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**In the Back of Your Mind: Subliminal Influences of
Religious Concepts on Prosocial Behavior**

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Abstract

Does religion enhance prosocial behavior? We investigate the ways in which implicit influences of religious concepts affect generosity and cooperation. In contrast to previous studies, we assess the direct impact of religion as an independent variable on prosocial behavior. We do so by subliminally priming participants with religious concepts in a scrambled sentence task before they play a dictator game and a prisoner's dilemma game. We found that implicit priming of religious concepts significantly increased prosocial behavior in both games. This result was present among both religious and nonreligious participants. Self-reported measure of religiosity was related neither to generosity nor to cooperation.

JEL classification: Z12, Z13, C9.

Keywords: religion, priming, dictator game, prisoner's dilemma game.

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Abstract

Does religion enhance prosocial behavior? We investigate the ways in which implicit influences of religious concepts affect generosity and cooperation. In contrast to previous studies, we assess the direct impact of religion as an independent variable on prosocial behavior. We do so by subliminally priming participants with religious concepts in a scrambled sentence task before they play a dictator game and a prisoner's dilemma game. We found that implicit priming of religious concepts significantly increased prosocial behavior in both games. This result was present among both religious and nonreligious participants. Self-reported measure of religiosity was related neither to generosity nor to cooperation.

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1 Introduction

Social scientists have suggested that religion has an important influence on prosocial behavior. James (1902[1994]) was among the first to argue that holy figures in religions are models of charity and altruism. Similarly, Freud (1927[1989]) suggested that religion helps people to face the downsides of their egoistic desires, and Erikson (1963[1993]) argued that religion encourages concern for others and for subsequent generations. According to Skinner (1969) and Johnson, Stopka, and Knights (2003), religion also provides reinforcements and punishments that preserve social and moral standards. Moreover, from an evolutionary perspective, Batson (1983) argued that religion extends limited individual

kinship to broader kinds of cultural kinships and Kirkpatrick (1999) suggested that religion allows for group formations that encourage the reciprocation of cooperative behavior.

Numerous studies have examined the conjecture that religion constrains egoistic behavior and promotes cooperation. Eckel and Grossman (2004) examined differences in the amount and pattern of giving to secular charities in response to subsidies by self-identified religious and nonreligious participants. Their results revealed no significant difference between religious and nonreligious people in either the amount or pattern of giving. Tan (2006) used the dictator game and the ultimatum game, and similar to Eckel and Grossman (2004) he found that religiosity, measured by the responses to different survey questions, had no significant influence in the experiments. Orbell, Goldman, Mulford, and Dawes (1992) focused on whether religiosity affects cooperation by using the prisoner's dilemma game. They conducted their experiment in what they considered more religious and less religious towns. They found no general relationship between religious affiliation and cooperation; however, they found that cooperation did increase with church attendance. Ruffle and Sosis (2006) studied the relationship between religion and cooperation but used a public goods game. They found that religious people were more cooperative with anonymous religious people than they were with anonymous nonreligious people. Similar results have been reported for the trust game by Johansson-Stenman, Mahmud, and Martinsson (forthcoming) and Tan and Vogel (forthcoming): more religious trustees were trusted more, and such behavior was more prominent among religious trusters. Tan and Vogel (forthcoming) also found that self-reported religious trustees were more trustworthy than nonreligious people in the trust game.

One question that arises is why some studies have found a relationship between religiosity and prosocial behavior while others have not. We believe that one explanation could be the way in which people's religiosity is measured. In previous studies, religiosity is

either self-reported or measured in terms of church attendance or other religious activities. The problem with the self-reported measure is that each person has a different understanding of religiosity. People can be spiritual without espousing any religious faith. Similarly, the problem with church attendance is that people who are not religious might attend church services. Church attendance does not mean that people practice the precepts of their religion. Other people may worship regularly but not follow the religion strictly in real life. Another difficulty with the previous literature is related to causality. They all assume a causal role of religion on prosocial behavior when these studies actually provide only correlational information. However, it is just as likely that being prosocial causes a person to be religious or to participate in religious activities. It is also fully possible that a third variable causes both prosocial behavior and religiosity.

