



The dark side of leadership: An experiment on religious heterogeneity and cooperation in India



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ABSTRACT

We investigate voluntary contribution to public goods in culturally heterogeneous groups with a laboratory experiment conducted among 432 Hindu and Muslim subjects in India. With our specification of 'Leading by example' we test for an interaction effect between leadership and religious heterogeneity in a high stake environment. While cultural diversity does not affect contributions in the standard linear Public Goods Game, it reduces cooperation in the presence of a leader. Furthermore, we show that preferences for conditional cooperation are only prevalent in pure groups. In mixed groups, poor leadership and uncertainty about followers' reciprocity hinders the functionality of leadership as an institutional device to resolve social dilemmas.

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1. Introduction

Ethnic, linguistic, and religious fractionalization has been found to have a negative effect on various outcome variables such as economic growth and political stability (e.g. [Alesina and La Ferrara, 2005](#); [Collier, 2000](#); [Easterly and Levine, 1997](#)). Field experiments in low-income communities show that social heterogeneity is associated, for example, with poorly maintained infrastructure ([Bardhan and Dayton-Johnson, 2002](#)), environmental degradation ([Baland and Platteau, 1996](#)), and more frequent defaults in microcredit-schemes ([Karlan, 2007](#)). While negative diversity effects are mostly absent in high income countries (e.g. [Ottaviano and Peri, 2006](#); [Putnam, 2007](#)), heterogeneity seems to harm development in poor countries (e.g. [Miguel and Gugerty, 2005](#)). The connection is often explained by a lack of cooperation across diverse groups, which causes an inefficient use of productive assets in general and a sub-optimal provision of public goods in particular (e.g. [Alesina et al., 1999](#); [Habyarimana et al., 2007](#)).

Although there seems to be a dependency between fractionalization and cooperation, a causal relationship cannot be explained within the standard framework of economic theory nor found in cross-country, regional, or illustrative quasi-experimental data. In order to fill this explanatory gap, the behavior of individual decision-makers has to be studied in a controlled context. A common way to study voluntary contribution in the laboratory is by using the Public Goods Game (PGG). Prior studies using versions of the PGG compare cooperation levels across countries, yet they mostly consider groups consisting of members of similar cultural background ([Brandts et al., 2004](#); [Henrich et al., 2005](#); [Kocher et al., 2008](#)). Hence, these studies do not offer the opportunity to draw conclusions about the interaction between cultural heterogeneity within groups and the observed level of cooperation. There are exceptions such as [Carpenter and Cardenas \(2011\)](#) who implement an 'intercultural experiment' among Colombian and US American students. However, their experiment uses a Common Pool Resource Game which conceptually differs from the PGG in terms of the existence of multiple (asymmetric) Nash equilibria.

In our specification of the PGG we vary the structure of observed groups with respect to their cultural characteristics. We use religious affiliation as the varying cultural characteristic, as it is a dimension of heterogeneity that operates strongly separating (e.g. [Basu, 2005](#)). Social science emphasizes the role of leadership

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as a natural candidate in facilitating coordination and cooperation within collectives. Hence, leadership may alleviate social dilemma problems caused or strengthened by cultural heterogeneity. Although a considerable body of literature examines the functionality of leadership (for an overview see [Ahlquist and Levi, 2011](#)), the conditions under which leadership meets these expectations are yet to be fully understood. So far, laboratory experiments have focused on the effects of leadership in culturally homogeneous groups (e.g. [Güth et al., 2007](#); [Levati et al., 2007](#); [Moxnes and van der Heijden, 2003](#)). In our experiment we test the efficacy of ‘Leading by example’ to foster voluntary cooperation in religiously heterogeneous groups. In this basic form of leadership within the PGG, a first-mover can induce cooperation by taking a costly effort and revealing his contribution to the remaining group members. Our specification of ‘Leading by example’ allows conclusive interpretations about the interaction between leadership and cultural heterogeneity.

The experiment was conducted in India, where recruited subjects were either Hindu or Muslim. The implementation in India offers three major advantages for experimental testing: First, India is a place to study at low cost, allowing for laboratory experiments with high stakes. Second, polarized stereotyping as well as frequent tensions between religious groups show that religious affiliation in India is a relevant category for social behavior. Both aspects strengthen internal validity. Third, following the demands made by [Henrich et al. \(2010\)](#), not to study exclusively WEIRD (i.e. Western, Educated, Industrialized, Rich, Democratic) people in behavioral experiments, we use a culturally and economically diverse subject pool of Indian students.

