31), and then have them respond to a survey probing their moral attitudes/beliefs. This would be an explicit priming technique, as participants reading the text will be actively engaging with the exact concept of interest (i.e., sanctified violence in religious texts).

On the other hand, implicit primes are designed to be subtle, and are generally favoured because there is a reduced risk of participants becoming aware of the study's aims. One shortcoming inherent in implicit priming techniques is that the concepts being primed need to be relatively simple, as more detailed and complex primes may demand more conscious effort to process, and this could result in participants becoming aware of the study's aims. An example of an implicit priming paradigm commonly utilised in the religious priming literature is the 'sentence unscrambling task' (SUT; Srull & Wyer, 1979), wherein participants are presented with several sets of randomly arranged words and are asked to rearrange them so that a coherent sentence is formed. In the religious priming literature, the word-sets given will contain religious words (e.g., 'church', 'God', 'Jesus'), and it is expected that exposure to those words will activate religious concepts in participants' minds; although, participants will be told that they are simply completing a word-puzzle task. Following the SUT, participants will complete a task assessing their attitudinal and/or behavioural prosociality to assess whether exposure to the religious primes influences prosociality.

Priming studies are generally favourable because they allow researchers to explore possible *causal* effects that religious concepts can have on participants' attitudes and/or behaviours (Batara et al., 2016). If participants are randomly assigned to their respective groups, and known extraneous variables (e.g., socioeconomic circumstances) are adequately controlled, any differences observed between those groups can sensibly be concluded to be due to the effects elicited by the different kinds of primes (e.g., religious primes or neutral/control primes) in each condition. Given the capacity of priming studies to uncover possible causal effects, there is now a growing body of literature exploring whether the activation of religious concepts via priming can produce effects on moral attitudes/behaviour.

Many studies in recent years have demonstrated that religious primes are effective in producing prosocial effects. For example, Randolph-Seng and Nielsen (2007) found that participants who were exposed to religious word primes (e.g., 'heaven', 'prayer') in the SUT cheated less in a subsequent task than participants exposed to sport-related and control primes did. Additionally, in their second study, Randolph-Seng and Nielsen found that participants who scored highly on an intrinsic religiosity measure who were exposed to subliminal religious primes (e.g., 'church', 'saint') also cheated less than intrinsically-religious participants in the control condition. In another priming study, Rand, Dreber, Haque, Kane, Nowak and Coakley (2014; Study 1) had Christian participants read generosity-related biblical passages (2 Corinthians 8:9-15 and Mark 10:17-23) and had them rate the extent to which the passage resonated with them along a 7-point Likert scale. Rand et al. found that participants who provided higher ratings (as to how well the passage resonated with them) were more cooperative in a one-shot prisoner's dilemma game than were participants who gave lower ratings. Many other priming studies have also demonstrated a positive religious priming effect on prosociality (e.g., Aveyard, 2014, Study 2; Batara et al., 2016; Shariff & Norenzayan, 2007). Such findings clearly support the religion-prosociality hypothesis.

Not all priming studies have yielded results in support of the religion-prosociality hypothesis, however. For example, Benjamin, Choi and Fisher (2016) conducted a study testing whether participants primed with religious concepts in an SUT paradigm would give away more money than control group participants in the Dictator Game (wherein participants are given a small sum of money and are asked to split the money however they please between themselves and an anonymous – actually non-existent – other participant). In addition to their own data, Benjamin et al. included the data from Shariff and Norenzayan (2007) and Ahmed and Salas (2011), in what was essentially a small-scale meta-analysis. Having analysed the collated data, Benjamin et al. failed to find an effect of religious primes on generosity in the Dictator Game. In another priming study, featuring participants from the United Arab Emirates, Aveyard (2014, Study 1) found that priming participants with religious concepts using an SUT priming paradigm did not influence honesty in a subsequent task.

Despite such null findings as those outlined above, a recent meta-analysis conducted by Shariff et al. (2016) found that there was a significant religious priming effect on prosociality. Notably, Shariff et al. explored whether the evidence in support of the religion-prosociality hypothesis in the priming literature was robust to possible publication bias and concluded that this was the case. However, van Elk et al. (2016) criticised the meta-analysis conducted by Shariff et al., noting that the technique utilised to control for the effects of publication bias (the ‘trim-and-fill’ method) may not have been ideal for this purpose, and noted that the criteria for inclusion/exclusion of studies featured in the meta-analysis were questionable. Given these concerns, van Elk et al. re-examined the data collated by Shariff et al. using two different meta-analytic techniques: the Precision-Effect Testing–Precision-Effect-Estimate with Standard Error (PET-PEESE) technique and the Bayesian Bias Correction (BBC) technique. While the BBC meta-analysis yielded a religious priming effect

robust to the effects of publication bias, the results from the PET-PEESE meta-analysis suggested that the effect of religious primes could be wholly attributed to publication bias. This led van Elk et al. to conclude that meta-analyses cannot settle the debate as to whether religious primes truly do influence prosociality, and that only pre-registered replication studies (studies which are accepted for publication prior to the results being obtained) with large sample sizes could achieve this end.

Given this recent controversy, it is now particularly important that researchers focus on whether *particular* religious primes produce more reliable effects than others. If religious primes truly do increase attitudinal and behavioural prosociality, then why is this so? Do religious primes in general produce prosocial effects, or do certain kinds of religious primes achieve this end more effectively than others? Religions are not monolithic constructs; they are highly complex and have many components, and so it is likely that primes that are relevant to different aspects of religious belief (e.g., punishment-related aspects, such as Hell, and reward-related aspects, such as Heaven) will influence religious people differently. Indeed, there is now a growing body of empirical literature suggesting precisely this.

### **Particular Primes, Particular Effects**

The vast majority of priming studies in the literature have approached the relationship between religiosity and prosociality in a rather broad way. Most such studies have utilised a diverse range of religious primes (e.g., ‘heaven’, ‘hell’, ‘God’, ‘Bible’, ‘church’, etc.) which are related only in the sense that they are relevant to religion (Ritter & Preston, 2013). Only a handful of studies have explored the ways in which *specific kinds* of religious primes can elicit *particular effects* (DeBono, Shariff, Poole & Muraven, 2017; Preston & Ritter, 2013; Saleam & Moustafa, 2016).

The obvious issue that arises from the use of a broad spectrum of distinct religious primes is that the resultant effects observed will be difficult to explain. The simplistic

explanation would be that the effects demonstrate that religious beliefs/thoughts, in general, promote prosociality. However, if distinct kinds of religious primes elicit distinct effects, then it is possible that only some of the primes being utilised are producing the effects, while others are not producing any attitudinal or behavioural changes, or may even be eliciting conflicting effects. Knowledge of which particular primes underlie the effects observed in religious priming studies will offer insight into *why* those effects are being observed.

As DeBono et al. (2017) noted, ‘religion’ is neither a simple nor monolithic construct; religion is highly multifaceted. Acknowledging the multifaceted nature of religion, many researchers have posited hypotheses accounting for how specific elements of religious traditions can promote particular attitudes and behaviours. For example, the ‘supernatural monitoring hypothesis’ (SMH) posits that because most religious traditions promote the idea that we are under constant surveillance by supernatural agents, priming people with religious concepts could increase prosociality by making people feel as though they are being watched (Atkinson & Bourrat, 2011; Gervais & Norenzayan, 2012). This feeling could translate into increased prosociality because people tend to behave more prosocially when they feel as though they are being watched by other people, as opposed to when they are alone (Haley & Fessler, 2005; Powell, Roberts & Nettle, 2012). This effect may be reflective of people’s concerns regarding the enhancement and maintenance of their public reputations (Piazza & Bering, 2008). Hence, given the SMH, one might predict that exposure to agent-based religious primes (e.g., primes that involve religious agents, such as ‘Jesus’, ‘God’ or ‘spirit’) – relative to, for example, institution-based religious primes (e.g., ‘chapel’, ‘church’) – may make religious people behave more prosocially. Indeed, Gervais and Norenzayan (2012) found not only that having people think about God (during a priming task) led to highly religious participants (relative to less or non-religious participants) expressing greater levels of public self-awareness, but also that priming religious people with religious words (e.g.,

‘God’, ‘prophet’, ‘spirit’) resulted in them responding in more socially-desirable ways during a subsequent task (Study 2). Perhaps this exaggeration in religious participants’ prosociality resulting from exposure to agent-related religious primes, as indicated by their socially-desirable responding on paper, will translate into actual increases in prosocial behaviour.<sup>2</sup>

The findings of several recent studies offer clear support for the notion that conceptually-distinct religious primes elicit distinct effects. For example, Harrell (2012) found that subliminal reward-related religious primes (e.g., ‘miracle’, ‘salvation’) increased behavioural prosociality, while more neutral religious primes (e.g., ‘cross’, ‘temple’) produced no effect on behavioural prosociality.<sup>3</sup> In another study, Yilmaz and Bahçekapili (2016, Study 1) found that implicitly priming participants with punishment-related religious words (e.g., ‘hell’, ‘devil’) increased their attitudinal prosociality, while unsorted religious primes (e.g., ‘grace’, ‘spirit’) had no effect on prosociality. Yilmaz and Bahçekapili (2016, Study 2) also found that people who read a passage of text talking about Allah’s tendency to punish people for their misdeeds responded more positively on measures of attitudinal prosociality – while participants who read a passage of text referring to Allah’s kindness and mercifulness responded no more positively – than control group participants.

These findings demonstrate that the simplistic categorisation of primes as either religious or secular is insufficient when trying to determine how religious beliefs/thoughts influence prosociality. In Harrell’s (2012) study, subliminal reward-related religious primes elicited identical effects to reward-related secular primes (e.g., ‘admire’, ‘applause’), and Yilmaz and Bahçekapili (2016, Study 1) found that punishment-related religious primes

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<sup>2</sup> Unfortunately, Gervais and Norenzayan (2012) did not use exclusively agent-related religious primes. For example, they also utilised ‘divine’ and ‘sacred’ as prime words. Hence, it is difficult to say whether the agent-related primes alone account for the observed effects, or whether *all* of the primes underlay the effects on the basis that they all contain religious content.

<sup>3</sup> This study utilised a largely Christian sample. One problem with the reward-unrelated religious primes in this study was that they were not specific to Christianity, and many of the words used were lesser known (e.g., ‘temple’ as opposed to ‘church’) or ambiguous (e.g., ‘cross’ as opposed to ‘crucifix’). This may have inadvertently lowered the probability that the reward-unrelated religious words would elicit noteworthy effects.

elicited identical effects to punishment-related secular primes (e.g., ‘police’, ‘prison’). These results suggest that the religious element is not what underlies the observed prosocial effects. Rather, it is whether the primes are reward-related or punishment-related, irrespective of whether or not those prime-words have religious connotations.

Given these findings, it seems clear that religious primes elicit their effects not because they carry religious content in general, but because they carry content that appeals directly to our interests (e.g., rewards, punishments, etc.). Of course, for reward-related or punishment-related primes of any kind to be effective, the people exposed to those primes need to believe that the relevant prime-words reflect actual rewards and punishments. What is rewarding or punishing to one person may be meaningless to another, and what is considered to be a viable reward by a religious person (e.g., an eternity in Heaven) may be a mere fairy-tale in the eyes of a non-religious person. Indeed, as Shariff et al. (2016) found in their meta-analysis of the religion-prosociality priming literature, the prosocial effects of religious primes do not appear to generalise to non-religious people. A prime-word like ‘heaven’ may only produce a prosociality effect if people actually believe in Heaven, and so the religious element of the prime is not entirely irrelevant. However, given the nature of the effects observed, and given that the effects of religious primes are identical to those of conceptually-equivalent (e.g., agent-related, reward-related, punishment-related) secular primes (Gervais & Norenzayan, 2012, Study 1; Harrell, 2012; Yilmaz & Bahçekapili, 2016, Study 1), it seems clear that the effects elicited by religious primes depend on the *particular* contents of those primes. Hence, future researchers exploring the effects of religious primes would be well advised to develop distinct conceptual categories for the primes they intend to use.

### **The Prominence of Reward and Punishment Concepts in Religious Traditions**

Given the data outlined in the previous section, the question arises: why is it that, at least in experimental settings, references to supernatural rewards and punishments elicit



prosocial effects, rather than, for example, anti-social effects?<sup>4</sup> After all, while many studies have found that priming people with general (i.e., non-particular) religious primes can increase prosociality (e.g., Shariff & Norenzayan, 2007), some studies have found that priming people with general religious primes can result in increases in anti-social behaviour (e.g., Johnson et al., 2010).

The predominant monotheistic religions of the modern era – namely Christianity and Islam – share a major theme in common: a focus on supernatural rewards and punishments (Johnson, 2016; Saleam & Moustafa, 2016). Christians and Muslims are promised that they will have an eternal afterlife in Heaven/Paradise if they believe in Christ/Allah and adhere to the teachings of the Bible/Qur’an. The following verses from the Bible and Qur’an attest to this:

*My sheep hear my voice, and I know them, and they follow me: And I give unto them eternal life; and they shall never perish, neither shall any man pluck them out of my hand.* – John 10:27-28 (KJV)

*Say, "Is that better or the Garden of Eternity which is promised to the righteous? It will be for them a reward and destination. For them therein is whatever they wish, [while] abiding eternally. It is ever upon your Lord a promise [worthy to be] requested.* – Qur’an 25:15-16 (Sahih International Translation)

Christians and Muslims are also threatened with the prospect of an eternity in Hell if they disbelieve and conduct themselves immorally. The following verses from the Bible and Qur’an attest to this:

*But the fearful, and unbelieving, and the abominable, and murderers, and whoremongers, and sorcerers, and idolaters, and all liars, shall have their part in the*

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<sup>4</sup> What is considered prosocial or anti-social differs from society to society and from religion to religion. The findings of relevant studies seem to converge on the conclusion that such primes will promote behaviour which is prosocial *within that sociocultural context*, but further research should be done to test this explicitly.

*lake which burneth with fire and brimstone: which is the second death. – Revelation 21:8 (KJV)*

*But as for those who defiantly disobeyed, their refuge is the Fire. Every time they wish to emerge from it, they will be returned to it while it is said to them, "Taste the punishment of the Fire which you used to deny." – Qur'an 32:20 (Sahih International Translation)*

Other mainstream religions, such as Hinduism and Buddhism, also contain supernatural reward and punishment elements. As D'Souza (2009) noted, the concept of 'karma' adds an element of reciprocity to any moral equation. 'Good karma' in various Eastern religious traditions provides an incentive to behave morally (good things happen to good people), just as the concept of 'bad karma' discourages people from behaving immorally (bad things happen to bad people). Johnson (2016) noted that the concept of karma may be an even more effective means of promoting prosocial behaviour than monotheistic religions' promises/threats of an eternity in Heaven or Hell, as one cannot simply apologise/repent in order to escape the consequences of bad karma. Indeed, karma is essentially a kind of "supernaturalistic cause and effect" (Saleam & Moustafa, 2016, pg.4), whereby one's moral actions will eventually lead to positive outcomes for oneself, and one's immoral actions will eventually lead to negative outcomes for oneself.

Even during ancient times, reward and punishment concepts featured – though not nearly as centrally – in a number of religious traditions. For example, in Ancient Egypt, it was believed that the deceased would be brought before the god Anubis, who would weigh their hearts against a feather from the goddess Maat, who was the divine embodiment of truth, morality, and justice (Armour, 2010; Carelli, 2011). If a person's misdeeds in life had made his/her heart heavier than the feather of Maat, then his/her heart would be consumed by a crocodile-headed creature named Ammit, and this would prevent that person from

progressing to the afterlife and *Paradise* (Budge, 2011; Carelli, 2011). Moreover, in Ancient Greek mythology, though the gods were largely unconcerned with human morality (Stark, 2008), it was said that virtuous people would go to the *Elysium* or to the *Islands of the Blessed* after death (Petrisko, 2000; Retief & Cilliers, 2006). While the gods of many ancient religions often made poor moral exemplars, as they were often highly capricious and cruel (Stark, 2008), it is nevertheless clear that concepts of divine rewards and punishments linked to moral/immoral conduct still featured in many of these early religions (Malinowski, 1935). Rather than being novel concepts in many of today's religious traditions, divine reward and punishment concepts, linked to human moral conduct, have existed for millennia.

These concepts are not mere relics in religion that are not taken seriously by modern-day religious people. Religious preachers and apologists regularly reference the divine rewards promised to righteous people, and the divine punishments promised to wicked people. Consider the following quote by Ravi Zacharias, a popular Christian preacher, which informs readers that the faithful adherents of Christianity will go to Heaven, while those who dismiss it will not:

*The mocker will not have the last laugh. You see, dancing on the grave of an extinguished Christianity is farcical at best. Because the grave is empty. And the one who knows the way out of the grave sits in the heavens and laughs.* – Zacharias (2015)

The following quote from a popular Christian apologist draws a clear link between morality and the afterlife:

*Virtually all conceptions of life after death, especially the religious conceptions, are rooted in the idea of cosmic justice... In all these doctrines, life after death is not a mere continuation of earthly existence, but rather a different kind of existence based on a settling of earthly accounts. These theories hold that even though we don't*

*always find terrestrial justice, there is ultimate justice. In this future accounting, what goes around does come around.* – D’Souza (2009, pg.180)

Beliefs in Heaven and Hell have very real consequences for human well-being and mental health. For example, Shariff and Akin (2014) found that belief in Heaven was associated with greater levels of self-reported happiness and life-satisfaction, while belief in Hell was associated with lower levels of self-reported happiness and life-satisfaction. Many religious people declare how terrified they are of going to Hell (e.g., see one account outlined by Dawkins, 2007, pg.317-318), and many books written about the reality of Heaven have achieved ‘best-seller’ status (e.g., Alexander, 2013; Burpo, 2011; Malarkey & Malarkey, 2011; Piper & Murphey, 2014). Clearly, beliefs in supernatural rewards and punishments weigh heavily on the minds of believers. Of course, in order to obtain supernatural rewards (e.g., an eternity in Heaven), rather than harsh supernatural punishments (e.g., an eternity in Hell), one must believe and adhere to the teachings of their religious tradition and live a righteous life. Hence, it would be wise for believers to behave morally, if they wish to achieve positive outcomes and/or avoid negative outcomes.

### **The Supernatural Punishment Hypothesis**

The notion that the punishment-related elements of religion are effective at promoting prosociality and dissuading anti-sociality is known as the ‘supernatural punishment hypothesis’ (SPH; Johnson, 2005). According to the SPH, the belief that invisible supernatural agents and forces exist, and can bring misfortune or pain to wrongdoers, acts as a strong disincentive for immoral behaviour. As the previous section outlined, today’s predominant holy texts contain a plethora of references to the punishments that wrongdoers will receive (e.g., Qur’an 4:10; Revelation 21:8) and the punishments that wrongdoers have supposedly already suffered throughout history (e.g., Exodus 14:21-31; Qur’an 29:39-40);

hence, believers are given strong reminders of the link between disobedience and punishment.

Many researchers exploring the link between religious belief and prosociality have argued that the punishment-related elements of various religious traditions may have played a particularly important role in the development of largescale cooperation, which is required for the building of vast societies like those of the modern era (Johnson, 2016; Yilmaz & Bahçekapili, 2016). In order for largescale societies to form, according to this account, there would need to be widely accepted/presumed penalties for cheaters and defectors, which would be sufficient to dissuade the vast majority of people from ever engaging in these anti-social activities (Johnson & Bering, 2006). Belief in the existence of morally-interested supernatural agents who can punish anti-social activities may have satisfied these criteria.

It could be argued, however, that secular systems of punishment could also meet such a standard. After all, humans have lived in societies with governments and penal systems for millennia. However, in the context of human history, as Johnson and Krüger (2004) argued, largescale secular societal systems for dealing with defectors (i.e., governments and legal systems) are relatively recent innovations. Belief in punitive supernatural agents may have played a significant role in the promotion of cooperation and prosociality in human prehistory, before the formation of secular systems. Perhaps such beliefs made the formation of largescale secular systems possible (Johnson, 2016).

One particular benefit of supernaturalistic systems of punishment, relative to secular systems of punishment, is that some of the costs of enforcement are outsourced to a supernatural being, thereby reducing the costs to righteous believers who no longer need to carry the entire burden of enforcement (Johnson, 2005). While religious communities still utilise secular punishments (e.g., exile, imprisonment, fines and torture), the looming threat of powerful supernatural punishments (e.g., eternal agony after death) may dissuade sizable

numbers of people from committing crimes, thereby relieving pressure on a given society's secular penal system (Johnson, 2005). Furthermore, even if a prospective criminal was highly confident that he/she could avoid detection and thereby escape secular punishment(s) for his/her misdeed(s), he/she could have no certain way of avoiding detection and punishment by supernatural agents. Arguably, this is a major advantage that supernatural punishment systems have over secular punishment systems.

