



The University of
Nottingham

UNITED KINGDOM • CHINA • MALAYSIA

UNNC School of Economics Working Paper Series

Series B Behavioural and Experimental Economics



CENTRE FOR DECISION RESEARCH & EXPERIMENTAL ECONOMICS

The Differential Effects of Jesus and God on Distributive Behaviour

Tom Lane

School Economics Working Paper – Behavioural Series 2019.8B

© 2019 by *Author names*. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

The differential effects of Jesus and God on distributive behaviour

Tom Lane^a

July 18, 2019

JEL classifications: **D91** – Role and Effects of Psychological, Emotional, Social, and Cognitive Factors on Decision Making; **D64** – Altruism; Philanthropy; Intergenerational Transfers **J15** – Economics of Minorities, Races, Indigenous Peoples, and Immigrants; Non-labor Discrimination; **Z12** – Religion.

Keywords: Christianity; Dictator Game; Pro-sociality; Discrimination; LGBTQ

a: School of Economics, University of Nottingham Ningbo China, 199
Taikang East Road, Ningbo, China, 315100 Email address:
Tom.Lane@nottingham.edu.cn

Abstract

This study shows that different belief concepts within the same religion can have different effects on distributive behaviour. A dictator game experiment measures the causal effects of the concepts of God and Jesus on both the pro-sociality of Christians and their propensity to discriminate against LGBTQ people. The concept of Jesus significantly raises the amounts Christians donate, but the concept of God does not. Christians are found, at borderline significance, to discriminate against LGBTQ people, but this discrimination is not significantly increased by the concepts of Jesus or God. Neither concept significantly affects the behaviour of a non-Christian sample.

1. Introduction

Is religion beneficial or harmful to humanity? The question has been the subject of a heated, longstanding and controversial debate outside of academia. Two competing arguments are often put forward. One view is that religion is a cause for good because it promotes pro-social behaviour. Another is that it is a cause for harm because it promotes conflict and discrimination against out-groups.

Only recently has hard scientific evidence – using, in particular, economic experiments – been brought to bear on each of these two arguments.

Increasingly, the headline message to be taken from this evidence is that the picture is complicated. While religion has in some cases been shown to increase both pro-sociality and discrimination, these effects appear not to be universal and to depend on precisely what is being tested. For instance, holding religious beliefs and belonging to religious institutions may have opposite effects on behaviour (Preston and Ritter, 2013).

This paper is an empirical attempt to delve further into the complexity. Using an incentivised experiment with religious priming, I test for the effects on distributive behaviour of different elements of religious belief within a single religion. The use of the priming technique – exogenously manipulating the salience of a belief concept by bringing it the forefront of the mind – ensures that the effects identified can be regarded as causal. Specifically, I investigate in a dictator game the effects of making salient the concepts of Jesus (a New Testament figure, often associated with compassion) and God (a harsher figure represented in both the New and Old Testaments) on the pro-sociality of US-based Christians, and on their propensity to discriminate against people defined as *lesbian, gay, bisexual, transgender and questioning (LGBTQ)*, who represent an identity group traditionally opposed by Christianity.

The results suggest that the concepts of God and Jesus do indeed differently influence the behaviour of Christians. Priming Jesus significantly increases the

amount they are willing to donate to the dictator game recipient, a suicide-prevention charity, whereas priming God has no such effect; and the effects of priming Jesus and God significantly differ from one another. To the author's knowledge, this is the first incentivised study to demonstrate that different belief concepts within the same religion can have significantly different causal effects on distributive behaviour.

This study, therefore, supports previous research showing a positive effect of religion on pro-sociality – but illustrates that this effect is likely to appear in some circumstances but not others. The idea that religion makes people more pro-social is intuitively appealing, given the content of much religious teaching, and enjoys theoretical support from an evolutionary perspective (e.g. Norenzayan and Shariff, 2008; Atran and Henrich, 2010; Wilson, 2010). A plausible mechanism through which such an effect could work is a supernatural incentive scheme, wherein religious followers believe they are being constantly observed by omniscient 'Big Gods', who may reward or punish their deeds either in this life or the next (Norenzayan, 2013).

Empirical research has often, but not always, found pro-sociality to be *correlated* with religiosity.¹ Attempts to identify causality are usually made, as in the current study, using priming techniques. On other occasions, researchers have taken advantage of natural religious primes, such as days of observance

¹ Significant results in this direction have been detected by surveys using self-reported measures of pro-sociality (Pelham and Crabtree, 2008; Renneboog and Spaenjers, 2012; Son and Wilson, 2012; Galen et al., 2015; Kirchmaier et al., 2018) and also by incentivised economic experiments (Karlán, 2005; Ahmed, 2009; Soler, 2012; Brañas-Garza et al., 2014; Delavande and Zafar, 2015; Everett et al., 2016), though other experiments have found the correlation to be null (Orbell et al., 1992; Eckel and Grossman, 2004; Tan, 2006; Shariff and Norenzayan, 2007; Anderson and Mellor, 2009; Malhotra, 2010; Ahmed and Salas, 2011; Xygalatas, 2013; Chuah et al., 2014; Kirchmaier et al., 2018). Many of these studies are reviewed in Hoffmann (2013).

(Malhotra, 2010), religious festivals (Akay et al., 2015) and the call to prayer (Duhaime, 2015). In recent years, numerous studies using these methods have found positive causal effects of religion on pro-sociality (Pichon et al., 2007; Randolph-Seng and Nielsen, 2007; Shariff and Norenzayan, 2007; Mazar et al., 2008; Malhotra, 2010; Ahmed and Hammarstedt, 2011; Ahmed and Salas, 2011; Horton et al., 2011; Hadnes and Schumacher, 2012; Xygalatas, 2013; Rand et al, 2014; Duhaime, 2015; Gueguen et al., 2015; Batara et al., 2016; Shariff et al., 2016). However, the evidence is not fully uniform; some such studies have not found a positive effect (Akay et al, 2015; Gomes et al., 2015; Parra et al., 2016; Miyatake et al., 2017; McNamara and Henrich, 2018). There is also evidence that the effects may differ by religion. Benjamin et al. (2016) observed that religious priming increased cooperation in the public goods game for Catholics but reduced it for Protestants, while it had no significant effect on the behaviour of Jews. The results of the current study add another layer of complexity to the picture: the causal effect of religion on pro-sociality depends upon which dimension of belief within a given religion is focal.

Empirical research on the hypothesised negative social consequences of religion has tended to focus, as this paper does, on its effects on intergroup discrimination.² Here, the prior evidence is more complicated still. Surveys have shown more religious individuals to be more prejudiced against outgroups (e.g. Johnson et al., 2012), though Shen et al. (2013) concluded that this correlation was fully explained by the more religious being more right-

² The aforementioned criticism of religion is that it is a source of discrimination *and* intergroup conflict. However, it is difficult to empirically test the causal effects of religion on conflict intensity. Historically, it is obvious that huge amounts of violence have been committed in the name of religion, but strong assumptions are required to infer from this that religion has caused a net increase in historical violence. Measuring the effects of religion on intergroup discrimination may be a reasonable proxy for measuring its effects on intergroup conflict.

wing authoritarian. Incentivised experiments by Chuah et al. (2014, 2016) have found religiosity to be positively correlated with intergroup discrimination, though no such effect was identified by Everett et al. (2016).

Several studies have attempted to use priming to investigate the causal effects of religion on intergroup bias. McCauley (2014) found theological messages reduced religious prejudice as measured in implicit association tests. Other studies have found religious priming to significantly increase the prejudice of Christians towards African-Americans (Johnson et al., 2010) and non-Christians (LaBouff et al., 2012; Johnson et al., 2012), and the prejudice of both Christians and Buddhists towards homosexuals (Johnson et al., 2012; Ramsay et al., 2014), while insignificant effects of religious primes on intergroup attitudes have also been found (Ramsay et al., 2016). From an incentivised experiment, Parra et al. (2016) presented evidence that discrimination between Christians and Muslims in Ghana increased as a result of religious priming. Conversely, Johnson et al. (2015) found religious priming of Christians reduced anti-Muslim discrimination in helping behaviour.

Given this inconsistent evidence, it may be that the impact of religion on intergroup bias depends on various factors. One of these could be the religion in question: for instance, in an incentivised experiment in Fiji, McNamara and Henrich (2018) found that priming traditional religious beliefs increased local in-group favouritism, but priming Christian beliefs had no such effect.

Another factor may be the dimension of religion under consideration. Preston and Ritter (2013) demonstrated that priming Christian subjects to think about their religious affiliation resulted in ingroup-favouritism in charitable giving, while priming them to think about God led instead to out-group favouritism,

suggesting that while the institution of Christianity may promote parochialism, its belief system may in fact mitigate it.³

This paper enters new territory by exploring whether different belief concepts within the same religion have different effects on group discrimination. By varying whether the suicide-prevention charity serves the general population or the LGBTQ community, the experiment measures anti-LGBTQ discrimination. I find that Christians do, at the 10% significance level, exhibit anti-LGBTQ discrimination. However, this level of discrimination is not significantly affected by making salient either God or Jesus (and the effects of the God and Jesus primes do not significantly differ from one another).

While the primary focus of this paper is the behaviour of Christians, I also report the results of the same experiment run on a non-Christian sample, who mostly identify as non-religious. Intuition suggests religious concepts should have no effect on the non-religious, but whether this is in fact the case remains an open question. Some previous studies have found priming religion can influence the behaviour of those outside the religion (Shariff and Norenzayan, 2007; Ahmed and Salas, 2011), while others have not (Rand et al., 2014; Horton et al., 2011). A meta-study by Shariff et al. (2016) concluded that religious priming has ‘no reliable effect’ on the pro-sociality of the non-religious. The results of my experiment are in line with this finding: neither the concept of Jesus nor God has a significant effect on the amounts non-Christians donate to charity, nor do they significantly affect the tendency of non-Christians to discriminate. I find no anti-LGBTQ discrimination amongst non-Christians.

