

Konda, Bruhan; Dietrich, Stephan; Nillesen, Eleonora

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## Does commonness fill the common fund? Experimental evidence on the role of identity for public good contributions in India

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**Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT)**

email: [info@merit.unu.edu](mailto:info@merit.unu.edu) | website: <http://www.merit.unu.edu>

Boschstraat 24, 6211 AX Maastricht, The Netherlands

Tel: (31) (43) 388 44 00

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# **Does Commonness Fill the Common Fund? Experimental Evidence on the Role of Identity for Public Good Contributions in India<sup>1</sup>**

Bruhan Konda<sup>a</sup>, Stephan Dietrich<sup>a</sup>, and Eleonora Nillesen<sup>a</sup>

<sup>a</sup>*UNU-MERIT; Maastricht University, The Netherlands.*

## **Abstract**

We examine how the type of common identity affects voluntary contribution to public goods in groups that differ in their social image. We conjecture that groups with perceived high-status identity engage in higher levels of collective action compared to groups with perceived low-status identity. We study this using a lab-in-the-field experiment in rural India with members from the top and bottom of the caste hierarchy. Using a 2-person public good game, we empirically test (i) whether a caste gap in contributions emerges when group identities are made salient (ii) whether these differences are driven by the presence of punishment, and (iii) whether exogenously boosting caste identities by a role model prime diminishes the caste gap. Our results show that stereotyped groups fail to act collectively to provide public goods, possibly due to lack of trust towards their own group members. This gap disappears after the role model priming treatment and reaffirms the role of social identity in explaining the difference in contributions between groups that differ in the social image.

**Keywords:** Common identity, Caste, Public goods, Lab-in-the-field experiment

JEL codes: C91, D64, D91, H41

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## **1. Introduction**

Much of society is characterised by the presence of social dilemmas – a situation in which agents face a choice between actions that serve their own (private) benefits and actions that serve collective (social) benefits. Examples for such social dilemmas are abound and range from actions to address global challenges like combating climate change to national tax compliance and also in actions related to the local issues like keeping streets free of litter or farmers management of irrigation channels. These are examples of public goods that characterise an environment congenial to free-riders. Welfare is highest if everyone cooperates, which however can only be achieved if agents are willing to sacrifice their own benefits for the sake of the group. In these settings, social identity is considered an important factor in determining the success of cooperation (Charness et al., 2007; Buchan et al., 2011; Smaldino, 2019). Social identity indicates one's own perception of self, based on his/her membership in a group such as ethnicity or gender (Tajfel, 1970). That is, social identity brings a sense of belongingness to a particular group. An individual's membership in a group shapes beliefs, preferences, and normative behaviour (Shih et al., 1999; Fehr and Hoff, 2011; Benjamin et al., 2016; Cox et al, 2020) and therefore influences the success of collective action. Social identity theory posits that members of a social group are more concerned with welfare of fellow “in-group” members than that of members of the “out-group” (Tajfel et al., 1979; Jackson, 2011). As such, social identity affects behaviour in collective action settings favouring in-group members while having a negative impact on perceptions and behaviour towards members of the out-group (Sherif et al., 1961; Tajfel, 1970; Bicskei et al., 2016; see also Tajfel and Turner, 1986 for a review). It assumes that the group members are motivated by the sense of positive distinctiveness of their groups in comparison to other social groups to which they do not belong. Therefore, social identity can be conducive to increased cooperation through higher degree of team identification, especially if salience of group membership is increased (e.g. Akerlof and Kranton, 2000; Eckel and Grossman, 2005; Chen and Li, 2009; Benjamin et al., 2010; Benjamin et al., 2016).

Does common group identity always ensure higher group cohesion and is it a panacea to improve cooperation among group members? There is now growing evidence that suggests in some contexts, members of certain groups are willing to express a negative emotion

towards their own group and show lack of social capital and are unwilling to perform actions that express social preference. For instance, there is experimental evidence showing a lack of trust among black citizens and first-generation immigrants in the US (Burns, 2006; Eckel and Wilson, 2006; Cox and Orman, 2015) and lower caste members in India (Cox et al., 2020); lack of altruistic motives among black citizens in the US (List and Price, 2009); lower willingness to punish norm violators among lower caste members in India (Hoff et al., 2011). All these studies associate the negative behaviours towards their own group members with the historical discrimination against their social group that constructed a negative social image about their own identity. That is, the identities have a social meaning attached to them (Loury, 2002) which reflects how the members of the groups perceive themselves and behave. This results in a hierarchical structure - the distinction between those groups that carry a negative identity with a lower social status and the groups that carry a positive identity with a higher perceived social status. The subordinate groups in turn internalise those stereotypes and conform to the discriminatory norms thereby reinforcing the social stigma (Bros, 2014).

In this paper, we examine how the type of common identity affects voluntary contribution to a public good (PG) in groups that differ in their social image. We conjecture that groups with perceived high-status identity engage in higher levels of collective action compared to groups with perceived low-status identity. It is important to understand what influences individuals to behave differently based on their shared social group membership. According to self-categorisation theory (Turner, 1985; Turner et al., 1987), every individual is a part of multiple social categories such as gender, caste, religion, etc.. These identities come with a host of associated attributes, stereotypes, and social expectations (Deaux, 1996). In many cultures, contributing to PGs and charities is considered an accepted norm of mainstream societies (Ostrom, 2000). Akerlof and Kranton (2000, 2010) in their proposed neo-classical utility model state that any deviation from such norms of an individual's identity creates disutility.<sup>2</sup> Therefore, someone who identifies positively with his/her group (groups with positive social image) may contribute higher amounts to PGs expecting others to do so, as it

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<sup>2</sup> The utility function is the following:  $U_x = U_x(a_x, a_{-x}, I_x)$ . Thus, utility depends on  $x$ 's identity ( $I_x$ ),  $x$ 's own actions ( $a_x$ ) and the actions of others ( $a_{-x}$ ).

increases their own utility. On the contrary, in groups with perceived negative identity, members are less willing to contribute due to their lack of incentive to improve group's welfare and resulting beliefs that their group members will not contribute. In addition, the efficacy of sanctioning mechanisms may co-vary with specific identities and as such influence differences in cooperation. Generally, it is observed that individuals are willing to sanction the deviant (non-cooperative) members from the out-group more than the in-group members (Bicskei et al., 2016) supporting the popular in-group favouritism paradigm.<sup>3</sup> Conversely, there are studies which show that groups in their attempt to protect and maintain positive identity (Stroebe et al., 2005) punish uncooperative in-group members stronger (McLeish and Oxoby, 2007, 2011). Taken together, we expect a perceived positive identity to be associated with higher contributions and higher punishment from their group members in case of non-cooperation. By contrast, groups with a perceived negative identity do not respond as strongly to the presence of punishment as there is less incentive to inflict punishment on their group members and lower expectations that their group members will inflict punishment on them. Overall, concerns about the group's welfare and second order effects on expected cooperation and punishment behaviour could explain the differences in PG contributions between groups that differ in their social image.

Since we expect a possible difference in behaviour to be attributed to differences in the perceived image associated with social identity of groups, one could ask: does improving the perceived image of low status groups increase cooperation? The context influences how individuals evaluate their choices and therefore, their preferences (Fehr and Krajbich, 2014). That is, an individual's behaviour is not only determined by the membership in a particular group, but also by the setting in which the groups are presented. For instance, Hoff and Pandey (2014), in their study with high and low caste students in India, found that the social setting influences intellectual performance, suggesting that preferences depend on the context and frame. Further, Vecchi and Zelinsky (2016) have shown that reminding Roma children of their ethnicity reduces their cognitive task performance, whereas priming them with role models improves performance. Similarly, Marx et al (2009) showed the positive impact of a role model on the academic performance of Black-Americans ("Obama effect").

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<sup>3</sup> See Balliet et al. (2014) for a meta-analytic review on in-group favoritism in cooperation.

These studies provide evidence in support of the possibility of breaking one's negative stereotype by priming them using ingroup role models. Therefore, we expect that presenting one's identity in a positive context (positive collective identity) could improve their cooperative behaviour (in line with the social identity theory), especially for low status groups. We examine this by priming the individuals positively with role models (Pleiss and Feldhusen, 1995; Marx et al., 2009) from members of their own caste. Priming<sup>4</sup> will help support the idea that social identity is the causal factor determining differences in cooperative behaviour between groups.

Our paper focuses on collective action among caste groups in India that have occupied the top and bottom of the caste hierarchy and therefore, are differentiated by their social status. Caste in contemporary India is still a major determinant of social identity especially in rural areas (Bros, 2014). The high and low status members come from General Castes (GC) and Scheduled Castes (SC) respectively. GC are known to dominate SC for centuries with their ability to enforce social norms favourable to them (Hoff, 2010). It has resulted in oppression, marginalisation, and discrimination against SC. GC therefore command social superiority due to their dominance and SC are transformed into socially weaker groups and exhibit submissive behaviour because of an oppressive social regime. Most villages in India are mixed in their caste composition, but members of upper and lower caste ranks generally live in different hamlets and follow endogamy resulting in limited interactions across castes that generates cultural differences.<sup>5</sup> Given the stark differences in their status-based identities, they are often associated with different qualities and stereotypes. GC are generally believed to be associated with positive attributes like honesty, wisdom, intelligence, and morality while SC are associated with negative qualities such as impurity, immorality, and incompetence (Deshpande, 2010). In addition, some experimental evidence shows differences in behaviour of GC and SC that can be attributed to their perceived social status (punishment - Hoff et al., 2011; trust - Cox et al., 2020).

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<sup>4</sup> In this paper, the use of the term 'priming' indicates positive-identity (role model) priming.

<sup>5</sup> "Culture as a matter of self-conscious orientation or identity is not a set of values or preferences, but instead a fragmented set of mental models, understandings, worldviews, and guides to action, and these elements may not be consistent" (Swidler, 1986, 2001; DiMaggio, 1997, as in Hoff and Pandey, 2014).



We examine the role of social identity in PGs provision by employing a 2-player one-shot PG game in a real-life setting, where members of GC and SC groups from rural India participated. 648 male and female participants came from 26 villages of Uttar Pradesh, one of the states in India that is known for the presence of strong caste-based discrimination. Thereby, we specifically test (i) whether the difference in contribution behaviour of caste groups emerges when their identities are made salient (ii) whether such differences are driven by the presence of punishment, and (iii) whether exogenously enhancing the strength of caste identities using a role model priming treatment diminishes differences between groups.

While there is a plethora of studies on understanding in-group out-group duality (with a focus on in-group bias), there is a dearth of studies focusing on behavioural differences between in-groups with differential social image. Most studies on understanding in-group behaviour on the basis of social significance of identities focused on the effect of stereotype threat/boost on academic performance (Steele and Aronson, 1995; Shih et al., 1999; Hoff and Pandey, 2014; Vecchi and Zelinsky, 2016) and very few studies dealt with economic decision making in a PG setting and in the context of giving, involving real-life groups (Liu et al., 2014; Li et al., 2017; Cox et al., 2020). However, these studies did not comprehensively examine the role of identity as a causal factor in explaining the behavioural differences between two groups. Our study extends this literature by examining how the differences in social status based identities influence real-life groups to achieve cooperation. Compared to other social psychology and behavioural economics studies that highlight the positive influence of a shared identity, we provide a comprehensive view by accounting for the social context in which groups exist. That is, we account for the effects of both positive and negative images of social identities. Further, attributing behavioural differences to social identity is challenging as there could be observed differences between groups and unobserved confounders that can influence the experimental outcomes. We address this by including anonymous and positive-identity (role model) priming treatments along with other econometric techniques that helps us to mitigate concerns about these confounding effects. Overall, our study provides an understanding of the role of the social context that leads to differential behaviour of individuals pertaining to groups of different perceived social status.

Our results show that contributions to a PG are influenced by the caste identity of participants. In particular, it demonstrates the distinct effects of types of common identity, wherein the contributions are significantly higher among GC compared to SC groups. The investigation on the effect pathways suggests that the gap in contributions between caste groups is driven by differences in their social image which shapes expectations on group behaviour, that in turn affects contributions.

