Location, Location, Location: Effects of Cross-Religious Primes on Prosocial Behavior

Dimitris Xygalatas, Eva Kundtová Klocová, Jakub Cigán, Radek Kundt, Peter Maño, Silvie Kotherová, Panagiotis Mitkidis, Sebastian Wallot & Martin Kanovsky

To cite this article: Dimitris Xygalatas, Eva Kundtová Klocová, Jakub Cigán, Radek Kundt, Peter Maño, Silvie Kotherová, Panagiotis Mitkidis, Sebastian Wallot & Martin Kanovsky (2016) Location, Location, Location: Effects of Cross-Religious Primes on Prosocial Behavior, *The International Journal for the Psychology of Religion*, 26:4, 304-319, DOI: [10.1080/10508619.2015.1097287](https://doi.org/10.1080/10508619.2015.1097287)

To link to this article: <http://dx.doi.org/10.1080/10508619.2015.1097287>

Accepted author version posted online: 09 Nov 2015.
Published online: 09 Nov 2015.

Submit your article to this journal [↗](#)

Article views: 158

View related articles [↗](#)

View Crossmark data [↗](#)

RESEARCH

Location, Location, Location: Effects of Cross-Religious Primes on Prosocial Behavior

Dimitris Xygalatas ^{a,b,c}, Eva Kundtová Klocová^c, Jakub Cigán^c, Radek Kundt^c, Peter Maňo^{c,d},
Silvie Kotherová^c, Panagiotis Mitkidis^{b,e,f}, Sebastian Wallot^b and Martin Kanovsky^d

^aDepartment of Anthropology, University of Connecticut, Storrs, CT, USA; ^bInteracting Minds Centre, Aarhus University, Aarhus, Denmark; ^cLaboratory for the Experimental Research of Religion, Masaryk University, Brno, Czech Republic; ^dFaculty of Social Sciences, Comenius University, Bratislava, Slovakia; ^eCenter for Advanced Hindsight, Social Science Research Institute, Duke University, Durham, NC, USA; ^fInterdisciplinary Centre for Organizational Architecture, Aarhus University, Aarhus, Denmark

ABSTRACT

Priming with religious concepts is known to have a positive effect on prosocial behavior; however, the effects of religious primes associated with outgroups remain unknown. To explore this, we conducted a field experiment in a multicultural, multireligious setting (the island of Mauritius). Our design used naturally occurring, ecologically relevant contextual primes pertinent to everyday religious and secular life while maintaining full experimental control. We found that both ingroup and outgroup religious contexts increased generosity as measured by a donation task. In accordance with previous research, we also found an interaction between individual religiosity and the efficacy of the religious primes. We discuss these findings and their interpretation, and we suggest potential avenues for further research.

Introduction

Religion and prosociality have long been considered to be closely intertwined. Religious doctrines and authorities routinely aspire to regulate social conduct and set the standards of appropriate interpersonal behavior. Based on this observation, it is a common assumption—not only among the general public but also among many scholars—that religious people behave more prosocially (see Galen, 2012). However, this assumption seems both conceptually and empirically unfounded. The fact that most (though not all) religions are concerned with prosociality does not necessarily imply that religious people are more prosocial, a logical leap that has been termed the “religious congruence fallacy” (Chaves, 2012). Furthermore, it is well documented that people’s behavior is often inconsistent with their attitudes (e.g., DiMaggio, 1997; Maio, Olson, Bernard, & Luke, 2003; Swidler, 1986; Vaisey, 2009), and this has long been observed in the realm of religion specifically (e.g., Evans-Pritchard, 1965; Wittgenstein, 1979). Conceptual issues aside, the bulk of the available empirical evidence do not confirm that religious people behave more prosocially, even if they say or think that they do (Chaves, 2010; Leach, Berman, & Eubanks, 2008).

Although religious people have been found to score higher in various prosocial attitudes (Brooks, 2003, 2005, 2007; Friedrichs, 1960; Furrow et al., 2004; Gronbjerg & Never, 2004; Guiso et al., 2003; Lam, 2002; McCullough & Worthington, 1999; Morgan, 1983; Putnam & Campbell, 2010; Su, Chou, & Osborne, 2011), they have also been shown to score higher in a host of negative and antisocial attitudes (Batson, Floyd, Meyer, & Winner, 1999; Cornwall, Perry, Louw,

CONTACT Dimitris Xygalatas xygalatas@uconn.edu Department of Anthropology, University of Connecticut, Storrs, CT 06269-2176, USA.

Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/hjpr

© 2016 Taylor & Francis

& Stringer, 2012; Park, 2012; Saslow et al., 2012; Stegmueller, Scheepers, Rossteutscher, & de Jong, 2012; Stokes & Regnerus, 2009; Victoroff et al., 2010). It is thus difficult to tell whether any prosocial effects of religion are an indication of general prosociality rather than of favouritism toward an ingroup (Hunter, 2001; Ottoni & Wilhelm, 2010), which might indeed be mirrored by hostility toward outsiders (Burris & Jackson, 1999; Heiphetz, Spelke, & Banaji, 2012; Hunsberger & Jackson, 2005).

From a methodological standpoint, the studies that have reported a positive link between religiosity and prosociality typically relied on correlational designs, which offer a low degree of internal validity and cannot establish causality. More crucially, the majority of those studies examined hypothetical or reported behavior rather than real behavior (Batson, Schoenrade, & Ventis, 1993; Clobert, Saroglou, & Hwang, 2015; Clobert & Saroglou, 2013; Ellison, 1992; Koenig, McGue, Krueger, & Bouchard, 2007; Morgan, 1983; Pichon, Boccato, & Saroglou, 2007; Pichon & Saroglou, 2009; Saroglou et al., 2005). Such subjective reports are poor predictors of actual behavior (Baumeister, Vohs, & Funder, 2007; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), particularly when socially desirable attributes like religiosity are being reported (Brenner, 2011; Hadaway, Marler, & Chaves, 1998). In fact, there is some evidence that religious individuals are particularly prone to social desirability effects (Burris & Jackson, 2000; Gervais & Norenzayan, 2012; Leak & Fish, 1989; McCullough & Willoughby, 2009; Sedikides & Gebauer, 2010). Finally, the well-documented popular belief that religiosity and morality are causally linked (de Dreu, Carsten, Yzerbyt, & Leyens, 1995; Ellison, 1992; Gervais, Shariff, & Norenzayan, 2011; Miller & Bornstein, 2006; Mitkidis, Xygalatas, Buttrick, Porubanova, & Lienard, 2014; Morgan, 1983; Orbell, Goldman, Mulford, & Dawes, 1992; Saroglou et al., 2005; Tan & Vogel, 2008) may act like a self-fulfilling prophecy by biasing respondents' views of themselves and others (Galen, 2012).

Most importantly, the biggest problem with those findings is that the self-reported prosociality does not correspond with people's real behavior. In other words, although religious people portray or see themselves as better people, they do not actually behave any better. Although a few studies have shown some correlation between particular aspects of religiosity and prosocial behavior (Branas-Garza, Espín, & Neuman, 2014; Fehr, Fischbacher, von Rosenbladt, Schupp, & Wagner, 2003; Paciotti et al., 2011; Perrin, 2000; Sosis & Ruffle, 2003, 2004), the overwhelming majority of the available evidence suggests otherwise (Anderson, Mellor, & Milyo, 2010; Batson et al., 1999; Batson et al., 1989; Batson et al., 1993; Burris & Jackson, 1999; Darley & Batson, 1973; Eckel & Grossman, 2004; Goldfried & Miner, 2002; Grossman & Parrett, 2011; Jackson & Esses, 1997; Johansson-Stenman, Mahmud, & Martinsson, 2009; Malhotra, 2010; Orbell et al., 1992; Pruckner & Sausgruber, 2009; Spilka, Hood, Hunsberger, & Gorsuch, 2003; Tan, 2006).