³ This is also supported by Bloom et al. (2015), who found priming religious social identity increased expressed hostility towards immigrants, whereas priming religious beliefs reduced it.

This paper's main contribution is towards knowledge on the complex and multi-dimensional effects of religion on economic behaviour. I find that some aspects of religious belief can have positive social effects, while others may not. In investigating the divergent effects of different God-concepts, this paper is related to recent studies by Johnson et al. (2013) and DeBono et al. (2017), which primed Christians with forgiving and punishing concepts of God. A forgiving, benevolent God-concept is likely to correspond more to the Christian perception of Jesus than of God (Cummings et al., 2017). DeBono et al. (2017) found priming the more punishing God-concept reduced cheating in an economic game⁴. While both this and the current study find different effects of different concepts, we differ in that in DeBono et al. the harsher God-concept produced more other-regarding behaviour, whereas in the current study the softer God-concept does. More closely related in both behaviour analysed and results is Johnson et al. (2013), who found the more benevolent God-concept had the more positive impact on pro-sociality. The present study differs from Johnson et al. in eliciting incentivised – rather than hypothetical and self-reported – behaviour.

This study also contributes to the literature on economic discrimination in general (e.g. Becker, 1957; Guryan and Charles, 2013), and anti-LGBTQ discrimination in particular. That anti-LGBTQ discrimination is found on the part of Christians tallies with previous research suggesting that LGBTQ groups are discriminated against (Badgett, 2007; Drydakis, 2009) and that Christians hold hostile attitudes towards them (e.g. Jäckle and Wenzelburger, 2015; Schnabel, 2016). The absence of anti-LGBTQ discrimination amongst non-Christians may come as a surprise, but is in fact consistent with the overall tendency of experimental games to return null results on group discrimination (Lane, 2016).

⁴ Shariff and Norenzayan (2011) also found a negative association between belief in a punishing God and the tendency to cheat.

2. Experimental Design

The experiment is designed to measure the effects of different aspects of Christian belief on pro-sociality and discrimination. This is implemented in a simple dictator game with a charity as the recipient⁵. Each subject in the experiment is given a sum of money and is tasked with choosing how to split it between him- or herself and the charity.

Christianity was chosen as the religion of focus for the simple reason that, with the number of Christians estimated at 2.3 billion in 2015 (Pew Research Center, 2017), it is still the largest world religion, and arguably therefore the most influential. The two aspects of Christian belief whose effects are measured are the concepts of God and Jesus. God and Jesus are the two main sources of authority in the Christian religion. While the doctrine of the Holy Trinity contends that the two are in essence the same, in practice Christians may regard them as distinct concepts. In particular, Jesus may be regarded as a softer, more loving figure. Moreover, while Jesus is associated specifically with the teachings of the New Testament, with their strong focus on kindness and forgiveness, God is associated with both these and the more vengeful teachings of the Old Testament. Indeed, there is evidence from Cummings et al. (2017) that in the United States Christians do hold different mental concepts of Jesus and God, with Jesus perceived as warmer and God as more stern.

The causal effects of the concepts of Jesus and God on subjects' behaviour are measured through the use of priming, i.e. bringing these concepts to the

⁵ Setting a charity, rather than another participant in the experiment, as the recipient is a common modification to the dictator game, implemented for instance by Eckel and Grossman (1996) and Fong and Luttmer (2011).

forefront of subjects' minds. The use of priming to estimate the effects of religion on economic behaviour follows the approach of previous studies in this literature (e.g. Shariff and Norenzayan, 2007; Mazar et al., 2008; Benjamin et al., 2016). Subjects in the experiment are randomly assigned to one of three priming conditions: Control, Jesus or God. In the Control condition, after the dictator game setting is explained to subjects, they are told: 'Before you make your decision, please take some time to think about what you will do.' This sentence is also included in the other conditions. However, in the Jesus condition, it is followed by another sentence: '**Please think about what Jesus would approve of you doing.**' In the God condition, it is instead followed by the sentence: '**Please think about what God would approve of you doing.**' With the instructions otherwise identical between the three conditions, any differences in giving levels between them can be attributed to differences in the prominence in subjects' minds of thoughts about Jesus and God (and what they would approve of), and therefore how strong an influence such concepts had on their decisions.⁶

In order to investigate discrimination, I also vary the recipient charity, with subjects randomly assigned to one of two conditions. In all cases, the charity is focused on youth suicide prevention; in the General condition, it supports suicidal youths in general, whereas in the LGBTQ condition it specifically supports suicidal youths who are lesbian, gay, bisexual transgender and questioning (LGBTQ). Subjects are not told the names of either charity, in

⁶ Note that when making comparisons against the Control treatment, we are measuring the effects of asking subjects to think about what Jesus or God would approve of *against the effects of not sending any message to subjects at all*. When seeking to gain insights about the effects the concepts of Jesus and God have on behaviour, this seems the appropriate comparison to make. Some audience participants have questioned why the Control treatment did not instead ask subjects to think about what 'other people' or 'society' would approve of. However, it is not obvious that, if a person does not hold any religious beliefs, this void will be filled by concerns about the preferences of society.

order to hold constant the information they possess about them and eliminate any potential bias resulting from knowledge of the charities' operations. Subjects simply receive a description of the charity which differs only in whether or not it mentions there being a specific LGBTQ focus. In the General condition, the description reads: 'The charity with which you can choose to share money is an organization **whose aim is to prevent suicides among young people.**' In the LGBTQ condition, this changes to: 'The charity with which you can choose to share money is an organization **whose aim is to prevent suicides among young people who are lesbian, gay, bisexual, transgender and questioning (LGBTQ).**'⁷ The difference in giving between the General and LGBTQ conditions can be interpreted as discrimination against (or in favour of) LGBTQ people.⁸ Thus, this study differs from

⁷ These descriptions accurately fitted the charities who actually received the money. The general charity was the National Center for the Prevention of Youth Suicide, while the LGBTQ charity was The Trevor Project.

⁸ To be precise, the difference participants can perceive between the people supported by the two charities is the *proportion* who are LGBTQ. Participants can clearly tell that for the LGBTQ charity this proportion is equal to one; they are provided no information about it in the case of the General charity but would be likely to infer it is much lower. If dictators donate less when a higher proportion of their donation will go to LGBTQ people, it is reasonable to interpret this as anti-LGBTQ discrimination. One might suppose that another difference between the two charities is the size of the populations they serve, with those supported by the LGBTQ charity being a subset of those supported by the General charity. However, participants are unable to infer anything about the population sizes served by either charity, as no information is provided about their scale or geographical scope (without this information, it is unknown whether the wider population from which each charity's recipients are drawn is the same, so it is unclear if those supported by the LGBTQ charity *are* a subset of those supported by the General charity). Furthermore, the matter of relative population size is unlikely to be salient to participants as they are each matched with only one of the two charities. As will be discussed in the results section, there is a tendency

previous research measuring the effects of religion on discrimination against religious outgroups (i.e. those not belonging to the same religion) by instead concentrating on discrimination against a group who – given the traditional Christian teaching that homosexuality is a sin – can be defined as ‘value-violating’ (Biernat et al., 1996; Johnson et al., 2012).

The study consists of six treatments in a 2x3 cross-cutting design. The treatment names are displayed in italics in Table 1. The experiment is run between-subjects, with each individual only exposed to one of the treatments. The effect of priming God on pro-sociality can be measured by comparing average giving in the General God and LGBTQ God treatments against that in the General Control and LGBTQ Control treatments, while the effect of priming Jesus is found by comparing average giving in the General Jesus and LGBTQ Jesus treatments against that in the General Control and LGBTQ Control treatments. Baseline discrimination can be identified by comparing average giving in the General Control treatment against it in the LGBTQ Control treatment. Discrimination once God has been primed is measured by comparing average giving between the General God and LGBTQ God treatments, while discrimination once Jesus has been primed is measured by comparing the General Jesus and LGBTQ Jesus treatments. An overall level of discrimination can be found by comparing average giving across all the General treatments against that across all the LGBTQ treatments. Finally, the effects on LGBTQ discrimination of priming God or Jesus can be found by comparing the levels of discrimination identified across the God or Jesus treatments with those identified across the Control treatments.

amongst the non-Christian sample to donate *more* to the LGBTQ charity – this pattern of behaviour would be less likely to emerge if subjects care about population size and determine that it is smaller for the LGTBQ charity.

Table 1: Treatment Design

		Recipient charity	
		General	LGBTQ
Prime	Control	<i>General Control</i>	<i>LGBTQ Control</i>
	God	<i>General God</i>	<i>LGBTQ God</i>
	Jesus	<i>General Jesus</i>	<i>LGBTQ Jesus</i>

Note: the names of the six treatments are presented in italics inside the table.

The experiment was run online using the survey website Qualtrics (Qualtrics, 2018), with subjects recruited through the worker platform Amazon MTurk. Online experiments are increasingly popular tools in behavioural economics (e.g. Dreber et al., 2013; Kranton and Sanders, 2017; Chang et al., 2019). Despite initial concerns about the loss of experimental control, researchers have found that stylised laboratory results can be replicated online (Horton et al, 2011; Arechar et al, 2018). Of particular relevance to the current study, Horton et al (2011) found an effect of religious priming on behaviour in a prisoner’s dilemma, thereby demonstrating that subjects do not need to be seated in a laboratory to be susceptible to priming effects.