The rest of the paper is organised as follows. Section 2 presents the experimental set-up and the context. Section 3 describes the main results. Section 4 presents the robustness checks. Section 5 discusses the findings and Section 6 concludes.

## 2. Experimental design

We designed a lab-in-the-field PG experiment to investigate how differences in social image between two groups carrying different common identities influences individual decisions to contribute to the PG. The experiment was administered in two waves.<sup>6</sup> Both waves of experiments were conducted in the same region but different villages of Uttar Pradesh state, India. The first wave was administered in April-June 2017 and the second wave in August 2019. In the following, we outline the design and procedures of the experiment conducted in the first wave. We introduce the second wave in Section 4.

### 2.1. Two-person one-shot PG game

In our PG game two participants A and B form a group. Each participant is endowed ( $E$ ) with INR250 which has to be allocated between a private and a public account. The participants can independently choose to contribute any of the following amounts  $c_i \in [0, E]$  viz., 0, 50, 100, 150, 200 or 250 to the PG where  $i = 1, 2$  indexes participants. Each participant gets his/her share ( $\alpha_i \sum_{i=1}^2 C_i$ ) from the total amount contributed by the group to the PG. The total returns from the PG game are always  $\sum \alpha = 1.5$ . For purposes of another research project, marginal returns ( $\alpha_i$ ) vary between groups in half of our sessions, but these treatments are

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<sup>6</sup> In the first wave we carried out the anonymous and revealed identity treatments and in the second wave we added positive-identity priming treatments while keeping the basic design of the game identical.

orthogonal to the treatments used in the present study.<sup>7</sup> We pool across return types in all our estimations. Participants are informed about their own and their partner's returns type. In our experimental setting, both participants come from different villages, and they play the game privately with the enumerator in their respective villages. Participants are not provided with any information about the village names of their partners. Their decisions are anonymously matched to obtain the final payoff.

### *Treatments*

The experiment consists of within and between subject treatments. [Table 1](#) provides an overview of the treatments. We have two treatment arms: Identity treatments and punishment treatments. Identity treatments include the treatments in which we did not reveal ( $T_1$  and  $T_3$ ) or revealed ( $T_2$  and  $T_4$ ) the caste identity of the matched partner. Among the revealed identity treatments, we have two groups that either comprise of two GC or two SC participants – hence we only consider groups that are homogeneous in their caste identity. In the next subsection, we discuss the procedure followed to reveal the matched partner's identity. Punishment treatments include the treatments without ( $T_1$  and  $T_2$ ) and with punishment ( $T_3$  and  $T_4$ ). Among our treatments, identity treatments are between-subject treatments and punishment treatment is a within-subject treatment. Therefore, all participants played two games: with and without punishment.

*Table 1: Treatment conditions*

Treatments (T)	No Punishment	With Punishment
Identity – Not revealed (n=120)	$T_1$	$T_3$
Identity – Revealed (n=390)	$T_2$	$T_4$

**Notes:** Number of participants in each treatment condition in brackets.

### **2.2.Identity: between-subject treatment**

We have two between-subject treatments based on identity – revealed identity treatment and anonymous treatment. Our identity treatment consists of using last names as the means

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<sup>7</sup> The heterogeneous marginal return treatment was actually designed for another study where we analyse the role of unequal benefits on PG provision in unequal communities. In groups with equal marginal returns, both participants get  $\alpha_i = 0.75$  whereas in groups with unequal marginal returns one of the participants received higher marginal returns ( $\alpha_i = 0.9$ ) and the other receives low ( $\alpha_i = 0.6$ ).

to convey the caste of the partners. This method is inspired by Hoff et al. (2011) where the fictitious first and last names are presented to the participants in which the last names allow them to implicitly infer the caste rank of the matched partner. In particular, the last names indicate the “specific caste” an individual belongs to. In the Indian caste system, an individual is always born into a specific caste and these specific castes are grouped into certain categories based on their social status (based on traditional caste hierarchy) representing the caste ranks. Therefore, an individual’s specific caste indicates his/her status based on the caste rank to which they belong. All specific castes that belong to a particular caste rank (for example GC) hold a similar perceived social status. In our experiment, we always matched participants of two different specific castes within the same caste rank. The focus of our study is at the level of caste rank and therefore, the mention of the term caste in this paper indicates its rank (vertical differentiator) but not specific caste. We focus at the level of caste ranks because there is no difference in the perceived social status (social image) of specific castes at the same level (rank).<sup>8</sup>

We used a set of four fictitious last names as a less intrusive method to convey caste information of the partner. While many studies on social identities provide information on the identities by directly mentioning the names of those identities, we chose the indirect method to avoid any potential conflicts, as caste is a politically sensitive subject in India. The last names were selected based on our discussions with GC and SC members and village heads during the pilot survey.<sup>9</sup> Once participants entered the experiment site, both enumerators and participants informally introduced themselves by shaking their hands and exchanging their names<sup>10</sup> through which we would identify the participant’s caste.<sup>11</sup> We follow Hoff et al. (2011) in using fictitious names that involves some form of minor deception

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<sup>8</sup> Using data from another round of experiment we test if participants behave similarly between same specific caste matching and matching at the level of caste-rank. Our results between different types of caste matching are comparable.

<sup>9</sup> From the pilot survey, we gathered some common last names that were mostly indicating the caste of participants. We tested the use of last names in the pilot experiment and asked all participants in the end whether it reflects anything in their mind. Almost all participants responded with the name of the caste that last name was indicating.

<sup>10</sup> We asked enumerators not to reveal their last names while introducing themselves to the participants to avoid potential experimenter demand effect.

<sup>11</sup> In some cases where it was difficult or impossible to identify the caste of the participant, the enumerators directly asked the participants for the name of the caste they belong.

– i.e. participants were devoid of information about the true name of their partners. As Hoff et al. (2011), we believe this is harmless and common in these types of experiments. However, it enables us to avoid the potential adverse effects and high costs of revealing the participants' true identity.<sup>12</sup> The anonymous matching treatment serves as a control treatment wherein participants do not learn about the caste of their partner. That is, participants get to know only the fictitious first name of their partners but not the last name that would implicitly reveal the caste. Given our experiment involves both male and female participants, we restricted our matching to the same gender (i.e., male-male; female-female) to avoid potential confounding effects.

### ***2.3.Punishment: within subject treatment***

Participants in both identity treatments played two one-shot games – one with and one without the opportunity to punish the other participant. In the game with punishment, participants were allowed to decide whether, and by how much to reduce the income of the partner after making their contribution decisions. To do so, they assigned a number of 5-rupee coins from a total of 12 coins given to them as part of their endowment.<sup>13</sup> Assigning punishment is costly for both punishing and punished parties. Each 5-rupee coin spent by the punisher reduces the income of the partner by INR20. We randomly varied whether participants could punish in the first or second game. We used peer punishment/second-party punishment, as this allows us to observe the behaviour of GC and SC participants in a voluntary cooperation environment that does not involve any formal entities. We used a strategy method for the punishment stage, i.e., a participant had to indicate how many coins he/she wants to punish for every possible contribution amount by his/her partner. The choice for the strategy method is pragmatic as the participants were located in different villages and unable to learn about the action of the other.<sup>14</sup> The assignment of the type of

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<sup>12</sup> Since our experiment involves the use of social hierarchy based on caste differences, we took great care in addressing ethical challenges. Firstly, we ensured that participants will never know the real identity of the matched partner. Secondly, we made caste identity less salient using a less intrusive method to avoid any potential experimenter demand effects and because caste is a politically sensitive issue.

<sup>13</sup> The reason for using maximum of 12 coins is that any participant who use all 12 coins ( $12 \times 20 = 240$ ) can reduce his/her partner's income close to zero ( $250 - 240 = 10$ ).

<sup>14</sup> Brandts and Charness (2011) exhibit that most studies find no difference between the results obtained from the strategy method vis-a-vis real-time responses. But strategy method has the advantage of having higher statistical power (Fehr and Fischbacher, 2004).

identity treatment and marginal return type for the participants remained the same in both games. The payoff function for the punishment treatment is therefore as follows.

$$\pi_i = E - C_i + \alpha_i \sum_{i=A}^B C_i - 20p_{BA} - 5p_{AB} \quad (1)$$

Where  $p_{BA}$  denotes the number of units of punishment given to participant A by participant B and  $p_{AB}$  denotes the number of units of punishment given by participant A to participant B.

#### ***2.4. Payoff***

Each experimental session lasted for about 90 minutes which was followed by a short survey to collect information on demographic and socio-economic characteristics. Afterwards we thanked participants and they received a show-up fee of INR100. Participants were informed that the payoff from the game would be paid only after 3-4 days as we needed to conduct experiments in other villages to match their decisions. Payoffs were paid in private to the participants in their own village. We randomly selected one of the two games to make the payouts. The average experimental earning was about INR274, in addition to the participation fee of INR100. The maximum payoff that one could earn was INR475 and the minimum could be negative due to punishment. Participants were told that in the case of negative payoffs we would set them to zero, however this did not happen in practice. Given a typical daily wage of INR250 in the region for non-skilled labour, we believe that we provided a salient incentive for participating in our experiments.

#### ***2.5. Sample selection***

We conducted our experiment in 22 villages within the Ram-Ganga sub-basin of Rampur district, that are home to both castes. The recruitment of participants was done through announcing our research activities using loudspeakers and by distributing pamphlets written in Hindi. In a household, a maximum of one member who is above 18 years could participate. Our participants come from Brahmin, Thakur, Saxena, and Gupta General Castes, and Jatav, Valmiki, and Dhobi Scheduled Castes. All experimental activities were conducted in caste-neutral venues such as schools and administrative buildings with prior permission from the administrative authorities. We conducted 5 to 7 experimental sessions per village.

In every experimental session, we could run games with a maximum of 6 participants in parallel owing to limited number of rooms and enumerators. To do so, we recruited up to 12 participants per session and randomly selected 6 from them after giving plenary instructions about the experiment. The other six acted as a reserve for that session. Afterwards, each participant was randomly assigned to an enumerator who explained the game in detail. Participants had to answer several control questions to ensure their understanding of the experiment. Only after the participant answered all the questions correctly, enumerators started the experiment. Those who failed the test were replaced by a randomly selected reserve. We obtained written informed consent from all participants.

## ***2.6. Sample characteristics***

Table 2 reports the demographic characteristics of participants by treatment in panel A, and by caste in panel B. In panel A we compare demographics between anonymous (T<sub>1</sub> and T<sub>3</sub>) and revealed identity groups (T<sub>2</sub> and T<sub>4</sub>). Mann-Whitney tests show that for most of the characteristics, both control and treatment groups are balanced except for gender. Overall, we see a higher participation of male than female members, due to the local norms which hinder women from participating in public activities. We re-run our main analysis by only including observations of male participants to test if the imbalance of gender composition has any effect on our outcomes. We discuss this in Section 4. Panel B shows differences in characteristics between GC and SC participants, which shows several statistically significant differences between them. Even though our treatment allocation is independent of these differences, it is an important concern as such differences can confound treatment effects when we compare the experiment behaviour between GC and SC groups. We address this by re-analysing our experiment data only for a matched sample of GC and SC and discuss the results in Section 4. Apart from matching, we also employ different strategies including role model priming, anonymous treatments, and difference-in-difference estimations to single out the identity effects.