On the other hand, evidence does suggest that exposure to religious concepts and contexts can have significant prosocial effects. In other words, "the religious situation is more important than the religious disposition" (Norenzayan & Shariff, 2008, p. 62). A number of controlled studies have found that religious primes can bolster prosocial behaviors (Ahmed & Hammarstedt, 2011; Ahmed & Salas, 2008, 2011; Ariely, 2008, 2012; Aveyard, 2014; Bering, McLeod, & Shackelford, 2005; Bulbulia & Mahoney, 2008; Hadnes & Schumacher, 2012; Mazar, Amir, & Ariely, 2008; Randolph-Seng & Nielsen, 2007; Ruffle & Sosis, 2010; Shariff & Norenzayan, 2007; Tsang, Schulwitz, & Carlisle, 2012; but also see Harrell, 2012).

Similar effects have been documented in naturalistic studies that used real-life religious contexts as stimuli. For example, Xygalatas (2012) found that Mauritian Hindus who were randomly assigned to perform the task in a temple were more cooperative in a public goods game than those who played in a restaurant; Ahmed and Salas (2013) found that randomly assigned Chilean Catholic university students who played a similar game in a university chapel were more cooperative and perceived other players to be more cooperative compared to those who played inside a lecture hall.

A recent meta-analysis that examined 93 studies across 11,653 participants (Shariff, Willard, Andersen, & Norenzayan, 2015) showed that the prosocial effects of religious priming are

robust across numerous cultures and types of behaviors, although they are more reliable specifically among religious participants. However, the boundaries of religious prosociality are less clear. In particular, the effects of contexts associated with religious outgroups have not yet been sufficiently explored. Clobert et al. (2015) found that priming with Buddhist concepts increased prosocial attitudes even among Christians. However, to our knowledge, no previous study has examined the effects of cross-religious primes on real behavior. Furthermore, no previous study has compared the effects of real-life ingroup and outgroup religious contexts. To examine these effects, we designed a field experiment, using real-life contextual primes while maintaining full experimental control. We compared the effects of Christian and Hindu contextual primes on generosity among a group of Mauritian Catholics. We predicted that Catholic participants would be more generous in both a Christian and a Hindu context compared to a control setting.

General context

The location for our experiment was Mauritius, a small island located in the Mascarene archipelago, 500 miles east of Madagascar, where the lead author had been conducting ethnographic field work over a period of 5 years. Mauritius's 1.3 million inhabitants constitute one of the most diverse societies in the world ethnically, religiously, linguistically, and culturally (Okediji, 2005), which makes it an ideal setting for studying social interaction and ingroup and outgroup relations. The biggest ethno-religious group (almost 49%) are Hindu, members of the Indian Diaspora whose ancestors arrived in Mauritius as indentured sugar plantation labourers in the 19th century or one of the various subsequent immigration waves (Eisenlohr, 2006). Christian Creoles (mostly Roman Catholic), people of African and Malagasy origin whose ancestors were brought to Mauritius as slave workers for the plantations (Allen, 1999) make up approximately 26% of the population. Muslims of Indian and Pakistani origin constitute 17% of the population, and there are smaller groups of Sino-Mauritians and Franco-Mauritians (Carroll & Carroll 2000; Statistics Mauritius, 2012).

Religion is a core feature of personal and collective identity for Mauritians and, together with ethnicity, constitutes one of two primary group markers. The proportion of people who self-identify as nonreligious is no greater than 0.7% (Statistics Mauritius, 2012). Numerous places of worship of various religions can be found in every neighbourhood across the country, and religious symbols are omnipresent in public and private spaces. The great variety of religious rituals performed in Mauritius range from private rites performed at home to the Hindu pilgrimage of Maha Shivaratri, which draws half of the entire population of the country; from ritual scripts that take a few seconds (like crossing oneself while passing by a statue of the Madonna) to week-long pujas; and from low-key collective prayers to high-intensity rites involving self-mutilation (Fischer et al., 2014).

Our study was conducted in Pointe aux Piments, a large rural village of 9,000 people, situated 20 km west of the capital city of Port Louis. Although located on the coast, Pointe aux Piments does not have sandy beaches, and as a result it has not been able to fully tap into the tourism industry, one of the biggest and most rapidly growing sectors of the national economy. Most of the inhabitants are low-income workers employed locally as fishermen, in the sugarcane fields that surround the village, or in various service sectors in the area. The village has a mixed population consisting mostly of Hindus and Christians, each representing more than 45% of the total inhabitants (Statistics Mauritius, 2012), and is home to numerous temples, churches, and small shrines. To examine the effects of ingroup and outgroup religious primes on prosocial behavior, we conducted a field experiment using a Catholic church and a Hindu temple dedicated to Kali as contextual primes.

Materials and methods

Participants and general procedure

One hundred two Catholic Mauritian Creoles (54 women) aged 18–61 (M age = 31.62 years, Mdn = 28, SD = 11.77) were recruited via a combination of random and snowball sampling.¹

We used a within-subject experimental design, where each participant made economic decisions in three different locations. The statistical power of the sample size for this design is .83. Each location represented either a religious prime or a control setting: a Catholic church (ingroup religious context), a Hindu temple (outgroup religious context), and a restaurant (control). The three venues were located in close proximity, within the same village. The experiment ran over the course of 12 days, but no data were collected on days with scheduled religious services (Fridays and Sundays).

Upon arriving at each location, participants were greeted by one experimenter and one local assistant, were informed about the study, and provided written consent. The order of the locations was counterbalanced, as were researchers and assistants across locations. According to the cover story, participants were told that the aim of the study was to test spatial navigation in various settings and that for each navigational task they finished successfully, they would receive 100 Mauritian rupees (MUR) and then move on to a new location to engage in the next task. The total amount that participants could make was 300 MUR (approximately \$10 USD), roughly equivalent to 3 days' salary for an unskilled worker. After completing each task and receiving their pay, participants were offered the opportunity to anonymously contribute to a charity. Short interviews were conducted after each task, and a questionnaire was administered at the end of the experiment.

Robust statistical methods of analysis (Wilcox, 2012) were used instead of nonparametric tests due to their higher precision and statistical power, most of them based on trimmed means instead of means: Recent statistical literature (Wilcox, 2012) convincingly shows that these methods are not sensitive to violations of assumptions of classical statistical methods, on the one hand, and on the other hand they have higher statistical power than nonparametric tests.

Contextual primes

All three locations were situated in the same neighbourhood near the northeast entrance to the village and had similar size and spatial arrangements, each consisting of a front porch, a main room with seats, and a back room with access restricted to specialists (inner sanctuary, Garbhagriha, kitchen). The two religious locations had a similar number of representations of supernatural agents in the form of statues and icons. To control for potential priming effects of these representations (Bateson, Nettle, & Roberts, 2006; Haley & Fessler, 2005; Kratky, McGraw, Xygalatas, Mitkidis, & Reddish, *in press*), we hung an equal number of agent representations on the walls of the restaurant in the form of posters of popular living and deceased actors and singers. To ensure that all locations were empty during experimentation, we obtained permission from the church and temple officials to use the premises and paid daily rent for the exclusive use of the restaurant.

Navigational task

Performance in the navigational task was not important for the purpose of this experiment; however, it was crucial that the task was plausible and yet easy enough so that all participants could successfully solve it. The task consisted in using a rod approximately 1 m long to navigate a paper cup through a maze without touching any of the walls of the maze or tipping the cup over (see Figure 1 and Figure 2). Each

¹In Mauritius there is a strong overlap between religion and ethnicity. Our local assistants were thus able to recruit subjects based on their physical features and dress code, as the large majority of Afro-Mauritians are Christian. Our questionnaires subsequently provided confirmation that each recruited subject was indeed Christian.

