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ABSTRACT

ESSAYS IN SOCIO-ECONOMIC DECISION-MAKING

BY

URMIMALA SEN

JULY 2014

Committee Chair: Dr. James C. Cox

Major Department: Economics

The first chapter reports experiments with payoff-equivalent public good and common pool games. Behavior of high-caste and low-caste Indian villagers is compared with behavior of American students in terms of economic surplus foregone or destroyed by failure of cooperation in the public good and common pool games. When information about caste is withheld *no* significant difference is observed in the efficiency of play between villagers and student subjects at American universities for both the public good game and the payoff-equivalent common pool game. Providing caste information leads to: (i) the lowest level of efficiency when low-caste first movers interact with a low-caste second mover, and (ii) the highest levels of efficiency when high-caste first movers engage with a high-caste second mover. Cross-caste play generates intermediate levels of efficiency.

In my second chapter I examine competition and cooperation across genders and castes in India and compare the data with incentivized laboratory experiments across genders and races in the US. High-caste males (India) and White males (U.S.) choose to compete the most and are universally cooperative. In India females compete more and cooperate less when they are paired with other females but *not* with males. The level of cooperation among the females of either race (US) is lower than that of the White males but is insignificantly different from the level of cooperation among the African American males.

In my third chapter I conducted artifactual field experiments in rural India with variations of dictator and ultimatum games. Eight treatments are played: in four we provide information that the other player is the spouse and in the remaining four variations spouse information is not

provided. When subjects are unaware of playing with their spouses, they choose to keep the dictator role for themselves or not empower the other player. Male spouses make higher offers in general relative to female spouses. The divisions in these games (no spouse information) are far less equitable than in dictator games with student subjects. We find more concern for procedural fairness when subjects know they are playing with their spouses than when they do not have this information.

ESSAYS ON SOCIO-ECONOMIC DECISION-MAKING

BY

URMIMALA SEN

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree
of
Doctor of Philosophy
in the
Andrew Young School of Policy Studies
of
Georgia State University

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2014

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Urmimala Sen
2014

ACCEPTANCE

This dissertation was prepared under the direction of the candidate's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economics in the Andrew Young School of Policy Studies of Georgia State University.

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Chapter I: Caste, Efficiency and Fairness with Public Goods and Common Pool Resources

Introduction

Authors from several different disciplines have argued for the importance of "trust" and "social capital" on the level of cooperation in a society that can promote economic development, democracy, and the rule of law. In economics, (Arrow, 1972) states: "Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence." (North, 1990) argues that failure to account for differences in coordination and cooperation across countries is a missing element in development economists' explanation of disparity of economic performance across countries. (Putnam, 1993) puts forward the hypothesis that trust and civic attitudes could account for differences in the economic (and government) performance between northern and southern Italy. (Fukuyama, 1995) argues for the importance of "social capital" – defined as a set of norms shared among members of a group that supports cooperation – as a determinant of economic development. (Knack & Keefer, 1997) find that "social capital" – measured by answers to questions from the World Values Survey – is strongly positively correlated with country levels of income per capita.

Recently, some authors have reported experiments with subjects in villages in India, designed to measure the effects of the caste system on economic behavior. An underlying question is whether the caste system has contributed to the historical poverty of India and, if so, might be continuing to retard Indian economic development. According to (Fehr, Hoff, & Kshetramade, 2008) "Spiteful preferences may constitute a considerable obstacle for trade, cooperation, and, thus, development." Several studies report caste effects on spiteful behavior

(Fehr et al., 2008) and subjects' performance in an incentivized maze solving game (Hoff & Pandey, 2006). We report results from public good and common pool experiments that directly reveal economic surplus foregone or destroyed by failure of cooperation. We compare the behavior of caste-uniformed West Bengali villagers to behavior of undergraduates at American universities as well as behavior of caste-informed villagers. By design, the public good game and the common pool game in our study are payoff equivalent. Thus behavior is predicted to be similar *across the two games* by models of unconditional social preferences, regardless of whether that behavior is spiteful ((Fehr & Schmidt, 1999); (Bolton & Ockenfels, 2000) or altruistic (Charness & Rabin, 2005), (Andreoni & Miller, 2002). In contrast, reciprocal preference theory (Cox, Friedman, & Sadiraj, 2008) predicts more altruistic (or less spiteful) behavior in public good than common pool games. We test hypotheses derived from the alternative models.

When we withhold information about caste of other subjects in a session in India, we find that the efficiency of play in these caste-uninformed treatments with villagers is not significantly different from the efficiency of play observed in similar experiments with student subjects at American universities (reported in (Cox, Ostrom, Sadiraj, & Walker, 2013); this is true in both the public good game and the common pool game. Thus an overall cultural difference in level of cooperation across countries is not observed. Our results confirm the empirical failure of the isomorphism of public good and common pool games implied by the unconditional social preferences models as reported by (Cox et al., 2013). The data are consistent with a theory of reciprocal preferences (Cox et al., 2008).

Different outcomes are obtained when we provide caste information to subjects in India. Our data indicate that the caste system has a strong effect on how social dilemma situations

among Indian villagers are resolved. We find strong within-group favoritism that supports cooperation among high caste individuals but not among low caste individuals. Efficiency is highest (lowest) in homogenous groups with high (low) caste subjects.

Disaggregation of the results into the behavior of first movers and second movers reveals that when the second mover is from the low caste, high caste first movers cooperate the least in the public good game but in the common pool game the least cooperative come from the low caste first movers. Uncooperative behavior towards in-group members is observed when low caste second movers withdraw a significant amount of contributions to the public good made by low caste first movers whereas high caste second movers exhibit the most (in-group) cooperative behavior in both games.

The rest of the paper is organized as follows. Section 2 provides an exposition of payoff equivalence between the public good game and common pool game. Section 3 reports implications of alternative theories for these games while section 4 explains the experimental protocols in India and the United States. Section 5 compares the behavior of students at American universities with that of West Bengali villagers who are not informed of the castes of other subjects. Section 6 compares and contrasts behavior of villagers who are informed of alternative homogeneous or heterogeneous caste compositions of subjects in their common pool or public goods games. Section 7 concludes.

Payoff-Equivalent Public Good and Common Pool Games

We report experiments with the "king" versions of the public good (or provision) game and the common pool (or appropriation) game studied in Cox, Ostrom, Sadiraj and Walker (2013).

Public Good Game

This game has *n* players consisting of *n*-1 first movers and one second mover. The first movers simultaneously choose amounts they will contribute from their private property endowments to a public good. Each agent is endowed with "tokens" in an Individual Fund and can choose an amount p_i from the feasible set to contribute to the Group Fund. Contributions to the Group Fund create surplus; each "token" added to the Group Fund decreases the value of the Individual Fund of the contributor by 1 frank (experimental currency unit) and increases the value of the Group Fund by *m* franks, where $n > m > 1$.

After observing the first mover choices, the second mover can choose to contribute any non-negative number of tokens up to his endowment to the Group Fund. Alternatively, the second mover can choose to take (in integer amounts) any part of the tokens contributed by the *n*-1 first movers if it is strictly positive. The second mover can choose an amount p_s to take or contribute) from the feasible set $\Psi^{pg} = \{-\sum_{j \neq s} p_j, -\sum_{j \neq s} p_j + 1, .., 0, 1, .., e\}$.

Let $P = (p_i \mid i = 1, ..., n)$ denote the vector of numbers of tokens contributed to the public good by the *n* players. The payoff to agent *i* in the public good game equals the amount of her endowment that is *not* contributed to the public good plus an equal (1/n) share of *m* times the amounts contributed to the public good by all agents:[1]

(1) $\pi_i^{pg}(P) = e - p_i + m \sum_{j=1..n} p_j / n$

[1] Note that the asymmetry between the most selfish choice across first and second movers: the maximum value of $e - p_i$ for a first mover *i* is whereas the maximum value of $e - p_s$ (for the second mover) is $e + \sum_{j \neq s} p_j \geq e$.

Common Pool Game

The game has *n* players consisting of *n*-1 first movers and one second mover. The Group Fund is endowed with *ne* tokens worth *m* franks each, for a starting total value *mne* franks. The first movers simultaneously choose how much to extract from a Group Fund. Each first mover can choose an amount from the set to extract from the Group Fund. Extractions from the Group Fund destroy surplus; each token removed from the Group Fund increases the value of the Individual Fund of the extractor by 1 frank but reduces the value of the Group Fund by *m* franks where, as above, $n > m > 1$.

After observing the first mover choices, the second mover decides how many of the remaining $ne - \sum_{j \neq s} z_j$ tokens to extract. The second mover (player *s*) chooses an amount z_s to extract from the feasible set of integers $\Psi^{cp} = \{0, 1, \ldots, ne - \sum_{j \neq s} z_j\}$.

Let Z denote the vector of numbers of tokens extracted from the common pool by the *n* players. The payoff to agent *i* equals the number of tokens he extracts from the common pool plus an equal (1/n) share of the remaining value of the common pool after the extractions by all agents (which is *m* times the total number of tokens left in the common pool by all players):[2]

(2) $\pi_i^{cp}(Z) = z_i + m(ne - \sum_j z_j) / n.$

Implications of Alternative Theories for the Public Good and Common Pool Games

The public good and common pool common pool games are constructed to be payoff equivalent, as follows. If the amount added to the Individual Fund (i.e. extracted from the Group Fund) in the common pool game equals the amount $e - p_j$ retained in the Individual Fund (i.e. *not*

[2] Note that the maximum value of for a first mover ($i \neq s$) is whereas the maximum value of z_s (for the second mover) is $ne - \sum_{j \neq s} z_j \geq e.$

contributed to the Group Fund) in the public good game, for each player $j = 1, \ldots, n$, then the payoff to any agent is the same in both games.[3] This follows immediately from statements (1) and (2) by noting that they imply $\pi_i^{pg}(\mathrm{P}) = \pi_i^{cp}(\mathrm{Z})$, when Z=E-P and E=(e,…,e).[4] Several testable hypotheses will be derived in this section.

We first consider the implications of unconditional preferences models including homo economicus (or "selfish") preferences and models of social preferences including inequality aversion models (Fehr and Schmidt 1999, Bolton and Ockenfels 2000) and the quasi-maximin model (Charness and Rabin 2002). These models have different implications for play in one of our games (either public good or common pool). But they all imply that the payoff equivalent public good and common pool games are strategically equivalent, which implies that agents will realize the same efficiency in the two game forms. This is stated in the following proposition.

Proposition 1. Unconditional (selfish or social) preferences imply that efficiency of play is the same in the public good and common pool games.

Proof: See Appendix A.

Proposition 1 implies the following testable hypothesis.

> *Hypothesis 1*: Efficiency data in a public good or common pool game are drawn from the same distribution.

An alternative to unconditional preferences is provided by the model of reciprocal preferences in Cox, Friedman and Sadiraj (2008). In that model, the reciprocal preferences of a

[3] Payoff equivalence does *not* require symmetric play; i.e. we do *not* assume that p_k and p_j are equal, for $k \neq j$.

[4] We use capital letters for vectors and lowercase letters for scalars.

second mover in an extensive form game are characterized by a partial ordering of opportunity sets (MGT), a partial ordering of preferences (MAT), and two axioms that link the partial orderings (Axioms R and S).[5] Opportunity set *G* is said to be More Generous Than (MGT) opportunity set *F* if: (a) the largest second mover payoff in *G* (denoted g^*_{SM}) is higher than the largest second mover payoff in *F* (denoted f^*_{SM}); and (b) the difference between and is not less than the corresponding difference for first mover(s), $g^*_{SM} - f^*_{SM} \geq g^*_{FM} - f^*_{FM}$. Part (a) of MGT "rules in" generosity and part (b) "rules out" the inclusion of instances of "self-serving generosity." Preference ordering *A* is said to be More Altruistic Than (MAT) preference ordering *B* if preference ordering *A* has higher willingness to pay to marginally benefit another than does preference ordering B. Axiom R formalizes reciprocity by stating that a second mover will be more altruistic when first mover(s) choose *G* rather than *F* if *G* MGT *F*. Axiom S states that the effect of Axiom R is stronger when a generous act (of commission) overturns the status quo than when an otherwise same act (of omission) upholds the status quo. The model of reciprocity with the preceding properties has testable implications for play of the payoff-equivalent public good and common pool games in our experiment, as follows. The higher (lower) first mover (FM) i's contribution (extraction) in the public good (common pool) game, the more generous the budget set of the second mover (SM),[6] and by Axiom R the more altruistic the SM's decision. Any contribution by a FM in the public good game provides the SM with a more generous budget set by overturning the status quo. Any extraction by a FM in the common pool game provides the SM with a less generous budget set by overturning the status quo. Therefore, by Axioms R and S

[5] We here provide an informal characterization of the model of reciprocity; it is formally developed in Cox, Friedman, and Sadiraj (2008).

[6] In the public good game, for a given vector, P_{-i} of contributions of other first movers, differences in the most selfish payoffs of FM *i* and the SM when *i* contributes p_i and p_i+x, $x>0$ satisfy

$$\pi_i^{pg*}(p_i + x, P_{-i}, e) - \pi_i^{pg*}(p_i, P_{-i}, e) = -mx/n < 0 < x = \pi_s^{pg*}(p_i + x, P_{-i}, -\sum_{j \neq s} P_j) - \pi_s^{pg*}(p_i + x, P_{-i}, -\sum_{j \neq s} P_j - x)$$

SMs' choices are more altruistic in the public good than (the payoff equivalent) common pool games but in both games SM's altruism increases with higher (lower) contributions (extractions). As budget sets in our game preserve the own-payoff price of altruism, Axioms R and S imply the following testable hypothesis.

Proposition 2. Assume reciprocal preferences that satisfy Axioms R and S.

a. For any given vector of contributions (resp. appropriations) of first movers in the public good (resp. common pool) game, second mover's choice in the public good game is efficiency-enhancing compared to the choice in the common pool game.

b. Efficiency is higher in public good games than in common pool games for social preferences that are convex, separable and with willingness to pay that (locally) increase when own payoff increases (weakly) more than other's payoffs.

Proof: See Appendix 1.

Proposition 2, part a implies the following testable hypothesis.

Hypothesis 2: Second movers' choices are more altruistic in the public good game than in the common pool game.

Our third hypothesis follows from part b of Proposition 2.

Hypothesis 3: Efficiency is higher in the public good game than in the common pool game.

Recall that there are two types of subjects in our experiment: high caste and low caste. An implication of within-group favoritism is higher degree of altruism in homogenous groups that in mixed ones, which gives us the fourth hypothesis

Hypothesis 4: The degree of altruism revealed by second movers' choices is higher in homogenous than in mixed groups.

If the degree of altruism of second movers' is affected by caste (as suggested by earlier studies) then the revealed level of altruism in the no caste information treatment is expected to be between the levels observed in the homogenous and mixed groups (Harsanyi, 1968). This gives us a fifth hypothesis

Hypothesis 5: The degree of altruism revealed by second movers' choices in the absence of information on caste is between the ones observed in homogenous and mixed groups.

Experiment Protocols

The experiment with students was previously reported in Cox, Ostrom, Sadiraj and Walker (2013). The experiment with villagers has not been previously reported.

Experiment with Students

Experiment sessions were conducted at both Georgia State University (GSU) and Indiana University (IU). In each session, subjects were recruited from subject databases that included undergraduates from a wide range of disciplines. Via the computer, the subjects were privately and anonymously assigned to four-person groups. No subject could identify which of the other subjects in the room were assigned to their group. Because no information passed across groups, each session involved numerous independent groups. At the beginning of each session, subjects privately read a set of instructions that explained the experimental treatment. Additionally, an experimenter reviewed the instructions publicly. The games described above were operationalized in a one-shot decision setting with a double-blind payoff protocol. The game settings and incentives were induced in the following manner.

In a public good game, each individual is endowed with 10 tokens worth $1 each in his or her Individual Fund. The decision task of each individual is whether to move tokens to a Group Fund. Any tokens moved to the Group Fund are tripled in value. An individual's earnings equal the end value of his or her Individual Fund plus one-fourth of the end value of the Group Fund.

In the common pool game, each group is endowed with 40 tokens worth $3 each in their Group Fund. The decision task of each individual is whether to move tokens to his or her own Individual Fund. Each token moved from the Group Fund reduces the value of the Group Fund by $3 and increases the value of the Individual Fund of the decision maker by $1. An individual's earnings equal the end value of his or her Individual Fund plus one-fourth of the end value of the Group Fund.

Experiment with Villagers

The treatments in this experiment cross the public good or common pool game form with caste configurations in a 2 X 5 design. The caste configurations are as follows:

1. No caste information
2. High caste second mover, with three low caste first movers (Mixed High)
3. Low caste second mover, with three high caste first movers (Mixed Low)
4. High caste second mover, with three high caste first movers (Homogenous high)
5. Low caste second mover, with three low caste first movers (Homogenous Low)

Procedures for the Village Experiment

We have a total of 808 subjects, 788 of them are Hindu subjects. Each subject participated in only one treatment. Twenty-one experimental sessions were conducted with each

session lasting 3-4 hours.[7] Each experimental session was planned for approximately 40 subjects; however some sessions had 44-48 subjects and one session had 32 subjects. The sessions were conducted in West Bengal, India in conjunction with three different Non-Government Organizations (NGOs).[8] At each place, volunteers from the NGO visited people's homes a few days before the experiment and read out the invitation script generated by us (in Bengali). The volunteers invited only one individual from each family. The experimenter was introduced to the assembled participants by the Secretary of the NGO and thereafter she read the consent form out to subjects. Subjects indicated their willingness to participate by either signing the form or putting in a thumb print (for subjects unable to read or write). Information on caste (and other demographic details) was collected by one of the experimenters (Sen) and was used in forming the treatment groups. Thereafter, the experimenter read the instructions for the experiment to them in Bengali and answered questions. In all ten (5x2) treatments, every subject is a member of a four-member group. In each of the five public good (PG) treatments, each individual is endowed with Rs 150 in a Private Fund. The first movers' decision task is whether to move money from their Private Funds to the Group Fund. Each of the three first movers can contribute anything from zero to Rs 150 (their entire endowment) to the Group Fund in increments of Rs 15. Any amount of money moved to the Group Fund reduced the value of the decision maker's Private Fund by that amount and increased the value of the Group Fund by three-times that amount. The second mover could contribute some or all of her own Rs 150 Private Fund

[7] The first group of eight sessions was conducted during the months of July-August 2011 while the second group of six sessions occurred during February 2012. The final group of seven sessions was conducted during July-August 2012. .

[8] Locations for the West Bengal experiments are: (1) Sagar Island, South 24 Parganas, West Bengal, (2) Panarhat, Falta area, South 24 Parganas, West Bengal, and (3) Jharkhali, Canning & Basanti block, South 24 Parganas, West Bengal.

endowment to the Group Fund or she could withdraw some or all of the contributions of the three first movers.

In each of the five common pool (CP) treatments, a group is endowed with Rs 1,800 in their Group Fund. The choice of each individual is whether to move money from the Group Fund to his or her Private Fund. A first mover can move any amount from 0 to Rs 150 into her Private Fund in increments of Rs 15. Any amount of money moved from the Group Fund reduced the value of the Group Fund by that amount and increased the value of the Private Fund of the decision maker one-third that amount. The second mover could withdraw none, some, or the entire amount left in the Group Fund by the first movers.

In both public good and common pool treatments, an individual's earnings equal the end value of his Private Fund plus one-fourth of the end value of the Group Fund. Note that the figures are economically significant: the minimum wage for unskilled workers in West Bengal at the time of this study was approximately Rs 110-130 per day.[9] Subjects were informed about the (single blind) payoff procedures. Further details on the procedures and challenges in conducting the experiment with villagers is reported in Appendix B. Instructions may be found in Appendix D.

Comparison of Caste-Uninformed Play with Student Play

In this section we report realized efficiency in the two games between villagers (provided no information on caste) and students. To get some insights on the norm of reciprocity (resp. trust) we compare normalized second (resp. first) movers' choices of students with choices of (caste-uninformed) villagers. The main question is whether data reveal different norms of cooperation and reciprocity across these two subject pools, and if so whether these differences are robust to the type of game.

[9] Source: http://labour.nic.in/wagecell/Wages/WestBengalWages.pdf

Efficiency of play by U.S. students and West Bengali villagers

We compare the efficiency of play by U.S. students with that of West Bengali villagers who are not informed of the caste identities of the other subjects in the group. Efficiency of play is measured by the ratio of actual surplus generated from play of the game to the maximum possible surplus in the game (expressed as a percentage). Let π_i denote the salient payoff of subject i from participating in the experiment. Each subject's initial endowment is e and there are *n* subjects in a game. Therefore the numerator in (3) is the surplus generated by a group of *n* subjects from making choices in an experiment session. The maximum possible surplus is *mne*, which would be generated by contributing all tokens to the Group Fund in the public good game or withdrawing 0 tokens from the Group Fund in the common pool game. Therefore the observed efficiency of play is:

$$(3) \quad \alpha = \frac{\sum_{i=1}^{n} \pi_i - ne}{mne - ne} \times 100$$

Figure C.1 shows (estimated kernel) densities of efficiencies for public good (or provision) and common pool (or appropriation) treatments in the U.S. and India. These figures suggest strong game effects on efficiencies with public good games inducing more cooperative behavior; but behavior seems similar between students and villagers.

Indeed, in the public good game, the (mean) efficiency among the caste-uninformed villagers is 44.88% and 39.08% for the students. In the common pool game, the (mean) efficiency among the caste-uninformed villagers is 20.74% and 18.42% for the students. Data from either game fail to reject the null hypothesis of equal distribution of efficiency across two populations (Kolmogorov-Smirnov test, p=0.24 (public good) and p=0.996 (common pool)). These data support the following conclusion:

Result 1a: Resolution of social dilemmas is similar between caste-uninformed play by villagers and U.S. students in either the public good game or the common pool game.

We next turn our attention to a testable implication of unconditional social preferences models, stated in Proposition 1: for such preferences, the payoff-equivalent public good and common pool games are strategically equivalent, which is our hypothesis 1. Data reject this hypothesis (Kolmogorov-Smirnov test, p=0.002 (West Bengali villagers) p=0.069 (US students)). The efficiencies are significantly smaller in the common pool game than in the public good game, which is consistent with hypothesis 3. Thus a second finding is:

> *Result 1b:* Inefficiencies from social dilemmas appear to be more severe in the common pool game than in the payoff-equivalent public good game regardless of whether subjects are U.S. students or caste-uninformed West Bengali villagers.

Trusting attitudes across U.S. students and West Bengali villagers

Many studies (e.g., North 1990, Putnam 1993, Fukuyama 1995, and Knack and Keefer 1997) argue that trusting attitudes have a significant effect on prosperity of societies. So the question we are interested in is whether caste-uninformed villagers are more (or less) trusting than U.S. students. To normalize data, we divide a first mover's contribution (or amount *not* extracted) by the maximum possible amount that he can contribute (or not extract).[10] Measured in this way, mean trust levels across populations are 0.49 (West Bengali villagers)[11] and 0.53 (U.S. students) in the public good game. The figures are slightly lower in the common pool game: 0.42 (West Bengali villagers) and 0.45 (U.S. students). Kolmogorov-Smirnov tests fail to reject the null

[10] As is true in much social preferences literature, we can't separate behavior motivated by trust from effects of altruism or risk attitudes with our data; so our measure of "trust" is a measure of all three effects combined.

[11] We get the trust figures in the following way: from Table C.1, we consider the average level of trust among the no-caste information groups in Public Good (73.57) and divide this by the initial endowment of 150 to arrive at 0.49. The other figures are obtained in a similar fashion.

hypothesis of equal distributions of trust across the two populations (p=0.92 for the public good game and p=0.97 for the common pool game). U.S. students' choices are characterized by similar levels of trust across games (p=0.239) but villagers trust marginally less in the common pool game (p=0.086). If we classify subjects into the categories of "almost no trust" (trust measure ≤ 0.1), "almost full trust" (trust measure ≥ 0.9) and put all others in one group, we again find that distributions of subjects in these three categories are not different across the two populations (Pearson chi2 test, p = 0.813 (public good) and p=0.616 (common pool)). In contrast, differences are significant across games (Pearson chi2, p = 0.009 (villagers) and p = 0.053 (students)); the number of subjects in the "almost no trust" category is twice as high in the common pool game than in the public good game (22 vs. 11 among villagers and 19 vs. 8 for students). We conclude that our data are consistent with:

Result 2a: Trusting levels are similar between caste-uninformed play by West Bengali villagers and U.S. students; this is robust across games.

*Result 2b***:** Significantly more people are trusting in the public good game than in the common pool game; this is robust across U.S. students and West Bengali villagers.

Norm of Reciprocity across U.S. students and West Bengali villagers

In order to gain some insight into whether the norm of reciprocity is different across the two populations, we turn our attention to second mover data. Since second mover choices can be dependent on choices made by the first movers and payoffs in the villager and student experiments are in different currencies, we construct normalized second mover choice variables for comparability, as follows. In a public good experiment, the minimum feasible choice of a second mover is a negative amount equal to the total contributions of the first movers. The maximum feasible choice is the second mover's Private Fund endowment, which is Rs150 in the

India experiment and $10 in the student experiment. The normalized choice variables for second movers in a public good game are:

$$Y_n^{pg} = \frac{\text{choice of the SM + sum of the choices by the FMs}}{\text{150 + sum of the choices by the FMs}} \quad \text{(villagers)}$$

$$= \frac{\text{choice of the SM + sum of the choices by the FMs}}{\text{10 + sum of the choices by the FMs}} \quad \text{(students)}$$

In a common pool experiment, the minimum feasible choice of a second mover is 0. The maximum feasible choice of a second mover equals the amount left in the common pool by the first movers, which is Rs600 minus the sum of the extractions by the first movers in a villager experiment or $40 minus the sum of the extractions by first movers in a student experiment. The normalized choice variables for second movers in a common pool game are:

$$Y_n^{cp} = \frac{\text{choice of the SM + (600 - sum of the choices by the FMs)}}{\text{600 - sum of the choices by the FMs}} \quad \text{(villagers)}$$

$$= \frac{\text{choice of the SM + (40 - sum of the choices by the FMs}}{\text{40 - sum of the choices by the FMs}} \quad \text{(students)}$$

Note that $Y_n^{pg} = 0$ (resp. $Y_n^{cp} = 0$) is the least generous feasible choice for a second mover in the public good (resp. common pool) game. Also, $Y_n^{pg} = 1$ (resp. $Y_n^{cp} = 1$) is the most generous feasible choice for a second mover in the public good (resp. common pool) game. Means of normalized second movers' choices are: 0.74 (Villagers) and 0.57 (US students) in the public good game whereas in the common pool game these figures are 0.31 (Villagers) and 0.30 (US students). According to Kolmogorov-Smirnov test our data fail to reject the null hypothesis of similar levels of reciprocity across two populations: p=0.446 (provision) and p=0.996

(appropriation). Data from both populations reject[12] the null hypothesis of similar reciprocity across games in favor of the alternative hypothesis of higher generosity in the public good games, which is our hypothesis 2. We conclude that:

Result 3a: Overall reciprocal attitudes are similar across students and villagers.

*Result 3b***:** Public good games elicit higher generosity than common pool; this is robust across U.S. students and West Bengali villagers.

Comparison of Caste-Informed Play with Caste-Uninformed Play

Social norms of trust and reciprocity may differ across caste. If so, then as stated in hypothesis 4 in section 3, in the presence of different norms, levels of trust and conditional altruism that we observed among caste-uninformed villagers reflect convex combinations of trust and reciprocity levels of homogenous (all players form the same caste) and mixed (first movers and the second mover belonging to different caste) groups. In-group favoritism requires higher (lower) trust and reciprocity in homogenous groups than in mixed groups in public (common) good games. The interplay between different norms across caste and across surplus creation/destruction games affects play efficiency, which is what we report next.

Realized Surplus with Public Goods and Common Pools

A central question is the effect of caste in-group and out-group behavior on cooperation in public good and common pool games. What effect does knowledge of other players' castes have on the ability of group members to generate surplus in a public good game or not to destroy surplus in a common pool game?

[12] Kolmogorov –Smirnov test, p=0.004 (villagers) and p=0.028 (US students)

Figure C.2 shows (estimated kernel) densities of efficiencies observed among West Bengali villagers when information on the caste of own group members is provided. Visual inspections suggest higher efficiency among high caste players (green dashed lines) than low caste players (red dashed lines); play efficiencies in other group compositions are between the ones observed in homogenous groups. Game effects are pronounced in the absence of information on caste (blue solid lines) but they seem to disappear in the presence of information on caste of others in the group, suggesting that caste effects on play efficiency are stronger than game effects.

Information on magnitudes of the caste and game effects on play efficiency (as well as on trust and reciprocity) is provided in Table C.1.Entries in each row show means (and 95% confidence intervals) of the variables reported in the top row of the table across different games but with the *same* caste composition. Entries in each column, on the other hand, correspond to play across different caste compositions within the *same* game; the largest and the smallest values of each column are on bold.

Consistent with insights from a visual inspection of Figure C.2, data reveal that play efficiency is highest (lowest) in groups with homogenous high (low) caste subjects whereas efficiencies in mixed groups are somewhere between; This ranking is robust to the type of game subjects are participating in.[13] Providing information on the caste of other members in the group has a significant[14] negative effect on play efficiency in public good games only in case of homogenous low caste groups (p=0.001) whereas the effect in common pool games is positive

[13] If we use the homogenous low caste treatment as the control group, according to Kruskal-Wallis test, efficiencies are significantly higher for all groups but the Mixed Low group in case of the public good game; Mean efficiency is still higher in the Mixed Low treatment (0.30) than in Homogenous Low treatment (0.17) but the difference fails to be significant as we are using adjusted p-value. In case of the common pool game, significantly higher efficiencies are observed only for data from homogenous groups with high caste subjects.

[14] Kruskal-Wallis test, (multiple comparisons) adjusted p-value for significance is 0.006.

for homogenous high caste players (p=0.006). Preserving caste composition, play efficiencies across games are similar; only when the information on caste is absent, public good games enhance efficiency (p<0.006; 0.45 (public good) and 0.21 (common pool); see No Caste Information row, the first two columns of Table C.1). Thus our data are consistent with the following conclusions:

> Result 4a. Homogenous groups with high caste subjects are more successful in solving social dilemmas than homogenous groups with low caste subjects; The success of mixed groups in solving such dilemmas is somewhere between and comparable to the success of caste-uninformed groups.
>
> Result 4b. Resolution of the social dilemma by caste informed villagers are similar across two games.

These findings on play efficiencies raise some questions: are high caste subjects better in solving social dilemmas because of higher level of trust? Or is it due to different norms of reciprocity among villagers from different caste? We turn our attention to the effect of information on caste on trusting attitudes and reciprocal behavior.

Trusting Attitudes across Games and Information on Caste: First Mover Data

For comparison purposes we consider the decisions of FMs as the rupee amounts allocated to the Group Fund in the public good games or rupee amounts left in (not extracted from) the Group Fund in the common pool games. Aggregated figures (means and 95% CI) on the decisions of the first movers are reported in the two middle columns (Trust part) of Table C.1. In public good games, average levels of trust vary from a low 64.11 (43%) in the mixed groups with low caste SMs to a high 94.77 (63%) in the mixed groups with high caste SMs. In the common pool game, average levels of trust vary from a low 38.50 (26%) in the homogenous groups with low caste subjects to a high 93.33 (62%) in homogenous groups with high caste subjects. Kruskal-Wallis

test rejects the null hypothesis of equal trust across five treatments (p=0.016 (public good) and p=0.001 (common pool)).[15]

When opportunities for surplus creations are available, trust levels are highest among groups with high caste SMs, with low caste first movers trusting more (94.77) than high caste first movers (88.33). In the presence of surplus destruction prospects, the high caste FMs show much greater restraint by leaving a larger quantity in the common pool for the high caste SMs. In comparison, the low caste FMs show the least amount of restraint when they play against SMs of their own caste in common pool games.