Recent findings in the religion-prosociality literature support this contention. For example, Shariff and Rhemtulla (2012) found a negative correlation between belief in Hell and national crime rates, using data from World Values Surveys (WVS) and European Value Surveys from a total of 67 countries.<sup>5</sup> In another study, spanning 186 societies around the world, Johnson (2005) found that belief in moralising high gods (MHGs) correlated with several metrics of societal cooperation (e.g., lending of money and payment of taxes). Johnson argued that this relation may stem from the fact that MHGs tend to threaten wrongdoers with divine punishments.

The SPH is also supported by the findings from several recent empirical studies. For example, Hadnes and Schumacher (2012) found that participants primed with traditional religious concepts (with an emphasis on punishment) were more likely to risk the endowments they were given in the Trust Game (see Berg, Dickhaut & McCabe, 1995) than were participants in the control group. Participants exposed to these religious primes also gave away higher sums of money than participants in the control condition in the Trust Game. Additionally, the results of two empirical studies conducted by Yilmaz and Bahçekapili (2016) found that the explicit and implicit priming of religious participants with punishment-related religious concepts was sufficient to increase their attitudinal prosociality.

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<sup>5</sup> The results of this study are explored further in the next section.

While the SPH has received a great deal of attention in the religion-prosociality literature, the supernatural reward hypothesis (SRH) has received very little attention. The evidence in support of the SRH, as well as the reasons for its neglect in the literature, are explored below.

### **The Neglect of the Supernatural Reward Hypothesis (SRH)**

While many studies have investigated the merits of the SPH, only one empirical study has directly explored the effects of reward-related religious primes on prosocial behaviour (i.e., Harrell, 2012; see above). Besides the findings of Harrell (2012), the findings of only one other empirical study provide tentative support to the SRH. Pichon, Boccato and Saroglou (2007; Study 1) found that participants exposed to religious primes with positive connotations (e.g., ‘Christmas’, ‘salvation’) chose to distribute larger numbers of pamphlets for charities than participants who were exposed to neutral religious primes (e.g., ‘parish’, ‘temple’), positive secular primes (e.g., ‘smile’, ‘thanks’), and neutral secular primes (e.g., ‘balance’, ‘switch’). Harrell noted that several of the positive religious prime-words used in this study were *reward-related*, which suggests that the mere presence of generically positive content may not be what produced the prosocial effects observed by Pichon et al., but rather, it may have been the reward-related elements producing the effects observed.

One factor underlying the lack of attention devoted to the SRH is the notion that punishments are far more effective than rewards when it comes to the promotion of prosociality (Shariff, 2008). As Johnson and Bering (2006) argued, rewards tend to be effective at encouraging *some* people to cooperate, but rewards cannot prevent *all* people from cheating. When it comes to cooperation, people have nothing to lose and much to gain by defecting. However, a system (e.g., a culture, religion or legal code) that promises to punish defectors has the capacity to encourage *all* people to cooperate and to deter *all* people from defecting. Arguably, systems based on supernatural punishment can achieve these ends,

just as secular systems (e.g., governments with penal systems) are designed to achieve these ends today (Johnson and Krüger, 2004).

It is noteworthy that there are few, if any, secular systems within which governments/authorities focus on rewarding people for doing good deeds. Contrastively, all modern-day legal systems punish (e.g., through imprisonment) individuals who break the law. Divine reward concepts may have emerged later and/or simply to enhance the effects of punishment-based systems by providing an additional incentive for people to cooperate (e.g., in Christianity and Islam, believers do not only avoid Hell through their religious adherence; they will also be rewarded with eternal life in Heaven/Paradise).

The notion that belief in supernatural punishments promotes cooperation and prosociality more effectively than belief in supernatural benevolence and rewards is supported by the fact that many pre-industrial societies believed in exclusively punitive and vengeful supernatural agents, while very few pre-industrial societies have embraced belief in exclusively benevolent supernatural agents (Johnson & Bering, 2006). It is argued that the commonality of systems centred on supernatural punishments, relative to systems centred on supernatural benevolence/rewards, suggests that supernatural punishments have greater societal utility than supernatural benevolence/reward beliefs (e.g., perhaps such beliefs produce more stable societies by increasing cooperation and prosociality). On this account, belief in benevolent supernatural agents and supernatural rewards has, at most, a minor influence on cooperation and prosociality.

Despite this, the superiority of divine punishments over divine rewards with regard to the promotion of cooperation and prosociality does not preclude the possibility that the expectation of divine rewards can, and does, motivate believers to behave prosocially. Indeed, as was previously noted, Harrell (2012) found that the subliminal priming of reward-related concepts was sufficient to increase generosity in anonymous settings (also see Pichon



et al., 2007). However, the limited evidence supporting the SRH is difficult to interpret, as there are other findings in the religion-prosociality literature that appear to contradict it. For example, running contrary to the predictions of the SRH, Shariff and Rhemtulla (2012) found that the extent to which belief in Heaven exceeds belief in Hell, in a given country, positively correlated with national crime-rates. That is, in countries within which higher proportions of people believe in Heaven, crime-rates are higher. Shariff and Rhemtulla also found that the extent to which belief in Hell exceeds belief in Heaven in a given country negatively correlated with national crime-rates. On the basis of these findings, Shariff and Rhemtulla concluded that belief in punitive supernatural agents is more conducive to the reduction of antisocial behaviour relative to belief in benevolent supernatural agents.

Several empirical studies have yielded further evidence supporting the idea that benevolent gods are unideal when it comes to promoting prosociality. Shariff and Norenzayan (2011) asked participants to rate the extent to which certain words reflected what they believed God's nature to be. Either before or after providing these ratings, participants completed a mathematical quiz, within which there were simple ways to cheat. Shariff and Norenzayan found that participants' ratings of God as 'compassionate', 'loving', 'peaceful', and so on, correlated positively with the number of times they cheated during the quiz task; whereas participants' ratings of God as 'harsh', 'terrifying', 'vengeful', and so on, correlated negatively with the number of times they cheated. Similarly, by using an explicit priming paradigm, Card (2013, Study 2) found that participants who read a passage about a benevolent God cheated more often on a subsequent quiz task than participants who read a passage about an all-powerful God and participants who read a passage of text referring to the mental health benefits that result from the consumption of fatty fish (the control condition passage). Yilmaz and Bahçekapili (2016, Study 2) also obtained results suggesting that benevolent gods may be unideal for the promotion of prosocial behaviour. While participants

who read a passage of text about Allah's vengefulness and punishments expressed higher attitudinal prosociality (relative to control group participants) in a subsequent task, participants who read a passage of text about Allah's mercifulness and forgiveness did not differ from control group participants in terms of attitudinal prosociality.

Taken together, the results of the studies outlined above appear to pose a significant challenge for the SRH. If participants primed with benevolent God concepts behave more antisocially than those primed with punitive God concepts (Shariff & Norenzayan, 2007), and no more prosocially than control group participants (Yilmaz & Bahçekapili, 2016, Study 2), then it would appear that divine rewards are relatively ineffective at increasing prosociality and decreasing anti-sociality. However, one major problem with disregarding the SRH on the basis of the findings outlined above is that, while the aforementioned findings all converge to suggest that benevolent deities are generally ineffective when it comes to the promotion of prosociality, it does not follow that divine rewards (a specific kind of divine benevolence) are ineffective at promoting prosociality. Indeed, belief in Heaven (or other divine rewards) is not tantamount to belief in a benevolent and forgiving deity. Consider the Biblical (John 10:27-28; Revelation 21:8) and Qur'anic (25:15-16; 32:20) verses quoted above. The gods reflected by those verses harshly punish immoral conduct *and* greatly reward moral conduct. A god could, theoretically, be angry and vengeful while still promising to reward people who behave morally. Similarly, a god could be friendly and loving while still promising to harshly punish those who harm others.

Perhaps a mistaken conflation of divine benevolence and divine rewards explains the lack of research testing the SRH. The lone empirical study directly examining the merits of the SRH (Harrell, 2012; also see Pichon et al., 2007) found that reward-related religious primes did promote positive behavioural prosociality (generosity, in this instance). Hence, the differentiation between divine benevolence and divine rewards is certainly not without merit.

Were the results outlined above (i.e., Card, 2013, Study 2; Shariff & Norenzayan, 2011; Shariff & Rhemtulla, 2012; Yilmaz & Bahçekapili, 2016, Study 2) sufficient to refute the SRH, then the results obtained by Harrell (2012) – and perhaps Pichon et al. – would be difficult to explain. However, only further experimentation can determine whether the SRH is correct or not, and any experiments designed to achieve this end should differentiate between divine benevolence and divine rewards. Study 1 (below) was designed with these considerations in mind.

### **The Present Research**

Given the lack of research focusing explicitly on the SRH, and given the recent controversies regarding publication bias (i.e., the successful publication of studies with positive findings, possibly complemented by a lack of publications of studies that failed to detect a religion-prosociality effect) in the religion-prosociality literature (see van Elk et al., 2016), the replication and expansion of the findings of Harrell (2012) is required. The study outlined in the next section was designed to replicate the findings of Harrell (i.e., that reward-related religious primes increase behavioural prosociality) using an explicit priming methodology (whereas Harrell, 2012, utilised a subliminal priming paradigm).

As was previously noted, one advantage of using explicit priming paradigms is that the primes used can convey complex messages that subliminal and implicit primes cannot (Shariff et al., 2016). On this basis, explicit reward-related religious primes may be preferable because participants will not only be presented with reward-related religious words but also with a coherent narrative that speaks about the value of those rewards, and how they can be obtained. Essentially, participants will be thinking about exactly what the experimenter wants them to think about.

The measure of prosociality in this study will be the amount of money participants give away in the Dictator Game (see Procedure section), which was the same measure of

behavioural prosociality utilised by Harrell (2012). It was hypothesised that participants who read the reward-related religious passage would give away more money in the Dictator Game than would participants who read a passage of text focusing on God's benevolence and mercifulness or a control text (in this case, a text about communication).

## **Study 1**

## Method

### Participants

All participants were recruited via Amazon's Mechanical Turk (MTurk) system. MTurk is an online marketplace which allows people to advertise tasks that they would like to have completed, while prospective participants are able to see those tasks and select which ones they are interested in completing (Buhrmester, Kwang & Gosling, 2011). Participants are paid for their time, as per the pay offered in the MTurk advertisements for any given task.

Prospective participants first responded to a short survey asking what religion they subscribe to, what country they reside in, and how deeply religious they consider themselves to be. Those who identified as being religious, and who gave a score of 4 or higher along the 7-point religiosity scale were eligible to participate in the study. Participation was restricted to Western nations.

This resulted in the recruitment of a total of 102 participants (36 males; 66 females; all over 18 years of age). Of these 102 participants, a total of 11 participants were excluded from the study. 6 participants were excluded from the analysis on the basis that they expressed – in response to the suspicion probe – fairly accurate knowledge as to what the purpose of the study was, and such knowledge may have influenced giving behaviour. One participant was removed from the analysis because his/her responses to the suspicion probe and other short-response questions were irrelevant to the questions being asked, and hence, did not make sense in context. Another 2 participants were excluded from the analysis because their attempts reflected a conspicuous lack of effort (e.g., identical responses to distinct questions, and unrealistically fast study completion times: ~3 minutes). The other 2 participants were excluded because they expressed strong theological disagreement with the content of the priming passage in the religious reward condition (i.e., that good deeds and divine rewards are completely unlinked in Christian doctrine), which may have influenced

the ultimate response on the dependent variable (e.g., by rousing annoyance and/or defensiveness in participants). These exclusions resulted in a final sample of 91 participants (33 males; 58 females). The vast majority of the participants were Christians ( $N = 86$ ),<sup>6</sup> while the sample also included 4 Jews and 1 Buddhist.

All participants – excluding those who were excluded for a lack of effort or for giving incoherent responses – were paid \$1.03(USD) for their participation, in addition to however much money they decided to keep in the Dictator Game (see below).

### **Procedure**

The methodology of this study was derived from that utilised by Yilmaz and Bahçekapili (2016, Study 2), with some minor deviations.<sup>7</sup> For example, their religious punishment condition was replaced with a religious reward condition. Unlike the study conducted by Yilmaz and Bahçekapili, this study utilised a *behavioural* measure of prosociality (i.e., the Dictator Game), rather than a measure of prosocial *attitudes* (i.e., a survey asking participants how likely they would be to help others in a given situation). Additionally, unlike the study conducted by Yilmaz and Bahçekapili, this study was conducted online, rather than in-person. Proof of ethics approval for this study is provided in Appendix A.<sup>8</sup>

**Priming phase.** Participants were randomly assigned to one of three conditions: religious reward (RR), religious kindness (RK), or the control condition. To counter the possibility of participants becoming aware of the study's purpose, participants were told that they were participating in two 'separate sub-studies' (mild deception). Participants were told that they had 60 minutes to complete both 'studies'.

After reading the study information (see Appendix B), participants were asked whether they consider themselves to be fluent in English. Those who answered 'No' were excluded

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<sup>6</sup> One of these Christian participants identified as a Mormon.

<sup>7</sup> Permission to use and adapt this priming procedure was obtained from Onurcan Yilmaz of Dogus University in Turkey via a personal correspondence.

<sup>8</sup> This ethics approval document also covers Studies 2 and 3 (below).

from participating further. Participants were then asked to provide informed consent (see Appendix C). As part of what participants were told was ‘Study 1’, participants then completed a short demographics questionnaire (see Appendix D) that asked them about their gender, age, religious persuasion, level of religious devoutness (along a 7-point scale), how many years they have studied at a college or university, what country they currently reside in, and how wealthy they consider themselves to be (along a 7-point scale).

After completing the short survey, participants in the RR condition read the following passage of text about the great rewards that God promises in return for pious/moral conduct:

*There are no rewards equal or equivalent to those that God possesses. The people who are moral and do good deeds will receive God’s greatest rewards. Those who believe in God and do good deeds will spend their afterlives in Heaven, and will live there eternally. In Heaven, those righteous people will be in constant enjoyment and fulfilment, and will have all that they could ever desire, and they will be most thankful. They will never experience any feelings of need or disappointment in Heaven. Of all of those who believe in God, the honest men and honest women, the patient men and patient women, the modest men and modest women, the just men and just women, and the charitable men and charitable women, will receive that great and unending reward – an eternity in Heaven – for their righteous conduct. This is God’s promise, and there is nothing as truthful or as trustworthy as God.*

Participants in the RK condition read the following passage of text referring to God’s kindness and forgiveness (adapted from Yilmaz & Bahçekapili, 2016, Study 2):

*God is the Lord of the heavens and the earth and all things between them. There is nothing in the universe as powerful, or as merciful, as God. He is both mighty and forgiving. Those who go about their lives and consider God in all of the*



*important decisions that they make will receive His favor. They are certainly righteous people, and God will grant them mercy. God is happy with them and they are happy with Him. But God does not demand absolute perfection. There are many people who have done good things and bad things. But if they acknowledge their sins, perhaps God will forgive them. Just as God may forgive those who do bad things unintentionally or out of ignorance, so long as they repent afterwards. And just as God will forgive those who are forced to sin by other people. Indeed, God does not blame you for the things you are unfairly forced to do.*

Participants in the control condition read the following passage of text about the properties of spoken language (adapted from Yilmaz & Bahçekapili, 2016, Study 2):

*A primary feature of language is that it helps people to live as social beings. People use language to express their thoughts, feelings, wishes, plans, and so on. An individual becomes part of the society by learning its language, and to learn that language, an individual must interact with other people in that society. Thus, social interaction is essential for language acquisition. It should be noted that there are two types of language: internal and external. Internal language is the representation of linguistic knowledge in your mind. External language is the expression of that knowledge in the form of speech or writing when interacting with other individuals. Factors such as the voice, age and sex of the speaker play a key role in determining the meaning of linguistic expressions. For example, the tone of the voice helps the listener to understand whether what he is hearing is a joke or is meant to be serious.*

Additionally, to ensure that participants were truthful when they claimed to be fluent in English, participants were asked to describe (in at least 80 characters) what the passage of text

they read was about. Participants who gave incoherent responses, or responses that otherwise indicated a lack of English-competency or basic effort, were excluded from the study. Asking participants to summarise the passage they had read was also expected to enhance the priming effect by having them actively engage with the material, when they could otherwise have rushed through it without absorbing the themes (e.g., divine reward) of each passage.

Participants then completed a shortened version of the Positive and Negative Affect Schedule (PANAS; Watson, Clark & Tellegen, 1988; see Appendix E), as their responses could indicate whether the texts in the different conditions elicited particular/discrepant effects on participants' moods. In this task, participants were presented with 20 words relevant to mood. Of those words, ten were 'positive' (e.g., 'calm', 'happy') and ten were 'negative' (e.g., 'irritable', 'sad'). Participants were asked to rate how accurately each word described their current mood, along a 5-point scale (1 = "not at all"; 5 = "highly"). Participants were also asked to briefly describe their current mood.

Following the PANAS, participants were asked what they thought the purpose of the study was. This question was included to further convince participants that the preceding questions were part of one study, and that what was to follow was a separate study. After responding to this question, participants were told that the 'first study' was finished, and that they were moving on to 'Study 2'.

**Dictator Game.** Participants then played the Dictator Game. In the Dictator Game, each participant is given a specified sum of money, and is asked to split that money between himself/herself and a 'Receiver'. Participants were told that they had been randomly assigned to the 'sender' group, meaning that they would be deciding how much money to send to the anonymous (though actually non-existent) 'receiver', whom they were told was supposedly completing a separate unpaid task. In this study, participants were allocated \$1.00(AUD) to split between themselves and the anonymous receiver. Participants were asked to ensure that

the amount they nominated fell between \$0.00(AUD) and \$1.00(AUD), as the nomination of an invalid amount would invalidate their data. Participants were also told that the receiver would not be told who the sender was, or how much money the sender kept for himself/herself. This was done to address the influence of social pressure on generosity. The entire Dictator game setup for this study is shown in Appendix F.

After completing the Dictator Game, participants responded to a suspicion probe question, which asked them what they thought the purpose of the research was, to see whether any of them had worked out the purpose of the study. Completion of the suspicion probe concluded the study. All participants who completed the online study were sent an e-mail which explained the true nature and purpose(s) of the study (see Appendix G) and were given the opportunity to withdraw participation if the mild deception involved gave them cause for concern.

## **Analyses and Results**

### **Statistical Analyses**

To determine whether the independent variables (IVs) of self-reported levels of tertiary education (none; less than 1 year; 1 year; 2 years; 3 years; 4 or more years), wealth (1 – 7) or religious devoutness (1 – 7) influenced generosity (the dependent variable, as measured by how much money participants chose to give away in the Dictator Game), Spearman's Rho correlational analyses were utilised. Spearman's Rho tests were favoured over parametric alternatives because, according to Shapiro-Wilk tests of normality, the data in all three experimental conditions violated the assumption of normality ( $p < .01$ ).

Mann-Whitney  $U$  tests were then conducted to determine whether males and females differed in terms of generosity (as measured by how much money participants chose to give away in the Dictator Game). Mann-Whitney  $U$  tests were used instead of  $t$  tests due to the non-normality of the data across all conditions.

To determine whether there were differences in generosity (as measured by how much money participants chose to give away in the Dictator Game) across the three experimental groups (RR, RK, and control), a between-subjects analysis of variance (ANOVA) test was conducted. The assumption of homogeneity of variance was met, and although the assumption of normality was violated in all conditions, ANOVA tests are generally considered to be robust to normality violations when there is a sufficient number ( $N \geq 30$ ) of participants in each group/cell (Hills, 2011).

In their study, Yilmaz and Bahçekapili (2016, Study 2) removed participants from the dataset if they rated the impressiveness of the passage of text they read (along a 7-point scale) with a score of 3 or less. In the present study, participants were not only asked to rate how ‘impressive’ the text was, but also how ‘meaningful’ it was. To ensure that the effect outlined above was robust to considerations of the impressiveness and meaningfulness of the text to individual participants, a Kruskal-Wallis test was conducted.<sup>9</sup> This non-parametric test was used instead of an ANOVA because, after the omission of the data from participants with low overall impressiveness-meaningfulness scores, two of the experimental conditions had fewer than 30 participants. For this statistical analysis, individual participants’ scores on the impressiveness and meaningfulness measures were summed and then divided by 2 to form overall impressiveness-meaningfulness scores. 7 participants whose overall scores fell *below* 3.5 were excluded from the analysis.