Table 2: Balance test across treatments and castes for important socio-economic factors

Variables	Panel A			Panel B		
	Identity treatment			Caste		
	Anonymous (n=120)	Revealed identity (n=390)	Mann- Whitney test <sup>3</sup> (p value)	General caste (n=200)	Scheduled caste (n=310)	Mann- Whitney test <sup>4</sup> (p value)
<b>Age<sup>1</sup></b>	3.31 (1.21)	3.34 (1.53)	0.71	3.71 (1.48)	3.09 (1.39)	0.00
<b>Family size</b>	6.40 (2.58)	6.50 (2.88)	0.93	6.14 (3.02)	6.69 (2.65)	0.00
<b>Gender</b> (Male=1)	0.96 (0.20)	0.82 (0.38)	0.00	0.86 (0.34)	0.84 (0.36)	0.54
<b>Marital status</b> (Married=1)	0.89 (0.31)	0.85 (0.35)	0.30	0.88 (0.32)	0.85 (0.36)	0.24
<b>Annual income<sup>2</sup></b>	4.24 (2.77)	4.36 (2.85)	0.79	5.30 (3.12)	3.71 (2.42)	0.00
<b>Land area (acre)</b>	1.01 (1.78)	1.31 (2.25)	0.17	2.04 (3.08)	0.72 (0.90)	0.00
<b>Education (years)</b>	6.66 (5.41)	6.00 (5.14)	0.29	8.49 (5.07)	4.64 (4.72)	0.00
<b>House type</b> (Brick house=1)	0.55 (0.50)	0.50 (0.50)	0.31	0.67 (0.47)	0.41 (0.49)	0.00

**Notes:** Numbers in parenthesis display standard deviations. <sup>1</sup>Age categories in years are 18to20=1, 21to30=2, 31to40=3,...,Above 90=9.

<sup>2</sup>Annual income categories are Below INR12000=1, INR12001to20000=2, INR20001to30000=3, INR30001to40000=4,...,Above INR100000=11. <sup>3</sup>Comparing socio-economic variables across identity treatment. <sup>4</sup>Comparing socio-economic variables across caste.

### 3. Results

We start by comparing the behaviour of participants across different treatments and caste groups. The summary of PG contributions across different treatments is presented in [Table 3](#). Panel A and Panel B illustrate contributions without and with punishment respectively. Overall, contributions are about 50 percent higher in the presence of punishment (Kruskal-Wallis test;  $p=0.00$ ). The average contribution without punishment is less than what is normally found in the literature for lab experiments which is 40-50% of the endowments (Choudhury, 2011). However, the contributions are known to vary in field experiments due to contextual factors (Ostrom, 2000). Comparing contributions by identity treatments shows that contributions have changed when identities are revealed as compared to the anonymous treatment. The difference is moderately significant for GC in the presence of punishment. It is also important to note the difference in the direction of change where GC has always increased their contributions under revealed identity, whereas SC has reduced contributions irrespective of the presence of punishment. The different contribution behaviour points out at the role of their identity.



*Table 3: Summary of contributions (in INR) by treatment*

Treatments	Panel A: Without Punishment		Panel B: With Punishment		Kruskal-Wallis test <sup>a</sup> (p value)
	GC	SC	GC	SC	
Identity – Not revealed	63.33 (30.90)	65.33 (36.74)	97.78 (46.41)	104.67 (50.79)	0.00
Identity – Revealed	69.03 (40.00)	60.85 (36.39)	113.87 (52.70)	98.72 (49.12)	
Mann-Whitney test <sup>b</sup> (p value)	0.37	0.13	0.06	0.47	

**Notes:** Numbers in parenthesis display standard deviations. <sup>a</sup>Comparing the change in contributions by the presence of punishment (pooling identity treatments and castes). <sup>b</sup>Comparing the change in contributions by the identity treatment.

Similarly, [Table 4](#) compares the amount of punishment by identity treatments for GC and SC. Punishment (number of coins punished) is significantly higher in the identity revealed group only for the general castes (Mann-Whitney test:  $p=0.00$ ). The summary from [Table 3](#) and [Table 4](#) suggest punishment leads to higher contributions by GC when the identities are revealed.

*Table 4: Summary of punishment by treatment*

Treatments	GC	SC
Identity – Not revealed	1.47 (2.38)	1.78 (2.30)
Identity – Revealed	2.05 (2.85)	1.96 (2.63)
Mann-Whitney test <sup>1</sup> (p value)	0.00	0.66

**Notes:** Numbers in parentheses display standard deviations. <sup>1</sup>Comparing the level of punishment across identity treatment.

In the following sub-sections, we detail the empirical strategy to test (i) whether differences in PG contribution behaviour of caste groups emerges when their identities are made salient (ii) whether differences are driven by the presence of punishment mechanisms, and (iii) whether caste groups differ in their actual punishment behaviour.

To enhance the readability of results, we report conditional predictions and marginal differences to describe differences between groups in the main text and refer to the Annex for complete regression outputs. In all regression models we control for a set of socio-economic factors including education, age, gender, land area, house type, family size, and marital status along with village, enumerator, and order fixed effects. We use standard OLS

for the regression and our results are robust to using other estimators that account for the discrete nature of the dependent variables.

### ***3.1.PG contributions under anonymity***

To systematically evaluate whether identities influence contribution behaviour, we begin our analysis by testing if there exists any systematic difference in the behaviour of GC and SC. We perform this by comparing the PG contributions of GC and SC participants when matched anonymously.

We regress PG contributions  $C$  of participant  $i$  on a binary variable *General Caste* indicating whether participant  $i$  belonged to GC or not. We also control for the presence of punishment, type of marginal returns, and a vector of individual characteristics  $Z$  which may have an effect on experiment behaviour. The regression model can be formulated as follows:

$$C_i = \alpha + \beta \text{General Caste}_i + kZ_i + u_i \quad (2)$$

Since our premise is that caste identity influences contribution behaviour, we expect no difference between participants' behaviour when the partner's identity is not revealed. [Table 5](#) shows the conditional difference in PG contributions between GC and SC when matched anonymously. The numbers in bold show the predicted contributions for GC and the numbers to the right indicate predicted marginal differences if they are SC participants, holding all else constant at the mean. We first run the regression on the pooled sample (pooled for treatments with and without punishment), and thereafter on the sub-sample of treatments without and with punishment respectively. Results for the pooled sample (panel A) shows that GC contributed about INR74 and not significantly different from that of SC in anonymous groups. Segregating the sample by punishment (panel B and panel C) yields similar results of no significant difference in contribution between groups.

Table 5: Margins for contributions (in INR) in anonymous groups

Caste matching	Predicted contributions	Marginal difference
		SC
Panel A: Pooled (n=240)		
GC	74.54	14.06 (21.48)
Panel B: No punishment (n=120)		
GC	62.24	3.75 (27.72)
Panel C: With punishment (n=120)		
GC	86.85	24.37 (35.82)

**Notes:** Refer to [Table A1](#) for the regression output. \*\*\*, \*\*, and \* indicate the significance at 1%, 5%, and 10% respectively. Numbers in parentheses display standard errors.

The results suggest that the contribution behaviour of both GC and SC is comparable in cases where the identity of the matched partner was unknown. Although this result is an indication that there is no underlying difference in the contribution behaviour between GC and SC, it is not sufficient to conclude that there are no unobserved confounders in our analysis. For that we present additional support using some more experimental and econometric measures in Section 4.

### 3.2.PG Contributions in identity-revealed homogeneous caste groups

In the next step we analyse PG contributions of GC and SC groups when caste identities are revealed. We do this to examine if revealing the caste identity of partners changes the behaviour of GC and SC differently due to differences in their caste identity. To test this, we employ an estimation strategy similar to equation 2 but to the sample of revealed identity treatments. Therefore, in the estimation model for contribution  $C$  of an individual  $i$ , we control whether participants of the matched group are from the GC (*General caste* = 1) along with the presence of punishment, type of marginal returns, and a vector of individual characteristics  $Z$ . The regression model is the following:

$$C_i = \alpha + \beta \text{General Caste}_i + kZ_i + u_i \quad (3)$$

The difference in contributions between GC and SC is given by the coefficient  $\beta$ . [Table 6](#) presents the predicted contributions of participants in GC groups and the predicted marginal

difference if the participant is from a SC group. We first run the regression on the pooled sample (pooling with and without punishment), and thereafter on the sub-sample of treatments without and with punishment.

Table 6: Margins for contributions (in INR) in revealed homogeneous caste groups

Caste matching	Predicted contributions	Marginal difference
		SC
Panel A: Pooled (n=780)		
GC	96.83	-20.59*** (5.62)
Panel B: No punishment (n=390)		
GC	73.95	-16.34** (7.47)
Panel C: With punishment (n=390)		
GC	119.71	-24.84*** (8.50)

**Notes:** Refer to [Table A2](#) for the regression output. \*\*\*, \*\*, and \* indicate the significance at 1%, 5%, and 10% respectively. Numbers in parentheses display standard errors.

As expected, our results show significantly higher PG contributions among homogeneous GC groups compared to homogeneous SC groups. On average, the model (pooled) suggests that PG contributions of GC participants is about INR20 (8% of endowment) higher than that of SC. Results from the estimations segregated by punishment also show a similar pattern. GC participants' contribution is higher irrespective of the presence of punishment.<sup>15</sup>

The difference in contributions between GC and SC groups persists even in the absence of punishment. Therefore, to examine if the presence of punishment has any significant role in influencing the difference in behaviour among those caste groups, we analyse the difference in difference of contributions between GC and SC groups across punishment by including an interaction term for GC and presence of punishment (Regression 3, Table A2). The F-test for the difference-in-differences of PG contributions shows that the difference is not significant (F=1.27; p=0.26) and we fail to reject the hypothesis that the differences in contributions

<sup>15</sup> We also run a regression by combining equations 2 and 3 and therefore, by adding an interaction term. The equation becomes  $C_i = \alpha + \beta General\ Caste_i + \gamma Revealed_i + \delta General\ Caste_i * Revealed_i + kZ_i + u_i$ . We found similar results. This is done to test if our results hold after adding the slope into the equation.

with and without punishment are the same. That is, we do not find support that the gap in contributions between GC and SC increases in treatments with punishment.

### 3.3. Punishment behaviour and caste differences

In this section, we examine if there exist differences in the actual punishment behaviour between GC and SC. We test this by regressing the amount of punishment  $P$  (number of coins) of participant  $i$  on a binary variable indicating whether  $i$  belongs to a *general caste* or not. In addition, we control for participants' own contributions to the PG, marginal returns to the PG, and a vector of control variables. The regression model can be formulated as follows:

$$P_i = \alpha + \beta \text{General Caste}_i + kZ_i + u_i \quad (4)$$

We expect GC to exhibit higher levels of punishment compared to SC given their strong in-group identity. Table 7 shows the predictions and marginal differences based on the estimation model 4. The numbers in bold show the predicted punishment for the GC group holding all else constant at the mean. The number to the right indicates the marginal difference for the SC. The results suggest that GC participants invested about 2.32 coins to punish their matched partner, which is 0.55 coins more compared to SC participants. The difference is borderline significant at the 10% level. This result indicate that GC inflicted slightly higher levels of punishment on their in-group members. Thus, while the threat of punishment does not increase or reduce the gap between GC and SC contributions relative to a non-punishment regime, actual levels of punishment are slightly higher among GC.

Table 7: Margins for punishment in revealed homogeneous caste groups

Caste matching (n=2340)	Predicted punishment	Marginal difference
		SC
GC	<b>2.32</b>	-0.55* (0.33)

**Notes:** Refer to Table A3 for the regression output. \*\*\*, \*\*, and \* indicate the significance at 1%, 5%, and 10% respectively. Numbers in parentheses display standard errors.

## 4. Robustness check

The results above suggest that social identity may play a role in explaining the difference between the two caste groups who differ in their social image. However, given that both caste groups display various socio-economic differences, there could possibly be some

unobserved confounders that influence their behaviour. To reduce concerns that our results are driven by other confounders we perform several robustness tests.

#### ***4.1. Positive-identity priming***

To ensure the role of differences in social image, particularly, the negative image attached with the identity of SC as the causal factor for difference in contribution between groups, we ran a treatment with a priming strategy (Lockwood et al., 2002; Dijksterhuis et al., 2007). That is, we conducted another PG experiment which is similar in design to our first wave with a positive-identity priming treatment. We call this the second wave of our experiment.