Decisions made by FMs can be motivated by trust on other FMs cooperation as well as trust on SMs reciprocating FMs cooperative choices. If FMs decisions are mainly driven by trust on cooperation of FMs then high (low) caste FMs decisions in homogenous (high SM) and mixed (low SM) groups should reveal the same underlying distribution, which reflects the social norm of trust among people within the same caste. Data reject this hypothesis: Data from groups with high caste FMs, reveal more cooperative (trusting) FMs in homogenous than mixed groups (p=0.057, Kolmogorov-Smirnov test) whereas data from groups with low caste FMs, reveal more cooperative (trusting) FMs in mixed than homogenous groups (p=0.015, Kolmogorov-Smirnov test). If, however, FMs decisions mainly reflect trust on SMs generosity then FMs decisions across groups with high (low) SMs should reveal the same underlying distribution of trust. Data support this hypothesis: low caste and high caste FMs are not different in how much they trust high caste SMs (p=0.857, Kolmogorov-Smirnov test); low caste SMs are trusted less but equally so by low and high caste FMs (p=0.767, Kolmogorov-Smirnov test). We conclude that decisions

[15] If we do not include data from caste-uninformed groups, p-values are 0.008 (public good) and 0.0002 (common pool).

of FMs, despite the caste, suggest that high cast SMs are believed to be more generous than low caste SMs.[16]

Result 5a. High caste SMs are trusted more than low caste SMs; the result is robust across games.

The null hypothesis of FMs being equally trusting across games is rejected only by data from homogenous groups with low caste subjects[17].

Altruism across West Bengali Villagers: Second Mover Data

Finally, we examine whether caste is associated with different levels of generosity. Figures reported in the Public Good column (Conditional Altruism part) of Table C.1, show that contributions of SMs are smaller than FMs, but as with data on trust, high caste SMs and FMs contributions are closer (10=88.33-78.33) than contributions between low caste SMs and FMs (177.58=69.81-(-107.77))); thus high caste SMs appear more generous than the low caste SMs in homogenous groups. The general belief that high caste SMs are more generous than low caste SMs (see result 5a) is supported by data from homogenous groups, but not by data from mixed groups. Data from public good games played by mixed groups, show that FMs contributions are closer to low caste SMs contributions than to high caste SMs (74.99 (low caste SM) versus 177.58 (high caste SM); similarly in common pool games.

Axioms S and R predict higher generosity in the PG game than in the CP game. Figures reported in the Common Pool column, in the Conditional Altruism part of Table C.1, show that

[16] Although data fail to reject the null hypothesis of equal trust across games, choices of the high caste FMs appear more trusting in the common pool games (93.33 and 70.75) than in the provision games (88.33 and 64.11)[16]. If low caste SMs are not believed to be generous, and if high caste SMs are believed to be less generous in the common pool games (as suggested by Axioms S and R), then high caste FMs trust revealing choices may have been motivated by an appeal to cooperation among high caste FMs as to resolve the social dilemma in the presences of negative externalities.

[17] See *** in the Common Pool column, Trust part of Table C.1; We see lower trust in the data from caste-uninformed groups, the p-values are 0.086 (Kolmogorov-Smirnov test).

with the exception of the homogenous low group, contributions of SMs are further (lower) than FMs contributions in CP than in PG : 114.96 (caste-uninformed), 37.33 (homogenous high), 113.6 (mixed high) and 35 (mixed low). This is consistent with part 2.a of Proposition 1.

We consider the decisions of FMs as the rupee amounts allocated to the Group Fund in the public good games or rupee amounts left in (not extracted from) the Group Fund in the common pool games. The normalized decisions of the three FMs in a group, along with the normalized decisions of the SMs in the group are presented in Figures C.3 and C.4. The first column in any pair of columns represents the normalized sum of the FM decisions in a group while the second column in any pair of columns represents the normalized SM decision in the same group.

We see that there is significant difference in behavior when the SMs interact with FMs of a different caste compared to when they interact with FMs of the same caste. In PG the high caste SMs reciprocate the most in the homogenous high groups while the low caste SMs reciprocate the least in the homogenous low groups. When we turn to the CP treatments, on average the high caste SMs still show maximum restraint in the homogenous high groups. The lowest level of reciprocation, however, is found among the U.S. student population, which is lower than the average levels of SM behavior in the no-caste information treatment in India or the SMs in the homogenous low caste groups.

To analyze data at the individual level, we ran censored linear regressions; censoring is warranted as the second mover's choices are bounded from above by the initial endowment and from below by the total amount of money invested by the first movers in the Group Fund. In addition, arguably responses of subjects who come from the same village may be correlated and could reflect locally established social conventions or interactions. To control for this we cluster

responses at a village level in the censored regressions. Estimates (and p-values) are displayed in Table C.2.

As the price of altruism is the same across SM's budget sets (being determined by total contributions of FMs), in the regressions reported in Table C.2, our dependent variable, altruism is measured as deviation from the most selfish choice. Explanatory variables include the minimum as well as the total sum of money contributed by the three first movers in a group to the Group Fund. Both of these variables are known to the second mover before he makes his decision, and according to Axiom R may affect SMs choices. The other main variable of interest is whether second mover generosity in homogenous caste groups is different from groups with mixed caste or no information of caste and if so, whether the type of caste of homogenous groups matters. We also include demographic variables to control for idiosyncratic characteristics of second movers. All estimates (and p-values) are reported in the second and third columns of Table C.2.

Public good games Both models, with and without demographics, report similar signs of estimates. Our data show that the level of generosity is, as predicted by Axiom R, positively affected by the sum invested in the Group Fund by the first movers. Compared to the mixed and no caste information groups, generosity is higher in high caste homogenous groups but significantly lower in low caste homogenous good. Our results are:

> *Result 6a:* There is a positive and significant relationship between the second mover choice and the total sum of money contributed by the three first movers in public good games.
>
> *Result 6b:* Generosity is highest in homogenous high caste groups and lowest in homogenous low caste groups in public good games.

Common Pool Games To test for robustness of findings across games, and to make comparison of generosity across two games transparent, both first and second movers choices in the common pool game used in our statistical analysis are transformed as described in the theoretical section: i.e., an amount extracted by a player is recorded as the money left in the common pool, which is the payoff equivalent choice in the PG game. All estimates (and p-values) are reported in the fourth and fifth columns of Table C.2. Again both models, with and without demographics, report similar signs of estimates in CP games. Unlike in the public good game, the level of generosity is positively affected by the minimum of the choices by the three first movers in the group but not by the total amount of money left in the fund. Generosity level seems to be higher (at least once controlling for demographics) for high-caste homogenous groups. Similar to the public good game, high caste second movers are not more generous than low caste movers as the estimate of High Caste variable is not statistically different from 0 (p=0.210). Our next result is:

> *Result 7*: The more cooperative the choice of the greediest first mover in the group, the higher is the generosity of the second mover in common pool games.

Concluding Remarks

Previous literature (Fehr et al., 2008) has suggested that spiteful preferences of upper caste Indians may pose an obstacle to trade, cooperation, and development. But the "spite" observed by Fehr, et al. (2008) is third-party, costly punishment of defectors. While costly punishment inherently reduces total payoffs in the immediate instance, the credible threat of such punishment may elicit more cooperation and higher payoffs in a larger context. We experiment with public good and common pool games that directly reveal economic surplus foregone or destroyed by failure of cooperation.

Our public good and common pool games incorporate a type of power asymmetry that provides ample opportunity for failure of cooperation. Three first movers simultaneously decide how much to contribute to a public good or extract from a common pool. One second mover makes a choice after observing choices made by the first movers. In the public good game, the second mover can either contribute to the public good or appropriate as his private property all of the previous contributions by the first movers. In the common pool game, the second mover can either refrain from taking from the common pool or extract part or all of the remaining resource in the common pool after the first movers' extractions.

In one treatment with each (public good or common pool) game form, we withhold information about the caste identification of all other subjects in an experiment session. The efficiency of play in these caste-uninformed treatments with villagers is not significantly different from the efficiency of play observed in an experiment with student subjects at American universities (reported in Cox, Ostrom, Sadiraj and Walker, 2013). This absence of a significant cultural effect holds for both the public good game and the payoff-equivalent common pool game. In this way, we did not observe an overall cultural difference in level of cooperation between the two subject pools.

Behavioral patterns become more heterogeneous, however, in treatments in which the Indian villagers are informed about the caste identities of other subjects. The highest efficiency is obtained in both public good and common pool games when three high caste first movers are matched with a high caste second mover. The lowest efficiency is observed when three low caste first movers are matched with a low caste second mover. [18]

[18] This result may be compared with previous findings by (Hanna & Linden, 2012) who find discriminatory behavior in education by low castes towards other low castes in India and by (List & Price, 2009) who find that minority solicitors, whether approaching a majority or minority household, are considerably less likely to obtain a contribution. This finding is similar to what (Alesina, Baqir, & Easterly, 1999) found earlier regarding the shares of

Intermediate efficiency levels are observed when the second mover comes from a different caste than the first movers. In comparison to the efficiency level observed in the public good game with students at American universities, the efficiency in homogenous (high caste) is significantly higher and the efficiency in homogenous (low caste) is significantly lower. For the common pool game, the efficiency of homogenous (low caste) treatment is significantly lower than for students; there is no significant difference between efficiency in homogenous (high caste) treatment and student efficiency of play in the common pool game.

The public good and common pool games in our experiment are payoff equivalent. They are strategically equivalent for all models of fixed social preferences including inequality aversion ((Fehr & Schmidt, 1999), (Bolton & Ockenfels, 2000), quasi-maximin ((Charness & Rabin, 2005), CES (Andreoni & Miller, 2002), and egocentric altruism (Cox & Sadiraj, 2007). In contrast, the public good and common pool games are not strategically equivalent for revealed altruism theory (Cox et al., 2008). Revealed altruism theory predicts specific differences in play between the public good game and common pool game: that second movers will behave more altruistically in the public good game than in the common pool game. Tests of these predictions reveal the following. Observed differences in revealed altruism across treatments are inconsistent with strategic equivalence of the public good and common pool games. In contrast, observed differences in play of second movers across public good and common pool games are consistent with the prediction of revealed altruism theory.

spending on productive public goods in U. S. cities are inversely related to the city's ethnic fragmentation. (Fershtman & Gneezy, 2001) found systematic mistrust towards male players among the minority ethnic Jews by both more educated & wealthier ethnic groups as well as their own groups.

Chapter II: Competition and Cooperation: A Comparative Study between India and the U.S.

Introduction

Economists have been interested in gender differences for a long time - especially why we see differential behavior of the genders to competition. This is an important question. As (Niederle & Vesterlund, 2007) explain, fewer women entering competitions implies fewer women would win such tournaments which, "*decreases the chances of women succeeding in competitions for promotions and more lucrative jobs*." The nature vs. nurture story comes into play- whether we behave in a certain manner because it was genetically ingrained in us before being born (nature theory) or because we adapt our behavior to ensure our acclimatization to the surroundings and the environment we are born into (the nurture story), suggesting that genetic tendencies ultimately may not matter. Evidence of a self-selection story exists as well – the annual earnings for women who graduated from an elite MBA program with labor earnings nearly identical to their male counterparts (at the time of graduation) were found to diverge considerably from the men approximately 10-16 years after completion. Some reasons include women selecting into less demanding jobs due to pressure on their time which may be devoted to their families (Bertrand, Goldin, & Katz, 2010). Some of the other reasons cited for gender differences include differential preferences or even gender discrimination. For example, (Niederle & Vesterlund, 2007) confirm that men are more competitive than women among U.S. undergraduates; while (Gneezy, Leonard, & List, 2009) examine the same question across the Masai in Tanzania (a strictly patriarchal society) and the Khasi in India (a matrilineal society) and find females are more competitive compared to males among the Khasi but the opposite results hold for the Masai. Performance seems to also depend on the gender mix (Gneezy & Rustichini, 2004). Evidence of differential preferences is provided by (Croson & Gneezy, 2009)

who identify that women are more risk averse; have different social preferences (e.g., more sensitive to social cues) and lower preferences for competition. (Babcock & Laschever, 2009) find that female MBAs may be less willing to aggressively negotiate for pay and promotion or may be subject to implicit or explicit gender discrimination ((Bertrand, Chugh, & Mullainathan, 2005)).

If women choose to compete less, it is important to ask what may be the possible cause here. It is possible that the females have innately different preferences-they choose to be more cooperative. Perhaps women feel the need to cooperate more towards their peers (contrasting with men being more competitive). This could be especially important in areas such as the workplace where it benefits an individual to be competitive; but being cooperative and helping others, even when not formally required, offer evidence of a positive externality. Studies in economics find that women tend to choose more equal distributions and to stick with those preferences even when the cost of doing so increases (Eckel & Grossman, 1998) as well as social psychology elucidating why females may be perceived as more cooperative relative to men: generally women are kinder (Conway, Pizzamiglio, & Mount, 1996), more agreeable (Feingold, 1994) and more supportive of their friends (Oswald, Clark, & Kelly, 2004).[19]

The objective of this paper is to examine whether the males compete more than females in two very different environments – villagers in rural India and undergraduates in a U.S. university; further, are women more cooperative? [20] We conduct artifactual field experiments in

[19] (Grant, 2013) provides an exposition of how important cooperation is. According to a team of Harvard psychologists who studied and determined what makes intelligence units effective: "The single strongest predictor of group effectiveness was the amount of help that analysts gave to each other. In the highest performing teams, analysts invested extensive time and energy in coaching, teaching, and consulting with their colleagues". Other studies find that cooperation has positive externalities which strengthen morale, commitment to organizational values, and ultimately increase the overall productivity (O'Reilly, 1983); (Tjosvold, Andrews, & Jones, 1983).

[20] The only study which examines both competition and cooperation is by psychologists (Van Vugt, De Cremer, & Janssen, 2007) who determine that men contribute more to their group if their group was competing with other

rural India[21] where we examine issues of gender and caste and compare the data with incentivized laboratory experiments conducted in Atlanta, GA where we examine issues of gender and race interactions. The games are conducted in an almost identical manner to enable parity across countries. We form mixed gender groups and single sex groups and examine the levels of competition and cooperation in such groups. We ask whether gender is determined as the stronger factor for subjects to compete or cooperate with each other, or does caste or race come up as important. To the best of our knowledge, there have been no reported experiments to date (laboratory or field) that look at how both caste and race interact with gender issues; hence this paper is an attempt to add to the existing literature by incorporating the gender interaction with both race and caste. We first attempt to figure out whether the gender stereotype exists (that males are more competitive compared to females) in India or in the US- conditional on that we determine whether females cooperate more compared to males. We ask whether males are found to be more competitive and if so, will females be found to be more cooperative. We also ask if caste or race matters at all in this scenario. We want to find out whether there is any group that can actually resolve the conflict between competition vs. cooperation.[22]

Why is this important? Competition and cooperation may be placed at the opposite ends of the spectrum but both are of equal importance for an organization to flourish: a competitive team structure improves speed while a cooperative structure enhances accuracy (Beersma et al., 2003). Both are essential since while a competitive team "emphasizes performance differences among team members, typically rewarding individuals with high performance and/or imposing sanctions on those with low performance", cooperative systems on the other hand may focus on

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groups compared to when there was no intergroup competition, female cooperation was relatively unaffected by intergroup competition and suggest that men respond more strongly than women to inter-group threats.

[21] An artifactual field experiment is one where we use non-standard subjects such as Indian villagers in this case. We use the terminology from (Harrison & List, 2004).

[22] Ideally a successful organization requires that an individual be competitive *and* cooperative at the same time.

"group accomplishments. They emphasize minimizing distinctions among group members (that is, distinctions based on performance) because these distinctions may impede teamwork, information sharing, and helping." (Beersma et al., 2003). Understanding the interaction between cooperation and competition is vital since "almost all conflicts are mixed-motive, containing elements of both cooperation and competition." (Deutsch & Krauss, 1962). When people in a team have cooperative goals, they want every members of the team to perform effectively since this process enables the team to be successful; while if people in a team have competitive goals, they are likely to feel that other team members acting ineffectively is beneficial to them since they have a better chance of attaining their goals (Tjosvold, 1998).

In India, gender is an issue of concern – as is evident from the Gender Inequality Index (reflecting inequality in achievements between women and men in empowerment, labor market and reproductive health) which stands at a high value of 0.645 for India.[23] The 2011 Human Development Index (the HDI which assesses long-term progress in health, education and income indicators) ranks India at a low 134 among 187 countries[24] (0.547) - well below the 2011 World HDI at 0.682 as well as the Median HDI at 0.630. However in India, gender is not the only factor to get discriminated against. There exist other elements such as caste - a system of social stratification, which has prevailed in India since pre-historic times[25]. Affirmative action policies have been active in India since 1950 to alleviate the "lower" castes. Yet there exist ample evidence of discrimination against the "lower" castes[26]. So how does caste interact with gender in India? The extant literature on caste and gender so far has mainly focused on how the lower castes (especially the women) have been discriminated against by higher castes (Kannabiran &

[23] From http://hdrstats.undp.org/en/indicators/68606.html. A higher value of the GII indicates more inequality.
[24] From http://hdrstats.undp.org/en/countries/profiles/IND.html.
[25] See (Keay, 2010), pp. 189 for more information. More details of the discrimination in India based on caste or gender may be found in Appendix H.
[26] See (Beteille, 1965), (Srinivas, 1980), (Anderson, 2005) for details

Kannabiran, 1991), how women's status in several regions in India continue to be defined by their caste (Deshpande, 2002) or how women have been under-represented in areas such as public office (Rai, 2002).[27]

Evidence of differential preferences leading to some evidence of discriminatory behavior with regard to gender or race is replete from the US. (Hallock & Bertrand, 1999) find that between the years 1992-97, representation of women in the highest paid jobs is just 2.5%.[28] (Wolfers, 2006) finds that the number of female CEOs has increased from just 4 in 1992 to 34 in 2004; however they still represent just 1.3% of the observations in his sample. (Babcock & Laschever, 2009) find that female MBAs may be less willing to aggressively negotiate for pay and promotion.[29] (Goldin & Rouse, 2000) use the audition process of symphony orchestras to determine that the number of women hired increases by 50% when the audition process is "blind" – implying a screen is used to conceal the gender of the musician from the jury. There are related labor market outcomes as well. (Blau, Kahn, & Waldfogel, 2004) examine why the male and female wages have been slow to converge in the 1990s against the 1980s. They determine that the changes in labor force selectivity, changes in gender differences in unmeasured characteristics and in labor market discrimination, as well as changes in the favorableness of demand shifts are the major factors here. (Bertrand et al., 2010) examine the careers of MBAs from the University Of Chicago Booth School Of Business for 17 years to understand how gender affects the career dynamics. Although the starting position is the same,

[27] In India, just 60 out of the 545 seats – 11% in the Lok Sabha (lower house of parliament) and 26 seats out of the allotted 245 seats- 10.6% in the Rajya Sabha (Upper House of Parliament) comprise of women (From Inter-Parliamentary Union – Composition of women, October 2012, http://www.ipu.org/wmn-e/classif.htm)

[28] They use Standard & Poor's ExecuComp dataset, which contains compensation information (base salary, bonus and the value of granted stock options) of the top five executives for all firms in the S&P 500, S&P Midcap 400 and S&P Smallcap 400 for the years 1992-97.

[29] (Black & Strahan, 2001) discuss the regulations in the banking industry where they found that the firms discriminated by sharing rents (brought about by deregulating) disproportionately with the male employees and estimate that the wages fell by 12% for males, as against just 3% for women implying a greater share of rents being shared with male workers.

the earnings of the male MBAs increase by almost 60 log points within a decade after MBA completion – most of which may be explained by differences in training prior to MBA graduation, differences in career interruptions, and differences in weekly hours. Most studies of wage and occupational differences find an unexplained gap, although the differential and the unexplained portion have both decreased over time. [30] Evidence of racial discrimination is also widespread across the labor market (Bertrand & Mullainathan, 2004); rental housing markets (Hanson & Hawley, 2011); how employment opportunities for low wage workers is subtly but systematically problematic for minority workers (Pager, Western, & Bonikowski, 2009) or how the probability of a welfare sanction (a financial penalty applied to individuals who fail to comply with welfare program rules) increases significantly when the discretization is attached to a black rather than a white welfare client (Schram, Soss, Fording, & Houser, 2009)- to name a few. (Alesina et al., 1999) examine how heterogeneity of preferences across ethnic groups in a city is linked to the amount and type of public goods in the city and determine that the shares of spending on productive public goods—education, roads, sewers and trash pickup—in American cities are inversely related to the city's ethnic fragmentation, even after controlling for other socioeconomic and demographic determinants.

Our results point to some very interesting facts. There are major differences in behavior across and within countries. In India, males of both low and high castes choose to compete significantly more than females of both castes, while in the US, the White males choose to compete significantly more than all other categories - the White females, African American males and females. Yet a cross-country comparison reveals U.S. males as the most competitive and the Indian females as the least competitive. Even U.S. females are marginally more

[30] For more details, see the literature review provided by (Altonji & Blank, 1999) and, for long term trends, (Goldin, 2006).

competitive than the Indian males (at 6.5% level of significance). In cooperation however, Indian males are found to be significantly more cooperative relative to females from both India and the US. Males in the U.S. are found to cooperate at levels that are insignificantly lower than the Indian males, yet within just the U.S. sample, the White males cooperate at significantly higher levels relative to the other groups. These results are robust to addition of demographic controls as well as curtailing the sample to an age group of less than 25 years.

Before proceeding further, we explain what we mean by "competition" and cooperation" in the context of our experiment. We define competition as "competing against others". This may be looked upon as external or extrinsic competition. We design experiments here to test how a subject competes against others (e.g., a tennis player would want to win all the Grand Slams by defeating the rest of the contestants). By cooperation, we mean the "*association of persons for common benefit"*.[31] In this essay, we consider "cooperation" to be the same as "being able to coordinate with the paired group member'. The experiments reported here test cooperation in the sense that if two individuals in a group are cooperative, that would bring about the maximum benefit to the group. Otherwise, there is a possibility that both may end up losing money. Whether individuals can actually reach that level of association is what we test in our experiments.

The rest of the paper is organized as follows. Section II provides an exposition of the experimental hypotheses while section III examines the experiment design. Section IV explains the experimental procedures followed in the two countries and section V discusses the results. Section VI concludes.

[31] Merriam-Webster dictionary, http://www.merriam-webster.com/dictionary/cooperation, accessed October 11 2011.

Stylized Facts for this Experiment

The objective of this experiment is to check whether there are differences in competitive and cooperative behavior when genders interact with castes or races. The two-person gender groups (in both India and the US) are as follows:

- Males with males (all male groups)
- Males with females (mixed gender groups)
- Females with females (all female groups)

The two-person caste compositions (for India) are as follows:

- High-castes with high-castes (all high caste groups)
- High-castes with low-castes (mixed caste groups)
- Low-castes with low-castes (all low caste groups)

The two-person caste compositions (for the US) are as follows:

- Whites with Whites (all White groups)
- Whites with African Americans (mixed race groups)
- African Americans with African Americans (all African American groups)

The literature on gender competition suggests overwhelmingly that males compete more than females in general (Niederle & Vesterlund, 2007); (Gneezy & Rustichini, 2004) and especially so in patriarchal societies (Gneezy et al., 2009). Therefore, we formulate our research hypotheses for the ***gender*** group combinations are as follows:

Stylized Fact I: Men choose to compete more than women.

Stylized Fact II: Females choose to cooperate more than men.

(Cox, Sadiraj, & Sen, 2014) conducted artifactual field experiments to examine the effect of caste in the context of social dilemmas with asymmetric public goods and common pool resource games. Their results indicate that while high castes exhibit within-group bias by acting more altruistically towards other high castes; low castes contribute less (public goods games) or extract significantly more (common pool games) when playing against their own caste. This

leads us to the testable assumption that perhaps the lower castes are possibly more competitive while the higher castes are more cooperative. We will examine the truth behind this assumption in the course of our experiment. Therefore, our research hypotheses for the ***caste*** group combinations are as follows:

Stylized Fact III: High caste subjects choose to compete less than low caste subjects.

Stylized Fact IV: High caste subjects choose to cooperate more than low caste subjects.

(Simpson, McGrimmon, & Irwin, 2007) finds that trust tends to be greater within race categories relative to across race categories. Trust is an essential element in cooperation (Ostrom, 2009). We hypothesize that within-group trust and hence cooperation is greater than across-group cooperation. To the best of our knowledge, there is no research which examines how the different races perform in a competitive task, which makes it difficult to formulate a stylized fact of any particular race competing more. However, since competition is expected to be at the opposite end of the spectrum from cooperation, we invert the case for competition to create *Stylized Fact* VI: across race competition is higher than within race competition. Therefore, our research hypotheses for the ***race*** group combinations are as follows:

Stylized Fact V: Cooperation is greater within a race than across races.

Stylized Fact VI: Competition is greater across races than within a race.

Subjects participated in three separate "parts" during the experiment. The first part is a risk elicitation treatment. The second is a competition game and the third part is a cooperation game. Descriptions of the experimental procedures followed in the two countries and the three games follow. Instructions may be found in Appendix G.

Experimental Design

Round 1: The Risk Round

Following (Gneezy et al., 2009), we design the risk game to introduce exogenous variation in the observability of investment returns. Each participant is given an initial endowment of Rs 100 in India ($8 in the US) and asked to divide the endowment between a zero-risk, zero-interest savings account and an investment which is risky but potentially profitable. The participant would receive five times the amount that they chose to invest in the risky prospect with probability one half, and will lose the amount invested otherwise. At the time of making the decision, the subject is informed that if this round is selected for payment at the end of the experiment, a coin will be flipped to determine whether his or her risky investment is successful. Thus, the main decision a subject is faced with is how much of the endowment to invest in the risky security and how much to allocate to the zero-profit alternative. Subjects are informed that if this round is chosen for payment at the end of the experiment, the die roll would actually be conducted and whatever they earned would be paid in private.[32]

Round 2: The Competition Task

Once subjects finished the making the decision for the risk round, they are informed about the gender and caste of their paired group member. Thereafter they are asked to complete the competition task. They are asked to under hand toss a tennis ball into a bucket placed 3 meters (10 feet) away for which they have 10 attempts. A successful shot occurs when the tennis ball

[32] There are several reasons why this simple binary task was chosen. First, we have subjects with low education levels and there could be possible lack of comprehension of a sophisticated risk elicitation task such as the one by (Holt & Laury, 2002). (Charness & Viceisza, 2012) test the understanding and level of meaningful responses to this task across farmers in rural Senegal and find a low level of understanding (including multiple switching by over 50% of the subjects). Moreover the (Holt & Laury, 2002) mechanism allows the subjects to see all the lottery choices before making a single decision. (Cox, Sadiraj, & Schmidt, 2014) demonstrate the problems that arise across the changes in the elicited risk preferences regarding the behavioral properties of this random decision selection mechanism.

enters the bucket. The task was chosen because it is simple to explain and implement and no gender differences in ability are expected, as demonstrated in (Gneezy et al., 2009).

But before subjects start this task, they are asked to make a decision on how they wished to be paid for their performance. They make this choice before performing the task. The two options to choose from are (a) Rs 20 per successful shot in India ($2 in the US), regardless of the performance of their paired opponent or (b) Rs (4*20) = Rs 80 each successful shot ($8 in the US) if they outperform their opponent. They are informed that in case they chose the second option and scored the same or less than the opponent; they would still receive Rs 20 (or $2) per successful shot. [33]

Round 3: The Cooperation Round

In this round, we used a modification of the roadmap game (adapted from (Deutsch & Krauss, 1962)) to elicit whether individuals cooperate with each other. Each subject pair (we call them A and B) is asked to travel from their respective starting points to their destinations. As indicated in the Figure E.1 roadmap, each subject has a different starting point and a different destination. There are two possible routes each subject can take. They can take either the short route (one lane road) or the long route (alternate route). If both individuals travel along the short path, their paths will collide and neither can reach their destination. Along the long route, they do not cross each other; however this route is long and takes more time compared to the short route.

A gate is placed at both ends of the short route. Each subject has control over the gate closest to their starting position. Each subject has the option of opening the gate to let the opponent pass

[33] This payoff structure is a modification over Gneezy et al (2009): the current design is starker since there is absolutely no reason for anyone to choose "not compete" because there is no way one can lose money in this game. Therefore anyone choosing to "not compete" would do so since they really do not want to compete with the paired group member.

or one can choose to close the gate and restrict the other person from travelling along the short route.

So in our game the subjects decide simultaneously-

- which route they would choose – the long one or the short one and
- whether they want their gate open or closed (if they choose the long route).

So the options are:

a) (long route, gate open), where the subject takes the long route and allows his opponent pass through the short route by opening his gate, thus showing cooperative behavior;

b) (long route, gate closed), where the subject shows non-cooperative behavior since he keeps his gate closed and does not allow his opponent to pass, while travelling via the long route;

c) (short route, gate open), where the subject wants to travel via the short route, so he has to keep his own gate open.[34]

Table E.1 shows the payoff structure for the normal form of the game for all possible decisions. If both subjects choose to travel via the long route, they each get a payoff of 1 unit when they reach their destination, irrespective of whether the gates are closed or open (since they are not using the shorter route). If one subject uses the short route and is able to reach the destination, they can get 5 points provided the paired partner kept the gate open. If the gate is closed, they get 0 points. If both use the short route, each subject gets -2 points, since neither would complete their trip.

Here 1 point translates to Rs 20 ($2 in the US). In case a subject earns a high payoff of 5 points in a round, she earns 5 times the amount or Rs 100 ($10) for that round. At the end of the

[34] The last option: short route, gate closed is ruled out this case since if a subject wants to travel via the short route, he will not be able to get into that route unless his own gate is open.

experiment, she gets paid on the basis of what she has earned in all the 10 rounds in this task (if this round is chosen for payment). The player types (A or B) are randomly assigned to the two players in a team. At the end of each round, both players are informed of the scores obtained and the decisions by each player in the pair.

Note that an efficient strategy would be for player 1 to choose the route and gate options as (long, open) in one round, thereby allowing the player 2 to choose the short route with gate open option (which gives the maximum payoff). Now, player 2, if motivated by positive reciprocity towards the player 1, chooses the long route with open gate in the following round, and allows player 1 to choose short route, with gate open. Testing for whether this level of cooperation and coordination can be attained by the players over two consecutive rounds is our objective in this round. We want to examine whether females perform better at this cooperation task, since it would offer an explanation for less competitive behavior among women.

We will also point out that in this experiment, being cooperative is not the same as being *altruistic*. An altruistic individual would act in a selfless manner e.g., offer money to a paired group member even if the decision maker does not get any benefits from such an action. A *selfish* action would be exactly the opposite where the subject would think of only the self-benefit and will not be concerned about others' welfare. By cooperation in this experiment we mean a situation where the best case scenario for an individual is to be "selfishly altruistic" –if I am being altruistic in one round, I have the expectation that the paired person will be altruistic towards me in the next round. This is certainly not a purely selfless act nor a purely selfish action - since being selfish is likely to hurt my own chances in the forthcoming rounds.

We note here that the order of the experiment was always the risk round, followed by the competition round and finally the cooperation round. Since subjects made the decisions for the

risk round *before* knowing who their paired group member would be, so this round could not be conducted at any time other than at the start of the experiment. The risk and competition rounds were conducted in private; one after the other while the cooperation round was performed while everyone was sitting together in the main room. At the juncture between the risk round and the competition round, the subjects were informed about the gender and caste of their paired group member. Providing this information was obviously crucial to the whole experiment. If the cooperation round had been performed in the middle, it would not have been possible to convey the information about the paired group member to each individual subject. In addition since this paper extends the experiment of Gneezy et al (2009), we wanted to keep the order the same as in the original experiment for easier comparison purposes.

