Religious fragmentation, social identity and rent-seeking: Evidence from an artefactual field experiment in India

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Abstract

We examine the impact of religious identity and village-level religious fragmentation on rent seeking behavior. We report on a series of two-player Tullock contest experiments conducted on a sample of 516 Hindu and Muslim participants in rural West Bengal, India. Our treatments are the identity of the two players and the degree of religious fragmentation in the village where subjects reside. We find no statistically significant differences in rent seeking behavior across different villages. We also do not find any significant differences in behavior as a function of players' identities. This is in contrast to evidence from the same sample which recorded significant differences in cooperation levels in prisoners' dilemma and stag hunt games. We attribute this to the fact that social identity may have a more powerful effect on cooperation than on conflict.

JEL – classification numbers: C93, D03, H41

Keywords: Social Identity, Social Fragmentation, Artefactual Field Experiment, Rent Seeking.

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1   Introduction

We often observe agents competing with each other to receive or get access to resources in a wide variety of economic and social situations. Examples for such contests include political competition, lobbying, or violent conflict. Often resources spent in these activities are not recoverable and have little social value. Social scientists have well documented and analyzed competition among social groups (e.g. Mitra and Ray, 2014). In a democratic context, social groups compete in the ballot box, but often competition takes a more violent turn in case of civil wars and rioting.

A significant number of quantitative studies (e.g. Sambanis, 2002 or Harbom et al., 2006) focus on aggregate cross-country analysis in order to explain violence. These cross-national studies find that the likelihood of wars and armed disputes among social groups increase with poverty and with weak institutions. More recently there have been a few national level more disaggregated studies using data at national level of competition and group violence. Urdal (2008) finds that scarcity of productive resources and urban inequality increase the risk of armed conflict, while Mitra and Ray (2014) also find the improvement of economic status of a minority group can be perceived by the majority group as a threat, and be a catalyst for conflict.

Since competing social groups generally have a common social identity which binds them together, it is important to analyze the behavioral motivations for conflict at the individual level. To this effect, we investigate what impact (if any) religious identities have on the likelihood of conflict over a resource using a simple artefactual field experiment conducted in West Bengal, India. We study the effect of religious identity by comparing the behavior

of Hindu and Muslim subjects when the play with their fellow in-group members to the case where they play someone of a different religion. We furthermore study the effect of fragmentation on the likelihood of conflict by running experiments in villages where the overwhelming majority of the population is of one religion, as well as villages where the population is roughly equally divided along religious lines.

Any individual likely identifies himself or herself with various identities: our ethnicity, political affiliation, sexual orientation or religion shape our beliefs and actions. In this paper we focus on how religious identity, affects individual decisions by Hindus and Muslims in villages in rural West Bengal, India. In India, religion has a prominent position in society. According to the Census of India 2001, Hinduism and Islam account for about 94% of India's population (81% being Hindu and 13% being Muslim). These religious groups have competed, often violently, in the past and continue to do so at present for resources, which highlight the importance of role religious identity could play. West Bengal, India, the region in which we conduct our study, has observed several episodes of severe violence between these two religious groups. Bengal as a state has been partitioned twice along Hindu-Muslim lines: once by the British empire in 1905 and, on the occasion of independence, in 1947 when India and East Pakistan (now Bangladesh) were created. On both occasions there were mass displacements of people from one side of the newly created border to the other and widely documented inter-religious violence (Akbar, 2003; Brass, 2003). Religious violence is still observed today, both in Bengal (Times of India, 2010) and elsewhere (New York Times, 2014). The continuing violence and competition among the religious groups indicate that religious identity potentially plays a crucial role, especially in contexts where individuals perceive competition or threat for resources from members belonging to other religious groups. Some

scholars argue that this competitive relationship between Muslims and Hindus stems from the historical power structure of the two groups. While most of the last millennium India's political rulers belonged to the Muslim religion, up to 200 years prior to independence and since then, Muslims ceased to be the governing class (Turner and Brown, 1978).

In order to understand the effect of identity and social fragmentation on rent-seeking behavior, we study the Tullock contest (Tullock, 1967; 1980). In this game, each competing party can spend part of its wealth to increase the probability of obtaining a resource. However, rent-seeking expenditures are sunk and therefore non-recoverable to both winning and losing parties (see Garfinkel and Skaperdas, 2007 and Konrad, 2007 for reviews on the economics of conflict and contests, respectively).

There is a vast experimental literature on behavior in contests in experiments, recently reviewed by Dechenaux et al. (2014). The main finding from the literature on Tullock contest experiments is that subjects consistently bid above the risk neutral Nash equilibrium. In the overwhelming majority of the experiments done to date, individuals play the game in the absence of social context. While some experimental work has been done in the context of groups (Abbink et al. 2010; 2012; Ahn et al. 2011), these experiments study how individual effort provision changes when competition is done via groups. The fact that group effort is the sum of individual group members' efforts introduces a public good problem, as there is the incentive to free ride on teammates. To the best of our knowledge, no attention has yet been given to the effect groups may have on behavior through changes in preferences due to group membership.

Our paper contributes to this literature by considering the effect of group identity, as well as that of social fragmentation on rent-seeking behavior in Tullock contests using real

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world groups. In this sense, our paper also builds on the experimental literature on social identity which has shown that social identity of individuals influences decision making in cooperation games (Goette et al., 2006), coordination games (Charness et al., 2007), and dictator games (Chen and Li, 2009).

We conjecture that if a player of a particular social group competes with a player with another social group we may observe higher degree of over-bidding compared to case where both players belong to the same social group. Furthermore, we hypothesize that, much like parallel work in cooperation games using the same experimental design, group identities become more salient in fragmented societies (Chakravarty et al., 2015). We find however that religious identity does not significantly influence behavior in the Tullock contest. This holds even when we consider players belonging to villages with different proportions of Hindus and Muslims accounting for different level of saliency of social identity.