We test whether exogenously enhancing the strength of caste identities using role models affects behaviour in the experiment. With the priming treatment we seek to exogenously vary the perceived collective image of both GC and SC participants. It helps us to support the idea that identity is the underlying mechanism explaining the differences in behaviour between anonymous and revealed-identity treatments. Participants who were randomly chosen for a priming treatment were briefed with success stories of 4 role models from their caste group before they received instructions about the PG game. In the control groups participants did not get any role model briefing before the PG game. In both treatment groups the caste identity of the partner was revealed and therefore the control group here is a revealed-identity group similar to the one in our first wave.

To cover a broad group of role models we selected popular male and female role models (2 male and 2 female role models from each caste) who come from different walks of life (see Annex [A11](#) and [A12](#) for more details). This selection was done after consultation with participants during the pilot survey. We avoided using the role models who have strong political backgrounds as it would confound the effects of priming. During the priming it was mentioned whether the role model belongs to GC or SC. We expect priming to promote a positive image about both GC and SC's collective identities leading to higher contributions to the PG compared to non-primed participants. More importantly, we expect the caste gap in contributions to diminish as priming would influence the SC to contribute relatively more than the GC. That is, we expect that the role models are less likely to improve on GCs collective image as they already carry a positive social identity. On the other hand, SC are

attached with negative stereotypes and thereby diminished social image, and therefore the positive-identity priming may infuse higher positivity (therefore higher contributions) for them compared to the GC. Further, for both primed and non-primed participants we collected information on their expectations about the contribution of their partners.<sup>16</sup> This information helps to understand the pathway through which identity affects behaviour.

We estimate the effect of priming on the change in contributions between caste groups using a linear regression. The estimation procedure is described in Annex A12. Importantly, the impact of priming is determined by taking the difference in differences of contributions between GC and SC across the priming treatment. Difference-in-differences help us to cancel out possible time-invariant unobserved confounders. The results are presented in Table A9 in the Annex. Our results shows that although contribution has increased among GC and SC after priming (GC:  $p < 0.1$ ; SC:  $p < 0.01$ ), there is a moderately significant reduction in difference between caste groups. That is, the gap between GC and SC has become somewhat smaller after priming compared to treatments without priming. These results point in the direction of social identity underlying the difference in PG contributions.<sup>17</sup>

## ***4.2. Matching***

We also use matching to reduce concerns that our results are influenced by confounders due to the existing socio-economic differences between GC and SC. To test if our results are robust, we re-run our main analysis on a matched sample that has less variability in covariates between GC and SC. To do matching we use Coarsened Exact Matching technique (Blackwell et al., 2009; Iacus et al., 2011) that ensures balance between groups for pre-treatment differences across control variables. The procedure is described in Annex A2. The

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<sup>16</sup> We collected this information from every participant just before the contribution decision is made. The following question is used to elicit the expectations: What do you think your partner (name) would contribute to the PG? We elicited the expectations without providing any incentives.

<sup>17</sup> To confirm that our priming indeed boosted identity (social image), we compared the differences in the level of self-esteem/self-image between GC and SC for both primed and non-primed groups. While GC exhibited higher self-esteem than SC in non-primed groups, the difference reduced by half in the primed groups with GC still scoring significantly high in self-esteem. The difference in difference of self-esteem score between GC and SC across priming is however non-significant. We believe it is because self-esteem is partly determined by some personal attributes that cannot be influenced through our priming.

regression output is presented in [Table A10](#) of the Annex. Our results after matching are very similar (both qualitatively and in significance) to the main results and therefore, shows that the observed socio-economic differences did not affect our results.

Another important socio-economic difference we highlighted from the panel A of [Table 2](#) is the imbalance of gender between anonymous and caste revealed groups. We test if such imbalance has caused any influence on our results by re-running our regressions on anonymous and identity revealed groups only with samples of male participants. The results for male participants (not presented here) were no different from that of the full sample analysis.

We also reproduce our results by following a tobit model as our contribution and punishment variables are censored at zero. The results from the tobit model (not presented here) are similar to our main results both qualitatively and quantitatively.

## **5. Discussion**

We investigate the role of social status/social-image differences between two groups with different common caste identities on PG contributions. Irrespective of one's identity, for a self-interested individual the dominant strategy is always to free ride in situations facing social dilemmas. However, the vast majority of the literature on in-group-out-group differences concedes that the presence of common identity results in higher levels of cooperation (Miller et al., 1998; de Cremer and van Vugt, 1999; Eckel and Grossman, 2005; Buchan et al., 2011). Our findings provide evidence for the presence of differential effects of common identity on contributions to the PG based on the perceived social status of groups. That is, when the caste identity is made salient, the contributions significantly differed between the two different caste groups. We found participants of high perceived status caste groups (GC) to contribute significantly more than the participants of the low perceived status caste group (SC).

Why did participants from different castes behave differently? Our inquiry into the role of punishment showed that overall contributions increased across caste groups in the presence of punishment, but it did not influence the difference in contributions between caste groups.



However, the comparison of actual punishment behaviour showed a moderately significant difference between the groups with GC punishing higher than the SC. Our results are in line with other experimental studies, which demonstrated that GCs generally punish higher than the SCs irrespective of the caste of the matched partner (Hoff et al., 2011). The higher willingness to punish participants from their own caste group while contributing higher may indicate the following. First, the higher punishment by GC possibly indicates their concerns for the perceived identity-threat because GCs consider norm violations by their own group members as a threat to their high-status caste identity. Sankaran et al. (2017) called such behaviour of higher willingness to sanction norm violators or “perpetrators” from their in-groups as “black-sheep effect” and showed that this behaviour is present among GC members. Given that our results are based on one-shot games, we can rule out the possibility of their intentions to improve experimental welfare through the threat due to actual punishment. Second, higher contributions in one-shot game may indicate GCs higher concerns for the group’s welfare compared to SCs.

When the caste identity of the partner is revealed, it provides a focal point based on the shared identity. That is, it might trigger the perceptions of participants based on the historical experiences with their communities. Remember that we collected information on the expectations about the partner’s contributions to the PG from all participants during our second wave. We presume that there exists a difference in expectations among GC and SC participants due to differences in the social image attached to their identity. Such differences could drive their contributions in one-shot PG games given the interdependence between the participants’ decisions and absence of feedback information about partner’s behaviour. Therefore, we test if expectations are different between caste groups by comparing the expected contributions between GC and SC participants following an estimation strategy that is similar to equation 3 but for the expected contributions of the matched partner. The estimation results from the pooled sample (pooling with and without punishment) in [Table A6](#) in the Annex shows that the GC participants expected significantly higher contributions from their partners compared to SC of about INR46. This indicates that the difference in expectations about the contributions between GC and SC groups is an important underlying mechanism that could explain the difference in actual contributions between the caste

groups. The expectations of contributions among the participants also reflect the level of trust among group members. For instance, Benjamin et al. (2016) in their study on the effect of religious salience on economic behaviour found that Catholics decreased contributions to PGs in their own group when religion is made salient due to their reduced level of trust as measured by expected contributions. A recent experimental study conducted in India showed GCs exhibiting a moderately higher level of trust compared to SCs (Cox et al., 2020). These results are in line with our findings and therefore suggest that expectation on the behaviour of others is an important channel that explains the differences in PG contributions between groups that differ in the type of common identities.

While our results are consistent with the argument that caste groups form different expectations based on the social image attached to their identities, which in turn is related to their level of contributions, we cannot rule out another potential alternative explanation. That is, the differential contributions of both caste groups could also be explained by the differences in their altruistic behaviour towards their group members. Though our experimental design does not allow us to directly measure altruism, we can indirectly infer it through our results from the actual punishment behaviour. Given that the punishment is costly, a moderately higher punishment from GC compared to SC indicates that GC may behave slightly more altruistic towards their group members than SC and hence, the role of altruism cannot be ignored.

While we account for the observed differences between GC and SC participants through matching and other measures, there could still be unobserved heterogeneity between caste groups that would influence their behavioural differences. Our findings of no difference in contributions between caste groups when matched anonymously are an indication that the behavioural differences are unaffected by the unobserved heterogeneity between the groups. However, in the treatments where caste identities are revealed, it would provide the participant an opportunity to perceive the partner's condition based on the common knowledge about his/her caste's socio-economic status in the society and this would affect their behaviour. That is, we cannot rule out that the differences in contributions and expectations are related to other stereotypes such as wealth differences. To test this, we employed positive-identity priming where we aim to only boost the identity for both caste

groups using role models by keeping all else the same. Our results after priming shows a significant reduction in the contributions gap between GC and SC. It reaffirms that social image difference is the critical factor that explains distinctiveness of common identity effect. As we have found in our previous analysis, the expectations about the partner's contribution drives the difference between groups, we test if it also holds good as a causal channel of the priming effect on PG contributions. Therefore, we compare the difference in expectations about the partner's contributions between caste groups across priming. The results confirm that the priming changed the expectations of GC and SC groups similar to that of their contributions (see [Table A8](#) in the Annex). It indicates that priming participants could induce positivity about their group membership (collective group identity) which in turn increase expectations from other group members and that could lead to higher contributions.

Though we have taken considerable care while administering the priming treatment, there are some limitations that come with our priming design (See Hoorn (2018) for a detailed discussion on challenges related to identity priming). Firstly, our priming results might be influenced by experimenter demand effect. Secondly, for practical reasons we did not randomise the role model priming based on the caste rank of the role models due to budget constraints. That is, both GC and SC were primed only by the role models from their own caste ranks. Therefore, we cannot disentangle if our results are driven simply by a role model priming or by the priming using role models from the same caste rank.

Lastly, our findings on the influence of social identity on PG contributions involve caste groups which have a salient and fixed identity. Given the strategic nature of the PG game, it is essential that the identity treatment guide participants' actions through the changed expectations based on the perceptions about their shared identity. When caste identity was revealed, we observed a significant difference in the expectations about other's contributions for GC and SC and these differences reduced after priming both groups with role models. These changes are akin to the differences in social image between the groups. On the contrary, when identity is more fluid, it would be difficult to observe such differences between the groups. For instance, Li et al. (2017) found a null effect of revealing identity on PG contributions. It can be attributed to the choice of identity parameter in their study that is based on the quality and perception of neighbourhood which is a very fluid characteristic

of an identity compared to a strong and fixed caste identity in our case. The absence of a strong identity (and therefore perceptions) is also featured in their observations on beliefs where revealing identities of the participants did not change the beliefs about others' actions.

## **6. Conclusions**

Our study utilised the pre-existing differences in the social image between two caste groups to examine how such differences affect voluntary contributions to PGs. We show that the groups with perceived high status (GC) contribute higher amounts to PGs than the groups with perceived low status (SC) and it is driven by the differences in the social image attached to their identity. We provide evidence for the role of differences in expectations between groups as a mechanism that explains the identity effect. Using role model priming we confirm the role of positive social image on cooperation. We show that promoting common identity per se is not a panacea to improve cooperation. That is, promoting common identity is effective only if the groups/communities are carrying a positive social identity, but not otherwise. Therefore, it is important to recognise the social context in which the shared group identity exists and use targeted policy approaches rather than applying it generally.

The results have important practical implications. Groups with strong positive social identity could be better equipped to overcome collective action dilemma and benefit more from PG provision than stigmatised groups, which may reinforce and perpetuate existing social structures. Lower ability of stigmatised groups to act collectively could constraint individual efforts to defend group interest and limit the demand for policies that benefit their interests. This calls for policies that promote in-group cooperation among SCs. For instance, it involves providing opportunities (financial or otherwise) for SC communities to work collectively (collaboratively) on some projects that improves their welfare. Working collectively helps them to develop mutual trust and may provide positive feedback on their collective identity esteem. This should be tailored into the already existing affirmative action policies that are designed to improve social, economic and political interests of the stigmatised groups.

Finally, this study focuses on the case of India, but the setting may apply to other contexts as well. While we use caste as our key identity parameter, more research should be done with

regards to differential effect of common identities by considering different identity parameters. This is left for future work.