Experimental Procedures across India and the United States

Procedures followed in India

The experimental sessions in India were conducted at Panarhat, Falta in the South 24 Parganas district in the eastern state of West Bengal using the premises of a local NGO during February 2012. At each place, volunteers for the NGO invited potential subjects by reading out the invitation script generated by us in the local language, Bengali.[35] The experiments were conducted using subjects from distant villages to ensure a good mix. All sessions were conducted in the local native language, Bengali. The experiments followed a single blind procedure. Once the participants showed up at the central location on the day of the experiment they were asked to provide certain demographic information such as their sex, age, religion, marital status, caste,

[35] The prospective subject was informed that an experiment is being conducted at a central location (e.g., a school), and they are being invited to participate. If they did show up at the designated time and place, they will have to perform some tasks and make some decisions. They are guaranteed to earn at least Rs 50 (show up fee); and if they do participate, they have a chance to earn a lot more.

years of education and occupation. They were also asked whether they have ever participated in any sport, and if so, for how many years.

The experimenter read the consent form to them in Bengali. Subjects indicated their willingness to participate by signing the form.[36] Next, the instructions were read aloud to the entire group of assembled participants by the experimenter. Subjects were also told at this point that they will receive payment for either Rounds 1, 2 or 3. The experimenter used a 6-sided die at the end of the experiment to decide which round they would get paid for. Subjects received an additional Rs 50 as show up fee. Subjects were informed that each of them would be included in a two-person team. Each team remained fixed for the entire experiment. The team member was another person from the entire gathering of individuals at the school on that particular day.

Next, the subjects are asked to come one by one to a separate private room for a one-to-one interaction with the experimenter. They made their choice for the risk task. Thereafter each participant is informed of the gender and caste of their partner. However no subject is ever informed of the identity of the other person. Thereafter subjects chose the competition reward scheme and completed this task. They are not informed of their opponent's performance. They were told to go back to the main room and await instructions for the next round.

After all subjects had completed the first two rounds, we played the third round to examine cooperation. Each subject was handed an envelope with 10 decision sheets, stapled together. The experimenter clarified all the instructions and asked the subjects to make their decision for the first round. Once all subjects have circled their choices in their decision sheets for the first round, the sheets were collected and points awarded for each decision. Next, the

[36] Unlike in a laboratory experiment in an American university, (where the instructions would be handed to all participants), we would not hand instructions to the subjects, since we are likely to have a mix of literate and semi-literate subjects. The instructions were verbally read out to subjects so as not to discriminate. The consent forms and the instructions were translated from English to Bengali and checked after having a different person translate them back into English.

sheets are returned to each subject. They are asked to carefully consider the decision of their partner for that round and thereafter complete the same set of decisions for the next round. Again all sheets are collected and points awarded. We repeated this process 10 times.

To ensure no strategic behavior, we implemented a number of procedures. The volunteers of the NGO were specifically asked to ensure no talking or discussion among the subjects. Since most people preferred to sit next to their friends or neighbors or people with whom they had travelled to the location, we repeatedly informed the subjects that their friends or neighbors will *not* be placed in the same group as them; they would be paired with strangers from other villages. This information was provided to the subjects several times and at regular intervals. People were made to sit far apart from each other to further hamper the process of communication. Groups were created beforehand with matched alphanumeric codes known only to the experimenter[37] – so that subjects (or even the volunteers) had no way of knowing which two people were in the same group.

All sessions were conducted at the Panarhat, Falta area, South 24 Parganas in rural West Bengal, India during February 2012. We conducted 6 sessions with 28 subjects per session, generating a total sample of 168 subjects. Table E.2 summarizes some characteristics of the subject population in India. We had an exactly equal gender split among our subject pool. 74% belonged to the higher caste.

Subjects were between 18-36 years, with a mean age of 26 years. The average age among male subjects was 25 years (standard deviation of 5 years) while the average for a female subject was 28 years (standard deviation of 6 years). All subjects had received some form of education. 35% of the male subjects had some level of secondary education and a further 51% had

[37] For example, two members of a group could be ABC321 and PQR987. It would be impossible for a subject (or volunteer) to guess accurately which two people were in the same group.

completed high school; 67% of the female subjects had some level of secondary education and another 25% had completed high school. Among the male subjects, 39% were students, 12% were farmers while 40% provided were employed either as a shopkeeper or other miscellaneous jobs. We also find that 80% of the female subjects were housewives and the rest were students. 4% of our entire sample is unemployed. 89% of the female population is married, compared to 32% of the male subjects. 95% of the females have played some game[38] in the past (88% of these subjects have between 4-10 years' experience of playing games); while all males have previously played some games (75% of them have between 10-22 years' experience of playing games).

Procedures followed in the United States

The subjects in the U.S. were recruited via the ExCEN Recruiting system. Once subjects had been seated in the laboratory, they were asked to fill out a demographic questionnaire which asked the same questions as in India.

After everyone had consented to be part of the experiment, the instructions were verbally read out to the subjects. The show up fee was $7.50. Once instructions had been provided for the first two rounds, subjects were asked to come to a separate place one by one where they first made the decisions for the risk task. Thereafter they were informed about the gender and race of their paired group member, asked to make a choice for the reward scheme in the competition round and then actually complete the competition task of tossing 10 tennis balls into a bucket placed 3 meters (10 feet away). Once all subjects had completed the first two rounds, the third and final task to test cooperation was played out exactly in the same way as in India.

[38] These games include cricket, football, badminton etc in India while games played in the U.S. included volleyball, basketball, baseball, track and field etc

We conducted 19 experimental sessions at the Experimental Economics Center (ExCEN) at Georgia State University during March-May 2013. We have a total sample size of 184 subjects. Table E.3 provides some descriptive statistics of the subjects. 49% of the population was female (90 females) and 42% was White (77 Whites). 41% of the females and 43% of the males were White. Just 2% of the sample is married. Subjects were between 18-35 years, with a mean age of 20 years. The average age among male subjects was 20.56 years (standard deviation of 3 years) while the average for a female subject was 19.99 years (standard deviation of 3 years).

Subjects had on average between 14-15 years of education (implying that most were sophomores or juniors). 82% of the females have played some sports or games in the past (between 1-15 years' experience of playing games with an average of about 5 years' experience); while 88% of the males have previously played some games (between 5-25 years' experience with an average of about 7 years' experience).

Experimental Results

Next, we examine the results from the three different experimental treatments across India and the US.

Choice of Risky Investment

We first examine the amounts placed in the risky investment by gender and caste or race. In India on average, males invest Rs 56 in the risky investment; while females invest Rs 50. A parametric means test and a Mann-Whitney non-parametric test rejects the notion that the level of contribution to the risky investment is the same across genders ($t = -1.9130$; $z = -1.849$).

On average in India, high caste subjects invest Rs 52 in the risky venture while the corresponding figure for low castes is Rs 55. The means test, the Kolmogorov-Smirnov (KS) and the Mann-Whitney (MW) tests fail to reject the notion that level of contribution to the risky

investment is same across high castes vs. low castes (t = 0.6908; p-value 0.725 in KS test and z = 1.096 in MW test).

In the US, males invest $5.69 on average. White males invest the highest amount among all gender and race categories ($6.25) while African American males invest $5.28 on average. These figures are higher than the average investment in the risky venture by all females ($4.83); White females ($5.04) and African American females ($4.68). A means test, a Mann-Whitney test and a Kolmogorov-Smirnov non-parametric test rejects the idea that the level of contribution to the risky investment is the same across genders.[39]

Table E.4 reports an OLS regression that examines the choice of risky investment. The dependent variable is the percentage of the endowment invested in the risky investment. Column (2) present s the results from the pooled data from India and the US. We have added country-gender interaction dummies here: **US-males** (which takes value=1 if subject is male and is from the US); **US-Females** (which takes value=1 if subject is female and is from the US) and **Indian-Females** (which takes value=1 if subject is female and is from India). We examine results relative to the omitted category: **Indian –Males** (which takes value=1 if subject is male and is from India). We find that the percentage of endowment invested in the risky option is significantly higher for the males in the U.S. while Indian females tend to invest a significantly lower percentage of their endowment. We also find that the more educated subjects invest more[40].

[39] The means test provides a t value of 3.20; the two-sample Wilcoxon rank-sum (Mann-Whitney) test provides a z value of -3.112 and corrected p-value from the KS test is 0.002.

[40] Our results are similar to the results reported in Gneezy et al (2009), who conduct the exact same test across the Khasi and the Maasai subjects and determine no difference in investment levels across genders in the two cultures: the gambled amount for Khasi (Maasai) women is not found to be significantly different from the gambled amount for Khasi (Maasai) men according to a two-sample t test.

Column (3) provides results from India only. We add gender-caste interaction variables: **male-high** (which takes value=1 if subject is male and high caste); **male-low** (which takes value=1 if subject is male and low caste); **female-high** (which takes value=1 if subject is female and high caste) and **female-low** (which takes value=1 if subject is female and low caste). The omitted category is high caste males. We find no significant difference in the percentage of the endowment invested in the risky option by any of the three categories (relative to our omitted group: high caste females).

Column (4) examines the choices from the subjects in the US. Here we add gender-race dummies: African American Males (which takes value=1 if subject is male and is African American); African American Females (which takes value=1 if subject is female and is African American); White Females (which takes value=1 if subject is female and is White). The omitted category is White males who invest a significantly higher amount in the risky investment relative to the other three categories- the White females as well as the African American males and females. This effect is robust to addition of demographic controls. So, on average White males take the most risk. So our main results are:

> *Result 1*: U.S. males invest significantly more in risky part of the lottery while Indian females invest significantly less relative to Indian males. U.S. females invest insignificantly more than Indian males.

Note that at the time of making the decision for how much to invest in the risky venture, we look only at how the males behaved vs. the females. We do not look at the behavior of the group with males with other males or males and females since the information about the paired partner had not been provided to the subject at this point. Partner information was provided *after* the subject had completed making the risky investment decision.

Competition round: Decision to Compete

The first main question we are interested in is whether men are actually more competitive compared to females (**Stylized Fact I**). We conduct a binary probit analysis considering the decision to compete as the dependent variable. We construct a binary variable "**t2_compete**" which takes the value 1 if the subject chooses to compete and 0 otherwise. Table E.5 reports the marginal effects from a probit analysis using the decision to compete as the dependent variable.

Column (2) reports the pooled data from India and the US, while columns (3) and (4) report data separately for India and the U.S. only. All columns control for age, years of education, marital status, whether the subject is a student or not, whether the subject has played any games and if so, how many years they have played and the percentage they had invested in the risky option in the first round. We find that U.S. males are significantly more likely to choose to compete relative to the omitted category: Indian males, while Indian females are significantly less likely to choose to compete relative to the Indian males. Not surprisingly, if a subject has played sports before, they are far more likely to choose to compete.

In column (3), we report the results from India and examine the choices of high caste females, low caste males and females relative to the omitted group: high caste males. We find that males from low castes choose to compete insignificantly less relative to the high caste males while both high and low caste females choose to compete significantly less. This is robust to controlling for all our demographic variables.

Note that if a subject chooses to compete but is unable to outperform their partner (obtains less or equal to the paired partner), they do *not* actually lose monetarily *since they still get paid as the case where they chose to not compete* (they would still receive Rs 20 per successful shot). Therefore there is no incentive to choose "not compete". Therefore a decision to choose "not

compete" here would indicate a very strong desire to avoid competition at any cost. However even in this situation most Indian female subjects chose "not compete" when informed that they were paired against a male. On such occasions, the instructions were explained again and subjects were informed that they would not lose by choosing "compete" to ensure that the female subject had not misunderstood the instructions. However the choice of "not compete" was not an uninformed one. Many female subjects responded that such behavior (competing against a male) was not "expected" from them. It appears that these female subjects have a deep-rooted stereotype in their minds – where competing against a male would be considered "improper" behavior. Responding in a "correct" manner was more important to them than monetary gain. Note that when paired with other females, most female subjects chose "compete".

Column (4) in Table E.5 reports the marginal effects from a probit regression to examine the choice to compete among the U.S. subjects. In the U.S., similar to the sessions in India, each subject is informed about the gender and race of the paired partner and thereafter asked to decide if he or she wants to compete or not before starting to toss the tennis balls. We examine the choices of African American males, African American females and White females relative to the White males. We find that the White males choose to compete significantly more than White females, African American males and females. This effect is robust to controls such as whether the subject has ever played games and how many years they have played, the amount invested in the risky investment and demographics.[41]

[41] On average males choose to compete 97% of the time while females choose to compete 92% of the time. African American males choose to compete 94% of the time while all our White male subjects chose to compete. Among the females, African Americans choose to compete 89% of the time while the White females chose to compete 97% of the time on average. It is surprising that even when subjects had nothing to lose monetarily, about 6% of the subjects chose to "not compete". This was not due to a lack of understanding the instructions. During informal conversations with the experimenter, the general reason to choose "not compete" turned out to be either "to not embarrass myself" or "not having the confidence to get even one successful shot, let alone beat my partner".

Figures E.2-E3 and E.6-E.7 provide graphical expositions of the decisions to compete among the group in India and the US, segregated by gender groups. Figure E.2 examines the decision to compete among males in the all-male groups (left panel) vs. their decision in the mixed gender groups (right panel) in India. Figures E.6 examines the decision to compete among the males in all-male groups (left panel) vs. their decision in the mixed gender groups (right panel) in the U.S. while Figure E.7 examines the decision to compete among the females in mixed groups (left panel) vs. their decision in the all-female groups (right panel). No significant differences are found in the decision to compete across any of the paired groups in any of these categories. However we do find striking differences in the decision to compete among the Indian females: just 40% choose to compete when paired with males but when paired with other females, nearly 71% choose to compete with each other.

Therefore, we find support for our **Stylized Fact** I: that the males from both India and the U.S. are more competitive compared to females of both countries. **Stylized Fact** III is not supported since both the high and low caste females chose to compete significantly less relative to the high and low caste males (column 3 in Table E.5). **Stylized Fact** VI is rejected since the highest level of competition is seen for the white males who choose to compete irrespective of who they have been paired with. So competition is high across race groups as well as within race groups at least among the males. So our results are:

> *Result 2*: U.S. males and females compete significantly more while Indian females compete significantly less relative to the Indian males. In India, females of either caste compete significantly less while low caste males compete insignificantly less than the high caste males. In the United States, White males are the most competitive.

Next, we ask a related question: the males may choose to compete more than females; but are they really able to perform better? Or is it just over-confidence? If the performance of the males is not at par with their decision to compete, we can perhaps attribute their decision to compete to over confidence. To examine performance in the competition round we use a Negative Binomial model where the dependent variable is a non-negative count variable. Table E.6 examines the actual performance during the competition round could generate values that are as follows: 0, 1, 2, 3 …10, depending on the number of tennis balls the subject manages to toss into the bucket, hence a negative binomial model is appropriate here. Column (1) examines the pooled data where males from both countries are found to perform significantly better relative to females from either country. In India (column (3)), high caste females perform significantly worse relative to all other categories while performance of the African American females is significantly worse relative to the other categories in the US.

Performance in the Cooperation Round

We have found that the males in our sample choose to compete more and perform better in the competition round; now we want to examine whether females are more cooperative relative to males. We want to check whether performance of the females is better compared to the performance of the males in this round. In other words, we ask the question whether the females able to coordinate better across the rounds - compared to the males. As mentioned before, we consider "cooperation" to be the same as "being able to coordinate with the paired group member". We reiterate that here we consider "cooperation" to be the same as "being able to coordinate with the paired group member" which would earn both members the maximum amount of money.

We conduct an ordered probit analysis to further examine the individual level of cooperation in Table E.7. We create a new dependent variable, the "cooperation" variable which can take any value between 0 and10 depending on how many rounds the subjects managed to cooperate (and coordinate so that each gets a high payoff).[42] Once again, we examine the results from the pooled data first and then examine the results from India and the U.S. separately.

Column (2) in Table E.7 reports the results from the pooled data. We find that both groups of females (from India and the US) are found to cooperate significantly less relative to the Indian males while the U.S. males cooperate insignificantly less. This result is robust to controlling for all the demographic variables. Column (3) reports the results from India where the omitted category is high caste males. High caste females are found to cooperate significantly less relative to the high caste males while the effects for low caste males and females are insignificant. Column (4) reports the results only for the U.S. where we find that all categories - African American males, African American females and White females cooperate significantly less relative to the White males.

> *Result 3*: Females cooperate significantly less irrespective of country, U.S. males cooperate insignificantly less relative to Indian males. In India, high caste females cooperate significantly less; low caste males and females cooperate insignificantly less relative to then high caste males. In the United States, White males cooperate more than everyone else.

Whether a subject decides to cooperate or not may depend of who the paired partner is. In other words, the same subject may choose to cooperate in one group while choosing to not cooperate in a different group. Evidence of differential behavior is available from the (Cox,

[42] So for example, if a group managed to cooperate (and coordinate) in 6 out of the 10 rounds, they get 6 for this round.

Sadiraj, & Sen, 2014)paper across the different castes. What we have examined in Table E.7 is the individual propensity to cooperate; next we will examine behavior across the different groups.

Tables E.8 and E.9 examine the cooperation in the different groups in India and the U.S. respectively. Table E.8 examines the effect of cooperation across different gender-caste groups. Our omitted category is the group of high caste females with low caste females. We note significantly higher levels of cooperation among the following groups: Low caste males with low caste males; Low caste males with low caste females; High caste males with high caste males; High caste males with high caste females; High caste males with low caste males; High caste males with low caste females and High caste females with low caste males – all relative to the omitted group of high caste females with low caste females. Surprisingly we find that the levels of cooperation among the all-female groups: low caste females with low caste females and high caste fem ales with high caste females are insignificantly different relative to the omitted group.

Table E.9 examines the effect of cooperation across different gender-race groups. The omitted category is the group where African American males interact with other African American males. We find that relative to the omitted category, cooperation is significantly higher among the following groups: when we have White males paired with other White males, White males paired with White females, White females paired with other White females, White males paired with African American males and White males paired with African American females. On the other hand, the remaining categories (African American males paired with African American females, African American females paired with other African American females, White females with African American males, White females with African American females and the case of no gender-race information) have positive coefficients but none of these coefficients are significant.

Therefore, the level of cooperation among these groups is statistically indistinguishable from the group that pairs African American males with African American males.

> *Result 4*: Significantly higher levels of cooperation are determined among the all-male groups and the mixed groups, relative to all-female groups, irrespective of caste in India. In the United States, we find significantly higher levels of cooperation among the groups with White males, relative to any group without White males.

Figures E.4-E.5 and E.8-E.9 provide graphical expositions of the decision to cooperate among the group in India and the US, segregated by gender groups. Figure E.4 examines the decision to cooperate among males in the all-male groups (left panel) vs. their decision in the mixed gender groups (right panel) in India. Once again, the striking differences are seen among the level of cooperation by Indian females in the mixed gender vs. the all-female groups. Females show more cooperative spirit when they are paired with males, but the level of cooperation drops drastically when paired with other females.

Therefore, we reject our **Stylized Fact II** and find the counter-intuitive result that females are *less cooperative* (especially against other females) compared to their male counterparts at least in India. In the U.S., females belonging to both races are less cooperative compared to White males but their level of cooperation is statistically indistinguishable from the African American males.

We also find partial support for our **Stylized Fact IV**: high caste males (always) and low caste males (mostly) tend to cooperate at significantly higher levels compared to high caste females. The level of cooperation among low caste females is found to be insignificantly greater compared to the high caste females. **Stylized Fact V** is also partially supported: cooperation is higher within one race (White) compared to the other (African American); yet we find evidence

of significant inter-race cooperation when White males are paired with either African American males or with African American females. We also get a positive (insignificant) effect when White females are paired with African American males or females. Therefore our results are:

Since the sample from the United States consists of subjects mostly under the age of 25, we conducted additional analysis with just the sample of subjects from both countries who are less than 25 years of age. Appendix F reports the results from this additional analysis for all our three experimental rounds. Our qualitative results do not change and in fact, become stronger in several situations. In competition, we still find that males in the U.S. choose to compete significantly more than Indian males while Indian females choose to compete significantly less. We still find that females in India choose to compete significantly less relative to the males, regardless of caste while White males choose to compete the most relative to any other groups in the US. In cooperation, males from either country cooperate significantly more than the U.S. females. The coefficient for Indian females is negative but not significant at conventional levels (11.6%). High caste females cooperate significantly less in India while in the U.S. once again, White males cooperate significantly more than all other categories. In cooperation groups with all males (from either caste or either race) or males with females cooperate significantly more than the all-female groups in both countries.

Conclusion

In this paper, we conducted an experiment to examine competition and cooperation across genders and castes in rural India and compared the data with similar experiments conducted in the U.S. to examine gender-race interactions. We tested the hypotheses that males will compete more, while the females will exhibit a higher level of cooperation in either country.

In India we find evidence that males of either caste choose to compete more relative to higher caste female subjects. Females choose to compete less. Both males and females made their decision to compete (or not) based on the gender of the paired group member. Females eagerly compete against other females; yet they refuse to compete against males. As mentioned before, choosing to not compete against males is not due to a lack of understanding of the instructions. This result is similar to what Laury et al (2013) find across single gender and coed schools: younger women in single gender schools compete more compared to their counterparts from coed schools in Georgia, USA. In cooperation, our regression results indicate that the high caste males always cooperate significantly more compared to all other groups. The level of cooperation among the low caste (males and females) is insignificantly higher relative to the high caste females. We find the counterintuitive result that females cooperate more when paired with males, yet the level of cooperation drops drastically when paired with other females.

In the US, we tested competition and cooperation among a group of undergraduates. We find that both White and African American males choose to compete far more than females. White males choose to compete more in the competition task. In terms of cooperation, White males exhibit the highest level of cooperation among all possible gender and race categories regardless of who they are paired with. All other gender-race categories: White females, African American males and females cooperate with certain race-gender categories but not with others. Therefore the White males fare the best in our experiment since they choose to compete the most *and* are universally cooperative.

Our results in competition are part of a vast literature that documents males choose to compete more than females. We add to that literature by including the gender – caste and gender-race interactions. In terms of cooperation, our results are in line with Solow and Kirkwood

(2002), who find no evidence that women are less likely to free-ride. We do not find support for Eckel's (1998) claim that women are more likely to choose more equal distributions, nor Sell et al (1993) who say that the sex of the partner and sex composition of the group had no significant effects upon individuals' contributions to the group.

Our Indian results are closest to the outcomes from the Spanish public examinations reported by Bagues and Esteve-Volart (2010), who find that while the male candidates benefit when randomly assigned to committees with a larger number of female evaluators; but female candidates are relatively less likely to succeed in such circumstances. Therefore, instead of the so-called `glass ceiling' (perception that males drive discrimination against women), they find evidence of a different kind of discrimination: it is actually the females driving the discrimination against other females. This appears to be a gender confirmation of a well-documented psychological feature called *Stereotype threat* -the risk of confirming to a negative stereotype about one's group. Steele & Aronson (1995) showed that African American college freshmen and sophomores performed poorly on standardized tests compared to White students when race was emphasized. In our experiment, we find something similar: our Indian female subjects compete more and cooperate less against other females relative to males. [43]

Across both countries, we find strikingly similar behavior among the males in competition: in both India and the US, they choose to compete more than females irrespective of caste or race. We also find that in both countries the sex of the partner and sex composition of the group matters a lot.[44] In terms of cooperation, we find high caste Indian males exhibit

[43] Our findings have policy implications for India, especially since the discussion about the Equal Opportunities Commission on minorities has recently been revived. Bagues and Esteve-Volart (2010) point to the Spanish Equality Law that imposes gender parity across all Spanish recruiting committees; yet such policies can be counter-productive. In light of the ongoing debate regarding the Equal Opportunities Commission in India, such possible adverse issues need to be carefully considered before imposing any equality laws.

[44] This result is similar to the findings of Gneezy et al (2003).

maximum levels of cooperation which may be compared to the high degree of cooperation shown by the White males. Yet we do note an important distinction in the cooperation results between the Indian females and the U.S. females - the American females choose to compete as well as cooperate when paired with males or females, irrespective of race. Our female subjects from rural India compete much less when paired against males, even when there is no incentive to choose *not compete*; and cooperate more with males (yet they choose to compete more and cooperate less with other females). This may be interpreted as a form of inequality aversion where the Indian females have an aversion to being paid more than their male counterparts. No such gender bias is observed among the U.S. females. The level of cooperation among the American females (whether White or African American), though lower relative to the White males, is still similar to the level of cooperation among the African American males or females.

Chapter III: Dictates, Ultimatums and Spousal Empowerment in Rural India

Introduction

How do people make decisions when they know that their decisions (a) will or (b) will not be known to their spouses? Do they behave more efficiently or less? Would it be more or less strategically? In developing countries, the individuals may be subject to risk but absence of formal avenues to insure themselves against this risk may lead them to use informal mechanisms or choose to pool risk within a household (Robinson, 2012). If risk is to be shared or pooled among the members of a household, it is important to learn how the pooling is done. Does a high level of reciprocity exist across members of the same household? Does behavior in experiments vary significantly when the individuals are made aware (or not) that the paired person is a spouse? Under conventional wisdom, one might assume that there will be higher levels of reciprocity and risk-sharing between spouses; yet past evidence (Hoel, 2013; Mani, 2011) suggests otherwise. (Mani, 2011) experimented with voluntary contribution mechanism games between spouses in rural Andhra Pradesh, India using a within-subjects design and found that men do not maximize household income in 31-51% of decisions while women behave inefficiently in 9-28% of decisions. Surprisingly, (Mani, 2011) also finds that men in rural South India are willing to undercut their own income to reduce their wives' incomes. (Hoel, 2013) used a within-subjects design to test efficiency and perfect information between spouses in Kenya and finds that 37% of people give more when their choice will be revealed to their spouse, but 13% are more generous when their decision remains hidden. People who are generous in public but selfish in secret behave less efficiently in secret when their spouse is more aware of their finances. Note that both (Hoel, 2013) and (Mani, 2011) have used a within-subjects design with each subject facing multiple decisions across several treatments, which possibly creates cross

task contamination (Cox, Sadiraj, & Schmidt, 2014). One can also have heterogeneous preferences among the members in a household. (Schaner, 2012) examines the question of whether heterogeneous discount rates lead individuals to take costly action to manipulate the intra-household resource allocation in terms of savings behavior and determines that the couples who are poorly matched on discount factors forgo at least 58 percent more potential interest earnings when compared to their better matched peers. Therefore it is of great importance to understand how individuals allocate or reciprocate when they are partnered with their own spouses.

(Cox, Sadiraj, & Sen, 2014) conducted asymmetric voluntary contributions and common pool resource games using the exogenous variation across the Indian caste system and find an absence of payoff-enhancing cooperation when the low caste subjects interact with other low caste subjects. The highest level of efficiency occurred when high caste subjects interacted with other high caste subjects. Mixed-caste groups achieved intermediate efficiency. In their experiment, however, subjects who are strangers to each other were placed into groups in that experiment. In the current experiment we study whether higher levels of reciprocity are exhibited when we have spouses as subjects.

To better understand the dynamics, we conducted artifactual field experiments[45] with different forms of the dictator and ultimatum games in a between-subjects study of spouses in rural West Bengal, India. The games we use in this experiment are adapted from (Shor, 2007) who re-examines the idea of fairness by bringing in procedural justice into the frame. They play the standard ultimatum and dictator games, but in addition they have two variations of the normal dictator and ultimatum games. The first variation is a dictator game with role choice where the first mover is given the option of being the dictator or giving up the responsibility of

[45] Using the classification by (Harrison & List, 2004)

being a dictator to the paired second mover. The second variation is an empowerment game where the first mover has the choice of playing a dictator game (by not empowering the second mover) or an ultimatum game by allowing the second mover to have the right of accepting or rejecting their proposal. Shor's results exhibit an interesting pattern in which 17 of 54 subjects (31%) chose the second mover to be the dictator; in the empowerment game 33 of 54 subjects (61%) chose to give the other player the ability to reject their offer and therefore chose to play an ultimatum game rather than a dictator game.

Similar to the experimental treatments reported in (Shor, 2007), we conducted the normal dictator and ultimatum games, as well as the two variations. To examine how individuals behave when they know that they are playing against their spouse vs. when they are not made aware of that fact, we played two treatments for each game. In each of the first treatments subjects were told that the paired person was their spouse. In the second treatment, subjects were not informed that they were playing with their spouse.

The remainder of the paper is organized as follows. Section II describes the conceptual framework that guides the experimental design. As well as how these experiments were implemented in the field. Section III describes the testable stylized facts for this experiment; Section IV describes the empirical analysis and results and Section V concludes.

Experiment Design and Procedure

The experiment was conducted in rural West Bengal. We worked in conjunction with a local non-government organization, whose premises were used for our study. For each session, approximately 15-20 husband and wife pairs were invited to come to a certain location (a school) at a pre-specified date and time. At the time of the invitation, each subject was informed that an experiment was being held at the location on the pre-specified date and time. If they showed up

for the experiment with their spouse on time, they would receive the show-up fee of Rs 50. If they participated in the experiment, they could earn a lot more. We conducted 17 sessions. Each session had 2 parts – the dictator/ultimatum game followed by the risk control round. In the ultimatum games, we also elicited the beliefs of the FMs.

Part 1 – Dictator and Ultimatum Games

We had a total of eight treatments. Two person groups were formed with both spouses in the same group. In four of these treatments, subjects knew that their paired group member was their own spouse. In the other four control treatments, information about spouse was *not* provided. All other features remained the same across paired treatments.

The first two treatments are standard ultimatum games: treatment 1 is with spouse information while treatment 2 is without spouse information. In both these treatments, the first mover (FM) is provided an endowment of Rs 400 and may choose to send some money to the second mover (SM). The SM can decide to accept or reject the offer. If the spouse chooses to accept the offer, both spouses get paid according to the split proposed by the FM. But if the SM chooses to reject the offer, each spouse just gets the show up fee (Rs 50). Treatment 3 and 4 are standard dictator games where treatment 3 is with spouse information while we do not provide spouse information in Treatment 4. In these pair of treatments, the FM is again provided an endowment (Rs 400) and may choose to send some money to the SM (spouse). Here, the paired SM has no decision to make. So this will be a case of either a surplus destruction game (as in vetos in ultimatum games) or possibly pure redistribution (dictator games).

The next pair of treatments involves dictator games with role choice. Again, in treatment 5, spouse information is provided while we do not provide this information in treatment 6. The FM is given the same endowment (Rs 400) as in Treatments 1 and 2 but is now asked to choose

whether or not to send money to their paired SM (spouse) – in addition, they will also have the choice of whether they would like to be the dictator or give up this right to the SM (spouse). So they can behave like a dictator and propose a split for their spouses in which case the spouse does not have a say in the decision making process; otherwise they can let their spouse be the dictator and allow the spouse to make the decision. If they give up the power, they have no further decision to make; they will have to accept whatever decision is made by their spouse.

The last two treatments are called empowerment games. Once again spouse information is provided in treatment 7 while we do not provide this information in treatment 8. The FM in this pair of treatments is provided the same endowment (Rs 400) and asked to choose whether or not to send money to the SM (spouse); however they will also be given the choice of whether they would like to empower their spouse or not. If empowered, the spouse can accept their offer or reject it. If they empower their spouse and the spouse accepts the proposed split, both subjects get the proposed split, but in case of rejection, each subject will get just the show up fee of Rs 50.

We compare behavior in cases where the subject is informed that they are playing against their spouse against the situation where they are not informed of the fact that their paired partner is actually their own spouse. We ask whether their perceptions of risk and reciprocity change when they know that they are playing the game with their spouses.