Figure 1. The position of the maze task on the floor of the Hindu temple. *Note.* For the experiment, the maze was placed on a plywood panel to avoid effects of anomalies on the floor.

Figure 2. A local assistant and two of the experimenters testing the maze task.

maze had been taped on a plywood panel and placed in the middle of the room at each location. All three mazes were of same size, as was the width of the pathways and the overall length of the successful trajectory that led to each exit. A repeated measures robust analysis of variance based on comparing 20% trimmed means (Wilcox, 1993, Wilcox, 2012, pp. 380–381) showed that there were no differences in perceived difficulty of the task between locations, $F(2, 122) = 1.58, p = .21$. Trimmed means were used following recent statistical literature (Wilcox, 2012), which strongly recommends using this method over nonparametric tests with low statistical power when some of the assumptions of classical tests are violated (especially assumptions of normality, homoscedasticity, and absence of outliers).

Participants were informed that if they succeeded in completing the task within 30 s, they would receive 100 MUR and move to the next location. Time was monitored by the experimenter by the use of a chronometer not visible to the participants or assistants. The experimenter was thus able to turn a blind eye to minor violations of time limits. However, if any participants obviously broke any of the rules, they were given a second chance to finish the task, ensuring that everyone could finish the task successfully. All participants were able to successfully complete the maze task.

Charity task

Although there is no perfect measure of prosociality, our operationalization sought to quantify altruistic behavior, that is, an unreciprocated action that benefits another at a personal cost to the self. To ensure that the behavior was truly altruistic, that is, not motivated by the hope of future reciprocation, the recipient of the behavior had to be anonymous. Toward this purpose, our dependent measure consisted in an inconspicuous dictator game (Kahneman, Knetsch, & Thaler, 1986), which was framed as a real-life charity. This narrow operationalization of prosociality allowed us to measure the exact financial cost of altruistic behavior.

Specifically, when participants completed each maze task, they received a reward of 100 MUR, which was presented in the form of 100 single-rupee coins placed in a bowl on the table. Subsequently, participants were told that funding for the study was provided only for those who were able to complete the maze task, but the experimenters had set up a charity for those who were not successful. They were then shown a second bowl and were asked if they wished to make an anonymous contribution to the charity.

To ensure that there were no anchoring effects of each donation to the next, we asked participants to allocate coins by handfuls from their own bowl to the charity bowl without counting them, although they were allowed to change the allocation until they were satisfied with the distribution. To avoid experimenter effects, the assistants were blind to our hypotheses, their interaction with participants was scripted, and donations were made in private (participants were left unattended and unobserved during the donation and told to cover the donation bowl with a lid when they finished). After the conclusion of the study, the money that participants donated was in turn donated by the experimenters to the two religious venues.

Postexperiment questionnaire

After each session, participants were asked to rate the difficulty of the navigation task. At the end of the experiment, participants filled in a questionnaire that included demographic information and a composite measure of religiosity consisting of three items adapted from the World Values Survey (2012; items V145-V147) in discussion with local focus groups. The first item assessed self-reported religiosity. Based on prior experience from working in this field site and to avoid ceiling effects (see Xygalatas et al., 2013), we used a comparative formulation (“How religious do you consider yourself to be compared to other people?”) on a 5-point scale ranging from (0) *not at all* to (4) *I am the most religious person I know*. The other two items assessed self-reported church attendance (“How often do you participate in events at the church?”) and frequency of prayer (“How often do you pray?”) ranging from *never* to *very often*. These three items were then combined to produce a composite measure of religiosity. Cronbach’s alpha for ordinal items, that is, based on the polychoric matrix (see Gadermann, Guhn, & Zumbo, 2012), is .63, which is an acceptable value given that there are only three items; standardized item-total correlations are .48 for self-reported religiosity scale; .46 for church attendance scale; and .36 for frequency of prayer scale. A principal component factor analysis supported the use of the combined religiosity scale, as the first factor accounted for more than 52% of the variance. A Kaiser-Meyer Olkin test of sampling adequacy suggested that the sample was factorable (.61), and Bartlett’s test of sphericity was significant, $\chi^2(3) = 21.86$, $p < .00$ (Kaiser, 1974). A parallel analysis (Humphreys & Montanelli, 1975) using a polychoric matrix and a minimal

residual method shows that there is a single dominant factor. Revelle and Rocklin's (1979) very simple structure method and Velicer's (1976) Minimum Average Partial method both confirmed this result. A factor analysis with a polychoric matrix and minimal residual method showed that this single factor had acceptable loadings (0.70, 0.65, 0.46) and explained 37 % of the variance. The regression score of this factor was used as the composite measure of religiosity in robust analyses. Robust (percentage bend) correlations (Wilcox, 2012) between all pairs of questions were significant: Religious/Participation, $r = .29, p < .003$; Religious/Prayer, $r = .23, p < .022$; Participation/Prayer, $r = .21, p < .015$.

Follow-up survey

After the experiment was completed, a research assistant contacted participants by phone and conducted a debriefing session. Interviewees had the opportunity to ask questions about the experiment and were asked to answer a short follow-up questionnaire. Fifty-six people agreed to complete the questionnaire. Participants were asked to state the purpose of our study. More than 55% responded "I don't know." Specific answers included several topics related to religion (18%; e.g., "To see if people have faith," "To know more about other religions," etc.), charity (11%; e.g., "To offer people an opportunity to earn extra money," "To raise funds for a charity," etc.), and a variety of other themes, primarily related to human cognition and behavior (23%; e.g., "to conduct a survey," "to identify personality differences," "to study people's behavior").² No participant made any explicit link between religion and charity, and only two participants correctly suspected that our study aimed to examine how people behave in different locations. Removing those two participants did not make any significant difference in any of the reported results. Overall, these answers indicate that the majority of participants were unaware of our hypotheses.

When we asked participants if they knew who else took part in the study, approximately 61% responded that it was other people from the village, and 7% that it was other people from their neighbourhood; 21% said they did not know, and 11% named specific people (e.g., "my cousin"), which indicates that they talked to other players about the experiment after their participation. These answers suggest that our cover story was convincing and that participants generally did not perceive other players to be exclusively members of their religious ingroup.

When we asked participants whether they had been to each of the three locations before taking part in our study, all but one stated that they had been inside the Christian church. On the other hand, only 13 had been inside the Hindu temple, and 23 had been inside the restaurant. This confirmed that the locations chosen were suitable for the purpose of our study, as the outgroup and control setting were not as familiar to participants as the ingroup setting.

Finally, when we asked participants whether they knew who owned the restaurant, only 12% were able to name the owner. This confirmed that the control setting was generally not associated with a specific religious group.

Results

Participants' mean composite religiosity was 3.26 ($Mdn = 3.33, SD = .66$) on a 1-to-5 scale. There were no significant gender differences in religiosity, perceived task difficulty, time spent in each task, or donations in any of the locations (all $ps > .26$).