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## Annexure

Table A1: PG contributions in anonymous groups

	(1) Contributions	(2) Contributions	(3) Contributions (No punishment)	(4) Contributions (With Punishment)
<b>General caste<sup>1</sup></b>	-4.444 (5.998)	-14.06 (21.48)	-3.749 (27.73)	-24.37 (35.82)
<b>Return<sup>2</sup></b>				
High		5.037 (6.880)	-0.993 (7.674)	11.07 (11.97)
Low		-18.87*** (6.620)	-14.88* (7.829)	-22.86** (11.04)
<b>Punishment</b> (1=yes, 0=no)		37.50*** (5.291)		
<b>Education (years)</b>		0.319 (0.731)	0.473 (0.811)	0.166 (1.295)
<b>Male</b>		-0.218 (12.72)	9.255 (9.521)	-9.690 (25.26)
<b>Age (years)<sup>3</sup></b>				
31-60		-13.03* (6.647)	-7.641 (7.606)	-18.42 (11.35)
>60		-18.12 (12.33)	-21.97* (12.81)	-14.26 (22.28)
<b>Family size</b>		-1.931* (1.169)	-2.080* (1.242)	-1.781 (2.073)
<b>House type</b> (1=Brick house 0=Thatched/mud house)		9.383 (6.643)	7.624 (8.056)	11.14 (11.07)
<b>Land area (Acre)</b>		1.793 (1.531)	2.879 (1.934)	0.706 (2.406)
Order of Punishment	No	Yes	Yes	Yes
Village FE	No	Yes	Yes	Yes
Enumerator FE	No	Yes	Yes	Yes
Constant	85*** (3.954)	101.3*** (32.59)	81.07** (39.12)	159.1*** (56.90)
Observations	240	240	120	120
R-squared	0.002	0.280	0.165	0.158

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: <sup>1</sup> SC is the base category. <sup>2</sup> Equal return is the base category. <sup>3</sup> 18-30 years is the base category.

Table A2: PG contributions in homogeneous caste groups

	(1) Contributions	(2) Contributions	(3) Contributions	(4) Contributions (No Punishment)	(5) Contributions (With Punishment)
<b>General caste<sup>1</sup></b>	11.66*** (3.659)	20.59*** (5.624)	17.11*** (6.172)	16.34** (7.474)	24.84*** (8.499)
<b>Return<sup>2</sup></b>					
High		13.87*** (4.397)	13.87*** (4.389)	8.335 (5.693)	19.40*** (6.646)
Low		-12.67*** (3.643)	-12.67*** (3.647)	-10.83** (4.698)	-14.52*** (5.445)
<b>Punishment</b> (1=yes, 0=no)		40.64*** (3.018)	37.87*** (3.873)		
<b>High caste and Punishment</b>			6.966 (6.178)		
<b>Education (years)</b>		0.431 (0.351)	0.431 (0.350)	-0.0400 (0.432)	0.903* (0.542)
<b>Male</b>		-1.753 (4.467)	-1.753 (4.469)	-1.033 (5.536)	-2.473 (7.035)
<b>Age (years)<sup>3</sup></b>					
31-60		-1.269 (3.682)	-1.269 (3.675)	-2.431 (4.427)	-0.106 (5.825)
>60		-10.15 (6.614)	-10.15 (6.601)	-6.602 (9.079)	-13.70 (9.310)
<b>Family size</b>		1.343** (0.656)	1.343** (0.655)	0.852 (0.912)	1.834** (0.892)
<b>House type</b> (1=Brick house 0=Thatched/mud house)		3.683 (3.362)	3.683 (3.358)	1.430 (4.369)	5.936 (5.065)
<b>Land area (Acre)</b>		-2.244*** (0.861)	-2.244** (0.873)	-0.872 (1.035)	-3.616*** (1.312)
Order of Punishment	No	Yes	Yes	Yes	Yes
Village FE	No	Yes	Yes	Yes	Yes
Enumerator FE	No	Yes	Yes	Yes	Yes
Constant	79.79*** (2.176)	53.55*** (10.12)	54.93*** (10.24)	68.76*** (12.90)	78.98*** (14.98)
Observations	780	780	780	390	390
R-squared	0.013	0.304	0.305	0.132	0.241

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: <sup>1</sup> SC is the base category. <sup>2</sup> Equal return is the base category. <sup>3</sup> 18-30 years is the base category.

*Table A3: Punishment behaviour of revealed (homogeneous) caste groups*

	(1) Punishment
<b>General caste<sup>1</sup></b>	0.547* (0.332)
<b>Contribution</b>	0.00747*** (0.00176)
<b>Contingent contributions<sup>2</sup></b>	
50	-1.628*** (0.0746)
100	-2.974*** (0.110)
150	-3.977*** (0.131)
200	-4.628*** (0.146)
250	-4.867*** (0.157)
<b>Return<sup>3</sup></b>	
High	-0.345* (0.182)
Low	0.418** (0.178)
<b>Education (years)</b>	-0.0186 (0.0178)
<b>Male</b>	0.0480 (0.219)
<b>Age (years)<sup>4</sup></b>	
31-60	0.0601 (0.175)
> 60	-0.160 (0.248)
<b>Not married</b>	0.303 (0.221)
<b>Family size</b>	-0.0219 (0.0273)
<b>House type</b> (1=Brick house 0=Thatched/mud house)	-0.188 (0.177)
<b>Land area (Acre)</b>	0.0403 (0.0327)
Order of punishment	Yes
Village FE	Yes
Enumerator FE	Yes
Constant	4.689*** (0.654)
Observations	2,340
R-squared	0.491

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: <sup>1</sup> SC is the base category. <sup>2</sup> 0 contribution is the base category. <sup>3</sup> Equal return is the base category. <sup>4</sup> 18-30 years is the base category.

*Table A4: PG contributions of GC and SC groups by priming*

	(1) Contributions	(2) Contributions (No punishment)	(3) Contributions (With punishment)
<b>General caste<sup>1</sup></b>	26.52 (16.72)	27.07 (25.78)	25.96 (25.54)
<b>Primed</b>	59.27*** (14.17)	62.38*** (22.30)	56.16** (21.19)
<b>General caste and Primed</b>	-36.74* (19.01)	-38.38 (28.65)	-35.10 (29.69)
<b>Return<sup>2</sup></b>			
High	23.76* (12.26)	21.89 (18.61)	25.62 (18.93)
Low	-29.08*** (11.04)	-30.88* (16.05)	-27.27 (17.72)
<b>Punishment (1=yes, 0=no)</b>	31.43*** (8.981)		
<b>Education (years)</b>	4.008*** (1.280)	4.503** (1.961)	3.512* (1.962)
<b>Male</b>	49.28*** (16.95)	45.49* (27.02)	53.06** (24.80)
<b>Age (years)<sup>3</sup> 31-60</b>	10.27 (9.784)	9.552 (14.94)	10.99 (15.11)
<b>Family size</b>	0.479 (2.246)	-0.579 (3.607)	1.537 (3.181)
<b>Not married</b>	-19.77 (12.49)	-22.08 (18.14)	-17.45 (20.19)
<b>House type (1=Brick house 0=Thatched/mud house)</b>	-0.837 (13.10)	0.616 (19.49)	-2.290 (21.00)
<b>Land area (Acre)</b>	-5.321*** (1.846)	-4.639* (2.745)	-6.004** (2.914)
Order of punishment	Yes	Yes	Yes
Village FE	Yes	Yes	Yes
Enumerator FE	Yes	Yes	Yes
Constant	-17.89 (46.22)	-10.39 (71.09)	6.028 (67.06)
Observations	140	70	70
R-squared	0.358	0.348	0.297

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: <sup>1</sup> SC is the base category. <sup>2</sup> Equal return is the base category. <sup>3</sup> 18-30 years is the base category.

Table A5: Expected PG contributions in revealed (homogeneous) caste groups

	(1) Expected contributions	(2) Expected contributions (No punishment)	(3) Expected contributions (With punishment)
<b>General caste<sup>1</sup></b>	46.53* (27.98)	54.77 (47.03)	38.29 (46.45)
<b>Return<sup>2</sup></b>			
High	-29.27 (18.58)	-22.77 (29.70)	-35.78 (30.16)
Low	21.59 (15.09)	6.007 (23.79)	37.17 (25.40)
<b>Punishment</b> (1=yes, 0=no)	26.92** (10.38)		
<b>Education (years)</b>	1.873 (1.729)	3.051 (2.750)	0.695 (3.049)
<b>Male</b>	-6.556 (26.83)	7.201 (41.99)	-20.31 (41.44)
<b>Age (years)<sup>3</sup></b>			
31-60	11.18 (17.01)	12.63 (28.15)	9.726 (27.05)
<b>Family size</b>	-0.726 (2.701)	-0.871 (4.209)	-0.581 (4.718)
<b>Not married</b>	-14.39 (26.88)	-21.73 (40.26)	-7.053 (41.97)
<b>House type</b> (1=Brick house 0=Thatched/mud house)	8.399 (22.08)	7.238 (35.14)	9.560 (36.64)
<b>Land area (Acre)</b>	-9.362** (4.256)	-13.40** (5.019)	-5.322 (7.646)
Order of punishment	Yes	Yes	Yes
Village FE	5.872 (20.57)	6.337 (29.61)	5.406 (34.21)
Enumerator FE	-11.56 (22.95)	-1.989 (35.56)	-21.12 (35.21)
Constant	91.94* (53.99)	74.75 (79.26)	136.1 (84.79)
Observations	78	39	39
R-squared	0.396	0.450	0.385

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: <sup>1</sup> SC is the base category. <sup>2</sup> Equal return is the base category. <sup>3</sup> 18-30 years is the base category.



*Table A6: Margins for expected contributions in revealed homogeneous caste groups*

Caste matching	Predicted expected contributions	Marginal difference
		SC
Panel A: Pooled (n=78)		
GC	121.10	-46.53*
Panel B: No punishment (n=39)		
GC	110.81	-54.77
Panel C: With punishment (n=39)		
GC	131.39	-38.29

Note: Refer to Table A5 for the regression output. \*\*\*, \*\*, and \* indicate the significance at 1%, 5%, and 10% respectively.

Table A7: Expected PG contributions of GC and SC groups by priming

	(1) Expected contributions	(2) Expected contributions (No punishment)	(3) Expected contributions (With punishment)
<b>General caste<sup>1</sup></b>	31.80** (14.28)	27.45 (22.69)	36.16* (20.71)
<b>Primed</b>	47.85*** (12.17)	42.33** (18.74)	53.36*** (16.83)
<b>General caste and Primed</b>	-34.85** (16.55)	-32.45 (26.58)	-37.24 (22.97)
<b>Return<sup>2</sup></b>			
High	-42.19*** (9.671)	-37.29** (14.26)	-47.10*** (14.10)
Low	8.653 (10.35)	-1.675 (15.24)	18.98 (16.20)
<b>Punishment</b> (1=yes, 0=no)	28.57*** (8.162)		
<b>Education (years)</b>	2.582** (1.227)	2.754 (1.865)	2.411 (1.963)
<b>Male</b>	15.43 (15.40)	22.78 (25.41)	8.085 (19.58)
<b>Age (years)<sup>3</sup></b>			
31-60	3.718 (9.514)	2.489 (15.75)	4.947 (13.26)
<b>Family size</b>	-2.606 (2.008)	-2.905 (3.100)	-2.307 (2.986)
<b>Not married</b>	-12.59 (11.80)	-14.69 (19.94)	-10.49 (15.08)
<b>House type</b> (1=Brick house 0=Thatched/mud house)	-8.328 (10.40)	-14.16 (15.91)	-2.496 (15.86)
<b>Land area (Acre)</b>	-3.648 (2.212)	-4.903 (3.267)	-2.393 (3.620)
Order of punishment	Yes	Yes	Yes
Village FE	Yes	Yes	Yes
Enumerator FE	Yes	Yes	Yes
Constant	56.84 (42.87)	55.32 (68.94)	86.93 (59.50)
Observations	140	70	70
R-squared	0.398	0.331	0.457

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. <sup>1</sup> SC is the base category.

