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Effect of religious priming in prosocial and destructive behaviour

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Abstract

In this paper, we study the behavioural impact of religious priming by showing participants religious words in a scrambled sentence task before a dictator game and a joy-of-destruction game. We also elicited data on individual religiosity and religious affiliation using a questionnaire. Priming religious words significantly increased prosocial behaviour in the dictator game, and the effect was especially striking among those reporting no religion, atheists and agnostics. The religious prime has no significant effect in mitigating destructive behaviour or own expectations of the other's destruction choice, but both destructive behaviour and expectations correlate positively with the multi-dimensional religiosity measure.

KEYWORDS

dictator game, joy-of-destruction game, prosocial behaviour, religious priming

1 | INTRODUCTION

Religion has been linked to a range of social and economic decisions as far back as Smith (1776). In modern research, economists have investigated the relationship between religion and income (Crabtree, 2010), GDP growth (Barro & McCleary, 2003), labour supply (Granger & Price, 2007) and other variables. McCleary and Barro (2006) discuss religion's two-way interaction with the political economy, both as a dependent variable and an independent variable. The present paper contributes to the economics research on religion and prosocial behaviour by soliciting donations to a real charity, adding the dimension of antisocial behaviour, and using a scrambled sentence task to prime participants with religious words. Moreover, we collected information on individual religiosity and religious affiliation in a questionnaire to evaluate the differentiated priming effects among different religious groups.

In the previous literature, researchers found that religions tend to espouse prosocial values such as charity, forgiveness, honesty and tolerance. Theories of religion generally posit that religion fosters prosocial behaviour (Norenzayan & Shariff, 2008).[1] Many empirical researches have studied the effects of religious priming on prosocial behaviour (see also the recent meta-analyses by Shariff, Willard, Andersen, and Norenzayan (2015) and by van Elk et al. (2015)).[2] Different from most previous studies, subjects in our study do not play a standard dictator game, but an Eckel and Grossman (1996) dictator game, in which they choose an amount to be donated to a charity instead of an anonymous stranger. One research question in our study is to investigate whether religious priming would affect the decision to donate for a good cause differently compared to the decision to allocate money to a stranger.

Religions tend to discourage antisocial behaviours such as deception and spite. There is an economics literature on negative behaviours (e.g. negative reciprocity, defection in the prisoner dilemma, free-riding in public goods games and spiteful behaviour in ultimatum games). However, the study of direct antisocial behaviour that does not arise from retaliation against other negative behaviour (perceived or otherwise) is limited. Abbink and Sadrieh (2009) introduced the joy-of-destruction game in which two players each receive an endowment and simultaneously decide on how much of the other player's endowment to destroy. Again in the joy-of-destruction game, Abbink and Herrmann (2011) find that approximately one-quarter of participants will destroy half their anonymous partner's endowment when the source of the destruction is hidden. To our knowledge, there has not been any experimental research on the subject of proactive antisocial behaviour and religiosity or religious priming.

Our study also adjoins the experimental economics literature that has studied the relationship between self-reported measures of religiosity and prosocial behaviour in various economic games. Most of these studies have found no significant relationship between religiosity and prosocial behaviour.[3] One novel part of our study is that we incorporate the self-reported religiosity measures into the experimental analysis on the priming effects in prosocial and destructive behaviour, so that we can shed light on the possible differentiated impact of religious priming on different religious groups categorized by self-reported religiosity measures.

In summary, we present an experimental study in which half of our participants were primed with religious words before they made a dictator game and a joy-of-destruction game decision. We observed that priming with religious words increased prosocial behaviour in the dictator game but

[1]An interesting recent experimental study conducted in a Muslim country by Haruvy, Ioannou, and Golshirazi (2018) shows that observant workers who are in the midst of fasting during Ramadan are far more generous to recipients than workers who have had their evening meal, but it is reversed when decision-makers are outside Ramadan.

[2]Randolph-Seng and Nielsen (2007) found that participants cheated significantly less in an honesty task when they had been primed with religious words. Pichon, Boccato, and Saroglou (2007) found that priming participants with religious words led to them taking more charity pamphlets when leaving an experimental session. Malhotra (2010) shows that religious participants were more likely to keep bidding on Sundays, and Malhotra concludes that Sunday served as a prime that activated religious norms in religious subjects. Benjamin, Choi, and Fisher (2016) found no significant effect of religious priming on dictator game giving. Lambarraa and Riener (2012) found that Moroccan subjects gave more in a dictator game when the experiment was administered in Arabic versus French; the Arabic language served as a prime of Arabic and Muslim identity. Shariff and Norenzayan (2007) found that priming people with religious words made them more generous in the dictator game.

[3]Eckel and Grossman (1996) found no significant difference between religious and non-religious people in the amount of giving to secular charities. Similar results are reported by Anderson and Mellor (2009) and Ahmed and Salas (2011) for the public goods game. Using a multi-dimensional measure of religiosity, Tan (2006) finds no influence of religiosity on pro-sociality measured by dictator and ultimatum games because of independent religiosity dimensions producing counter-working effects that cancel each other out. In a trust game that reveals a responder's religiosity score, Tan and Vogel (2008) find that both a proposer's trust and a responder's trustworthiness increase with the responder's religiosity.

did not mitigate destructive behaviour in the joy-of-destruction game. Although priming religion had an overall effect of increasing donations to charity, the strongest effect was found among those claiming no religion, atheists and agnostics. Participants with higher religiosity are found to be more likely to destroy in a joy-of-destruction game and more likely to expect destructive behaviour from their anonymous partners.