There are nevertheless certain important concerns that require careful attention when running an experiment online. In the present study, it was important that when making their allocation decision subjects considered it credible that they would receive the precise amount of money they chose to keep and the rest would really go to the designated charity. After the dictator game was explained to subjects, they saw a screen entitled ‘**Frequently asked question: can I be sure that the money I choose not to keep will really be given to charity?**’ On this screen, subjects received assurances that this was indeed the case. The page mentioned that the research was conducted under the University of Nottingham’s CEDEX research group, with a link to the group’s

webpage and a statement that ‘We are a reputable research group and do not deceive participants in our experiments.’ All subjects were given an anonymous ID number and told that these would be listed alongside the corresponding amounts given to charity at a web-link supplied. On the same page would be uploaded copies of the charity receipts confirming that the full amounts had been donated as promised. Subjects were given contact details for the university’s ethics committee and invited to get in touch if they believed they or the charity had received incorrect amounts. Complete screenshots of the experimental instructions are provided in Supplementary Materials 1.

As subjects were not in the lab, care was also required to ensure the priming techniques had a chance of being successful and could not simply be ignored. After subjects were told to take some time to think about their decision (and, in the Jesus and God conditions, to think about what Jesus or God would approve of) subjects were told the experiment was paused and they would not be able to click forward for around one minute. After the pause, the following message appeared on the screen: ‘**Update: the experiment is no longer paused.** Before you continue to the next screen, first please briefly describe your thoughts from the last minute.’ The forward button would not work until some text had been entered into the box. This task ensured that, while there was no guarantee subjects had actually spent the previous minute thinking about their dictator game decision, they were encouraged to further engage with it at this stage.^{9 10}

⁹ A few subjects entered random or irrelevant text into the box, but the vast majority reported thinking about the dictator game decision.

¹⁰ One potential problem is that the measurements both of discrimination and the effects of the primes could be confounded by attrition rates which differed across treatments (as a result, for instance, of subjects experiencing negative reactions to the particular charities or

As I am most interested in how the concepts of Jesus and God affect the behaviour of Christians, I restricted access to the experiment to MTurk workers located in the United States, a Christian-majority country with a high level of religiosity (Pew Research Center, 2015). Subjects reported their religion in the post-experimental questionnaire; 53.8% of the subjects who completed the experiment reported themselves to be Christians. This left an almost equal-sized non-Christian sample on whom the effects of the Jesus and God primes could also be tested. Some previous research has suggested that religious priming can affect the behaviour even of those who do not belong to the religion in question (Ahmed and Salas, 2011; Benjamin et al., 2016).

The experiment was conducted in July 2018. Subjects were paid 2 USD for participating. The dictator game stake was 8 USD. While this is slightly less than a typical stake for an economic experiment conducted in a developed country, the compensation rates for online experiments tend to be lower because of the speed and convenience with which subjects can complete them. The current experiment took subjects around 10 minutes to complete and therefore represented a very high level of reimbursement for MTurk workers, whose median hourly income has been estimated to be as low as 2 USD (Hara et al, 2018).

primes and leaving the experiment in protest). As Qualtrics records incomplete responses, I am able to review the attrition rates. Of the 460 times a participant started the experiment, it was left unfinished 22 times. Of those who dropped out, seven did so before reaching the information about the charity. Four did so immediately upon receiving the description of the general charity and another four did so immediately upon receiving the description of the LGBTQ charity. Four did so after receiving the God prime (three having been matched with the LGBTQ charity and the other with the general charity), two did so after receiving the Control prime (one matched with each charity), and one (matched with the LGBTQ charity) did so after receiving the Jesus prime. This evidence suggests the impact of attrition on the estimated treatment effects is likely to be very slight. See Zhou and Fischbach (2016) and Arechar et al (2018) for fuller discussion of the issue of dropouts in online experiments.

The experiment was completed 438 times, but due to a glitch there were 14 cases of the same MTurk worker being able to access and complete the experiment four days after initially participating. These subjects' second attempts are dropped from the data. Demographic information about the subjects is summarised in Table 2, separated into the Christian and non-Christian samples.

Table 2: Demographic information about experimental subjects

Christian (N=228)					
Age	Mean = 36.9			SD=13.1	
Gender	Male 55.7%			Female 44.3%	
Nationality	USA 96.5%			Others 3.5%	
Christian Denomination	Catholic 51.3%	Protestant 38.6%		Orthodox 2.2%	Others 7.9%
Sexual Orientation	Heterosexual 82.5%	Bisexual 12.7%	Homosexual 3.1%	Prefer not to say 1.3%	Questioning 0.4%
Non-Christian (N=196)					
Age	Mean = 34.1			SD=9.4	
Gender	Male 63.3%			Female 36.7%	
Nationality	USA 94.4%			Others 5.6%	
Religion	No religion 75.5%	Hindu 5.6%	Jew 4.6%	Muslim 4.1%	Others 7.1%
Sexual Orientation	Heterosexual 84.2%	Bisexual 11.2%	Homosexual 3.6%	Questioning 1.0%	

3. Results

The Christian and non-Christian samples are analysed separately. The primary focus of the study is the behaviour of Christians; this is covered first, in section 3.1. I then, in section 3.2, discuss the behaviour of non-Christians.

3.1 Christian sample

I first present raw statistics on donations by Christians in each treatment.

Table 3 displays, by treatment, the mean percentage of the dictator game stake given to charity by subjects who report themselves to be Christians, with standard deviations and sample sizes included in parentheses. Note that the average donation across all treatments was 31.55%, a figure close to the typical mean giving rate for a dictator game (Engel, 2011).

Relative to the Control treatments, donations are higher when either God or Jesus is primed. In the case of God, the difference is very small; across both recipient charities, the donation rate increases from 27.30% to 27.82% when God is primed. The increase is similar regardless of whether the money is donated to the general charity or the LGBTQ one.

Table 3: Average percentage of stake donated by Christians

		Recipient charity		
		General	LGBTQ	Combined
Priming	Control	28.94 (sd=26.92, n=39)	25.35 (sd=28.42, n=33)	27.30 (sd=27.48, n=72)
	God	29.52 (sd=30.83, n=43)	25.46 (sd=30.61, n=31)	27.82 (sd=30.59, n=74)
	Jesus	44.48 (sd=31.26, n=40)	33.11 (sd=32.07, n=42)	38.65 (sd=32.00, n=82)
	Combined	34.24 (sd=30.40, n=122)	28.46 (sd=30.49, n=106)	31.55 (sd=30.51, n=228)

Table 3 presents the mean amounts donated to charity, as a percentage of the stake, in each treatment. Only Christian subjects are included. Standard deviations and number of observations are provided in parentheses.

In the case of Jesus, the difference is much larger. Donations increase from 27.30% to 38.65% when Jesus is primed, across both recipient charities. The

increase is larger for the general charity (from 28.94% to 44.48%) than it is for the LGBTQ charity (from 25.35% to 33.11%).

The table also shows that donations to the general charity are higher than to the LGBTQ charity; across all priming conditions, Christians matched with the general charity give 34.24% of the stake, while those matched with the LGBTQ charity give 28.46%. The general charity receives this advantage in the Control and God treatments, but the discrepancy is larger for the Jesus treatments, where 44.48% of the stake is given to the general charity in contrast to 33.11% to the LGBTQ charity.

The significance of the treatment differences is addressed using regression analysis, in order to control for variables collected in the post-experimental questionnaire. The demographic variables included are the subject's age in years (*Age*), and dummy variables for gender (*Female*), nationality (*Foreign*, equal to one if the subject's nationality is not American) and sexuality (*Non-heterosexual*, equal to one if the subject does not report him- or herself to be heterosexual). Also included are two measures of religiosity: *Weekly Church*, a dummy variable equal to one if the subject reports attending church at least once per week, and *Daily Prayer*, another dummy variable equal to one if the subject reports praying at least once per day. The dependent variable is the percentage of the stake donated to the charity. As there are lower and upper limits on donations, the models used are left- and right-censored Tobit regressions.

Three models are presented in Table 4. Model (1) investigates the effects on giving of the Jesus and God primes across both recipient charities. This is done by including two treatment dummies: *Jesus*, equal to one if the subject is in either Jesus treatment, and *God*, equal to one if the subject is in either God treatment. The coefficient on the *Jesus* dummy indicates that priming Jesus raises the donation rate by over 15 percentage points, relative to the omitted control treatments. This effect is significant at the 5% level. The coefficient on

God, however, is very close to zero and insignificant, providing no evidence that priming God has any effect on the willingness of Christians to donate. A linear restriction test confirms that the coefficients on *Jesus* and *God* significantly differ ($p=0.021$): this suggests that different effects on the donation behaviour of Christians are exerted by the concepts of Jesus and God, and what they approve of.

Model (2) separates the effects on giving of Jesus and God, according to whether donations go to the general or the LGBTQ charity. Five treatment dummy variables are included: one for each treatment except for the General Control, which is the omitted category. The coefficient on *General Jesus* estimates that, when the money is to be donated to the general charity, priming Jesus raises the rate of giving by 22.52 percentage points, with the effect significant at the 5% level. When the LGBTQ charity is the recipient, the significance of the effect of priming Jesus is tested by a linear restriction test on the equivalence of the coefficients on *LGBTQ Control* and *LGBTQ Jesus*. This test does not find giving significantly differs between these two treatments ($p=0.423$). Neither the coefficient on *General God* nor the result of the linear restriction test comparing *LGBTQ Control* and *LGBTQ God* ($p=0.690$) are significant, providing no evidence that priming God affects the amounts donated to either charity. A linear restriction test comparing the *General Jesus* and *General God* coefficients finds the effects of priming Jesus and God on giving to the general charity are significantly different from one another ($p=0.031$). However, an equivalent test comparing the coefficients on *LGBTQ Jesus* and *LGBTQ God* finds no significant difference in the effects of priming the two on donations to the LGBTQ charity ($p=0.233$).