<sup>2</sup> Equal return is the base category. <sup>3</sup> 18-30 years is the base category.

*Table A8: Margins of differences in expected contributions of caste groups by priming*

Caste-priming matching	Predicted expected contributions	Marginal difference		Difference of differences – F test (p value)
		Non-Primed - SC	Primed – SC	
Panel A: Pooled (n=140)				
Non-primed - GC	116.83	-31.80**		0.04
Primed - GC	129.83		3.04	
Panel B: No punishment (n=70)				
Non-primed - GC	102.58	-27.45		0.23
Primed – GC	112.46		5.01	
Panel C: With punishment (n=70)				
Non-primed – GC	131.09	-36.16*		0.11
Primed – GC	147.21		1.08	

Note: Refer to Table A7 for the regression output. \*\*\*, \*\*, and \* indicate the significance at 1%, 5%, and 10% respectively. With the F-test we compare the change in expectations of contributions from non-primed to positive-identity primed between GC and SC.

## A11. List of role models

Enumerators individually read out to the participants the following paragraphs about the role models in the local language (Hindi) before starting the explanations about the PG game. It was mentioned to the participants (individually) that it does not influence their payoffs and therefore no questions will be asked based on that.

### General Caste role models

#### 1. Sachin Tendulkar

Sachin Tendulkar is known as the greatest One Day International and Test Cricket player in the world. Sachin, more famously known as the 'master blaster' of Indian cricket, holds more batting records than any other player in the world. He received the Rajiv Gandhi Khel Ratna, India's highest sporting honor and the civilian award Padma Shri. He was born in an upper caste family in Mumbai.

#### 2. Arundhati Bhattacharya

Arundhati Bhattacharya is an Indian banker and was the former Chairman of the State Bank of India. She is the first woman to be the chairperson of state Bank of India. Last year, she was listed as the 25<sup>th</sup> most powerful woman in the world by an international agency (Forbes). She is widely regarded as one of the most successful businesswomen of India. She was born in an upper caste family.

#### 3. Manoj Bajpayee

Manoj Bajpayee is a famous Indian film actor who predominantly works in Hindi cinema and has also done Telugu and Tamil films. He is the recipient of two National film awards and three Film fare awards. He is known for his work on Gangs of Wasseypur, Special 26, and Veer Zaara. He was born in an upper caste, farming family.

#### 4. Shakuntala Devi

She was an Indian writer, mathematician, and mental calculator popularly known as the "human computer". Her talent earned her a place in The Guinness Book of world records. She taught mathematics to many students and helped them to understand many complex problems with simple tricks. She was born in an upper caste family in Karnataka.

### **Scheduled Caste role models**

1. Dr. B. R. Ambedkar

Popularly known as Baba Saheb, Ambedkar was a social reformer in India who campaigned against the social discrimination of lower caste Individuals. He was the first law minister of Independent India and the principal architect of constitution of India. He also received India's highest civilian award, Bharat Ratna. He was born in a Dalit family.

2. P.T. Usha

She is regarded as one of the greatest athletes India has ever produced. She is the first Indian woman to reach the final of an Olympic event. She also holds the world record for most gold medals earned by a female athlete in a single track running race. She also won the highest award for sports in India, the Arjuna award. She was born in a Dalit family in Kerala.

3. Ilayaraja

Ilayaraja is regarded as one of the greatest music composers in India. He has won five Indian National Film awards and also received Padma Bhushan, one of the highest civilian award by the Government of India for his lasting contribution to music. He mainly works in South Indian cinema. He was born in a Dalit family from Tamil Nadu.

4. Tina Dabi

Tina created history by becoming the first ever Dalit girl to top the IAS (civil service) examination, which is one of the most difficult examinations in India. Tina became an inspiration for young girls across India. She graduated in political science from Delhi University. She was born in a Dalit family.

## A12. Role model priming

Priming treatments were administered in August 2019 in the same region as of the first wave but in different villages. We conducted it in 4 villages, and these were part of the pool of villages from which we sampled for our first wave. We randomly selected who receives the priming treatment from both caste groups and therefore it is a between-subject treatment. The procedure used for the selection of participants is same as in the first wave.

For both GC and SC we chose 4 role models from their castes who come from different walks of life such as sports personalities, social reformers, singers, and individuals who occupied eminent positions in the country, etc. We ensured that the lists of role models for both castes have a similar distribution of occupations (see Annex A11).

### Priming and PG contributions

To estimate the impact of priming on contribution behaviour we need to ensure that the comparison of primed to the non-primed are free from confounders. For instance, participants who did not receive the priming treatment were not administered with neutral priming, which is a very important concern to address. That is, a simple act of administering some procedure before the start of the experiment even if it is unrelated to identity priming might influence the behaviour of the participants. For example, the primed and non-primed participants do not differ only by the additional briefing provided to them but also by the delay they face in making the actual decisions in the PG game. Even though these factors are unrelated to the identity salience and priming, it could still confound the impact of priming if we only focus on the treatment effect - comparing between non-primed and primed groups (Li, Oliveira, and Eckel, 2017). We address this by employing a difference-in-difference strategy that would cancel out the potential confounders and we discuss this below. Here we assume that the time-delay affects both primed GC and SC equally.

To estimate the effect of priming on the change in contributions between caste groups we regress the amount of contributions  $C$  of participant  $i$  on a binary variable indicating whether  $i$  belongs to a *General Caste* or not, a binary variable *primed* indicating the participants who received the priming treatment. In addition, we control for marginal returns to the PG, presence of punishment, and a vector of socio-economic characteristics. The regression model is the following:

$$C_i = \alpha + \beta \text{general caste}_i + \gamma \text{primed}_i + \delta (\text{General Caste}_i * \text{primed}_i) + kZ_i + u_i \quad (5)$$

The model predictions and marginal differences are presented in Table A5. We hold all control variables constant at the mean in the predictions. The numbers in bold refer to the predicted contributions under no priming and with priming for GC participants. Next to it, we show the change in contributions for SC participants by priming. In the last column, we

present the p-value of an F-test on the difference in differences of contributions between GC and SC participants if assigned the priming or no priming treatment.

*Table A9: Margins of differences in contributions of caste groups by priming*

Caste-priming matching	Predicted contributions	Marginal difference		Difference of differences – F test (p value)
		Non-Primed – SC	Primed – SC	
Panel A: Pooled (n=140)				
Non-primed – GC	99.94	-26.52 (16.71)		0.06
Primed – GC	122.47		10.22 (17.24)	
Panel B: No punishment (n=70)				
Non-primed – GC	83.46	-27.07 (25.78)		0.19
Primed – GC	107.47		11.30 (24.64)	
Panel C: With punishment (n=70)				
Non-primed – GC	116.42	-25.96 (25.54)		0.24
Primed – GC	137.48		9.14 (28.59)	

Notes: Refer to Table A4 for the regression output. \*\*\*, \*\*, and \* indicate the significance at 1%, 5%, and 10% respectively. With the F-test we compare the change in contributions from non-primed to positive-identity primed between GC and SC. Numbers in parentheses display standard errors.

We first present the results for the pooled sample (pooling with and without punishment) in panel A and thereafter split the sample by punishment treatments in panel B and panel C respectively. Our results from the pooled sample suggests that the contribution has increased among both GC and SC after priming (GC:  $p < 0.1$ ; SC:  $p < 0.01$ ). Comparing between castes shows that the contribution moderately varies between GC and SC groups when they did not receive priming ( $p = 0.11$ ). GC contributed about INR100 whereas SC contributed about INR26 less than them. A similar pattern is observed between caste groups across punishment. Comparing contributions for the participants who got exposed to priming shows a reduction in magnitude of difference between caste groups along with a change in the direction of difference with SC contributing about INR10 more than the GC participants. Most importantly, comparing the difference in difference of contributions shows a moderately significant reduction in difference between caste groups of about INR16 in the pooled sample. The significance of the F-test indicates that the gap between GC and SC has become smaller after priming compared to treatments without priming. Sub-samples segregated by punishment also witnessed a similar level of reduction in the differences however the F-test for the difference in difference of contributions is insignificant, which could be related to the reduction in the sample size.

## A2. Coarsened Exact Matching (CEM)<sup>18</sup>

CEM is a matching technique that involves balancing the pre-treatment differences in the covariates to improve the causal inferences of a treatment. Therefore, the balanced data will have similar empirical distribution of covariates. CEM belongs to a class of Monotonic Imbalance Bounding (MIB) methods. In this method we choose the level of imbalance ex-ante and the algorithm will determine the number of matched samples based on the chosen imbalance level. It is the opposite in case of EPBR (Equal percent bias reducing methods – EX: PSM). Here, adjusting imbalance in one variable does not affect the imbalance among other variables and therefore it allows for different level of imbalance across the set of covariates which is very important as it is unrealistic to expect the same level of imbalance among treated and control groups for all the variables. The number of matched units is therefore determined by this level of imbalance.

CEM involves three steps. The first is to coarsen the original  $X$  variables  $C(X)$  as per the requirement by the researcher which is based on the prior knowledge about the variable in question. The second is the application of exact matching to the coarsened variables ( $C(X)$ ), which will sort the observations into strata. The strata which contain both treated and control units are retained. The strata which contain only treated observations are considered with extrapolated values of control observations unless otherwise we fix our quantity of interest to the set exactly matched treated and control observations. Later each matched unit  $i$  in stratum  $s$  are assigned some weights (CEM-weights -  $w_i$ ).  $w_i = 1$  for the treated units in stratum  $s$ , and  $w_i = \left(\frac{m_C}{m_T}\right)\left(\frac{m_T^s}{m_C^s}\right)$  where  $m_C$  and  $m_T$  denote the number of control and treated units matched in the sample and  $m_C^s$  and  $m_T^s$  denote the respective numbers in each stratum. The unmatched units of samples receive a weight of  $w_i = 0$ . These weights are used later for the analysis of the matched samples.

The imbalance under CEM is not only restricted to the difference in means but it considers a measure that encompasses the imbalance with distance between multivariate empirical distributions of both treated and control observations of the pre-treatment control variables. The multivariate imbalance measure (Iacus et al, 2011) is therefore defined as,

$$L_1(f, g; H) = \frac{1}{2} \sum_{l_1 \dots l_k \in H(X)} |f l_1 \dots l_k - g l_1 \dots l_k|$$

Where,  $f$  and  $g$  are the relative empirical frequency distributions for the treated and control observations respectively.  $H(X_1)$  indicate a set of unique values generated by the bins chosen for the variable  $X_1 \in \mathbf{X}$ . This will later be used to construct the multidimensional histogram from the cells produced by the Cartesian product of all the control variables ( $H(\mathbf{X}) = H$ ).  $f l_1 \dots l_k$  are the relative frequency of observations in the multivariate cross tabulation belonging to the cell with coordinates  $l_1 \dots l_k$  representing treated units. Similarly,

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<sup>18</sup> Follow Iacus et al (2011) and Iacus et al (2012) for more details about CEM and in general MIB methods.



for  $gl_1 \dots l_k$  representing control units. This  $L_1$  measure is interpreted as follows. For any given set of bins, if two empirical distributions are mutually exclusive (completely separated) then it takes the value of 1. If both the empirical distributions exactly overlap then it takes the value of 0. Therefore,  $L_1$  varies between 0 and 1.

In our study we coarsened several variables based on the prior knowledge about the data into several categories (bins) as follows. The variable years of education is coarsened into five categories such as No Education (0 years of schooling), Primary and Middle school (1 to 7 years), High school (8 to 10 years), Pre-University Education (11 to 12 years), and Bachelors degree and above (13 years and above). Land area is categorized into Land less (not owned land), Marginal and Small farmers (0.1 to 2.5 acres) and, Medium and Large farmers (above 2.5 acres). For the variable age the categories are, Young (between 18-30 years), Middle age (31-50 years), and Old age (51 years and above). Family size is categorized as Small family (up to 4 members), Medium family (5 to 9 members), and Large family (above 10 members). We retained the variables Gender and House type in their original form as the dummy variables as defined in our regression analysis.