Participants donated an average of 49.32 MUR ($Mdn = 35, SD = 48.11$) in all three locations combined. There was a significant order effect on the amount donated within subjects across the three settings, with donations decaying over time, $F(2, 192) = 11.26, p < .01, \eta_p^2 = 0.13$. However, as we used restricted randomization, the order of the locations did not have any differential effect on donations across venues, $F(10, 192) = 1.18, p = .30$. Overall donations were not significantly

²The sum is more than 100% because some participants gave more than one answer.

influenced by age ($r = .16, p = .11$; robust percentage bend correlation $r = .15, p = .13$) or education ($r = .07, p = .48$; robust percentage bend correlation $r = .11, p = .27$). Perceived task difficulty did not have an effect on donations in any of the three locations (church: $r = -.73, p = .46$, robust percentage bend correlation $r = .02, p = .87$; temple: $r = .04, p = .71$, robust percentage bend correlation $r = .09, p = .36$; restaurant: $r = -.11, p = .29$, robust percentage bend correlation $r = .08, p = .44$), and neither did the amount of time participants spent on each location (church: $r = .03, p = .79$, robust percentage bend correlation $r = .16, p = .11$; temple: $r = .11, p = .27$, robust percentage bend correlation $r = .002, p = .98$; restaurant: $r = .09, p = .36$, robust percentage bend correlation $r = -.04, p = .73$).

Mean donation was 14.92 MUR in the restaurant, 16.31 in the Christian church, and 18.10 in the Hindu temple (Table 1). A repeated measures robust analysis of variance based on comparing 20% trimmed means (Wilcox, 1993, 2012) and using religiosity as a covariate in the model revealed significant differences between locations, $F(2, 200) = 5.15, p < .01, \eta_p^2 = 0.05$. Mauchly's test was not significant, indicating that the assumption of sphericity was not violated, $\chi^2(2) = 5.63, p = .06$. Planned contrasts revealed that donations in each religious location were significantly higher than in the control location, whereas there were no significant differences between the two religious locations (Table 2).

There was no correlation between religiosity and donations ($r = .09, p = .39$). To further assess the potential role of religiosity, we used a factor analysis to compute a scale score for religiosity and then dichotomized the variable to compare donations between highly religious and less religious participants. There were no significant differences in donations between the two groups in any of the three locations (all $p > .43$), nor in overall donations: $t(100) = .09, p = .93$.

To assess whether there was any interaction between religiosity and the religious primes, we compared how well donations were fit by a set of generalized linear multilevel regression models (Table 3). The null model (Model A) included only the intercept, Model B included a single prime condition (donations in the restaurant as the baseline, and donations in the church and in the temple as fixed effects), and Model C included a prime condition in interaction with religiosity. All models included random effects for individual subjects (respondent ID) to compensate for the fact that each

Table 1. Donations in Each Venue.

	M	Mdn (SD)
Donation in restaurant	14.92	10 (18.51)
Donation in church	16.31	12 (17.78)
Donation in temple	18.10	11 (22.61)

Table 2. Planned Contrasts Between Locations.

	Donation in the Restaurant	Donation in the Church
Donation in the restaurant	—	—
Donation in the church	$F(1, 100) = 6.55, p < .02, \eta_p^2 = 0.06$	—
Donation in the temple	$F(1, 100) = 7.64, p < .008, \eta_p^2 = 0.07$	$F(1, 100) = .55, p = 0.46$

Table 3. Multilevel Linear Regression Models.

Model	Model Parameters	Hypothesis	[DIC(weight)]
A	FE: Intercept RE: Respondent ID	Null model	2 570 (0.00)
B	FE: Prime RE: Respondent ID	Differences among primes	2 544 (0.01)
C	FE: Prime, Prime: Religiosity RE: Respondent ID	Differences between primes in interaction with religiosity	2 496 (0.99)

Note. FE = fixed effects; RE = random effects; DIC = deviance information criterion.

Table 4. Parameters of the Best Fitting Model.

Independent Variables	Model C
	β Coefficient (95% CI)
Intercept	14.96 [11.68, 18.26]
Prime 2 (church)	-4.28 [-7.44, 1.14]
Prime 3 (temple)	1.80 [-1.34, 4.96]
Prime 1 (restaurant): Religiosity	-0.29 [-4.47, 3.92]
Prime 2 (church): Religiosity	7.14 [2.91, 11.34]
Prime 3 (temple): Religiosity	4.27 [-6.74, 15.33]
Variance Parameter	SD (95% CI)
Intercept Respondent ID	12.49 (11.50, 13.57)

Note. CI = confidence interval.

participant contributed to three donations. The religiosity variable was a continuous factor score as described above.

We evaluated model fit using the Deviance Information Criterion (DIC; Lunn, Jackson, Best, Spiegelhalter, & Thomas, 2012) and DIC weights (Burnham & Anderson, 2002). DIC allows us to estimate the out-of-sample prediction error of a model by penalizing a model for its complexity; therefore, smaller values of DIC indicate better expected out-of-sample predictions, and more complex models must overcome a substantive penalty to be deemed better than simpler models. DIC weight, on the other hand, is a transformation of DIC that can be thought of as the probability that a particular model is the best out of the set of models being considered. DIC weights allow a group of models to be mutually compared rather than requiring that individual models be accepted or rejected.

We fitted the models in the R Environment for Statistical Computing (R Development Core Team, 2015), using Stan (Stan Development Team, 2015), a Hamiltonian Monte Carlo sampler. Results are based on 5,000 samples each from five chains, after 5,000 adaptation steps in each. Convergence was assessed by the R-hat Gelman and Rubin statistic. Model code was generated and DIC calculated using glmer2stan (McElreath, 2015), a package for Rstan. The data were analyzed using uninformative (flat) priors.

Model C has a DIC weight of 0.99; therefore it has a 0.99 probability of being the best model (Table 3). Looking at its parameters and their confidence intervals (Table 4), we can see that only the interaction between donations and religiosity is significant. In other words, although higher religiosity did not lead to higher donations overall, more religious individuals were significantly more affected by the religious primes.

Discussion

Our study offered the first naturalistic investigation of the effects of cross-religious contextual primes. Using a real-life context and an innovative design, we found that both ingroup and outgroup religious settings increased generosity among participants compared to the control setting. In accordance with previous studies, we did not find any main effects of individual religiosity on prosocial behavior. However, we did find a significant interaction between religiosity and the effects of the religious primes.

Previous work on religious priming has for the most part consisted of laboratory studies that used WEIRD (Western, Educated, Industrial, Rich, Democratic) populations of university students (Henrich, Heine, & Norenzayan, 2010), who are both synchronically and diachronically among the least representative examples of typical human behavior. In this study, we used a field experiment recruiting from the general population of a non-Western country while still maintaining a high degree of control, random assignment, and for the first time using a within-subject field design to study religious prosociality.

The majority of previous studies in this area have used formalized and often complicated economic games to measure prosocial behavior. Although such games are widely used as measures of interpersonal behavior, they are not representative of most types of economic interaction, let alone of prosociality in general. An additional concern with standard economic games has to do with the internal validity of the measures. For example, previous field experiments used cooperation games (Ahmed & Salas, 2013; Sosis & Ruffle, 2003; Xygalatas, 2012), where each player's decision also depends on expectations about the behavior of others. Although these studies typically also control for such expectations by asking participants to predict the behavior of other players, it is possible that such conscious and self-reported estimates do not accurately correspond to more intuitive assumptions or that such assumptions interact with prosocial tendencies in more intricate ways, as has been shown by Ahmed and Salas (2013).

Addressing these concerns, our study used a simple, unreciprocated act of charity, which provided a more straightforward measure of altruistic behavior that resembled naturally occurring acts of charity. To increase relevance, participants were not simply given the money by the experimenters but won it through their performance in the navigational task (Harrison & Mouden, 2011; Muehlbacher & Kirchler, 2009), whereas the stakes were high (approximately 3 days' salary of an unskilled worker) so that contributions carried a significant financial cost (Henrich et al., 2005). However, despite the near-universal relevance of money in contemporary human societies, many areas of human interaction do not involve monetary transactions. It is thus important for future studies to extend religious priming research to include other forms of prosocial behavior.