Is the discrimination by Christians against the LGBTQ charity significant? Across all priming conditions, the answer is yes, but only at the 10% level. This is estimated by the coefficient on *LGBTQ*, a dummy variable equal to one if the subject is in any of the LGBTQ treatments, which implies the LGBTQ

Table 4: Tobit regressions – Christian subjects

Dependent variable: Percentage of stake donated			
	(1)	(2)	(3)
Jesus	15.33** (6.51)		22.52** (9.09)
God	-0.03 (6.82)		3.18 (8.96)
LGBTQ	-9.30* (5.39)		-1.53 (9.58)
General Jesus		22.52** (9.09)	
General God		3.18 (8.96)	
LGBTQ Control		-1.53 (9.58)	
LGBTQ Jesus		6.04 (9.00)	-14.95 (13.19)
LGBTQ God		-5.67 (9.88)	-7.33 (13.65)
Age	-0.20 (0.21)	-0.18 (0.21)	-0.18 (0.21)
Female	7.94 (5.63)	7.43 (5.64)	7.43 (5.64)
Foreign	17.48 (14.17)	17.94 (14.25)	17.94 (14.25)
Non-heterosexual	5.65 (7.26)	6.65 (7.31)	6.65 (7.31)
Weekly Church	-11.57 (7.04)	-12.65* (7.10)	-12.65* (7.10)
Daily Prayer	18.50*** (6.53)	18.76*** (6.53)	18.76*** (6.53)
Constant	22.19** (10.50)	18.39* (11.10)	18.39* (11.10)
Pseudo R ²	0.01	0.01	0.01
Observations	228	228	228

*Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Tobit models are left and right censored. Standard errors in parentheses. Only Christian subjects are included. The omitted treatment category is Control in model (1) and General Control in model (2).*

focus of the charity reduces donation levels by 9.3 percentage points. Model (2) allows further investigation of where the discrimination is significant. When neither Jesus nor God are primed, it is not: this is determined by the insignificance of the coefficient on *LGBTQ Control*. The significance of discrimination when God is primed is examined by a linear restriction test comparing *General God* versus *LGBTQ God*. A p-value of 0.36 indicates discrimination is not significant across the God treatments. However, when Jesus is primed discrimination is found to be weakly significant, according to a linear restriction test comparing the coefficients on *General Jesus* and *LGBTQ Jesus* ($p=0.067$).

A further question is whether either the Jesus or God primes *increase* the level of discrimination, relative to the levels in the control treatments. This is addressed in model (3), which includes the variables *Jesus*, *God* and *LGBTQ*, as well as *LGBTQ Jesus* and *LGBTQ God*, which are now interpretable as interaction terms. The coefficients on Jesus and God here represent the effects of priming Jesus and God specifically when subjects are matched with the general charity, while the coefficient on LGBTQ represents the effect of the recipient being the LGBTQ charity rather than the general charity for subjects in the Control treatments. The coefficient on LGBTQ Jesus now estimates how much this effect of the charity being LGBTQ increases if Jesus is primed, while the coefficient on LGBTQ God now estimates how much it increases if God is primed. Neither variable is significant, indicating that discrimination is not significantly stronger in either the Jesus or the God treatments than it is in the Control treatments.

One further finding from Table 4 is particularly noteworthy. *Ceteris paribus*, praying at least once a day is associated with donating more money to the charities (significant at the 1% level in all models), while attending church at least once a week is associated with donating less (significant at the 10% level in the second and third models). This adds weight to the existing evidence that

there can be different effects of religious belief and religious institution (Preston and Ritter, 2013; Bloom et al., 2015).¹¹ The other control variables are not significant. Given previous research showing that older people tend to be more generous in the dictator game (Engel, 2011; Matsumoto et al., 2016), one might have expected a significantly positive coefficient on Age. However, the absence of this may be due to an age in-group effect: the charities are described as providing support for young people, which may have raised giving by younger subjects.

3.1.1 Analysis of Christians' reported thoughts

A key result highlighted in the previous subsection is that Christians primed to think about Jesus give more either than those primed to think about God or those not dealt any religious prime. As part of the priming process, subjects were asked to report what they had thought about while the experiment was paused. These responses provide the opportunity to examine different possible explanations as to why the treatment differences emerged.

First, I investigate how effective the primes are in making the subjects think about Jesus or God. If those in the Jesus treatments report thinking about Jesus more than those in the God treatment report thinking about God, the higher giving rate in the Jesus treatments could be due to the Jesus concept more firmly implanting itself in subjects' minds. However, this is not the case. 25.6% of the Christians under the Jesus prime mention Jesus in their reported

¹¹ The effects on giving of the *Weekly Church* and *Daily Prayer* variables are found to be very similar if they are separated between the General and LGBTQ treatments. Therefore, evidence is not found that these variables are related to discrimination.

thoughts, while 32.4% of the Christians under the God prime mention God.¹² This difference is insignificant in a chi-squared test ($p=0.348$).

Another hypothesis could be that Christians consciously perceive differences between what behaviour Jesus and God would approve of in this situation. This is also not supported by the evidence of the reported thoughts. Only a few Christians explicitly describe what they think God or Jesus would want them to do. 4.9% of those in the Jesus treatments make statements implying they believe Jesus would favour giving part or all of the money to the charity, while 9.5% of subjects in the God treatments make equivalent statements implying God would favour giving (the treatment difference is insignificant in a chi-squared test, with $p=0.264$). On the other hand, 3.7% of individuals in the Jesus treatments make statements implying they believe Jesus would approve of the subject keeping all the money, in comparison to 4.1% in the God treatments who imply God would favour keeping it (also insignificant in a chi-squared test, with $p=0.898$).

A third potential explanation is that the Jesus and God primes differently affected the way subjects consciously felt towards the charitable cause in question. This is not clearly supported. Subjects under the Jesus and God primes were less likely to discuss their feelings towards the charity or its cause than those in the Control treatments: 37.8% in the God treatments and 41.5% in the Jesus treatments did this (these two rates are insignificantly different according to a chi-squared test, with $p=0.644$), compared to 62.5% in the Control treatments. Most likely this was because subjects in the God and Jesus treatments were instead reporting thinking about Jesus and God. There are no significant differences in the specific discussion of the cause between those under the Jesus and God primes (all p -values on chi-squared tests comparing the following rates between the Jesus and God treatments are above 0.4).

¹² Perhaps unsurprisingly, no Christian in the Control treatments mentions either Jesus or God.

12.2% in the Jesus treatments and 9.5% in the God treatments reported thinking that the charity was for a good cause (compared to 16.7% in the Control treatments); 7.3% in the Jesus treatments and 10.8% in the God treatments discussed in sympathetic terms those supported by the charity (compared to 15.3% in the Control treatments). 17.1% in the Jesus treatments and 20.3% in the God treatments presented reasons for not giving money to the charity or its cause (compared to 25.0% in the Control treatments).

A regression reported in Supplementary Materials 2 (Table A1) includes additional control variables capturing these reported thoughts. Specifically, the regression controls for whether the subject mentions either God or Jesus, whether they state that God or Jesus would be in favour of giving or keeping the money, whether they mention any feelings towards the charity or its cause, whether they state that it is a good cause, whether they discuss those supported by the charity in sympathetic terms, and whether they present reasons for not giving money to the charity or its cause. While most of these variables have a significant effect on the giving rate, the important point is that the coefficient on *Jesus* remains significant, and a linear restriction test still finds it significantly differs from the coefficient on *God*. This shows that the variables capturing subjects' reported thoughts do not mediate the relationship between the primes and the rate of giving, and thus do not explain why the Jesus prime has a different effect from the God prime and from no prime. Given this inability of the reported thoughts to explain the treatment differences, a credible possibility is that the differential effects of the primes take place through subconscious, rather than conscious, channels.¹³

3.2 Non-Christians

I now briefly analyse the behaviour of the remaining 196 subjects in the experiment who do not report themselves to be Christians. The same tobit

¹³ For a discussion of economics and the subconscious, see Camerer et al. (2004).

regression models are employed as above, with the same dependent and independent variables. These are presented in Table 5.

The patterns of behaviour found amongst the Christian sample are not replicated in this non-Christian sample. Whereas priming Jesus had a positive and significant effect on the donation rate for Christians, amongst non-Christians the effect is negative and insignificant. Overall, there are in fact no significant treatment effects on non-Christians: their donations are not shown to be affected by priming either Jesus or God, and linear restriction tests find the effects of the Jesus and God primes are not significantly different from each other. This is the case either when considering the General and LGBTQ treatments together, as in model (1), or separately, as in model (2).

There is no discrimination by non-Christians against the LGBTQ charity: in fact, they give more to it than to the General charity, although the difference is never significant – either across all priming conditions (model (1)), or in each of the priming conditions separately (model (2), for which linear restriction tests show the coefficients on *General Jesus* and *LGBTQ Jesus* do not significantly differ, and neither do those on *General God* and *LGBTQ God*). Model (3) shows there is no significant effect on the level of discrimination as a result of priming God or Jesus.