2 | EXPERIMENTAL METHODOLOGY

The experiment was conducted at CIRANO's Bell experimental laboratory in Montreal, using zTree software (Fischbacher, 2007). Each experimental session began with a general introduction, followed by a scrambled sentence task with either a God concepts prime or no prime, then a dictator game decision and a joy-of-destruction game decision, and ended with a questionnaire. The two games were played in reverse order for half the sessions to check for order effects. The instructions for each game were distributed immediately preceding the start of the game. Each session took approximately 1 h. At the end of each session, participants were paid with the total earnings from the experiment, as well as receiving a $5 show up fee. We now describe each part of the experiment in detail.

2.1 | Scrambled sentence task

All subjects performed a scrambled sentence task, which for half the sessions contained a God concepts prime. This priming manipulation was originated by Srull and Wyer Jr (1979) and employed by Shariff and Norenzayan (2007) and Benjamin et al. (2016). The purpose of religiously priming our participants is to make their religious identity salient (Turner, 1985). Religious words might activate prosocial thoughts due to the semantic relatedness (and, accordingly, mental association) between religion and altruism (Randolph-Seng & Nielsen, 2008). Half of our participants (the control group) were not primed, and this allowed us to examine the marginal effect of religious identity norms.

The priming instrument for this study is that used in Shariff and Norenzayan (2007). Subjects unscrambled 10 five-word sentences, dropping an extraneous word from each to create a grammatical four-word sentence. To make the priming subtle enough in the religious prime treatments, five of the scrambled sentences contained the target words spirit, divine, God, sacred and prophet, and the other five contained only neutral words unrelated to religion, and forming no other coherent concept. For the neutral prime treatments, all 10 sentences are unrelated to religion. Yo check whether the prime will induce any experimenter demand effect, we ask subjects to speculate on the purpose of the study in the questionnaire.

In our design, to reduce the effect of "coming to play" (Carpenter, Liati & Vickery, 2006), participants were paid $2 for each sentence scramble completed for a total of $20, whether the scramble was completed correctly or not. The $20 earned was then split evenly between the two games as endowment, with $10 allocated to the dictator game and $10 allocated to the joy-of-destruction game.

2.2 | Dictator game

The first game consists of a simple one-shot dictator game (e.g. Eckel and Grossman, 1996; Forsythe, Horowitz, Savin, and Sefton, 1994; Kahneman, Knetsch, and Thaler, 1986; Tonin and Vlassopoulos, 2013). The one-shot dictator game, where subjects are not motivated by reciprocity or reputational concerns, is considered a measure of altruism, and will allow us to look at the relationship between

religiosity and altruism and also whether priming has any effect on altruism. Each subject is provided $10 (out of the $20 previously earned) to allocate between themselves and a charity which they will choose from a diverse list of 10 secular charities.[4] The subject can choose to donate any portion of the allocation, from $0 to $10, and keep the remainder for themselves.

At the end of the session, the assistant in the laboratory electronically sent the data file generated by zTree to an assistant in a separate room. While participants were completing their questionnaire, the assistant in the other room calculated the total donations to each charity and made out cheques to charities, and prepared final payments for the participants, which were put in a sealed envelope labelled only with the subject's computer ID. Then the assistant in the laboratory went to the other room, picked up the sealed envelopes and distributed them to the participants in the laboratory. Finally, the participants left the laboratory after filling in the receipt form and putting the folded form in a box individually.[5]

To ensure the credibility of the process, one of the participants was selected to serve as a monitor during the dictator game. At the end of the session, the monitor went to the other room and verified that the amounts on the cheques matched those in the file (without seeing the computer ID), sealed the envelopes, and accompanied the experimenter and assistant to the nearest mailbox and mailed the cheques to the charities.

2.3 | Joy of destruction game

The other game participants played was the hidden treatment of the joy-of-destruction game borrowed from Abbink and Herrmann (2011). Players are paired randomly and anonymously and provided with $10 each (of the $20 previously earned in the word scrambles). Both players simultaneously decide whether or not to destroy $5 of the other player's endowment. With 1/3 probability, the player loses $5 regardless of the other player's decision. A player who loses $5 is not told whether this was because of the opponent's action or the result of the lottery. In a departure from Abbink and Herrmann, we do not impose a cost of $1 to destroy.[6]

Because this game is a one-shot game, fear of retaliation and other strategic concerns do not play a role in the players' decision-making. The random-chance aspect of the game reduces the "moral costs of nastiness", as Abbink and Herrmann (2011) put it, because a player who has lost $5 cannot identify the other player as the cause of destruction, while a player tempted to destroy can convince themselves that the $5 might be destroyed anyway by the lottery. The targeted player cannot find out the destroyer's identity; hence the moral cost effect involves the player's own conscience only.

The players were also asked if they think their partner will choose to destroy their endowment or not. Differing from Abbink and Herrmann (2011), we do not provide incentives for a correct answer, because it is easy for participants to deduce whether their partner has chosen to destroy or not by looking at their own final earnings from the game, which in our view negates the effect of the random-chance aspect.

[4]We only provided secular charities in the list because we are interested in how religiosity affects the general prosociality instead of generosity on religion-related courses.

[5]Strictly speaking, this procedure is not a double-blind procedure as in Eckel, Grossman, and Johnston (2005) and Ottoni-Wilhem, Vesterlund, Xie (2017), because the subjects' computer ID is fixed and corresponds to the subject ID in the excel file generated by zTree by the laboratory setup. Nevertheless, the procedure did prevent direct interactions between the assistant who prepared the payments and the participant who received the payment.

[6]Pilot sessions ($n = 38$) where a cost of $1 was imposed to destroy the other player's endowment yielded a destruction rate of 5.4%.