This paper investigates how implicit influences of religious concepts affect generosity and cooperation. Our experiment relies on a dictator game and a prisoner's dilemma game. In contrast to previous studies, we assess a direct impact of religion as an independent variable on prosocial behavior in terms of generosity and cooperation. We do so by using the *scrambled sentence paradigm* of Srull and Wyer (1979) to subliminally prime religious concepts before participants play the dictator game and the prisoner's dilemma game. In the scrambled sentence task, participants were asked to construct coherent and grammatically correct four-word sentences out of five words presented in random order by eliminating one of the words. For those in prime condition, the scrambled sentences contained words that were associated with religion. After completing the scrambled sentence task, participants played the dictator game and the prisoner's dilemma game. Further, to make our study comparable with previous experimental studies, participants answered a conventional set of questions related to religion and religious practice after the experiment.

Previous findings in social psychology give us reasons to expect that priming religious concepts may affect the behavior in our experimental games. Baldwin, Carell, and Lopez (1990), for example, found that priming people with religious images affected their self-evaluation. Wenger (2004) found that people identified actions expressing religiousness more quickly when they had been primed with religious concepts. Randolph-Seng and Nielsen (2007) demonstrated that people primed with religious words cheated significantly less on a subsequent task and Shariff and Norenzayan (2007) found that priming people with religious words made them more altruistic and generous. Similarly, Pichon, Boccato, and Saroglou (2007) found that the number of charity pamphlets taken by participants before leaving the classroom was larger when participants had been primed with religious words.

To sum up, we present a study in which we primed half of our participants with religious concepts before they were confronted with a dictator game, a prisoner's dilemma game, and finally with a survey containing a conventional set of questions related to religion and religious practice. We arrived at the following observations: Implicit priming of religious concept increased prosocial behavior in both games. Hence, primed participants allocated more money to the recipient than did participants in the control treatment in the dictator game, and participants in the prime condition cooperated more than participants in the control condition in the prisoner's dilemma game. These results were observed among both religious and nonreligious participants. Self-reported measure of religiosity and other religious measures were related neither to generosity nor to cooperation.

2 Research design

A total of 224 undergraduate natural science students were recruited at Pontificia Universidad Católica de Valparaíso in Chile for this study. Sixty-four of the participants were female and 160 were male. The mean age of the participants was 19 years.

The experiment was conducted after ordinary lectures and began with a general introduction. Participants were then assigned four tasks: a scrambled sentence task, a dictator game, a prisoner's dilemma game, and a survey measuring religiosity. Each section of the experiment was conducted separately. Thus, the dictator game was not played until all material from the scrambled sentence task had been collected, the prisoner's dilemma game was not played until the decisions for the dictator game had been collected, and finally the survey was not distributed until the decisions for the prisoner's dilemma game had been collected. We will discuss the scrambled sentence task, the experimental games and the survey separately and in detail.

2.1 Scrambled sentence task

Different techniques of priming people to induce possible implicit influences on subsequent responses and behaviors have traditionally been used in psychology research. For example, Bargh, Chen, and Burrows (1996) found that people walk significantly more slowly when they are primed with words that are associated with the elderly, Dijksterhuis and van Knippenberg (1998) showed that people answer questions more accurately when primed with concepts associated with a professor, and Nelson and Norton (2005) found that participants saw themselves as more likely to help in hypothetical situations when primed with concepts related to superheroes.

We used the *scrambled sentence paradigm* of Srull and Wyer (1979) to prime our participants. Half of the participants received a prime with religious concepts and half of the participants did not. All participants were asked to construct coherent and grammatically correct four-word sentences out of ten sets of five words presented in random order by eliminating one of the words. For example, "ate I food Canada the" would become "I ate the food" by eliminating "Canada." For those in prime condition, 5 of the 10 scrambled sentences

contained words that were associated with religion, (*spiritual, divine, holy, God, and prophet*), and five that were not. Those in the control condition were given words with no religious connotation.

2.2 Dictator game

After the scrambled sentence task was completed, participants played the dictator game. The dictator game, introduced by Kahneman et al. (1986), is a one-shot/two-person game in which the first player, *the dictator*, must decide how to distribute a sum of money between herself or himself and a second player, *the recipient*. The recipient must accept the dictator's decision.