Note that the ultimatum game, where the FM may choose to send some money to the SM but the SM makes the final decision whether to accept or reject the offer is potentially risky to the FM. A FM with *homo economicus* preferences can propose to keep all the money for himself; however this may be rejected by the SM (as has been shown by experimental data, e.g., (Dickinson, 2002). If the SM rejects the FM's proposed split, each subject ends up with only the

show-up fee. Proposing less than a 50-50 split could pose a risk to the FM and the riskiness of the FM's offer is arguably monotonically increasing with the proportion of the total amount of money she proposes to keep for herself. Therefore in the ultimatum games, we elicited the FM beliefs as well (see Part 3-Belief elicitation for more details). One may propose an egalitarian split because of risk aversion rather than altruism. Compare this scenario with that of a dictator game which is a control for the FM's expectations of rejection by the SM. Since the FM no longer has to worry about whether his or her proposed split is accepted or rejected, the risk element has been removed from the game – which is one reason why the dictator game is constructed as a control for the ultimatum game. The dictator game is also used as a control treatment for the ultimatum game because positive offers in the latter can be motivated by altruism as well as risk aversion. Therefore in our design we also use a risk control task which is described below.

Part 2 - Risk Control Round

After the dictator/ultimatum round has been completed for all subjects, we play the risk round. We adapt the experimental design from (Holt & Laury, 2002) to provide subjects with choices over monetary lotteries. Table 1 summarizes the design and parameters. Subjects are informed that they will have to complete 5 tasks and that one of these 5 tasks will be randomly selected for payment.

There are 2 options, A and B. An option is represented by either a blue bag for option A or a red bag for option B. Each bag has 10 different colored balls representing different payoff values. Subjects are informed right at the start that the number of balls of different colors in the 5 tasks will be different across the blue and red bags and they should choose accordingly.

The blue bag (option A) always has 10 balls which are either green or orange in color. Each green ball always represents Rs 200 while each orange ball always represents Rs 160. On the other hand the red bag (option B) always has 10 balls which are either yellow or pink in color. Each yellow ball always represents Rs 385 while each pink ball always represents Rs 10. The combinations of the different colored balls in each bag are reported in Table 1.

For example, consider the implementation of Task 1 from Table 1. For option A represented by a blue bag, we placed 3 green balls and 7 orange balls into the bag in front of the subjects and explained that if this blue bag is selected and one of the green balls is drawn, the subject would receive Rs 200. On the other hand, if one of the orange balls is drawn it would be worth Rs 160. Similarly for Task 2 there will be 4 green balls and 6 orange balls.

Option B is represented by a red bag. For Task 1, we placed 3 yellow balls and 7 pink balls into the red bag and explained that if this red bag is selected and one of the yellow balls drawn, it would be worth Rs 385. Similarly, if one of the pink balls is drawn, it would be worth Rs 10.

All subjects in a session were given the instructions for the dictator or ultimatum games first and asked to come one by one to a separate room to make their decisions in private. Afterwards they were asked to return and sit in the main room. Before the start of the risk round, the subjects were provided with a decision sheet which exhibited the five tasks. First subjects were provided the general instructions for the risk round, the blue and the red bags and the contents of each bag.

Thereafter they were informed and shown the color combinations of the 10 balls representing different payoff values in the blue and red bags for the first task. They were told that they would have to indicate which bag they would prefer for this task. A subject could pick

either option A if they liked the blue bag or option B if they liked the red bag. Volunteers from the NGO made sure subjects did not chat or interact with other and made their own decisions. If a subject had questions, they were asked to raise their hand and the experimenter explained or clarified instructions once again. Next we checked every subject's decision sheet to ensure that the task had been completed and thereafter we went on to the second task.

After all 5 tasks had been completed for all subjects in a similar fashion, we called each subject one by one to the private room once again and one of the 5 tasks was selected at random for each subject by picking up one of five numbered white balls – note that these balls are white, numbered and different from the ones used in the blue or red bags. The differences were also clearly pointed out to all subjects to avoid confusion. Thereafter the task chosen (by one of the white numbered balls) was played out for real money in front of the subject. The blue or red bag (as chosen by the subject for that task) was filled with the specific color combination for that particular task and the subject was asked to pick up one ball from the bag albeit without looking inside. Depending on the color of the ball picked up, the subject received payment for the risk round.

The purpose of the risk control task was to elicit risk preferences which will allow us to estimate the subject's coefficient of risk aversion to complement the data from the dictator and ultimatum games. Therefore we used a shortened version of the original (Holt & Laury, 2002) ten lottery choices. We reduced the number of possible classifications to five (from the original nine in (Holt & Laury, 2002), Table 3, pg. 1649) in order to make the one-on-one oral elicitation of option choices more manageable. However what we cut off are two risk preference classifications at the top (highly risk loving and very risk loving) and the two risk preference classifications at the bottom (highly risk averse and "stay in bed"). The total percentage of

choices in these four rows in (Holt & Laury, 2002), Table 3 is 6%. Using our data, we can estimate whether the subject's risk preferences are risk loving, risk neutral, slightly risk averse, risk averse or very risk averse.[46]

Part 1A - Belief Elicitation

This applies only to the FMs in Ultimatum games (Treatments 1, 2) and in Treatments 7 and 8 (if the SM had been empowered). This is *not applicable* for the SMs in Ultimatum games, for anyone in Dictator Games (Treatments 3 and 4) or in the Dictator games with role choice (Treatments 5 and 6). The risk round is played after belief has been elicited in applicable cases.

The following questions from Table 2 were asked after the decision of the split had been made: "I will ask you some questions about whether your spouse/paired person B will accept the proposed split. There is no right or wrong answer – I just want to know what you think. Please answer any one: whether you agree strongly OR agree OR disagree OR disagree strongly whether the spouse/paired person B will accept. You can get an additional Rs 100 if you tell me what you think."

We followed the payoff protocol "pay all sequentially" for this experiment. So subjects were paid for both rounds (dictator or ultimatum and the risk round) and were informed about their payments at the end of each round. In the games where the belief was elicited, subjects received the payment for specifying their beliefs as well. Instructions may be found in Appendix K.

Testable Stylized Facts for this Experiment

Previous research has found certain stylized facts regarding spousal behavior across different countries. We will try to examine whether these stylized facts are true for our experiment as well. These stylized facts are as follows:

[46] We will note here that we are not reporting results from the risk round since about 51% of our entire subject pool switched multiple times suggesting incomprehension.

Stylized fact 1: *Average offers made by FMs in all games will be higher with spouses (Treatments 1,3,5 and 7) relative to strangers (Treatments 2,4,6 and 8).*

This is derived from previous artifactual field experiments conducted across several developing countries that suggest that spouses behave strategically depending on whether (or not) the information of their behavior is available to their spouse. [47]

Stylized fact 2: *Across all treatments, the female spouses will make average offers that are higher relative to the average offers made by the male spouses.*

This is derived from previous work by Mani (2011) which suggests that the husbands undercut their own income to reduce the income of their wives in southern India while Ashraf (2009) finds that in rural Philippines husbands put money into personal accounts in private decision-making but when required to communicate, they prefer wives' accounts.

Experimental Results

Average Offers by Treatment

Table I.3 provides a comparison of the average offers made by the FMs in the Ultimatum games, Dictator games, Dictator with Role Choice games and Empowerment games when the subjects may or may not know that they are playing with their spouses. In all treatments, subjects make higher average offers when they know that they are playing with their spouses rather than when they are not made aware that the SM is in fact their own spouse. Column (2) provides information about when the offers are significantly different across games with and without spouse information. Treatments differ for the ultimatum games: with and without spouse information; the dictator game with role choice- when the FMs keep the Dictator role for themselves as well as the SM is given the responsibility of a dictator by the FM as well as when

[47] See (Ashraf, 2009; Hoel, 2013; Mani, 2011) among others.

the dictators choose to play the ultimatum game in the Empowerment games. We also test the equality of average offers across each pair of games (this is reported in spare brackets in column (2) for each pair of games). We find significantly different behavior with and without spouse information in the following treatments - ultimatum games, the dictator with role choice game – both when the dictator role is retained by the FM as well as when the FM decides to give up this role to the SM as well as in the empowerment games when FMs decide to play the ultimatum game. However the amounts offered by FMs when they know that they are playing with their spouse in unanimously higher compared to when this information is not made public. So in fact we find support for our Stylized Fact 1 since people do seem to care about offering a higher amount of money when they know that they have been paired with their own spouse relative to when they are not made aware of that fact.

Columns (3) and (4) of Table I.3 examine the average offers by male and female spouses while column (5) examines the equality of these offers. In nearly all cases, the male spouses make higher offers relative to female spouses. The only exception is the treatment of dictator games without any spouse information where male FMs offer about 28% of their endowment but female FMs offer nothing. Thus we find evidence that male FMs are actually found to make higher offers on average relative to the female FMs and hence we can reject Stylized Fact 2.

We analyze further to examine the Stylized Facts. Figures I.1-I.4 show the average offers made by FMs across all 8 treatments, segregated by gender. The left panel (odd numbers) in all panels provides information of average offers when spouse information is publicly available while the right panel (even numbers) provides information of average offers when spouse information is *not* publicly available. Figure I.1 shows the average offers in the Ultimatum Game when subjects are given the information that their paired partner is their spouse (Treatment

1) and when they are not provided the spouse information (Treatment 2). When spouse information is provided, 81% of the subjects send Rs 200 which is exactly half of their endowment. Another 9.5% choose to send their entire endowment. In Treatment 2 when spouse information is not provided, almost 62% of the subjects choose to send Rs 0 while 38% send Rs 200.

In a dictator game with spouse information (Treatment 3), 62.5% of subjects choose to offer nothing to their spouses while 18.75% offer Rs 200. 6.25% offer Rs 100 and another 12.5% offer Rs 300. When subjects are not aware that they are playing against their spouse, 75% choose to offer nothing while 16.67% offer Rs 200. 4% offer Rs 250 while another 4% offer Rs 350. Figure I.3 shows that in the dictator game where the FMs are offered the choice of role as "dictator" or to give up this role (Treatment 5), 41% of FMs chose to give the power of being a dictator to their spouses (20 FMs out of 49) while only 18.75% (9 out of 48 FMs) gave the power when they did not know that they were playing with their spouse in Treatment 6. Figure I.4 indicates that among the 59% of the FMs who chose to *not* give any power to their spouses in Treatment 5 (n=29), 62% gave nothing 17.24% gave Rs 200, 10.34% gave Rs 150 while about 7% gave Rs 100 and 3% gave Rs 300. In Treatment 6 when subjects are not made aware of the fact that they are playing with their spouses, 87.18% of FMs gave nothing while 7.69% gave Rs 200.[48] Therefore while FMs give more when they know that they are paired with their spouses (relative to when this is unknown), the male spouses actually offer more rather than the female spouses.

So our main results are:

Result 1: The FMs make the highest offers (69% of endowment) in Empowerment Games when FM gave power to reject to the Spouse. The male and female FMs make

[48] Further information about the break ups and histograms may be found in the Appendix J.

highest offers (74% of endowment from the male FMs; 68% of endowment from the females) in the same Empowerment Games with spouse information.

> *Result 2*: The FMs make the lowest offers (4.81% of endowment) in the Dictator with Role choice Games when FM kept dictator role for themselves and in the Empowerment Game when FM did not give power to reject to spouse (4.89% of endowment). Lowest offers by Male Spouses happen in the Empowerment Games (6.25% of endowment) when FM did not give power to reject to their spouses while female FMs make lowest offers in Dictator Games with no Spouse information and Empowerment Game when FM did not give power to reject to spouses. In both cases, female FMs offer nothing.

Table I.4 provides an OLS regression to further examine these issues. Column (2) examines the behavior of the full sample when spouse information is provided to the subjects while column (3) examines the behavior of the full sample when spouse information is not provided. In column (2), relative to the omitted category (dictator games), subjects make higher offers in the Ultimatum Games and the Empowerment Games. In column (2), we also find that significantly lower offers are made to their spouses by college-educated FMs and by subjects who are over the age of 40. In column (3), we find that significantly higher offers are made by male FMs, while significantly lower offers are made by subjects who either have one or more daughters or live in a joint family (with their in-laws).

In games where we provide spouse information, male spouses make significantly higher offers in the Ultimatum Games and the Empowerment Games while they make significantly lower offers if they are college educated or if they are over the age of 40. On the other hand, female spouses make significantly higher offers in the Ultimatum Games and significantly lower offers if they are college educated.

In games where we withhold the information about spouses, we find that male spouses make significantly higher offers if they are college educated. Both male and female spouses offer significantly less if they have one or more daughters.

Behavior in Ultimatum and Dictator Games

Table I.5 examines the FM behavior in the ultimatum and dictator games. In the paired ultimatum games (with and without spouse information), we find that subjects offer significantly more when the spouse knowledge is made public, relative to the omitted category (ultimatum without spouse information). Female spouses also offer significantly more when knowledge of spouse is known to them, relative to when they do not know this information. Female spouses offer significantly less when they have one or more sons, while Muslim wives offer significantly more to their husbands. In the ultimatum games without spouse information, 3 out of 14 SMs rejected the offer from their paired FMs. No rejections happened when the SM knew that the paired FM was their own spouse.

In the paired dictator games (with and without spouse information), we find that subjects offer *insignificantly* more when the spouse knowledge is made public, relative to the omitted category (dictator without spouse information). However female spouses do offer significantly more when the spouse knowledge is made public, relative to when they do not know the identity of paired SMs.

Behavior in Dictator with Role Choice and Empowerment Games

Next we examine whether FMs are more likely to give decision-making power to strangers in Treatment 6 than to their spouses in Treatment 5 or whether the FMs will empower strangers in Treatment 8 rather than spouses in Treatment 7.

First we examine whether FMs choose to give up their role as dictator to the SMs in treatments 5 and 6 in Table 6. Note that if a FM gives up the role and make the SM the "dictator", they do not have any other decision to make. The SM makes the decision of dividing the money. In such cases the FMs will have to accept whatever division is proposed by the SMs. On the other hand if the FMs choose not to give up their decision making power, the FMs will retain their roles as dictators in such occasions and play the normal dictator game where the SMs will have no decision to make.

In Table I.6, column (2) we report marginal effects from a binary probit analysis that examines the FM choices. We find that relative to the case of no-spouse information, there is positive likelihood that the FMs give up the decision-making role to the SMs when the FMs know that they are playing with their spouses. This is however insignificant. The choice to remain as the dictator is not found to be dependent on whether the spouse is male or female, number of sons or daughters, the level of education or years married. Low caste Hindus and Muslims are found to be significantly more likely to give up the decision-making power to their spouses relative to the omitted category of high caste Hindus. Subjects in the age range of 25 or less are also found to be significantly more likely to give up the decision-making power to their spouses relative to the older FMs.

If FMs choose to remain as dictators, how much do they offer their paired SMs? Column (3) provides this information. Relative to the no-spouse case, FMs make insignificantly higher offers when they are know that they are paired with their spouses. The amount offered by the FMs does not appear to depend on the gender, level of education, number of children, family status (joint or nuclear), number of years married, age range or the religion and caste composition of the subjects.

Column (3) examines the offers made by SMs when they have been provided the decision-making power by the FMs. These SMs reciprocate by offering a significantly higher amount when they know that their spouses have given them this power (relative to when they do not know this fact). Similar to the case of the FMs, the amount offered does not appear to depend on the gender, level of education, number of children, family status (joint or nuclear), number of years married, age range or the religion and caste composition of the decision makers.

Result 3: In Dictator with Role Choice Game, FMs are insignificantly more likely to remain as dictators when they know that they are playing with their spouses. SMs who are given decision-making power by their spouses (FMs) and are aware that the FMs are their own spouses return significantly higher amounts to their paired FMs.

Next we examine the behavior of the FMs who choose to empower (or not) their spouses by deciding to play the ultimatum game (or dictator game). Note that if the FMs choose to empower the SMs, this will make the game into an ultimatum game since the empowered SM can choose to accept or reject the proposed split. On the other hand if the FM chooses not to empower the SM, then the game is converted to a dictator game where the FM retains full control over the endowment.

Table I.7 examines the FM decisions in Empowerment Games. Column (2) of Table 7 reports the first decision made by the FMs. We find that there is significantly positive likelihood that the FMs empower the SMs when FMs know that they are playing with their spouses in the Empowerment Game with Spouse Information. This effect is irrespective of whether we consider the male or female FMs. Subjects with some level of education (either school or college) and low caste Hindus are significantly more likely to empower their paired SMs (relative to subjects with no education and high caste Hindus, respectively). Having one or more daughters (relative to

having no daughters), one or more sons (relative to having no sons), living in a joint family with in-laws (relative to living in a nuclear family) or being in the 25 years or less age bracket (relative to the age range 25-40 years) implies that the FM is significantly less likely to empower the SM. When the ultimatum game is played, subjects who have one or more daughters make significantly higher offers relative to the subjects who have no daughters.[49] So our main results are:

> *Result 4*: In Empowerment Games, FMs are significantly more likely to empower spouses when they have spouse information. Having more children, living in a joint family or being younger implies a significantly lower likelihood that the SM is empowered relative to FMs who have no children, live in nuclear families or are older.

The Empowerment Games involves a choice of whether or not to be a dictator or to play the dictator game. In additional analysis, we include the number of safe choices in the risk game by a subject in the regressions. Our hypothesis is that, all else equal, higher risk aversion will imply a higher likelihood of choosing the dictator game. Table I.8 reports results from the Empowerment Game regressions and includes the number of safe choices in the risk game by a subject. In the Empowerment Game, we find that higher risk aversion (implying more safe choices are made) is associated with a higher likelihood of choosing to play the dictator game. Therefore our final result is:

> *Result 5:* All else equal, higher risk aversion is associated with a higher likelihood of choosing to play the dictator.

[49] In regressions not reported here, we check whether having more sons or daughter or both decreases the likelihood of empowerment or the amount being offered. We find that having more sons or more daughters implies a significantly higher likelihood that the subject chooses not to empower the SM. However the number of children does not have any effect on the amount that is offered.

Conclusion

We examine how spouses behave when they may or may not be aware that their decisions are known to their spouses. We asked whether a high level of reciprocity exists across members of the same household and whether behavior in experiments varies significantly when the individuals are made aware (or not) that the paired person is a spouse. To answer these questions we played artifactual field experiments using the dictator, ultimatum and variations of these games using two-person groups (spouses) of villagers in rural West Bengal, India.

Our results indicate that when subjects know that they are playing with their spouses, they make significantly higher offers on average (33.69% of endowment) to their spouse relative to when they are not aware of the fact (13.49% of endowment). This is in line with previous evidence from the Philippines (Ashraf, 2009) and (Hoel, 2013). In the two new variations we have used, the dictator with role choice games and the empowerment games, subjects show a higher likelihood of providing decision-making power to their spouses (in role choice games) or empowering their spouses (in the empowerment games) when they know that they paired with their spouses relative to when they are not made aware of that fact. Similarly when the SMs know that they have been provided decision-making power (role choice games) or empowered (empowerment games) by their spouses, they reciprocate more relative to when they do not know this fact. However contrary to previous literature, we find that the female spouses will make offers that are lower on average relative to the ones made by the male spouses.[50]Average offers by male spouses are significantly higher offers on average (28.29% of endowment) relative to the ones by the female spouses (17.08% of endowment).

[50] In informal conversations with the experimenter after decisions had been made, female subjects gave some behavioral insights into why they had shown somewhat "un-altruistic" behavior. The mount retained by a female FM was more likely to be spent on a microfinance project or their children's welfare. Money provided to their husbands was more often than not spent in a myriad of non-efficient ways and was hence wasted.

We also find that the divisions in these games (with no spouse information) are actually far less equitable than traditional dictator games as reported in (Shor, 2007). For example, in the two new variations we have used here, FMs make an average offer of just 5.47% of their endowment in the dictator with role choice game while the average offer in the empowerment game is 18% of their endowment when they are not aware of the fact that they are playing with their spouses. When they know that their paired partner is their spouse, their average offers are 26.79% (role choice game) and 38.78% (empowerment game) of their endowment.

In addition we find that when subjects are unaware that they are playing with their spouse, they choose to keep the dictator role for themselves or not to empower the other player. 18.75% of the FMs chose to empower the SMs in the role choice game while the number of FMs who empowered SMs was 28% when no spouse information was provided to anyone. Compare that to the 40.82% and 51.02% of FMs who made their spouses the dictators in the Role Choice games or empowered their spouses in the Empowerment games when they knew that they were actually playing with their spouses. Therefore we find support for subjects' concern for distributive fairness but not procedural fairness.

Appendix A: Derivation of Theoretical Results in Chapter I

We will use capital letters for vectors and *s* for the second mover. Let *e* be the initial Private Fund endowment of each player in the public good game and *ne* be the initial Group Fund endowment in the common pool game. Let *m* denote the marginal effect of player i's action on the Group Fund. Let wtp($\cdot$) denote the willingness to pay of player i with respect to player j, that is, $wtp_{ij}(\cdot) = \frac{u_i(\cdot)}{u_j(\cdot)}$.

Proof of Proposition 1. First note that player *i*'s payoff in the public good game when the vector of contributions is P, equals player *i*'s payoff in the common pool game when the vector of appropriations is, $A = E - P$, verified as follows

$$\begin{aligned}\pi_i^{cp}(A) &= e - p_i + \frac{1}{n}(ne - m\sum_j (e - p_j)) = e - p_i + \frac{1}{n}(m\sum_j (e - e + p_j)) \\ &= e - p_i + \frac{1}{n}(m\sum_j p_j) = \pi_i^{pg}(P)\end{aligned} \tag{A.1}$$

For player *s* (the second mover), then the best reply in the common pool game to appropriation vector $A_{-s} = E - P_{-s}$ satisfies $e - br_s^{pg}(P_{-s}) = br_s^{cp}(E - P_{-s})$ as for all feasible appropriations, y one has

$$\begin{aligned}\pi_s^{cp}(E - P_{-s}, e - br_s^{pg}(P_{-s})) &= \pi_s^{pg}(P_{-s}, br_s^{pg}(P_{-s})) \\ &\geq \pi_s^{pg}(P_{-s}, e - y) = \pi_s^{cp}(E - P_{-s}, y)\end{aligned} \tag{A.2}$$

where the first and the second equalities follow from statement (A.1) whereas the inequality follows from $br_s^{pg}(P_{-s})$ being the best response to provision vector P_{-s} in the public good game.

It follows from statements (A.1) and (A.2) that $P = (P_{-s}, Br^{pg}(X_{-s}))$ is a SPE in the public good game iff $A = (E - P_{-s}, E - Br^{pg}(E - X_{-s}))$ is a SPE in the common pool game. This together with player i's payoffs from a vector of appropriations, *A (=E-P)* in the common pool game and from

the vector of contributions, *P* in the public good game being identical, imply that efficiency and the inequality index of payoff distributions are the same across games.

Proof of Proposition 2. Assume convex preferences. Let P be the most efficient SPE in the public good game. Then (at an interior solution) for all (first movers) i,

$$\sum_j wtp_{ij}(\pi(P)) + \frac{\partial br(P_{-s})}{\partial p_i}(1 + \sum_{j \neq s} wtp_{ij}(\pi(P)) + (\frac{n}{m} - 1) wtp_{is}(\pi(P)) = \frac{n}{m} - 1 \quad \text{(A.3)}$$

where $P_s = br(P_{-s})$ is a solution to the following equation

$$\sum_{i \neq s} wtp_{si}^{pg}(\pi(P_{-s}, br(P_{-s}))) = \frac{n}{m} - 1. \quad \text{(A.4)}$$

Let $F_i(\pi_P)$ denote the expression on the left-hand-side of the first equation. By Axioms S and R (see Cox et al. 2013), for all i, $wtp_{si}^{pg}(Y) \geq wtp_{si}^{cp}(Y), \forall Y$. Hence

$$\sum_{i \neq s} wtp_{si}^{cp}(\pi(E - P_{-s}, E - br(E - P_{-s}))) \leq \frac{n}{m} - 1 \quad \text{(A.5)}$$

By convexity, the second mover can increase the value of the left-hand-side of the last inequality by increasing his appropriation, as by doing so the second movers' payoff increases whereas others' payoffs decrease. By payoff equivalence, an increase in appropriations in the common pool game is equivalent to a decrease in "contributions" in the public good game, hence

$$e - A_s^{cp}(E - P_{-s}) = P_s^{cp} \leq P_s^{pg} \quad \text{(A.6)}$$

Note that the relation between the vector of payoffs, $\pi(P)$ in the public good game and the one in the appropriation game at the (new) vector of contributions, $(E - P_{-s}, A_s^{cp})$ is

Appendix A (cont.)

$$\pi^{cp}(E - P_{-s}, A^{cp}) = \pi - (\frac{m}{n}, \frac{m}{n} - 1)\varepsilon,$$

where $\varepsilon = A_s^{cp} - (e - P_s) > 0.$ Using the last statement and notation $F_i(\pi_P)$ (below (A.4)) we get

$$F_i(\pi^{cp}(E - P_{-s}, A^{cp})) = F_i(\pi - (\frac{m}{n}, \frac{m}{n} - 1)\varepsilon)$$

For separable preferences, i.e. $U_i(\pi) = u_i(\pi_i) + \sum_j v_i(\pi_j)$ with $wtp_{ij}(.) = \frac{u_i(\pi_i)}{v_i(\pi_j)}$ positively monotonic on identical amounts of increase in payoffs, $wtp_{ij}(\pi_i - \varepsilon, \pi_j - \varepsilon) \leq wtp_{ij}(\pi_i, \pi_j), \forall \pi_i, \pi_j$, one has

$$F_i(\pi^{cp}(E - P_{-s}, A^{cp})) = F(\pi - (\frac{m}{n}, \frac{m}{n} - 1)\varepsilon) \leq F(\pi) = \frac{n}{m} - 1$$

Therefore, the value of $F_i(\pi^{cp}(E - P_{-s}, A^{cp}))$ increases if the first mover *i* leaves less in the Group Fund. Hence, the common pool game is expected to be less efficient than the payoff equivalent public good game.

Appendix B. Details on Procedures for the Village Experiment in Chapter I

An individual subject's decisions were recorded in a separate, private room by the experimenter. The final payment at the end of the experiment was handed out to each subject privately and separately. Each subject was paid according to what decision he or she had made in the experiment as well as the decisions made by the other group members in addition to the Rs 50 show-up fee.

The groups were formed based on the caste categories to which each subject belonged. Each subject was invited to come to a separate room to make her individual decision in private. After each subject came in and took his or her seat in the private room, the experimenter briefly explained the procedure and rules once again. Thereafter, the subject was handed a decision sheet based on his or her role as first mover or second mover. Across all ten treatments, the second mover subject was also informed about the amount of money contributed (PG) to or extracted (CP) from the Group Fund by each of the three first movers. The subject was asked to carefully consider all the information and thereafter make his or her decision in private. In the caste-informed treatments, each subject in a four-person group was informed about the caste composition of the other members of the group. No information about the caste of the other group members was provided to the subjects in the no-caste-information treatments.

Once the decision had been made and recorded, the experimenter thanked the subject for his or her time and asked additional questions. During February 2012, a series of questions about household income was asked after all decisions had been made. However, we will not use these income figures in this analysis because the data are of low quality. Several subjects mentioned that their answers may be incorrect since they were themselves unaware of how much they consume out of their own produce and how much they sell. This proportion varies across the year – depending on the seasonality of the plant. In such occasions, the experimenter asked for

Appendix B (cont.)

the most recent month and how much they earned during that time, but again, this may not reflect the correct figure as some plants grow well during winter months and poorly during warmer months. Several Hindu women mentioned that they live in a joint family with the families of their brothers-in-law or uncles and are hence unaware of what the total family income is. Some subjects admitted that they would not provide their correct income information. In some other occasions, the subject would provide a broad range and left the experimenter the task of guessing an accurate figure. In other cases, the subject would admit that they did not have any source of income and they depended on loans from family members or neighbors for sustenance.

We randomized people from high and low castes into treatments with and without information on caste. We focus our data analysis on differences across treatments. The treatments are independent of characteristics of the individual subjects, therefore the expected interaction of income and the treatment is zero. Hence our estimate of the treatment effect is unbiased in the limit. This is supported by our large sample size. Our focus is to test the importance of revealing information on caste and whether this contextual cue changes how people act. Both the high and the low castes are faced with identical tasks. So we expect that any possible effects of unobserved incomes are independent of information on caste.

We had to overcome difficulties in recruiting lower caste subjects. In order to be able to recruit a heterogeneous subject sample, we went to villages with relatively large presence of lower caste individuals. However, there were still obstacles to obtaining a good show up rate of the lower caste subjects. There were several instances where the husband or father of a female lower caste subject would show up at the site, ask to talk to the experimenter (Sen) to ensure that his wife or daughter would be interacting with a female experimenter and no male interaction

Appendix B (cont.)

with a male (volunteer or NGO worker) would be required. Only after he was assured that no male interaction would occur, the female subject was brought to the site.

In other locations, we found subjects typically arriving at the experiment site in groups with their friends or neighbors. To ensure that subjects did not play strategically believing that their friends would be in the same group, we applied the following procedure. The name and village of residence of the subjects had been taken down one after the other in the order of arrival at the experiment site. Each subject was called by name one after the other to come to the private room. However consecutive people being called to the private room were placed in different groups. For example, subject numbers 1, 2 and 3 may have come from the same village and be called one after the other, but we placed them in different groups –for example subject #1 may be the first mover person 1 in Group 1, subject #2 could be the first mover person 1 in Group 2 and subject #3 could be the second mover person 1 in Group 3. At the time of explaining the instructions of the game, the subjects were clearly informed that they would be in groups different from their friends. When a subject came to the private room to make the decision, he or she was once again reminded that friends were not in the same group. Subjects may have made an assumption of a person's caste or characteristics when they saw the last person leaving the room. To minimize any effects from such observations, subjects were specifically informed that the previous person leaving the room would not be in their group.