2.4 | Questionnaire

After participants finished both the dictator and joy-of-destruction games, we asked them to answer a questionnaire with 33 questions (see Appendix). The first two questions in the questionnaire are drawn from Shariff and Norenzayan (2007): (a) "Please briefly speculate on what you think this study was about so far" and (b) "Has there been anything that you do not understand or find odd about this study so far?" Participants need to submit answers to these two questions before seeing other questions. Question 3–13 collect information on demographics and volunteer/charitable activity. The questionnaire also included the Cognitive Reflection Task (Frederick, 2005) problems (Q14–16) requiring participants to analytically override an intuitive, yet incorrect, response to obtain a correct response. A control (Q17) is included to determine if the participants were already familiar with the CRT questions.

Questions 18–27 have to do with religious identity and beliefs. Question 18 asks about religious group membership, while question 19 asks "Do you consider yourself a religious person?" This is a similar question to that used by Ahmed and Salas (2011) and gives us a self-reported binary measure of religiosity. Prior research has confirmed that religion is multidimensional in nature. The questions Q20–27 will be used to construct a nondenominational multidimensional measure of religiosity created by Rohrbaugh and Jessor (1975).

We use the questions from Rohrbaugh and Jessor (1975) instead of those from De Jong et al. (1976) because the subject population in Montreal has come from multiple cultures and religions. The questions from De Jong et al. (1976) are designed particularly for Christians and are, thus, not appropriate to use in this context. The answers to the first question regarding frequency of religious service attendance have been divided into five reasonable bins and allotted 4 points for the most frequent attendance and zero for no attendance. For each of the following 7 questions, answer (a) (the most religious answer) was allotted 4 points, answer (b) was allotted 3 points, and so on, with answer (e) garnering zero points. There are four different dimensions included in the Rohrbaugh and Jessor (1975) measure. The first two items measure "ritual religiosity", the second two items measure "consequential religiosity", the third two items measure "ideological religiosity" and the last two items measure "experiential religiosity". Thus, each participant has a score ranging from 0 to 8 for each dimension, and a total religiosity score ranging from 0 to 32.

Finally included in the questionnaire is the 6-question Adult Self-Report Scale-Version 1.1 (ASRS-V1.1) Screener, which is a subset of the WHO's 18-question Adult ADHD Self-Report Scale-Version 1.1 (Adult ASRS-V1.1) Symptom Checklist (Kessler et al., 2005). Carpenter et al. (2006) found a positive correlation between an ADHD scale and the amount given in a dictator game, suggesting that participants give because they come to an experiment "to play". An ADHD measure will allow us to control for this effect in our analysis.

3 | RESULTS

A total of 132 subjects participated in this experiment that consisted of four treatments by varying "prime" and game order, as described in Table 1. Among the subjects, 6 were suspicious about the study's hypothesis and 2 forfeited during the session, leaving 124 subjects included in the analysis. In identifying their membership in a religious group (or lack thereof), subjects were nearly evenly split into 4 major groups: Christian (32), other religions (32), no religion (32) and atheist/agnostic (28). Approximately half of the participants are Caucasian, and one-quarter are East Asian. Out of the 124 participants, 63 are male and 60 are female, and 1 did not identify his/her gender.

TABLE 1 Treatments

	Prime	Neutral prime	Observations
DG followed by JOD	Treatment A: $n = 36$ (33)	Treatment C: $n = 34$ (32)	$n = 70$ (65)
JOD followed by DG	Treatment B: $n = 34$ (31)	Treatment D: $n = 28$ (28)	$n = 62$ (59)
Observations	$n = 70$ (64)	$n = 62$ (60)	$n = 132$ (124)

Note. Numbers in parentheses are those included in the analysis. DG, dictator game; JOD, joy-of-destruction game.

TABLE 2 Demographic information conditional on religious group

	Male	Age	1st ethical group	2nd ethical group
Christian ($n = 32$)	41%	31	Caucasian	East Asian
Muslim ($n = 13$)	54%	26	Middle Eastern	South Asian
Other religion ($n = 19$)	32%	31	Caucasian	East Asian
No religion ($n = 60$)	63%	28	Caucasian	East Asian

Note. The group of no religion includes those who are atheist and agnostic.

Table 2 provides some demographic descriptions for each religious group. There are fewer male participants in the Christian and other religion groups, there are more men in the no religion group, and almost half of those in the Muslim group are men. Most Muslim participants are from Middle Eastern and South Asian countries; among other groups, most are Caucasian and East Asian. On average, the participants are young, around 26 to 31 years old, and most are studying in Montreal universities.

3.1 | Measuring religiosity

According to subjects' answers to the questionnaire, we calculate two measures of religiosity, which are commonly used in the literature. The first is the multi-dimensional measure of general religiosity (De Jong et al. 1976; Rohrbaugh & Jessor, 1975; Tan, 2006; Tan & Vogel, 2008), *genreli*, based on the answers in questions Q(20)–Q(27). The second is the self-identified binary measure of religiosity, *reli*, based on the answer to Q(19) "Do you consider yourself to be a religious person?" in the survey, which categorizes people into religious and nonreligious groups.[7]

Preliminary tests confirm our sample's suitability for factor analysis on the general religiosity. We conducted a principal components analysis (PCA), which follows the methodology outlined in Kline (2000), adopting Kaiser's eigenvalue of 1.00 as a minimum threshold. Although the Rohrbaugh and Jessor (1975) religiosity measure contained four theoretical dimensions, PCA extracted a single factor (explaining 59.13% of the total variance), which we interpret as a measure of general