Focusing on within-group heterogeneity in a setting where cultural prejudice has to be expected, we contribute to the understanding of the impact of religious diversity on cooperation and the functionality of leadership in a heterogeneous environment. The remainder of the paper is structured as follows: in [Section 2](#) we outline the theoretical background, hypotheses, and prior findings. In [Section 3](#) we describe our experimental design. [Section 4](#) summarizes descriptive results and provides an explanation for the observed effects. [Section 5](#) concludes.

2. Hypotheses

First, we describe the notion of the Public Goods Game. Second, we formulate hypotheses on the effect of heterogeneity on cooperation behavior. Third, we elaborate the effectiveness of ‘Leading by example’ in pure and mixed groups.

2.1. Linear Public Goods Game

The standard PGG represents a dilemma situation where individual incentives and social interest diverge. Cooperation in the PGG can be modeled through the linear voluntary contribution mechanism ([Isaac and Walker, 1988](#)). The payoff Π of individual i is given by

$$\Pi_i = e_i - c_i + \beta \sum_{j=1}^n c_j$$

where e_i is participant i ’s endowment, c_i his contribution, and n the total number of group members. Assuming rationality, common knowledge of rationality, and selfish preferences, subjects would choose $c_i = 0$, whereas $c_i = e_i$ is the social optimum as it maximizes the sum of payoffs for all group members. The utility of the public good – and thus the individual incentive to contribute to its provision – is given by the efficiency factor β . As long as $1/n < \beta < 1$, the game represents a social dilemma and facilitates an experimental test of cooperative behavior between group members.

Experimental research finds cooperation rates of roughly 50% in the PGG (see [Camerer, 2003](#)), which clearly rejects the theoretical expectation of rational defection. The principle of conditional cooperation offers one of the most promising ways to explain pro-social behavior in the PGG (e.g. [Fischbacher et al., 2001](#); [Keser and van Winden, 2000](#); [Sonnemans et al., 1999](#)). One of the main results is that most participants can be categorized as conditional cooperators with a self-serving bias (always giving a little less than what they believe the others will contribute on average). Experimental findings support conditional cooperativeness not only as the prevalent individual preference, but also as the average preference of all participants. In our experiment we consider contribution behavior conditional on the others’ religious affiliation (heterogeneity treatment), as well as contribution behavior reciprocal to a leader’s contribution (leadership treatment).

2.2. Heterogeneity in the Public Goods Game

Experimental evidence as to the effect of heterogeneity on cooperation in the (linear) PGG is conflicting, and explanations of behavior are still inconclusive. [Finocchiaro-Castro \(2008\)](#) compares the behavior of English and Italian students. Using a partner design in a repeated PGG (group members interacting repeatedly with each other) he finds evidence for higher contribution levels in homogeneous than in mixed groups (under common knowledge of others’ nationalities). With a relatively weak heterogeneity treatment (differences in political party preference, Christian denomination, season of birth), [Koopmans and Rebers \(2009\)](#) find stronger conditional cooperation within homogeneous groups in an online PGG conducted among Dutch students. In contrast, [Schündeln \(2013\)](#) examines ethnic heterogeneity in the context of the private provision of public goods in Uganda, using data from a household survey. He provides evidence for contribution levels that are higher in ethnically mixed groups than in pure groups. In a Common Pool Resource Game, [Carpenter and Cardenas \(2011\)](#) find no significant difference between the extraction behavior of Colombian and US American students. However, in mixed groups Colombians (US Americans) tend to extract significantly more (less) than in pure control groups. The balancing of countervailing effects leads to overall extraction rates similar to the ones in pure groups.

A common explanation for negative effects of heterogeneity is weak inter-group cooperation (e.g. [Alesina et al., 1999](#); [Alesina and La Ferrara, 2005](#)). Such in-group favoritism can result from preference-based or strategic discrimination within heterogeneous populations. Preference-led discriminators have a taste for interactions with their own group and a dislike of cooperative exchange with members of other groups ([Becker, 1971](#); [Tajfel, 1982](#)). Strategic in-group favoritism rests on statistical discrimination ([Arrow, 1973](#); [Phelps, 1972](#)), where a partner’s cooperativeness is inferred from observable information (e.g. the partner’s religion). Also, being unsure about the effects of heterogeneity on others’ behavior may disturb cooperativeness. We test the hypothesis:

H1. Heterogeneity reduces the level of cooperation.

In our specification of the PGG, information on the partners’ religious affiliation is signaling group composition, and thus is expected to affect choices. Individuals interacting with an out-group participant (outsider) may be less cooperative in dilemma situations, where avoiding vulnerability and trying to free-ride are dominant strategies.

2.3. Leadership in the Public Goods Game

The concept of ‘Leading by example’ has been introduced to game theory by [Hermalin \(1998\)](#). In his theoretical model a leader

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