Appendix C: Figures and Tables for Chapter I

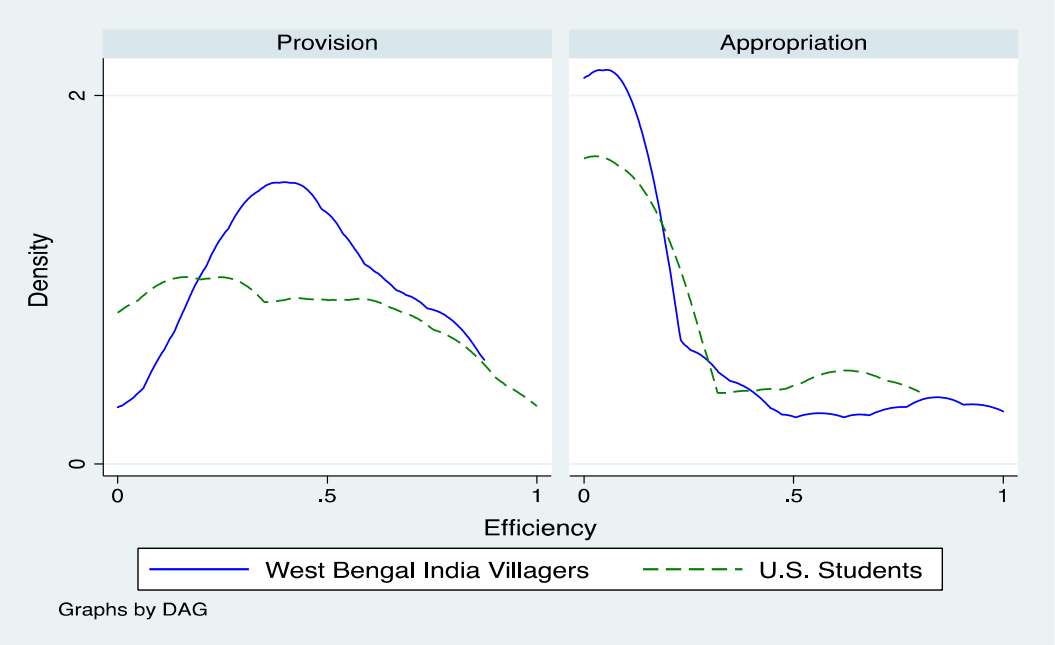


Figure C.1. Play Efficiency [51]

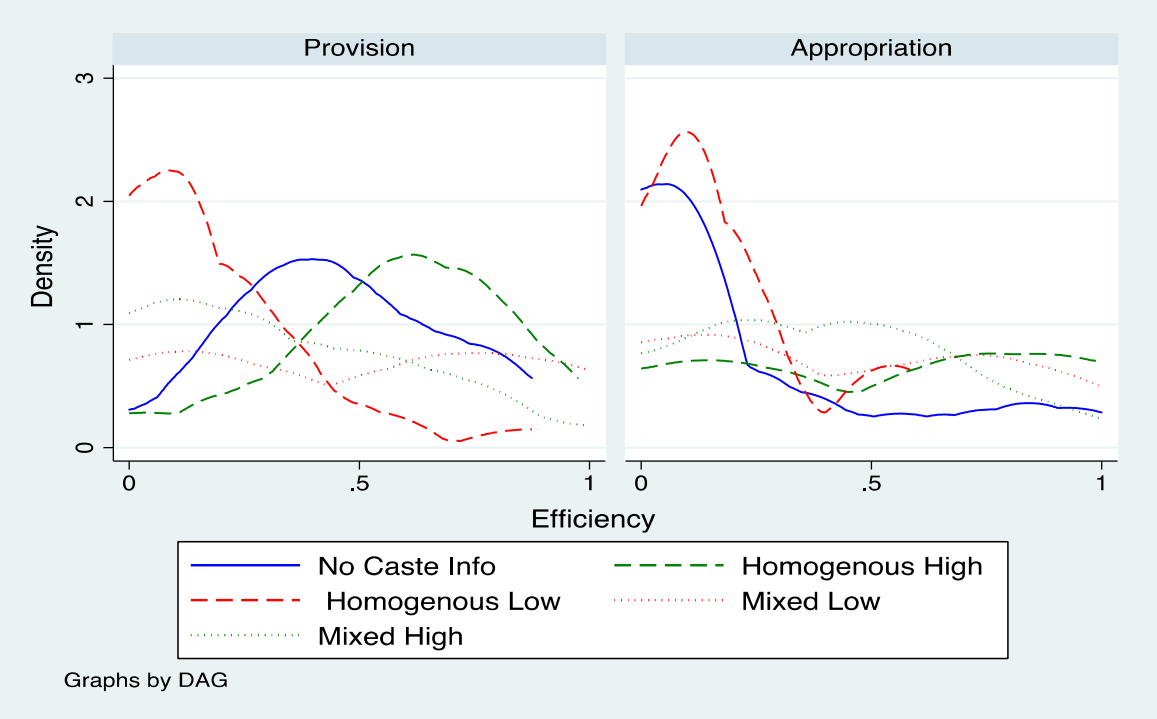


Figure C.2. Play Efficiency among Caste-informed Villagers

[51] DAG represents a dummy for AG or Appropriation Groups.

Appendix C (cont.)

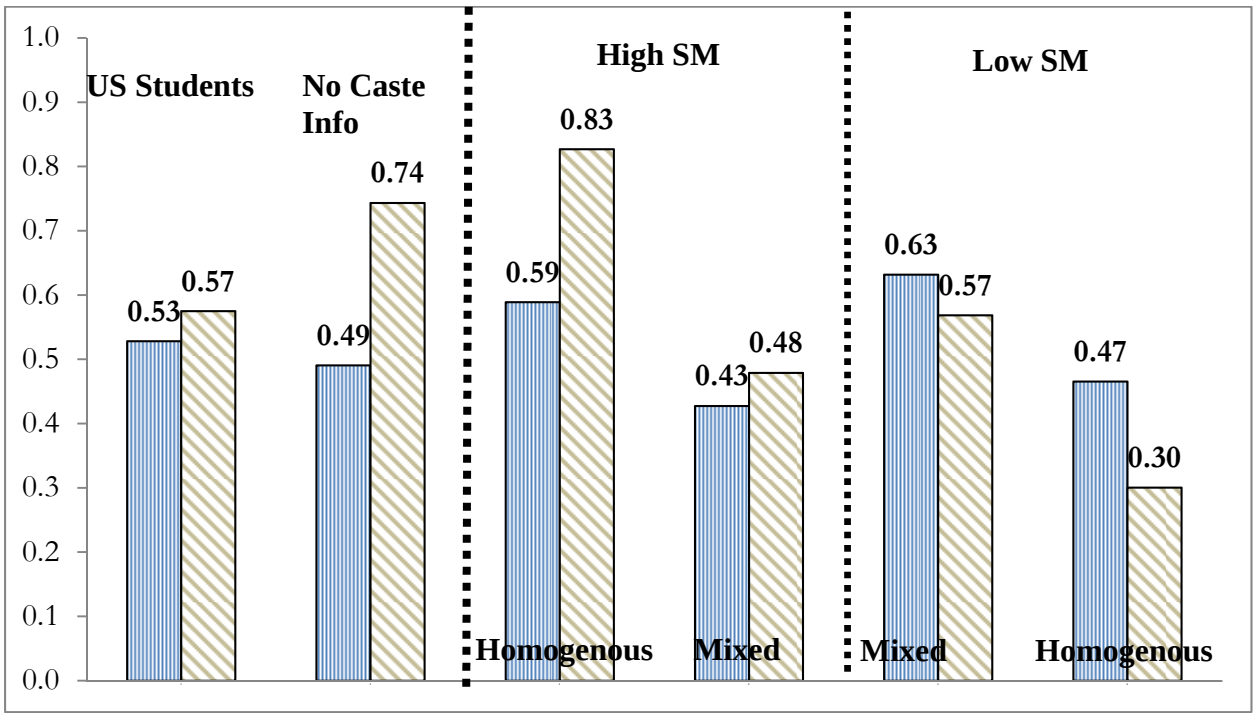


Figure C.3: Figures for PG games - FM and SM normalized decisions

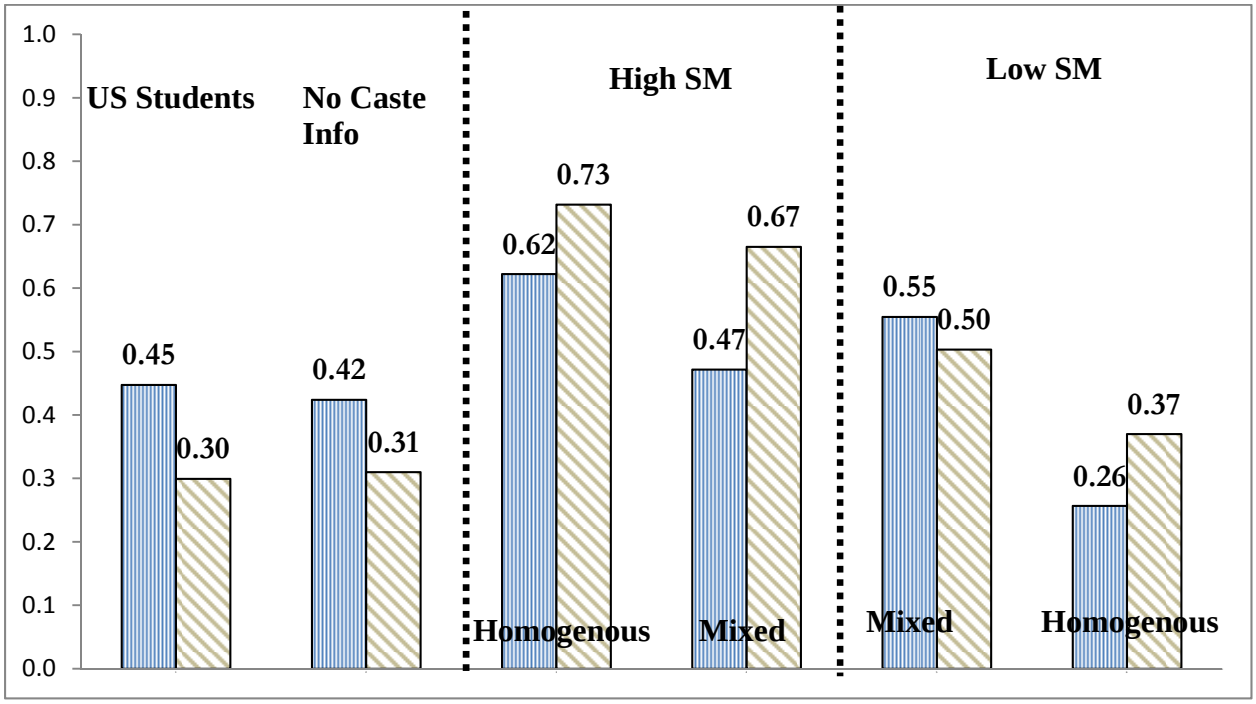


Figure C.4: Figures for CP games - FM and SM normalized decisions

FM normalized decisions **SM normalized decisions**

Appendix C (cont.)

Table C.1. Efficiency, Trust and Conditional Altruism among West Bengali Villagers

	Efficiency		**Trust**		**Conditional Altruism**	
Game **Composition**	Public Good	Common Pool	Public Good	Common Pool	Public Good	Common Pool
No Caste Information	0.45 (0.34, 0.56)	0.21*** (0.05, 0.37)	73.57 (59.23, 87.91) {63}	63.61* (57.59, 82.03) {54}	48.57 (-14.85, 112.00) {21}	**-66.39**** (-144.21, 11.43)
Homogenous (all High)	**0.57** (0.45, 0.70)	**0.56** (0.33, 0.79) {15}	88.33 (73.42, 103.25) {54}	**93.33** (74.24, 112.43)	**78.33** (11.59, 145.01)	**56** (-34.75, 146.75) {15}
Homogenous (all Low)	**0.17** (0.08, 0.26) {26}	**0.16** (0.07, 0.25) {20}	69.81 (57.59, 82.03) {78}	**38.5** (24.21, 52.79) [60}	**-107.77** (-171.16, -44.38) {26}	-18.75** (-77.01, 39.51) {20}
Mixed (High SM)	0.45 (0.27, 0.63) {22}	0.37 (0.21, 0.52) {25}	**94.77** (80.47, 109.08)	83.20 (68.54, 97.86) {75}	-13.64 (-101.84, 74.57) {22}	-30.4 (-112.23, 51.43) {25}
Mixed (Low SM)	0.30 (0.14, 0.46) {17}	0.41 (0.27, 0.55) {20}	**64.11** (49.45, 78.78) {51}	70.75 (53.91, 87.59)	-10.88 (-87.65, 65.89) {17}	35.75 (-33.02, 104.52) {20}

Figures in brackets correspond to 95% CI; braces show the number of observations; bold, largest and smallest values in a column. Game effect significant at 10% (*), 5% (**), 1% (***).

Table C.2. Censored Regressions with clusters at village level: Dependent variable is the difference between SM choice and the most selfish choice

Regressors	Public Good Game		Common Pool Game	
	No demographics	With demographics	No demographics	With demographics
First Mover Choice Effects				
X_Choice_Sum	1.23	1.045	0.58	0.77
	[0.020]**	[0.027]**	[0.192]	[0.101]
X_Choice_Min	-0.94	-0.710	2.55	2.12
	[0.550]	[0.634]	[0.039]**	[0.089]*
Caste Effects				
Homogenous High	100.10	198.71	203.01	277.36
	[0.168]	[0.014]**	[0.133]	[0.086]*
Homogenous Low	-249.52	-299.35	-62.68	-79.60
	[0.004]***	[0.003]***	[0.390]	[0.331]
Demographics				
Male		-46.30		-72.57
		[0.527]		[0.371]
Years of education		15.12		9.82
		[0.166]		[0.201]
Married		-153.26		-27.73
		[0.119]		[0.672]
High Caste		-141.86		-132.63
		[0.100]		[0.205]
Constant	48.23	236.98	-10.84	7.75
	[0.541]	[0.164]	[0.910]	[0.936]
Observations	99	99	95	95
Number of clusters	29	29	32	32

Robust p values in parentheses; *** p<0.01, ** p<0.05, * p<0.1; SEs clustered at village level

Appendix D: Instructions for PG and CP Games, India in Chapter I

PG INSTRUCTIONS

First room: introduction

Welcome. Thank you for agreeing to participate in this experiment.

I will first read to you the Informed Consent Form. You can indicate your willingness to participate by signing/putting your thumb impression on the form.

I will now ask you to provide some information about yourself.

- You full name:
- Your address/village of residence:
- Your religion:
- Your caste:
- Your age;
- Your education level:
- Your marital status:
- Your current occupation:
- Your voter id/ tractor/scooter/driving license no. /Ration card number/School leaving certificate number

Thank you very much for providing this information. Please go sit in the room.

Second room Instructions (where all subjects have been seated)

- No Talking Allowed
- You will be asked to make one decision in this experiment and provide answers to a short questionnaire.
- Each person will be matched with 3 other people to form a group. Thus, each group will contain 4 individuals.
- Starting Balances
  Each individual starts with an Individual Fund of 150 INR (provided by our university).
  Each four person group begins with a Group Fund of 0 INR.

Decision Task for each of the 3 Type X Decision Makers in a Group

- First, the three Type X persons in a group make their decisions.
- Each Type X person will decide whether or not they want to contribute any amount from his/her own Individual Fund to the Group Fund.
- If the Type X person contributes 15 INR to the Group Fund, his/her Individual Fund decreases by 15 INR. At the same time, the experimenter will add another 30 INR to the Group Fund. So the Group Fund increases by 45 INR.

- Each decision must be in multiples of 15. Maximum contribution is 150 INR per person of Type X.
- So, each Type X person can contribute 0, 15, 30, 45, 60, 75, 90, 105, 120, 135, or 150 INR to the Group Fund, which increases by three times the amount of the Type X person's contribution.

Decision Task for the 1 Type Y Decision Maker in a Group

- The Type Y person will be shown the decisions of each of the 3 anonymous Type X persons in his/her group.
- The Type Y person will now decide whether or not to contribute any amount from his/her own Individual Fund to the Group Fund **OR** withdraw any amount from the Group Fund that was added by the 3 Type X persons.
- If the Type Y person withdraws 15 INR from the Group Fund, his/her Individual Fund increases by 15 INR. At the same time, the experimenter will withdraw another 30 INR from the Group Fund. So the Group Fund decreases by 45 INR.
- If the Type Y person contributes 15 INR to the Group Fund, his/her Individual Fund decreases by 15 INR. At the same time, the experimenter will add another 30 INR to the Group Fund. So the Group Fund increases by 45 INR.
- Each decision must be in multiples of 15. Maximum contribution is 150 INR.
- So, the Type Y person can withdraw any amount of 0, 15, 30, 45, 60, 75, 90, 105, 120, 135, 150 ….. up to a total amount of INR that would reduce the value of the Group Fund to 0 INR.
- The Type Y person can contribute any amount of 0, 15, 30, 45, 60, 75, 90, 105, 120, 135, 150.

Earnings

- The final value of the Group Fund, after the Type X and Type Y person decisions will be divided equally among all individuals in the group.
- This amount would be added to the amount that the individual has in his/her own Individual Fund.

Thus, a person's total earnings will equal the final value in his/her own Individual Fund plus one-fourth of the final value of the amount left in the Group Fund.

This decision task will be completed only once.

Appendix D (cont.)

Please note that you may have come with your friends or neighbors – they will be in <u>different</u> groups. So please do not make decisions thinking that will help your friends since that will not help them – they are in a separate group.

Are there any questions?

<u>First room – one to one interaction with the subject: repeated three times for the 3 Type X subjects</u>

Type X subject (repeat 3 times)

- First, I will verify your information.
- You are Type X person. The other Type X members in your group are from caste____, the Type Y person is from caste ____.
- You will now take your decision about how much to contribute to the Group Fund.
    - If you contribute 15 INR, your Individual Fund <u>decreases</u> by 15 INR. At the same time, the experimenter will add another 30 INR to the Group Fund. So the Group Fund <u>increases</u> by 45 INR.
    - You can contribute any multiple of 15, such as 0, 15, 30, 45, …, 150. If you send 150 INR, your Individual Fund <u>decreases</u> by 150 INR. At the same time, the experimenter will add another 300 INR to the Group Fund. So the Group Fund <u>increases</u> by 450 INR.
- Whatever is left in the Group Fund after all 3 Type X people and the 1 Type Y person have made their decisions will be divided equally among the four people in your group.
- Please think carefully and circle your decision in this sheet.
- Please note that you may have come with your friends or neighbors – they will be in <u>different</u> groups. So please do not make decisions thinking that will help your friends since that will not help them – they are in a separate group.
- After you finish, I will ask some additional questions.

Type Y subject

- First, I will verify your information.
- You are Type Y. The three Type X members in your group are from caste____.

The three Type X people in your group have taken the following decisions:

Type X #1 has chosen to send _____INR to the Group Fund.

Type X #2 has chosen to move _____ INR to the Group Fund.

Type X #3 has chosen to move _____ INR to the Group Fund.

So now the Group Fund has an amount

Appendix D (cont.)

= 3* (Type X person 1's contribution to the Group Fund + Type X person 2's contribution to the Group Fund + Type X person 3's contribution to the Group Fund) = _____INR.

- You will now take your decision about how much to withdraw from or how much to contribute to the Group Fund.
    - If you withdraw 15 INR from the Group Fund, your Individual Fund increases by 15 INR. At the same time, the experimenter will withdraw another 30 INR from the Group Fund. So the Group Fund decreases by 45 INR.
    - You can withdraw any multiple of 15, such as 15, 30, 45, ….up to a total amount of INR that would reduce the value of the Group Fund to 0 INR.
    - If you withdraw 150 INR, your Individual Fund increases by 150 INR. At the same time, the experimenter will withdraw another 300 INR from the Group Fund. So the Group Fund decreases by 450 INR.
    - If you contribute 15 INR, your Individual Fund decreases by 15 INR. At the same time, the experimenter will add another 30 INR to the Group Fund. So the Group Fund increases by 45 INR.
    - You can contribute any multiple of 15, such as 0, 15, 30, 45, …, 150.
    - If you contribute 150 INR, your Individual Fund decreases by 150 INR. At the same time, the experimenter will add another 300 INR to the Group Fund. So the Group Fund increases by 450 INR.
- Whatever is left in the Group Fund after your decision will be divided equally among yourself and the 3 Type X people in your group.
- Please think carefully and circle your decision in this sheet
- Please note that you may have come with your friends or neighbors – they will be in different groups. So please do not make decisions thinking that will help your friends since that will not help them – they are in a separate group.
- After you finish, I will ask some additional questions.

Appendix D (cont.)

PG: Decision Form for Type X #1 Person

Type X #1

Group Number: _____

Type X #2 is of _____ caste.

Type X #3 is of _____ caste.

Type Y person is of _____ caste.

Recall that each 15 INR that you contribute to the Group Fund decreases your Individual Fund by 15 INR. I will add another 30 INR to the Group Fund. So the Group Fund is increased by three times the amount you contribute.

The amount in the Group Fund after all four people in your group made their decision will be shared equally by the four people in the group.

Circle the number of rupees you wish to contribute to the Group Fund

0 15 30 45 60 75 90 105 120 135 150

Appendix D (cont.)

PG: Decision Form for Type X #2 Person

Type X #2

Group Number: _____

Type X #1 is of _____ caste.

Type X #3 is of _____ caste.

Type Y person is of _____ caste.

Recall that each 15 INR that you contribute to the Group Fund decreases your Individual Fund by 15 INR. I will add another 30 INR to the Group Fund. So the Group Fund is increased by three times the amount you contribute.

The amount in the Group Fund after all four people in your group made their decision will be shared equally by the four people in the group.

Circle the number of rupees you wish to contribute to the Group Fund

0 15 30 45 60 75 90 105 120 135 150

Appendix D (cont.)

PG: Decision Form for Type X #3 Person

Type X #3

Group Number: _____

Type X #1 is of _____ caste.

Type X #2 is of _____ caste.

Type Y person is of _____ caste.

Recall that each 15 INR that you contribute to the Group Fund decreases your Individual Fund by 15 INR. I will add another 30 INR to the Group Fund. So the Group Fund is increased by three times the amount you contribute.

The amount in the Group Fund after all four people in your group made their decision will be shared equally by the four people in the group.

Circle the number of rupees you wish to contribute to the Group Fund

0 15 30 45 60 75 90 105 120 135 150

Appendix D (cont.)

PG: Decision Form for Type Y

Type Y person Group Number: _____

Type X #1 is of _____ caste.

Type X #1 has chosen to send _____INR to the Group Fund.

Type X #2 is of _____ caste.

Type X #2 has chosen to send _____INR to the Group Fund.

Type X #3 is of _____ caste.

Type X #3 has chosen to send _____INR to the Group Fund.

So, the Group Fund now has _____INR

Recall that each 15 INR that you contribute to the Group Fund decreases the value of your Individual Fund by 15 INR. I will add another 30 INR to the Group Fund. So the Group Fund increases by three times the amount you contribute.

Each 15 INR you withdraw from the Group Fund increases the value of your Individual Fund by 15 INR. I will withdraw another 30 INR to the Group Fund. So the Group Fund decreases by three times the amount you withdraw.

The amount in the Group Fund after all four people in your group have made their decisions will be shared equally by the four people in the group.

Circle the number of rupees you wish to **contribute** to the Group Fund:

0 15 30 45 60 75 90 105 120 135 150

OR

Circle the number of rupees you wish to **withdraw** from the Group Fund

0 15 30 45 60 75 90 105 120 135 150

165 180 195 210 225 240 255 270 285 300

315 330 345 360 375 390 405 420 435 450

465 480 495 510 525 540 555 570 585 600

Appendix D (cont.)

CP INSTRUCTIONS

First room: introduction

Welcome. Thank you for agreeing to participate in this experiment.

I will first read to you the Informed Consent Form. You can indicate your willingness to participate by signing/putting your thumb impression on the form.

I will now ask you to provide some information about yourself.

- You full name:
- Your address/village of residence:
- Your religion:
- Your caste:
- Your age;
- Your education level:
- Your marital status:
- Your current occupation:
- Your voter id/ tractor/scooter/driving license no. /Ration card number/School leaving certificate number

Thank you very much for providing this information. Please go sit in the room.

Second room Instructions (where all subjects have been seated)

- No Talking Allowed
- You will be asked to make one decision in this experiment and provide answers to a short questionnaire.
- Each person will be matched with 3 other people to form a group. Thus, each group will contain 4 individuals.
- Starting Balances
  Each four person group starts with a Group Fund of 1800 INR (provided by our university). Each individual begins with an Individual Fund of 0 INR.
- Decision Task for the 3 Type X Decision Makers in a Group
  - First, the three Type X persons in a group make their decisions.
  - Each Type X person will decide whether or not to withdraw any money from the Group Fund to move to his/her own Individual Fund.
  - If the Type X person withdraws 15 INR from the Group Fund, his/her Individual Fund increases by 15 INR. At the same time, the experimenter will withdraw another 30 INR from the Group Fund. So the Group Fund decreases by 45 INR.

Appendix D (cont.)

- Each decision must be in multiples of 15. Maximum withdrawal is 150 INR per person of Type X.
- So, each Type X person can withdraw 0, 15, 30, 45, 60, 75, 90, 105, 120, 135, or 150 INR from the Group Fund to move to his/her Individual Fund. The Group Fund decreases by three times the increment in the Individual Fund**.**

- **Decision Task for the 1 Type Y Decision Maker in a Group**

  - The Type Y person will be shown the decisions of each of the 3 anonymous Type X persons in his/her group.
  - The Type Y person will then decide whether or not to withdraw any money from the Group Fund to move to his/her own Individual Fund.
  - If the Type Y person withdraws 15 INR from the Group Fund, his/her Individual Fund increases by 15 INR. At the same time, the experimenter will withdraw another 30 INR from the Group Fund. So the Group Fund decreases by 45 INR.
  - Each decision must be in multiples of 15.
  - So, the Type Y person can withdraw 0, 15, 30, 45, 60, 75, 90, 105, 120, 135, 150 ….. up to a total limit of money that would reduce the value of the Group Fund to 0 INR. The Group Fund decreases by three times the amount of increment of the Individual Fund.

- **Earnings**

  - Whatever remains in the Group Fund will be divided equally among all individuals in the group.
  - This amount would be added to the amount that the individual has in his/her own Individual Fund.

Thus, a person's total earnings will equal the final value in his/her own Individual Fund plus one-fourth of the final amount left in the Group Fund.

This decision task will be completed only once.

Appendix D (cont.)

Please note that you may have come with your friends or neighbors – they will be in <u>different</u> groups. So please do not make decisions thinking that will help your friends since that will not help them – they are in a separate group.

Are there any questions?

<u>First room – one to one interaction with the subject: repeated three times for the 3 Type X subjects</u>

Type X subject (repeat 3 times)

- First, I will verify your information.
- You are Type X person. The other Type X members in your group are from caste____, the Type Y person is from caste ____.
- You will now take your decision about how much to withdraw from the Group Fund.
    - If you withdraw 15 INR, your Individual Fund <u>increases</u> by 15 INR. At the same time, the experimenter will withdraw another 30 INR from to the Group Fund. So the Group Fund <u>decreases</u> by 45 INR.
    - You can withdraw any multiple of 15, such as 0, 15, 30, 45, …, 150. The Group Fund decreases by three times the increment of the Individual Fund.
- Whatever is left in the Group Fund after all 3 Type X people and the 1 Type Y person have made their decisions will be divided equally among the four people in your group.
- Please think carefully and circle your decision in this sheet.
- Please note that you may have come with your friends or neighbors – they will be in <u>different</u> groups. So please do not make decisions thinking that will help your friends since that will not help them – they are in a separate group.
- After you finish, I will ask some additional questions.

Type Y subject

- First, I will verify your information.
- You are Type Y person. The three Type X members in your group are from caste____,

The three Type X people in your group have taken the following decisions:

Type X #1 has chosen to withdraw _____INR from the Group Fund.

Type X #2 has chosen to withdraw _____INR from the Group Fund.

Type X #3 has chosen to withdraw _____INR from the Group Fund.

Appendix D (cont.)

So now the Group Fund is left with an amount

= 1800- 3*(Type X person 1's move to Individual Fund +Type X person 2's move to Individual Fund +Type X person 3's move to Individual Fund) INR

= _____INR.

- You will now take your decision about how much to withdraw from the Group Fund.
    - If you withdraw 15 INR from the Group Fund, your Individual Fund increases by 15 INR. At the same time, the experimenter will withdraw another 30 INR from the Group Fund. So the Group Fund decreases by 45 INR.
    - You can withdraw any multiple of 15, such as 15, 30, 45, ….up to a total amount of INR that would reduce the value of the Group Fund to 0 INR.
    - The Group Fund decreases by three times the amount of increment in your Individual Fund.
- Whatever is left in the Group Fund after your decision will be divided equally among yourself and the 3 Type X people in your group.
- Please think carefully and circle your decision in this sheet.

- Please note that you may have come with your friends or neighbors – they will be in different groups. So please do not make decisions thinking that will help your friends since that will not help them – they are in a separate group.
- After you finish, I will ask some additional questions.

Appendix D (cont.)

CP: Decision Form for Type X #1 Person

Type X #1

Group Number: _____

Type X #2 is of _____ caste.

Type X #3 is of _____ caste.

Type Y person is of _____ caste.

Recall that each 15 INR that you withdraw from the Group Fund increases your Individual Fund by 15 INR. I will withdraw another 30 INR from the Group Fund. So the Group Fund decreases by three times the increment of your Individual Fund.

The amount in the Group Fund after all four people in your group made their decision will be shared equally by the four people in the group.

Circle the number of rupees you wish to withdraw from the Group Fund:

0 15 30 45 60 75 90 105 120 135 150

Appendix D (cont.)

CP: Decision Form for Type X #2 Person

Type X #2

Group Number: _____

Type X #1 is of _____ caste.

Type X #3 is of _____ caste.

Type Y person is of _____ caste.

Recall that each 15 INR that you withdraw from the Group Fund increases your Individual Fund by 15 INR. I will withdraw another 30 INR from the Group Fund. So the Group Fund decreases by three times the increment of your Individual Fund.

The amount in the Group Fund after all four people in your group made their decision will be shared equally by the four people in the group.

Circle the number of rupees you wish to withdraw from the Group Fund:

0 15 30 45 60 75 90 105 120 135 150

Appendix D (cont.)

CP: Decision Form for Type X #3 Person

Type X #3

Group Number: _____

Type X #1 is of _____ caste.

Type X #2 is of _____ caste.

Type Y person is of _____ caste.

Recall that each 15 INR that you withdraw from the Group Fund increases your Individual Fund by 15 INR. I will withdraw another 30 INR from the Group Fund. So the Group Fund decreases by three times the increment of your Individual Fund.

The amount in the Group Fund after all four people in your group made their decision will be shared equally by the four people in the group.

Circle the number of rupees you wish to withdraw from the Group Fund:

0 15 30 45 60 75 90 105 120 135 150

Appendix D (cont.)

CP: Decision Form for Type Y

Type Y Person

Group Number: _____

Type X #1 is of _____ caste.

Type X #1 has chosen to withdraw _____INR from the Group Fund.

Type X #2 is of _____ caste.

Type X #2 has chosen to withdraw _____INR from the Group Fund.

Type X #3 is of _____ caste.

Type X #3 has chosen to withdraw _____INR from the Group Fund.

So, the Group Fund now has _____INR

Each 15 INR you withdraw from the Group Fund increases the value of your Individual Fund by 15 INR. I will withdraw another 30 INR to the Group Fund. So the Group Fund decreases by three times the increment of your Individual Fund.

The amount in the Group Fund after all four people in your group made their decisions will be shared equally by the four people in the group.