[7]In the literature there are alternative methods to define a binary religious measure. For example, Benjamin et al. (2016) define subjects as being "religious" if they belong to a religious group and score above the group median in religious service attendance, while Shariff and Norenzayan (2007) define subjects as being "religious" if they belong to a religious group or score above the median in a belief in God question. With a similar principle, we define a third religiosity measure, *reli_aboveMed*. This variable is equal to 1 if a participant claims a religion in Q(18) and his or her general religiosity measure is above the median of those claiming a religion, and zero if he or she claims a religion but is below the median of those claiming a religion or identifies as having no religion, being atheist or agnostic. However, this measure has no significant effect in any of the tests we present in this paper.

religiosity. Communalities on all variables are high except for Q8 (0.28). Factor scores (*genreli*) for each subject's general religiosity have been computed. These are standardized *z*-scores weighted on corresponding factor loadings and are suitable for regression analysis. Factor scores (*genreli*) for each subject's general religiosity have been computed. The factor scores are standard normal, but still maintain a positive skewness. The scores had a minimum of 0 (least religious), a maximum of 32 (most religious), a mean of 10.7 with a standard deviation of 7.7, and a median of 14.5.

For the binary measure of religiosity, *reli*, based on the answer to Q(19) "Do you consider yourself to be a religious person?" in the survey, 20 of 124 respondents answered in the affirmative. The correlation between *genreli* and the self-reported binary measure of religiosity, *reli*, is 0.6214 ($p < 0.0001$). With the concern that the priming procedure may affect subjects' answers in the questions related to religiosity, we conduct OLS regression on *genreli* and logit regression on *reli* and find that the prime dummy is insignificant in either regression.

We also test the order effect, whether the dictator game or the joy-of-destruction game is the first task following the word scramble, on the altruistic behaviour and destructive behaviour. We find no order effects in the positive contributions, contribution rate or destroy rate. Only marginal significance is found for the mean contribution in the dictator game between treatments A and B (two-tailed Mann–Whitney test, $p = 0.94$).

3.2 | Dictator game decision

As shown in Table 3, primed participants who chose to donate gave on average \$1.07 more than those who were not primed ($p = 0.0087$). However, priming had no significant effect overall on the decision to donate. This suggests that the priming effect is more important at the intensive margin of prosocial behaviour.

By using the self-identified binary measure of religiosity, those who identified themselves as being religious showed a strong effect from priming; the mean nonzero contribution of religious subjects in the control treatment was \$1.83, while those in the prime treatment gave \$4.71, for a difference of \$2.88 ($p = 0.0174$). The difference for those who did not identify as religious was \$0.75, and not significant. This effect, however, is not significant in the regression.

To quantify the priming effect and its robustness to other factors that might also affect decisions in the dictator game, we evaluate the impact of priming on the amount of positive giving through regression analyses. The results in Table 4 show that priming has a significant effect on the contribution levels among subjects who give a positive amount in the dictator game.

We estimate a logit model with the same set of specifications for the regression on contribution levels to evaluate the effect of priming on the decision of whether to contribute in the dictator game. As shown in Table 5, in most specifications, priming has no significant effect on the likelihood of giving. However, in the sixth regression, where we add religious groups and their interactions with priming, we find that the priming effect is significantly positive. That is, priming makes people more

TABLE 3 Contribution in the dictator game by treatment

	Prime	Control	Difference	*p*-values
Contribution rate	77%	68%	9%	$p = 0.322$
Mean nonzero contribution	\$4.32 ($n = 49$) (2.41)	\$3.25 ($n = 41$) (2.70)	\$1.07***	$p = 0.0087$
Mean contribution	\$3.31 ($n = 64$) (2.80)	\$2.22 ($n = 60$) (2.70)	\$1.09**	$p = 0.0157$

Note. Amounts are out of \$10. Standard deviations are in parentheses. Differences between means are tested with the Wilcoxon–Mann–Whitney test and differences in proportions are tested with Fisher's exact test. *(**)[***] denotes two-tailed significance at $p < 0.1(0.05)$ [0.01].

TABLE 4 Results of linear regressions on contribution levels in dictator game

	(1)	(2)	(3)	(4)	(5)	(6)
Prime	1.071**	1.081**	0.832	1.010*	0.970*	1.474*
	(0.538)	(0.531)	(0.575)	(0.540)	(0.555)	(0.833)
Order		1.004*	0.967*	1.061*	0.912*	0.923
		(0.532)	(0.542)	(0.541)	(0.541)	(0.567)
Reli			−1.592			
			(1.108)			
Reli_prime			1.704			
			(1.526)			
Genreli				−0.157		
				(0.419)		
Genreli_prime				0.201		
				(0.576)		
Christian					0.483	1.317
					(0.651)	(0.994)
Muslim					−0.935	−0.143
					(0.968)	(1.165)
Other religion					−0.237	−0.457
					(0.766)	(1.144)
Christian_prime						−1.499
						(1.323)
Muslim_prime						−2.542
						(2.210)
Other religion_prime						0.687
						(1.607)
Observations	90	90	90	89	90	90

Note. Standard errors are in parentheses;
**$p < 0.05$; *$p < 0.1$.

likely to contribute. The three religious affiliations also have positive effects on the likelihood of contribution.

Interestingly, the priming effects interacting with each religious group are significantly negative. This implies that, relatively, priming is more effective in increasing the likelihood of contribution among the non-religious subjects, compared with all other religious groups. The intuition is that priming might be very effective in inducing the prosocial preference among people who have no particular religious affiliation and, hence, no regular religious practice.

Finally, we include non-givers to evaluate the overall effect of priming on contributions in dictator games, using a Tobit model. The results in Table 6 show that priming effects and their interactions with religion become more significant and are consistent with those in Tables 4 and 5.