The individual weights generated using all the above coarsened variables are then used for the regression analysis by retaining the original structure of the covariates. In our case, the treatment variable is caste of the member (High caste and Low caste). Our classification of treatments does not have treated and control units as such. Therefore, we considered Low caste as the treated group and High caste as the control group to accommodate the matching requirements. Unlike other matching methods like PSM, this method drops unmatched observations from both treated and control groups. This protects us from the potential sample selection bias that would have occurred by using EPBR methods in special cases like ours.

Table A10: Contribution in homogeneous caste groups after matching

	(1) Contribution	(2) Contribution	(3) Contribution	(4) Contribution
<b>General caste<sup>1</sup></b>	23.53*** (6.027)	29.98*** (7.738)	25.82*** (9.187)	34.14*** (10.97)
<b>Return<sup>2</sup></b>				
High		19.13*** (7.300)	9.111 (8.058)	29.14** (11.42)
Low		-2.727 (6.290)	2.785 (7.993)	-8.239 (8.213)
<b>Punishment</b> (1=yes, 0=no)		45.87*** (5.660)		
<b>Education (years)</b>		1.558*** (0.563)	0.963 (0.686)	2.152** (0.878)
<b>Male</b>		4.510 (7.268)	4.749 (9.626)	4.272 (10.25)
<b>Age (years)<sup>3</sup></b>				
31-60		10.04* (5.423)	9.000 (6.263)	11.08 (8.565)
>60		-6.144 (10.46)	-5.131 (11.30)	-7.157 (16.89)
<b>Family size</b>		2.962*** (1.001)	1.936* (1.045)	3.988*** (1.367)
<b>House type</b> (1=Brick house 0=Thatched/mud house)		5.066 (5.713)	-1.367 (7.126)	11.50 (8.513)
<b>Land area (Acre)</b>		-3.603* (2.108)	0.106 (2.418)	-7.313** (2.844)
Order of Punishment	No	Yes	Yes	Yes
Village FE	No	Yes	Yes	Yes
Enumerator FE	No	Yes	Yes	Yes
Constant	79.58*** (2.619)	46.88** (19.37)	78.74*** (21.96)	60.89** (26.42)
Observations	504	504	252	252
R-squared	0.049	0.405	0.236	0.394

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. <sup>1</sup> SC is the base category. <sup>2</sup> Equal return is the base category. <sup>3</sup> 18-30 years is the base category.

### A3. Plenary instructions<sup>19</sup>

*[Read the instructions loudly]*

Greetings and welcome to all of you. Thanks for taking the time to come today. My name is **Bruhan Konda**, and I am a PhD student from United Nations University, The Netherlands. I am here for research concerning the role of social structure on economic development and cooperation. For my research, I would like to play some games with you. It may take about 1.5 hours, so if you think you will not be able to stay that long, let us know now or anytime.

Before we begin, I want to make some general comments about what we are doing here today and explain the rules that we must follow. **We will be playing the games for money.** Depending on the decisions made by you and other players in these games, you can win some money and it will be yours to take home (**You are not required to spend your own money**). In addition to the money you can win from the game, we also pay a participation fee of 100 rupees. The money that you receive from the game is not from my own pocket but given to me to use for research. The games are part of a scientific research project involving many people from different societies.

The games will be explained individually. Please listen as carefully as possible, because **only people who understand the game will actually be able to play.** You cannot talk to any others until the end of the game. This is very important. Please be sure to obey this rule, because it is possible for one person to spoil the game. Do not worry if you do not completely understand the game as we go through the rules. You will have a chance later to ask us questions before taking the decisions. If any individual fails to understand the games, he/she will not be allowed to play the games and thus lose the chance of winning money.

Now each one of you will be assigned to one of my fellow research assistants and they will explain the game in detail to you.

*[1. Now, each enumerator has to take an individual who is willing to participate to a room or an isolated place and explain the individual instructions.*

*2. There are three different sets of individual instructions with the titles “Equal Returns”, “Unequal Returns (High)”, and “Unequal Returns (Low)”.*

*3. Choose one of the three sets of individual instructions randomly for an individual and explain the instructions as mentioned in that set.*

*4. Do not mention to the individual about the availability of different set of instructions.*

*5. Once you have randomly selected a set of individual instructions for an individual, you should not change it again for any reason.]*

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<sup>19</sup> Instructions in *italics* are for enumerators.

#### A4. Instructions for the PG game<sup>20</sup>

##### Individual game instructions for **Equal Returns** – Punishment **second**

*[Read the instructions loud and clear and answer the questions, if any, from the participant]*

1. We will play some games today and it may take 1.5 hours.
2. You will play these games with another person. You are person A and you will play this game with person B. Person B is from another village where the same game being played. You will not know the name of the village of person B. You will only know the name of the person B. Only my head researcher knows who plays with whom, and he will never tell anyone, neither me nor you.
3. Similarly, person B will know your name but not the name of your village.  
*(Now, ask the person to pick a chit from a bowl of chits with names of his potential partners and read the name from the chit he/she chose)*
4. You are **person A** and you will play these games with person B \_\_\_\_\_ (*name of **person B***), who is from a different village.  
  
*(Make sure that you pronounce the name correctly and say it two times)*
5. Now, we will understand the games. Please listen carefully because only if you understand the game, you will be able to participate and win the money.
6. I will explain game 1 first and, other games will be explained only after playing the first game.
7. **Any decisions you make in these games will be strictly confidential.** Since your decisions are private, we ask that you do not reveal your decisions to any other participants either during or after the experiment.
8. One of the games will be selected randomly to make your payment.
9. Whatever money you will earn will be given to you in private in 3-4 days (*day \_\_\_\_\_; place \_\_\_\_\_; time \_\_\_\_\_* )
10. In addition to the income you earn from the game, you will also receive 100 rupees as the participation fee and it will be given to you today at the end of the game.

##### **Game 1 explanation:**

1. (*Enumerator explains the game board*) This is the game board. This is the place for A and this is B's place. This is the place (*show the place named "public fund" on the board*) where money grows in value.
2. To start the game, A (you) gets 250 rupees (also B gets the same).  
*(Place 12 notes of 20 rupees and 1 note of 10 rupees in a cup and keep it in front of him/her on the board in the place of A)*
3. Now you have to decide how much from the 250 rupees to contribute into the public fund. You may contribute any amount between 0 and 250 among these choices (0, 50, 100, 150, 200, 250).  
*(‘0’ indicates that the person do not wish to contribute any amount to the public fund)*

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<sup>20</sup> Instructions in *italics* are for enumerators.

4. The amount of money that you did not contribute into the public fund gives you the same value and is yours. (*Explain this example* - For example, let's assume that you decide to contribute 50 rupees into the public fund, then  $250 - 50 = 200$  rupees will be yours) And the amount of money you contribute into the public fund gives you different returns, because it **grows in value**. I will explain that now.
5. As I told you at the beginning, another person B also play the same game as you do. Similarly, he will be asked to contribute any amount to the public fund, given the same choices (0, 50, 100, 150, 200, 250).
6. I will add the total amount of money in the public fund (which is the total money contributed by you and person B to the public fund).
7. To this total amount in the project, I will add 50 percent or half of the value of that money. Therefore the money grows in the public fund.  
(*Explain this example* – For example, let's assume that you decide to contribute 50 rupees into the public fund and if person B decides to contribute 100 rupees into the public fund, the total amount in the project will be  $50 + 100 = 150$  rupees. To this 150 rupees, I will add 75 rupees which is 50 percent or half of 150 rupees. Now the amount of money in the public fund grown to  $150 + 75 = 225$  rupees)  
(*Show or point out the place of "public fund" in the game board and emphasize that the money which is put here grows in value*)
8. I will divide the grown money in the public fund in to **two equal parts** and give one part to you and the other part to person B.  
(*Explain this example* - From the above example where there is 225 rupees in the public fund, you will get 112.5 rupees and person B also gets 112.5 rupees)
9. The total income you get from playing this game includes the amount of money you get from the public fund and the amount of money which is not contributed but left with you.  
(*Explain this example* – From the above example, assume that you got 112.5 rupees from the public fund and you contributed 50 rupees and therefore 200 rupees is left with you. Therefore, your income from the game is  $112.5 + 200 = 312.5 \approx 313$  rupees.
10. Irrespective of the amount of money you or person B contributes to the public fund, you both will get the equal share from the grown public fund money.
11. If you decide to contribute nothing to the public fund and similarly if the other person (person B) also decides to contribute nothing then, you will have the 250 rupees given to you at the beginning to take home and it will be your income from the game.
12. How much money you can earn in the game depends on what you (person A) and person B (with whom you are playing the game) choose in the game.

### **More Examples**

Let us consider some examples now to understand the game better.

1. **(A/150, B/50)**

Assuming that You (A) contribute 150 rupees to the public fund and person B contributes 50 rupees, the total money in project is  $150+50 = 200$  rupees. I will add 50 percent (or half of its value) to it which is  $200/2 = 100$  rupees. Now the money in the public fund grows to  $200+100 = 300$  rupees. I will divide it equally into two parts ( $300/2 = 150$  rupees). Both you and person B get 150 rupees each from the public fund.

- Therefore, your income is  $150+100$  (money not contributed out of 250 rupees) = 250 rupees.
- Person B's income is  $150+200$  (money not contributed by B) = 350 rupees.

2. **(A/250, B/0)**

Assuming that You (A) contribute 250 rupees in to the public fund and person B contributes nothing (keeps everything for himself), the total money in public fund is  $250+0 = 250$  rupees. I will add 50 percent (or half of its value) to it which is  $250/2 = 125$  rupees. Now the money in public fund grows to  $250+125 = 375$  rupees. I will divide it equally into two parts ( $375/2 = 187.5$  rupees). Both you and person B get 187.5 rupees each from the public fund.

- Therefore, your income is  $187.5+0$  (money not contributed by you) =  $187.5 \approx 188$  rupees.
- Person B's income is  $187.5+250$  (money not contributed by B) =  $437.5 \approx 438$  rupees.

3. **(A/50, B/200)**

Assuming that You (A) contribute 50 rupees in to the public fund and person B contributes 200 rupees, the total money in public fund is  $50+200 = 250$  rupees. I will add 50 percent (or half of its value) to it which is  $250/2 = 125$  rupees. Now the money in public fund grows to  $250+125 = 375$  rupees. I will divide it equally into two parts ( $375/2 = 187.5$  rupees). Both you and person B get 187.5 rupees each from the public fund.

- Therefore, your income is  $187.5+200$  (money not contributed by you) =  $387.5 \approx 388$  rupees.
- Person B's income is  $187.5+50$  (money not contributed by B) =  $237.5 \approx 238$  rupees.

*(Enumerator has to make sure that the person is clear about the game structure)*

Let us practice before game starts

**Test questions**

1. **(A/0, B/100)** A contributes nothing to the public fund and B contributes 100 rupees
  - What is your income from the game or how much money do you take home from the game?
  - What is B's income from the game or how much money does person B take home from the game?
2. **(A/250, B/250)** A contributes 250 rupees to the public fund and B also contributes 250 rupees
  - What is your income from the game or how much money do you take home from the game?
  - What is B's income from the game or how much money does person B take home from the game?
3. **(A/100, B/200)** A contributes 100 rupees to the public fund and B contributes 200 rupees
  - What is your income from the game or how much money do you take home from the game?
  - What is B's income from the game or how much money does person B take home from the game?

*(Continue to play the real game only if you are satisfied with the person's understanding of the game)*

To facilitate your decision making, I have given you a table where you can see how much income you and your partner (person B) can earn based on the choices you both make.

### Income matrix

In the above table, reading from the left indicates the income you (person A) can make at any of your choice of contribution with respect to every choice made by the person B. All your possible incomes are presented in the colored area. Similarly, reading from the top indicates all the possible contribution choices the person 2 has. The income for person 2 at every possible choice of contribution is presented in the plain area.