Circle the number of rupees you wish to **withdraw** from the Group Fund:

0	**15**	**30**	**45**	**60**	**75**	**90**	**105**	**120**	**135**	**150**
165	**180**	**195**	**210**	**225**	**240**	**255**	**270**	**285**	**300**	
315	**330**	**345**	**360**	**375**	**390**	**405**	**420**	**435**	**450**	
465	**480**	**495**	**510**	**525**	**540**	**555**	**570**	**585**	**600**	

Appendix E: Figures and Tables for Chapter II

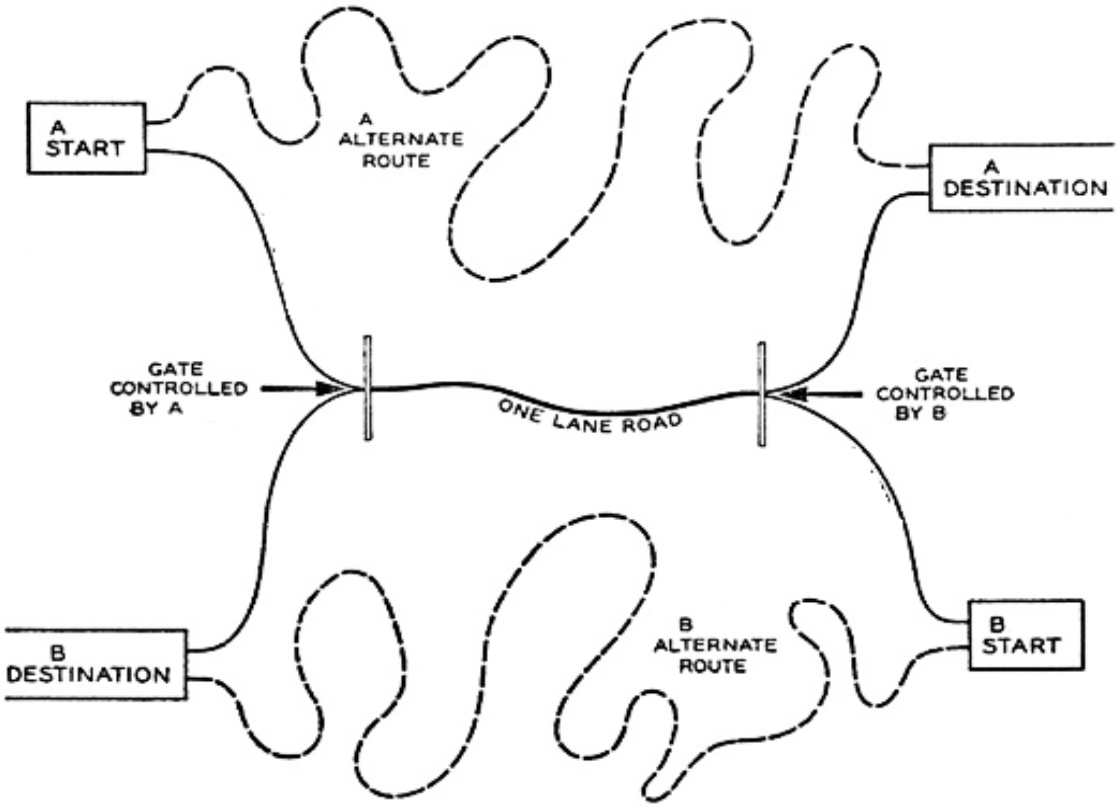


Figure E.1: Subject's Road Map (adapted from Deutsch & Krauss, 1962)

Pl A \ Pl B	Long route, gate open	Long route, gate closed	Short route, gate open
Long route, gate open	(1,1)	(1,1)	(1,5)
Long route, gate closed	(1,1)	(1,1)	(1,0)
Short route, gate open	(5,1)	(0,1)	(-2,-2)

Table E.1: Points Structure in the Cooperation Game

Appendix E (cont.)

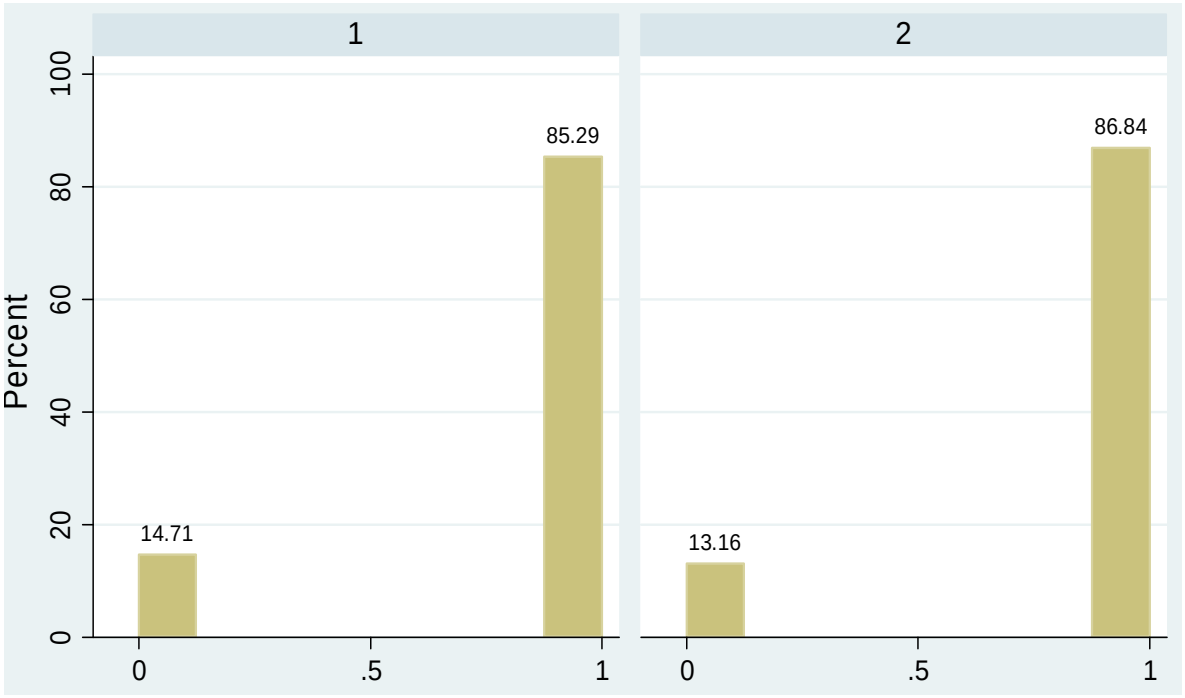


Figure E.2: Decision to Compete among Males in India–
Males with Males (Left panel - Group 1) vs. Males with Females (Right Panel - Group 2)
[Note: 1 means decision to compete; 0 means decision to not compete.]

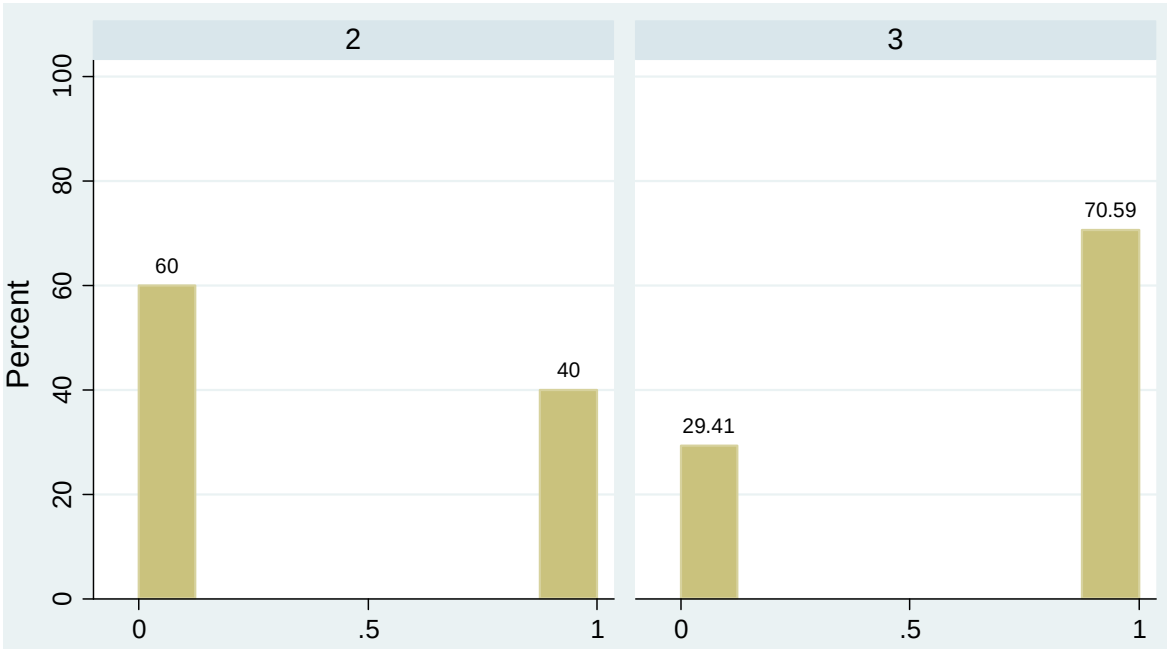


Figure E.3: Decision to Compete among Females in India –
Females with Males (Left panel - Group 2) vs. Females with Females (Right panel - Group 3)

Appendix E (cont.)

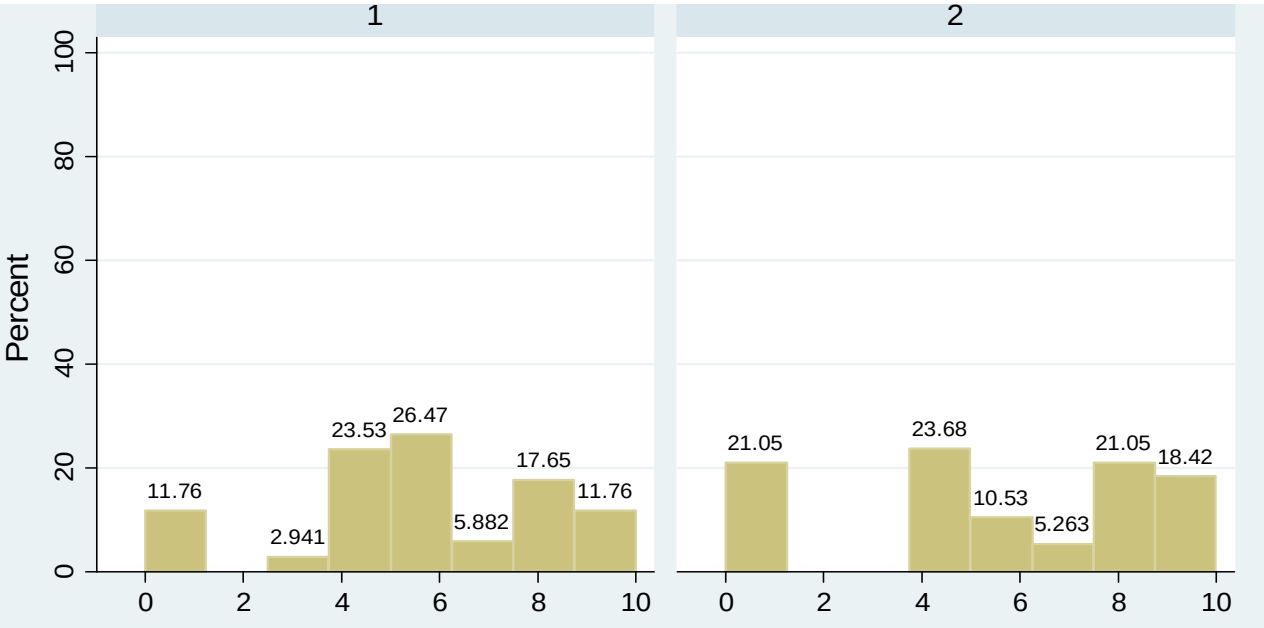


Figure E.4: Level of Cooperation among Males in India –
Males with males (Left panel - Group 1) vs. Males with females (Right panel - Group 2)

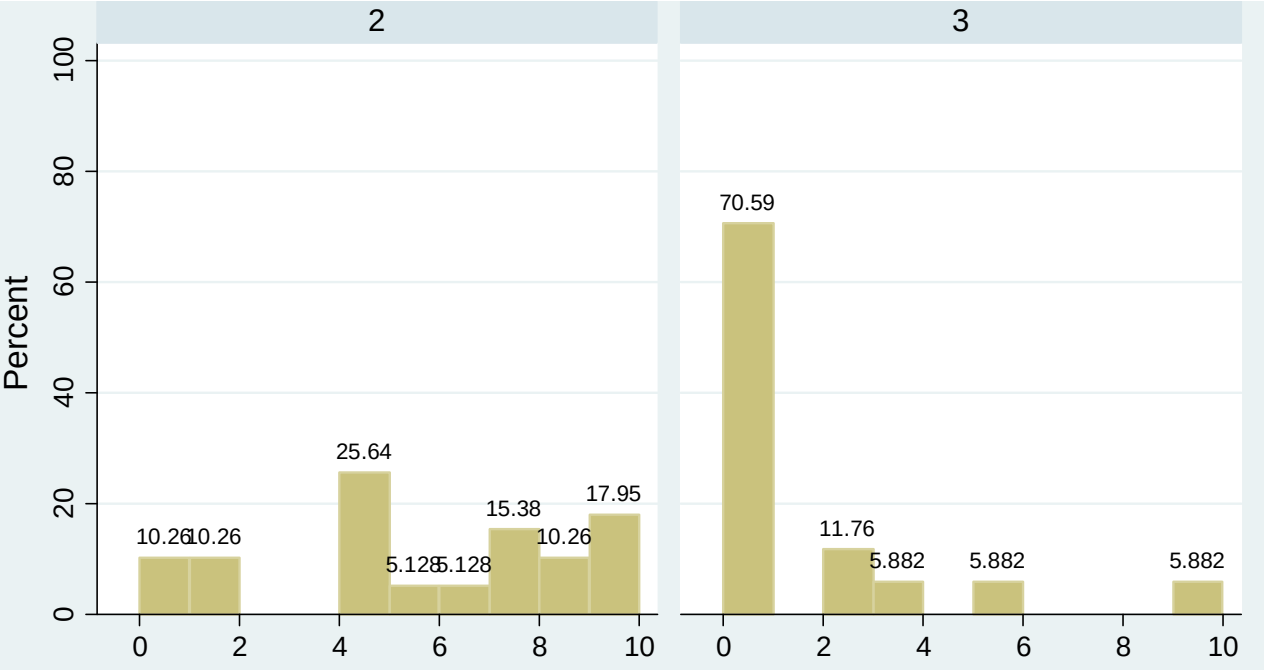


Figure E.5: Level of Cooperation among Females in India –
Females with males (Left panel - Group 2) vs. Females with females (Right panel - Group 3)

Appendix E (cont.)

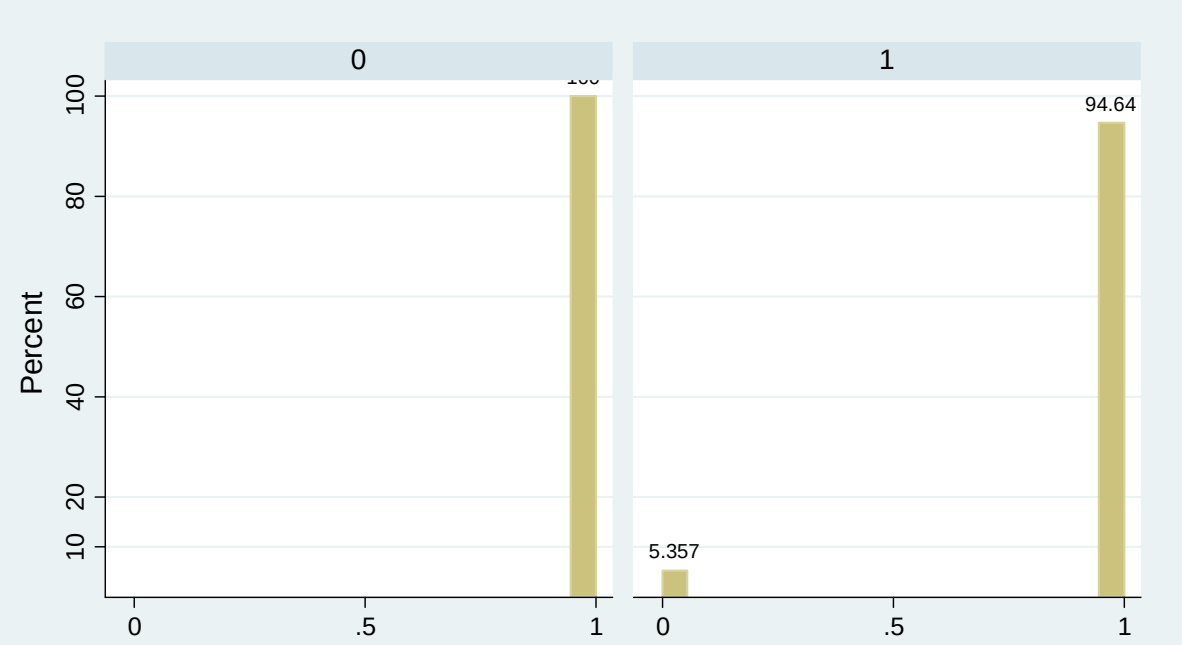


Figure E.6: Decision to Compete among Males in the U.S.–
Males with Females (Left panel - Group 0) vs. Males with Males (Right panel - Group 1)
[Note: 1 means decision to compete; 0 means decision to not compete.]

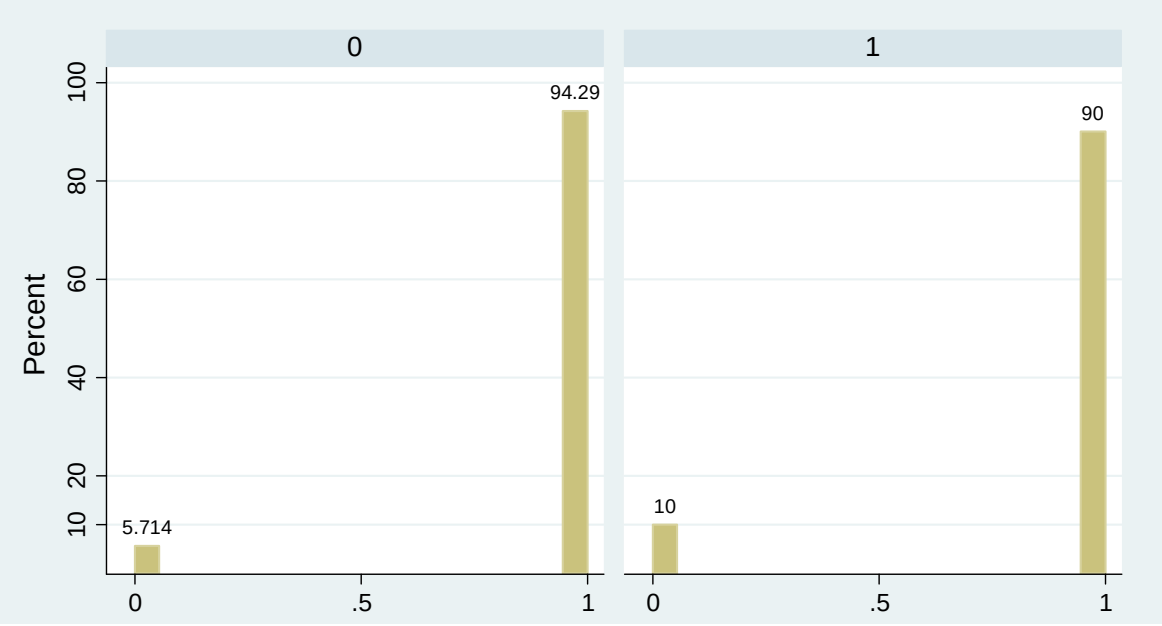


Figure E.7: Decision to Compete among Females in the U.S. –
Females with Males (Left panel - Group 0) vs. Females with Females (Right panel - Group 1)

Appendix E (cont.)

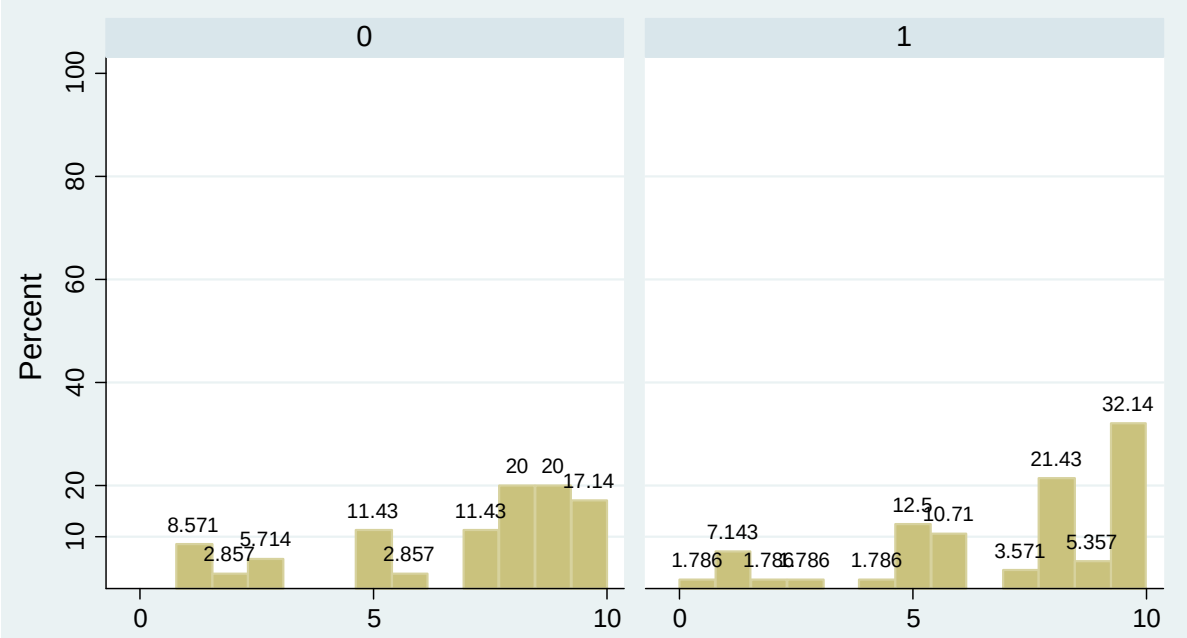


Figure E.8: Level of Cooperation among Males in the U.S. –
Males with females (Left panel - Group 0) vs. Males with males (Right panel - Group 1)

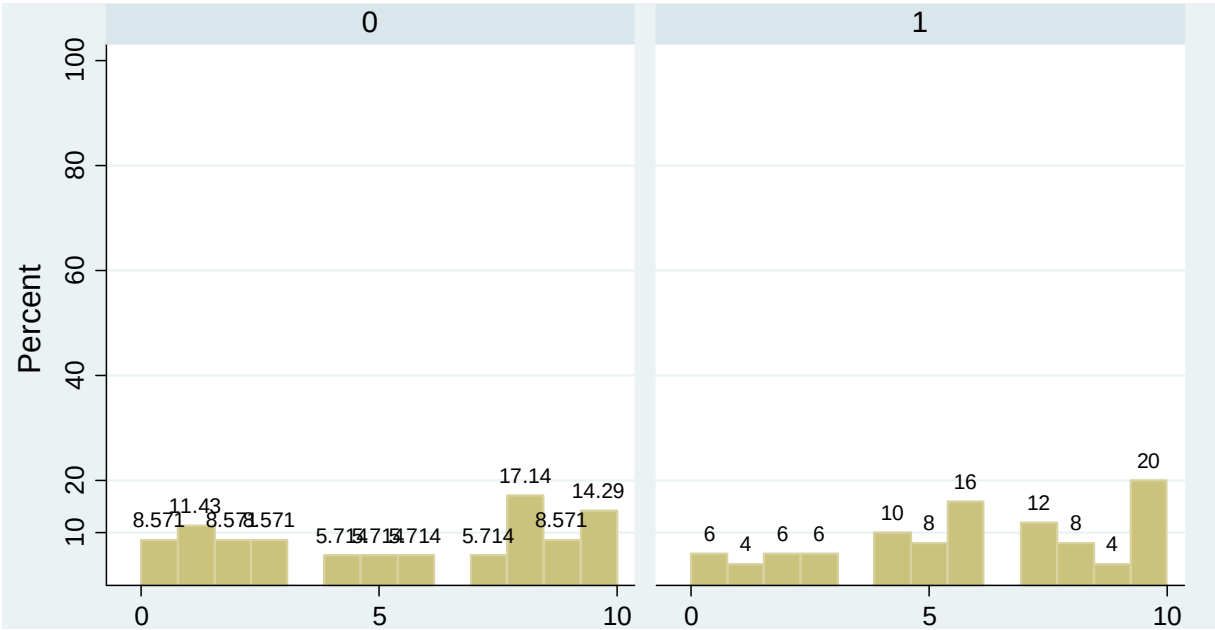


Figure E.9: Level of Cooperation among Females in the U.S. –
Females with males (Left panel - Group 0) vs. Females with females (Right panel - Group 1)

Appendix E (cont.)

Table E.2: Summary Statistics on Experimental Subjects from India

Variable	Mean	S.D.	N
Gender (Male=1; 0 otherwise)	0.50	0.50	168
Caste (1=high; 0 otherwise)	0.74	0.44	165
Across Females			
Caste	0.78	0.41	84
Age	28.06	5.59	84
Primary Education or less	0.67	0.47	84
Married	0.89	0.31	84
Played any games	0.95	0.21	84
Number of years played	5.86	2.72	84
Choice of Risky investment - *All Females*	49.82	19.49	84
Choice of Risky investment - *High Caste Females*	50.45	20.30	66
Choice of Risky investment - *Low Caste Females*	47.50	16.47	18
Chose to Compete - *All Females*	0.54	0.50	84
Chose to Compete - *High Caste Females*	0.56	0.50	66
Chose to Compete - *Low Caste Females*	0.44	0.51	18
Performance in Competition Task - *All Females*	2.73	1.56	84
Performance in Competition Task - *High caste Females*	2.59	1.48	66
Performance in Competition Task - *Low caste Females*	3.22	1.77	18
Level of Cooperation - *All Females*	3.52	3.45	84
Level of Cooperation - *High caste Females*	3.34	3.37	66
Level of Cooperation - *Low caste Females*	4.19	3.73	18
Across Males			
Caste	0.69	0.46	84
Age	24.61	5.48	84
Primary Education or less	0.35	0.48	84
Married	0.32	0.47	84
Played any games	1	0	84
Number of years played	13.54	5.14	84
Choice of Risky investment - *All Males*	55.77	20.82	84
Choice of Risky investment - *High Caste Males*	54.38	23.06	56
Choice of Risky investment - *Low Caste Males*	60	15.61	25
Chose to Compete - *All Males*	0.87	0.34	84
Chose to Compete - *High Caste Males*	0.88	0.33	56
Chose to Compete - *Low Caste Males*	0.84	0.37	25
Performance in Competition Task - *All Males*	3.98	1.66	84
Performance in Competition Task - *High caste Males*	3.88	1.51	56
Performance in Competition Task - *Low caste Males*	4.08	2.04	25
Level of Cooperation - *All Males*	5.13	3.08	84
Level of Cooperation - *High caste Males*	5.73	3.10	56
Level of Cooperation - *Low caste Males*	4.40	2.48	25

Appendix E (cont.)

Table E.3: Summary Statistics on Experimental Subjects from the U.S.

Variable	Mean	S.D.	N
Gender (Male=1; 0 otherwise)	0.51	0.50	184
Race (1=White; 0 otherwise)	0.42	0.49	184
Across Females			
Race	0.41	0.49	90
Age	19.98	3.44	90
Class Standing	2.46	1.03	90
Marital Status	1.03	0.23	90
Played any games?	0.82	0.38	90
Number of years played	4.94	4.89	90
Choice of Risky investment - *All Females*	4.83	1.81	90
Choice of Risky investment - *African American Females*	4.68	1.65	53
Choice of Risky investment - *White Females*	5.04	2.02	37
Chose to Compete - *All Females*	0.92	0.27	90
Chose to Compete - *African American Females*	0.89	0.32	53
Chose to Compete - *White Females*	0.97	0.16	37
Performance in Competition Task - *All Females*	2.63	1.52	90
Performance in Competition Task - *African American Females*	2.45	1.46	53
Performance in Competition Task - *White Females*	2.89	1.59	37
Level of Cooperation - *All Females*	3.56	3.27	90
Level of Cooperation - *African American Females*	2.83	3.17	53
Level of Cooperation - *White Females*	4.61	3.18	37
Across Males			
Race	0.43	0.50	94
Age	20.56	3.09	94
Class Standing	2.57	1.11	94
Marital Status	1.06	0.32	94
Played any games?	0.88	0.32	94
Number of years played	6.62	5.85	94
Choice of Risky investment - *All Males*	5.69	1.85	94
Choice of Risky investment - *African American Males*	5.28	1.78	54
Choice of Risky investment - *White Males*	6.25	1.80	40
Chose to Compete - *All Males*	0.97	0.18	94
Chose to Compete - *African American Males*	0.94	0.23	54
Chose to Compete - *White Males*	1.00	0.00	40
Performance in Competition Task - *All Males*	3.78	1.81	94
Performance in Competition Task - *African American Males*	3.93	2.03	54
Performance in Competition Task - *White Males*	3.58	1.47	40
Level of Cooperation - *All Males*	4.49	3.85	94
Level of Cooperation - *African American Males*	3.00	3.72	54
Level of Cooperation - *White Males*	6.51	3.04	40

Appendix E (cont.)

Table E.4: OLS to examine Investment in Risky Option

	Percentage of Endowment invested in Risky Option		
	Pooled Data (2)	*India Data* (3)	*U.S. Data* (4)
Pooled Data			
U.S. Males	0.1108		
	[0.011]**		
U.S. Females	0.0067		
	[0.875]		
Indian Females	-0.0736		
	[0.042]**		
India Data			
High Caste Females		-0.0343	
		[0.421]	
Low Caste Males		0.0629	
		[0.155]	
Low Caste Females		-0.0607	
		[0.266]	
U.S. Data			
African American Males			-0.1169
			[0.014]**
African American Females			-0.1856
			[0.000]***
White Females			-0.1402
			[0.012]**
Demographic Variables			
Years of Education	0.0117	0.0098	0.0114
	[0.051]*	[0.129]	[0.581]
Married	-0.0766	-0.0373	-0.1677
	[0.123]	[0.504]	[0.060]*
Age (in years)	0.0016	-0.0018	0.006
	[0.620]	[0.644]	[0.337]
Subject is a Student	0.0495	-0.0068	0.000
	[0.362]	[0.911]	[0.00]
Constant	0.4214	0.5025	0.65
	[0.000]***	[0.000]***	[0.019]**
Observations	**352**	**168**	**184**
R-squared	0.14	0.053	0.133

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix E (cont.)

Table E.5: Marginal Effects from Binary Probit Regressions to examine the Choice of Compete

	Pooled Data (2)	*India Data* (3)	*U.S. Data* (4)
Pooled Data			
U.S. Males	1.0807		
	[0.006]***		
U.S. Females	0.7392		
	[0.065]*		
Indian Females	-0.6082		
	[0.058]*		
India Data			
High Caste Females		-0.6604	
		[0.076]*	
Low Caste Males		-0.2084	
		[0.580]	
Low Caste Females		-1.0639	
		[0.016]**	
U.S. Data			
African American Males			-4.7176
			[0.000]***
African American Females			-4.8495
			[0.000]***
White Females			-4.4953
			[0.000]***
Demographic Variables			
Age (in years)	-0.0297	-0.0354	-0.0439
	[0.207]	[0.190]	[0.416]
Years of Education	0.037	0.027	0.0032
	[0.372]	[0.520]	[0.988]
Married	0.342	0.3977	0.000
	[0.341]	[0.322]	[0.00]
Subject is a Student	-0.5337	-0.4912	0.000
	[0.187]	[0.261]	[0.00]
Played any games?	1.0853	0.1433	1.0498
	[0.003]***	[0.837]	[0.017]**
Number of years played	0.022	0.0131	0.1353
	[0.337]	[0.662]	[0.018]**
Percentage invested in Risky	0.9832	0.7516	1.5468
	[0.027]**	[0.163]	[0.122]
Constant	-0.4378	1.0063	5.1144
	[0.609]	[0.385]	[0.038]**
Observations	**352**	**168**	**184**

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix E (cont.)