2 Experimental Design, Procedures and Hypotheses

2.1 The game

We implement a simplified version of the Tullock contest. Subjects were endowed with INR 80, which they could spend to obtain a prize equal to INR 80.[1] The expected value of the contest, V_i is given by $V_i = 80 + 80p_i - E_i$, $i = 1, 2$. The prize value of the contest is 80 and $E_i \in \{0, 20, 40, 60, 80\}$ is the financial expenditure of player i.[2] The probability of player i winning the contest is given by p_i, which is equal to $1/2$ if both players spend zero and

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[1]We set the prize value equal to the endowment to avoid the possibility of subjects incurring losses.

[2]We opted for a reduced action set to facilitate participants' understanding of the game.

	0	20	40	60	80
0	40, 40	0, 60	0, 40	0, 20	0, 0
20	60, 0	20, 20	7, 13	0, 0	-4, -16
40	40, 0	13, 7	0, 0	-8, -12	-13, -27
60	20, 0	0, 0	-12, -8	-20, -20	-26, -34
80	0, 0	-16, -4	-27, -13	-34, -26	-40, -40

Table 1: Payoff Matrix for the Tullock contest

$E_i/(E_i + E_j)$ if at least one player spends a positive amount.

The payoff matrix in Table 1 displays the game played by two risk-neutral players in our experiment.[3] The unique Nash equilibrium of the game is $(20, 20)$, in which both players bid a quarter of the value of the prize, as in the continuous version of the game. A somewhat unusual feature of our implementation of the Tullock contest is the assumption that if neither player makes a positive expenditure, both players have an equal chance of obtaining the prize. Note also that spending 40, 60 and 80 is strictly dominated by spending 20. Once we eliminate the strictly dominated strategies, we obtain a game with the same properties as the prisoners' dilemma: the joint profit maximizing outcome is achieved when both players spend zero on the contest, but it is in their individual best interest not to do so. However, this does not have any implications on equilibrium behavior: behaviorally though, this could lead to a decline in average effort levels as compared to the extant literature.

2.2   Hypotheses

The main purpose of the experiment is to understand how social identity preferences interact with religious fragmentation to affect on rent-seeking behavior.

We start by asking whether in-group biases will manifest themselves in rent-seeking

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[3]The game was not displayed or explained to participants in this manner. See the instructions and supporting materials in the Appendix.

behavior. Chen and Li (2009) show that experimental subjects exhibit a greater degree of advantageous inequality aversion with regards to in-group members. Fonseca (2009) shows that the best response by a player in a Tullock contest decreases with advantageous inequality aversion. This forms our first hypothesis:

Hypothesis 1: Rent-seeking levels should be lower in the H-H/M-M treatments than either the H-M or the MIX treatment in fragmented villages.

The theoretical literature in social psychology has long argued that in-group biases and out-group biases should be orthogonal (Allport, 1954; Brewer, 1999), and Morita and Servátka (2013) find evidence find evidence of this in the lab. Out-group derogation, if it exists, should manifest itself in a higher degree of disadvantageous inequality aversion (Chen and Li, 2009). Fonseca (2009) shows that increasing disadvantageous inequality aversion leads to an increase in the optimal best response in a Tullock contest. This forms our second hypothesis.

Hypothesis 2: Rent-seeking levels should be higher in the H-M treatment than the MIX treatment in fragmented villages.

We now turn to the main hypothesis of the paper, which concerns the interaction between social identity and fragmentation. Brewer (1991) proposes a theory of optimal distinctiveness, in which one's affiliation to a group – and therefore our sense of identity – is affected by two competing needs. One one hand, we feel the need to belong to a group. On the other hand, we feel the need to be distinct. The former drives isolated individuals to seek membership of social groups, while the latter leads one to identify more strongly with

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groups that emphasize one's uniqueness (i.e. our religion, rather than our belonging to the human species).

This argument means than our participants' sense of religious identity should be more salient in villages where there is an out-group, as opposed to villages where all citizens share the same religious beliefs. This means advantageous inequality aversion should be higher in fragmented villages than homogeneous villages, and as result, rent-seeking levels should be lower. This is our final hypothesis.

Hypothesis 3: Rent-seeking levels in H-H/M-M treatments should be lower in fragmented villages than in homogeneous villages.

2.3 Participant Recruitment and Experimental Procedures

We employed a mixed-gender, mixed-religion team of local research assistants to recruit participants and conduct the sessions, so as to minimize any possible experimenter demand effect. A week ahead of a planned session, our research assistants travelled to the village where that session would take place. A set of neighborhoods were randomly selected, and within each neighborhood, recruitment was done on a door-by-door basis. On a given street, every two consecutive houses were skipped and the third house would be approached and those who agreed to participate would be signed up. Participants were reminded about the session the day before it took place. Participants did not know the purpose of the experiment: when approached, they were informed that the research team would be conducting decision-making sessions. We conducted one session per village.[4]

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[4]After the first session in the first village, it was clear that participants discussed the experiments among their social network. Due to a combination of the novelty factor and the generous incentive payments, the

We made religious identity salient by making the names of participants common knowledge, and by allowing participants to visually identify their potential counterparts in the games participants played.[5] Sessions took place in the village's school building. Upon arrival, participants were asked to remain outside the main school building and wait for their name to be called out. Upon hearing their name, each participant was taken to the main classroom, and told to sit at one of the ends of the classroom, facing the middle. It is reasonably easy to identify someone as a function of their name, since Muslim names are quite different from Hindu names. Calling in participants individually made their religious identities salient (and established the existence of an out-group) in an inconspicuous way.[6]

Participants were told they would be making a series of decisions with someone on the other side of the room, and they were told that they would always make each decision with a different person. This allowed participants to identify the religious identity of their potential counterparts, either through their choice of attire, or by recognizing participants across the room.[7] However, since there were typically 15 to 20 participants on either side of the room, it was impossible for participants to know who their counterpart was in each game, therefore preserving the anonymity of decisions – this was important since 83% of participants stated in the post-experimental questionnaire that they recognized most of the participants in the room.