Instead of including the whole non-Christian sample, the analysis above could be conducted specifically on the sample who report having no religion (N=148) and therefore no belief in any kind of God. Alternatively, it could be conducted on non-Christians who are also not Jewish or Muslim (N=179), the main other Abrahamic religions to which Jesus is a relevant figure. Using either alternative subsample, the results look qualitatively similar (see Supplementary Materials 2, Tables A2 and A3). The only notable differences are that the favouritism towards the LGBTQ charity by subjects in the Jesus treatments becomes significant (at the 10% level amongst the non-religious sample, at the 5% amongst the sample excluding Muslims and Jews), and the

Table 5: Tobit regressions – Non-Christian subjects

Dependent variable: Percentage of stake donated			
	(1)	(2)	(3)
Jesus	-1.14 (9.45)		-7.29 (13.53)
God	1.59 (9.32)		4.25 (13.61)
LGBTQ	10.77 (7.58)		8.53 (12.73)
General Jesus		-7.29 (13.53)	
General God		4.25 (13.61)	
LGBTQ Control		8.53 (12.73)	
LGBTQ Jesus		13.63 (13.46)	12.40 (18.98)
LGBTQ God		8.44 (12.76)	-4.34 (18.32)
Age	0.55 (0.41)	0.47 (0.42)	0.47 (0.42)
Female	13.22* (7.96)	13.31* (7.94)	13.31* (7.94)
Foreign	-35.38* (17.96)	-35.60** (18.00)	-35.60** (18.00)
Non-heterosexual	16.34 (10.38)	16.42 (10.34)	16.42 (10.34)
Weekly Church	25.97 (20.63)	27.84 (20.80)	27.84 (20.80)
Daily Prayer	20.95 (13.53)	21.76 (13.69)	21.76 (13.69)
Constant	-25.65 (15.82)	-22.22 (17.01)	-22.22 (17.01)
Pseudo R ²	0.01	0.01	0.01
Observations	196	196	196

*Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Tobit models are left and right censored. Standard errors in parentheses. Only non-Christian subjects are included. The omitted treatment category is Control in model (1) and General Control in model (2).*

favouritism towards the LGBTQ charity across all treatments becomes significant at the 10% level amongst the sample excluding Muslims and Jews (though not amongst the non-religious sample).¹⁴

4. Conclusion

This paper is motivated by arguments mooted religion to be either a positive or negative societal force. Focusing specifically on Christianity, evidence is found that religious belief concepts can harness positive effects in the form of increased pro-sociality. On the other hand, the beliefs do not clearly impose the negative effect of enhancing discrimination against a value-violating group: although the results of the experiment are in that direction, they are not

¹⁴ A final piece of analysis concerns whether the behaviour of the Christian subjects differs significantly from that of the non-Christians. This is investigated by rerunning model (1) with the combined Christian and non-Christian sample: output is presented as model (1) in Supplementary Materials 2, Table A4. The positive and significant coefficient on the dummy variable *Christian* indicates that Christians in this experiment are significantly more generous than non-Christians when matched with the charity serving the general population. This supports previous research showing that more religious people tend to be more prosocial, although it must be noted that data was not collected on all socioeconomic variables one would ideally control for. Inspection of the interaction between *LGBTQ* and *Christian* in the regression also shows that the anti-LGBTQ discrimination by Christians in the experiment is, at the 5% level, significantly stronger than that of non-Christians (who, as mentioned above, actually give more to the LGBTQ charity). One might expect this could be driven by there being fewer LGBTQ subjects amongst the Christians than the non-Christians, but Table 2 suggests there are in fact more. The size of the *Christian x LGBTQ* interaction term changes little when, in model (2), only heterosexual subjects are included (the significance level falls to 10% but this appears to be largely driven by the reduction in the sample size). A few Christians – 7.5% of those matched with the LGBTQ charity, compared to only 1% of non-Christians – expressed opinions of personal hostility towards LGBTQ people.

significant. Thus, this paper identifies one positive societal force of Christianity and is unable to confirm a negative one.

The main contribution of this study, however, is to show that these effects vary across different Christian belief concepts. Thinking about what Jesus would approve of results in Christians donating more to needy individuals, but thinking about what God would approve of has no such impact. To the author's knowledge, this is the first incentivised study to indicate that different belief concepts within one religion can differently impact the distributive behaviour of its adherents.

There are very practical implications to the results of this experiment. They suggest that, within Christian communities, invoking the concept of Jesus – rather than God – can provide a powerful nudge towards increased other-regarding behaviour. Most specifically, this offers a clear tool to charity fundraisers: the priming method used in this experiment is quite simple, relying on a written message, and could easily be quite closely replicated in real fundraising situations. Given the scale of Christianity's involvement in the charity sector, in the United States and elsewhere, methods which can most effectively harness donors' religiosity can make a substantial aggregate impact on donation levels.

More generally, this paper adds to our growing understanding of the ways religions influence economic behaviour. It builds upon and supports existing evidence (Johnson et al., 2013; Preston and Ritter, 2013; DeBono et al., 2017) that the effects of religions are complex and multifaceted. It appears that not only can the impact on economic behaviour of believing in a religion differ from that of belonging to the religion (Preston and Ritter, 2013), but also that the behavioural impacts of belief depend upon which particular element of it is salient. This is consistent with the findings of studies by Johnson et al. (2013) and DeBono et al. (2017), which indicated different effects of different God-concepts. However, further research is needed for a fuller understanding of

how alternative God-concepts determine economic behaviour. This is particularly the case given that, whereas in the current study the more benevolent God-concept yielded the more societally optimal behaviour (increased charitable giving), in DeBono et al. (2017) the more punishing God-concept yielded it (in the form of more honest behaviour).

Nonetheless, the existence of heterogeneity in the effects of different belief concepts is important, because within a single religion different sects, and even different individual religious teachers, emphasise different elements of the canon to different extents. Within Christianity, some sects preach a more vengeful Old Testament God, while others expound a loving New Testament figure. Whereas one pastor may prefer to teach the parable of the Good Samaritan, another may favour the story of Sodom and Gomorrah. Thus the decisions taken by religious leaders over how to impart their faith may have important consequences for the economic behaviour of their followers.

This study has focused on the behaviour of Christians in the United States. There is still much potential for future research to investigate how the behaviour of individuals of other faiths is affected by the many dimensions of their own religions. Given the vast diversity in the way Christianity is practised around the world, a test of whether the current study's results regarding the effects of Jesus and God hold true among Christians in countries beyond the United States would also be interesting. The behavioural economics of religion remains a fruitful area in general for future research, and there is much left to discover over how different aspects of Christianity, and other religions, affect other types of economic behaviour besides those considered in this paper.

Acknowledgements

This research was funded by the University of Nottingham Ningbo China, including through the Globalisation and Economic Policy Research Centre (GEP China). I received helpful comments from many audience members at various events, including Malte Baader, Thorsten Chmura, Robin Cubitt, Cindy Fu, Simon Gächter, Hugh Allen Holden, Orestis Kopsacheilis, James Murphy, David Ong, Elke Renner, Martin Sefton, Chris Starmer, Fabio Tufano and David Whynes.

References

- Ahmed, A. M. (2009). Are religious people more prosocial? A quasi-experimental study with madrasah pupils in a rural community in India. *Journal for the Scientific Study of Religion*, 48(2), 368-374.
- Ahmed, A., & Hammarstedt, M. (2011). The effect of subtle religious representations on cooperation. *International Journal of Social Economics*, 38(11), 900-910.
- Ahmed, A. M., & Salas, O. (2011). Implicit influences of Christian religious representations on dictator and prisoner's dilemma game decisions. *The Journal of Socio-Economics*, 40(3), 242-246.
- Akay, A., Karabulut, G., & Martinsson, P. (2015). Cooperation and punishment: The effect of religiosity and religious festival. *Economics Letters*, 130, 43-46.
- Arechar, A. A., Gächter, S., & Molleman, L. (2018). Conducting interactive experiments online. *Experimental Economics*, 21(1), 99-131.
- Atran, S., & Henrich, J. (2010). The evolution of religion: How cognitive by-products, adaptive learning heuristics, ritual displays, and group competition generate deep commitments to prosocial religions. *Biological Theory*, 5(1), 18-30.
- Badgett, M. L. (2007). Discrimination based on sexual orientation: A review of the literature in economics and beyond. In *Sexual orientation discrimination* (pp. 37-61). Routledge.
- Batara, J. B. L., Franco, P. S., Quiachon, M. A. M., & Sembrero, D. R. M. (2016). Effects of Religious Priming Concepts on Prosocial Behavior Towards Ingroup and Outgroup. *Europe's journal of psychology*, 12(4), 635.
- Becker, G. S. (1957). *The economics of discrimination*, University of Chicago press.

- Benjamin, D. J., Choi, J. J., & Fisher, G. (2016). Religious identity and economic behavior. *Review of Economics and Statistics*, 98(4), 617-637.
- Biernat, M., Vescio, T. K., & Theno, S. A. (1996). Violating American values: A “value congruence” approach to understanding outgroup attitudes. *Journal of Experimental Social Psychology*, 32(4), 387-410.
- Bloom, P. B. N., Arikan, G., & Courtemanche, M. (2015). Religious social identity, religious belief, and anti-immigration sentiment. *American Political Science Review*, 109(2), 203-221.
- Brañas-Garza, P., Espín, A. M., & Neuman, S. (2014). Religious pro-sociality? Experimental evidence from a sample of 766 Spaniards. *PloS one*, 9(8), e104685.
- Camerer, C. F., Loewenstein, G., & Prelec, D. (2004). Neuroeconomics: Why economics needs brains. *scandinavian Journal of Economics*, 106(3), 555-579.
- Chang, D., Chen, R., & Krupka, E. (2019). Rhetoric matters: A social norms explanation for the anomaly of framing. *Games and Economic Behavior*, 116, 158-178.
- Chuah, S. H., Gächter, S., Hoffmann, R., & Tan, J. H. (2016). Religion, discrimination and trust across three cultures. *European Economic Review*, 90, 280-301.
- Chuah, S. H., Hoffmann, R., Ramasamy, B., & Tan, J. H. (2014). Religion, ethnicity and cooperation: An experimental study. *Journal of Economic Psychology*, 45, 33-43.
- Cummings, J. P., Kusner, K. G., Lucero, S., Padgett, E. A., Gollery, T. J., & Pargament, K. I. (2017). A Comparison of Christians’ Concepts of Jesus Christ and God. *The International Journal for the Psychology of Religion*, 27(1), 35-50.