The final consideration was the results on the PANAS. One participant was removed from the PANAS-related analyses because he/she was unable to record responses to the PANAS due to a technical error. The scores on the 10 positive affect items (e.g., ‘happy’, ‘relaxed’) were summed to form each participant’s overall ‘positive affect’ score, and scores

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<sup>9</sup> It is generally unadvisable to use ANOVA tests when the assumption of normality is violated in a dataset that contains less than 30 participants in each cell (Hill, 2010).

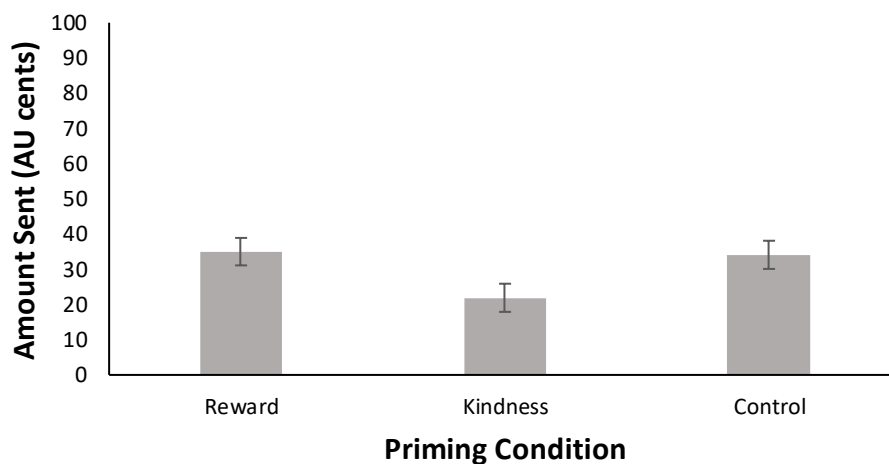
on the remaining 10 items were summed to form each participant's overall 'negative affect' score. To determine whether self-reported levels of positive affect (DV) differed across experimental conditions (IVs), a between-subjects ANOVA test was conducted. However, to determine whether self-reported levels of negative affect (DV) differed across experimental conditions (IVs), a Kruskal-Wallis test was conducted because the assumption of homogeneity of variance was violated.

## Results

Levels of self-reported levels of tertiary education did not correlate with generosity generally ( $r_s = .07, p = .52$ ), nor within any of the experimental conditions (RR:  $r_s = .21, p = .26$ ; RK:  $r_s = .08, p = .66$ ; control:  $r_s = .19, p = .31$ ). Nor did levels of self-reported wealth correlate with generosity generally ( $r_s = .02, p = .84$ ), or within any of the experimental conditions (RR:  $r_s = .04, p = .82$ ; RK:  $r_s = .02, p = .84$ ; control:  $r_s = .14, p = .45$ ). Nor did levels of self-reported religious devoutness correlate with generosity across the entire sample ( $r_s = .04, p = .71$ ), or within any of the experimental conditions (RR:  $r_s = .01, p = .94$ ; RK:  $r_s = -.13, p = .48$ ; control:  $r_s = .28, p = .13$ ).

No difference in generosity between males and females was observed across the entire sample:  $U = 867, p = 0.44$ . Within each experimental condition, males ( $Mdn = \$0.30$ , interquartile range = 0.30) and females ( $Mdn = \$0.50$ , interquartile range = 0.33) did not differ significantly in terms of generosity in the RR condition:  $U = 107, p = 0.92$ . Nor did males ( $Mdn = \$0.10$ , interquartile range = 0.30) and females ( $Mdn = \$0.20$ , interquartile range = 0.37) differ significantly in terms of generosity in the RK condition:  $U = 89.5, p = 0.39$ . Nor did males ( $Mdn = \$0.35$ , interquartile range = 0.33) and females ( $Mdn = \$0.35$ , interquartile range = 0.40) differ significantly in generosity in the control condition:  $U = 90.5, p = 0.86$ .

In the main analysis, a significant main effect of experimental condition on generosity was observed:  $F(2, 88) = 5.46, p < .01$ . Tukey HSD post-hoc comparisons were utilised to determine where the specific differences between the groups lay. Participants in the RR condition ( $M$  given = \$0.35) and the control condition ( $M$  given = \$0.34) did not differ significantly in terms of generosity ( $p = .99$ ). However, participants in the RK condition ( $M$  given = \$0.18) were significantly *less* generous than participants in the RR condition ( $p = .01$ ) and participants in the control condition ( $p = .02$ ). These findings are illustrated in Figure 1.



**Figure 1.** *The average amount of money (in Australian cents) given by participants in each experimental condition.*

After excluding the 7 participants who did not find the texts they read impressive or meaningful, the Kruskal-Wallis test revealed that the effect of experimental condition on generosity was still significant:  $H(2) = 9.96, p < .01$ . Post-hoc Mann-Whitney  $U$  tests revealed that the participants in the RR condition and the control condition still did not differ significantly in terms of generosity ( $U = 375, p = .78$ ), and that participants in the RK condition were still significantly *less* generous than participants in the RR condition ( $U = 221, p < .01$ ) and the control condition ( $U = 241.5, p < .01$ ).

No significant differences in self-reported positive affect were observed across the experimental conditions:  $F(2, 86) = 0.93, p = .40$ . Nor were any significant differences in self-reported negative affect observed across the experimental conditions:  $H(2) = 2.16, p = .34$ .

## Discussion

### Implications for the Supernatural Reward Hypothesis

The central hypothesis of this study was that religious participants exposed to a reward-related religious prime would be more generous in the Dictator Game, relative to participants exposed to a control prime or a prime emphasising divine kindness/mercy. This hypothesis was not supported by the data. While participants who read the passage about divine rewards gave away more money than participants who read a passage of text about divine kindness/mercy, participants in the control condition gave away approximately the same amount on average.

Prior to this study, only one empirical study exploring the merits of the SRH had been conducted (i.e., Harrell, 2012). In that study, subliminal primes were used, while explicit primes were utilised in this study. Harrell found that reward-related religious primes did positively influence generosity, while the present study found no such effect. The results of the present study are also at variance with those obtained by Pichon et al. (2007), who found that religious primes with positive content were more effective at increasing prosociality (by increasing the accessibility of prosocial concepts in participants' minds) than general religious primes. The reward-related religious passage in this study was positive in nature, and yet participants in the religious reward condition were no more prosocial than participants in the control condition. The question arises: why did the present study fail to demonstrate an effect?

Perhaps van Elk et al. (2016) were correct in their assessment about the risk of publication bias. It may be the case that other studies exploring the merits of the SRH found null results and were simply never published. Van Elk et al. found that the robustness of the religious priming effect on prosociality may not be robust after accounting for potential publication bias, and the null finding of the present study could be considered a vindication of van Elk et al.'s concerns. However, there is another possible reason as to why the present study failed to yield the anticipated effect.

While the data obtained in Study 1 offer no support for the SRH, it must be noted that this study had several weaknesses. Perhaps the most interesting flaw stems from the general nature of the priming passage utilised in the religious reward condition. Some Christian participants who were excluded from the analyses expressed religious disagreements with the passage of text in the religious reward condition. These participants noted that one does not gain entry to Heaven – according to Christianity – simply by doing good deeds; rather, one must accept and embrace Christ. This interpretation of the Christian doctrine seems to be accurate (e.g., see Ephesians 2:8-9; Isaiah 64:6; John 11:25, 14:6; Mark 16:16), and hence, the reward-related religious passage used in this study may have been too general and theologically problematic to effectively promote prosociality. Given this, perhaps the reward-related religious prime used in Study 1 failed to elicit an effect because it was not tailored specifically to the beliefs of the majority of participants in the study; namely Christians.

Such a suggestion is not without warrant. Using a Muslim sample from the United Arab Emirates, Aveyard (2014, Study 1) explored whether participants exposed to religious prime-words in a sentence unscrambling task (SUT) would conduct themselves more honestly in a subsequent mathematical task (relative to participants in the control group), within which they had the opportunity to cheat (the “computer glitch paradigm”; see von Hippel, Lakin & Shakarchi, 2005). Aveyard found no differences in honesty between the two



groups. However, in a second study, Aveyard found that participants who heard the *athan* (a traditional Muslim call to prayer) in the religious priming condition did conduct themselves more honestly than control group participants. Aveyard concluded that culturally-sensitive primes may be more effective at producing effects than primes that are not designed specifically for cultural groups that the participants come from.

Duhaime (2015) replicated the findings of Aveyard (2014, Study 2) in a field study involving Muslim participants from Morocco. In a marketplace setting, Duhaime offered local shopkeepers (and other interested passers-by) the chance to (1) receive 20 Moroccan dirhams<sup>10</sup> (the local currency) while nothing is given to charity, (2) receive 10 Moroccan dirhams and allow 30 Moroccan dirhams to be given to charity, or (3) keep nothing and allow 60 Moroccan dirhams to be given to charity. In short, the less money participants chose to take, the more money the experimenter would donate to charity. Duhaime found that participants who responded during (or very shortly after) the public call to prayer (the *athan*) were significantly more generous than participants who responded when the call to prayer was inaudible. Duhaime did not compare the effects of this culturally-sensitive prime (i.e., the call to prayer) to those of typical Western methods (e.g., prime-words featured in sentence unscrambling tasks), but these findings do reinforce Aveyard's contention about the efficacy of primes that are tailored to the communities within which they are used.

Given these findings, it may be advisable for researchers exploring the religion-prosociality link using priming paradigms to use religiously homogenous samples (i.e., participants from the same religious tradition and sect) in their studies, and to utilise primes that are designed specifically to appeal to people from the selected religious tradition/sect. For example, relative to the priming passage used in the religious reward condition in Study 1, perhaps a passage referring to how believing in Christ and following His example is the

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<sup>10</sup> 1 Moroccan dirham is worth \$0.13(AUD), as of October, 2017.

surest path to Heaven would resonate better with Christian participants, and thereby be more effective in producing a prosociality effect in a Christian sample. Indeed, if Aveyard's (2014) conclusion that culturally-sensitive primes are more effective in producing effects is correct, then participants exposed to culturally-relevant reward-related religious primes should behave more prosocially than participants exposed to generic reward-related religious primes.

Culturally-relevant primes may be particularly effective in explicit priming studies. Subliminal primes bypass conscious awareness and rumination (Jacobs & Sack, 2012), and implicit primes do not necessarily provide a narrative for participants to absorb or to critique. Indeed, the purpose of using implicit primes is to ensure that participants do not ruminate on the content of the prime, as this could lead to them becoming aware of the purpose of the study (Shariff et al., 2016). Explicit primes, however, are likely to be the subject of conscious contemplation, and thus, there is greater potential for disagreement and defensiveness on the part of participants. It is unlikely that negative reactions from participants who object to the contents of a particular prime (e.g., on the basis of a theological disagreement) will be conducive to prosociality. For this reason, it is important to ensure that specific primes and priming paradigms used in studies exploring the religion-prosociality link are designed with precision, so that they are relevant to the people who are being exposed to them.

This consideration of cultural-relevance forms the rationale of Study 2 (see below). However, the results of Study 1 have other noteworthy implications that must be addressed before progressing to the next study.

### **Divine Rewards and Selfishness**

While the SRH was not supported by the results obtained in Study 1, the opposite hypothesis (i.e., that divine rewards make people behave selfishly) is also unsupported. As was previously noted, Shariff and Rhemtulla (2012) found that crime-rates are higher in countries wherein belief in Heaven exceeds belief in Hell. Given this, one might conclude

that belief in divine rewards leads to increased selfishness, and hence, exposure to reward-related religious primes might actually *decrease* prosociality.

The data obtained in Study 1 do not support such a contention. Religious participants exposed to reward-related religious primes gave away about the same amount of money as participants in the control condition and gave away more money than participants in the religious kindness condition. While Shariff and Rhemtulla (2012) were investigating links between certain kinds of religious belief and anti-social behaviour (i.e., crime), the findings of this study challenge any extrapolation of their findings to apply to the relationship between certain – in this case, reward-related – religious beliefs and prosociality. While concepts of divine benevolence may promote certain kinds of anti-sociality (e.g., an increased tendency to cheat during a quiz task; see Shariff & Norenzayan, 2011), the results from Study 1 yielded no evidence suggesting that divine reward concepts negatively influence prosociality.

The results from Study 1 may offer some insight into the difference between the results of Harrell (2012) and Shariff and Rhemtulla (2012). Given that Harrell (2012) utilised subliminal reward-related religious primes (thereby bypassing conscious awareness and appraisal), it is possible that participants were only influenced by the reward-related elements of the primes and were not influenced to think about divine forgiveness or mercifulness. Moreover, it may be the case that stronger belief in Heaven correlates positively with belief in kind and merciful gods and it is possible that it was the belief in kind and merciful gods that underlay the higher crime rates, rather than the expectation of divine rewards. Such a conclusion is somewhat speculative, and further research will need to be undertaken to explore this possibility. However, the next section will, in part, explore the merits of this contention.

### **Divine Mercifulness and Selfishness**

While the main hypothesis (i.e., that reward-related religious primes would increase prosociality, relative to alternative primes) was not supported by the results, the data do still indicate a complex association between religious belief and prosocial behaviour. The most notable finding was that the participants who read the passage about God's forgiving and merciful nature were less generous than participants from the other two groups. As was indicated by the lack of differences across experimental groups on the PANAS sub-scales, differences in generosity across groups did not appear to be influenced by mood. While this finding must be interpreted with caution given the small sample size, other studies have demonstrated similar effects (e.g., Card, 2013, Study 2; DeBono et al., 2017; Shariff & Norenzayan, 2011).

This result reinforces the findings of Shariff and Norenzayan (2011), who found that belief in a kind, forgiving and merciful God correlated positively with cheating (i.e., antisocial/immoral) behaviour. Previous priming studies exploring the prosocial effects of divine benevolence primes found that people exposed to divine benevolence/forgiveness primes express no more willingness to help others than people exposed to control primes (Card, 2013, Study 1), cheat more often in quiz tasks than people exposed to control primes (Card, 2013, Study 2; also see DeBono et al., 2017, Study 3) and steal more money when the opportunity arises than people exposed to control primes (DeBono et al., 2017, Study 2). Study 1 adds to this growing literature by demonstrating that religious participants exposed to divine benevolence primes are less generous than religious participants exposed to control primes when they are given the opportunity to divide money between themselves and anonymous others.

It is also noteworthy that previous studies exploring the effects of divine benevolence/forgiveness primes on prosociality (e.g., Card, 2013, Study 2; DeBono et al.,

2017; Studies 1–3) have generally focused on anti-social behaviour. That is, such studies have tended to focus on whether such primes increase/decrease the likelihood of cheating or stealing. As DeBono et al. (2017, pg.S8) noted, “[i]t is conceivable that ‘positive’ forms of moral behavior, which involve actively doing good, rather than avoiding doing wrong” may not be affected in the same way. The findings of Study 1 are significant, as they suggest that divine benevolence/forgiveness primes can decrease the likelihood of prosocial behaviours (e.g., generosity, in this instance).

Two previous studies tested the effects of divine benevolence primes on positive forms of prosociality (Card, 2013, Study 1; Yilmaz & Bahçekapili, 2016, Study 2). Card found that participants primed with benevolent god concepts expressed no more willingness to help than control participants, and Yilmaz and Bahçekapili found that participants primed with benevolent god concepts did not differ from control group participants on a measure of prosocial intentions. In Study 1, participants exposed to benevolent god concepts donated *less* than control group participants. This latter finding suggests that divine benevolence/forgiveness concepts may not merely be unideal for the promotion of prosocial behaviours (e.g., by being no more effective at promoting prosociality than control primes are), but such concepts may even be *counterproductive* in certain instances.

Collectively, the results outlined above suggest that those who believe in a god who forgives people who behave selfishly and/or immorally may feel far less compelled to behave prosocially. If the gods will forgive us for our mistakes and transgressions, the question arises as to whether or not behaving prosocially is worthwhile at all. Perhaps the belief that one will be forgiven for his/her transgressions makes many religious people feel free to transgress again (DeBono et al., 2017).

While such an account does make sense of the data obtained, consideration of the issue of cultural-sensitivity noted in the previous section gives rise to an obvious question: if

the primes used in Study 1 were not tailored to any particular religious group (e.g., contained no references to exclusively Christian supernatural agents, such as Jesus), then why were participants in the religious kindness condition significantly less generous than participants in the other conditions? Why did the culturally-non-specific priming passage in the religious kindness condition elicit an effect, while the culturally-non-specific priming passage in the religious reward condition failed to do so?

While the lack of cultural sensitivity may have been true of the priming passage utilised in the religious reward condition, it is unlikely that the religious kindness passage was equally problematic. The concept of divine forgiveness for one's imperfections and transgressions is a major theme in Christianity (see 1 John 1:9; Acts 3:19; Ephesians 4:31-32; Matthew 6:12-14), and the vast majority of participants in Study 1 were Christians. Hence, although the passage was not deliberately addressed to Christian participants, the core theme of the passage was consistent with Christian doctrine. In the case of the religious reward passage, one could object – as some participants did – that the passage did not accurately represent the Christian view of how people reach Heaven.

Ultimately, the findings of Study 1 contribute further evidence that notions of divine forgiveness and mercy are un conducive to prosocial behaviour. This particular finding also contributes further evidence in support of the notion that conceptually-distinct primes (e.g., divine reward primes vs. divine kindness primes) can elicit distinct effects on prosociality (Preston & Ritter, 2013; Saleam & Moustafa, 2016). However, this study was not without its shortcomings, which are addressed in the following section.

### **Limitations**

It is worth noting that Study 1 featured a small sample size, and so any conclusions based on the data obtained must be interpreted with caution. Van Elk et al. (2016) noted that one significant issue in the religious priming literature has been the utilisation of small

samples in empirical studies. This issue is particularly noteworthy given that recent meta-analyses have demonstrated a negative correlation between effect size and sample size in the religious priming literature (van Elk et al., 2016; also see Shariff et al., 2016). That is, religious priming studies with larger sample sizes tend to show smaller differences across experimental groups. This is concerning because studies with larger sample sizes generally produce much more reliable results (van Elk et al., 2016).

It is also noteworthy that in Harrell's (2012) study, the amount of money available to participants in the Dictator Game was \$8.00(USD), whereas in the present study, only \$1.00(AUD) was offered to each participant. This difference may be important for several reasons. For example, the smaller amount of available money necessarily restricts the range of responses available to participants. Moreover, participants may not have believed that such a small quantity of money was worth dividing (e.g., a 50% split would mean that each person only receives \$0.50, when perhaps it would be better, at least perceptibly, for one person to receive all the money). These are worthy considerations; however, previous research has found that the amount of money offered to participants from the United States in the Dictator Game (e.g., \$1.00, \$5.00 or \$10.00) appears to have little effect on the percentage of money they decide to give away (Raihani, Mace & Lamba, 2013). Furthermore, this smaller amount of available money did not prevent a difference in generosity between participants in the religious kindness and other conditions from being observed.

This study also used a highly subjective measure of personal religiosity. Participants in this study were simply asked how religiously devout they considered themselves to be. Although religious devoutness was uncorrelated with generosity, a more objective measure of participants' levels of religious devoutness (e.g., the Centrality of Religiosity Scale; see Huber & Huber, 2012; Huber, 2003) may have been more appropriate.

Another flaw in this study's research design was the lack of secular priming conditions. Harrell's (2012) study not only included a religious reward priming condition, but also a secular reward priming condition, wherein participants were exposed to primes that had reward connotations that were not religious in nature (e.g., 'applause', 'appreciate'). The inclusion of a secular reward condition and a secular kindness condition could have facilitated a clearer understanding of whether religious participants are influenced more by exposure to religious primes or secular primes. Moreover, if participants exposed to particular religious primes (e.g., reward-related religious primes) are more or less generous than participants exposed to equivalent secular primes (e.g., reward-related secular primes), this *might* also suggest that the common element between the two conditions (e.g., the reward element) does not underlie the differences between the groups. Given these considerations, the inclusion of equivalent secular priming conditions is advised to future researchers in the field.

It should also be noted that this study only featured participants from Western nations, and the vast majority of participants identified as Christians; hence, the findings may not generalise to non-Western cultures or to people from other faiths. Divine rewards feature prominently in other religious traditions (e.g., Islam; see Saleam & Moustafa, 2016), and perhaps the salience of reward concepts differs across religious traditions, meaning that some religious groups may be more responsive to reward-related religious primes than others. A larger study featuring sufficient numbers of participants from a variety of religious groups could test such a hypothesis.

Lastly, as was previously noted, one possible shortcoming of this study was the generic nature of the priming passage in the religious reward condition. Perhaps a more culturally-sensitive priming passage would have produced an effect. This hypothesis is tested in the following empirical study.