Participants were told that they had been randomly matched with another person and they were asked how much out of CLP 10 000 they would be willing to send to the recipient. They were told to keep as much of the money they would like, knowing that however much they left, if any, would be given to the recipient subject to keep. Participants were told to think carefully about their decision since one pair of participants, one dictator and one recipient, would be randomly selected and be paid according to the decision made by the dictator.

2.3 Prisoner's dilemma game

Following the dictator game, we proceeded with the prisoner's dilemma game, framed by Flood (1952) and Dresher (1961). Participants were informed that they had been paired with another person in the experiment. Participants were then asked to choose between Alternatives A and B, and were given the following information: If both of you choose A, then both of you will receive CLP 10 000. If both of you choose B, then both of you will receive CLP 8 000. If you fail to coordinate, then the one who chooses Alternative A will

receive CLP 5 000, and the one who chooses Alternative B will receive CLP 12 000. Table 1 illustrates the prisoner's dilemma game used in the experiment.

<< TABLE 1 ABOUT HERE >>

In this game, Alternative A is the cooperative strategy, and Alternative B is the defecting strategy. Joint income is maximized if both players choose Alternative A; however, each player also has an incentive to choose Alternative B. For example, given that Player 1 chooses Alternative A, Player 2 can increase income from CLP 10 000 to CLP 12 000 by free-riding off Player 1. This game also reflects how much players trust each other. Choosing Alternative B minimizes the players' vulnerability to the decision of their co-players, since by choosing Alternative B, players avoid the possibility of earning CLP 5 000. Again, participants were told to think carefully about their decision since one pair of participants would be randomly selected after the experiment and be paid according to the decisions made by the players.

2.4 Survey

Finally, after all experimental procedures we administered the survey. In addition to conventional questions about age and gender, the large part of the survey contained questions about religiosity. We used questions about religiosity developed by De Jong, Faulkner, and Warland (1976). These are presented in Table 2. Participants were asked choose an answer from a set of possible answers on each question. The questions were Christian-oriented, which was suitable with the pool of participants we had. The questions asked about three dimensions of religiosity which have been considered the most important: beliefs, experiences, and practice. Eight questions asked about religious beliefs, four questions asked about religious experiences, and five questions asked about religious practice.

<< TABLE 2 ABOUT HERE >>

We included one simple question about religiosity from the World Values Survey (WVS): “Independently of whether you go to church or not, would you say you are (1) a religious person, (2) not a religious person, or (3) a convinced atheist?” Respondents who chose Alternative 2 or 3 were categorized as nonreligious. Among our participants, 124 of the participants were categorized as religious and 100 participants as nonreligious. We included this question to obtain a simple self-reported measure of religiosity for our main analysis below.

3 Results

3.1 Principal component analysis

To simplify the information collected from the survey questions presented in Table 2 about participants’ religiosity, we ran a principal component analysis (PCA). We included all questions in Table 2 in our PCA except for the WVS question since we used that question separately in our analysis. The central idea of PCA is to reduce the dimensionality of a data set consisting of a large number of possibly correlated variables, while retaining as much as possible of the variation present in the data set. This is achieved by transforming to a new set of uncorrelated variables, principal components. PCA makes it possible to calculate a score for each participant on a given principal component. Hence, instead of using participants’ responses to each survey question, for example in a regression, we can simplify our analysis by using the principal components. Further, in contrast to the responses to the survey questions, we can include all principal components in the same regression because they are uncorrelated avoiding the problem of multicollinearity. Excellent references to PCA are Jolliffe (2002) and Field (2005) and we follow their recommendations below.