- DeBono, A., Shariff, A. F., Poole, S., & Muraven, M. (2017). Forgive us our trespasses: Priming a forgiving (but not a punishing) god increases unethical behavior. *Psychology of Religion and Spirituality*, 9(S1), S1.
- Delavande, A., & Zafar, B. (2015). Stereotypes and madrassas: experimental evidence from Pakistan. *Journal of Economic Behavior & Organization*, 118, 247-267.
- Dreber, A., Ellingsen, T., Johannesson, M., & Rand, D. G. (2013). Do people care about social context? Framing effects in dictator games. *Experimental Economics*, 16(3), 349-371.
- Drydakis, N. (2009). Sexual orientation discrimination in the labour market. *Labour Economics*, 16(4), 364-372.
- Duhaime, E. P. (2015). Is the call to prayer a call to cooperate? A field experiment on the impact of religious salience on prosocial behavior. *Judgment and Decision Making*, 10(6), 593.
- Eckel, C. C., & Grossman, P. J. (1996). Altruism in anonymous dictator games. *Games and economic behavior*, 16(2), 181-191.
- Eckel, C.C. and Grossman, P.J. (2004) Giving to secular causes by the religious and nonreligious: an experimental test of the responsiveness of giving to subsidies. *Nonprofit and Voluntary Sector Quarterly* 33(2): 271–289.
- Engel, C. (2011). Dictator games: A meta study. *Experimental Economics*, 14(4), 583-610.
- Everett, J. A., Haque, O. S., & Rand, D. G. (2016). How good is the Samaritan, and why? An experimental investigation of the extent and nature of religious prosociality using economic games. *Social Psychological and Personality Science*, 7(3), 248-255.

- Fong, C. M., & Luttmer, E. F. (2011). Do fairness and race matter in generosity? Evidence from a nationally representative charity experiment. *Journal of Public Economics*, 95(5-6), 372-394.
- Galen, L. W., Sharp, M., & McNulty, A. (2015). Nonreligious group factors versus religious belief in the prediction of prosociality. *Social Indicators Research*, 122(2), 411-432.
- Gomes, C. M., & McCullough, M. E. (2015). The effects of implicit religious primes on dictator game allocations: A preregistered replication experiment. *Journal of Experimental Psychology: General*, 144(6), e94.
- Gueguen, N., Bougeard-Delfosse, C., & Jacob, C. (2015). The positive effect of the mere presence of a religious symbol on compliance with an organ donation request. *Social Marketing Quarterly*, 21(2), 92-99.
- Guryan, J., & Charles, K. K. (2013). Taste-based or statistical discrimination: the economics of discrimination returns to its roots. *The Economic Journal*, 123(572), F417-F432.
- Hadnes, M., & Schumacher, H. (2012). The Gods are watching: An experimental study of religion and traditional belief in Burkina Faso. *Journal for the Scientific Study of Religion*, 51(4), 689-704.
- Hara, K., Adams, A., Milland, K., Savage, S., Callison-Burch, C., & Bigham, J. P. (2018, April). A data-driven analysis of workers' earnings on amazon mechanical turk. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (p. 449). ACM.
- Hoffmann, R. (2013). The experimental economics of religion. *Journal of Economic surveys*, 27(5), 813-845.
- Horton, J. J., Rand, D. G., & Zeckhauser, R. J. (2011). The online laboratory: Conducting experiments in a real labor market. *Experimental economics*, 14(3), 399-425.

- Jäckle, S., & Wenzelburger, G. (2015). Religion, religiosity, and the attitudes toward homosexuality—A multilevel analysis of 79 countries. *Journal of homosexuality*, 62(2), 207-241.
- Johnson, K. A., Li, Y. J., Cohen, A. B., & Okun, M. A. (2013). Friends in high places: The influence of authoritarian and benevolent god-concepts on social attitudes and behaviors. *Psychology of Religion and Spirituality*, 5(1), 15.
- Johnson, K. A., Memon, R., Alladin, A., Cohen, A. B., & Okun, M. A. (2015). Who helps the Samaritan? The influence of religious vs. secular primes on spontaneous helping of members of religious outgroups. *Journal of Cognition and Culture*, 15(1-2), 217-231.
- Johnson, M. K., Rowatt, W. C., & LaBouff, J. (2010). Priming Christian religious concepts increases racial prejudice. *Social Psychological and Personality Science*, 1(2), 119-126.
- Johnson, M. K., Rowatt, W. C., & LaBouff, J. P. (2012). Religiosity and prejudice revisited: In-group favoritism, out-group derogation, or both?. *Psychology of Religion and Spirituality*, 4(2), 154.
- Karlan, D.S. (2005) Using experimental economics to measure social capital and predict financial decisions. *American Economic Review* 95(5): 1688–1699.
- Kirchmaier, I., Prüfer, J., & Trautmann, S. T. (2018). Religion, moral attitudes and economic behavior. *Journal of Economic Behavior & Organization*, 148, 282-300.
- Kranton, R. E., & Sanders, S. G. (2017). Groupy versus non-groupy social preferences: Personality, region, and political party. *American Economic Review*, 107(5), 65-69.
- LaBouff, J. P., Rowatt, W. C., Johnson, M. K., & Finkle, C. (2012). Differences in attitudes toward outgroups in religious and nonreligious

- contexts in a multinational sample: A situational context priming study. *International Journal for the Psychology of Religion*, 22(1), 1-9.
- Lane, T. (2016). Discrimination in the laboratory: A meta-analysis of economics experiments. *European Economic Review*, 90, 375-402.
- Malhotra, D. (2010) (When) are religious people nicer? Religious salience and the 'Sunday effect' on pro-social behavior. *Judgment and Decision Making* 5(2): 138–143.
- Matsumoto, Y., Yamagishi, T., Li, Y., & Kiyonari, T. (2016). Prosocial behavior increases with age across five economic games. *PLoS One*, 11(7), e0158671.
- Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of marketing research*, 45(6), 633-644.
- McCauley, J. F. (2014). Measuring and Reducing Religious Bias in Post-Conflict Zones: Evidence from Côte d'Ivoire. *Political Psychology*, 35(2), 267-289.
- McNamara, R. A., & Henrich, J. (2018). Jesus vs. the ancestors: how specific religious beliefs shape prosociality on Yasawa Island, Fiji. *Religion, Brain & Behavior*, 8(2), 185-204.
- Miyatake, S., & Higuchi, M. (2017). Does religious priming increase the prosocial behaviour of a Japanese sample in an anonymous economic game?. *Asian Journal of Social Psychology*, 20(1), 54-59.
- Norenzayan, A. (2013). *Big gods: How religion transformed cooperation and conflict*. Princeton University Press.
- Norenzayan, A., & Shariff, A. F. (2008). The origin and evolution of religious prosociality. *science*, 322(5898), 58-62.

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

Parra, J. C., Joseph, G., & Wodon, Q. (2016). Religion and Social Cooperation: Results from an Experiment in Ghana. *The Review of Faith & International Affairs*, 14(3), 65-72.

Pelham, B., & Crabtree, S. (2008). *Worldwide, highly religious more likely to help others*. <http://www.gallup.com/poll/111013/worldwide-highly-religious-more-likely-help-others.aspx>.

Pew Research Center (2015). *U.S. Public Becoming Less Religious*. Downloaded (28/6/19) from <https://www.pewforum.org/2015/11/03/u-s-public-becoming-less-religious/>

Pew Research Center (2017). *The Changing Global Religious Landscape*. Downloaded (6/6/19) from <https://www.pewforum.org/2017/04/05/the-changing-global-religious-landscape/>

Pichon, I., Boccato, G., & Saroglou, V. (2007). Nonconscious influences of religion on prosociality: A priming study. *European Journal of Social Psychology*, 37(5), 1032-1045.

Preston, J. L., & Ritter, R. S. (2013). Different effects of religion and God on prosociality with the ingroup and outgroup. *Personality and Social Psychology Bulletin*, 39(11), 1471-1483

Qualtrics (2018). Data for this paper was generated using Qualtrics software. Copyright © [2018] Qualtrics. Qualtrics and all other Qualtrics product or service names are registered trademarks or trademarks of Qualtrics, Provo, UT, USA. <http://www.qualtrics.com>

Ramsay, J. E., Pang, J. S., Shen, M. J., & Rowatt, W. C. (2014). Rethinking value violation: Priming religion increases prejudice in Singaporean Christians

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

Ramsay, J. E., Tong, E. M., Pang, J. S., & Chowdhury, A. (2016). A puzzle unsolved: Failure to observe different effects of God and religion primes on intergroup attitudes. *PloS one*, 11(1), e0147178.

Rand, D. G., Dreber, A., Haque, O. S., Kane, R. J., Nowak, M. A., & Coakley, S. (2014). Religious motivations for cooperation: an experimental investigation using explicit primes. *Religion, Brain & Behavior*, 4(1), 31-48.

Randolph-Seng, B., & Nielsen, M. E. (2007). Honesty: One effect of primed religious representations. *The International Journal for the Psychology of Religion*, 17(4), 303-315.

Renneboog, L., & Spaenjers, C. (2012). Religion, economic attitudes, and household finance. *Oxford Economic Papers*, 64(1), 103-127.

Schnabel, L. (2016). Gender and homosexuality attitudes across religious groups from the 1970s to 2014: Similarity, distinction, and adaptation. *Social Science Research*, 55, 31-47.

Shariff, A. F., & Norenzayan, A. (2007). God is watching you: Priming God concepts increases prosocial behavior in an anonymous economic game. *Psychological science*, 18(9), 803-809.

Shariff, A. F., & Norenzayan, A. (2011). Mean gods make good people: Different views of God predict cheating behavior. *The International Journal for the Psychology of Religion*, 21(2), 85-96.

Shariff, A. F., Willard, A. K., Andersen, T., & Norenzayan, A. (2016). Religious priming: A meta-analysis with a focus on prosociality. *Personality and Social Psychology Review*, 20(1), 27-48.

Shen, M. J., Haggard, M. C., Strassburger, D. C., & Rowatt, W. C. (2013). Testing the love thy neighbor hypothesis: Religiosity's association with

positive attitudes toward ethnic/racial and value-violating out-groups. *Psychology of Religion and Spirituality*, 5(4), 294.

Soler, M. (2012). Costly signaling, ritual and cooperation: Evidence from Candomblé, an Afro-Brazilian religion. *Evolution and Human Behavior*, 33(4), 346-356.

Son, J., & Wilson, J. (2012). Using normative theory to explain the effect of religion and education on volunteering. *Sociological Perspectives*, 55(3), 473–499.