## **Study 2**

## Method

### Participants

Data from the 31 religious reward (RR) group participants from Study 1 (11 males; 20 females) were retained for Study 2. Additional participants were recruited via MTurk until each of the two conditions in this study – the religious reward condition, and the new ‘Christian reward’ condition (CR) – had usable data from ~45 participants, after accounting for those to be excluded from the analysis (e.g., participants who expressed knowledge of the study’s aims in response to the suspicion probe question). Prospective participants first responded to a short survey asking what religion they subscribe to, what country they reside in, and how deeply religious they consider themselves to be. Those who identified as Christians (e.g., Baptists, Catholics, Lutherans, etc.), and who gave a score of 4 or higher along the 7-point religiosity scale were eligible to participate in the study. Participation was restricted to Western countries.

Prior to exclusions, 83 additional participants (25 males; 58 females) were recruited to participate in this study. Of these initial 83 participants, a total of 19 participants were excluded from the study. 16 participants were excluded from the analysis because their responses on the suspicion probe questions indicated fairly accurate knowledge as to what the purpose of the study was. One participant was removed from the analysis because he/she expressed a great deal of annoyance toward the survey rules and noted that he/she was experiencing personal problems, and these factors may have influenced his/her decision in the Dictator Game. One participant was removed from the study because he/she expressed theological disagreement with the content of the priming passage in the CR condition (i.e., that good deeds and divine rewards are completely unlinked in Christian doctrine), which may have influenced his/her response in the Dictator Game. Lastly, one participant was excluded because he/she attempted the study twice. These exclusions resulted in a final

sample of 91 participants (29 males; 62 females). Most of the participants were Christians ( $N = 90$ ),<sup>11</sup> while the sample also included 1 Jewish participant.

All participants recruited for Study 2 – excluding the participant who re-attempted the study – were paid \$1.03(USD) for their participation, in addition to however much money they decided to keep in the Dictator Game (see below). Participants from Study 1 whose data were retained for Study 2 were not paid any additional money.

### **Procedure**

The methodology for Study 2 was identical to that of Study 1. The only novel element of this study was the introduction of a new religious priming condition: the Christian reward (CR) condition. All new participants were randomly assigned to either the religious reward (RR) condition or the Christian reward (CR) condition.

While new participants in the RR condition read the same passage of text as RR participants from Study 1, participants in the new CR condition read the following passage of text about how belief in Christ and following Christ's moral example would ensure that they reach Heaven in the afterlife:

*Jesus Christ is our Lord and Savior, and is the son of God. It is only through Christ that we can reach Heaven in the afterlife. If we believe in Christ and follow His example, we are assured that we will spend eternity with Him in Heaven. Good deeds alone, without belief, are insufficient. But the believers who help the needy (if they can), the believers who are generous, the believers who pray even for their foes, the believers who are honest, and the believers who avoid immorality, will all find their way to Heaven. And there is no reward in existence that in any way compares to life in Heaven; wherein all pain and wounds will be healed, and there will be no unhappiness or hatred. There will*

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<sup>11</sup> Two of the Christian participants identified as Mormons.

*only be eternal happiness, love, and peace with our Lord, which is what He intended for us from the beginning, so long as we were willing to abide in Him, to embrace Him, and to adhere to His guidance and teachings. And our Lord never fails to fulfil what He promises. While we may need to endure discomfort and grief at times, what awaits us in the afterlife will surely make our perseverance and sacrifices seem well worthwhile.*

Apart from these minor differences, all other elements of the methodology of Study 2 were identical to those of Study 1 (e.g., completion of the demographics survey and the adapted PANAS, and participation in the Dictator Game).

## **Analyses and Results**

### **Statistical Analyses**

To determine whether the independent variables (IVs) of self-reported levels of tertiary education (none; less than 1 year; 1 year; 2 years; 3 years; 4 or more years), wealth (1 – 7) or religious devoutness (1 – 7) influenced generosity (the dependent variable, as measured by how much money participants chose to give away in the Dictator Game), Spearman's Rho correlational analyses were utilised. Spearman's Rho tests were favoured over parametric alternatives because, according to Shapiro-Wilk tests of normality, the data in both experimental conditions violated the assumption of normality ( $p < .01$ ).

A Mann-Whitney  $U$  test was then conducted to determine whether males and females differed in terms of generosity (as measured by how much money participants chose to give away in the Dictator Game). This non-parametric test was used instead of a  $t$  test due to the non-normality of the data across the two experimental conditions.

Another Mann-Whitney  $U$  test was then conducted to determine whether there were differences in generosity (as measured by how much money participants chose to give away in the Dictator Game) between the experimental groups (RR and CR). Again, the non-

parametric test was used due to the non-normality of the data in both experimental conditions. Additionally, as was done in Study 1, all individual participants' scores on the impressiveness and meaningfulness measures were summed and then divided by 2 to form overall impressiveness-meaningfulness scores. 7 participants whose overall scores fell below 3.5 were excluded from the analysis. After these exclusions, the data were re-analysed using a Mann-Whitney *U* test.

Lastly, to determine whether there were any differences in positive and/or negative affect (as measured by the positive and negative affect subscales of the PANAS) between the two experimental groups, two Mann-Whitney *U* tests were conducted. The scores on the 10 positive-word (e.g., 'happy', 'proud') items were summed to form each participant's overall 'positive affect' score, and scores on the 10 negative-word items (e.g., 'loathing', 'sad') were summed to form an overall 'negative affect' score. Two participants were excluded from these analyses because they failed to complete some of the individual items on the PANAS, making it impossible to compute accurate subscale scores. Another participant was removed from the analysis because his/her scores on the negative PANAS subscale were completely at odds with how the participant described his/her overall mood (his/her negative affect score was very high, but the participant's description of his/her mood was very positive), and so it appears that the PANAS was not seriously attempted by the participant. For the negative subscale of the PANAS, two outliers were detected in the CR condition with comparatively high negative affect scores. The outlying scores were reduced to one unit higher than the highest non-outlying score, as per the recommendations Tabachnick and Fidell (2007).

## Results

Self-reported levels of tertiary education did not correlate with generosity generally ( $r_s = .05, p = .65$ ), nor within either of the experimental conditions (RR:  $r_s = .13, p = .38$ ; CR:  $r_s = .07, p = .67$ ). Nor did levels of self-reported wealth correlate with generosity generally ( $r_s$

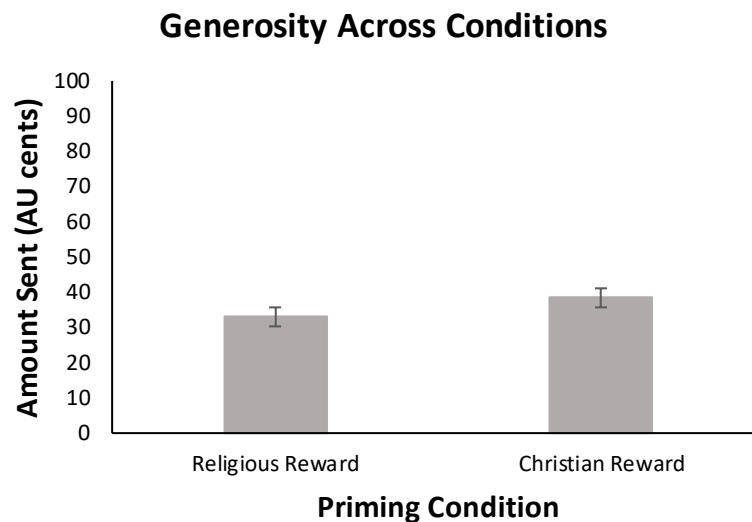
= .01,  $p = .92$ ), or within either of the experimental conditions (RR:  $r_s = .01$ ,  $p = .96$ ; CR:  $r_s = .01$ ,  $p = .96$ ). Nor did levels of self-reported religious devoutness correlate with generosity across the entire sample ( $r_s = .06$ ,  $p = .55$ ), or within either of the experimental conditions (RR:  $r_s = .07$ ,  $p = .63$ ; CR:  $r_s = .11$ ,  $p = .46$ ).

No difference in generosity between males and females was observed across the entire sample:  $U = 880$ ,  $p = 0.86$ . Within each experimental condition, males (Mdn = \$0.40, interquartile range = 0.29) and females (Mdn = \$0.25, interquartile range = 0.30) did not differ significantly in terms of generosity in the RR condition:  $U = 215$ ,  $p = 0.67$ . Nor did males (Mdn = \$0.25, interquartile range = 0.33) and females (Mdn = \$0.50, interquartile range = 0.25) differ significantly in terms of generosity in the CR condition:  $U = 193.5$ ,  $p = 0.59$ .

In the main analysis, no significant differences in generosity were observed between the RR group ( $M = \$0.33$ , Mdn = \$0.30, interquartile range = 0.28) and the CR group ( $M = \$0.38$ , Mdn = \$0.50, interquartile range = 0.25):  $U = 898$ ,  $p = 0.25$ . These findings are illustrated in Figure 2 (below). The small (non-significant) difference between the two groups decreased when the 11 participants who gave low impressiveness-meaningfulness scores (less than 3.5) were removed from the dataset (RR:  $M = \$0.36$ , Mdn = \$0.50, interquartile range = 0.25; CR:  $M = \$0.38$ , Mdn = \$0.50, interquartile range = 0.25):  $U = 751$ ,  $p = 0.64$ . Even after the exclusion of the two Mormon participants and the 1 Jewish participant, the difference remained non-significant:  $U = 704$ ,  $p = 0.73$ .<sup>12</sup>

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<sup>12</sup> In this analysis, participants with low impressiveness-meaningfulness scores were also excluded, in addition to the exclusion of the strictly non-Christian participants.



**Figure 2.** *The average amount of money (in Australian cents) given by participants in the RR and CR conditions.*

No significant difference in self-reported positive affect was observed between the RR group ( $M = 33.18$ ,  $Mdn = 34$ , interquartile range = 14) and the CR group ( $M = 36.53$ ,  $Mdn = 37$ , interquartile range = 16):  $U = 765.5$ ,  $p = 0.13$ . Nor was any significant difference in self-reported negative affect observed between the RR group ( $M = 15.49$ ,  $Mdn = 11$ , interquartile range = 8) and the CR group ( $M = 12.14$ ,  $Mdn = 10$ , interquartile range = 4):  $U = 804.5$ ,  $p = 0.14$ .

## Discussion

### Implications for the Supernatural Reward Hypothesis

The main hypothesis for Study 2 was that Christian participants exposed to a reward-related religious prime tailored specifically to their religious tradition (i.e., Christianity) would behave more generously than Christian participants (and religious participants in general) who were exposed to a more generic reward-related religious prime. The data from Study 2 offered no support for this hypothesis. Moreover, given that participants in the religious reward condition in Study 2 were approximately equally generous relative to control group participants from Study 1, the findings of Study 2 suggest that even culturally-sensitive

reward-related religious primes are no more effective at promoting prosociality than control primes. This finding poses a significant challenge to the supernatural reward hypothesis (SRH).

The results of Studies 1 and 2 suggest that the conscious contemplation of reward-related religious concepts does not markedly increase generosity in anonymous settings. Despite the many reasons outlined in previous sections for believing that the reward-related concepts in religion can promote prosociality, the results obtained in Studies 1 and 2 do not support this claim. This null finding is peculiar, given that Harrell's (2012) subliminal priming study did demonstrate such an effect. The subliminal priming study conducted by Pichon et al. (2007), which contained several reward-related religious primes (among other religious primes that had *positive* connotations), also found a positive effect on prosociality. Hence, the current divide appears to be between studies using explicit priming paradigms (i.e., Study 1 and Study 2; see above) and studies using subliminal priming techniques.

One possible explanation for the findings is that the positive results found by Harrell (2012) occurred by chance. Perhaps reward-related religious primes are actually ineffective at increasing generosity. Explicit primes should produce more pronounced effects because there is a greater capacity for priming participants with more complex and detailed concepts (Shariff et al., 2016). Hence, if the SRH is correct, and if a subliminal priming study (i.e., Harrell, 2012) yielded evidence clearly supportive of the SRH, then one would expect that an explicit priming study would also detect a prosocial effect of reward-related religious primes. Studies 1 and 2 yielded no such evidence; hence, there is strong reason to doubt the veracity of the SRH. However, there are alternative explanations for the data obtained in Studies 1 and 2 that are worth exploring.

It is possible that the explicit reward-related religious primes used in Studies 1 and 2 not only primed participants with divine reward concepts, but also led to thoughts of divine



benevolence and forgiveness. That is, participants may have interpreted God's rewarding nature – as indicated in the priming passages – as being indicative of a generally benevolent/forgiving nature. Given that divine benevolence/forgiveness primes have regularly been found to have negative effects on prosociality (e.g., see Study 1 above; also see Card, 2013; DeBono et al., 2017; Shariff & Norenzayan, 2011), any thoughts of divine benevolence/forgiveness resulting from the reading of explicit reward-related religious passages may have diluted any potential prosocial effects that the reward-element(s) of the primes may have elicited. As was noted earlier, while divine rewards do constitute a kind of divine benevolence, a rewarding supernatural agent is not necessarily a benevolent one (e.g., the Qur'an notes that God will *reward* good people, but also that He will harshly *punish* wrongdoers). Perhaps future explicit priming research could disentangle concepts of divine benevolence and divine reward to better isolate the prosocial effects of the reward-related elements of religion.

Another possible explanation for the difference in results across priming techniques (explicit vs. subliminal) may be that the participants who read the reward-related religious passages consciously suppressed the effects of the primes. That is, participants may have noticed that the content of the passage was affecting their judgement in the Dictator Game (e.g., by making them think about the rewards they may receive for being generous), and they may have actively tried to behave impartially. Perhaps participants tried to override their own perceived selfishness. Many participants were excluded from the analyses because they understood the significance and purpose of the priming passage, but perhaps many other participants realised that the passage was influencing their judgement without realising that this was the purpose of the study. If participants were correcting their responses in an attempt to be more impartial and less selfish, this could account for why the results from Studies 1 and 2 differ from those obtained in subliminal priming studies.

While the possible explanations outlined above may explain the inconsistent findings, one other noteworthy difference between Harrell's (2012) subliminal priming study and Studies 1 and 2 is that Harrell's study was conducted in a laboratory setting, whereas Studies 1 and 2 were conducted entirely online. It is possible that the MTurk samples utilised were not equivalent to regular samples; however, research suggests that MTurk samples do yield reliable data, relative to samples drawn by more traditional methods (Buhrmester et al., 2011; Simons & Chabris, 2012). Furthermore, in the religion-prosociality literature, studies using MTurk samples have produced results identical to those produced by lab-based samples (Shariff et al., 2016). Hence, it seems unlikely that the difference in experimental setting underlies the differences in priming effectiveness.

### **Limitations**

Study 2 suffered from many of the same limitations as Study 1 (e.g., small sample size). While the prime in the Christian reward condition was tailored more precisely to Christian beliefs, one of the participants expressed the same theological disagreement with the content of the prime that some participants expressed about the reward-related religious prime in Study 1. That is, divine rewards are not promised to people who behave morally, but rather, are promised to those who repent for their sins, and accept Jesus Christ as their Lord and Saviour. While the passage in the Christian reward condition explicitly appealed to Christian doctrine, some participants may have felt as though the passage did not reflect their beliefs about divine rewards. Hence, it is *possible* that the null finding is, in part, a reflection of the fact that, according to Christianity, moral behaviour is neither a sufficient nor necessary condition for gaining entry to Heaven.

Additionally, Study 2 featured a sample of Western Christians, and the null findings from this study may not generalise to samples drawn from non-Western and/or non-Christian cultures. As DeBono et al. (2017) noted, the gods of different religious traditions often have

markedly different attributes, and consequently, those religions will likely differ in terms of their effects/influences on behaviour. While Christians may not be influenced to behave more generously by reward-related religious primes, perhaps Muslims or Hindus might be. Future studies should be conducted to determine whether there are differences across religious traditions in terms of how reward-related religious primes influence prosociality.

But while it is well arguable that morality and divine rewards are unlinked in Christian doctrine, it is not known how many Christians are aware of this possibility. Perhaps the layman's interpretation of Christian doctrine is that 'good things happen to good people'. Indeed, in a study featuring 1,456 practising Christians, the Barna Group (2017) found that about 32% of practising Christians believe this karmic notion. More research should be devoted to exploring whether most Christians believe that morality and entry to Heaven are linked or unlinked. The findings of such research would have important implications for how the findings of Studies 1 and 2 should be interpreted. Notably, if the majority of Christians do not believe that moral behaviour is necessary when it comes to gaining entry to Heaven, then this could explain why the explicit priming of reward-related religious concepts was ineffective at increasing the generosity of Christian participants.

Importantly, as was a noted weakness of Study 1, it is still possible that the reward-related religious passages in Study 2 promoted thoughts of divine benevolence in addition to any thoughts about contingent divine rewards. Given that research has found that the priming of divine benevolence/mercifulness concepts is ineffective and/or counterproductive when it comes to promoting prosociality (see Card, 2013; DeBono et al., 2017; Shariff & Norenzayan, 2011; also see Study 1 above), the accidental priming of such concepts may weaken any prosocial effects that the divine reward concepts elicited.

### **Implicit Priming of Divine Reward Concepts**

I mentioned above that there are many types of priming techniques. Thus far, the SRH has been tested using an explicit priming paradigm (Studies 1 and 2; see above) and a subliminal priming paradigm (Harrell, 2012). The SRH has not yet been tested using any typical implicit priming paradigm (e.g., the sentence unscrambling task).

As was noted above, there are reasons as to why the explicit priming of reward-related religious concepts may not be effective at increasing prosociality. Given that Harrell (2012) found that reward-related religious primes that bypass conscious awareness can increase generosity, perhaps reward-related religious primes that do not necessarily bypass conscious awareness, but which are nevertheless not made particularly salient to religious participants, will also be effective at increasing generosity. Importantly, because implicit primes are less salient than explicit primes, they are not expected to be as heavily subjected to rumination by participants, and this lack of rumination may reduce the possibility of participants thinking about the relationship between divine rewards and divine benevolence. Furthermore, the simplistic nature of implicit primes (e.g., simple words or sounds) may better isolate the specific concepts that are intended to be primed in participants, which may further reduce the possibility of conceptual overlap (i.e., between concepts of divine forgiveness and divine reward) and its potential effects.

Study 3 (see below) explored whether the implicit priming of divine reward concepts is sufficient to increase the generosity of Christian participants. The hypothesis was that Christian participants presented with reward-related religious prime-words (e.g., 'Heaven') would be more willing to donate money to charity in a subsequent task than Christian participants exposed to control primes or neutral religious primes (e.g., 'church'). A secondary hypothesis was that Christian participants exposed to reward-related secular prime-

words (e.g., 'rewarded') would donate about as much money as Christian participants exposed to reward-related religious prime-words.

## **Study 3**

## Method

### Participants

All participants for this study were recruited via Amazon's Mechanical Turk (MTurk) system. Prospective participants first responded to a short survey asking what religion they subscribe to, what country they reside in, and how deeply religious they consider themselves to be. Those who identified as being Christian, and who gave a score of 4 or higher along the 7-point religiosity scale, were eligible to participate in the study. Participation was restricted to Western nations, and only participants whom had not participated in Studies 1 or 2 were eligible for this study.

This resulted in the recruitment of a total of 135 participants (33 males; 102 females). Of these 135 participants, a total of 14 participants were excluded from the study. 6 participants were excluded from the analysis on the basis that they expressed – in response to the suspicion probe – fairly accurate knowledge as to what the purpose of the study was, and such knowledge may have influenced giving behaviour. 1 participant was excluded from the analysis because his/her responses reflected a conspicuous lack of effort (e.g., were incoherent, and did not address the questions asked). Another participant was excluded because he/she failed to respond to all questions in the study (of note, the participant did not specify which religion he/she subscribes to). A further 2 participants were excluded because their raw scores on the Centrality of Religiosity Scale (CRS) fell below 25, and 4 other participants were excluded because they identified as being non-religious on the CRS measure (e.g., referring to themselves as non-religious and/or “spiritual”), despite having CRS scores in excess of 25. These exclusions resulted in a final sample of 121 participants (28 males; 93 females).

All participants were paid \$0.50(USD) for their participation, in addition to however much money they decided to keep in the Charity Task (see below).

## Procedure

This study was conducted entirely online. Studies 1 and 2 were modelled on the methodology utilised by Yilmaz and Bahçekapili (2016, Study 2), which involved the use of explicit primes (i.e., passages of religious text). In this study, however, an implicit priming paradigm – the ‘sentence unscrambling task’ (SUT) – was utilised.