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sessions themselves raised interest among villagers in the hours after the sessions ended, therefore contaminating the pool of potential participants in that village.

[5]This is a combination of two existing methods of making identity salient: Habyarimana et al. (2007) induce ethnic identity in experiments conducted in Uganda using photographs of participants, while Fershtman and Gneezy (2001) induce ethnic identity in experiments conducted in Israel using participants' names.

[6]Eliciting religious identity through names could have also elicited participants' caste identity as well. We control for this possibility in the econometric analysis of the data, and our results are robust.

[7]The experiments were unusual events in the villages, and many participants came to the sessions in formal attire. In rural Bengal, Hindu men wear "dhoti," a long white cloth draped around the waist, and Muslim men wear "lungi," a piece of checkered cloth also worn around the waist. Hindu women wear "saris," as well as "bindi" on their forehead, while Muslim women wear "salwar" and "kamiz" and no "bindi."

In the H-H and M-M sessions, all subjects in the room shared the same religion, so the seating arrangement was irrelevant. In the H-M sessions, Hindu subjects were all seated in one end of the room, while Muslim subjects sat in the other end; finally, in the MIX sessions, Hindu and Muslim subjects sat on both ends of the room.

Sessions were split in three parts. In the first part, participants played three games: the Prisoners' Dilemma, the Stag-Hunt game and the Tullock contest (in that specific order). In the second part of the session, participants played a series of individual decision-making tasks.[8] In the third part, participants individually responded to a questionnaire in a separate room, got feedback on the decisions made in the experiment, and received their corresponding payment. An experimenter standing in the middle of the room read the instructions aloud, using visual aids to explain the incentive structure of each game (see Appendix for the experimental materials). We did not employ written instructions since about a third of our subjects was unable to read or write. As such, we denoted payoffs in INR and used images of Indian notes and coins to represent payoffs. See the supporting materials for copies of the instruction sets, the visual aids we used as part of explaining the game and decision forms.

The instructions explained the Tullock game as follows: subjects were told they would receive INR 80, which they could use to purchase lottery tickets. The lottery tickets would be put in a bag, along with the lottery tickets purchased by the other person they were matched with for that game. One ticket would be randomly drawn and the outcome would determine who would win the INR 80 prize. The actual draw was done at the end of the session for each pair. Each ticket cost INR 20, which means that subjects could purchase

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[8]The data from the Prisoners' Dilemma and Stag Hunt game, is the focus of a companion paper, Chakravarty et al. (2015).

0, 1, 2, 3 or 4 tickets. The framing of the experiment is consistent with the literature on Tullock contests and it was sufficiently familiar to subjects to allow them to understand the incentive structure.

A potential pitfall of running experiments in which subjects do multiple tasks is that there may be contamination of behavior across games, such as order effects, wealth effects, behavioral spillovers or hedging. Order effects are certainly possible in our experiment; while they would affect cooperation levels, the hypotheses of interest are on differences in behavior across villages and/or treatments, all of which were exposed to the same order of play. We minimized the scope for wealth, spillover and hedging effects in our experiment by (a) not informing subjects of the games they were about to play ahead of time; (b) not providing feedback between games; (c) implementing a turnpike matching scheme, whereby subject i was never matched with the same person twice, and any of i's matches would never play each other. Subjects were reminded of these features at the start of each game.

The first part of the session took approximately 60 minutes and sessions as a whole lasted on average 3 hours. The average payment for the whole session was INR 598.70 ($9.65).[9]

2.4 Ethics

Given that a substantial proportion of subjects could not read or write, we opted to administer a consent form verbally. Before the start of the session, an experimenter read a statement explaining that subjects' decisions would be strictly anonymized, that all decisions would

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[9]The average daily wage for a rural worker in West Bengal in 2011 ranged from INR 105 ($1.74) for an unskilled female worker to INR 297.50 ($4.93) for a male well digger; in most agricultural occupations average daily wages were approximately INR 130 ($2.15), Government of India (2012).

| | | Treatment | | | |
		M-M	H-H	H-M	MIX
Village Type	Homogenous - Muslim	(94, 3)	-	-	-
	Fragmented	(40, 1)	(70, 2)	(130, 4)	(58, 2)
	Homogenous - Hindu	-	(124, 4)	-	-

Note: (# of subjects, # of villages).

Table 2: Experimental design

be identified only through an ID number, which would not be matched with their name. Subjects were free to leave the session at any time, and they also had the right to opt out from the study and having their data removed from the study. An English language copy of the verbatim consent text is in the Appendix. This study was approved by the University of Exeter Ethics officer (IRB equivalent).

3   Results

Table 3 outlines the average expenditure level in each of the six treatments. We start by examining behavior in fragmented villages. The average amount spent on the Tullock contest is nominally higher when subjects play an out-group member than when they play an in-group member, but only marginally significantly so for the Hindu sample (Hindu: $z = 1.727, p = 0.084$; Muslim: $z = 1.179, p = 0.239$, Mann Whitney (MW) test). Effort levels are also nominally, though not significantly higher in MIX than in H-H ($z = 1.394, p = 0.163$, MW test) or M-M ($z = 0.783, p = 0.434$, MW test). Finally, we do not observe any differences in behavior between the MIX condition where the identity of subjects' matches was uncertain and the H-H ($z = 0.229, p = 0.819$) or M-M ($z = 0.783, p = 0.434$) treatments. We now turn

		M-M	H-H	H-M			MIX		
				Hindu	Muslim	All	Hindu	Muslim	All
Village Type	Homogenous Muslim	2.28 (2.55)							
	Fragmented	2.85 (2.56)	2.37 (1.99)	3.42 (2.97)	3.35 (2.45)	3.38 (2.71)	3.19 (2.63)	3.23 (2.47)	3.21 (2.54)
	Homogenous Hindu		3.14 (2.67)						

Note: standard deviations in parentheses.