Tan, J.H.W. (2006) Religion and social preferences: an experimental study. *Economics Letters* 90(1): 60–67.

Wilson, D. S. (2010). *Darwin's cathedral: Evolution, religion, and the nature of society*. University of Chicago Press.

Xygalatas, D. (2013). Effects of religious setting on cooperative behavior: A case study from Mauritius. *Religion, Brain & Behavior*, 3(2), 91-102.

Zhou, H., & Fishbach, A. (2016). The pitfall of experimenting on the web: How unattended selective attrition leads to surprising (yet false) research conclusions. *Journal of personality and social psychology*, 111(4), 493.

Supplementary Materials

Supplementary Materials 1: screenshots of the experimental instructions

Note: these screenshots are from the LGBTQ God treatment. Where applicable, annotations below the screenshots explain how they differ in the other treatments.

Participant Information Sheet for Qualtrics experiment on economic behavior

Dear Participant,

Thank you for agreeing to participate in this experiment in connection with my research at the University of Nottingham Ningbo. The project is a study about economic decision-making. It should take you 10-15 minutes to complete the experiment.

For participating in this experiment you will receive \$2, plus a bonus of up to \$8. You must not participate in this experiment if you are under the age of 16.

Your participation in the experiment is voluntary. You are able to withdraw from the experiment at any time and to request that the information you have provided is not used in the project. Any information provided will be confidential. Your MTurk Worker ID will be taken so that you can receive your bonus, but when stored the data will be anonymized as quickly as possible, and your identity will not be revealed to any third party.

The research project has been reviewed according to the ethical review processes in place in the University of Nottingham Ningbo. These processes are governed by the University's Code of Research Conduct and Research Ethics. Should you have any question now or in the future, please contact me. Should you have concerns related to my conduct of the survey or research ethics, please contact the University's Ethics Committee.

Yours truly,
Tom Lane

Contact details:

Researcher: Tom Lane (Tom.Lane@nottingham.edu.cn)

University Research Ethics Committee Coordinator, Ms. Joanna Huang
(Joanna.Huang@nottingham.edu.cn)

PARTICIPANT CONSENT FORM

Project topic: Qualtrics experiment on economic behavior

Researcher's name: Tom Lane

Please click on all the statements below to confirm that you agree with them.

I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part.

I understand the purpose of the research project and my involvement in it.

I understand that I may withdraw from the research project at any stage and that this will not affect my status now or in the future.

I understand that while information gained during the study may be published, I will not be identified and my personal results will remain confidential.

I understand that data will be stored in accordance with data protection laws.

I understand that I may contact the researcher if I require more information about the research, and that I may contact the Research Ethics Sub-Committee of the University of Nottingham, Ningbo if I wish to make a complaint related to my involvement in the research.

I am aged 16 or above.



Please enter your MTurk Worker ID. Make sure you enter this correctly. If you do not do so, we will not be able to pay you any bonus money earned in the experiment.



Information about your task and payment for this experiment

For participating in this experiment, you will receive \$2. A code will be provided to you on the final page of the experiment, which you will need to enter on MTurk to receive this.

In addition, you may receive a bonus. The amount of money you will receive as your bonus depends on your decision in the task described below:

The task

Your task is to decide how to share \$8 between yourself and a charity. You can claim as much or as little as you want of the \$8 to keep for yourself. Whatever you keep will be your bonus from this experiment. Whatever you don't keep will be donated to the charity.

Please click forward to indicate that you understand this task and how your payment and bonus from the experiment will be determined.



Frequently asked question: can I be sure that the money I choose not to keep will really be given to charity?

Yes, definitely. This research is conducted within the Centre for Decision Research and Experimental Economics (<https://www.nottingham.ac.uk/CEDEX/>) at the University of Nottingham. We are a reputable research group and do not deceive participants in our experiments.

In this experiment, your anonymous participant ID number is 07:00:48:695. Feel free to make a note of this. NOTE: this ID number is not the same as the code to enter for payment on MTurk, which will be provided at the end of the experiment.

After all participants have completed the experiment, a list of the amounts given to charity by all participants in the experiment will be placed next to their anonymous participant ID numbers on this webpage: <https://www.nottingham.ac.uk/cedex/documents/misc/experiment-on-economic-behaviour.pdf>

On the same page we will also upload copies of receipts given by the charity to confirm that the donations were received. The link to this website will be provided again on the final screen of this experiment. We guarantee that all payments to charity will be made no later than July 20, so feel free to check the website after this date and see that we have done as promised.

If you do not believe the correct amounts have been given to yourself or the charity, you can contact the researcher (Tom.Lane@nottingham.edu.cn) or our university's ethics committee (Joanna.Huang@nottingham.edu.cn). These contact details will be provided again on the final screen of this experiment.



Information about the charity.

The charity with which you can choose to share money is an organization **whose aim is to prevent suicides among young people who are lesbian, gay, bisexual, transgender and questioning (LGBTQ).**



Note: in all General treatments, the above sentence instead reads: ‘The charity with whom you can choose to share money is an organization **whose aim is to prevent suicides among young people.**’

On the next screen, you will be asked to make your decision over how much of the \$8 to keep yourself and how much to donate to preventing suicides among young people who are lesbian, gay, bisexual, transgender and questioning (LGBTQ).

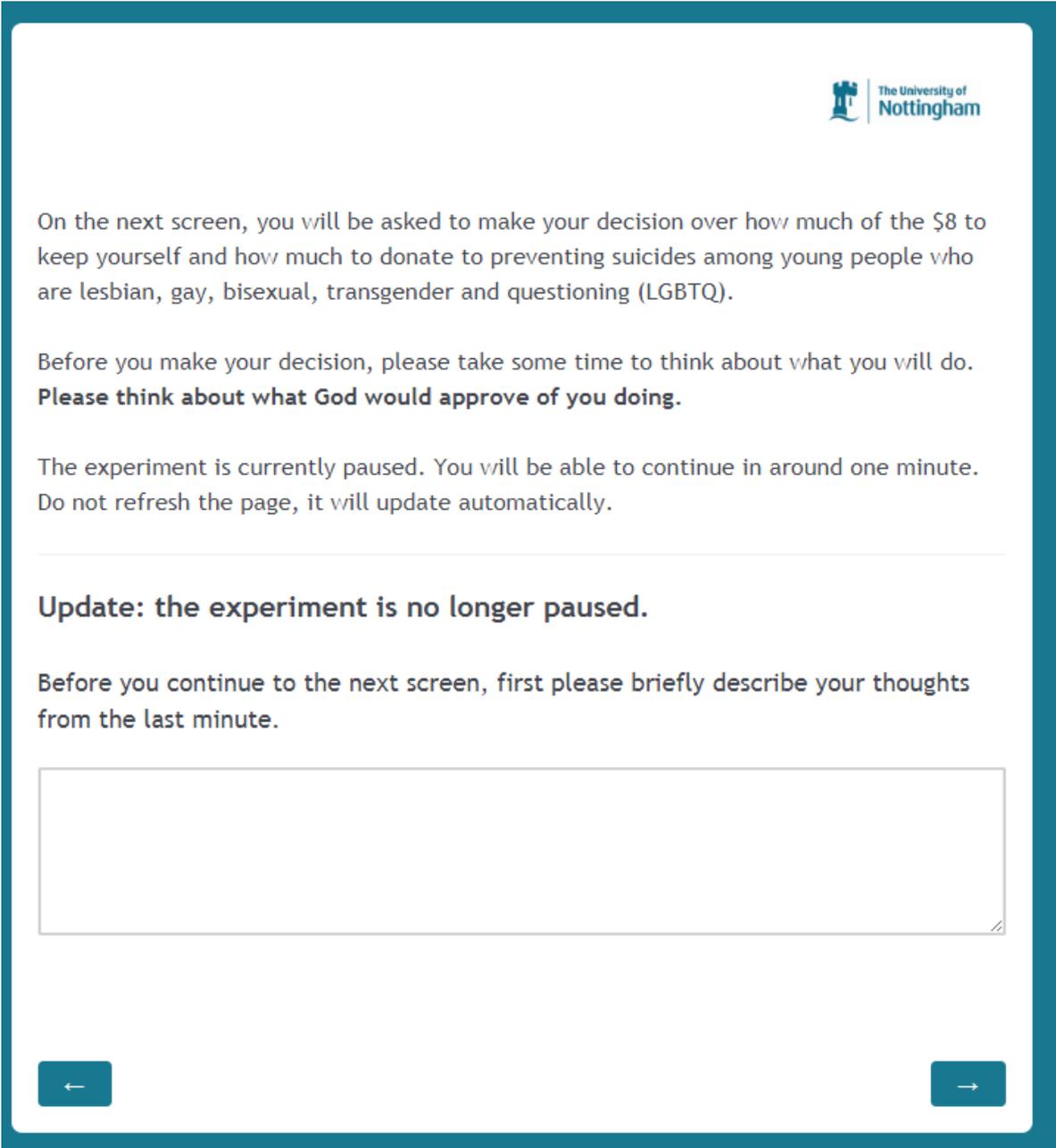
Before you make your decision, please take some time to think about what you will do.
Please think about what God would approve of you doing.

The experiment is currently paused. You will be able to continue in around one minute. Do not refresh the page, it will update automatically.



Note: in all General treatments, the first sentence above instead reads: ‘On the next screen, you will be asked to make your decision over how much of the \$8 to keep yourself and how much to donate to preventing suicides among young people.’

In the Control treatments, the sentence ‘**Please think about what God would approve of you doing**’ is absent. In the Jesus treatments, it is replaced with ‘**Please think about what Jesus would approve of you doing.**’



The University of Nottingham

On the next screen, you will be asked to make your decision over how much of the \$8 to keep yourself and how much to donate to preventing suicides among young people who are lesbian, gay, bisexual, transgender and questioning (LGBTQ).

Before you make your decision, please take some time to think about what you will do.
Please think about what God would approve of you doing.