First, we checked the suitability of the data for conducting PCA. On the one hand, if the questions about religiosity measure the same underlying dimension or dimensions

then we would expect them to be correlated. On the other hand, if variables correlate too much then it might be impossible to determine the unique contribution to a principal component of those variables. Therefore initially, we eliminated any variables that either did not correlate with any other variables or that correlated highly with other variables. However, we found no such variables. The Pearson correlation coefficients between all pairs of questions were less than 0.8 and statistically significant, $0.1 < \rho(n = 224) < 0.8, p < 0.01$. Further, the determinant of the correlation matrix was $0.001 > 0.00001$ meaning that multicollinearity and singularity was not a problem in our data. Next, we calculated the Kaiser-Meyer-Olkin (KMO), Kaiser (1970), measure of sampling adequacy and Bartlett's (1950) test of sphericity. The KMO measure varies from 0 to 1. A value close to 1 indicates that the patterns of correlations between variables are relatively compact and so PCA should yield distinct and reliable components. Kaiser (1974) recommends accepting values larger than 0.5: for our data this measure was 0.916. The Bartlett's (1950) statistic tests the null hypothesis that the correlation matrix is an identity matrix. As argued before, for PCA to work, we want some relationship among variables. Therefore, we want this test to be significant. In our case, the Bartlett's (1950) test is highly significant and therefore PCA is appropriate, $\chi^2(df = 136, n = 224) = 1346.35, p < 0.001$.

After establishing the appropriateness of our data we proceeded with the PCA by calculating the eigenvalues associated with each linear component before and after extraction. Before extraction, 17 linear principal components were identified within the data. We used Kaiser's (1960) rule, extracting all components with eigenvalues larger than 1, which left us with four components. These components explained about 60% of the total variance.

<< TABLE 3 ABOUT HERE >>

Our next step was to calculate the rotated component matrix for the extracted components. The component matrix, presented in Table 3, is a matrix of the component loadings for each variable onto each component. The idea with the rotation is that each variable should be heavily loaded on as few components as possible. We used Varimax with Kaiser's (1958) normalization rotation method and the rotation converged in 13 iterations. We adopted the strict conventional cut-off value of 0.4 and loadings that fell below are suppressed in Table 3. The suppression of loadings less than 0.4 makes the interpretation easier.

We have labeled the first component *Belief* because questions related to the belief dimension are highly loaded with this component. The second component has been labeled *Experience* because questions related to the experience dimension are particularly loaded with this component. Similarly, the last two components have been labeled *Practice 1* and *Practice 2*, because questions related to the practice dimension are particularly loaded with these components. Hence, our PCA clearly revealed that the 17 first questions in Table 2 can be explained by four uncorrelated components: *Belief*, *Experience*, *Practice 1*, and *Practice 2*. Finally, we calculated a score for each participant for each principal component. These are later used in our regression analysis. We now turn to our main results.

3.2 Dictator game

The percentage of the total endowment sent by participants in each group is presented in Table 4. The categorization of participants into religious and nonreligious groups is made by using the WVS question of religiosity. For the total sample, religious participants sent on average slightly more than nonreligious participants, 32% and 30% of the endowment respectively, but this difference is negligible, $t(df = 222, n = 224) = -0.714, p = 0.476$.

<< TABLE 4 ABOUT HERE >>

Participants in the control treatment sent an average of 27% while participants in the prime condition sent an average of 35% of the initial endowment. This difference is statistically significant, $t(df = 222, n = 224) = -3.292, p = 0.001$. The priming effect was present in both religious and nonreligious participants. Religious participants in the control and prime conditions donated on average 28% and 35%, respectively, $t(df = 122, n = 124) = -2.47, p = 0.016$, and nonreligious participants in the control and prime condition donated on the average 27% and 34%, respectively, $t(df = 98, n = 100) = -2.100, p = 0.038$. Our results show no behavioral differences between religious and nonreligious participants, however, priming religious concepts significantly increased the amount sent in the dictator game.

In Table 4 we categorized participants as religious and nonreligious according to the WVS question. We now turn our attention to the other questions in Table 2 by using the information derived from the PCA. We ran a Tobit regression with the amount donated as a dependent variable and the four principal components – *Belief*, *Experience*, *Practice 1*, and *Practice 2* – derived earlier as independent variables. The Tobit regression is suitable in this case since the experimental design restricted the dependent variable to values between 0 and 10 000. We also included age, a dummy equal to one for those who were primed, and a dummy equal to one if a participant was a female as independent variables. The results for this regression are presented in Table 5.