Table 3: Average expenditure levels across treatments and subject pools

to the comparison of behavior when subjects are paired with in-group members in fragmented villages and homogeneous villages. We see a small decrease in rent-seeking expenditures in homogeneous villages in both H-H ($z = 1.686, p = 0.092$) and M-M ($z = 1.482, p = 0.138$) treatments. This constitutes our first finding.

Observation 1: The average level of rent-seeking expenditures by subjects is not significantly affected either by the identity of their match or by the type of village.

Figure 1 shows the distribution of rent-seeking expenditures in the contests as a function of treatment, village type and subjects' religious identity. Although there are nominal differences in the distribution of expenditure levels, there are only two pairwise comparisons that yield significant differences: the distributions in the H-H and H-M (Hindu sample) in fragmented villages ($D = 0.202, p = 0.092$, Kolmogorov-Smirnov, KS, test) and the distribution of expenditures in H-H in fragmented and homogeneous villages ($D = 0.198, p = 0.042$). Interestingly, the fraction of zero-expenditure observations is roughly equal to 20% in almost all treatments, the exception being the M-M treatment in Muslim-homogeneous villages.[10]

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[10]Note that the outcome in which both players spend zero is the joint payoff maximizing outcome in our game.

This is our second observation.

Observation 2: The distribution of rent-seeking expenditures by subjects is not significantly affected either by the identity of their match or by the type of village in a consistent way.

We now consider the effect of individual-level and village-level characteristics on behavior. To that end, we estimate a series of ordered logit model taking the expenditure level of subject i as the dependent variable. The results of our estimations are in Table 4. Model (1) has as regressors a series of dummy variables for treatment, a dummy variable for Muslim and the relevant interactions. It confirms the analysis so far, to the extent that expenditure levels in homogeneous villages are lower than in fragmented villages for both religious groups. The ordered logit model does pick up statistically significant differences between village types. It confirms the earlier finding that conditional on fragmented villages, expenditure levels are lower among in-group/in-group matches than either the MIX or H-M cases, although those differences are only significantly in case of the Hindu sample (H-H = M-M: $\chi^2(1) = 3.54, p = 0.06$; M-M = H-M + $H\text{-}M \times Muslim$: $\chi^2(1) = 2.58, p = 0.11$).

Model (2) extends the earlier analysis to include subject-specific variables such as age and gender; we also included a series of post-experimental measures of in-group attitudes such as whether subjects disliked members of the other religious group, which we coded as a dummy variable ($DisOG_i$) and its interactions with treatment/religious groups. We were also able to collect data on caste: in particular, we asked subjects in the post-experiment questionnaire whether they belonged to a Scheduled Caste, Scheduled Tribe or Other Backward Caste. These are groups which have suffered from discrimination in recent Indian history; their members enjoy constitutional recognition, and benefit from widespread
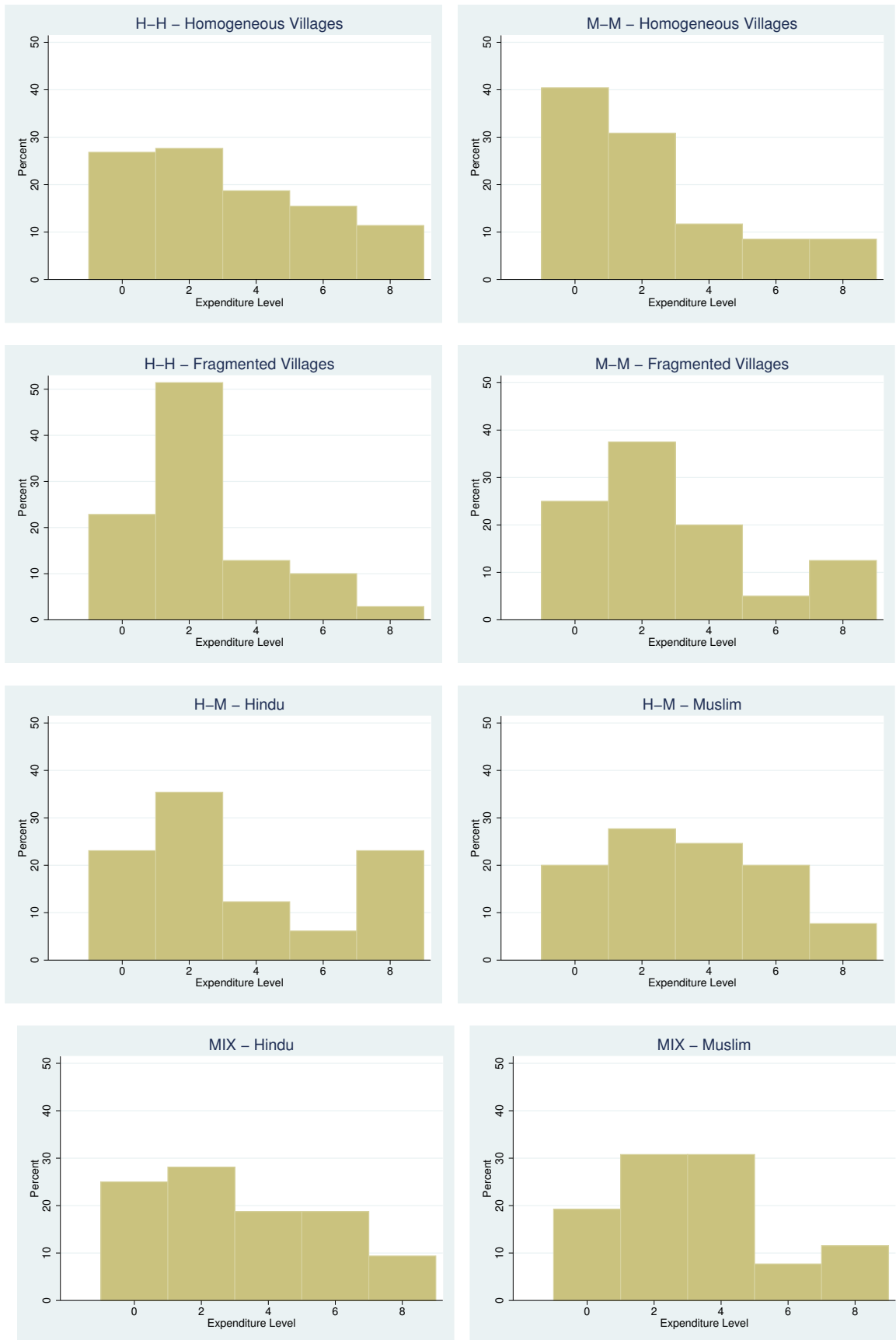
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Figure 1: Distributions of expenditure levels.