The experiment is currently paused. You will be able to continue in around one minute. Do not refresh the page, it will update automatically.

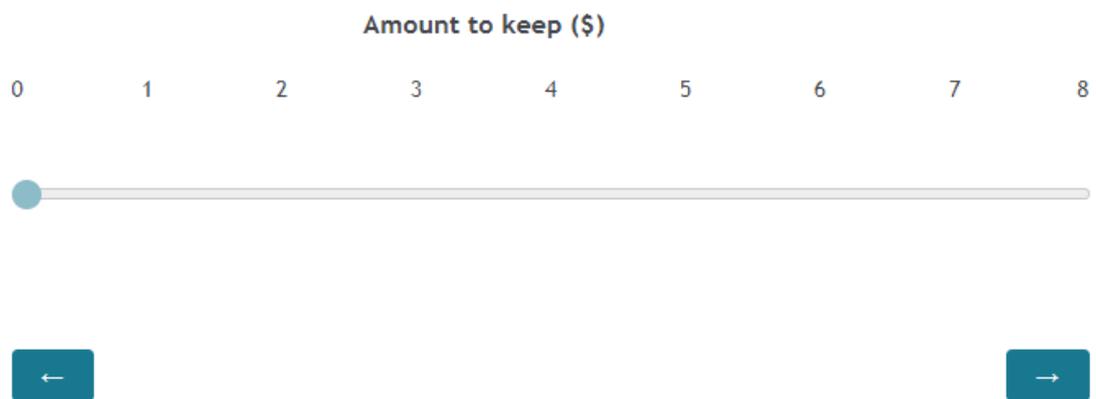
Update: the experiment is no longer paused.

Before you continue to the next screen, first please briefly describe your thoughts from the last minute.

← →

Please now make your decision over how much of the \$8 to keep yourself and how much to donate to preventing suicides among young people who are lesbian, gay, bisexual, transgender and questioning (LGBTQ).

Make your decision by adjusting the slider below to select the amount (in \$) that you will keep for yourself. The amount that you do not keep for yourself will be given to preventing suicides among young people who are lesbian, gay, bisexual, transgender and questioning (LGBTQ).



Note: in all General treatments, the first sentence above instead reads ‘Please now make your decision over how much of the \$8 to keep yourself and how much to donate to preventing suicides among young people.’ The final sentence reads: ‘The amount that you do not keep for yourself will be given to preventing suicides among young people.’

So, you would like to keep \$4 and give \$4 to preventing suicides among young people who are lesbian, gay, bisexual, transgender and questioning (LGBTQ). Click forward to confirm this or go back to change it.



Note: the above amounts are displayed for a participant who chooses to donate \$4. In the General treatments, the above sentence would read: ‘So, you would like to keep \$4 and give \$4 to preventing suicides among young people.’

Finally, please answer a few questions about yourself. You must complete these questions to receive your payment and bonus.



What is your age?



What is your gender?

Male

Female



What is your nationality?

- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua and Barbuda
- Argentina
- Armenia
- Aruba
- Australia



Which of the following best describes your religion?

Christianity - Catholic

Christianity - Protestant

Christianity - Orthodox

Christianity - Other

Islam

Judaism

Hinduism

Sikhism

Buddhism

Taoism

Confucianism

Other religion

No religion



How often do you usually go to church?

At least once per week

Less than once per week but at least once per month

Less than once per month but at least once in three months

Less than once in three months but at least once in six months

Less than once in six months but at least once per year

Less than once per year

Never



How often do you usually pray?

At least once per day

Less than once per day but at least once in three days

Less than once in three days but at least once per week

Less than once per week but at least once per month

Less than once per month but at least once in three months

Less than once in three months but at least once in six months

Less than once in six months but at least once per year

Less than once per year

Never



Which of the following best describes your sexual orientation?

Heterosexual

Bisexual

Homosexual

Questioning

Prefer not to say



Thank you for completing the experiment. The survey code is 129356. Please enter this code on MTurk in order to receive your \$2 participation fee. We will process your bonus payment as soon as possible.

After all participants have completed the experiment, a list of the amounts given to charity by all participants in the experiment will be placed next to their anonymous ID codes on this webpage: <https://www.nottingham.ac.uk/cedex/documents/misc/experiment-on-economic-behaviour.pdf>

On the same page we will also upload copies of receipts given by the charity to confirm that the donations were received.

If you do not believe the correct amounts have been given to yourself or the charity, you can contact the researcher (Tom.Lane@nottingham.edu.cn) or our university's ethics committee (Joanna.Huang@nottingham.edu.cn).

Supplementary Materials 2: regression output

Table A1: Tobit regression – Christian subjects

Dependent variable: Percentage of stake donated	
(1)	
Jesus	19.45*** (6.20)
God	4.79 (6.62)
LGBTQ	-9.08* (5.02)
Age	-0.09 (0.20)
Female	7.97 (5.18)
Foreign	16.21 (13.03)
Non-heterosexual	-0.91 (6.98)
Weekly Church	-12.71* (6.62)
Daily Prayer	9.92 (6.17)
Mentions God/Jesus	-28.07*** (7.94)
Believes God/Jesus favours giving	14.77 (13.73)
Believes God/Jesus favours keeping	-2.78 (19.96)
Mentions cause/charity	-16.35** (8.28)
Sympathetic to recipients	24.35*** (9.17)
Believes good cause	21.98*** (8.14)
Provides reasons for not giving	-25.12*** (8.34)
Constant	32.94*** (10.17)
Pseudo R ²	0.04
Observations	228

*Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Tobit models are left and right censored. Standard errors in parentheses. Only Christian subjects are included. The omitted treatment category is Control. Linear restriction test on Jesus v God: $p = 0.017$.*

Table A2: Tobit regressions – Non-Abrahamic subjects

Dependent variable: Percentage of stake donated			
	(1)	(2)	(3)
Jesus	2.34 (9.69)		-9.01 (14.00)
God	4.09 (9.53)		3.14 (14.12)
LGBTQ	15.17* (7.91)		7.71 (12.83)
General Jesus		-9.01 (14.00)	
General God		3.14 (14.12)	
LGBTQ Control		7.71 (12.83)	
LGBTQ Jesus		20.70 (13.73)	22.00 (19.59)
LGBTQ God		13.59 (12.98)	-2.75 (18.91)
Age	0.28 (0.43)	0.19 (0.43)	0.19 (0.43)
Female	13.84* (8.23)	13.22 (8.20)	13.22 (8.20)
Foreign	-36.23* (20.53)	-36.45* (20.52)	-36.45* (20.52)
Non-heterosexual	18.97* (10.96)	19.35* (10.89)	19.35* (10.89)
Weekly Church	18.04 (21.71)	18.50 (21.70)	18.50 (21.70)
Daily Prayer	28.00* (16.60)	31.03* (16.75)	31.03* (16.75)
Constant	-20.10 (16.40)	-13.24 (17.54)	-13.24 (17.54)
Pseudo R ²	0.02	0.02	0.02
Observations	179	179	179

*Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Tobit models are left and right censored. Standard errors in parentheses. Only subjects who are not Christians, Muslims or Jews are included. The omitted treatment category is Control in model (1) and General Control in model (2). In model (2) a linear restriction test finds General Jesus differs from LGBTQ Jesus ($p = 0.045$)*

Table A3: Tobit regressions – Non-religious subjects

Dependent variable: Percentage of stake donated			
	(1)	(2)	(3)
Jesus	2.20 (11.89)		-11.49 (17.70)
God	6.53 (11.29)		10.05 (16.86)
LGBTQ	13.02 (9.48)		8.03 (15.34)
General Jesus		-11.49 (17.70)	
General God		10.05 (16.86)	
LGBTQ Control		8.03 (15.34)	
LGBTQ Jesus		21.06 (16.56)	24.52 (23.57)
LGBTQ God		12.55 (15.63)	-5.53 (22.23)
Age	0.48 (0.49)	0.40 (0.49)	0.40 (0.49)
Female	7.94 (10.12)	6.91 (10.08)	6.91 (10.08)
Foreign	-269.55 (8333.53)	-268.83 (8362.13)	-268.83 (8362.13)
Non-heterosexual	11.99 (14.37)	10.62 (14.30)	10.62 (14.30)
Daily Prayer	39.50 (28.64)	44.64 (28.94)	44.64 (28.94)
Constant	-26.55 (19.13)	-20.41 (20.24)	-20.41 (20.24)
Pseudo R ²	0.02	0.02	0.02
Observations	148	148	148

*Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Tobit models are left and right censored. Standard errors in parentheses. Only subjects with no religion are included. The omitted treatment category is Control in model (1) and General Control in model (2). Weekly Church is omitted due to collinearity. In model (2) a linear restriction test finds General Jesus differs from LGBTQ Jesus ($p = 0.073$)*

Table A4: Tobit regression – Christian and non-Christian subjects

Dependent variable: Percentage of stake donated		
	(1)	(2)
Jesus	8.41 (5.46)	10.12 (6.23)
God	1.64 (5.55)	0.55 (6.49)
LGBTQ	10.24 (6.72)	9.81 (7.75)
Age	0.03 (0.20)	0.07 (0.23)
Female	9.93** (4.64)	8.88 (5.46)
Foreign	-8.03 (10.89)	-13.23 (14.10)
Non-heterosexual	8.38 (6.00)	
Weekly Church	-4.33 (6.98)	-7.62 (8.07)
Daily Prayer	16.45*** (6.16)	20.09*** (7.18)
Christian	18.44*** (6.97)	19.44** (7.95)
Christian x LGBTQ	-19.11** (9.04)	-18.90* (10.42)
Constant	-6.05 (8.88)	-8.64 (10.42)
Pseudo R ²	0.01	0.01
Observations	424	353

*Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Tobit models are left and right censored. Standard errors in parentheses. Model (2) excludes non-heterosexual subjects. The omitted treatment category is Control.*