3.3 | Joy-of-destruction decision

There is no priming effect on the decision of destroy in the JOD game. In the prime treatment, the destroy rate was 9.38% (6/64), while in the control treatment, the destroy rate was 15% (9/60). This difference was not significant ($p = 0.414$).

TABLE 5 Results of logit regression on contribution decision in dictator game (marginal effect)

	(1)	(2)	(3)	(4)	(5)	(6)
Prime	0.0823	0.0844	0.0865	0.0881	0.0836	0.306***
	(0.0801)	(0.0801)	(0.0889)	(0.0815)	(0.0809)	(0.111)
Order		0.0932	0.0986	0.0842	0.0888	0.0499
		(0.0802)	(0.0809)	(0.0810)	(0.0807)	(0.0824)
Reli			−0.0893			
			(0.159)			
Reli_prime			−0.0188			
			(0.215)			
Genreli				0.0405		
				(0.0553)		
Genreli_prime				−0.0754		
				(0.0835)		
Christian					0.0515	0.209**
					(0.0922)	(0.0996)
Muslim					0.0159	0.170*
					(0.129)	(0.0969)
Other religion					0.0776	0.249***
					(0.107)	(0.0957)
Christian_prime						−0.483**
						(0.215)
Muslim_prime						−0.599***
						(0.200)
Other religion_prime						−0.592***
						(0.226)
Observations	124	124	124	123	124	124

Note. Standard errors are in parentheses;
***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

To evaluate the robustness of the statistical tests, we estimate logit models of the decision to destroy (*destroy*). The response variable *destroy* is equal to one if the subject destroyed \$5 of his or her partner's payoff, and zero otherwise, and the response variable *expect* is equal to one if the subject expected his or her partner to destroy, and zero otherwise. Table 7 shows the results on the determinants of the likelihood of destroy.[8] None of the regressions finds significant effects of priming on the likelihood of destroy and the expectation that one's partner will destroy. Most of the control variables have no effect on either the likelihood of destroy or the expectation on others to destroy. However, we find a significantly positive effect of general religiosity on the likelihood of destroy and the expectation on others' probability to destroy.

Additional statistical analysis shows that those who chose to destroy were more likely to think their partner would choose to destroy; the correlation between these two variables is 0.32 ($p = 0.0003$). Having played the dictator game first is associated with a lower rate of destruction in the JOD game, but this is not significant. Of those who made a donation to charity, 13.33% (12/90) chose to destroy; 8.82% (3/34) of those who did not donate to charity chose to destroy. This

[8]The results on the likelihood of expecting one's partner to destroy are similar, and, hence, not reported here, but are available from the authors.

TABLE 6 Results of Tobit regression on dictator game contribution

	(1)	(2)	(3)	(4)	(5)	(6)
Prime	1.088**	1.107**	0.929*	1.080**	1.028**	2.234***
	(0.490)	(0.480)	(0.521)	(0.484)	(0.481)	(0.669)
Order		1.083**	1.084**	1.097**	1.077**	0.967**
		(0.480)	(0.480)	(0.486)	(0.478)	(0.477)
Reli			−1.303			
			(0.918)			
Reli_prime			1.055			
			(1.300)			
Genreli				0.036		
				(0.328)		
Genreli_prime				−0.128		
				(0.489)		
Christian					0.485	1.950**
					(0.580)	(0.826)
Muslim					−0.818	0.522
					(0.819)	(0.989)
Other religion					−0.064	0.589
					(0.699)	(1.010)
Christian_prime						−2.719**
						(1.127)
Muslim_prime						−3.425**
						(1.692)
Other religion_prime						−1.161
						(1.386)
Constant	2.222***	1.644***	1.861***	1.668***	1.658***	1.052*
	(0.352)	(0.430)	(0.456)	(0.432)	(0.501)	(0.537)
Log-likelihood	−300.29342	−297.80185	−296.76633	−295.64733	−296.67052	−292.76161
Prob > χ^2	0.0279	0.0074	0.0182	0.0434	0.0337	0.0107
Pseudo R^2	0.0080	0.0162	0.0196	0.0164	0.0200	0.0329
Observations	124	124	124	123	124	124

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

difference is not significant. Similarly, there is no relationship between the donation amount and the decision to destroy.

4 | DISCUSSION AND CONCLUSION

Using a real charity as the giving target in a dictator game, this study replicates the finding in Shariff and Norenzayan (2007) that priming participants with God concepts increases a dictator game contribution. However, we find that general religiosity had no effect on the decision to give to charity or the donation level. Although priming religion had a positive overall effect of increasing donations to charity, the strongest effect was found among those claiming no religion, atheists and agnostics. Our results fit the theoretical framework put forward by Benjamin et al. (2016). Their framework

TABLE 7 Logistic regressions of *destroy* (marginal effects)

	(1)	(2)	(3)	(4)	(5)
Prime	−0.055	−0.046	−0.045	−0.026	0.017
	(0.057)	(0.063)	(0.058)	(0.054)	(0.086)
Order	0.035	0.036	0.036	0.035	0.025
	(0.058)	(0.058)	(0.056)	(0.054)	(0.056)
Reli		0.046			
		(0.092)			
Reli_prime		−0.045			
		(0.151)			
Genreli			0.063**		
			(0.031)		
Genreli_prime			−0.034		
			(0.055)		
Christian				−0.028	−0.011
				(0.078)	(0.115)
Muslim				0.172**	0.206**
				(0.070)	(0.092)
Other religion				0.060	0.105
				(0.071)	(0.100)
Christian_prime					−0.031
					(0.158)
Muslim_prime					−0.089
					(0.151)
Other religion_prime					−0.091
					(0.151)
Observations	124	124	123	124	124

Note. Standard errors are in parentheses;
**$p < 0.05$.

generated the perhaps counterintuitive conclusion that priming a category need not have a stronger effect on those who identify more strongly with the category. Those who identify most strongly could become saturated with the category, dampening the priming effect.