affirmative action policies, as well as assured political representation. We then measured the proportion of people on the other side of the room (i.e. the set of potential matches for any participant) who stated belonging to the same group as the decision-maker, which we denote $PropMyCaste_i$, and $PropMyCaste_i \times Adv$, which is an interaction with a dummy Adv for those subjects who were not members of disadvantaged groups. Finally we included data from the 2001 Indian Census on village size, illiteracy rate and unemployment. These variables should be able to pick up any differences in village characteristics that we could not account for in our design. Our estimates of treatment effects are robust to the inclusion of village-specific and individual-specific characteristics. However, we do not pick up any significant coefficient on these extra variables. This is our final observation.

Observation 3: Behavior in the Tullock contest is unaffected by observable individual-specific or village-specific characteristics.

4   Discussion

The main finding of our experiment is that rent-seeking behavior by subjects in our experiment appears to be insensitive to the identity of their match, or to the type of village in which they reside. We can rule out the possibility that behavior in this experiment was somehow inconsistent with the typical behavior in this class of experiments. Average expenditure levels in our experiment are above the risk neutral Nash equilibrium, which is consistent with the literature (Dechenaux et al. 2014).

One possibility for the relative invariance in behavior across treatments is the coarse action grid available to subjects. For instance, it is possible that for some subjects the optimal

DV: E_i	(1)		(2)	
M-M	-0.30	(0.31)	0.07	(0.34)
M-$M \times HomogVil$	-0.52***	(0.08)	-0.91***	(0.23)
H-H	-0.48***	(0.07)	-0.69***	(0.24)
H-$H \times HomogVil$	0.42**	(0.17)	0.34*	(0.20)
H-M	0.07	(0.30)	-0.35	(0.43)
H-$M \times Muslim$	0.02	(0.59)	0.26	(0.68)
$Muslim$	0.06	(0.36)	0.13	(0.43)
$DistanceHC$			-0.01	(0.01)
$VillPop$			< 0.001	(< 0.001)
$VillIlit$			-1.37	(1.86)
$VillUnemp$			-1.18	(1.18)
$DisOG_i$			0.25	(0.17)
$DisOG_i \times Muslim$			-0.35	(0.46)
$DisOG_i \times H$-M			0.57	(0.40)
$DisOG_i \times H$-$M \times Muslim$			0.29	(0.50)
$PropMyCaste_i$			0.003	(0.86)
$PropMyCaste_i \times Adv$			0.15	(0.74)
$KnowAll_i$			0.01	(0.24)
$Male_i$			-0.13	(0.15)
Age_i			0.01	(0.01)
$Cutoff\ 1$	-1.24	(0.17)	-2.46	(0.96)
$Cutoff\ 2$	0.22	(0.04)	-0.98	(0.92)
$Cutoff\ 3$	1.06	(0.09)	-0.13	(0.89)
$Cutoff\ 4$	1.96	(0.17)	0.79	(0.87)
N	515		514	
LL	-771.90		-765.42	

Table 4: Ordered Logit estimates of the determinants of cooperation in the Tullock contest.

expenditure level was an intermediate level of expenditure (e.g. $E_i = 3$). However, since that action was unavailable, subjects may have had to select a lower level of expenditure. We took this design option in order to make the game easier to explain, but in doing so we may have inadvertently reduced the scope for treatment differences. However, we still observed large variation in effort levels, so it is unlikely this is the primary reason for the absence of treatment effects.

We argue that the relative insensitivity of expenditure levels to in-group/out-group variations is due to the fact that social identity preferences have a stronger bearing with regards to in-group "love" rather than out-group "hate". This view has been first put forward by Allport (1954) and reiterated by Brewer (1999). In this sense, one would expect subjects to be more willing to cooperate with in-group members out of concerns for their well-being, rather than by disregard to the well-being of outsiders. While such preferences could explain higher cooperation rates in social dilemmas, it does not necessarily follow that identity will affect behavior in competitive environments. As such, subjects' willingness to expend resources competing for a prize may not be affected by their competitor's identity.

In this light, it is interesting to contrast the behavior of subjects in the Tullock contest to their behavior in the prisoners' dilemma game, since when we eliminate strictly dominated strategies from the Tullock contest, both games share the same incentive structure (assuming risk neutrality). In our companion paper, Chakravarty et al. (2015), we document significant differences in cooperation levels in the prisoners' dilemma as a function of whether subjects play an in-group member or an out-group member, as well as whether subjects reside in a homogeneous or fragmented village. This would be consistent with the view put forward by Mitra and Ray (2014), who model inter-religious conflict on the basis of income inequality

and competition for resources.

However, recent experimental evidence (e.g. Hargreaves-Heap and Zizzo, 2009) shows that out-group derogation can also be a powerful driver of behavior. A better understanding of the role social identity preferences play in games of cooperation vs. games of conflict is clearly necessary and should be the object of future research, with a view to better understand the behavioral drivers of inter-group conflict in the field.