As is true of any field study, it is not readily apparent whether our results are specific to the Mauritian context or can be generalized to other populations or religious traditions—a matter that can be resolved only by cross-cultural comparative research and replication. Mauritius is one of the most heterogeneous societies (Okediji, 2005) as well as one of the most densely populated countries in the world, which means that interreligious contact is abundant and thorough. This context might be historically atypical, although at the same time useful for projections of future arrangements, as it seems more characteristic of current trends in global immigration and population growth patterns. Mauritius's long history of multiculturalism and limited intergroup tensions may also contribute to those results. In a conflictive setting, symbols associated with an outgroup might be likely to trigger suspicion or hostility. To the contrary, Mauritius constitutes a well-known example of successful multiethnic coexistence where ethnic or religious tensions have traditionally been limited relative to most places (Christopher, 1992).

More specifically, religious beliefs and practices in Mauritius tend to be highly syncretistic (Eriksen, 1998; Xygalatas, 2012). It is not uncommon, for example, to see Christians crossing themselves in front of a Hindu Temple, Buddhists participate in a Christian pilgrimage, or Hindus making fruit offerings to the Virgin Mary. It is thus possible that this syncretism increases the familiarity with and relevance of outgroup religious traditions. Indeed, recent evidence from Mauritius suggests that participation in certain ritual practices may increase prosocial attitudes toward both ingroup and outgroup members (Xygalatas et al., 2013).

Several possible mechanisms may be underlying the effects of religious cues on prosociality, and it is likely that they can all act independently to add to the effect. One such potential mechanism is linked to the perception of being monitored, which can activate evolved sensitivities related to reputational management (Haley & Fessler, 2005) and is known to have positive effects on prosocial behavior (Bateson et al., 2006; Kratky et al., *in press*). Indeed, most places of worship are replete with material representations of agency, whether in the form of decorative artwork or embedded in the architecture itself, for example, statues and icons, frescoes, and gargoyles. Both Catholic and Hindu places of worship make abundant use of them, as was the case in our experimental locations. To control for these priming effects of agency, we manipulated agent representations in the control setting to match those of the religious ones. Although there inevitably remained some qualitative differences between the various depictions, our findings seem to indicate that the effects of religious

contexts extend beyond the influence of such agentic representations. For a stronger demonstration, future research might attempt to replicate these findings in religious contexts lacking such explicit agentic portrayals (e.g., mosques).

Whether or not divine beings are visibly depicted, a place of worship by its very nature evokes associations of those beings, which in turn may trigger a sense of vigilance and notions of supernatural reward or punishment (Bulbulia, 2009; Johnson & Bering, 2006; Rossano, 2007; Shariff & Norenzayan, 2007; Piazza et al., 2011). In addition, religious primes may trigger semantic associations with normative themes related to religious doctrines and narratives (Bargh, Chen, & Burrows, 1996; McKay, Efferson, Whitehouse, & Fehr, 2011). As Shariff and Norenzayan (2007) noted, such notions are “semantically and dynamically associated with acts of generosity and charitable giving” (p. 807). It should further be noted that these effects are not inherent or unique to religion. Priming with secular concepts associated to justice (Shariff & Norenzayan, 2007) or even science (Makellams & Blasovich, 2013) is known to similarly increase prosocial behavior and attitudes.

A related question with regards to the religious priming literature is whether the observed effects are due to the religious nature of the prime or due simply to their association with group membership. In a recent study, Thomson (2015) found that priming participants with ingroup affiliation increased self-reported morality, whether that affiliation was religious or secular. Our findings show that even outgroup religious primes may promote prosociality, and that this effect manifests in actual behavior. It would be interesting for further research to examine whether outgroup secular primes might have the same effect on behavior.

Recent research (Shariff et al., 2015) suggests that the interaction between individual religiosity and religious primes might be crucial for the effectiveness of those primes. Our sample in this study consisted entirely of religious participants (to varying extents), and our results confirmed that more religious participants were more susceptible to the effects of the religious primes. This raises the question of whether such effects would still be significant among atheists, which will have to be answered by future research.

A recurrent question in the literature on religious priming is whether its observed effects constitute instances of generalized prosociality or are merely limited to ingroup favouritism (Galen, 2012; Martin & Wiebe, 2014; Ruffle & Sosis, 2006). Our study was conducted in a multi-ethnic, multireligious setting where participants did not know the recipients of their donations, which was also confirmed by our postexperiment survey. In fact, given that Christians are a minority group in Mauritius, players would be statistically more likely to be donating their money to a religious outgroup rather than an ingroup member. Therefore, we take our charity measure to be an indicator of prosocial behavior that extends beyond the religious ingroup, at least for most participants. On the other hand, participants knew that other players were from the same village, which is another kind of ingroup. We therefore cannot know whether the observed effects would generalize to completely unrelated strangers.

Overall, contextual priming studies bring much-needed ecological validity to this area of research. Although the experimental task was inevitably artificial, the contextual stimuli were naturally occurring, which is crucial given that religious stimuli are highly sensitive to cultural and environmental particularities (Aveyard, 2014). Nonetheless, there is inevitably a trade-off between this increased realism afforded by naturalistic environments, on one hand, and the higher level of control over variables afforded by laboratory settings, on the other, as naturalistic designs do not always allow researchers to exclude or control for extraneous and confounding variables. For example, research reveals subtle differences in the way concepts related to “religion” and those related to “god” may affect prosocial behaviour (Preston, Ritter, & Hernandez, 2010). Thus, bringing our field results back to the lab may help refine these findings further.

Our study has examined a hitherto unexplored aspect of religious prosociality, and we hope that future research will clarify further aspects of this topic. For example, a highly relevant and related question is how religious settings may affect behaviors specifically toward outgroups. A study by LaBouff, Rowatt, Johnson, and Finkle (2012) found that religious contexts may increase negative

attitudes toward religious outgroups. Further research needs to examine whether this translates into antisocial behaviors toward outgroup members.

On another matter, given that we have already argued against the validity of self-reports for measuring religious prosociality, an accumulating body of behavioral research reveals a most intriguing pattern: On the one hand, religious primes seem to be effective in increasing prosocial behavior; on the other hand, religious people, who should be expected to be more exposed to religious primes, do not behave more prosocially. One potential explanation for this apparent contradiction is that the effects of religious primes on prosociality are short-lived (see Malhotra, 2010), and we hope that future research will examine the decay rates of such effects. On the other hand, it is also possible that nonreligious people are more prone to the positive influence of secular primes (Norenzayan, 2012). That too needs to be determined by future research. The study presented here is not sufficient to answer these questions. However, it adds to a growing body of evidence that has begun to use precise methodologies to address such issues empirically.

Funding

This work was supported by the Faculty of Arts at Masaryk University; the Laboratory for the Experimental Research of Religion, cofinanced by the European Social Fund and the state budget of the Czech Republic (LEVYNA, CZ.1.07/2.3.00/20.0048); the Innovative Theoretical and Methodological Perspectives in the Study of Religion grant MUNI/A/1148/2014; the Technologies of the Mind project at the Interactive Minds Centre at Aarhus University, financed by the Velux Foundation; and the Cultural Evolution of Religion Research Consortium, financed by the Canadian Social Sciences and Humanities Research Council. We are grateful to Lloyd Black, Jordan Kiper, Martin Lang, Hudson Rollinson, John Shaver, and Richard Sosis for providing valuable comments on this manuscript.