There are several other papers that examine individuals' giving and destruction behaviour in a single experiment. Sadrieh and Schröder (2012), with their give-or-destroy game, find that the desire to influence relates to gaining utility from the process of altering the fortune of others, no matter in which direction. They find a strong correlation between the strength of prosocial and antisocial preferences. Zizzo and Fleming (2011), also combining a dictator game and a money-burning game find that in sessions where dictators gave more, they also destroyed more. Zhang and Ortmann (2016) show that both giving and destruction decisions are context-dependent, by using an experimental design in which a take option is added to dictator games and a giving option is added to destroy games. In our study, those who gave to charity were 4.8% more likely to choose to destroy. The difference was not statistically significant, but in line with the aforementioned findings.

Participants with higher religiosity are found to be more likely to destroy in a joy-of-destruction game and more likely to expect destructive behaviour from their anonymous partners. Childs (2013) finds that the more religious University of Regina students are, the more likely they are to lie for financial gain and surmises it may be that subjects for whom religion was important feel separate

from other students at this largely secular university. Montreal is also a largely secular city; only 16% of our subjects identified themselves as being religious. It is possible that the higher destruction rate of those who are more religious is partly due to a lack of empathy for an anonymous partner who is likely not part of their religious "in-group".

Our results have policy implications. First, invoking the religious frame and advertising religious norms in society may actually enhance prosocial behaviour of the apparently non-religious, but will have little effect on the openly religious. Second, invoking the religious frame has no effect on behaviour. Religiousness per se, however, seems to enhance mistrust and antisocial behaviour. However, an important caveat of this study is that we can only show a correlation and future studies are needed to clarify the actual causality. One needs a larger sample to evaluate precisely the effect of priming on one specific religious group.

Lastly, the choices in dictator games might not reflect prosocial preferences, as Bardsley (2008) and List (2007) suggest that the "altruistic" behaviour in dictator games might be an artefact and the analysis should consider context-specific social norm and experimental protocol. In our setting, the other side of dictator games is a real charity, which might alleviate the problem compared with the experiments where the dictator allocates money for another experiment participant.

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APPENDIX INSTRUCTIONS FOR EXPERIMENT (DICTATOR GAME FOLLOWED BY JOY-OF-DESTRUCTION GAME)

Instructions for experiment

Overview

This is an experiment in decision making. The instructions are simple and if you follow them carefully and make good decisions, you might earn a considerable amount of money, which will be paid to you in cash at the end of the experiment. During the experiment, please do not talk to each other. Please also turn off your smart phone or iPad.

In this experiment I will ask you to perform a Sentence Scramble task, then make two economic decisions, and finally to answer a questionnaire. Your earnings will be only associated with the Sentence Scramble task and your choices in the two decisions, but will not depend on your answers in the questionnaire.

First, we will read the Sentence Scramble Instructions together, and then you will complete the task on your computer. After that, we will distribute the instructions for Decision #1, we will read them together, and then you will complete your decision on your computer. The same goes for Decision #2.

After everyone has completed both of their decisions, you will be reminded of your choice in each decision task and your total earnings today will be shown on the computer screen. My assistant in the other room will calculate your payment, including your $5 show-up fee, and put them in an envelope with your station number on it, and seal the envelope. At the same time, you will complete a questionnaire. Please note that the assistant in the other room will never enter the lab.

After everyone has completed the questionnaire, I will go to the other room to collect the **sealed envelopes** and then distribute them to you. You will then be required to open your payment envelope privately, sign and fold the receipt, and drop your receipt in the box at the door on your way out of the lab.

Sentence Scramble Instructions

Unscramble the following groups of words to make a four-word phrase or sentence by dropping the irrelevant word. For example,

high winds the flies plane --> the plane flies high.

For each scramble, please type your chosen words into the 4 spaces. You can use the TAB key to move from space to space. Then press OK. The computer program will then check your entries. The program will not accept punctuation, or even the space bar. You must also spell the words exactly as you see them displayed, i.e. if there is a proper name with a capital letter, you must reproduce it with a capital letter. However, any word order will be accepted, so please just make your best guess. Please complete each scramble within 60 seconds. You will be paid $2 for each scramble you complete.

Sentence Scramble *(religious prime, on computer screen)*

The following set of five words forms a sentence when one word is dropped and the remaining four words are unscrambled.

1. felt she eradicate spirit the _____
2. dessert divine was fork the _____
3. appreciated presence was imagine her _____
4. more paper it once do _____
5. send I over it mailed _____
6. evil thanks give God to _____
7. yesterday it finished track he _____

8. sacred was book refer the _____
9. reveal the future simple prophets _____
10. prepared somewhat I was retired _____

Sentence Scramble *(neutral prime, on computer screen).*
The following set of five words forms a sentence when one word is dropped and the remaining four words are unscrambled.

Please drag and drop four of the words into four of the spaces to form a complete sentence.