**Priming phase.** Participants were randomly assigned to one of four experimental conditions: religious reward (RR), religious neutral (RN), secular reward (SR) or the secular neutral (SN).<sup>13</sup> Participants first read the study information and informed consent form (see Appendix H), which informed them that they were participating in two separate studies (as with Studies 1 and 2, this was mild deception). The ‘first study’ was supposedly testing how reflection on one’s own religious beliefs affects their mood, and whether this influence on mood leads to improved or impaired performance on a simple cognitive task. The ‘second study’ was supposedly testing how much money people are willing to donate to anonymous charities. Participants were informed that they had a maximum of 60 minutes to complete ‘both’ studies. Participants were then asked whether they consider themselves to be fluent in English. Those who answered ‘No’ were excluded from participating further. Following this, participants were asked to provide informed consent.

Participants then completed the Centrality of Religiosity Scale: Version 10 (CRS-10; see Appendix I).<sup>14</sup> The CRS-10 measures the nature of people’s religious beliefs, and how important and salient those beliefs are to their lives (Huber & Huber, 2012). For the purposes of this study, three questions were added to the CRS-10, asking participants how wealthy they consider themselves to be (along a 7-point scale), what country they reside in, and how many years they have studied at a college or university.

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<sup>13</sup> The secular neutral (SN) condition is essentially a control condition, as the primes utilised in this condition are not specific to any topic/theme in particular.

<sup>14</sup> Permission to use the CRS-10 was granted by the scale’s creator, Professor Stefan Huber of the University of Berne in Switzerland.



After completing the CRS-10, participants then moved on to the SUT (see Appendix J). In this task, participants in each condition were presented with a series of 12 nonsensical 5-word strings (e.g., don't, please, heaven, that, do; library, quiet, digit, the, is), with each series of 5 words appearing on a separate page. Participants were instructed to construct coherent 4-word sentences by rearranging the words and removing one word in each string that does not appear to fit. For example, in the two examples provided above in parentheses, the words 'heaven' and 'digit' could be removed to form the sentences: "Please don't do that" and "The library is quiet". Before beginning the SUT, participants were provided with two example strings (with solutions), to ensure that they understood how to complete the task.

In the RR, RN and SR conditions, 4 of the 12 word-strings presented to participants were distractor items, which did not contain prime-words. Because the SN condition is essentially a control condition, all of the word-strings in the SN condition should be considered distractors with no significant content. The distractor items in the RR, RN and SR conditions were included to conceal the significance of the prime-words. The remaining 8 strings in these experimental conditions contained a single prime-word, with two relevant prime-words from each condition being used twice (see Table 1).

**Table 1.** Prime words used in the RR, RN and SR conditions.

Condition	Prime-Phrases	Words Used Twice
RR	afterlife, eternal life, heaven, miracle, salvation, saved	heaven, salvation
RN	church, faith, God, prayer, spiritual, temple	faith, God
SR	applause, appreciated, awards, bounty, fame, rewarded	awards, rewarded

Because Studies 1 and 2 utilised explicit primes, the inclusion of manipulation check items was unnecessary. However, to ensure the effectiveness of the implicit primes used in this study, manipulation checks were used. After completing the SUT, participants in the RR

condition were asked to select one of seven words that best described the religious theme in the sentences they constructed: God's anger, God's apathy, God's leniency, God's mercifulness, God's punishments, God's rewards, or God's vengefulness. If the implicit reward-related religious primes are effective, then participants in the RR condition would be expected to select the 'God's rewards' option from the list. Similarly, participants in the RN condition were simply asked to select one of seven words that they thought best described the nature of God: angry, apathetic, lenient, merciful, punishing, rewarding, or vengeful.

To avoid the unintended priming of participants in the SR and SN conditions with religious concepts, participants in these conditions were asked to select one of seven words that best describes the nature of government: angry, apathetic, lenient, merciful, punishing, rewarding, or vengeful.

After completing the manipulation check item, participants then completed a shortened version of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). However, the shortened PANAS utilised in this study (see Appendix K) only contained 5 positive affect items (attentive, calm, enthusiastic, happy, proud) and 5 negative affect items (angry, depressed, guilty, irritable, sad); whereas the shortened PANAS utilised in Studies 1 and 2 contained 10 items for each affect subscale. As with Studies 1 and 2, this shortened PANAS was utilised, in part, to determine whether different kinds of primes were eliciting different effects on participants' moods. Secondly, the shortened PANAS was utilised as a distraction, to reduce the likelihood that participants would realise that the purpose of the study was to assess whether the content of the SUT influenced their generosity in the subsequent Dictator Game task.

Following the completion of the shortened PANAS, participants were asked what they thought the purpose of the 'first study' was. This question was included as a kind of deception. Including this question would make it appear as though two separate studies were actually

being conducted, and that they had just completed the first study, when in fact, what followed (i.e., the charity task; see below) was a separate element of the same study. If a suspicion probe question only followed the ‘second study’, there may have been a greater risk of participants realising that they were simply completing two elements of the same study.

After responding to this deceptive suspicion probe question, participants progressed to what they were told was a second supposedly ‘separate’ study.

**Charity task.** Participants in Studies 1 and 2 played the Dictator Game, wherein the supposed recipient of any money given by participants is an anonymous person. In this study, participants were allocated \$1.00(AUD) to split between themselves and an unspecified charity chosen by the researcher (see Appendix L). As with Studies 1 and 2, this was deception, as there was no charity group to which any money not taken by the participant would be sent. Some participants in Studies 1 and 2 may have been sceptical as to the existence of the anonymous receiver in the Dictator Game, and so the scenario may seem more plausible if the anonymous receiver is replaced with an anonymous charity.

After completing the charity task, participants responded to a suspicion probe question, asking them what they thought the purpose of the study was. Completion of the suspicion probe concluded the study. As with Studies 1 and 2, all participants who completed this study were sent an e-mail which explained the true nature and purpose(s) of the study and clarified the deception regarding the charity task (see Appendix M). Participants were informed that they could withdraw their participation if the deception involved caused them any discomfort.

## **Analyses and Results**

### **Statistical Analyses**

To determine how deeply religious individual participants were, their scores on each item of the CRS-10 were summed to create overall CRS-10 scores. Typically, overall CRS scores are divided by the number of CRS items (see Huber & Huber, 2012) for the purpose of

categorising participants in terms of the extent to which religion (e.g., as ‘not religious’ or ‘highly religious’). In this study, summed CRS-10 scores were used as a discrete measure of religiosity. To assess whether participants’ religious devoutness (as measured by participants’ CRS-10 scores) influenced their generosity (the DV, as measured by how much money participants chose to donate in the charity task), a series of Spearman’s Rho correlational analyses were utilised (within each condition and for the entire sample). The Spearman’s Rho test was utilised because, according to Shapiro-Wilk tests of normality, the assumption of normality was violated in all conditions ( $p < .01$ ). A between-subjects ANOVA test was also conducted to determine whether average CRS scores differed across the experimental conditions.

A series of Spearman’s Rho correlational analyses were then utilised (within each of the 4 experimental conditions, and for the entire sample) to determine whether self-reported levels of tertiary education level (none; less than 1 year; 1 year; 2 years; 3 years; 4 or more years) or wealth (1 – 7) were related to generosity in the Dictator Game. Spearman’s Rho tests were utilised due to the violation of the normality assumption.

A series of Mann-Whitney *U* tests were then conducted (within each condition and for the entire sample) to assess whether males and females differed in terms of generosity in the Dictator Game. Mann-Whitney *U* tests were used instead of *t* tests due to the non-normality of the data across all conditions.

To determine whether there were differences in generosity across the four experimental groups (RR, RN, SR and SN), after controlling for the effects of personal levels of religious devotion (as measured by scores on the CRS, which correlated with generosity in the RR and RN conditions; see next section), a between-subjects ANCOVA was utilised. While Shapiro-Wilk tests of normality revealed that the normality assumption had been violated in all of the experimental conditions ( $p < .01$ ), ANOVA tests are generally

considered to be robust to normality violations when there are more than 30 participants in each experimental condition (Hills, 2011). The assumption of homogeneity of variance was met, but the assumption of homogeneity of regression slopes was violated. In cases where the homogeneity of regression slopes assumption is violated, Green and Salkind (2016) recommended that the effects of the IV on the DV be measured at different levels of the covariate (CV), but due to the low sample size in this study, this was not feasible. The interaction between the IV and the CV is not necessarily problematic in this instance, as it stands to reason that the effectiveness of general religious primes will correlate positively with religious devoutness (as was observed in the RN condition), and there are plausible explanations as to why the effectiveness of reward-related religious primes may negatively correlate with religious devoutness in Christian samples<sup>15</sup> (as was observed in the RR condition; see Discussion below). Nevertheless, this interaction should be considered when interpreting the results.

For the RR condition, an additional Mann-Whitney *U* test was conducted to determine whether there were differences in generosity between participants who thought the religious theme in the SUT was focused on ‘God’s rewards’ or ‘God’s mercifulness’. This additional test was conducted because differences in how the reward-related religious prime was interpreted may have had contrastive influences on generosity. Equivalent tests did not need to be conducted for the RN (most participants responded that God’s nature was ‘merciful’) or SR (most participants responded that the theme of the SUT was ‘society’s rewards’) conditions because responses to the manipulation check question in these conditions were fairly uniform. Because responses to the manipulation check item in the control condition

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<sup>15</sup> One such reason was discussed above, and this was the fact that morality and divine rewards are not clearly linked in Christian doctrine. I revisit this issue in the Discussion section below.

varied greatly, a Kruskal-Wallis test was conducted to determine whether differences in these responses were related to differences in generosity.

Because the initial ANCOVA test did not differentiate between participants in the RR condition who interpreted the theme of the SUT as being related to God's rewards and those who interpreted the theme as being related to God's mercifulness, a Kruskal-Wallis analysis was conducted with the RR group divided into two groups, in accordance with how RR group participants responded to the manipulation check item. This non-parametric test was utilised because division of the RR group resulted in the formation of two experimental groups with only 15 participants in each. One participant from the RR condition interpreted the theme of the SUT as being related to God's punishment, and this participant was excluded from this analysis.

To measure participants' levels of positive affect, scores on the 5 positive affect items were summed to form each participants' overall 'positive affect' score. To measure participants' levels of negative affect, scores on the remaining 5 items were summed to form an overall 'negative affect' score. To determine whether self-reported levels of positive and negative affect (DVs) differed across experimental conditions (IVs), two Kruskal-Wallis tests were conducted. These non-parametric tests were utilised because missing PANAS responses for a participant in the SR condition resulted in that group having less than 30 participants.

## **Results**

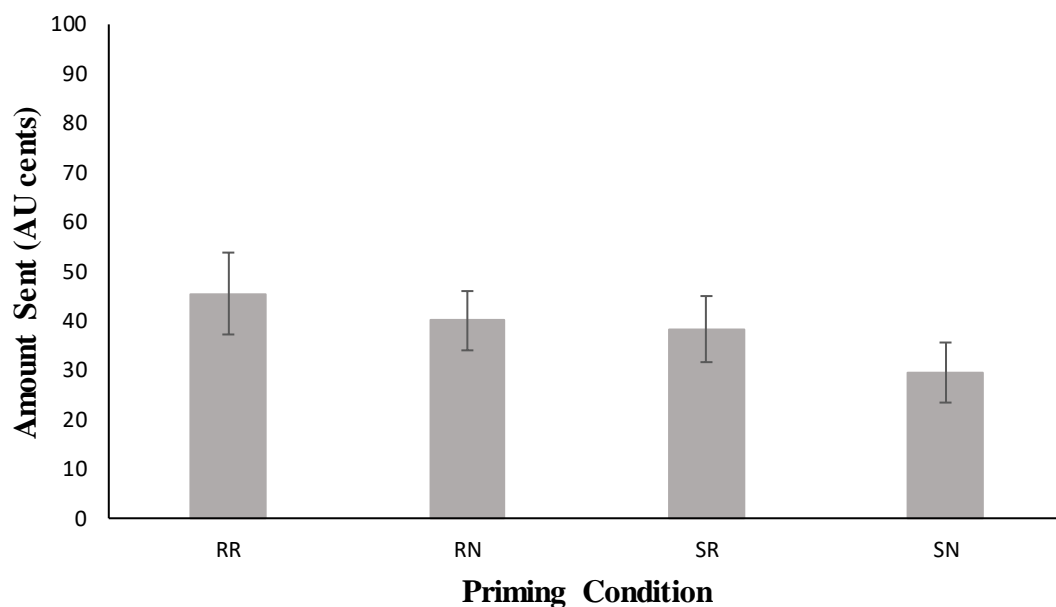
Scores on the CRS survey did not correlate with generosity across the entire sample ( $r_s = .09, p = .39$ ), nor within the SR ( $r_s = .11, p = .56$ ) or (SN:  $r_s = .13, p = .49$ ) conditions; however, CRS scores were negatively correlated with generosity in the RR condition ( $r_s = -0.36, p = .05$ ) and positively correlated with generosity in the RN condition ( $r_s = .41, p = .02$ ). Average levels of religiosity did not differ across experimental conditions:  $F(3, 117) = 1.14, p = .34$ .

Self-reported levels of tertiary education did not correlate with generosity generally ( $r_s = .05, p = .56$ ), nor within any of the experimental conditions (RR:  $r_s = .27, p = .14$ ; RN:  $r_s = .28, p = .13$ ; SR:  $r_s = .25, p = .18$ ; SN:  $r_s = .07, p = .73$ ). Nor did levels of self-reported wealth correlate with generosity generally ( $r_s = .03, p = .79$ ), or within any of the experimental conditions (RR:  $r_s = .11, p = .56$ ; RN:  $r_s = .16, p = .42$ ; SR:  $r_s = .02, p = .92$ ; SN:  $r_s = .04, p = .83$ ).

No difference in generosity between males and females was observed across the entire sample:  $U = 1158.5, p = 0.37$ . Males (Mdn = \$0.50, interquartile range = 0.75) and females (Mdn = \$0.50, interquartile range = 0.46) did not differ significantly in terms of generosity in the RR condition:  $U = 55, p = 0.62$ . Nor did males (Mdn = \$0.10, interquartile range = 0.50) and females (Mdn = \$0.50, interquartile range = 0.50) differ significantly in terms of generosity in the RN condition:  $U = 60, p = 0.13$ . Nor did males (Mdn = \$0.30, interquartile range = 0.85) and females (Mdn = \$0.25, interquartile range = 0.46) differ significantly in terms of generosity in the SR condition:  $U = 88, p = 1.0$ . Nor did males (Mdn = \$0.16, interquartile range = 1.0) and females (Mdn = \$0.25, interquartile range = 0.50) differ significantly in terms of generosity in the SN condition:  $U = 67.5, p = 0.82$ .

On the manipulation check item, almost all participants in the RN condition rated God as being ‘merciful’ ( $N = 27$ ), and almost all participants in the SR condition responded that the theme in the SUT was ‘society’s rewards’ ( $N = 26$ ). However, responses in the RR condition were not as unanimous, with roughly half of the participants ( $N = 15$ ) responding that the theme of the SUT was ‘God’s mercifulness’, and roughly half of the participants ( $N = 15$ ) responding that the theme of the SUT was ‘God’s rewards’. Responses as to the nature of society in the SN condition were more varied, with the most common responses being ‘apathetic’ ( $N = 14$ ) and ‘angry’ ( $N = 8$ ).

After controlling for differences in personal levels of religious devoutness (as gauged by participants' CRS scores), the ANCOVA test revealed no significant differences in generosity across the four experimental conditions:  $F(3, 117) = 1.0, p = .40$ . Figure 3 (below) illustrates these findings. As was noted in the previous section, this ANCOVA test did not differentiate between participants in the RR group who interpreted the theme of the SUT task as being related to God's reward or God's mercy. However, RR group participants who interpreted the primes as being reward-based gave significantly more money to charity ( $M = \$0.59$ ,  $Mdn = \$0.50$ , interquartile range = 0.50) than RR group participants who interpreted the primes as being mercy-based ( $M = \$0.31$ ,  $Mdn = \$0.25$ , interquartile range = 0.50):  $U = 59.5, p = 0.03$ .

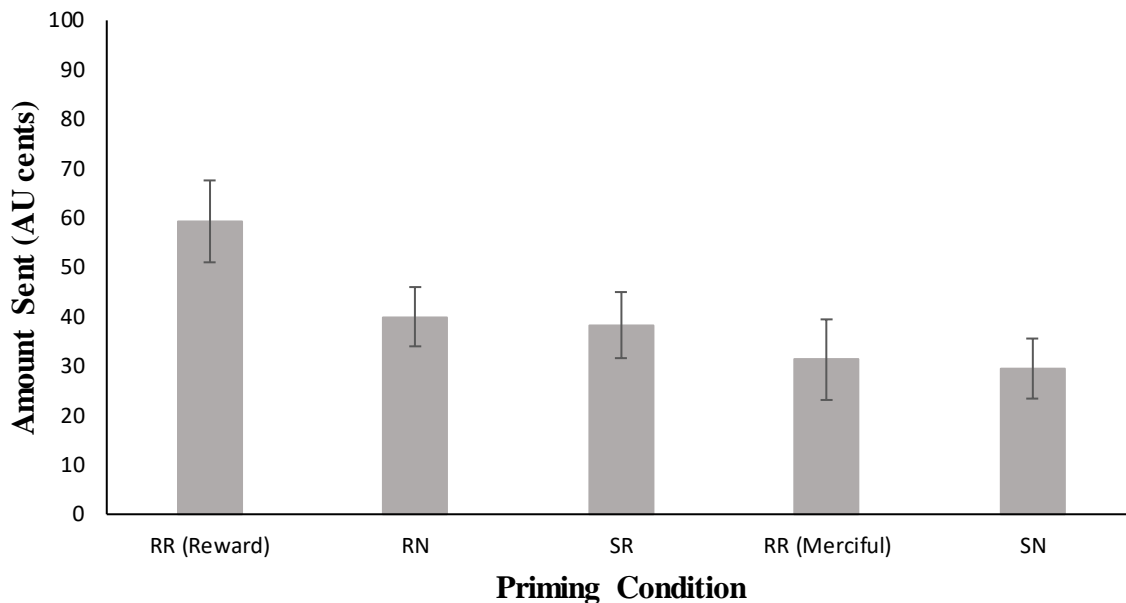


**Figure 3.** *The average amount of money (in Australian cents) given by participants in each experimental condition (RR = religious reward; RN = religious neutral; SR = secular reward; SN = secular neutral).*

Dividing the RR group participants in accordance with their responses to the manipulation check produced a result that was approaching statistical significance:  $H(4) = 9.07, p = .06$ . Post-hoc Mann-Whitney  $U$  tests revealed that RR group participants who



interpreted the primes as being reward-related offered more money to charity ( $M = \$0.59$ ) than participants in all other groups: RN ( $M = \$0.40$ ;  $U = 144$ ,  $p = .04$ ), SR ( $M = \$0.38$ ;  $U = 143.5$ ,  $p = .04$ ), and SN ( $M = \$0.30$ ;  $U = 107.5$ ,  $p < .01$ ). However, only the contrast with the SN group remains significant after controlling for multiple comparisons. These findings are illustrated in Figure 4.



**Figure 4.** Differences in generosity across conditions after dividing RR group participants according to their responses on the manipulation check.

No significant differences in self-reported positive affect were observed across the four experimental conditions:  $H(3) = 3.64$ ,  $p = .30$ . Dividing the RR group in accordance with participants' responses on the manipulation check item did not change this result:  $H(4) = 4.81$ ,  $p = .31$ . In terms of self-reported negative affect, no significant differences were observed across the experimental conditions:  $H(3) = 2.31$ ,  $p = .51$ . Dividing the RR group in accordance with participants' responses on the manipulation check item did not change this result:  $H(4) = 5.10$ ,  $p = .28$ .

## Discussion

### Implications for the Supernatural Reward Hypothesis

It was hypothesised that participants presented with implicit reward-related religious primes would be more generous than participants exposed to neutral religious primes and control primes. This hypothesis was *moderately* supported by the data. While the religious reward group as a whole did not give more generously than any of the other experimental groups, participants who interpreted the implicit reward-related religious primes as being relevant to God's rewards, as opposed to God's mercifulness, did give more generously than participants in the religious neutral (RN), secular reward (SR), and control (SN) conditions.

While this finding was expected, and does appear to support the SRH, the data must be interpreted with caution. Each of the groups in Study 3 featured approximately 30 participants, and this finding (i.e., that generosity in the religious reward condition was moderated by how the primes were interpreted by participants) was obtained by splitting the already small religious reward group, approximately, in half. Further research will need to be undertaken to confirm whether or not this effect would still be apparent in a much larger sample.