5 Acknowledgements

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A   Appendix — For Online Publication

A.1   Subject Characteristics

In this section, we outline the basic characteristics of our sample. In particular, we wish to understand whether the participant subsample from homogeneous villages differs in a systematic way than the subsample from fragmented villages. To this effect, we compare the two types of villages, pooling the two types of homogeneous villages on a number of characteristics, including caste, marital status, place of birth (both the subjects and their next-of-kin), land ownership, profession, and literacy level.

Table 5 displays the proportion of subjects in each type of village that belong to each of 37 categories. We do not find large discrepancies on any category, although some of the differences are statistically significant using Fisher's exact test. The two differences that are worthy of note are the proportion of advantaged caste subjects, which is ten percentage points higher in Homogeneous villages, while OBC subjects are more prevalent by eight percentage points in Fragmented villages. We also sampled more subjects who either finished or were enrolled in tertiary education in Homogeneous villages. Nevertheless, we reiterate that we do not find systematic differences across multiple categories; even those categories where we there are significant differences, these are not sufficiently large to warrant concern.

A.2   Methodological Note

Before reproducing the experimental materials, a methodological note is warranted. A large proportion of our participant sample was unable to read and/or write to a satisfactory level of proficiency. Around a third of our sample was completely unable to read or write and a

Variable	Fragmented Villages	Homogeneous Villages	p-value
Male	0.45	0.49	0.374
Age	35.24 (12.26)	33.52 (13.05)	0.127
SC	0.18	0.20	0.821
ST	0.00	0.02	0.168
OBC	0.16	0.08	0.003
Advantaged Castes	0.60	0.70	0.020
Single	0.18	0.24	0.098
Married	0.77	0.71	0.188
Widowed	0.04	0.04	0.823
Divorced	0.01	0.01	0.640
Separated	0.00	0.01	0.425
No Family Status	0.00	0.00	1.000
Born Here	0.69	0.71	0.699
Spouse Born Here	0.42	0.43	0.787
Father Born Here	0.65	0.69	0.346
Landless Contracted Labourer	0.01	0.03	0.179
Landless Farmer	0.12	0.15	0.294
Landless Non-contracted Labourer	0.11	0.05	0.011
Landed Less 0.5 H	0.06	0.05	0.711
Landed Less 1H	0.08	0.06	0.500
Landed More 1H	0.03	0.04	0.804
Seamstress	0.09	0.09	0.877
Student	0.08	0.15	0.024
Office Worker	0.02	0.02	0.739
Unemployed	0.03	0.06	0.048
Housewife	0.26	0.18	0.034
Attendant	0.03	0.01	0.080
Tutor House	0.01	0.01	1.000
Healthworker	0.00	0.00	1.000
Govt Rep	0.03	0.01	0.080
Quack	0.01	0.00	0.510
Tobacco Worker	0.03	0.10	<0.001
Other	0.01	0.01	1.000
Retired	0.00	0.01	0.076
Illiterate	0.20	0.19	0.911
Sign Name	0.13	0.11	0.498
Primary Education	0.15	0.14	0.802
Secondary Education	0.41	0.39	0.716
Tertiary Education	0.10	0.17	0.026

Standard deviations in paretheses.

p-values refer to 2-sided Fisher's exact tests except for "Age", where they refer to 2-sided t-test.

Table 5: Subject characteristics as a function of village type.

further 17% only had basic primary education. As such, we had to describe the different games in a different way than that used in typical laboratory experiments. We took a number of design decisions, which we describe and justify in turn.

We opted not to present any payoff matrix to participants. Based on early pilots, we felt that a payoff matrix (even in simple 2×2 games) would be too confusing and abstract to many participants. Instead, we presented the game to participants using a simple, but familiar framing. We then enumerated the actions available to participants, and we described each contingency in the game in turn using visual aids. To circumvent the illiteracy problem, payoffs were described using rupee notes and coins, since all participants were familiar with currency.

We framed the Tullock contest as a task in which subjects were endowed with INR 80 and could spend any amount they wished on lottery tickets. Whatever lottery tickets were purchased would be put into a physical bag and one would be drawn. The winner would earn INR 80.

We piloted this frame in a session with a group of participants in the Birbhum district who had the same socio-economic background as our main subject pool. The feedback we obtained from post-session interviews suggested that our choice of framing led to participants understanding the incentive structure of the game without leading to experimenter demand effects. It is possible that our choice of framing could have led participants to interpret games in unintended ways, but we feel that participant confusion would be a worse outcome.

A.3 Instructions

The following instructions are the English translations from Bengali. Experimenters read them aloud to participants as a fixed script. The team of experimenters used large A1-sized sheets mounted in the middle of the room to assist them in explaining every contingency of each game. The text in bold inside square brackets indicates an action by the experimenter, and was not part of the script. We include the example sheets along with the main text for ease of exposition. We also include the decision forms in separate sub-sections.

A.3.1 Preamble

Welcome to our session. In this session, we will ask you to make series of decisions.

This session is part of a large study sponsored by a university. The purpose of this study is to understand how people make decisions in a typical Indian village. The objective is to better understand how to improve the welfare of villagers in India.

The decisions you will make are not a test of your knowledge. There is no right or wrong way to decide. What we want to know is how you decide when faced with slightly different problems. These problems give you the chance of earning a significant amount of money, so please think carefully before making your decisions.

Please do not talk either to the people sitting next to you or the people across the room about the task. If you have any questions about the experiment, or if something does not make sense, please raise your hand, and one of my colleagues will take your question.

The money you earn will depend on what you choose, on what other people in the room choose and sometimes depending on chance.

We will first explain to you carefully the nature of each decision, and how your payment is determined in each decision. This will involve some examples. Please pay attention to the rules. If you have any question or if the rules are difficult to understand, please ask. It is very important to us that you understand how each decision works.

You will make your decisions on a piece of paper, which we will provide. Please make sure you fill all the necessary decisions, since these will be what determines your payment for the session.

The pieces of paper you will receive will have a number. This number is unique to you. We will pay you based on your number. Please do not write your name on the piece of paper. That way, no one will ever be able to link the decisions you make in this session to you.