Table E.6: Negative Binomial Regressions for Performance in Competition Round

	Pooled Data (2)	*India Data* (3)	*U.S. Data* (4)
Pooled Data			
U.S. Males	0.0312		
	[0.766]		
U.S. Females	-0.3012		
	[0.009]***		
Indian Females	-0.3743		
	[0.000]***		
India Data			
High Caste Females		-0.5049	
		[0.000]***	
Low Caste Males		0.0627	
		[0.573]	
Low Caste Females		-0.2322	
		[0.124]	
U.S. Data			
African American Males			0.1131
			[0.225]
African American Females			-0.3024
			[0.003]***
White Females			-0.177
			[0.101]
Demographic Variables			
Chose to Compete	0.1484	0.1377	0.2794
	[0.085]*	[0.151]	[0.159]
Age (in years)	0.0045	0.0061	0.0057
	[0.516]	[0.533]	[0.639]
Years of Education	-0.0063	-0.0026	-0.0039
	[0.686]	[0.874]	[0.927]
Married	-0.1644	-0.0725	-0.284
	[0.060]*	[0.495]	[0.040]**
Subject is a Student	0.0735	0.0178	0.000
	[0.516]	[0.880]	[0.00]
Played any games?	0.0644	-0.1211	-0.0054
	[0.474]	[0.575]	[0.955]
Number of years played	0.0069	-0.0077	0.0138
	[0.175]	[0.348]	[0.025]**
Constant	1.1296	1.3849	1.1071
	[0.000]***	[0.001]***	[0.059]*
Observations	**352**	**168**	**184**

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix E (cont.)

Table E.7: Marginal Effects from Ordered Probit Regressions for Performance in Cooperation Round at the individual level

	Pooled Data *(2)*	*India Data* *(3)*	*U.S. Data* *(4)*
Pooled Data			
U.S. Males	-0.1776		
	[0.402]		
U.S. Females	-0.4532		
	[0.027]**		
Indian Females	-0.3958		
	[0.027]**		
India Data			
High Caste Females		-0.4996	
		[0.025]**	
Low Caste Males		-0.261	
		[0.211]	
Low Caste Females		-0.1456	
		[0.671]	
U.S. Data			
African American Males			-1.0553
			[0.000]***
African American Females			-1.075
			[0.000]***
White Females			-0.5174
			[0.015]**
Demographic Variables			
Age (in years)	0.0105	0.0164	0.0101
	[0.461]	[0.373]	[0.695]
Years of Education	0.0296	0.0263	0.0284
	[0.284]	[0.415]	[0.756]
Married	0.1696	0.368	-0.3431
	[0.425]	[0.150]	[0.343]
Subject is a Student	-0.1538	-0.1904	0.000
	[0.517]	[0.472]	[0.00]
Observations	**352**	**168**	**184**

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix E (cont.)

Table E.8: Ordered Probit Marginal Effects for Cooperation Task for Indian Groups

(omitted category - High caste females with low caste females)

Dependent variable - Level of Cooperation (takes value 0-10 based on how many rounds both subjects in a group chose to cooperate)	
Low caste males with low caste males	1.7054
	[0.000]***
Low caste males with low caste females	2.2637
	[0.000]***
Low caste females with low caste females	0.6988
	[0.180]
High caste males with high caste males	2.5376
	[0.000]***
High caste males with high caste females	2.2408
	[0.000]***
High caste females with high caste females	0.805
	[0.186]
High caste males with low caste males	2.0435
	[0.000]***
High caste males with low caste females	2.0942
	[0.000]***
High caste females with low caste males	1.8878
	[0.000]***
Observations	**81**

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

The standard errors are clustered at the group level.

Table E.9: Ordered Probit Marginal Effects for Cooperation Task for U.S. Groups

(omitted category: African American males with African American males)

Dependent variable - Level of Cooperation (takes value 0-10 based on how many rounds both subjects in a group chose to cooperate)	
African American males with African American females	0.3612
	[0.547]
African American females with African American females	0.4762
	[0.373]
White males with White males	2.0357
	[0.000]***
White males with White females	1.5931
	[0.001]***
White females with White females	1.7683
	[0.003]***
White males with African American males	1.9377
	[0.002]***
White females with African American females	0.5384
	[0.320]
White males with African American females	1.0404
	[0.084]*
African American males with White females	0.6185
	[0.278]
Observations	**88**

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

The standard errors are clustered at the group level.

Appendix F: Additional Tables to examine Subject Behavior under age 25 for Chapter II

Table F.1: OLS for checking Investment in Risky Option

	Percentage of Endowment invested in Risky Option		
	Pooled Data	*India Data*	*U.S. Data*
Pooled Data			
U.S. Males	0.0407		
	[0.397]		
U.S. Females	-0.0773		
	[0.114]		
Indian Females	-0.1303		
	[0.029]**		
India Data			
High Caste Females		-0.0999	
		[0.162]	
Low Caste Males		0.0608	
		[0.273]	
Low Caste Females		-0.1363	
		[0.150]	
U.S. Data			
African American Males			-0.1225
			[0.016]**
African American Females			-0.2086
			[0.000]***
White Females			-0.1589
			[0.008]***
Demographic Variables			
Years of Education	0.0375	0.0388	0.0254
	[0.002]***	[0.008]***	[0.323]
Married	-0.1249	-0.1271	-0.0965
	[0.103]	[0.135]	[0.607]
Age (in years)	-0.0095	-0.0076	-0.0042
	[0.286]	[0.657]	[0.742]
Subject is a Student	-0.0406	-0.0441	
	[0.531]	[0.569]	
Constant	0.4764	0.4041	0.5904
	[0.010]**	[0.287]	[0.075]*
Observations	248	75	173
R-squared	0.135	0.175	0.113

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix F (cont.)

Table F.2: Binary Probit Regressions to examine Choice of Compete

	Pooled Data	*India Data*	*U.S. Data*
Pooled Data			
U.S. Males	1.0541		
	[0.047]**		
U.S. Females	0.6522		
	[0.244]		
Indian Females	-1.4247		
	[0.007]***		
India Data			
High Caste Females		-2.0409	
		[0.005]***	
Low Caste Males		-0.1411	
		[0.783]	
Low Caste Females		-2.0083	
		[0.007]***	
U.S. Data			
African American Males			-4.8271
			[0.000]***
African American Females			-4.9757
			[0.000]***
White Females			-4.7323
			[0.000]***
Demographic Variables			
Age (in years)	-0.0172	0.1006	-0.1581
	[0.836]	[0.425]	[0.325]
Years of Education	0.0124	0.0106	0.1516
	[0.903]	[0.930]	[0.598]
Married	-0.3396	-0.4863	0.000
	[0.556]	[0.437]	[0.00]
Subject is a Student	-0.1755	0.1743	
	[0.783]	[0.793]	
Played any games?	1.405	0.000	1.0851
	[0.001]***	[0.00]	[0.011]**
Number of years played	0.014	-0.0425	0.1354
	[0.694]	[0.510]	[0.012]**
Percentage invested in Risky	0.6591	-0.2048	1.2655
	[0.244]	[0.796]	[0.198]
Constant	0.0706	0.33	5.4935
	[0.968]	[0.906]	[0.033]**
Observations	248	74	173

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix F (cont.)

Table F.3: Negative Binomial Regressions for Performance in Competition Round

	Pooled Data	*India Data*	*U.S. Data*
Pooled Data			
U.S. Males	0.0017		
	[0.988]		
U.S. Females	-0.3105		
	[0.016]**		
Indian Females	-0.4232		
	[0.027]**		
India Data			
High Caste Females		-0.5489	
		[0.009]***	
Low Caste Males		0.073	
		[0.607]	
Low Caste Females		-0.6238	
		[0.071]*	
U.S. Data			
African American Males			0.1318
			[0.194]
African American Females			-0.2914
			[0.007]***
White Females			-0.1665
			[0.153]
Demographic Variables			
Chose to Compete	0.2738	0.2562	0.2776
	[0.070]*	[0.229]	[0.168]
Age (in years)	0.0064	0.0419	-0.0033
	[0.748]	[0.252]	[0.921]
Years of Education	0.0063	0.0169	0.0119
	[0.771]	[0.501]	[0.840]
Married	-0.0441	-0.0092	0.000
	[0.736]	[0.953]	[0.00]
Subject is a Student	-0.0678	0.0106	
	[0.608]	[0.940]	
Played any games?	0.0226	0.2166	-0.0366
	[0.818]	[0.443]	[0.726]
Number of years played	0.0131	-0.0148	0.0183
	[0.054]*	[0.297]	[0.013]**
Constant	0.8262	0.0672	0.7656
	[0.084]*	[0.944]	[0.165]
Observations	248	75	173

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix F (cont.)

Table F.4: Ordered Probit Regressions for Performance in Cooperation Round

	Pooled Data	*India Data*	*U.S. Data*
Pooled Data			
U.S. Males	-0.2697		
	[0.260]		
U.S. Females	-0.5309		
	[0.026]**		
Indian Females	-0.4594		
	[0.116]		
India Data			
High Caste Females		-0.7221	
		[0.064]*	
Low Caste Males		-0.3912	
		[0.211]	
Low Caste Females		-0.2687	
		[0.593]	
U.S. Data			
African American Males			-1.0453
			[0.000]***
African American Females			-1.0867
			[0.000]***
White Females			-0.5194
			[0.018]**
Demographic Variables			
Age (in years)	0.0369	0.0624	0.0526
	[0.366]	[0.442]	[0.369]
Years of Education	0.0604	0.0695	0.0134
	[0.222]	[0.230]	[0.903]
Married	0.336	0.4651	-0.234
	[0.224]	[0.231]	[0.182]
Subject is a Student	-0.2791	-0.2564	
	[0.269]	[0.413]	
Observations	248	75	173

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix F (cont.)

Table F.5: Ordered Probit Marginal Effects for Cooperation Task for Indian Groups (omitted category - High caste females with low caste females)

Dependent variable - Level of Cooperation (takes value 0-10 based on how many rounds both subjects in a group chose to cooperate)	
Low caste males with low caste males	1.4939
	[0.063]*
Low caste males with low caste females	2.7343
	[0.002]***
Low caste females with low caste females	2.1801
	[0.001]***
High caste males with high caste males	3.0194
	[0.000]***
High caste males with high caste females	2.0563
	[0.003]***
High caste females with high caste females	-0.2217
	[0.800]
High caste males with low caste males	1.6833
	[0.008]***
High caste males with low caste females	2.677
	[0.000]***
High caste females with low caste males	1.9197
	[0.005]***
Observations	**35**

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

The standard errors are clustered at the group level.

Appendix F (cont.)

Table F.6: Ordered Probit Marginal Effects for Cooperation Task for U.S. Groups (omitted category: African American males with African American males)

Dependent variable - Level of Cooperation (takes value 0-10 based on how many rounds both subjects in a group chose to cooperate)	
African American males with African American females	0.3802
	[0.544]
African American females with African American females	0.4465
	[0.428]
White males with White males	1.9155
	[0.001]***
White males with White females	1.5649
	[0.003]***
White females with White females	1.7274
	[0.006]***
White males with African American males	1.8737
	[0.005]***
White females with African American females	0.3815
	[0.480]
White males with African American females	0.9967
	[0.131]
African American males with White females	0.5554
	[0.365]
Observations	**83**

Robust p values in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%
The standard errors are clustered at the group level.

Appendix G: Subject Instructions for Chapter II (India)

First room: introduction

Welcome. Thank you very much for agreeing to participate in this experiment.

I will first read to you the Informed Consent Form. You can indicate your willingness to participate by signing the form.

I will now ask you to provide some information about yourself.

- You full name;
- Your address;
- Your religion;
- Your caste;
- Age;
- Your education level;
- Your marital status;
- Your current occupation;
- Whether you have ever played a sport, and for how many years;
- Your voter id/Your driving license no./your Ration card number

Thank you very much for providing this information. Please go sit in the room.

First room Instructions (where all subjects have been seated)

- No Talking Allowed. Please switch off your cell phones or mute them.
- This experiment has three tasks. You will each have to complete these tasks.

- After all three tasks have been completed; you will be compensated for your time. I will randomly pick up one of the three tasks and pay you for that task. In addition, you will also receive Rs 50 show up fee. Payment will be made in private at the end of the experiment.

- Therefore, you may be paid for **any one** task: either task 1 or task 2 or task 3. You will **not** know which task you are paid for until the end of the experiment.

- Each person will be randomly matched with 1 other person to form a team. Thus, each team will contain 2 individuals. You will not be told who the other person in your team is. This pairing will remain fixed for the whole duration of the experiment.

- Note that you may have come with your friends or neighbors. They will **not** be placed in the same group as you. Your partner will be a stranger.

- For the first two tasks, I will call each individual one by one to a different room. I will ask each one of you to take one decision and afterwards you would have to perform a task.

Appendix G (cont.)

- I will explain below what the decision is and what task you have to perform.
- The decision you have to take:
    - I will give you an initial endowment of Rs 100. This money has been provided by my university.
    - You task is to decide how to divide this endowment between a zero-risk, zero-interest savings account and an investment which is risky but potentially profitable.
    - You can receive five times the amount that you choose to invest in the risky prospect with probability one half, or lose the amount invested otherwise.
    - At the end of the experiment, <u>if this round is chosen for payment</u>, a coin will be flipped to determine whether the risky investment is successful or not.
    - So the main decision is to divide your endowment between the risky investment and the non-risky zero profit alternative.
    - Once your decision has been completed, we will go on to the second task.
- The task you have to perform:
    - You have to toss a tennis ball into a bucket 10 feet away-**<u>Underhand.</u>**
    - You will have to do this task 10 times.
    - A successful shot meant that the tennis ball entered the bucket.

Once everyone has finished doing these 2 tasks, we will start the third task. This will be conducted in this room. I will give you the instructions at that point of time.

Please raise your hand if you have any questions.

Once we have completed all three rounds, I will again ask each one to come one by one to the other room. I will flip a 6 sided die to determine whether all of you get paid on Task 1, 2 or 3.

So everyone will be paid for the same task, but you don't know which task it is until the experiment is over. In addition, you also get Rs 50 as show up fee.

Second room: one to one interaction with me: Task 1

- I will now give you Rs 100.

Appendix G (cont.)

- You have to decide how much of that endowment you want to put in a zero-risk, zero-interest savings account and how much you want to put in an investment which is risky but potentially profitable.
- The amount invested in the risky investment - if it is successful, you will receive 5 times the amount you invested.
- The amount invested in the risky investment – if it is not successful, you will receive zero.
- The amount kept in the savings account stays the same.
- There is a half chance that the risky investment will be successful and a half chance that it will be unsuccessful.
- If this round is chosen for payment at the end of the experiment, I will flip a coin to decide whether the investment is successful or not.
- So now, please make your decision about how to divide the endowment.
- *[Decision sheet to subject- subject makes decision.]*

Second room: one to one interaction with me: Task 2

As I mentioned before, you have been randomly paired with another person. I will not tell you who the other person is. However, your teammate is _____ (**male/female**) and is from _____ (**high/low) caste**.

- You have to toss a tennis ball into a bucket placed 10 feet away.
- Please throw the ball **underhand**.
- You have to do this 10 times.

But before we start, I will ask you to make a decision: I will give you a choice.

- You have to choose between
  - Rs 20 per successful shot, regardless of the performance of your paired opponent or,
  - Rs 20X4=Rs 80 per successful shot if you outperform your opponent.
- If you choose the second option and score the same or less than the other participant, you will still receive Rs 20 per successful shot.

- So please make the decision about how you would like to proceed. Then complete the task. *[Subject completes task.]*

- Please go back to the first room and wait there.

Appendix G (cont.)

First room: interaction with whole group: Task 3

I have given each of you an envelope. Please open it. Look at the roadmap on the board or the one with you. Suppose you are A and your paired opponent is B.

Each of you has a starting point and a destination. There are two ways to reach the destination. You can take either the short route (One Lane road) or the long route (Alternate Route).

If both of you take the short route, at one point, you will meet each other. You cannot cross each other. Along the long route, you will not cross each other; however this route is long and takes more time.

One more important point to notice:

A gate is placed at both ends of the one lane route. If you are A, you have control over the gate closest to your starting position. You can open the gate to let your opponent pass, or you can close the gate and stop the other person from travelling along the one-way route.

But if you close your gate, you cannot travel along the short route yourself – you have to take the longer route. So you can **NEVER** choose the (short route, gate closed) option.

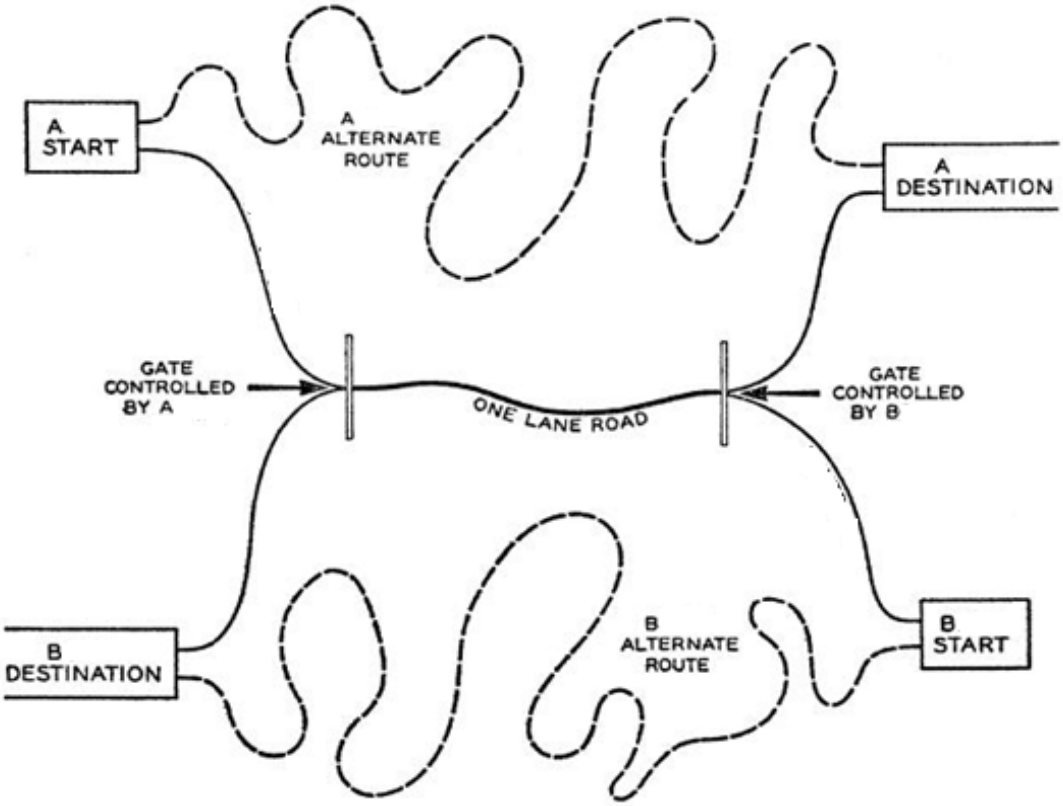


Figure G.1: Subject's road map (in instructions)

Appendix G (cont.)

So now you have to make 2 simultaneous decisions:

- Whether you want to travel along the LONG route (Alternate route) or the SHORT one (one lane road);
- Whether you want the gate to be OPEN or CLOSED.

For each trip you complete, you can earn at least 1 point, where 1 point translates to Rs 10. The player types (A or B) would be randomly assigned to the two players in a team.

How will you be paid? Here is the payoff table:

Player B **Player A**	**Long route, gate open**	**Long route, gate closed**	**Short route, gate open**
Long route, gate open	**(1, 1)**	**(1, 1)**	**(1, 5)**
Long route, gate closed	**(1, 1)**	**(1, 1)**	**(1, 0)**
Short route, gate open	**(5, 1)**	**(0, 1)**	**(-2, -2)**

Table G.1: Payoff structure in Task 3

At the end of the experiment, you will be paid on the basis of what you have earned in all the 10 rounds in this task (if this round is chosen for payment).

In your envelope, you will find 10 sheets of decision making. Make your decisions for Round 1. Please circle your choices in the sheet of paper.

Once you are done, please raise your hand, I will come and collect the sheet of paper from you. Once everyone has completed, I will update all the accounts. Thereafter, I will give you back the sheet of paper with the information of what decisions your paired opponent has taken as well as payoff from this round to both of you.

Once everyone has been informed, we will go on to the second round.

We will repeat this 10 times. Are there any questions? *[Subjects complete task.]*

Appendix G (cont.)

Decision Form for Task 1

Subject id#_____

The decision you have to take:

- I will give you an initial endowment of Rs 100. This money has been provided by my university.
- You task is to decide how to divide this endowment between a zero-risk, zero-interest savings account and an investment which is risky but potentially profitable.
- You can receive 5 times the amount that you choose to invest in the risky prospect with probability one half, or lose the amount invested otherwise.
- So the main decision is to divide your endowment between the risky investment and the non-risky zero profit alternative.
- If this round is chosen for payment, then we will actually flip the coin to see how much each of you earned from this round.

So please make your decision about how much you want to put in the risky investment and how much you want to put in the zero-risk zero-interest account.

My decision is:

Risky investment	**Non-risky investment**

Appendix G (cont.)

Decision Form for Task 2

Subject id#_____

Your partner is

- **_____ (male/female)** and
- belongs to the **_____ (high/low) caste.**

- You have to toss a tennis ball into a bucket placed 10 feet away.
- Please throw the ball **underhand**.
- You have to do this 10 times.

But before we start, I have to ask you to make a decision: I will give you a choice.

- You have to choose between
  - (a) Rs 20 per successful shot, regardless of the performance of your paired opponent or,
  - (b) Rs 4X20=Rs 80 per successful shot if you outperform your opponent.
- If you choose the second option and score the same as the other participant, you will receive Rs 20 per shot.

So now please make your decision about how you want to play this round.

I want to choose:

Option 1 (NOT compete)	Option 2 (Compete)

The task:

Subject # _____ has tossed _____ tennis balls into the bucket.

Please go and sit in the first room.

Appendix G (cont.)

Decision Sheet for Task 3 – Round 1 – you are Person A

Subject id#_____

Please look at the payoff table and the roadmap and then choose.

UNDERLINE any one of the 3 options below

LONG route with gate CLOSED
LONG route with gate OPEN
SHORT route with gate OPEN

RESULTS from Round 1 (<u>to be filled in by the experimenter</u>)

	Person B's choice	**Your payoff**	**Person B's payoff**
Round 1			

Appendix G (cont.)

Decision Sheet for Task 3 – Round 1 – you are Person B

Subject id#_____

Please look at the payoff table and the roadmap and then choose.

UNDERLINE any one of the 3 options below

LONG route with gate CLOSED
LONG route with gate OPEN
SHORT route with gate OPEN

RESULTS from Round 1 (<u>to be filled in by the experimenter</u>)

	Person B's choice	**Your payoff**	**Person B's payoff**
Round 1			

Appendix H: Discrimination by Caste and Gender in India for Chapter II

The forty-second Amendment to the Constitution of India explicitly promotes social equality and implies the absence of discrimination on the grounds of caste, color, creed, sex, religion, or language. Yet as late as in 2008, an expert group established by the Ministry of Minority Affairs, Government of India clearly acknowledged that ”Discriminatory practices reportedly continue to exist in education, employment, housing and other areas where women, *dalits*, tribals, disabled persons, minorities and other “deprived sections” are sometimes denied of equal opportunity.” (Dalits belong to India’s "untouchable" or the lowest castes).[52] There was a dire need for an Equal Opportunity Commission in India[53] since there is no effective method to address the rampant discrimination and denial of equal opportunity to disadvantaged sections. The report proposed a draft bill in 2008 to promote “Equality of Opportunity” to all sections of people particularly the deprived groups and establish the Equal Opportunity Commissions to effectively intervene in policy development, program implementation and public administration on behalf of the deprived and discriminated. However no concrete action has been undertaken by the Government of India as of today.[54]

[52] This report conceded “Though Equality is a foundational value of our Republic; stark inequalities mark our present social reality and prospects for the future generations. Inter-group inequalities often coincide with boundaries of communities and are becoming more visible than before. Hence there is an urgent need to address these inequalities and supplement the existing policies of reservations by fine tuning the definition of the beneficiaries, expanding the range of modalities and evolving a forward looking and integral approach to affirmative action. That is why we need an Equal Opportunity Commission.”

[53] The report can be downloaded from the website of the Ministry of Minority Affairs, Government of India: http://www.minorityaffairs.gov.in/sites/upload_files/moma/files/pdfs/eoc_wwh.pdf

[54] A report in June 2012 states that the current political party has revived the debate on whether they will actually set up the EOC – there have been fears in the past that setting up the EOC would make National Commission for Minorities, (which tackles cases of violation of rights) redundant.
http://www.telegraphindia.com/1120608/jsp/nation/story_15584314.jsp#.UH7iW7JlR4c

Appendix H (cont.)

A. Discrimination by Caste

No collection of wealth must be made by a Sudra, even though he be able (to do it); for a Sudra who has acquired wealth, gives pain to Brahmanas.

From *The Laws of Manu* (1964) ch. X, verse 129, p. 430; reprinted in (Deshpande, 2001)

Since ancient times, Hindu society was divided into five distinct hereditary and mutually exclusive *Jatis* or castes, namely, the Brahmins (priests) at the top, followed by the Kshatriyas (warriors), the Vaisyas (traders and merchants), the Sudras (conducting basic jobs for everyone else) and the "untouchables" (or Dalits), engaged in the most appalling menial jobs[55]. After Independence from the British in 1947, the Constituent Assembly of India undertook steps to improve the condition of the low castes, including the "reservation" status for the Scheduled Castes (SC) and Scheduled Tribes (ST)[56]. However this did not mean an eradication of the caste system. In his presidential address to the Indian National Congress in 1957, noted Indian anthropologist M. N. Srinivas lamented that 'the manner in which the British transferred political power to the Indians enabled caste to assume political functions. In independent India, the provision of constitutional safeguards to the backward sections of the population, especially the Scheduled Castes and Tribes, has given a new lease of life to caste."(From Caste in Modern India, (Srinivas, 1957)).

[55] Historically, a village economy had a specific caste hierarchy where the upper caste individuals were rich land owners, who hired the low caste individuals to work on their lands. This usually translated to exploitation of the low castes by the high caste individuals ((Beteille, 1965); (Srinivas, 1980); (Anderson, 2005); (Bose, 1958) and (Srinivas, 1957)).

[56] This meant favorable treatment of the low castes in the form of quotas in education and public sector jobs. Refer to The Constitution (Scheduled Castes) Order, 1950; and The Constitution (Scheduled Tribes) Order, 1950. (http://lawmin.nic.in/ld/subord/rule3a.htm; http://lawmin.nic.in/ld/subord/rule9a.htm)

Appendix H (cont.)

According to UNICEF and Human Rights Watch, caste discrimination affects an estimated 250 million people worldwide, majority of whom are located in India.[57] Deshpande (2001) identified and aggregated five indicators- education, occupation, landholding, assets and livestock and constructed a Caste Development/Deprivation Index and found evidence of "inter caste disparity within the more general problem of poverty". (Borooah, 2005) analyzed inequality and poverty in India within the context of caste-based discrimination and showed that at least one-third of the average income differences were due to the "unequal treatment" of the low castes. (Hoff & Pandey, 2006) found public revelation of caste led to a 20 percent decline in performance among low caste subjects. (Ito, 2009) found evidence of discrimination against backward classes with regard to regular employment in rural North India. (Aiyar, 2012) provided examples of cases of the improvement in the status of the Dalits after twenty years of reforms in India yet acknowledged at the end that they are still at the very bottom of the economic ladder.

B. Discrimination by Gender

In the late 1980s, Amartya Sen coined the term "missing women" for the estimated 100 million women in the world who are not alive due to family neglect and discrimination[58]. Out of these women, 50 million are estimated to be missing from India alone. The current sex ratio in India bears testimony to this disturbing fact. The Census of India, 2011 finds that there are approximately 940 females per 1000 males; an improvement from the 2001 sex ratio (933

[57] http://www.hrw.org/news/2001/08/29/global-caste-discrimination. A 2007 United Nations anti-racism committee report pointed out to two distinct causes: "the "untouchability" and discrimination upper-caste community members practice on a daily basis and the desire of upper-caste community members to protect their own entrenched status by preventing Dalit development and the fulfillment of Dalits' rights".
(http://www2.ohchr.org/english/bodies/cerd/docs/ngos/chrgj-hrw.pdf)
[58] http://ucatlas.ucsc.edu/gender/Sen100M.html, 1990.

females per 1000 males); yet the sex ratio among children in the 0-6 age category has dwindled to 914 female children per 1000 males (against 927 in 2001). While the sex ratio in the overall category shows an improvement, the sex ratio among 0-6 aged children in the urban areas has declined to 902 in 2011 (against 906 in 2001) while the comparative figures for rural India are 919 in 2011 (vs. 934 in 2001).

Earlier studies have examined the phenomena such as the declining sex ratio, differences in education, occupation etc. in India[59]. (Deshpande, 2007) constructed a Gender-Caste Development Index based on data from 1998-99 in order to quantify intergroup disparity based on gender and caste. She concluded that despite improvement over the early 1990s, the material standard of living as well as educational outcomes for women continue to be low, along with significant inter caste disparity as well as regional variation. (Menon & Rodgers, 2009) examined the question of women's age gap in India's manufacturing sector and found that India's increasing openness to trade is actually associated with larger wage gaps in India's concentrated manufacturing industries. (Ramaswami & Mahajan, 2012)examined the effect of variations in female labor supply to agriculture (in part due to cultural restrictions) and variations in male labor supply to agriculture (because of non-farm employment opportunities) on female and male wages and the gap between them, and found evidence that greater female labor supply to agriculture reduces female wages more than male wages and hence affects the female to male agricultural wage ratio adversely.

[59] See for example, (Dreze & Sen, 1995), (Duraisamy & Duraisamy, 1999), (Drèze & Murthi, 2001), (Gandhi Kingdon, 2002), and (Bajpai & Goyal, 2004), (Deshpande, 2007).

Appendix I: Figures and Tables for Chapter III

Table I.1: Risk Control Task

	Option A - BLUE BAG	**Option B – RED BAG**
Task 1	3/10 of Rs 200; 7/10 of Rs 160 (3 green balls & 7 orange balls in a blue bag.)	3/10 of Rs 385; 7/10 of Rs 10 (3 yellow balls & 7 pink balls in a red bag.)
Task 2	4/10 of Rs 200; 6/10 of Rs 160 (4 green balls & 6 orange balls in the blue bag.)	4/10 of Rs 385; 6/10 of Rs 10 (4 yellow balls & 6 pink balls in the red bag.)
Task 3	5/10 of Rs 200; 5/10 of Rs 160 (5 green balls & 5 orange balls in the blue bag.)	5/10 of Rs 385; 5/10 of Rs 10 (5 yellow balls & 5 pink balls in the red bag.)
Task 4	6/10 of Rs 200; 4/10 of Rs 160 (6 green balls & 4 orange balls in the blue bag.)	6/10 of Rs 385; 4/10 of Rs 10 (6 yellow balls & 4 pink balls in the red bag.)
Task 5	7/10 of Rs 200; 3/10 of Rs 160 (7 green balls & 3 orange balls in the blue bag.)	7/10 of Rs 385; 3/10 of Rs 10 (7 yellow balls & 3 pink balls in the red bag.)

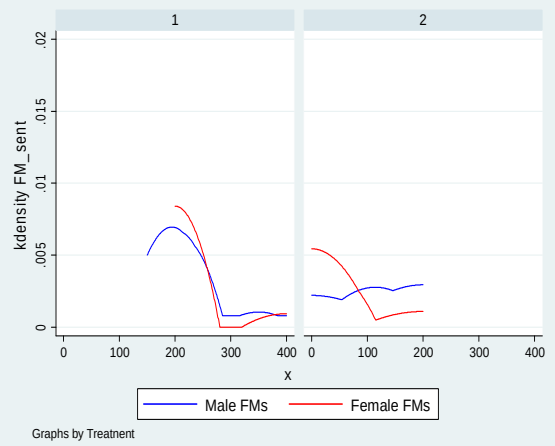
Table I.2: Belief elicitation task

The proposed split is as follows: Rs 0 to your spouse/paired person and Rs 400 to yourself	**Strongly agree / agree /disagree / Strongly disagree**
The proposed split is as follows: Rs 80 to your spouse/paired person and Rs 320 to yourself	**Strongly agree / agree /disagree / Strongly disagree**
The proposed split is as follows: Rs 160 to your spouse/paired person and Rs 280 to yourself	**Strongly agree / agree /disagree / Strongly disagree**
The proposed split is as follows: Rs 320 to your spouse/paired person and Rs 80 to yourself	**Strongly agree / agree /disagree / Strongly disagree**
The proposed split is as follows: Rs 400 to your spouse/paired person and Rs 0 to yourself	**Strongly agree / agree /disagree / Strongly disagree**

Appendix I (cont.)