Despite the small sample size, the findings of Study 3 indicate a clear prosocial effect of reward-related religious primes (so long as those primes are interpreted as such); hence, Study 3 is the first successful replication of the findings of Harrell (2012). These findings raise questions as to whether implicit reward-related religious primes can effectively promote other forms of behavioural prosociality (e.g., blood donations or volunteering to help others), besides charitable giving. Perhaps such primes may also influence attitudinal prosociality, as Yilmaz and Bahçekapili (2016, Study 1) found to be the case with implicit punishment-related religious primes. Future research can test these possibilities, and the findings of Study 3 seem to warrant further testing of the SRH.

But while the findings of Study 3 do replicate the findings of Harrell (2012), and do support the SRH, there were also several unexpected findings. The first unexpected finding was that participants in the secular reward condition were no more generous than participants in any of the other experimental groups. Harrell (2012) found that the subliminal priming of secular reward-related concepts (e.g., ‘applause’) was equally effective, relative to the subliminal priming of reward-related religious concepts, at increasing generosity. In Study 3, only the reward-related religious primes appeared to have any such effect. This suggests that the religious element of the reward-related religious primes may have underlay the apparent prosocial effect. However, just as reward-related secular primes did not appear to elicit any prosocial effects, neutral religious primes (e.g., ‘God’) did not appear to have any such effects either. This finding suggests that it is the interaction of the reward-related and religious elements of the primed concepts that resulted in the increase in generosity. Given that all participants in Study 3 were Christians, perhaps the results suggest that secular forms of reward are less enticing/important to Christians or to religious people generally. Further research (with larger samples) is needed to determine whether the findings of Study 3 or Harrell’s study more accurately represent reality, or whether methodological differences (e.g., the priming paradigms utilised) between these two studies explain the different results.

The second unexpected finding in Study 3 was an inverse correlation between religious devoutness and generosity in the religious reward condition. One would expect that people who are more devoutly religious would respond more positively to religious primes than people who are less devout, and yet, while generosity correlated positively with religious devoutness in the religious neutral condition (as expected), the opposite effect was observed in the religious reward condition. While this finding seems surprising on its face, there is a fairly plausible explanation for this inverse correlation. As was noted earlier, it is possible that many of the more devout Christians in the study were more aware of the unclear

connection between moral conduct and divine rewards in Christian doctrine than the less devout Christians. Such knowledge may have led some of the more devout participants, who interpreted the primes as being reflective of God's rewarding nature, to give less generously than less devout participants. Similarly, more devout participants in the religious reward condition who interpreted the primes as being reflective of God's mercifulness may have donated less money because they felt more assured of God's mercy and may have held a firmer belief that these rewards were not contingent upon the selflessness/prosociality of their conduct.

One problem with this interpretation of the negative correlation observed between religious devoutness and generosity in the religious reward condition is that this same correlation was not observed in the religious reward condition in Study 1, or in either of the conditions in Study 2 (both of which involved religious reward primes). Given that the reward-related religious primes in those studies were passages of text specifically discussing the supposed link between prosocial behaviour and divine rewards, one would expect not only to observe the same negative correlation between religious devoutness and generosity as was found in Study 3, but perhaps an even *stronger* correlation. Hence, the differences in findings across Studies 1 – 3 are difficult to reconcile.

While Study 3 was not without many limitations (e.g., low sample size; see Limitations section below), the findings of this study have raised many questions, and justify further empirical investigations of what appears to be a complex relationship between belief in supernatural reward concepts and behavioural prosociality.

### **Divine Benevolence and Mercifulness, and Prosociality**

In addition to providing evidence supporting the SRH, the findings of Study 3 also lend further support to the contention that the priming of divine mercifulness concepts does not effectively promote prosociality. Participants who interpreted the reward-related religious

primes as being reflective of God's mercifulness offered to give no more money to charity than participants in the control condition, which suggests that thoughts about divine benevolence have no effects on behavioural prosociality.

Two previous studies demonstrated that the priming of divine benevolence concepts is no more effective at promoting attitudinal (Yilmaz & Bahçekapili, 2016, Study 2) or behavioural (Card, 2013, Study 1) prosociality, and the findings of Study 3 reinforce those previous findings. However, as was outlined above, numerous studies have shown that the priming of divine benevolence/mercifulness concepts can actually *decrease* prosociality. For example, Card (2013, Study 2) found that participants primed with divine benevolence concepts cheated during a quiz task more often than participants in the control condition. In Study 1 of this thesis (see above), participants who read the passage of text that spoke of God as being merciful and forgiving gave away less money in the Dictator Game than participants in the control condition did.

Because the primes in Study 3 were not designed to reflect God's mercifulness, the effects of these primes may not provide a completely accurate indication of how *actual* divine mercifulness primes influence prosociality. Even though many participants believed that the underlying theme in the priming task was God's mercifulness, the fact that none of the priming sentences referred to forgiveness for those who sin, or to God's kindness and tendency towards mercy in general, should not be overlooked. It is possible that the reward-related religious primes in Study 3 were effective in priming these participants with divine reward concepts, but those participants' subsequent reflections on the sentences they constructed led them to think about divine mercifulness. In this way, it is possible that exposure to the reward concepts had a prosocial effect, while the detection of an underlying theme of divine benevolence/mercifulness had an antisocial effect. Perhaps conflicting effects

of this sort resulted in what appeared to be an overall non-effect on prosociality for participants who interpreted the reward-related religious primes as being mercy-related.

Future research could provide insight into whether or not these conflicting effects are likely to be occurring together by replicating Study 3 with the inclusion of a religious mercifulness priming condition. If participants presented with implicit mercy-related religious primes are less generous than participants presented with control primes, then this may suggest that participants who interpret reward-related religious primes as being related to divine mercifulness are being primed in two different directions (i.e., by the actual content of the primes, and by their own reflections on the underlying theme that connects the sentences in the SUT).

### **Limitations**

While the findings of Study 3 do have noteworthy implications for the SRH specifically, and religion-prosociality literature generally, this study had many limitations. Foremost among these limitations was the small sample size. Distinguishing between participants who interpreted the reward-related religious primes differently entailed splitting an already small group in half, and thus, it is possible that the results obtained stem, at least partially, from this shortcoming. On this basis, until the findings of Study 3 are replicated in a larger sample of participants, these results should be interpreted with caution.

Another weakness of this study was the non-inclusion of a religious mercy priming condition. As was noted in the previous section, the inclusion of a condition utilising mercy-related religious primes may have provided important insights as to why the reward-related religious primes only increased the generosity of participants who detected the religious reward theme, and not for those who thought the theme of the SUT was God's mercifulness.

It should also be noted that all participants in Study 3 resided in the United States, and all participants identified as Christians. Hence, the findings of this study may not generalise

to non-Western or non-Christian cultures. If different cultures and religious traditions place different levels of emphasis on divine reward concepts, then the prosocial effects of reward-related religious primes would most likely differ across those cultures and religious traditions.

## **General Discussion and Conclusions**



## General Discussion

### Reward-Related Religious Primes and Prosociality

The three studies detailed above constitute a multifaceted investigation of the supernatural reward hypothesis (SRH). Prior to these studies, only a single empirical study (i.e., Harrell, 2012) had explored whether the priming of supernatural reward concepts can effectively increase behavioural prosociality. While Harrell tested the SRH using subliminal reward-related religious primes, the studies outlined above tested the SRH using a general explicit priming method (Study 1), a more culturally-sensitive explicit priming method (Study 2), and an implicit priming method (Study 3). Both explicit priming studies failed to demonstrate a significant prosocial effect of general or culturally-specific reward-related religious primes, but the implicit priming study (Study 3) did yield some supporting evidence for the SRH. Though the results varied across these three studies, collectively, these findings have considerable implications for the SRH, and the religious priming literature generally.

The findings of Studies 1 and 2 suggest that reward-related religious primes – even when tailored to the specific religious group (Christians, in this instance) being primed – are ineffective at increasing behavioural prosociality. However, as I outlined above, it is possible that *explicit* reward-related religious primes are generally ineffective at promoting prosociality because participants themselves may notice that they are thinking selfishly (i.e., allowing reward-oriented thinking to influence their generosity), and *may* consequently decide to be less generous in an attempt to be more impartial. Contrastively, because the centrality and purpose of the reward-related religious primes were less obvious to participants in Study 3 (within which implicit primes were used), it is possible that the supernatural reward theme did not become conspicuous enough to motivate participants to suppress their reward-oriented thinking.

While none of the results obtained across Studies 1 – 3 refute this contention, responses to the suspicion probe items in Studies 1 and 2 suggested that very few participants were aware of the purpose of the study.<sup>16</sup> That is, the vast majority of participants expressed no suspicion that the reward-related elements of the passage of text they read were designed to influence their generosity in the Dictator Game. Hence, it seems unlikely that participants' possible active suppression of reward-based thinking explains the null results. However, it is still possible that participants were aware that the primes had influenced their decision-making, without them concluding that this was the purpose of the study. The inclusion of a final open-ended question asking participants what influenced their decision-making in the Dictator Game may have been appropriate for addressing this problem.

Intergroup differences in mood do not appear to be relevant to any of the effects (or null effects) observed across Studies 1 – 3 either. The PANAS was used to determine whether exposure to different categories of primes would result in differences in positive and/or negative affect across experimental groups. No differences in mood were observed between any of the experimental groups in any of the three studies. This indicates that the positivity/negativity of mood was not a causal factor in any intergroup differences in generosity (e.g., between the religious kindness group and other groups in Study 1) observed across Studies 1 – 3. Similarly, the null effects of explicit reward-related religious primes on generosity (relative to control group participants) in Study 1 cannot be attributed to differences in positive/negative affect across conditions.

As was noted earlier, it is also possible that an in-person study might have yielded different results. Harrell's (2012) study was conducted in laboratory settings, whereas Studies 1 and 2 (see above) were conducted entirely online, and the observed effects of reward-

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<sup>16</sup> Too few participants expressed awareness of the purpose of the study for any meaningful comparison to be made between the generosity of omitted participants and those who expressed no awareness of the purpose of the study.

related religious primes differed across these studies. However, while it is possible that reward-related religious primes may be more effective in in-person/laboratory studies – as a simplistic comparison of the findings of Harrell and Studies 1 and 2 would suggest – this seems unlikely. There are no obvious theoretical reasons as to why reward-related religious primes would be less effective in online settings than in laboratory settings. Moreover, Summerville and Chartier (2013, Study 2) found that the giving behaviours of online participants who play the Dictator Game reflect a belief that the ‘receiver’ participant is a real person. Additionally, Amir, Rand and Gal (2012) found that the proportion of money given by online participants in the Dictator Game was comparable to what is typically given in laboratory studies (see the meta-analysis conducted by Engel, 2011). These findings challenge any suspicion that online participants simply find the Dictator Game scenario less believable/plausible than laboratory participants do. Indeed, if this were so, it would be difficult to explain why a difference in generosity was observed between participants in the religious kindness condition and participants in the religious reward and control groups (see Study 1).

A more plausible explanation for the null findings in Studies 1 and 2 emerged in Study 3. The results of this study suggested that any effects that reward-related religious primes may have on prosociality are likely to be moderated by how those primes are interpreted by individual participants. In Study 3, participants who interpreted implicit reward-related religious primes as being reminders of God’s rewards donated approximately twice as much money (see Figure 4 above) as those who interpreted the primes as being indicative of God’s mercifulness. This finding suggests that certain interpretations of reward-related religious primes can be conducive to prosociality, while others may be unconducive to prosociality. As I have argued, different thoughts about *why* certain rewards are received are likely to produce differences in behaviour. Namely, those who believe that divine rewards are

received because God is merciful do not necessarily need to behave prosocially to attain those rewards, whereas those who believe that prosocial behaviour is – at least in part – a means to the end of receiving those divine rewards have a clear incentive to behave prosocially. But the question arises: why were the reward-related religious primes in Study 3 so often interpreted as being reflective of divine mercifulness?

It is noteworthy that all of the reward-related religious primes utilised across Studies 1 – 3 portrayed God positively (i.e., as a rewarder of good behaviour), while none of the primes portrayed God negatively (i.e., as someone who would readily and gladly deny rewards to those who misbehave). For this reason, it is unsurprising that participants in Study 3 often interpreted the reward-related religious primes as being indicative of God's general benevolence/mercifulness. Perhaps greater emphasis on the idea that the divine rewards available to believers are strictly *contingent* upon their moral conduct, rather than being available *irrespective* of their moral/immoral conduct, would have reduced the likelihood of participants interpreting the reward-related religious primes as being indicative of general divine benevolence.

While Studies 1 – 3 all suffered from this methodological shortcoming, only Study 3 included a mechanism (i.e., the forced-choice manipulation check item) capable of addressing it. The forced-choice question asked participants whether the theme of the passage they read was relevant to particular attributes of God (i.e., anger, apathy, leniency, mercifulness, punishments, rewards, or vengeance). Unlike the questions in Studies 1 and 2 (asking what the passages of text were about), this forced-choice option demanded that participants consider the underlying *theme* of the task. Even if some participants' interpretations of the primes in Study 3 were influenced by the positive portrayal of God in those primes, the manipulation check item facilitated at least an imperfect distinction between those participants and others whose interpretations may have been less affected. Contrastively,

Studies 1 and 2 did not include systematic measures for checking whether participants were actually interpreting the reward-related passages of text as being relevant to divine mercifulness or divine rewards. Participants in Studies 1 and 2 were only asked to summarise the text they read, rather than to interpret it, or to identify its underlying themes. Hence, the null effects of reward-related religious primes in those studies *may* stem from undetected differences in how participants interpreted the reward-related religious passage.

It is also possible that exposure to reward-related religious primes may have – due to conceptual overlap – primed participants with divine reward concepts *and* divine benevolence/mercifulness concepts. Given that these two distinct concepts appear to have contrasting/conflicting effects on prosociality (e.g., contrast the findings of Harrell, 2012, with those of DeBono et al., 2017; also see Studies 1 and 3 above), the simultaneous priming of these distinct concepts may appear to have no influence on prosociality.

### **Divine Mercifulness Primes and Prosociality**

One of the contentions expressed throughout this thesis was that divine benevolence/mercifulness and divine reward concepts are related, but distinct. While the offering of divine rewards may be a form of benevolence, a god could – at least in theory – offer supernatural rewards to compliant believers whilst still being generally malevolent and/or cruel. Furthermore, the provision of rewards in return for obedience is not a form of mercifulness; rather, mercifulness entails the provision of rewards (or the suspension or withholding of punishments) for those who have exhibited disobedience. In this sense, it seems clear that divine benevolence/mercifulness and divine reward concepts should not be conflated.

There was already a growing body of literature suggesting that concepts of divine benevolence and divine mercifulness are uncondusive to prosocial behaviour. Relative to other primed religious concepts (e.g., supernatural punishment), the priming of religious

participants with concepts of divine benevolence, forgiveness and mercy has commonly resulted in increased *anti-social* behaviour (see Card, 2013, Study 2; DeBono et al., 2017, Studies 2 – 3; also see Shariff & Norenzayan, 2011). Some studies have found divine benevolence/mercifulness primes to be no more effective than control primes at influencing prosocial attitudes (Yilmaz & Bahçekapili, 2016, Study 2) or behaviours (Card, 2013, Study 1). The results of Studies 1 and 3 (above) contribute to this body of literature.

While DeBono et al. (2017) found that divine forgiveness primes generally increased anti-social behaviour (e.g., cheating during quiz tasks), they noted that this does not necessarily mean that such primes will reduce positive forms of prosocial behaviour (e.g., generosity). No previous studies had explored the effects of divine benevolence/mercifulness primes on the financial generosity of religious people. The findings of Study 1 are significant because they demonstrate that divine forgiveness/mercifulness primes *can* reduce positive forms of prosociality, such as generosity. Participants presented with a passage of text referring to God's merciful and forgiving nature were less generous than control group participants in the Dictator Game. Importantly, they were also less generous than participants who read a passage of text about the ways in which God rewards moral behaviour. This latter finding provides clear empirical support for the notion that concepts of divine benevolence/mercifulness and divine reward should be treated as distinct.

Such results as those outlined above are unsurprising. If the receipt of rewards is only assured by compliance with certain rules, then people have an obvious incentive to comply with those rules. If the receipt of rewards is assured even to those who are perpetually uncompliant, then there is little incentive to comply with those rules. In fact, there is an obvious incentive not to comply, as violators will profit – additionally – from their violations. For example, if someone can steal somebody else's property and still be granted entry into Heaven, then he/she has received two rewards (i.e., stolen property and entry into Heaven),

whereas someone who decides not to steal somebody else's property will only receive one reward (i.e., entry into Heaven).

It should be noted, however, that the results of Study 3 ostensibly conflicted with those of Study 1. While the results of Study 1 demonstrated a negative effect of divine forgiveness/mercifulness primes on generosity, the findings of Study 3 indicated that religious people who interpret primes as being related to divine mercifulness are no more generous than control group participants. In Study 3, participants in the religious reward condition who interpreted the primes as being related to divine mercifulness gave away about the same amount of money to charity as participants in the control condition. Given that Studies 1 and 3 (see above) used highly similar methods for testing participants' generosity (i.e., the Dictator Game in Study 1, and a slight variation of the Dictator Game in Study 3), it may seem peculiar that one study would show a significant difference in generosity between control group participants and participants primed with divine mercifulness concepts (Study 1), while the other would indicate that there is no such difference between the two groups (Study 3). Why would two highly similar studies yield such contrastive findings?

The answer to this question may stem from an important difference between Studies 1 and 3. With regard to the priming of divine benevolence/mercifulness concepts, Yilmaz and Bahçekapili (2016, Study 2) had participants read a passage of text that focused explicitly on God's tendency to forgive those who make mistakes and repent, and Card (2013, Studies 1 – 2) had participants read magazine-style articles, which portrayed God as being kind and benevolent. In those previous studies, concepts of divine benevolence were deliberately being primed by the researchers. The concept of divine benevolence/mercifulness was also central and overt in the priming passage in Study 1. Contrastively, in Study 3, the primes used were intended to prime participants with divine reward concepts, and as I outlined earlier, a supernatural agent does not need to be benevolent to promise divine rewards to adherents.

While many participants detected a divine mercifulness theme, all participants in the religious reward group were still presented with a conspicuous theme of contingent divine rewards (i.e., the idea that God only rewards good behaviour), and this may also have influenced their giving behaviours.

If primes are likely to be interpreted in different ways by different participants, and if individual participants are able to detect multiple distinct themes within single primes (e.g., short sentences or passages of text), then it will always be difficult to conclude which particular interpretations/themes underlie any effects – or even null effects – observed. For this reason, it is necessary to address the broader and important problem of conceptual overlap.

### **The Wider Conceptual Overlap Problem**

Throughout this thesis, I have argued that it is imperative that the primes used in religious priming research be as conceptually clear and specific as possible. Conceptual clarity and specificity will reduce the degree to which interpretations of individual primes differ and should reduce the number of distinct themes detected by participants. If primes are conceptually vague/ambiguous, then different participants may interpret them differently, and individual participants may be primed with multiple concepts at once.

This is not an abstract concern without an empirical basis in the psychological literature. As I noted earlier, Pichon et al. (2007; Study 1) found that participants exposed to religious primes of a ‘positive’ nature exhibited increased helping behaviour, relative to participants exposed to ‘neutral’ religious primes or secular primes. But simply classifying religious primes as positive (or even ‘neutral’; see below) is problematic because different concepts may be positive for different reasons. For example, the word ‘heaven’ may be positive because it refers to a grand reward that religious people can attain, while the word



‘communion’ may be positive because it is related to valued traditions and a sense of religious community.<sup>17</sup>

The findings of Harrell (2012) demonstrated that conceptual overlap of this sort may have been a considerable problem in the study conducted by Pichon et al. (2007). Three of the prime-words in Harrell’s religious reward condition (‘heaven’, ‘miracle’ and ‘salvation’) were present in Pichon et al.’s positive religious condition, and two of the prime-words in Harrell’s reward-unrelated religious condition (‘pilgrimage’ and ‘temple’) were present in Pichon et al.’s neutral religious condition. Despite a pre-test study revealing that participants considered all five of these words to be equally positive, Harrell found that participants in the religious reward condition were more generous than participants in the reward-unrelated religious condition. At the very least, this finding suggests that some primes with positive content influence prosociality more significantly than others. It could also be argued that it is not the general positive connotations of religious primes that promote prosociality, but rather, it is likely that some positive religious themes (e.g., reward) promote prosociality while others are uninfluential (or even reduce prosociality; e.g., divine mercifulness primes have been found to reduce prosociality and increase anti-sociality in several studies). In Pichon et al.’s study, the effects observed may have stemmed from the effects of *some* primes in the positive religious condition (e.g., ‘heaven’), but not others (e.g., ‘temple’).