Your payment for each task will be determined at the end of the session. You will then be paid in cash. While you are collecting your cash we will also do a brief questionnaire with each of you individually.

A.3.2 Tullock Contest Instructions

In this task you will be paired with someone across the room. You will only be paired with that person for this game; you will never be paired with that person again in this session. You and person with whom you are matched will have to make a decision. Your payment for this task will depend on what you choose and what the other person chooses. We will give you 80 rupees. You may use any of the 80 rupees to bid for a prize. This prize is worth 80 rupees. The prize will be drawn in a lottery. To win, you must buy tickets; each ticket costs 10 rupees. You can buy 0, 2, 4, 6 or 8 tickets. We will place each ticket you buy in a bag; each ticket the other person buys, we will place it in the same bag. We will draw

one ticket at random; if that ticket is yours, you receive the prize; if not, the other person receives the prize. Note our lottery is slightly different from regular lotteries you might be familiar with. Unlike regular lotteries, in our lottery the total number of lottery tickets is NOT fixed. Therefore, while like regular lotteries, in our lottery too the more tickets you buy, the higher the chance you have to win. However, unlike regular lotteries, in our lottery, the more tickets the other person buys, the higher the chance you will lose. Remember, once you buy the tickets you cannot have the money you spent on them back, whether you win the prize or not. If you win, your payment for this task will be 80 rupees minus what you spent plus the prize. If you lose, your payment for this task will be 80 rupees minus what you spent. Both you and the other person must choose at the same time. This means you will not know what the other person has chosen while making your own choice. Let?s go through a few examples using my colleagues. **Example 1:**
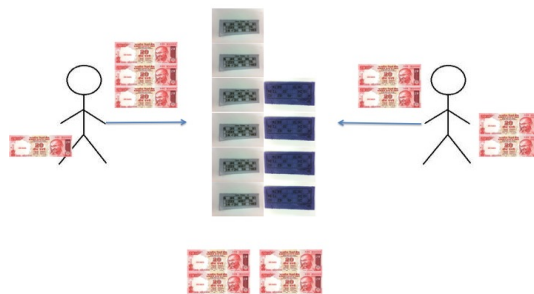

Figure 2: Accompanying A1-size sheet to Example 3.

The sheet on the wall shows the first example we would like to go through with you. Suppose [X] buys 6 tickets and [Y] buys 4 tickets. This means there 10 tickets in the bag. [X] has a 6-in-10 chance of winning the prize and [Y] has a 4-in-10 chance of winning. If the ticket that is drawn is [X]?s, he will win the prize. [X]?s final payment is, [**TRY TO ELICIT**

ANSWER FROM A PARTICIPANT!] the value of the prize (80 rupees), plus the 20 rupees he kept = 100 rupees. [Y]?s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] the 40 rupees she kept. If the ticket that is drawn is [Y]?s, she will win the prize. In that case [X]?s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] the 20 rupees he kept. [Y]?s final payment is [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] 80 rupees plus the 40 rupees she kept = 120 rupees. **Example 2:**
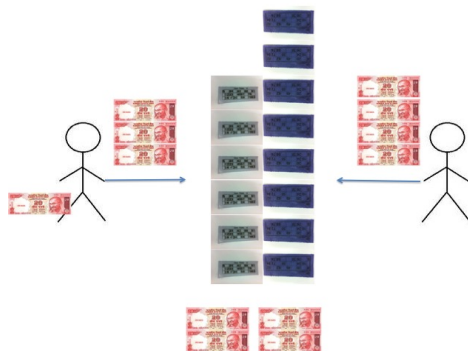

Figure 3: Accompanying A1-size sheet to Example 3.

The sheet on the wall shows the second example we would like to go through with you. Suppose [X] buys 6 tickets and [Y] buys 8 tickets. This means there are 14 tickets in the bag. [X] has a 6-in-14 chance of winning the 80 rupees and [Y] has a 8-in-14 chance of winning. If the ticket that is drawn is [X]?s, he will win the prize. [X]?s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] the value of the prize 80 rupees, plus the 20 rupees he kept = 100 rupees. [Y]?s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] 0 rupees since she did not keep any rupees from the original amount she had. If the ticket that is drawn is [Y]?s, she will win the 80 rupees.

[X]?s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] the 20 rupees he kept. [Y]?s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] 80 rupees. **Example 3:**
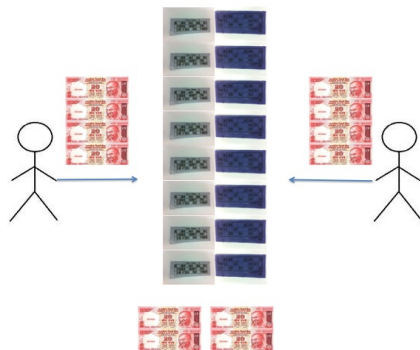

Figure 4: Accompanying A1-size sheet to Example 3.

The sheet on the wall shows the third example we would like to go through with you. Suppose [X] buys 8 tickets and [Y] buys 8 tickets. This means [X] will have 8 tickets in the bag and [Y] will have 8 tickets in the bag. This means [X] has a 1-in-2 chance of winning the prize and [Y] also has a 1-in-2 chance of winning. If the ticket that is drawn is [X]'s, he will win the prize. [X]'s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] the value of the prize, 80 rupees, since he did not keep any rupees from the original amount he had. [Y]?s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] 0 rupees, since she did not keep any rupees from the original amount she had. If the ticket that is drawn is [Y]?s, he will win the prize. [X]'s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] 0 rupees, since he did not keep any rupees from the original amount he had. [Y]?s final payment is, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] 100 rupees. **Example 4:**
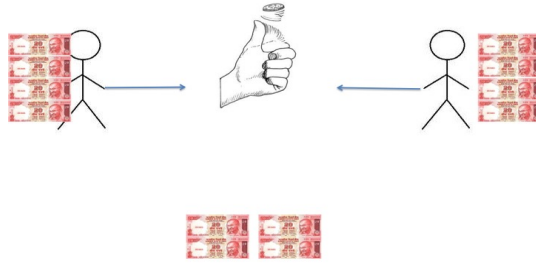
Figure 5: Accompanying A1-size sheet to Example 3.