1. fall was worried she always _____.
2. shoes give replace old the _____.
3. retrace good have holiday a _____.
4. more paper it once do _____.
5. send I over it mailed _____.
6. saw hammer he the train _____.
7. yesterday it finished track he _____.
8. sky the seamless blue is _____.
9. predictable he shoes his tied_____.
10. prepared somewhat I was retired _____

Dictator Game Instructions (distributed before the game was played).
Decision #1 Instructions

The first decision involves 50% of the $20 you have earned by completing the sentence scrambles. We would like you to divide the $10 between yourself and a charity of your choice. You must decide how much of the $10 to keep for yourself and how much to pass to your selected charity. You may choose to keep it all for yourself and pass nothing to the charity, keep nothing for yourself and pass it all to the charity, or keep some for yourself and pass the remainder to the charity.
Payment to charity: At the end of the experiment, the assistant in the other room will calculate the total donations to each charity and will make out cheques for these amounts. One of you who is seated by computer 1 has been chosen as the monitor. The monitor will verify the amounts and place the cheques in addressed and stamped envelopes and will be paid an extra $5 for this task. The monitor and the experimenters will go together to the nearest mailbox and drop the envelopes in the mailbox. Anyone who wishes to join is welcome.
Dictator Game (on computer screen)
Decision #1
Following is a list of ten charities. Please select the ONE charity you wish to be paired with by placing an X in the box next to your choice.

NAME	DESCRIPTION
Amnesty International	Campaigns to uphold human rights across the world.
Canadian Red Cross	Offers emergency response, health and social care, first aid and refugee services.
Canadian Cancer Society	Works toward improving our understanding of cancer and develop better ways to prevent, diagnose and treat the disease.
Greenpeace Canada	Defends the natural world and promotes peace by investigating, exposing and confronting environmental abuse, and championing environmentally responsible solutions.

(Continues)

NAME	DESCRIPTION
HelpAge Canada	Help older people in Canada and the developing world to overcome poverty, claim their rights, challenge discrimination and lead dignified, secure, and healthy lives.
MSF (Medecins Sans Frontiers\Doctors Without Borders)	Committed to providing medical aid wherever it is needed, regardless of race, religion, politics or gender and also to raising awareness of the plight of the people we help.
Centraide of Greater Montreal	Support a network of community agencies which meet real needs (poverty, housing, food security, academic success, mental health, etc.) while helping people in difficulty (children, youth, women, men, people with disabilities) in Laval, on Montreal Island and on the South Shore.
Make-A-Wish Canada	Grants the personal wishes of children with life threatening illnesses to enrich the human experience with hope, strength and joy.
Oxfam Canada	A development, relief, and campaigning organisation that works with others to find lasting solutions to poverty and suffering around the world.
Montreal SPCA (Montreal Society for the Prevention of Cruelty to Animals)	Works to reduce the harmful impact of human activities on animals through education, campaigning and the application of ethics, science and law.

Of your **$10**, how much do you wish to keep for yourself, and how much do you wish to pass to your charity of choice?

Keep for Self:$ _____

(Increments of $0.10)

Pass to Charity:$ _____

(Increments of $0.10)

Total:$10

Joy-of-Destruction Game Instructions (distributed before the game was played)

Decision #2 Instructions

In this part of the experiment you are randomly matched with another participant - your partner. You will not learn the identity of the participant you are matched with, and vice versa your partner will never learn your identity.

You and your partner both have $10, consisting of the other 50% of the $20 you earned by completing the sentence scramble. You have to decide whether to reduce your partner's income or to leave it as is. Reducing your partner's income will not cost you anything. Similarly, your partner will not incur any cost if he or she chooses to reduce your income.

If both of you choose to leave the other person's income unaltered, both of you will earn the $10.

If both of you choose to reduce the other person's income, both of you will earn $5.

If you choose to reduce your partner's income, but he/she decides to leave your income unaltered, you will earn $10 and your partner will earn $5.

If you choose not to reduce your partner's income, but he/she decides to reduce yours, you will earn $5 and your partner will earn $10.

After you and your partner have decided whether or not to reduce the other person's income, a computerized lottery will make a final decision whether your and your partner's income will be reduced. With 1/3 probability (33.33% chance) your income, independent of your or your partner's decision, will be reduced. With 2/3 probability, your and your partner's decisions will be realized: If you or

your partner has decided to reduce the other person's income – the income will be reduced. If you or your partner has decided not to reduce the other person's income – the income will not be reduced.
Please be aware that neither you nor your partner will learn about the outcome of the lottery. Therefore, if your income or your partner's income will be reduced by $5, you will never learn what the reason for this reduction has been: the decision of your partner or the results of the lottery.

We will also ask you to make your best guess of what your partner will decide to do.

Joy-of-Destruction Game (on computer screen).

Decision #2.

Your endowment in this game is **$10**. Do you want to reduce your partner's income by **$5**? If you choose "YES", your partner`s income will be reduced by $5. Your partner simultaneously makes the same decision.
Please note that with 1/3 probability your income will be reduced, independent of your or your partner's decision. With 2/3 probability, your and your partner's decisions will be realized. Neither you nor your partner will learn about the outcome of the lottery.
Please think about your decision carefully.

YES
NO

We now ask you to estimate if your partner decides to reduce your income by **$5**.
My estimate is that

My partner will NOT reduce my income
My partner will reduce my income

Questionnaire – Please note the questionnaire will not affect your earnings.