Further evidence against the idea that generically positive religious primes increase prosociality came from Study 1 (above). Divine mercifulness and forgiveness are ostensibly positive concepts, and yet, the priming of religious participants with such concepts has been found to reduce prosocial behaviour (see Study 1, above), and even to increase antisocial behaviour (e.g., Card, 2013, Study 2; DeBono et al., 2017, Study 2). These findings, in addition to those of Harrell (2012), clearly demonstrate that the umbrella term ‘positive’ is far

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<sup>17</sup> Both of these words (i.e., ‘communion’ and ‘heaven’) were used by Pichon et al. (2007, Study 1).

too broad. The term encompasses positive concepts that have been linked to prosociality (e.g., reward) and positive concepts that have been linked to reductions in prosociality (e.g., divine forgiveness/mercifulness).

The problem of conceptual overlap is not restricted to instances where different primes under the same umbrella heading could/should be placed into separate sub-categories. There are also instances wherein the same prime-word or priming passage can be interpreted as belonging to different or multiple sub-categories. In the case of positive religious primes, individual religious concepts may be positive for a multitude of different reasons, and to different extents. For example, the word ‘Christmas’ may be positive because it reminds people of religious tradition(s) and time spent with their families, but this word may *also* be positive because it reminds people that they will be receiving gifts (i.e., eliciting reward-anticipation).<sup>18</sup>

The findings of Study 3 (above) demonstrate the relevance of this type of conceptual overlap to investigations of the SRH. Even though none of the priming sentences in the religious reward condition contained obvious references to divine mercifulness, many participants still detected this theme, as their responses to the manipulation check item indicate. While the use of implicit primes (relative to explicit primes) should reduce the amount of rumination that participants are likely to devote to the primed concepts, about half of the participants in the religious reward condition of Study 3 were still able to detect a divine mercifulness theme. Hence, while participants were forced to choose only one theme that was present in the SUT, it is possible that participants actually detected multiple themes (e.g., God’s mercifulness *and* God’s rewards), and simply selected the theme that they believed was most prominent. If this was the case, it is possible that specific concepts/themes (e.g., divine benevolence and divine reward) that were being simultaneously primed elicited

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<sup>18</sup> The word ‘Christmas’ was listed as a positive religious prime by Pichon et al. (2007, Study 1).

opposing effects that may have cancelled each other out. Perhaps participants who responded that the underlying theme of the SUT was divine reward(s) would have donated more, were it not for the possible simultaneous priming of divine mercifulness concepts. Perhaps participants who responded that the underlying theme was God's mercifulness would have donated less, were it not for the simultaneous priming of divine reward concepts.

These contentions are supported by the findings of Study 1. The prime in the religious kindness condition was a passage of text devoted specifically to concepts of divine forgiveness and mercifulness, without any reference to supernatural rewards (e.g., eternal life). Participants in that group gave away about half as much money as participants in the religious reward group and the control group. Participants in the religious reward group gave away no more money than control group participants, but as I argued in the preceding sections, this finding may have been due to participants interpreting the reward-related religious passage as being reflective of a generally benevolent and merciful God.

A broader problem affecting studies testing the effects of specific types of religious primes (e.g., reward-related) on prosociality has been the use of so-called 'neutral' religious conditions. Research testing the effects of specific types of religious primes arose due to recognition that the monolithic categorisation of primes as "religious" was inadequate and was unlikely to capture many of the nuances with regard to how religious belief influences attitudes and behaviours (Preston & Ritter, 2013; Ritter & Preston, 2013; Saleam & Moustafa, 2016). Despite this, many studies testing the effects of specific religious primes have utilised similarly monolithic categories as a basis for comparison with their more specific categories (e.g., see Harrell, 2012<sup>19</sup>; Pichon et al., 2007; Yilmaz & Bahçekapili, 2016, Study 1<sup>20</sup>). This criticism is equally applicable to Study 3 (above), which featured a

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<sup>19</sup> Harrell (2012) used a 'reward-unrelated religious' condition. This is no different to a typical 'neutral religious' condition, as this category includes all religious concepts except reward-related ones.

<sup>20</sup> Yilmaz and Bahçekapili (2016, Study 1) used a 'non-punishing religious' category, which acted as their neutral religious category.

‘religious neutral’ condition within which a broad range of conceptually distinct prime-words were used (e.g., ‘church’, ‘God’, ‘prayer’).

One could argue that, although ‘neutral’ religious priming categories will encompass a broad range of conceptually-distinct primes, the priming effects of those distinct concepts will be small. For example, consider a hypothetical neutral religious priming condition that contains the prime-words: ‘Hell’, ‘God’, ‘church’, and ‘forgiveness’. These words appear to prime concepts of divine punishment, supernatural agents, religious institutions, and divine mercifulness, respectively. Because only a single word primes each of these concepts, any effects of the priming of those concepts may be small and could even be counteracted by the effects of the other prime-words (e.g., divine mercifulness and punishment primes may have conflicting effects). Future research could explore this possibility by testing whether the proportion of prime-words belonging to a particular category (e.g., punishment-related or reward-related) is related to the magnitude of any prosocial effects observed. Future research could also examine whether certain categories of primes counteract the effects of others (e.g., perhaps the effects of divine mercifulness primes will counteract the effects of divine punishment primes).

The problem of conceptual overlap should be a serious consideration for future researchers because the use of certain primes in their ‘neutral religious’ conditions could produce prosocial effects that make those of their more specific religious primes appear less significant than they would be if more appropriate comparison prime-words were to be chosen. Moreover, the use of broad categorisations of primes will make the interpretation of data difficult. Besides studies contrasting the effects of conceptually-specific religious primes (e.g., reward-related or punishment-related), many studies in the religion-prosociality priming literature have simply used a single and monolithic ‘religious priming’ category, without any sub-categories (e.g., Ahmed & Hammarstedt, 2011; Aveyard, 2014, Study 1; Randolph-Seng

& Nielsen, 2007; Shariff & Norenzayan, 2007).<sup>21</sup> Such studies may demonstrate that priming people with religious concepts can increase attitudinal and/or behavioural prosociality, but they offer very limited insights as to how/why the religious primes are eliciting prosocial effects. Without the appropriate (sub-)categorisation of religious primes, it is difficult to ascertain whether it is the priming of religious concepts in general that is producing the observed effects, or whether only specific categories of religious concepts are eliciting the observed effects (Saleam & Moustafa, 2016).

In order to categorise religious primes, researchers need some understanding of how most participants interpret the prime-words they are presented with. In their cluster-analytical study, Ritter and Preston (2013) presented participants with a list of 32 religious words on a screen and had them sort those words into 2 – 5 categories based on criteria chosen by the participants (e.g., they could create one category for agent-related words and/or one category for positive/negative words, etc.). Ritter and Preston found that participants' categorisations of the religious words formed three clear clusters: agents (e.g., 'angel', 'God'), spiritual/abstract concepts (e.g., 'faith', 'prayer') and institutional/concrete concepts (e.g., 'Bible', 'church'). Additionally, the words 'heaven', 'miracle' and 'salvation' clustered closely together in Ritter and Preston's cluster-analytical study, which suggests that supernatural rewards should be treated as a separate category (Saleam & Moustafa, 2016; also see Harrell, 2012). Empirical research also suggests that concepts of divine mercifulness (e.g., Card, 2013; DeBono et al., 2017; also see Study 1 above) and divine punishment (e.g., DeBono et al., 2017; Yilmaz & Bahçekapili, 2016) should be treated as belonging to separate categories. Perhaps a largescale cluster-analytical study featuring more participants and a larger number of religion-related words could reveal other categories of religious concepts.

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<sup>21</sup> Four out of the five religious primes used by Shariff and Norenzayan (2007) were agent-related ('divine', 'God', 'prophet' and 'spirit'); hence, it may be concluded that agent-related religious primes elicited the observed effects. However, there was no second religious priming condition using non-agent-related primes as a basis for comparison. For a more comprehensive critique of this study, see Randolph-Seng and Nielsen (2008).

Once clear religious prime categories have been identified, researchers can compare the prosocial effects of primes from different categories. Knowledge of which primes elicit prosocial effects, which primes elicit no prosocial effects, and which primes elicit antisocial effects will promote a more comprehensive understanding of how religious beliefs influence prosociality.

### **Conclusions**

Ultimately, the mixed findings across Studies 1 – 3 raise no fewer questions than they answer. The findings of Study 3 suggest that implicit reward-related religious primes can increase generosity if participants interpret those primes as being related to God's rewards. Contrastively, the findings of Study 1 suggest that explicit reward-related religious primes are ineffective at increasing generosity, and the findings of Study 2 indicate that the null finding in Study 1 did not stem from a lack of cultural-specificity of the reward-related religious priming passage utilised. However, an extrapolation of the findings of Study 3 would suggest that the null findings in Study 1 may have stemmed from undetected differences in how participants were interpreting the content of the reward-related religious priming passage (e.g., as being related to divine mercy *and/or* divine reward). Future explicit priming research is needed to investigate this possibility.

While evidence regarding the prosocial effects of reward-related religious primes was mixed, the hypothesis that concepts of divine benevolence/mercy and divine rewards have distinct behavioural influences was supported by the data (see Studies 1 and 3). In Study 1, a clear difference in generosity was observed between participants in the religious reward condition and the religious kindness condition. Additionally, the findings of Study 3 showed that different interpretations of reward-related religious primes – as being reflective of the rewards that God offers or how merciful God is – result in different giving behaviours. Collectively, these findings support the contention made throughout this thesis that future

priming studies designed to test the SRH should clearly distinguish between concepts of (1) contingent divine rewards and (2) divine benevolence/mercifulness.

Relatedly, the hypothesis that concepts of divine benevolence may influence people to behave less prosocially and/or anti-socially (see DeBono et al., 2017) was also supported by the data. The findings of Study 1 contribute to a growing body of empirical research indicating that the priming of divine benevolence/mercifulness concepts negatively influences the behavioural prosociality of religious people. And while the findings of Study 3 showed that participants who interpreted religious reward primes as being reflective of God's mercifulness were no less generous than control group participants, this may be because they were simultaneously primed with divine reward concepts.

### **Future Directions**

The findings of Studies 1 – 3 have important implications for any future investigations of the SRH, and for religious priming research in general. However, as I noted throughout this thesis, a particularly noteworthy issue in the religious priming literature has been the common utilisation of small sample sizes (see van Elk et al., 2016). While the findings of Studies 1 – 3 may provide some insights regarding the veracity of the SRH and suggest a complex relation between divine reward concepts and prosociality (i.e., that participants' interpretations of reward-related religious primes can differ in consequential ways), all three studies utilised small samples of participants; hence, all findings across these studies must be interpreted with caution. Replication of Studies 1 – 3 with larger sample sizes (i.e., upward of 75 participants per experimental group) would strengthen the conclusions detailed above and provide a stronger foundation for future investigations of the merits of the SRH.

Future researchers testing the SRH should carefully develop reward-related religious primes (whether implicit or explicit) to avoid – to the fullest extent possible – conceptual

overlap between religious reward concepts and divine benevolence/mercifulness concepts. As I noted above, the reward-related religious primes used in Studies 1 – 3 (above) all portrayed God as a benevolent figure, and this introduced considerable unintended conceptual overlap. Because the provision of divine rewards is reflective of divine benevolence, concepts of divine reward and divine benevolence/mercifulness are difficult to disentangle. Future researchers are advised to consider utilising primes that not only portray God as a rewarder of good deeds, but also as a deity who will deny rewards to those who are disobedient. The inclusion of such primes should reduce the extent to which participants interpret reward-related religious primes as being reflective of God's general benevolence/mercifulness.

Future researchers testing the SRH might also consider testing whether reward-related religious primes increase/decrease antisocial behaviours. For example, researchers could test whether participants exposed to reward-related religious primes are more or less likely to cheat (when given the opportunity) in quiz tasks. The only religious priming studies that have tested the effects of reward-related religious primes (i.e., Harrell, 2012; Studies 1 – 3 above) have focused on prosocial behaviour (i.e., generosity). Perhaps studies testing the SRH could be conducted in more naturalistic settings. For example, researchers could test whether religious people who just listened to a sermon focusing on divine rewards donate more money to charity than participants who listen to a sermon that does not focus on divine rewards or punishments.

Irrespective of the particular hypothesis being tested, future researchers are strongly advised to utilise manipulation check items when priming specific types of religious concepts (e.g., reward-related). Manipulation checks are not only necessary to ensure that priming has occurred; Study 3 (above) demonstrated that manipulation checks are also necessary to ensure that participants are being primed with the concepts that researchers intend to prime them with. Approximately half of the participants in the religious reward group thought that



the theme of the SUT was divine *mercifulness*, while the other half thought that the theme of the SUT was divine *reward*. If participants interpret primes differently than expected, and these different interpretations lead to different behavioural consequences, then researchers may end up making inaccurate conclusions (e.g., one could conclude that supernatural reward primes do not increase prosociality, even though the prime-words utilised were priming some participants with divine mercifulness concepts). Hence, the inclusion of items capable of detecting such interpretational differences is essential. Perhaps simpler manipulation-check items (e.g., the forced-choice question in Study 3) could be used in addition to more open-ended questions probing participants' interpretations/understandings of the primes they are presented with.

Regarding investigations of the SRH specifically, appropriate manipulation check items could be effective at determining whether explicit reward-related religious primes are ineffective at eliciting prosocial effects due to the possible active suppression of reward-oriented thinking by participants. Replication of Studies 1 and 2 with the inclusion of measures for detecting what participants think the underlying themes of the primes are could settle this issue. For example, if participants who interpret an explicit reward-related religious prime as being reflective of God's rewarding nature give more generously than those who think that the same prime is reflective of God's mercifulness, then this would suggest that distinct interpretations of the same prime can greatly influence the results. Such a finding would, therefore, indicate that it is not the suppression of reward-oriented/selfish thinking that makes participants exposed to explicit reward-related religious primes appear no more inclined towards generosity than control group participants.

Future comparative research as to the effects of reward-related religious and secular primes is also warranted. Interestingly, while both studies found reward-related religious primes to be effective at increasing generosity, Harrell (2012) found that subliminal reward-

related secular primes were effective at increasing generosity, Study 3 failed to find such an effect using implicit reward-related secular primes. This latter finding suggests that religious people value secular rewards (e.g., awards) less than religious rewards (e.g., salvation) when those rewards are being consciously appraised. However, given the low sample size used in Study 3, this finding needs to be replicated, perhaps with the inclusion of nonreligious participants. If nonreligious people respond more prosocially after exposure to both types of reward primes or only to secular reward primes, while religious people only respond more prosocially when exposed to religious reward primes, then this would suggest that religious belief results in the devaluing/discounting of secular rewards (e.g., awards and fame).

Largescale cluster-analytical studies of the sort conducted by Ritter and Preston (2013) would also be useful in the context of the religious priming literature. Such studies may yield data that would allow future researchers to create religious priming categories based on how participants themselves tend to interpret particular prime-words. While researchers could form categories of religious primes themselves, there is no guarantee that laymen will interpret the prime-words identically to the researchers. For example, the religious reward primes that I utilised in Study 3 were designed specifically to prime participants with divine reward concepts. Unexpectedly, half of the participants in the religious reward group interpreted the primes as being about God's mercifulness, despite their being no overt references to this concept. Studies exploring how participants themselves interpret religious primes may help future researchers to avoid this methodological shortcoming.

Moreover, as Saleam and Moustafa (2016) noted, there is a vast body of priming research exploring *whether* religious primes influence prosociality, but very few studies have directly investigated *why* prosocial effects have been observed. Although recent studies demonstrating the prosocial/antisocial effects of particular categories of religious primes

(e.g., see Card, 2013; DeBono et al., 2017; Harrell, 2012; Yilmaz & Bahçekapili, 2016; also see Studies 1 and 3 above) allow for more informed conclusions to be drawn about the mechanisms (e.g., reward anticipation) underlying the link(s) between religious belief and prosociality, such conclusions remain somewhat speculative in the absence of physiological and neurological data.

Physiological (e.g., electrodermal response) and neurological (e.g., functional magnetic resonance imaging) studies may help researchers understand the underlying mechanisms through which particular religious primes elicit their effects. Such knowledge could complement data collected in priming studies. For example, if exposure to divine punishment primes increases activity in participants' amygdalae – a brain region linked to the fear response, and which has been found to activate in response to punishment (Orsini & Maren, 2012; Moustafa, Gilbertson, Orr, Harzallah, Servatius & Myers, 2013) – this would suggest that divine punishment primes are successfully eliciting a fear of punishment in participants. Similarly, if divine reward primes were found to increase activity in brain regions linked to reward-anticipation (e.g., the nucleus accumbens; see Abe & Greene, 2014), this would suggest that divine reward primes are successfully eliciting reward-anticipation in participants. Such findings would be significant, as they would suggest that any prosocial effects elicited by divine punishment (see Yilmaz & Bahçekapili; also see Hadnes & Schumacher, 2012) or divine reward primes (see Harrell, 2012; also see Study 3 above) are due to fear of punishment and reward-anticipation, respectively.

Ultimately, the findings of Studies 1 – 3 offer numerous insights as to how investigations of the SRH, and religious priming research generally, could progress. The recommendations listed here are only few among many possibilities. It is hoped that future researchers will consider the issues (e.g., conceptual overlap) and recommendations (e.g.,

diversification of methods) outlined in this thesis, and that the insights produced herein are of value to the religious priming literature going forward.

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## **Appendices**



## Appendix A

## Human Ethics Approval Form

Locked Bag 1797  
Penrith NSW 2751 Australia  
Research Engagement, Development and Innovation (REDI)



REDI Reference: H12092  
Risk Rating: Low 2 - HREC

**HUMAN RESEARCH ETHICS COMMITTEE**

13 April 2017

Doctor Ahmed Moustafa  
School of Social Sciences and Psychology

Dear Ahmed,

I wish to formally advise you that the Human Research Ethics Committee has approved your research proposal H12092 "The Prosocial Effects of Explicit Reward-Related Religious Primes", until 13 April 2018 with the provision of a progress report annually if over 12 months and a final report on completion. In providing this approval the HREC determined that the proposal meets the requirements of the National Statement on Ethical Conduct in Human Research.

This protocol covers the following researchers:  
**Ahmed Moustafa, Alan Nixon, James Saleam**

**Conditions of Approval**

1. A progress report will be due annually on the anniversary of the approval date.
2. A final report will be due at the expiration of the approval period.
3. Any amendments to the project must be approved by the Human Research Ethics Committee prior to being implemented. Amendments must be requested using the HREC Amendment Request Form: [https://www.westernsydney.edu.au/data/assets/word\\_doc/0012/1096995/FORM\\_Amendment\\_Request.docx](https://www.westernsydney.edu.au/data/assets/word_doc/0012/1096995/FORM_Amendment_Request.docx)
4. Any serious or unexpected adverse events on participants must be reported to the Human Research Ethics Committee via the Human Ethics Officer as a matter of priority.
5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the Committee as a matter of priority
6. Consent forms are to be retained within the archives of the School or Research Institute and made available to the Committee upon request.
7. Project specific conditions:  
There are no specific conditions applicable.

Please quote the registration number and title as indicated above in the subject line on all future correspondence related to this project. All correspondence should be sent to the e-mail address [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au) as this e-mail address is closely monitored.

Yours sincerely

  
Professor Elizabeth Deane  
Presiding Member,  
Western Sydney University Human Research Ethics Committee

## Appendix B

## Study Information for Studies 1 and 2

**Description**

\*\*\*IF YOU WOULD LIKE TO PARTICIPATE, IT IS ESSENTIAL THAT YOU CAN READ AND UNDERSTAND THE ENGLISH LANGUAGE. IF YOU ARE NOT FLUENT IN ENGLISH, PLEASE DO NOT CONTINUE.\*\*\*

You are invited to participate in two research studies being conducted by James Saleam, a Masters' student from the School of Social Sciences and Psychology at Western Sydney University. Both studies are being supervised by Dr. Ahmed Moustafa and Dr. Alan Nixon.

Study 1 will explore how people rate different kinds of texts, and how peoples' personal levels of religiosity, and their current moods, relate to the ratings they give. Study 2 explores how people divide money between themselves and anonymous strangers (Group 1), and explores whether people can accurately predict what percentage of money they just received (Group 2).

**How is the study being paid for?**

Both projects are supported by a grant from the School of Social Sciences and Psychology at Western Sydney University.

**What will I be asked to do?**

In Study 1, you will be asked to complete a short survey regarding certain basic details (e.g., age, sex, how religious you think you are, etc.). You will then read a short passage of text, and rate how 'impressive' and 'meaningful' you found that text to be. Following this, you will complete another short survey regarding your current mood.