*(Now play the real game from the tablet given to you. Enter the details into the tablet and to a given record sheet)*

		Person B					
		_____ (Name of the person )					
		0	50	100	150	200	250
Person A (You)	0	250 250	238 288	225 325	213 363	200 400	188 438
	50	288 238	275 275	263 313	250 350	238 388	225 425
	100	325 225	313 263	300 300	288 338	275 375	263 413
	150	363 213	350 250	338 288	325 325	313 363	300 400
	200	400 200	388 238	375 275	363 313	350 350	338 388
	250	438 188	425 225	413 263	400 300	388 338	375 375



### **Real game (Game 1)**

1. Ok, let us start the game 1 and you are making the real decisions
2. This is your money valuing 250 rupees  
(Show the person the money placed at the place of A on the game board)
3. This is person B's money (place 12 notes of 20 rupees and 1 note of 10 rupees in a bowl at the place of B on the game board) and his name is \_\_\_\_\_ (name of person B)
4. Now you have to decide how much of 250 rupees that you want to contribute to the public fund among these choices (0, 50, 100, 150, 200, 250)
5. You can use the above given income matrix as a reference to make your decision.

(Enumerator has to ask the following question and record the answer in the record sheet/tablet) - BELIEFS

Since you know that your partner (Person B \_\_\_\_\_) is also playing the same game, what do you think your partner (name) would contribute to the public fund?

INR \_\_\_\_\_.

6. If you decide to contribute money to the public fund, please place that amount of money in the cup placed at **public fund** on the game board (Enumerator points to the place of public fund on game board). If you decide to contribute nothing to the public fund, then leave the money in its current position. I will go out of your sight for a minute, you can make your decision. (Enumerator goes out of the person's sight)

(Enumerator has to record the amount of contribution made by the person in the below table and the record sheet/tablet)

ID number	Name of the person	Contribution made in game 1 (in rupees)

### **Game 2 explanation**

1. *(Enumerator has to again arrange the game board as it was at the beginning of the game 1)*  
Now I will explain to you the second game.
2. In this game, I will include another step to the game 1 you have just played.
3. The addition to the game is the possibility of reducing the income of your partner (person B).
4. Here you have to first play the same game again that you just played. That is, deciding how much to contribute to a public fund from the 250 rupees that is given to you.
5. After making the contribution, you will be asked to **reduce the income of your partner (person B) by spending your money**  
*(After the person makes his contribution, enumerator has to provide him/her twelve 5 rupee coins)*
6. Each two rupee coin you spend reduces the income of your partner (person B) by 1 note of 20 rupees.
7. For example –
  - i) If you spend 4 coins, person B will lose 4 twenty rupee notes.
  - ii) If you spend 6 coins, person B will lose 6 twenty rupee notes.
  - iii) If you do not spend anything, person B will not lose anything.
8. You can spend any number of five rupee coins (0, 1, 2, ..., 12) to reduce the income of your partner (person B). Similarly the person B is also allowed to reduce your income by spending his money.
9. **The amount equivalent to the number of coins you spend on reducing the income of person B will be deducted from your income from the game. And the number of notes of twenty rupees of your income that is reduced by your partner (person B) will also be deducted from your income.**
10. Since at the moment we do not know the contribution of person B, we will give you all the possible contribution choices available to person B and ask you to indicate the number of coins you are willing to spend to reduce B's income for all his/her possible contribution choices.
  - *(Show the person the following table and explain the punishment process again)*
  - *(Also mention that the person will get twelve 5 rupee coins at each contribution choice that the person B has got)*

<b>Your (person A) contribution</b>	<b>Person B's contribution</b>	<b>Number of 5 rupee coins you spend</b>
<hr/> <i>(Write the contribution of person A in game 1)</i>	0	
	50	
	100	
	150	
	200	
	250	

11. How much money you can earn in the game depends on what you (person A) and person B (with whom you are playing the game) choose in the game in both contribution and assigning coins to reduce the income of the other.

## **Examples**

### **1. (A/150, B/0)**

Assuming that You (A) contribute 150 rupees in to the public fund and person B contributes nothing, the total money in the public fund is  $150+0 = 150$  rupees. I will add 50 percent (or half of its value) to it which is  $150/2 = 75$  rupees. Now the money in the public fund grows to  $150+75 = 225$  rupees. I will divide it equally into two parts ( $225/2 = 112.5$  rupees). Both you and person B get 112.5 rupees each from the public fund.

- Therefore, your income is  $112.5+100$  (money not contributed out of 250 rupees) =  $212.5 \approx 213$  rupees.
- Person B's income is  $112.5+250$  (money not contributed by B) =  $362.5 \approx 363$  rupees.

### **(P<sub>A</sub>/5, P<sub>B</sub>/6)**

Now assume that you (person A) spend 5 coins to reduce the income of B and similarly B spends 6 coins to reduce your income.

- You will loose 6 twenty rupee notes (120 rupees) and 25 rupees will be deducted from your income for spending 5 coins. Therefore your final income will be  $213-120-25 = 68$  rupees.
- Person B will loose 5 twenty rupee notes (100 rupees) and 30 rupees will be deducted from his/her income for spending 6 coins. Therefore person B's final income will be  $363-100-30 = 233$  rupees.

### **2. (A/200, B/150)**

Assuming that You (A) contribute 200 rupees in to the public fund and person B contributes 150 rupees, the total money in the public fund is  $200+150 = 350$  rupees. I will add 50 percent (or half of its value) to it which is  $350/2 = 175$  rupees. Now the money in the public fund grows to  $350+175 = 525$  rupees. I will divide it equally into two parts ( $525/2 = 262.5$  rupees). Both you and person B get 262.5 rupees each from the public fund.

- Therefore, your income is  $262.5+50$  (money not contributed out of 250 rupees) =  $312.5 \approx 313$  rupees.
- Person B's income is  $262.5+100$  (money not contributed by B) =  $362.5 \approx 363$  rupees.

### **(P<sub>A</sub>/8, P<sub>B</sub>/0)**

Now assume that you (person A) spend 8 coins to reduce the income of B and similarly B does not spend any coins to reduce your income.

- You will not loose any twenty rupee notes and 40 rupees will be deducted from your income for spending 8 coins. Therefore, your final income will be  $313-0-40 = 273$  rupees.
- Person B will loose 8 twenty rupee notes (160 rupees). Therefore person B's final income will be  $363-160 = 203$  rupees.

### **3. (A/0, B/0)**

Assume that both You (A) and person B do not contribute any amount to the public fund. Then,

- Your income is  $0+250$  (money not contributed out of 250 rupees) = 250 rupees.

- Person B's income is  $0+250$  (money not contributed by B) = 250 rupees.

**( $P_A/3, P_B/10$ )**

Now assume that you (person A) spend 3 coins to reduce the income of B and similarly B spends 10 coins to reduce your income.

- You will lose 10 twenty rupee notes (200 rupees) and 15 rupees will be deducted from your income for spending 3 coins. Therefore, your final income will be  $250-200-15 = 35$  rupees.
- Person B will lose 3 twenty rupee notes (60 rupees) and 50 rupees will be deducted from his/her income for spending 10 coins. Therefore, person B's final income will be  $250-60-50 = 140$  rupees.

*(Enumerator has to make sure that the person is clear about the game structure)*

Let us practice before the game starts.

### **Test questions**

1. **( $A/100, B/250$ )** A contributes 100 rupees to the public fund and B contributes 250 rupees
  - What is your income from the game?
  - What is B's income from the game?

**( $P_A/1, P_B/7$ )** Now assume that you (person A) spend 1 coin to reduce the income of B and similarly B spends 7 coins to reduce your income.

- What is your final income from the game or how much money do you take home from the game?
- What is B's final income from the game or how much money does person B take home from the game?

2. **( $A/200, B/200$ )** A contributes 200 rupees to the public fund and B contributes 200 rupees
  - What is your income from the game?
  - What is B's income from the game?

**( $P_A/1, P_B/1$ )** Now assume that you (person A) spend 1 coin to reduce the income of B and similarly B spends 1 coin to reduce your income.

- What is your final income from the game or how much money do you take home from the game?
- What is B's final income from the game or how much money does person B take home from the game?

3. **( $A/50, B/200$ )** A contributes 50 rupees to the public fund and B contributes 200 rupees
  - What is your income from the game?
  - What is B's income from the game?

**( $P_A/5, P_B/12$ )** Now assume that you (person A) spend 5 coins to reduce the income of B and similarly B spends 12 coins to reduce your income.

- What is your final income from the game or how much money do you take home from the game?
- What is B's final income from the game or how much money does person B take home from the game?

*(Continue to play the real game if you are satisfied with the person's understanding of the game, otherwise explain to him/her game 2 again)*

*(Now play the real game from the tablet given to you. Enter the details into the tablet and to a given record sheet)*

### **Real game (Game 2)**

1. Ok, let us start game 2 and you are making the real decisions  
*(Enumerator has to arrange the game board as it was at the beginning of the game 1)*
2. This is your money valuing 250 rupees  
*(Show the person the money placed at the place of A on the game board)*
3. This is person B's money (place 12 notes of 20 rupees and 1 note of 10 rupees in a bowl at the place of B on the game board) and his name is \_\_\_\_\_ *(name of person B)*
4. Now you have to decide how much of 250 rupees that you want to contribute to the public fund among these choices (0, 50, 100, 150, 200, 250)
5. You can use the income matrix given below as a reference to make your decision. This is the same matrix that was given to you before.

*(Enumerator has to ask the following question and record the answer in the record sheet/tablet) -*

#### **BELIEFS**

Since you know that your partner (Person B \_\_\_\_\_) is also playing the same game, what do you think your partner (name) would contribute to the public fund?

INR \_\_\_\_\_.

6. If you decide to contribute money to the public fund, please place that amount of money in the cup placed at **public fund** on the game board *(Enumerator points to the place of public fund on game board)*. If you decide to contribute nothing to the public fund, then leave the money in its current position. I will go out of your sight for a minute, you can make your decision. *(Enumerator goes out of the person's sight)*

*(Enumerator has to record the amount of contribution made by the person in the below table and the record sheet/tablet)*

ID number	Name of the person	Contribution made in game 2 (in rupees)

### Income matrix

		Person B					
		_____ (Name of the person )					
		0	50	100	150	200	250
Person A (You)	0	250 250	238 288	225 325	213 363	200 400	188 438
	50	288 238	275 275	263 313	250 350	238 388	225 425
	100	325 225	313 263	300 300	288 338	275 375	263 413
	150	363 213	350 250	338 288	325 325	313 363	300 400
	200	400 200	388 238	375 275	363 313	350 350	338 388
	250	438 188	425 225	413 263	400 300	388 338	375 375

7. Now you just need to make one more decision.
8. You have been given the option to reduce the income of your partner (person B \_\_\_\_\_).
9. You have to decide how many 5 rupee coins you want to spend (0, 1, 2,....., 12) to reduce the income of your partner (person B) at every possible contribution level of person B. Similarly person B is also allowed to reduce your income by spending his money. Each 5 rupee coin you spend reduces one 20 rupee note of person B from his income.  
(Enumerator has to give the person twelve 5 rupee coins and mention that he gets twelve coins for each choice of contribution that the person B has got)
10. You have to put the coins that you are willing to spend in the given cup as we mention the possible contribution by your partner (person B). Do not put any coin into the bowl if you do not want to reduce the income of your partner (person B).  
(Enumerator has to place a cup in front of the person and point it out to the person)  
(Enter the number of coins spent by the person at each contribution level in the table given below)

<b>Your (person A) contribution</b>	<b>Person B's contribution</b>	<b>Number of 5 rupee coins you spend</b>
<p>_____</p> <p>(Write the contribution of person A in game 2)</p>	0	
	50	
	100	
	150	
	200	
	250	

(Game ends here and proceed with the survey questions)

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