<< TABLE 5 ABOUT HERE >>

The first column gives the estimated coefficients, the second column gives the marginal effects of the probability of donating a positive amount, and the last column presents the marginal effects conditioned on that the donation is nonzero. As before, priming religious concepts significantly increases the average amount sent in the dictator game. For example, the second column shows that the probability that a participant sent a nonzero amount, that is, sent anything at all, was five percentage points higher when primed with religious concepts.

Similarly, the last column shows that given that a participant sent a nonzero amount, the average amount sent increased by almost CLP 700 when primed with religious concepts. Hence, priming affected both the decision of whether to send something or not, and the decision of how much to send. Note, however, that none of the principal components are significantly related to the amount sent in the dictator game. Similar to the WVS question, we conclude that religiosity, as measured by different survey questions in Table 2, is not related to the behavior in the dictator game.

3.3 Prisoner's dilemma game

The proportions of participants that chose Alternative A (the cooperative strategy) in each group are presented in Table 6. As in Table 4, the categorization of participants into religious and nonreligious groups is made by using the WVS question of religiosity. Religious participants seem to have cooperated more than nonreligious participants in both the control and prime conditions but this trend was not statistically significant; $\chi^2(df = 1, n = 112) = 0.547, p = 0.460$, in the control condition, and $\chi^2(df = 1, n = 112) = 0.430, p = 0.512$, in the prime condition.

Twenty-seven percent of the participants in the control condition and 44% of the participants in the prime condition chose to cooperate. This is a considerable difference, $\chi^2(df = 1, n = 224) = 7.058, p = 0.008$. This effect was present among both religious and nonreligious participants. Thirty and 46% of the religious participants in the control and prime condition, respectively, chose to cooperate, $\chi^2(df = 1, n = 124) = 3.510, p = 0.061$. Similarly, 24% and 40% of the nonreligious participants in the control and prime condition, respectively, chose to cooperate, $\chi^2(df = 1, n = 100) = 3.098, p = 0.078$.

<< TABLE 6 ABOUT HERE >>

Similar to the results for the dictator game, there are no behavioral differences between religious and nonreligious participants in the prisoner's dilemma game. However, priming religious concepts significantly increased cooperation. As before, to investigate if the questions in Table 2 can predict behavior in the prisoner's dilemma game, we ran a probit regression. The decision to cooperate or not was set as a dependent variable and the four principal components derived earlier as independent variables. A probit regression was suitable since the dependent variable was a dummy. We also included age, a dummy equal to one for those who were primed, and a dummy equal to one if a participant was a female as independent variables. The results for the regression are presented in Table 7.

<< TABLE 7 ABOUT HERE >>

The first column gives the estimated coefficients, and the second column gives the marginal effects of the probability of cooperating. The marginal effects show that priming religious concepts significantly increased the probability of cooperating by 17 percentage points. However, none of the principal components affected the probability of cooperating. We conclude that religiosity, measured by the different survey questions, is not related to the behavior in the prisoner's dilemma game.

4 Discussion

All religions encourage prosocial behavior, but does religion really enhance such behavior? Previous research has studied self-reported measures of religiosity alongside measures of prosocial behavior in experimental games and has provided many interesting but mixed results. Some studies have found a relationship between religion and prosocial behavior while others have not. Previous research also has an important limitation: it provides correlational evidence that does not allow for drawing any conclusions about possible direction of influence. To address this problem the present study took religion as an

independent variable and showed that priming religious concepts increases prosocial behavior in two experimental games: the average amount sent in the dictator game and the probability of cooperating in the prisoner's dilemma game was significantly higher for those in the prime condition than for those in the control condition.

The results make several suggestions. First, the relationship between religion and prosocial behavior is quite profound in the sense that it seems to be beyond people's consciousness and awareness. Second, one can conceive of at least one direction of causality: religion causes people to act more prosocially. Third, the results offer experimental evidence in favor of what is a common assumption in most theories of religion: religion has the effect of emphasizing prosocial behavior.