In Study 2, you have been assigned to Group 1. Group 1 participants are given a small sum of money to split between themselves and an anonymous participant from Group 2. Whatever amount you choose to keep will be awarded to you via MTurk at the end of the study.

**How much of my time will I need to give?**

Completing both studies will take you approximately 20 minutes.

**What benefits will I, and/or the broader community, receive for participating?**

Participants will be paid \$1.37(AUD) for participating, and will also receive the amount of money they choose to keep in Study 2.

**Will these studies involve any risk or discomfort for me? If so, what will be done to address it?**

No discomfort is expected to result from participation in either study. However, if you are feeling distressed or uncomfortable at any time, you may cease participation.

**How will the results be published or disseminated?**

The results of these research projects will be published within a Master's thesis. Published data will be presented in such a way that the participant cannot be identified.

**Will the data and information that I have provided be disposed of?**

Only the researchers will have access to the data you provide. However, your data may be used in other related projects for an extended period of time. None of the data used for other projects will contain information relevant to your identity.

**Can I withdraw from the study?**

Participation is entirely voluntary, and you are not obliged to be involved. If you do participate you can withdraw at any time without giving reason. If you choose to withdraw, any information that you have supplied will be disposed of at your request.

**What if I require further information?**

Please contact James Saleam (e-mail: 17122492@student.westernsydney.edu.au), should you wish to discuss the research further before deciding whether or not to participate.

**What if I have a complaint?**

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

These studies have been approved by the Human Research Ethics Committee at Western Sydney University. The ethics reference number is: H12092.

If you think these studies violate Amazon Mechanical Turk's terms and conditions, you can seek further information, or make a formal complaint by visiting:  
<https://www.mturk.com/mturk/contactus>

**Only people who are fluent in the English language are eligible to participate. Are you fluent in the English language?**

Yes / No

**Do you understand and acknowledge all of the information provided above?**

Yes / No

## Appendix C

## Informed Consent Form for Studies 1 and 2

**By confirming my consent, I am acknowledging that:**

-The procedures and the time involved have been explained to me, and I have been given the opportunity to contact the researcher if I had any questions regarding these studies.

**By confirming my consent, I am prepared to:**

-Participate in an online reading and rating task

-Complete online questionnaires regarding my mood and certain personal attributes (e.g., age, gender, religious devotion)

-Participate in an economic game involving money

**By confirming my consent, I understand that:**

-My involvement is confidential, and that the information gained during the study may be published and stored for other research use but no information about me will be used in any way that reveals my identity

-I can withdraw from the study at any time without affecting my relationship with the researcher/s, and any organisations involved, now or in the future

**Do you consent?**

Yes / No

**Please create an 8-character password. Make it as unique as you can, so that you can be identified and paid on Murk.**

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## Appendix D

## Demographics questionnaire

**Study 1**

**Please respond to all questions.**

**What is your gender?** Male / Female

**What is your age?**

**What is your religion (if any)?**

**How religious do you consider yourself to be (1 = not at all; 7 = very devout)?**

1                    2                    3                    4                    5                    6                    7

**For how many years have you studied at a university or college?**

None; Less than 1 year; 1 year; 2 years; 3 years; 4 or more years

**In what country do you live?**

**How wealthy do you consider yourself to be (1 = very poor; 7 = very rich)?**

1                    2                    3                    4                    5                    6                    7

## Appendix E

## Shortened PANAS for Studies 1 and 2

**Mood Survey**

**Consider each word in the left-most column and think about how well that word describes your current mood. Provide a response for each word.**

How accurately does each of the following words reflect your current mood? (1 star = not at all; 5 stars = highly accurately)

Active	☆	☆	☆	☆	☆
Afraid	☆	☆	☆	☆	☆
Angry (at self)	☆	☆	☆	☆	☆
Ashamed	☆	☆	☆	☆	☆
Attentive	☆	☆	☆	☆	☆
Calm	☆	☆	☆	☆	☆
Cheerful	☆	☆	☆	☆	☆
Delighted	☆	☆	☆	☆	☆
Depressed	☆	☆	☆	☆	☆
Disgusted (at self)	☆	☆	☆	☆	☆
Distressed	☆	☆	☆	☆	☆
Enthusiastic	☆	☆	☆	☆	☆
Guilty	☆	☆	☆	☆	☆
Happy	☆	☆	☆	☆	☆
Irritable	☆	☆	☆	☆	☆
Joyful	☆	☆	☆	☆	☆
Loathing	☆	☆	☆	☆	☆
Proud	☆	☆	☆	☆	☆

Relaxed					
Sad					

**Briefly, how would you describe your current mood?**

**What do you think the point of this research is?**

## Appendix F

## Dictator Game

**Study 2**

**Please read the following instructions carefully.**

You are about to play an economic game. You have been assigned to Group 1 (the 'Sender' group).

You will be given \$1.00(AUD), which you can split between yourself and an anonymous participant from the 'Receiver' group. Receiver group participants are completing a different task, not involving payments. You can split the money however you like (e.g., you can keep \$0.50 and send \$0.50, or you can keep \$0.25 and send \$0.75, and so on). And how much you decide to keep will not affect your \$1.37(AUD) participation payment. You will receive whatever you decide to keep in addition to the \$1.37(AUD) you get for participating.

Please note, the Receiver participants will be given no information about you or how much money you decided to keep. They will not even know that the initial amount given to you was \$1.00(AUD). Hence, there is no pressure on you to give anything; how much you send is entirely up to you.

How much of the \$1.00(AUD) would you like to **send** to the person from the Receiver group? Do not include a dollar sign (\$); simply nominate how much money you would like to **send** (e.g., 0.25, 0.50 or 0.95).

**Please ensure that the amount you have decided to send is an amount between 0.00 and 1.00. If you enter an invalid amount, your data for this study will not be valid.**

**What do you think the point of this research is?**



## Appendix G

## Debriefing E-Mail for Studies 1 and 2

Dear participant,

Thank you for participating in this study. This e-mail has been sent to inform you about the study you participated in and provide you with avenues to provide feedback or express any concerns you may have.

During this study, you were told that you were actually participating in two separate studies; the first involving a couple of surveys and the rating of a passage of text, and the second involving an economic game where you are given the chance to split a sum of money between yourself and a second (anonymous) participant from another group. In actual fact, these were simply two elements of the same study.

The purpose of this study was to assess how the reading of different kinds of texts influences generosity. Some participants read a religious text about how God rewards moral behaviour, some read a text about God's positive attributes, and others read a text about language. It was expected that reading a text about how God rewards good people would result in readers giving more money to the anonymous participant in the economic game. These details were not disclosed at the beginning, as knowledge of the study's aims may have affected the results. There were no malicious intentions behind the withholding of this information.

If you have any concerns about the study, the purpose(s) of the research, or any other queries, please see the information below.

### **Information and Contact Details**

#### **How was this study funded?**

This project is supported by a grant from the School of Social Sciences and Psychology at Western Sydney University.

#### **How do you intend to publish or disseminate the results?**

It is anticipated that the results of this research project will be published within a master's thesis. Published data will be presented in such a way that the participant cannot be identified.

#### **Will the data and information that I have provided be disposed of?**

Please be assured that only the researchers will have access to the raw data you provide. However, your data may be used in other related projects for an extended period of time. No personal details will be kept with the data, to ensure confidentiality.

#### **Can I withdraw from the study?**

If you would like to withdraw your data from the study, please inform James Saleam (e-mail: 17122492@student.westernsydney.edu.au). Withdrawing your data will result in a forfeiture of any money earned for participation and during the study (i.e., during the economic game).

#### **Can I tell other people about the study?**

You can tell others about the study, but it is important that the purpose of the study not be disclosed to anyone who may participate in the study, as this could affect their responses.

#### **What if I require further information?**

Please contact James Saleam if you have any enquiries regarding the study you participated in

E-mail: 17122492@student.westernsydney.edu.au

**What if I have a complaint?**

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

If you agree to participate in this study, you may be asked to sign the Participant Consent Form. The information sheet is for you to keep and the consent form is retained by the researcher/s.

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is H12092.

## Appendix H

## Study Information and Informed Consent Form for Study 3

**Description**

\*\*\*IF YOU WOULD LIKE TO PARTICIPATE, IT IS ESSENTIAL THAT YOU CAN READ AND UNDERSTAND THE ENGLISH LANGUAGE. IF YOU ARE NOT FLUENT IN ENGLISH, PLEASE DO NOT CONTINUE.\*\*\*

You are invited to participate in two research studies being conducted by James Saleam, a Masters student from the School of Social Sciences and Psychology at Western Sydney University. Both studies are being supervised by Dr. Ahmed Moustafa.

Study 1 will explore how religious self-assessments influence mood and task performance. Study 2 explores how people divide money between themselves and charities in online settings.

**What will I be asked to do?**

In Study 1, you will be asked to complete a short survey regarding your religious beliefs, and some other basic details (e.g., age). You will then complete a short cognitive task involving the construction of coherent sentences. Following this, you will complete a short survey regarding your current mood.

In Study 2, you will be given a small sum of money to split between yourself and an anonymous charity chosen by the researchers. Whatever amount you choose to keep will be awarded to you via MTurk at the end of the study.

**How will the results be published or disseminated?**

The results of these research projects will be published within a Master's thesis. Published data will be presented in such a way that the participant cannot be identified.

**Will the data and information that I have provided be disposed of?**

Only the researchers will have access to the data you provide. However, your data may be used in other related projects for an extended period of time. None of the data used for other projects will contain information relevant to your identity.

**Can I withdraw from the study?**

Participation is entirely voluntary and you are not obliged to be involved. If you do participate you can withdraw at any time without giving reason. If you choose to withdraw, any information that you have supplied will be disposed of at your request.

**What if I require further information?**

Please contact James Saleam (e-mail: 17122492@student.westernsydney.edu.au), should you wish to discuss the research further before deciding whether or not to participate.

**What if I have a complaint?**

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

These studies have been approved by the Human Research Ethics Committee at Western Sydney University. The ethics reference number is: H12092.

If you think these studies violate Amazon Mechanical Turk's terms and conditions, you can seek further information, or make a formal complaint by visiting:  
<https://www.mturk.com/mturk/contactus>

**Only people who are fluent in the English language are eligible to participate. Are you fluent in the English language?**

Yes / No

**Do you understand and acknowledge all of the information provided above?**

Yes / No

**Do you consent to participating in both studies?**

Yes / No

**Please create a password of at least 8 characters. Make it as unique as you can, so that you can be identified and paid on MTurk. You can use your MTurk Worker ID if you want to.**

## Appendix I

## Centrality of Religiosity Scale: Version 10 (Amended)

*\*The numbers in parentheses indicate how many points a particular response contributes towards a participant's overall CRS score. These values were not visible to participants, and are displayed here only to demonstrate how participants' responses were scored.\**

**Study 1**

**Please respond to all questions.**

**What is your gender?** Male / Female

**What is your age?**

**In what country do you live?**

**For how many years have you studied at a university or college?**

None; Less than 1 year; 1 year; 2 years; 3 years; 4 or more years

**How wealthy do you consider yourself to be (1 = very poor; 7 = very rich)?**

1                      2                      3                      4                      5                      6                      7

**What is your religion (if any)?**

**For the following questions, please consider your personal conception of "God" or "something divine".**

	Not at all (1)	Not much (2)	Moderately (3)	Quite a bit (4)	Very much (5)
1. To what extent do you believe that God, or something divine, exists?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. How interested are you in learning more about religious topics?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. To what extent do you believe in an afterlife (e.g., immortality of the soul, resurrection of the dead, or reincarnation)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. How important is it to take part in religious services?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. How important is personal prayer to you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**How often do you pray?**

Several times per day (5)

Once per day (5)

More than once per week (4)

Once per week (3)

One to three times per month (3)

A few times per year (2)

Once per year or less (2)

Never (1)

**How often do you take part in religious services?**

More than once per week (5)

Once per week (5)

One to three times per month (4)

A few times per year (3)

Once per year or less (2)

Never (1)

**Please carefully consider your answers to the following questions.**

	Not at all (1)	Not much (2)	Moderately (3)	Quite a bit (4)	Very much (5)
1. How often do you think about religious issues?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. How often do you experience situations in which you have the feeling that God or something divine intervenes in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. How often do you experience situations in which you have the feeling that God or something divine wants to show or reveal something to you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

**Briefly, how would you describe your religious beliefs?**

--

## Appendix J

## Sentence Unscrambling Task

**Sentence Construction Task**

**In this task, you will be presented with a series of word-lists. You will be asked to create coherent 4-word sentences from the word-lists provided. However, each word-list actually contains 5 words. One of the 5 words is out of place, and will need to be removed so that a coherent sentence can be formed.**

**The words in each list will appear in a random order, so after you remove the word that does not seem to fit, you must then rearrange the remaining 4 words to form a coherent sentence.**

**Consider the following examples...**

Was; It; Cavern; There; Up

The word 'cavern' does not seem to fit. If this word is removed, the following sentence can be formed: *It was up there.*

-----

Door; Through; Go; Until; The

The word 'until' does not seem to fit. If this word is removed, the following sentence can be formed: *Go through the door.*

-----

The task begins on the next page, so move on when you fully understand the rules of the task.

NOTE: In order to be paid for this task, please check your responses to ensure that they make sense. If more than two of your responses are incorrect, it will be assumed that you did not seriously attempt the task, and your response will be deemed invalid.

**Enter each 4-word sentence in the box below each word-list.**

[Religious Reward condition]

There; Chance; Forthwith; No; Is

Grants; God; Life; Eternal; Five

Is; Wonderful; Heaven; Beetle; Very

Train; Salvation; Us; Awaits; Eternal

Let's; Dreamed; Inside; All; Wait

That; Was; Miracle; Walked; A



Saved; I; Been; Have; Find

Sticks; Tap; There; Two; Were

People; Nice; Goodwill; Afterlife; Have

Go; Time; Why; It's; To

Don't; Heaven; Please; Do; That

Wanted; Salvation; Regarding; Just; He

**Many of the sentences above contained religious content. Which of the following words best describes the underlying religious theme in those sentences?**

God's anger

God's apathy

God's leniency

God's mercifulness

God's punishments

God's rewards

God's vengefulness

[Religious Neutral condition]

There; Chance; Forthwith; No; Is

Is; Prayer; Older; Important; Very

Is; Codes; Faith; Important; Religious

Always; God; Doors; There; Is

Let's; Dreamed; Inside; All; Wait

Church; Quiet; Was; The; Habits

Twice; He; Temple; Visited; The

Sticks; Tap; There; Two; Were

People; Nice; Goodwill; Spiritual; Have

Go; Time; Why; It's; To

Don't; God; Please; Do; That

Important; Is; Hopeful; Faith; Highly

**In your opinion, which of the following words best describes the nature of God?**

Angry  
Apathetic  
Lenient  
Merciful  
Punishing  
Rewarding  
Vengeful

[Secular Reward condition]

There; Chance; Forthwith; No; Is

Good; Awards; People; Receive; Triplet

Work; His; Appreciated; Towers; Was

Kindness; Rewarded; Her; Makings; Was

Let's; Dreamed; Inside; All; Wait

Round; A; Applause; Circuit; Of

Awards; I've; Many; Have; Received

Sticks; Tap; There; Two; Were

People; Nice; Goodwill; Bounty; Have

Go; Time; Why; It's; To

Don't; Rewarded; Please; Do; That

Generosity; Fame; With; Elegant; Comes

**Many of the sentences above contained social content. Which of the following words best describes the underlying theme in those sentences?**

Society's anger  
Society's apathy  
Society's leniency  
Society's mercifulness  
Society's punishments  
Society's rewards  
Society's vengefulness

[Secular Neutral condition]

There; Chance; Forthwith; No; Is

Article; Long; Tutor; The; Was

Always; Are; People; Door; There

Was; House; The; Habits; Quiet

Let's; Dreamed; Inside; All; Wait

Is; Digit; Library; The; Empty

Recognized; I; Man; Have; The

Sticks; Tap; There; Two; Were

Owns; Jury; She; Properties; Many

Go; Time; Library; It's; To

Don't; Throwing; Please; Do; That

There; People; With; Ten; Were

**In your opinion, which of the following words best describes the nature of society?**

Angry

Apathetic

Lenient

Merciful

Punishing

Rewarding

Vengeful

## Appendix K

## Shortened PANAS for Study 3

**Mood Survey**

**Consider each word in the left-most column, and think about how well that word describes your current mood. Provide a response for each word.**

How accurately does each of the following words reflect your current mood? (1 star = not at all; 5 stars = highly accurately)

Angry (at self)	☆	☆	☆	☆	☆
Attentive	☆	☆	☆	☆	☆
Calm	☆	☆	☆	☆	☆
Depressed	☆	☆	☆	☆	☆
Enthusiastic	☆	☆	☆	☆	☆
Guilty	☆	☆	☆	☆	☆
Happy	☆	☆	☆	☆	☆
Irritable	☆	☆	☆	☆	☆
Proud	☆	☆	☆	☆	☆
Sad	☆	☆	☆	☆	☆

**Briefly, how would you describe your current mood?**

**What do you think the point of this research is?**

## Appendix L

## Charity Task

**Study 2**

**Please read the following instructions carefully.**

For this task, you will be given \$1.00(AUD), which you can split between yourself and a charity organisation for the homeless (the specific charity will be chosen by the researcher). You can split the money however you like (e.g., you can keep \$0.50 and send \$0.50 to charity, or you can keep \$0.25 and send \$0.75 to charity, and so on). And how much you decide to keep will not affect your participation payment. You will receive whatever you decide to keep in addition to the \$0.64(AUD) you get for participating.

There is no pressure on you to donate any particular amount; how much you donate is entirely up to you.

How much of the \$1.00(AUD) would you like to **donate** to charity? Do not include a dollar sign (\$); simply nominate how much money you would like to **donate** (e.g., 0.25, 0.50 or 0.95). What is left over will be yours to keep.

**Please ensure that the amount you have decided to donate is an amount between 0.00 and 1.00. If you enter an invalid amount, your data for this study will not be valid.**

**What do you think the point of this research is?**

## Appendix M

## Debriefing E-Mail for Study 3

Dear participant,

Thank you for participating in this study. This e-mail has been sent to inform you about the study you participated in, and provide you with avenues to provide feedback or express any concerns you may have.

During this study, you were told that you were actually participating in two separate studies; the first involving a sentence unscrambling task, and the second involving a charitable giving scenario where you are given the chance to split a sum of money between yourself and an unspecified charity chosen by me. In actual fact, these were simply two elements of the same study.

The purpose of this study was to assess whether exposure to particular concepts/words in the sentence unscrambling task would influence generosity in the charity task. Some participants unscrambled sentences about God's rewards for moral behaviour, some unscrambled sentences containing general religious terms (e.g., 'church'), some unscrambled sentences about society's rewards for moral behaviours, and others unscrambled sentences with no real theme.

It was expected that those who were reminded of God's and/or society's rewards for good people would donate more money to charity than participants in the other groups. These details were not disclosed at the beginning, as knowledge of the study's aims may have affected the results. There were no malicious intentions behind the withholding of this information.

If you have any concerns about the study, the purpose(s) of the research, or any other queries, please see the information below.

### **Information and Contact Details**

#### **How was this study funded?**

This project is supported by a grant from the School of Social Sciences and Psychology at Western Sydney University.

#### **How do you intend to publish or disseminate the results?**

It is anticipated that the results of this research project will be published within a Master's thesis. Published data will be presented in such a way that the participant cannot be identified.

#### **Will the data and information that I have provided be disposed of?**

Please be assured that only the researchers will have access to the raw data you provide. However, your data may be used in other related projects for an extended period of time. No personal details will be kept with the data, to ensure confidentiality.

#### **Can I withdraw from the study?**

If you would like to withdraw your data from the study, please inform James Saleam (e-mail: 17122492@student.westernsydney.edu.au). Withdrawing your data will result in a forfeiture of any money earned for participation and during the study (i.e., during the economic game).

#### **Can I tell other people about the study?**

You can tell others about the study, but it is important that the purpose of the study not be disclosed to anyone who may participate in the study, as this could affect their responses.

#### **What if I require further information?**

Please contact James Saleam if you have any enquiries regarding the study you participated in

E-mail: 17122492@student.westernsydney.edu.au

**What if I have a complaint?**

If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through Research Engagement, Development and Innovation (REDI) on Tel +61 2 4736 0229 or email [humanethics@westernsydney.edu.au](mailto:humanethics@westernsydney.edu.au).

Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

If you agree to participate in this study, you may be asked to sign the Participant Consent Form. The information sheet is for you to keep and the consent form is retained by the researcher/s.

This study has been approved by the Western Sydney University Human Research Ethics Committee. The Approval number is H12092.