Orcid

Dimitris Xygalatas <http://orcid.org/0000-0003-1561-9327>

References

- Ahmed, M. A., & Hammarstedt, M. (2011). The effect of subtle religious representations on cooperation. *International Journal of Social Economics*, 38, 900–910.
- Ahmed, M. A., & Salas, O. (2008). In the back of your mind: Subliminal influences of religious concepts on prosocial behavior. *Working Papers in Economics*, 331, 1–25.
- Ahmed, M. A., & Salas, O. (2011). Implicit influences of Christian religious representations on dictator and prisoner's dilemma game decisions. *Journal of Socio-Economics*, 40, 242–246.
- Ahmed, M. A., & Salas, O. (2013). Religious context and prosociality: An experimental study from Valparaíso, Chile. *Journal for the Scientific Study of Religion*, 52, 627–637.
- Allen, R. B. (1999). *Slaves, freedmen, and indentured laborers in colonial Mauritius*. Cambridge, UK: Cambridge University Press.
- Anderson, L., Mellor, J., & Milyo, J. (2010). Did the Devil make them do it? The effects of religion in public goods and trust games. *Kyklos*, 63, 163–175.
- Ariely, D. (2008). *Predictably irrational. The hidden forces that shape our decisions*. New York, NY: HarperCollins.
- Ariely, D. (2012). *The honest truth about dishonesty. How we lie to everyone – especially ourselves*. New York, NY: HarperCollins.
- Aveyard, M. E. (2014). A call to honesty: Extending religious priming of moral behavior to Middle Eastern Muslims. *PLoS ONE*, 9, e99447.
- Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology*, 71, 230–244.
- Bateson, M., Nettle, D., & Roberts, G. (2006). Cues of being watched enhance cooperation in a real-world setting. *Biology Letters*, 2, 412–414.

- Batson, C. D., Floyd, R. B., Meyer, J. M., & Winner, A. L. (1999). And who is my neighbor?: Intrinsic religion as a source of universal compassion. *Journal for the Scientific Study of Religion*, 38, 445–457.
- Batson, C. D., Oleson, K., Weeks, J., Healy, S. P., Reeves, P. J., Jennings, P., & Brown, T. (1989). Religious prosocial motivation: Is it altruistic or egoistic? *Journal of Personality*, 57, 873–884.
- Batson, C. D., Schoenrade, P., & Ventis, W. L. (1993). *Religion and the individual: A social-psychological perspective*. New York, NY: Oxford University Press.
- Baumeister, R. F., Vohs, K. D., & Funder, D. C. (2007). Psychology as the science of self-reports and finger movements: Whatever happened to actual behavior? *Perspectives on Psychological Science*, 2, 396–403.
- Bering, J., McLeod, K., & Shackelford, T. K. (2005). Reasoning about dead agents reveals possible adaptive trends. *Human Nature*, 16, 360–381.
- Branas-Garza, P., Espín, A. M., & Neuman, S. (2014). Religious pro-sociality? Experimental evidence from a sample of 766 Spaniards. *PLoS ONE*, 9, e104685.
- Brenner, P. S. (2011). Exceptional behavior or exceptional identity?: Overreporting of church attendance in the U.S. *Public Opinion Quarterly*, 75, 19–41.
- Brooks, A. C. (2003). Religious faith and charitable giving. *Policy Review*, No. 121.
- Brooks, A. C. (2005). Does social capital make you generous? *Social Science Quarterly*, 86, 1–15.
- Brooks, A. C. (2007). *Who really cares: America's charity divide—Who gives, who doesn't, and why it matters*. New York, NY: Basic Books.
- Bulbulia, J. (2009). Charismatic signalling. *Journal for the Study of Religion, Nature and Culture*, 3, 518–551.
- Bulbulia, J., & Mahoney, A. N. (2008). Religious solidarity: The hand grenade experiment, *Journal of Cognition and Culture*, 3, 295–320.
- Burnham K. P., & Anderson D. R. (2002). *Model selection and multimodel inference: A practical information-theoretic approach*. New York, NY: Springer Verlag.
- Burris, T. C., & Jackson, L. (1999). Hate the sin/love the sinner, or love the hater? Intrinsic religion and responses to partner abuse. *Journal for the Scientific Study of Religion*, 38, 160–174.
- Burris, T. C., & Jackson, L. (2000). Social identity and the true believer: Responses to threatened self-stereotypes among the intrinsically religious. *British Journal of Social Psychology*, 39, 257–278.
- Carroll, B. W., & Carroll, T. (2000). Accommodating ethnic diversity in a modernizing democratic state: theory and practice in the case of Mauritius. *Ethnic and Racial Studies*, 23, 120–142.
- Chaves, M. (2010). Rain dances in the dry season: Overcoming the religious congruence fallacy. *Journal for the Scientific Study of Religion*, 49, 1–14.
- Christopher, A. (1992). Ethnicity, community and the census in Mauritius, 1830–1990. *Geographical Journal*, 158, 57–64.
- Clobert, M., & Saroglou, V. (2013). Intercultural non-conscious influences: Prosocial effects of Buddhist priming on Westerners of Christian tradition. *International Journal of Intercultural Relations*, 37, 459–466.
- Clobert, M., Saroglou, V., & Hwang, K.-K. (2015). Buddhist concepts as implicitly reducing prejudice and increasing prosociality. *Personality and Social Psychology Bulletin*, 41, 513–525.
- Cornwall, J., Perry, G. F., Louw, G., & Stringer, M. D. (2012). Who donates their body to science? An international, multicenter, prospective study. *Anatomical Sciences Education*, 5, 208–216.
- Darley, J. M., & Batson, C. D. (1973). From Jerusalem to Jericho: A study of situational and dispositional variables in helping behavior. *Journal of Personality and Social Psychology*, 27, 100–108.
- de Dreu, C. K. W., Yzerbyt, V. V., & Leyens, J. P. (1995). Dilution of stereotype-based cooperation in mixed-motive interdependence. *Journal of Experimental Social Psychology*, 31, 575–593.
- DiMaggio, P. (1997). Culture and cognition. *Annual Review of Sociology*, 23, 263–287.
- Eckel, C. C., & Grossman, P. J. (2004). Giving to secular causes by the religious and nonreligious: An experimental test of the responsiveness of giving to subsidies. *Ethnography*, 33, 271–289.
- Eisenlohr, P. (2006). *Little India: Diaspora, time, and ethnolinguistic belonging in Hindu Mauritius*. Berkeley: University of California Press.
- Ellison, C. G. (1992). Are religious people nice people? Evidence from the National Survey of Black Americans. *Social Forces*, 71, 411–430.
- Eriksen, T. H. (1998). *Common denominators: Ethnicity, nation building and compromise in Mauritius*. Oxford, UK: Berg.
- Evans-Pritchard, E. E. (1965). *Theories of primitive religion*. Oxford, UK: Clarendon Press.
- Fehr, E., Fischbacher, U., von Rosenbladt, B., Schupp, J., & Wagner, G. G. (2003). A nation-wide laboratory. Examining trust and trustworthiness by integrating behavioral experiments into representative survey. *Schmollers Jahrbuch*, 122, 519–542.
- Fischer, R., Xygalatas, D., Mitkidis, P., Reddish, P., Konvalinka, I., & Bulbulia, J. (2014). The fire-walker's high: Affect and physiological responses in an extreme collective ritual. *Plos One* 9(2): e88355.
- Friedrichs, R. W. (1960). Alter versus ego: An exploratory assessment of altruism. *American Sociological Review*, 25, 496–508.
- Furrow, J. L., King, P. E., & White, K. (2004). Religion and positive youth development: Identity, meaning, and prosocial concerns. *Applied Developmental Science*, 8, 17–26.