The sheet on the wall shows the fourth example we would like to go through with you. Suppose [X] buys 0 tickets and [Y] buys 0 tickets. Since no person bought any ticket, we flip a coin to determine who wins the prize. This means [X] has a 1-in-2 chance of winning the prize and [Y] also has a 1-in-2 chance of winning.

If [X] wins, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] he will receive the prize plus the 80 rupees he started with which adds to 160 rupees. [Y] will receive, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] the 80 rupees she started with. If [Y] wins he will receive, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] the prize plus the 80 rupees he started with which adds to 160 rupees. [X] will receive, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] the 80 rupees she started with.

Example 5:

The sheet on the wall shows the fifth example we would like to go through with you. Suppose [X] buys 2 tickets and [Y] buys 0 tickets. This means [X] will have 2 tickets in the bag, while [Y] will have no tickets in the bag. Hence, [X] will win and his payment will be, [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] the prize plus the 60 rupees he has
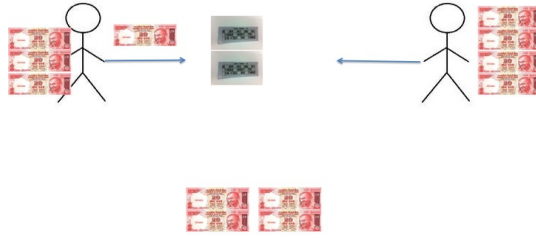
Figure 6: Accompanying A1-size sheet to Example 3.

left. His total payment is 140 rupees. [Y] will receive , [**TRY TO ELICIT ANSWER FROM A PARTICIPANT!**] 80 rupees. ANY QUESTIONS? (wait for a few seconds) In your decision sheet, please choose how many lottery tickets you want to buy, where each lottery ticket costs you 10 rupees. [Experimenters should now hand the decision sheet to the subjects]

A.4 Post-experimental Questionnaire

After all participants completed the final task and the experimenter team collected all decision materials, participants were called individually to a separate room where they were asked a number of survey questions, prior to knowing the outcome of each game and receiving their payoff. Table 6 outlines each question, along with summary statistics.

Question Text	Category/Domain
Age	$[16, 80]$
Religion	{Hindu, Muslim, Christian, Sikh, Buddhist, Parsi, Other}
Caste	{SC, ST, OBC, Normal, Other}
Marital Status	{Single, Married, Widowed, Divorced, Husband Left, Other}
Born in Village?	{Yes, No, Don't Know}
If not, how long have you lived here?	
Spouse Born in Village?	{Yes, No, Don't Know}
If not, how long has (s)he lived here?	
Father Born in Village?	{Yes, No, Don't Know}
If not, how long has he lived here?	
Grandfather Born in Village?	{Yes, No, Don't Know}
If not, how long has he lived here?	
Education Level	{Illiterate, Sign Name, Dropped out at grade x, Completed grade x,

	Currently sitting grade x }
Profession	{Landless contract laborer, Landless farmer, Landless non-contract laborer, Attendant, Small-property farmer (< 0.5 Ha), Medium-property farmer (< 1 Ha), Big-property farmer > 1 Ha), Quarry worker, Student, Office worker, Unemployed, Housewife, Tutor House, Health Worker, Gov't employment program, Village quack, Village tobacco factory, Other}
Does your village have a pond?	{Yes, No, Don't Know}
Who owns it?	{Gov't, NGO, Village}
Do you use it?	{Yes, No, Don't Know}
Has it been appropriated/expropriated?	{Yes, No, Don't Know}
If yes, by whom?	{Higher caste, Land-owning villagers, Rich families, Political party, Panchayat, Other}
Does your village have a tubewell?	{Yes, No, Don't Know}
Who owns it?	{Gov't, NGO, Village, Private individual, Don't Know}

Do you use it?	{Yes, No}
Has it been appropriated/expropriated?	{Yes, No, Don't Know}
If yes, by whom?	{Higher caste, Land-owning villagers, Rich families, Political party, Panchayat, Other}
How far is the Block Health Center?	
If you fall ill, where do you go?	{Dispensary, Primary Health Center, Block Health Center, District Hospital, Nursing Home, Private Doctor, Village Quack, Other}
Name 3 public goods your village lacked for the last 3 years	{Water, Education, Health, Transport, Road, Drainage, No Problems, Don't Know, Others }
Name 3 important public goods	{Water, Education, Health, Transport, Road, Drainage, No Problems, Don't Know, Others}
Do you think of yourself as an Indian?	{Yes, No, Indifferent, Don't know, I belong to this village/district}
Do you think of yourself as a Hindu/Muslim?	{Yes, No, Indifferent, Don't know}
Do you believe you belong to this village?	{Yes, No, Indifferent, Don't know}
If a close relative married a non-hindu/	{Good, Bad,

non-muslim, how would you feel?	Indifferent, Not Bad, Don't know}
If your neighbor belongs to a different religion, how would you feel?	{I like, I don't like, It's normal, Do not dislike, Indifferent, We do not mix, Don't know}
(Hindus only) If your neighbor belongs to a different caste, how would you feel?	{I like, I don't like, It's normal, Do not dislike, Indifferent, We do not mix, Don't know}
Would you like children from other religions in your child's school?	{Few, < half, Half, > Half, Almost everyone, I don't like children from other religions in school, Better everyone studies together, Don't know}
In your village, how many are of your religion?	{Few, < Half, Half, > Half, Almost everyone, Don't know}
In today's session, was there any person from your religion or other religion whom you personally knew?	{Few, < Half, Half, > Half, Almost everyone, Don't know}

Table 6: Post-experimental questions