



Cooperation and punishment: The effect of religiosity and religious festival[☆]



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HIGHLIGHTS

- We examine how a religious festival and religiosity affect cooperation.
- Less religious subjects increased cooperation significantly outside the festival.
- Results show a substitution effect between religious and non-religious activities.
- Conditional cooperation is an important motivation for subjects.

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ABSTRACT

This paper examines how a religious festival (Ramadan) and the degree of religiosity affect cooperation and costly punishment in a public goods experiment. We find significantly higher cooperation levels outside the festival among less religious people. This behavior is consistent with a substitution effect between religious and non-religious activities.

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1. Introduction

It is of general interest to better understand why individuals engage in costly cooperation, and public goods experiments have been used to this end. Previous experimental research has shown that important factors affecting the degree of cooperation are the behavior of others, since a large fraction of people are conditional cooperators (e.g. Fischbacher et al., 2001), norm

enforcement, especially by allowing for costly punishment of others (e.g. Fehr and Gächter, 2000), and the socio-cultural environment (e.g. Gächter et al., 2010). While religion plays an important role both in shaping the society and in affecting our behavior, it has only caught limited attention of economists (e.g. Hoffmann, 2012; Iannaccone, 1998). This paper focuses on the role of a large religious festival, as a natural priming, and religiosity on cooperation and costly punishment using public goods experiments (see, e.g. Chaudhuri, 2011, for an extensive review of public goods experiments). Our strategy to identify the effect of religious festival and religiosity on cooperation and punishment is based on comparing experiments conducted both during the early morning of the most important day of Ramadan, the Night of Power (*Leylat al-Qadr*), and, as a reference, on another day outside Ramadan when there is no special prayer or religious festival.

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The existing literature that uses public goods experiments to disentangle the effects of different domains of religion on cooperation is limited and the findings are mixed (see, e.g. Hoffmann, 2012, for an extensive review). For instance, Anderson and Mellor (2009) find that contributions are neither influenced by religious denomination nor by participation, while Ruffle and Sosis (2007) find that the people who are the most engaged in collective religious festivals also are the most cooperative among the members of religious and secular Israeli kibbutzim. They too find a mixed effect of religious identity norms on cooperation. In this paper, we contribute to the literature on understanding how religion affects behavior by simultaneously focusing on the unexplored effect of religious festival on cooperative and punishment behavior of people across religiosity.

2. Experimental design

The experiment consists of two parts: first a standard linear one-shot public goods experiment, i.e., without punishment possibilities, and then a one-shot public goods experiment with costly punishment possibilities.¹ We conduct exactly the same experiment at two points in time by using a between-subject design, during the most important day during the Ramadan month and again two months later on a day with no specific religious activity other than regular prayers. We conduct the experiment at Istanbul University, Turkey.

In the standard public goods experiment, each subject is a member of a group consisting of three people. She is endowed with 20 Guilders.² The marginal per capita return (MPCR) from investing in the public good is 0.5. This replicates the features of a public good by creating a conflict between the private optimum to contribute zero and free-ride since $MPCR < 1$ and the social optimum to fully contribute, since $MPCR \cdot n > 1$. The payoff for subject i in the public goods experiment is

$$\pi_i = 20 - c_i + 0.5 \sum_{j=1}^3 c_j, \quad (1)$$

where c is the amount invested in the public good.

In the second public goods experiment, we also include punishment possibilities. Each subject may then punish any other group member(s) if they so wish after they have received information on the contributions to the public good. The unit cost per punishment point is 1 Guilder, which results in a deduction of 3 Guilders for the punished member of the group. A maximum of 10 punishment units can be assigned to any one member of the group. The payoff function for subject i in the public goods experiment with punishment is

$$\pi_i = \max \left(20 - c_i + 0.5 \sum_{j=1}^3 c_j - 3 \sum_{h \neq i} p_{hi}; 0 \right) - \sum_{k \neq i} p_{ik}, \quad (2)$$

where p_{hi} is the deduction as a result of punishment member h 's punishment of member i , and p_{ik} is member i 's cost of punishing member k .