- Gadermann, A. M., Guhn, M., & Zumbo, B. D. (2012). Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Practical Assessment, Research, and Evaluation*, 17(3), 1–13.
- Galen, L. W. (2012). Does religious belief promote prosociality? A critical examination. *Psychological Bulletin*, 138, 876–906.
- Gervais, W. M., & Norenzayan, A. (2012). Like a camera in the sky? Thinking about God increases public self-awareness and socially desirable responding. *Journal of Experimental Social Psychology*, 48, 298–302.
- Gervais, W. M., Shariff, A., & Norenzayan, A. (2011). Do you believe in atheists? Distrust is central to anti-atheist prejudice. *Journal of Personality and Social Psychology*, 101, 1189–1206.
- Goldfried, J., & Miner, M. (2002). Quest religion and the problem of limited compassion. *Journal for the Scientific Study of Religion*, 41, 685–695.
- Gronbjerg, K. A., & Never, B. (2004). The role of religious networks and other factors in types of volunteer work. *Nonprofit Management and Leadership*, 14, 263–289.
- Grossman, P. J., & Parrett, M. B. (2011). Religion and prosocial behavior: A field test. *Applied Economics Letters*, 18, 523–526.
- Guiso, L., Sapienza, P., & Zingales, Z. (2003). People's opium? Religion and economic attitudes. *Journal of Monetary Economics*, 50, 225–282.
- Hadaway, C. K., Marler, P. L., & Chaves, M. (1998). Overreporting church attendance in America: Evidence that demands the same verdict. *American Sociological Review*, 63, 122–130.
- 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, 689–704.
- Haley, K. J., & Fessler, D. M. T. (2005). Nobody's watching? Subtle cues affect generosity in an anonymous economic game. *Evolution and Human Behavior*, 26, 245–256.
- Harrell, A. (2012). Do religious cognitions promote prosociality? *Rationality and Society*, 24, 463–482.
- Harrison, F., & Mouden, E. C. (2011). Exploring the effects of working for endowments on behavior in standard economic games. *PLoS ONE*, 6, e27623.
- Heiphetz, L., Spelke, E. S., & Banaji, M. R. (2012). Patterns of implicit and explicit attitudes in children and adults: Tests in the domain of religion. *Journal of Experimental Psychology: General*, 142, 864–879.
- Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., ... Tracer, D. (2005). "Economic man" in cross-cultural perspective: Behavioral experiments in 15 small-scale societies. *Behavioral and Brain Sciences*, 28, 795–755.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33, 61–135.
- Humphreys, L. G., & Montanelli, R. G. (1975). An investigation of the parallel analysis criterion for determining the number of common factors. *Multivariate Behavioral Research*, 10, 193–205.
- Hunsberger, B., & Jackson, L. M. (2005). Religion, meaning, and prejudice. *Journal of Social Issues*, 61, 807–826.
- Hunter, J. A. (2001). Self-esteem and in-group bias among members of a religious social category. *The Journal of Social Psychology*, 141, 401–411.
- Jackson, L. M., & Esses, V. M. (1997). Of scripture and ascription: The relation between religious fundamentalism and intergroup helping. *Personality and Social Psychology Bulletin*, 23, 893–906.
- Johansson-Stenman, O., Mahmud M., & Martinsson, P. (2009). Trust and religion: Experimental evidence from Bangladesh. *Economica*, 76, 462–485.
- Johnson, D., & Bering, J. (2006). Hand of God, mind of man: Punishment and cognition in the evolution of cooperation. *Evolutionary Psychology*, 4, 9–233.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1986). Fairness and the assumptions of economics. *The Journal of Business*, 59, 285–300.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39, 31–36.
- Koenig, L., McGue, M., Krueger, R. F., & Bouchard, T. J. (2007). Religiousness, antisocial behavior, and altruism: Genetic and environmental mediation. *Journal of Personality*, 75, 265–290.
- Kratky, J., McGraw, J., Xygalatas, D., Mitkidis, P., & Reddish, P. (in press). "It depends who is watching you: 3-dimensional agent representations increase generosity in a naturalistic setting." *PlosOne*.
- 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. *The International Journal for the Psychology of Religion*, 22, 1–9.
- Lam, P.-Y. (2002). As the flocks gather: How Religion Affects Voluntary Association Participation. *Journal for the Scientific Study of Religion*, 41(3), 405–422.
- Leach, M. M., Berman, M. E., & Eubanks, L. (2008). Religious activities, religious orientation, and aggressive behavior. *Journal for the Scientific Study of Religion*, 47, 311–319.
- Leak, G. K. & Fish, S. (1989). Religious orientation, impression management, and self-deception: Toward a clarification of the link between religiosity and social desirability. *Journal for the Scientific Study of Religion*, 28, 355–359.
- Lunn, D., Jackson, C., Best, N., Spiegelhalter, D. J., & Thomas, A. (2012). *The BUGS Book: A practical introduction to Bayesian analysis*. Boca Raton, FL: CRC Press.
- Maio, G. R., Olson, J. M., Bernard, M., & Luke, M. A. (2003). Ideologies, values, attitudes, and behavior. In J. Delamater (Ed.), *Handbook of social psychology* (pp. 283–308). New York, NY: Plenum.

- Ma-Kellams, C., & Blascovich, J. (2013). Does “science” make you moral? The effects of priming science on moral judgments and behavior. *PLoS ONE*, 8, e57989.
- Malhotra, D. (2010). (When) are religious people nicer religious salience and the “Sunday effect” on pro-social behavior. *Judgment and Decision Making*, 5, 138–143.
- Martin, L. H., & Wiebe, D. (2014). Pro- and assortative-sociality in the formation and maintenance of religious groups. *Journal for the Cognitive Science of Religion*, 2, 5–16.
- Mazar, N., Amir, O., & Ariely, D. (2008). The dishonesty of honest people: A theory of self-concept maintenance. *Journal of Marketing Research*, 45, 633–644.
- McCullough, M. E., & Willoughby, B. L. B. (2009). Religion, self-regulation, and self-control: Associations, explanations, and implications. *Psychological Bulletin*, 135, 69–93.
- McCullough, M. E., & Worthington, E. L. (1999). Religion and the forgiving personality. *Journal of Personality*, 67, 1141–1164.
- McElreath, R. (2015). *glmer2stan: Rstan Models Defined by glmer Formulas*. University of California, Davis.
- McKay, R., Efferson, C., Whitehouse, H., & Fehr, E. (2011). Wrath of God: Religious primes and punishment. *Proceedings of the Royal Society B: Biological Sciences*, 278, 1858–1863.
- Miller, M. K., & Bornstein, B. H. (2006). The use of religion in death penalty sentencing trials. *Law and Human Behavior*, 30, 675–684.
- Mitkidis, P., Xygalatas, D., Buttrick, N., Porubanova, M., & Lienard, P. (2014). The impact of authority on cooperation: A cross-cultural examination of systemic trust. *Adaptive Human Behavior and Physiology*, 1, 341–357.
- Morgan, S. P. (1983). A research note on religion and morality: Are religious people nice people? *Social Forces*, 61, 683–692.
- Muehlbacher, S., & Kirchler, E. (2009). Origin of endowments in public good games: The impact of effort on contributions. *Journal of Neuroscience, Psychology, and Economics*, 2, 59–67.
- Norenzayan, A. (2012). *Big Gods: How religion transformed cooperation and conflict*. Princeton, NJ: Princeton University Press.
- Norenzayan, A., & Shariff, A. (2008). The origin and evolution of religious prosociality. *Science*, 322, 58–62.
- Okediji, T. O. (2005). The dynamics of ethnic fragmentation. *American Journal of Economics and Sociology*, 64, 637–662.
- Orbell, J., Goldman, M., Mulford, M., & Dawes, R. (1992). Religion, context, and constraint toward strangers. *Rationality and Society*, 4, 291–307.
- Ottoni, W. M. (2010). Giving to organizations that help people in need: Differences across denominational identities. *Journal for the Scientific Study of Religion*, 49, 389–412.
- Paciotti, B., Richerson, P., Baum, B., Lubell, M., Waring, T., McElreath, R., ... Edsten, E. (2011). Are religious individuals more generous, trusting, and cooperative? An experimental test of the effect of religion on prosociality. *Research in Economic Anthropology*, 31, 267–305.
- Park, J. J. (2012). When race and religion collide: The effect of religion on interracial friendship during college. *Journal of Diversity in Higher Education*, 5, 8–21.
- Perrin, R. D. (2000). Religiosity and honesty: Continuing the search for the consequential dimension. *Review of Religious Research*, 41, 534–544.
- Piazza, J., Bering, J. M., & Ingram, G. (2011). “Princess Alice is watching you”: Children’s belief in an invisible person inhibits cheating. *Journal of Experimental Child Psychology*, 109(3), 311–320.
- Pichon, I., Boccato, G., & Saroglou, V. (2007). Nonconscious influences of religion on prosociality: A priming study. *European Journal of Social Psychology*, 37, 1032–1045.
- Pichon, I., & Saroglou, V. (2009). Religion and helping: Impact of target thinking styles and just-world beliefs. *Archive for the Psychology of Religion*, 31, 215–236.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879–903.
- Preston, J., Ritter, R., & Hernandez, J. I. (2010). Principles of religious prosociality: A review and reformulation. *Social and Personality Psychology Compass*, 4, 574–590.
- Pruckner, G. J., & Sausgruber, R. (2009). Honesty on the streets—A natural field experiment on newspaper purchasing (Working Paper No. 0924). Available at <http://www.laborrn.at/wp/wp0924.pdf>
- Putnam, R. D., & Campbell, D. E. (2010). *American grace: How religion divides and unites us*. New York, NY: Simon & Schuster.
- R Development Core Team. (2015). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.
- Randolph-Seng, B., & Nielsen, M. E. (2007). Honesty: One effect of primed religious representations. *The International Journal for the Psychology of Religion*, 17, 303–315.
- Revelle, W., & Rocklin, T. (1979). Very simple structure: An alternative procedure for estimating the optimal number of interpretable factors. *Multivariate Behavioral Research*, 14, 403–414.
- Rossano, M. J. (2007). Supernaturalizing social life. *Human Nature*, 18, 272–294.
- Ruffle, B., & Sosis, R. (2006). Cooperation and the in-group-out-group bias: A field test on Israeli kibbutz members and city residents. *Journal of Economic Behavior and Organization*, 60, 147–163.