Fourth, in line with Orbell, Goldman, Mulford, and Dawes (1992), Eckel and Grossman (2004), and Tan (2006), self-reported religiosity is not related to prosocial behavior. This is in contrast to the findings of Ruffle and Sosis (2006), Johansson-Stenman, Mahmud, and Martinsson (forthcoming), and Tan and Vogel (forthcoming). However, the results of these studies could actually be explained by in-group bias since religious people were more prosocial only when they were interacting with other religious people. In-group bias, which is a well-known phenomenon in social psychology, can occur within any group formation. Ahmed (2007) showed that even mere membership in the smallest or most arbitrary of groups can trigger in-group bias.

Finally, subliminal influences of religious concepts affect both those who identify themselves as religious and those who identify themselves as nonreligious. This might seem a little bit odd; however, Gardner, Gabriel, and Lee (1999) suggest that priming effects often work independently of, or even contrary to preexisting personal dispositions related to the priming construct. Religion is an important element of all societies. Historically, religions have had a considerable influence in the development of laws and social norms.

Thus, it is possible that even if people are not religious, they are unconsciously affected by religious concepts.

Subsequent research should examine many remaining questions. First, future research should investigate whether the results found in this paper using lab experiments may be extended to more natural settings involving real prosocial behavior rather than prosocial behavior in experimental games. Second, participants in our study and in almost all previous study had a Christian background. It would be interesting to examine how consistent the relationship between religion and prosocial behavior is across religions, countries, and cultures. Replications in other religious contexts are necessary before findings can be generalized. A third question is whether the present results can be generalized to priming not only with religious concepts of universal relevance, *spiritual, divine, holy, God, and prophet*, but with religious concepts from different religious traditions, such as Christianity, Judaism, Islam, or Hinduism. For example, how would religious Christian concepts like *Jesus, crucifix, and Christmas* or Muslim concepts like *Allah, Mohammed* and *zakat* affects people's behavior relative to the general religious concepts used in this paper? A fourth related question is whether or not religious concepts from one religion have an impact on the behavior of followers of another religion. Finally, how would religious concepts, for example, *Jihad* or *crusade*, with negative connotations affect people's behavior?

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Table 1
The prisoner's dilemma game

		Player 2			
		A		B	
Player 1	A	10 000	10 000	5 000	12 000
	B	12 000	5 000	8 000	8 000

Table 2
 Questions measuring religiosity

Variable	Survey question
<i>Belief dimension</i>	
Immortality	What do you believe about immortality?
Afterlife	What do you feel will probably happen to you after death?
God	What do you believe about God?
Jesus	What do you believe about Jesus?
Influence	What do you believe about the idea that God has and continues to act in the history of man?
Prayer	Which of the following comes closest to expressing your conception of prayer?
Sin	Which of the following statements comes closest to expressing your conception of sin?
Bible	What is your view of the Bible?
<i>Experience dimension</i>	
Incidence	Have you ever had an experience, which at that time, you thought of as a religious experience? If so, which of the following comes closest to expressing the dominant character of your experience?
Closeness	There are particular moments in my life when I feel “close” to the Divine.
Sinner	I know what it feels like to repent and experience forgiveness of sin.
Forgiven	I have experienced the joy and peace that comes from recognizing that one is a forgiven sinner.
<i>Practice dimension</i>	
Worship	How often do you attend Sabbath worship services?
Member	Do you presently belong to a church?
Funding	Do you contribute funds to church?
Use	How would you describe your use of the Bible?
Affiliation	In how many religious affiliated organizations, groups, or activities do you participate?
<i>WVS question of religiosity</i>	
Religiosity	Independently of whether you go to church or not, would you say you are a religious person, not a religious person, or a convinced atheist?