The subjects were also asked about their beliefs on how much they thought others on average had contributed to the public good.

We monetarily incentivize beliefs as follows: when a subject's guess is either exactly right or within 0.5 points of the actual figure, she will earn 20 Guilders, whereas if the estimate is more than 0.5 points off, the subject will earn 10 Guilders divided by the (absolute) distance between her guess and the actual average contribution (e.g. Gächter and Renner, 2010). Our identification strategy to determine a subject's degree of religiosity is based on fasting during Ramadan, which is highly demanding religious activity since it requires strict avoidance of fluids and nourishment from dawn to dusk. We take the extreme case and consider only the subjects who spent the whole Ramadan fasting to have a high degree of religiosity.³ Both experimental sessions were conducted in the early morning to avoid confounded effects of hunger and Ramadan.⁴

3. Results

3.1. Descriptive statistics

In the experiment conducted during Ramadan, 44.4% of the subjects are classified as having a high degree of religiosity, while the figure for the experiment outside Ramadan is 38.9%. The difference is statistically insignificant ($p = 0.450$). Table 1 reports unconditional mean contribution levels, beliefs about others' contributions, and punishment levels. In line with previous public goods experiments, we observe higher average contribution levels when punishment possibilities are available both during Ramadan (7.63 vs. 9.14, $p = 0.010$) and outside Ramadan (9.46 vs. 10.58, $p = 0.054$).

In this paper we investigate the effect of the religious festival and religiosity on cooperation and punishment levels, and our design allows us to disentangle them. First, we investigate the overall effect of religious festivals. The contributions are significantly higher outside Ramadan both without the possibility of punishment (7.63 vs. 9.46, $p = 0.011$) and with the punishment possibility (9.14 vs. 10.58, $p = 0.050$) using a Wilcoxon rank-sum test. The contribution differences between, during, and outside Ramadan are mainly due to changing contribution behavior among subjects with a low degree of religiosity (without punishment 7.42 vs. 10.80, $p = 0.004$, and with punishment 8.56 vs. 11.25, $p = 0.008$), compared with insignificant differences for highly religious people (without punishment 7.90 vs. 7.34, $p = 0.594$, and with punishment 9.88 vs. 9.51, $p = 0.896$).

Second, we investigate whether there is a contribution difference between subjects with a low and high degree of religiosity during and outside the religious festival. During Ramadan, there is an insignificant difference in contributions between the low and high religiosity groups (without punishment possibility 7.42 vs. 7.90, $p = 0.464$, and with punishment possibilities 8.56 vs. 9.88, $p = 0.123$). The contribution levels differ significantly between the low and high religiosity groups outside Ramadan without punishment possibilities (10.80 vs. 7.34, $p = 0.003$). Yet the difference is insignificant when we allow for the punishment possibilities (11.25 vs. 9.51, $p = 0.252$). Thus, the overall results imply that the contribution differences across Ramadan are due to changing contribution behavior of low religious people during and outside Ramadan.

We now turn our attention to the beliefs about others' contributions and punishment points assigned. The beliefs follow the same

¹ The subjects were randomly selected from the list of the Istanbul University Economics Faculty students and invited to the experiment. It was a paper and pen ran experiment in a large lecture hall. Besides the detailed instructions of the experiment, they also solved some questions related to the experiment to ensure that they understood the experiment.

² The experiment is conducted during the period September–November, 2006. 1 Guilder = 0.15 New Turkish Lira (TRY) at the time of the experiments. The average exchange rate at the time of the experiments was 1.45 TRY = 1 USD.

³ 30 days for males and 25 days for females since the latter are exempt from fasting during menstruation.

⁴ Fasting can have important physiological and behavioral effects such as increased aggression and negative mood, forgetfulness, mental idleness, and confusion (e.g. Bialkowski et al., 2012).

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