- Ruffle, B., & Sosis, R. (2010). *Do religious contexts elicit more trust and altruism? An experiment on Facebook* (Working Papers).
- Saroglou, V., Pichon, I., Trompette, L., Verschueren, M., & Dernelle, R. (2005). Prosocial behavior and religion: New evidence based on projective measures and peer ratings. *Journal for the Scientific Study of Religion*, 44, 323–348.
- Saslow, L. R., Willer, R., Feinberg, M., Piff, P. K., Clark, K., Keltner, D., & Saturn, S. R. (2012). My brother's keeper?: Compassion predicts generosity more among less religious individuals. *Social Psychological and Personality Science*, 4, 31–38.
- Sedikides, C., & Gebauer, J. E. (2010). Religiosity as self-enhancement: A meta-analysis of the relation between socially desirable responding and religiosity. *Personality and Social Psychology Review*, 14, 17–36.
- Shariff, A., & Norenzayan, A. (2007). God is watching you. *Psychological Science*, 18, 803–809.
- Shariff, A. F., Willard, A. K., Andersen, T., & Norenzayan, A. (2015). Religious priming: A meta-analysis with a focus on prosociality. *Personality and Social Psychology Review*. Advance online publication. doi:10.1177/1088868314568811
- Sosis, R., & Ruffle, B. (2003). Religious ritual and cooperation: Testing for a relationship on Israeli religious and secular kibbutzim. *Current Anthropology*, 44, 713–722.
- Sosis, R., & Ruffle, B. (2004). Ideology, religion, and the evolution of cooperation: Field experiments on Israeli kibbutzim. *Research in Economic Anthropology*, 23, 89–117.
- Spilka, B., Hood, R. W., Hunsberger, B., & Gorsuch, R. (2003). *The psychology of religion: An empirical approach*. New York, NY: Guilford Press.
- Stan Development Team. (2013). *Stan: A C++ Library for Probability and Sampling*, Version 2.6. Available at <http://mc-stan.org/>
- Statistics Mauritius. (2012). *2011 housing and population census. Volume II: Demographic and fertility characteristics*. Port Louis, Mauritius: Ministry of Finance and Economic Development.
- Stegmuller, D., Scheepers, P., Rossteutscher, S., & de Jong, E. (2012). Support for Redistribution in Western Europe: Assessing the role of religion. *European Sociological Review*, 28, 482–497.
- Stokes, C. E., & Regnerus, M. D. (2009). When faith divides family: Religious discord and adolescent reports of parent–child relations. *Social Science Research*, 38, 155–167.
- Su, H., Chou, T., & Osborne, P. G. (2011). When financial information meets religion: Charitable-giving behavior in Taiwan. *Social Behavior and Personality: An International Journal*, 39, 1009–1019.
- Swidler, A. (1986). Culture in action: Symbols and strategies. *American Sociological Review*, 51, 273–286.
- Tan, J., & Vogel, C. (2008). Religion and trust: An experimental study. *Journal of Economic Psychology*, 29, 832–848.
- Tan, J. H. W. (2006). Religion and social preferences: An experimental study. *Economics Letters*, 90, 60–67.
- Thomson, N. D. (2015). Priming social affiliation promotes morality—Regardless of religion. *Personality and Individual Differences*, 75(C), 195–200.
- Tsang, J. A., Schulwitz, A., & Carlisle, R. D. (2012). An experimental test of the relationship between religion and gratitude. *Psychology of Religion and Spirituality*, 4, 40–55.
- Vaisey, S. (2009). Motivation and justification: A dual-process model of culture in action. *American Journal of Sociology*, 114, 1675–1715.
- Velicer, W. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, 41, 321–327.
- Victoroff, J., Quota, S., Adelman, J. R., Celinska, B., Stern, N., Wilcox, R., & Sapolsky, R. M. (2010). Support for religio-political aggression among teenaged boys in Gaza: Part I: Psychological findings. *Aggressive Behavior*, 36, 219–231.
- Wilcox, R. R. (1993). Robustness in ANOVA. In L. Edwards (Ed.), *Applied analysis of variance in the behavioral sciences* (pp. 345–374). New York, NY: Marcel Dekker.
- Wilcox, R. R. (2012). *Introduction to robust estimation and hypothesis testing* (3rd ed.). Burlington, MA: Elsevier.
- Wittgenstein, L. (1979). *Remarks on Frazer's Golden Bough* (R. Rhees, Ed.; A. C. Miles, Trans.). Atlantic Highlands, NJ: Humanities Press.
- World Values Survey. (2012). WVS 2010–2012 questionnaire. Retrieved from www.worldvaluessurvey.org/wvs/articles/folder_published/article_base_136/files/WVS_2010-2014_Questionnaire_v2012-06.pdf
- Xygalatas, D. (2012). Effects of religious setting on cooperative behavior: A case study from Mauritius. *Religion, Brain & Behavior*, 3, 91–102.
- Xygalatas, D., Mitkidis, P., Fischer, R., Reddish, P., Skewes, J., Geertz, A. W., ... Bulbulia, J. (2013). Extreme rituals promote prosociality. *Psychological Science*, 24, 1602–1605.