Table 3
PCA: Extracted and varimax rotated components

	Principal components extracted			
	Belief	Experience	Practice 1	Practice 2
<i>Belief dimension</i>				
Immortality	0.619		0.414	
Afterlife	0.606		0.446	
God	0.685			
Jesus	0.736			
Influence	0.486			
Prayer	0.716			
Sin	0.637			
Bible	0.780			
<i>Experience dimension</i>				
Incidence	0.441	0.424		0.463
Closeness		0.715		
Sinner		0.768		
Forgiven		0.719		
<i>Practice dimension</i>				
Worship				0.492
Member			0.714	
Funding			0.673	
Use				0.651
Affiliation				0.738
Percentage of total variance explained	24.328	14.354	10.647	10.197

Note: Preliminary tests confirmed the suitability of the sample for PCA. KMO measure of sampling adequacy was 0.916 and Bartlett's (1950) Test of Sphericity was significant at $p < 0.0001$. We adopted Kaiser's (1960) eigenvalue criteria of 1.00 as a minimum threshold for extracting relevant components. This resulted in four principal components presented in this table. Varimax with Kaiser (1958) normalization rotation method was used. Rotation converged in 13 iterations. We adopt the strict conventional cut-off value of 0.4 and loadings that fall below are suppressed in the table.

Table 4
 Percentage of the total endowment sent in the dictator game

	Control	Prime	Total
Religious	28.07% (57)	34.78% (67)	31.69% (124)
Nonreligious	26.73% (55)	34.22% (45)	30.10% (100)
Total	27.41% (112)	34.55% (112)	30.98% (224)

Note: Number of observations is given in the brackets. The WVS question of religiosity is used to categorize participants into religious and nonreligious groups. People who responded that they consider themselves as nonreligious and atheists were pooled into the single group of nonreligious.

Table 5
Results for the tobit regression

Independent variables	Coefficients	Marginal effects Prob(Donation > 0)	Marginal effects E(Donation Donation > 0)
Constant	3070.35* (1091.51)		
Age	-28.40 (56.66)	-0.0016 (0.0032)	-23.13 (46.13)
Female	239.71 (282.36)	0.0127 (0.0144)	196.84 (233.75)
Primed	818.75* (251.52)	0.0461* (0.0162)	665.90* (204.39)
Belief	-111.68 (126.20)	-0.0062 (0.0071)	-90.95 (102.83)
Experience	138.26 (124.01)	0.0077 (0.0070)	112.59 (101.03)
Practice 1	35.59 (122.38)	0.0020 (0.0068)	28.98 (99.66)
Practice 2	120.76 (121.29)	0.0067 (0.0068)	98.34 (98.76)

Note: Standard errors are given in the brackets. The dependent variable is the amount donated (a number between 0 and 10 000). Female = 1 if female and Primed = 1 if participants were in the prime condition; both dummies 0 if otherwise. Number of observations = 223, $-2 \log$ likelihood = 3563.03, pseudo $R^2 = 0.0040$. There were 27 left-censored observations, 0 right-censored observations, and 196 uncensored variables. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Table 6
 Percentage of participants that chose to cooperate

	Control	Prime	Total
Religious	29.82% (17/57)	46.27% (31/67)	38.71% (48/124)
Nonreligious	23.64% (13/55)	40.00% (18/45)	31.00% (31/100)
Total	26.79% (30/112)	43.75% (49/112)	35.27% (79/224)

Note: Number of participants cooperating and number of observations are given in brackets. The WVS question of religiosity is used to categorize participants into religious and nonreligious groups. People who responded that they consider themselves as nonreligious and atheists were pooled into the single group of nonreligious.

Table 7
Results for the probit regression

Independent variables	Coefficients	Marginal effects Prob(Cooperate)
Constant	-1.2423* (0.7623)	
Age	0.0282 (0.0393)	0.0104 (0.0145)
Female	0.2703 (0.2016)	0.1018 (0.0769)
Primed	0.4550*** (0.1804)	0.1671*** (0.0652)
Belief	0.0685 (0.0914)	0.0253 (0.0338)
Experience	0.0980 (0.0894)	0.0362 (0.0331)
Practice 1	0.0669 (0.0888)	0.0248 (0.0329)
Practice 2	0.0163 (0.0887)	0.0060 (0.0328)

Note: Standard errors are given in the brackets. The dependent variable is equal to 1 if a participant cooperated in the prisoner's dilemma game and 0 otherwise. Female = 1 if female and Primed = 1 if participants were in the prime condition; both dummies 0 if otherwise. Number of observations = 223, $-2 \log$ likelihood = 277.43, pseudo $R^2 = 0.0431$. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.