1. Please briefly speculate on what you think this study was about so far.
2. Has there been anything that you do not understand or find odd about this study so far?
3. Excluding today, how many times have you donated money to a charitable organization, such as an international aid organization, child agency, church and so forth, in the past year?
   a) 0
   b) 1 or 2 times
   c) 3, 4 or 5 times
   d) 6 to 10 times
   e) More than 10 times
4. Approximately how much money have you donated to charitable organizations in the past year?
   a) $0
   b) $1–10
   c) $11–25
   d) $26–50

e) $51–$100
f) $101–$250
g) $251–500
h) More than $500

5. How many times have you volunteered some of your time to a charitable organization, such as a non-profit, university charity effort, church and so forth, in the past year?
a) 0
b) 1 or 2 times
c) 3, 4 or 5 times
d) 6 to 10 times
e) More than 10 times

6. Approximately how many hours have you donated to charitable organizations in the past year?
a) None
b) 1–5 hours
c) 6–10
d) 11–20
e) 21–30
f) 31–50
g) 51–75
h) 76–100
i) More than 100 hours

7. How much money do you spend in a typical week? (This should be your daily expenses e.g. food, travel, mobile charges, excluding e.g. rent, tuition)
a) $0–$40
b) $41–$60
c) $61–$80
d) $81–$100
e) More than $100

8. How many hours per week do you currently work for pay?
a) I am not working (0 hours per week)
b) Between 1 and 5 hours per week
c) Between 6 and 10 hours per week
d) Between 11 and 15 hours per week
e) Between 16 and 20 hours per week
f) Between 21 and 25 hours per week
g) Between 26 and 30 hours per week
h) Between 31 and 35 hours per week
i) More than 35 hours per week

9. What is your family's annual household income approximately?
a) Less than $30,000
b) Between $30,000 and $50,000
c) Between $50,000 and $75,000
d) Between $75,000 and $100,000
e) Between $100,000 and $150,000
f) Between $150,000 and $200,000
g) More than $200,000

10. Are you
    a) Male
    b) Female
    c) Other
11. How would you describe your ethnicity (please pick the most applicable)?
    a) Caucasian (of European ancestry)
    b) East Asian (e.g. Chinese, Thai, Japanese, Malaysian, Vietnamese, Indonesian)
    c) South Asian Subcontinent (e.g. Indian, Pakistani)
    d) Middle Eastern
    e) Black (of African ancestry)
    f) Hispanic
    g) Mixed/Other
12. What is your major area of study?
    a) Economics
    b) Business other than economics
    c) Math, Engineering, Sciences
    d) Arts and social sciences other than Economics
    e) other
    f) I am not a student
13. What is your age? _____
14. A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost? _____ cents
15. If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? _____ minutes
16. In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? _____ days
17. Have you seen any of the last three questions (12–14) before?
    a) None
    b) 1 of them
    c) 2 of them
    d) All three
18. What is your religion?
    a) Christian
    b) Jewish
    c) Muslim
    d) Hindu
    e) Sikh
    f) Buddhist
    g) Other religion, please specify _____
    h) No religion
    i) Atheist
    k) Agnostic
19. Do you consider yourself to be a religious person?
    a) Yes
    b) No

20. How often have you attended religious services during the past year? _____ times

21. Which of the following best describes your practice of prayer or religious meditation?

a) Prayer is a regular part of my daily life

b) I usually pray in times of stress or need but rarely at any other time

c) I pray only during formal ceremonies

d) Prayer has little importance in my life

e) I never pray

22. When you have a serious personal problem how often do you take religious advice or teachings into consideration?

a) Almost always

b) Usually

c) Sometimes

d) Rarely

e) Never

23. How much of an influence would you say that religion has on the way that you choose to act and the way that you choose to spend your time each day?

a) No influence

b) A small influence

c) Some influence

d) A fair amount of influence

e) A large influence

24. Which of the following statements comes closest to your belief about God?

a) I am sure that God really exists and that He is active in my life

b) Although I sometimes question His existence, I do believe in God and believe He knows of me as a person

c) I don't know if there is a personal God, but I do believe in a higher power of some kind

d) I don't know if there is a personal God or a higher power of some kind, and I don't know if I will ever know

e) I don't believe in a personal God or in a higher power

25. Which of the following statements comes closest to your belief about life after death (immortality)?

a) I believe in a personal life after death, a soul existing as a specific individual

b) I believe in a soul existing after death as a part of a universal spirit

c) I believe in a life after death of some kind, but I really don't know what it would be like

d) I don't know whether there is any kind of life after death, and I don't know if I will ever know

e) I don't believe in any kind of life after death

26. During the past year, how often have you experienced a feeling of religious reverence or devotion?

a) Almost daily

b) Frequently

c) Sometimes

d) Rarely

e) Never

27. Do you agree with the following statement? "Religion gives me a great amount of comfort and security in life"

a) Strongly disagree
b) Disagree
c) Uncertain
d) Agree
e) Strongly agree

Choose the answer that best describes how you have felt and conducted yourself over the past 6 months

28. How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?

a) Very often
b) Often
c) Sometimes
d) Rarely
e) Never

Choose the answer that best describes how you have felt and conducted yourself over the past 6 months

29. How often do you have difficulty getting things in order when you have to do a task that requires organization?

a) Very often
b) Often
c) Sometimes
d) Rarely
e) Never

Choose the answer that best describes how you have felt and conducted yourself over the past 6 months

30. How often do you have problems remembering appointments or obligations?

a) Very often
b) Often
c) Sometimes
d) Rarely
e) Never

Choose the answer that best describes how you have felt and conducted yourself over the past 6 months

31.When you have a task that requires a lot of thought, how often do you avoid or delay getting started?

a) Very often
b) Often
c) Sometimes
d) Rarely
e) Never

Choose the answer that best describes how you have felt and conducted yourself over the past 6 months

32. How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?

a) Very often
b) Often
c) Sometimes

d) Rarely

e) Never

Choose the answer that best describes how you have felt and conducted yourself over the past 6 months

33. How often do you feel overly active and compelled to do things, like you were driven by a motor?

a) Very often

b) Often

c) Sometimes

d) Rarely

e) Never