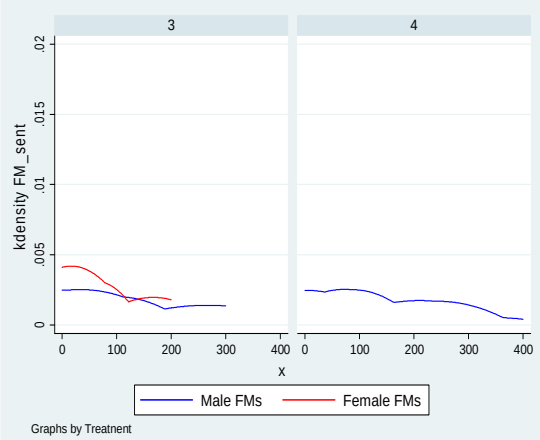
Table I.3: Average Offers made by the FMs across Treatments, segregated by gender (in percentage).				
	Percentage of endowment sent by all FMs (2)	**Percentage of endowment sent by Male Spouses (3)**	**Percentage of endowment sent by Female Spouses (4)**	**Gender Equality test (5)**
T1 - Ultimatum, Spouse info	**55.36%**	**55.68%**	**55%**	**0.926**
T2 - Ultimatum, No Spouse info	**19.23% [0.00**]**	**28.57%**	**8.33%**	**0.159**
T3 - Dictator, Spouse info	**20.31%**	**25%**	**15.63%**	**0.539**
T4 - Dictator, No Spouse info	**15.10% [0.58]**	**27.88%**	**0%**	**0.0126*****
T5 - Dictator, Role choice, Spouse info				
FM kept dictator role for self	**16.81%**	**14.58%**	**20.45%**	**0.523**
Given dictator role by spouse (FM)	**41.25%**	**48.86%**	**31.94%**	**0.399**
T6 - Dictator, Role choice, No spouse info				
FM kept dictator role for self	**4.81% [0.011**]**	**7.50%**	**1.97%**	**0.220**
Given dictator role by FM	**8.33% [0.038**]**	**25%**	**6.25%**	**-**
T7 - Empowerment, Spouse info				
Spouse (FM) gave power to reject	**68.75%**	**74.17%**	**67.50%**	**0.523**
Spouse (FM) did not give power to reject	**4.89%**	**6.25%**	**3.57%**	**0.605**
T8 - Empowerment, No Spouse info				
FM gave power to reject	**50% [0.003***]**	**50%**	**50%**	**-**
FM did not give power to reject	**5.56% [0.812]**	**11.76%**	**0%**	**0.0148*****

Figures within square brackets in column (2) indicate the p-value from the test of equality between each pair of games across the eight treatments.



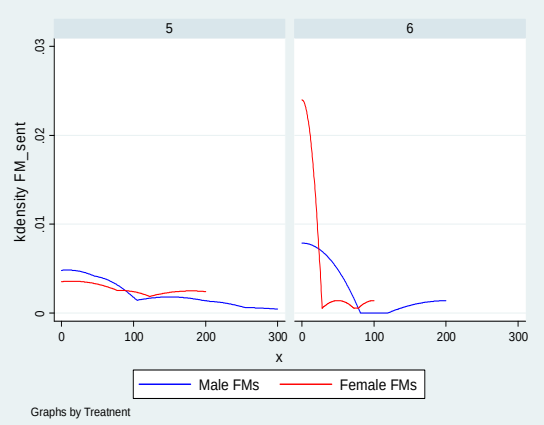
Figures I.1: Average offers by FMs in Ultimatum Games

Left Panel: with Spouse Info;
Right Panel: No Spouse info



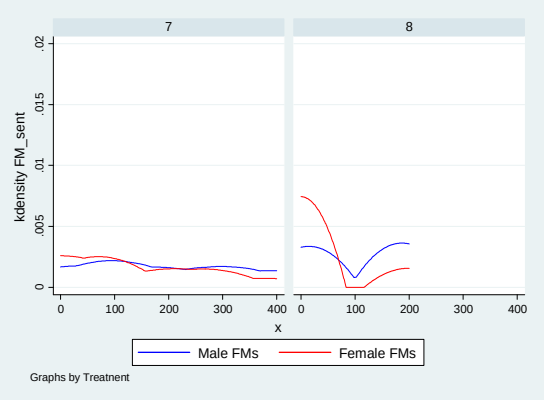
Figures I.2: Average offers by FMs in Dictator Games

Left Panel: with Spouse Info;
Right Panel: No Spouse info



Figures I.3: Average offers by FMs in Dictator Games with Role Choice

Left Panel: with Spouse Info;
Right Panel: No Spouse info



Figures I.4: Average offers by FMs in Empowerment Games

Left Panel: with Spouse Info;
Right Panel: No Spouse info

Appendix I (cont.)

Table I.4: Regressions to compare Subject Behavior across All Games With and Without Spouse Information, segregated by Gender

	Dependent Variable - how much was sent by the FMs?					
	Full Sample (2)	**Full Sample (3)**	**Male Spouses (4)**	**Female Spouses (5)**	**Male Spouses (6)**	**Female Spouses (7)**
Games With Spouse Information						
Ultimatum Game, Spouse Info	119.2314		116.2006	146.3168		
	[0.003]***		[0.016]**	[0.000]***		
Dictator With Role Choice, Spouse Info	-7.7389		-20.1478	17.6025		
	[0.844]		[0.663]	[0.611]		
Empowerment Game, Spouse Info	72.3204		132.9569	35.3723		
	[0.016]**		[0.002]***	[0.434]		
Games Without Spouse Information						
Ultimatum Game, No Spouse Info		8.412			12.3291	13.9413
		[0.754]			[0.676]	[0.648]
Dictator With Role Choice, No Spouse Info		-47.9827			-40.5351	-38.1045
		[0.190]			[0.270]	[0.276]
Empowerment Game, No Spouse Info		7.0785			37.3831	-18.6905
		[0.827]			[0.338]	[0.645]
All Demographics						
Male	49.9636	62.4071				
	[0.108]	[0.009]***				
Education Level						
Some school education	-31.591	69.4526	-1.3276	-28.6516	66.724	58.8526
	[0.316]	[0.111]	[0.962]	[0.352]	[0.194]	[0.248]
College educated	-151.6538	97.9683	-104.0634	-133.281	82.8133	0.000
	[0.002]***	[0.009]***	[0.032]**	[0.026]**	[0.037]**	[0.00]

Appendix I (cont.)

Table I.4: Regressions to compare Subject Behavior across All Games With and Without Spouse Information, segregated by Gender (cont.)

Family details						
Has one of more daughters	-0.5011	-29.0829	-12.1719	0.3309	-32.6297	-34.2086
	[0.986]	[0.067]*	[0.457]	[0.991]	[0.048]**	[0.025]**
Has one of more sons	-35.0773	-0.3464	-19.3263	-35.7535	-14.1919	-4.2683
	[0.124]	[0.985]	[0.231]	[0.279]	[0.547]	[0.822]
Lives in a joint family (with in-laws)	21.759	-36.6125	2.7465	34.9605	-39.1646	-17.4689
	[0.118]	[0.052]*	[0.877]	[0.192]	[0.245]	[0.170]
Years Married						
Have been married for 10 years or less	-12.7031	-25.2591	-17.1022	20.2547	-8.5427	-8.3416
	[0.777]	[0.318]	[0.568]	[0.531]	[0.788]	[0.785]
Have been married for 25 years or more	100.1508	-7.1304	43.478	74.8363	-15.2544	-1.9792
	[0.106]	[0.823]	[0.235]	[0.316]	[0.650]	[0.954]
Age bracket						
Age 25 or less	-26.5191	18.4326	61.0728	-45.0278	-11.4673	-15.1635
	[0.678]	[0.445]	[0.266]	[0.472]	[0.656]	[0.483]
Age 40 or more	-70.0272	2.1721	-53.1865	-38.9991	18.5955	4.5252
	[0.057]*	[0.905]	[0.040]**	[0.178]	[0.470]	[0.888]
Caste and Religion Details						
Hindu, Low Caste	28.2764	5.5661	17.2085	28.2356	-19.5742	-3.8589
	[0.245]	[0.790]	[0.556]	[0.388]	[0.325]	[0.903]
Muslim	28.1175	34.3828	-25.791	66.6654	31.7067	31.382
	[0.527]	[0.140]	[0.663]	[0.179]	[0.212]	[0.141]
Constant	75.1665	60.3813	119.1746	54.084	109.9961	87.3191
	[0.220]	[0.137]	[0.047]**	[0.400]	[0.058]*	[0.093]*
Observations	**115**	**126**	**91**	**90**	**103**	**99**
R-squared	**0.267**	**0.32**	**0.332**	**0.334**	**0.3**	**0.165**

Robust p values in brackets, SEs are clustered at village level; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix I (cont.)

Table I.5: Regressions to compare Subject Behavior across Ultimatum and Dictator Games, With and Without Spouse Information.

Dependent Variable - how much was sent by the FMs?

	Ultimatum (omitted games without Spouse info)			Dictator (omitted games without Spouse info)		
	Full Sample (2)	**Male Spouses (3)**	**Female Spouses (4)**	**Full Sample (5)**	**Male Spouses (6)**	**Female Spouses (7)**
Game Form						
Ultimatum, Spouse Info	197.2725	188.6394	191.2944			
	[0.016]**	[0.111]	[0.007]***			
Dictator, Spouse Info				0.827	-40.8463	102.9808
				[0.985]	[0.631]	[0.040]**
All Demographics						
Male	-17.379			93.98		
	[0.342]			[0.115]		
Education Level						
No Education	-66.6365	-57.805	-18.3257	-84.7685	-102.5214	19.8114
	[0.522]	[0.751]	[0.751]	[0.355]	[0.286]	[0.507]
Family details						
Has one of more daughters	5.7778	14.4659	-3.9548	-3.8187	0.536	24.3283
	[0.429]	[0.553]	[0.734]	[0.851]	[0.992]	[0.409]
Has one of more sons	3.9315	20.0343	-40.8182	32.5838	100.9601	-18.8646
	[0.951]	[0.814]	[0.038]**	[0.262]	[0.149]	[0.337]
Lives in a joint family (with in-laws)	13.1345	13.0103	22.0774	-16.3236	12.0669	11.3285
	[0.493]	[0.149]	[0.525]	[0.220]	[0.573]	[0.523]
Years Married						
Have been married for 10 years or less	54.6596	29.4349	45.0172	-12.2956	21.1907	-28.8055
	[0.115]	[0.295]	[0.222]	[0.655]	[0.775]	[0.312]
Have been married for 25 years or more	-76.7053	-98.6151	21.0786	70.1344	87.0396	14.1558
	[0.505]	[0.595]	[0.181]	[0.540]	[0.551]	[0.872]
Age bracket						
Age 25 or less	-56.0156	-43.2402	-29.9532	98.8577	155.8821	75.2978
	[0.143]	[0.579]	[0.705]	[0.021]**	[0.172]	[0.415]
Age 40 or more	79.033	55.2693	9.8887	-2.8488	16.8202	-30.8736
	[0.460]	[0.499]	[0.741]	[0.984]	[0.891]	[0.619]
Caste and Religion						
Hindu, Low Caste	5.7862	10.7001	36.7697	-13.6424	-62.154	-54.0046
	[0.935]	[0.882]	[0.489]	[0.606]	[0.107]	[0.482]
Muslim	155.3131	159.7143	131.4103	28.0847	27.8443	-28.4434
	[0.093]*	[0.295]	[0.044]**	[0.465]	[0.377]	[0.453]
Observations	**34**	**28**	**27**	**40**	**29**	**27**

Robust p values in brackets, SEs are clustered at village level; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix I (cont.)

Table I.6: Regressions to compare Subject Behavior across Dictator with Role Choice Games, With and Without Spouse Information.

	FM chose to remain as Dictator (2)	Amount offered by FMs (who chose to remain dictators) (3)	Amount offered by SMs (who became dictators) (4)
Game Form			
Dictator with Role Choice Game, with Spouse Info	0.3966	69.1697	132.9748
	[0.372]	[0.137]	[0.003]***
All Demographics			
Male	-0.0074	28.6873	74.3446
	[0.987]	[0.238]	[0.205]
Education Level			
Some school education	-0.2424	40.5359	76.9888
	[0.579]	[0.265]	[0.653]
College educated	0.1342	-106.6641	0.000
	[0.917]	[0.142]	[0.000]
Family details			
Has one of more daughters	-0.0172	-11.1462	58.9572
	[0.957]	[0.552]	[0.295]
Has one of more sons	-0.1673	1.3101	-83.4647
	[0.418]	[0.924]	[0.295]
Lives in a joint family (with in-laws)	-0.5969	3.7664	57.7894
	[0.172]	[0.840]	[0.184]
Years Married			
Have been married for 10 years or less	0.4813	-23.3998	21.4723
	[0.311]	[0.617]	[0.797]
Have been married for 25 years or more	0.5467	15.7187	-32.0142
	[0.239]	[0.768]	[0.698]
Age bracket			
Age 25 or less	-0.5688	26.8232	87.3808
	[0.015]**	[0.581]	[0.400]
Age 40 or more	0.3534	-57.7113	14.1136
	[0.216]	[0.246]	[0.877]
Caste and Religion Details			
Hindu, Low Caste	-0.8622	19.9534	-106.0469
	[0.020]**	[0.494]	[0.290]
Muslim	-0.8062	34.1844	70.4633
	[0.077]*	[0.262]	[0.178]
Observations	**97**	**68**	**29**

Robust p values in brackets, SEs are clustered at village level; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix I (cont.)

Table I.7: Regressions to compare Subject Behavior across Empowerment Games, With and Without Spouse Information

	FM chose to Empower SM (2)	Amount offered- Ultimatum Game played (3)	Amount offered- Dictator Game played (4)
Game Form			
Empowerment Game, with Spouse Info	1.3391	129.9199	-24.4031
	[0.001]***	[0.106]	[0.286]
All Demographics			
Male	0.0258	30.0286	35.6848
	[0.933]	[0.324]	[0.136]
Education Level			
Some school education	12.4082	0.00	-15.5232
	[0.000]***	[0.00]	[0.646]
College educated	6.8878	67.2031	-13.9543
	[0.000]***	[0.379]	[0.695]
Family details			
Has one of more daughters	-0.3958	96.3409	-0.4578
	[0.014]**	[0.002]***	[0.982]
Has one of more sons	-0.6523	85.209	3.1378
	[0.040]**	[0.152]	[0.795]
Lives in a joint family (with in-laws)	-0.7236	21.9871	1.7962
	[0.009]***	[0.438]	[0.915]
Years Married			
Have been married for 10 years or less	-0.1452	-38.4468	13.2276
	[0.755]	[0.405]	[0.759]
Have been married for 25 years or more	-0.0255	-8.4932	-12.7701
	[0.977]	[0.910]	[0.513]
Age bracket			
Age 25 or less	-12.41	-75.4312	-9.5103
	[0.000]***	[0.282]	[0.826]
Age 40 or more	0.4876	-71.6728	-17.4014
	[0.138]	[0.059]*	[0.509]
Caste and Religion Details			
Hindu, Low Caste	0.8434	52.6904	0.5685
	[0.005]***	[0.375]	[0.971]
Muslim	-0.1342	34.0191	32.8439
	[0.764]	[0.740]	[0.357]
Observations	**99**	**39**	**60**

Robust p values in brackets, SEs are clustered at village level; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix I (cont.)

Table I.8: Additional Regressions to compare Subject Behavior across Empowerment Games, With and Without Spouse Information (includes number of safe choices from the risk game)

	FM chose to Empower SM (played Ultimatum Game) (2)	Amount offered-Ultimatum Game played (3)	Amount offered-Dictator Game played (4)
Game Form			
Empowerment Game, with Spouse Info	1.5083	112.0894	-25.8286
	[0.000]***	[0.205]	[0.230]
All Demographics			
Male	0.0539	30.3041	34.6301
	[0.858]	[0.299]	[0.150]
Education Level			
Some school education	12.4787	0.00	-21.0028
	[0.000]***	[0.00]	[0.605]
College educated	7.0395	52.8464	-18.9707
	[0.000]***	[0.519]	[0.656]
Family details			
Has one of more daughters	-0.3278	97.5645	-5.4633
	[0.035]**	[0.005]***	[0.844]
Has one of more sons	-0.3999	60.0214	-4.2796
	[0.269]	[0.411]	[0.793]
Lives in a joint family (with in-laws)	-0.7274	31.8108	2.2207
	[0.004]***	[0.129]	[0.904]
Years Married			
Have been married for 10 years or less	-0.0748	-36.1532	9.3824
	[0.880]	[0.496]	[0.817]
Have been married for 25 years or more	-0.2081	26.8096	-12.5616
	[0.808]	[0.802]	[0.507]
Age bracket			
Age 25 or less	-12.4434	-68.2468	-10.9627
	[0.000]***	[0.365]	[0.798]
Age 40 or more	0.5326	-74.3842	-19.1763
	[0.093]*	[0.095]*	[0.474]
Caste and Religion Details			
Hindu, Low Caste	1.0088	40.6751	-2.1833
	[0.000]***	[0.338]	[0.895]
Muslim	-0.1958	24.1488	35.815
	[0.659]	[0.787]	[0.362]
Risk Attitudes			
Number of Safe Choices	-0.1463	12.3406	4.1719
	[0.033]**	[0.231]	[0.282]
Observations	**99**	**39**	**60**

Robust p values in brackets, SEs are clustered at village level; * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix J: Additional Figures for Chapter III

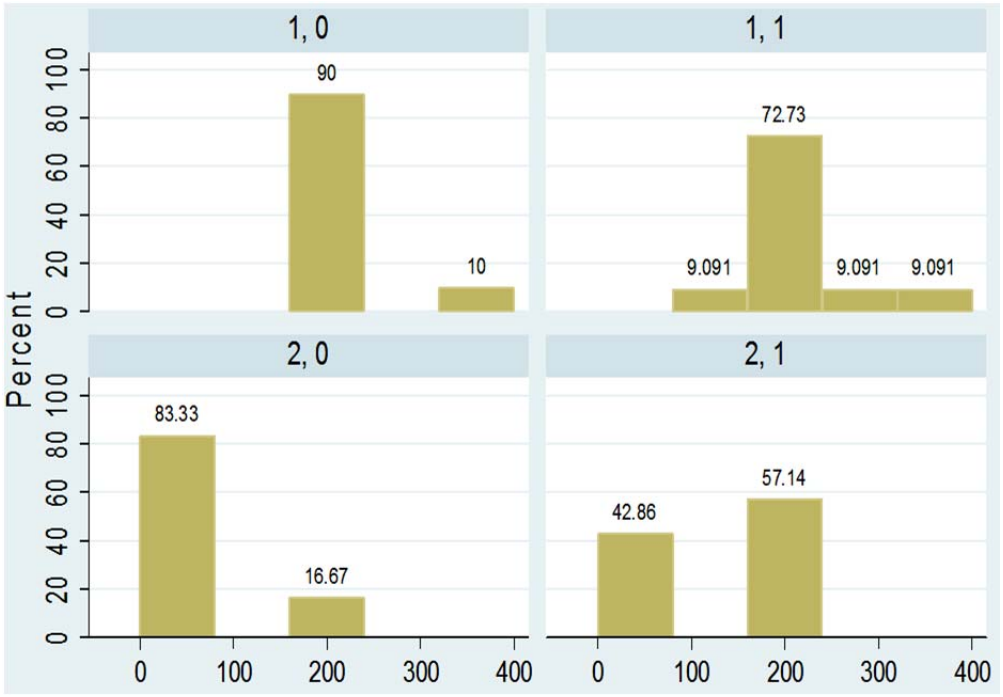


Figure J.1: Histograms to examine Distribution of offers by Treatment & Gender across treatments 1 and 2: Ultimatum Game: With Spouse info and decisions by Female FMs (1, 0-Top Left panel), Ultimatum Game: With Spouse info and decisions by Male FMs (1, 1-Top Right panel), Ultimatum Game: Without Spouse info and decisions by Female FMs (2, 0-Bottom Left panel) and Ultimatum Game: Without Spouse info and decisions by Male FMs (2, 1- Bottom Right panel)

[The top left figure indicates the behavior of female FMs when they *know* that they are playing against their husbands in the Ultimatum Game. The top right figure indicates the behavior of male FMs when they *know* that they are playing against their wives in the Ultimatum Game. The bottom left figure indicates the behavior of female FMs when they *do not know* that they are playing against their husbands in the Ultimatum Game. The bottom right figure indicates the behavior of male FMs when they *do not know* that they are playing against their wives in the Ultimatum Game.

Appendix J (cont.)

Figure J.2: : Histograms to examine Distribution of offers by Treatment & Gender across treatments 3 and 4: Dictator Game: With Spouse info and decisions by Female FMs (3 0-Top Left panel); Dictator Game: With Spouse info and decisions by Male FMs (3, 1-Top Right panel); Dictator Game: Without Spouse info and decisions by Female FMs (4, 0-Bottom Left panel) and Dictator Game: Without Spouse info and decisions by Male FMs (4, 1- Bottom Right panel)

[The top left figure indicates the behavior of female FMs when they *know* that they are playing against their husbands in the Dictator Game. The top right figure indicates the behavior of male FMs when they *know* that they are playing against their wives in the Dictator Game. The bottom left figure indicates the behavior of female FMs when they *do not know* that they are playing against their husbands in the Dictator Game. The bottom right figure indicates the behavior of male FMs when they *do not know* that they are playing against their wives in the Dictator Game.]

Appendix J (cont.)

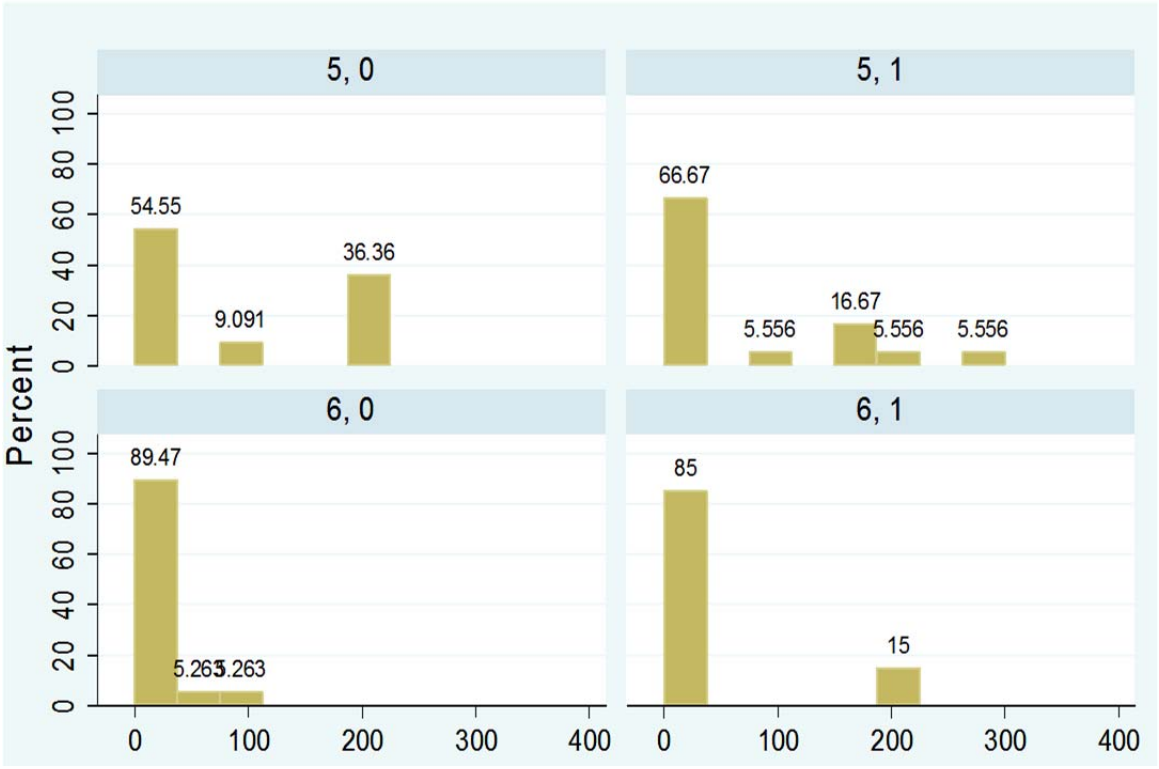


Figure J.3: : Histograms to examine Distribution of offers by Treatment & Gender across treatments 5 and 6: Dictator Game with Role Choice: With Spouse info and decisions by Female FMs (5, 0-Top Left panel); Dictator Game with Role Choice: With Spouse info and decisions by Male FMs (5, 1-Top Right panel); Dictator Game with Role Choice: Without Spouse info and decisions by Female FMs (6, 0-Bottom Left panel) and Dictator Game with Role Choice: Without Spouse info and decisions by Male FMs (6, 1- Bottom Right panel)

[The top left figure indicates the behavior of female FMs when they *know* that they are playing against their husbands in the Dictator Game with role choice. The top right figure indicates the behavior of male FMs when they *know* that they are playing against their wives in the Dictator Game with role choice. The bottom left figure indicates the behavior of female FMs when they *do not know* that they are playing against their husbands in the Dictator Game with role choice. The bottom right figure indicates the behavior of male FMs when they *do not know* that they are playing against their wives in the Dictator Game with role choice.]

Appendix J (cont.)

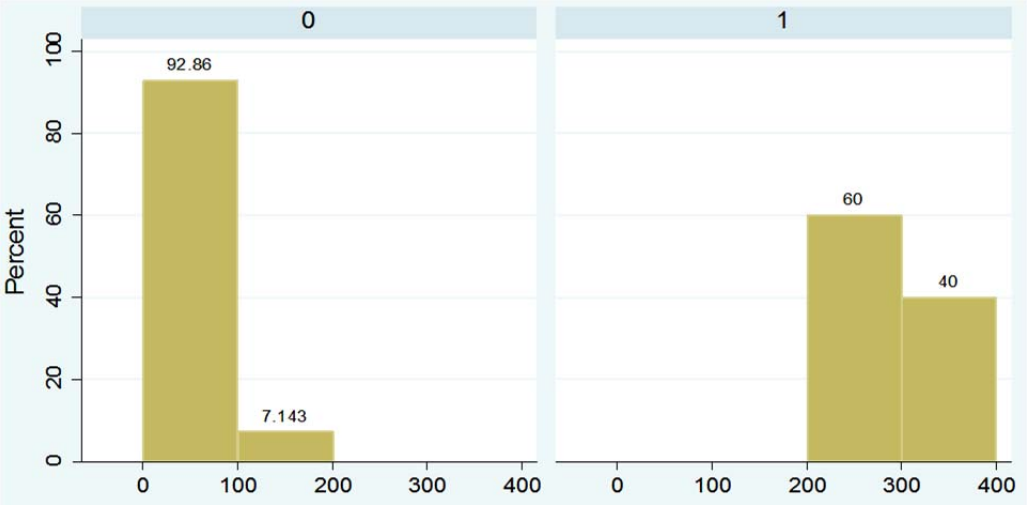


Figure J.4: Histograms to examine Distribution of offers in Treatment 7 (Empowerment Game) by Female FMs with spouse info:

When they do not empower their husbands (0-left panel) and when they empower their husbands (1-right panel)

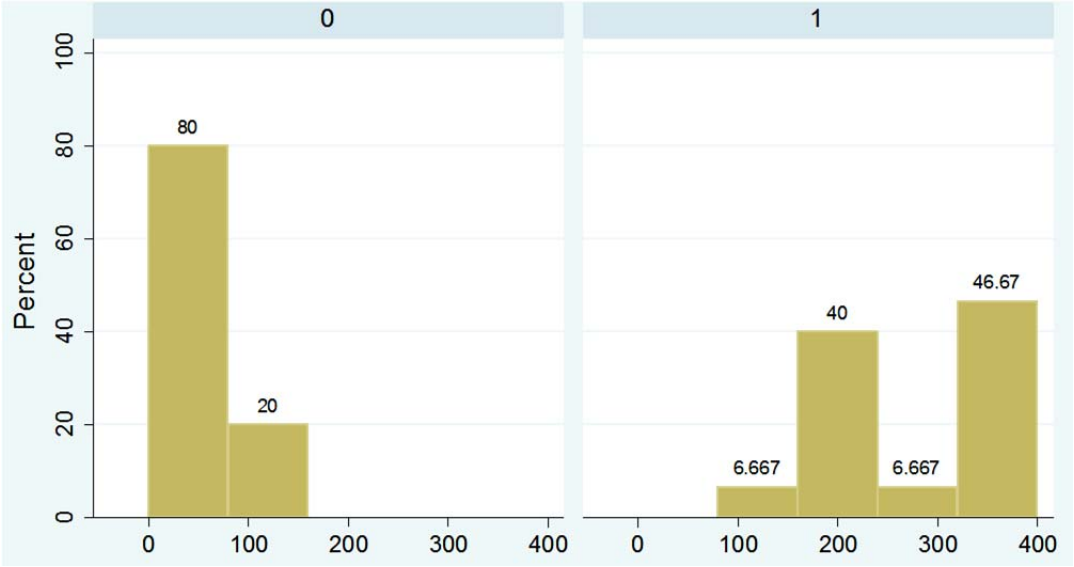


Figure J.5: Histograms to examine Distribution of offers in Treatment 7 (Empowerment Game) by Male FMs with spouse info:

When they do not empower their wives (0-left panel) and when they empower their wives (1-right panel)

Appendix J (cont.)

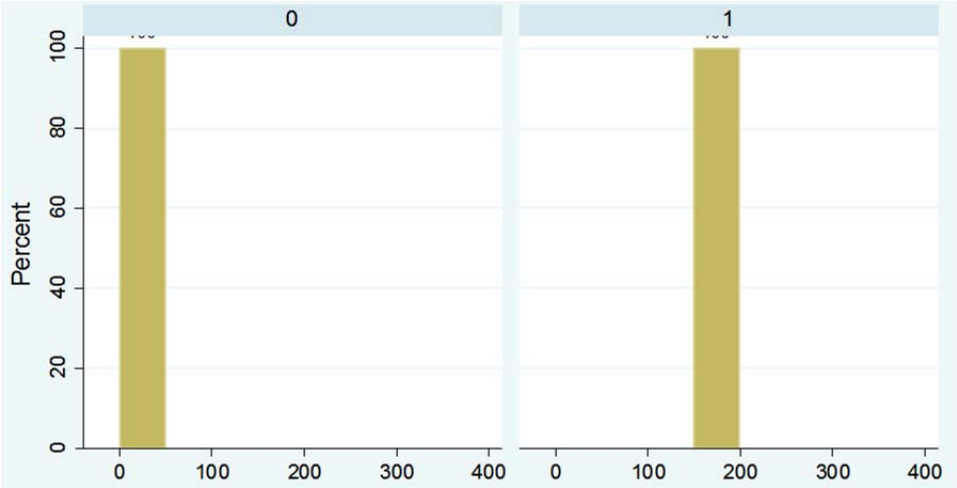


Figure J.6: Histograms to examine Distribution of offers in Treatment 8 Empowerment Game) by Female FMs with no spouse info:
When they do not empower the SMs (0-left panel) and when they empower the SMs (1-right panel)

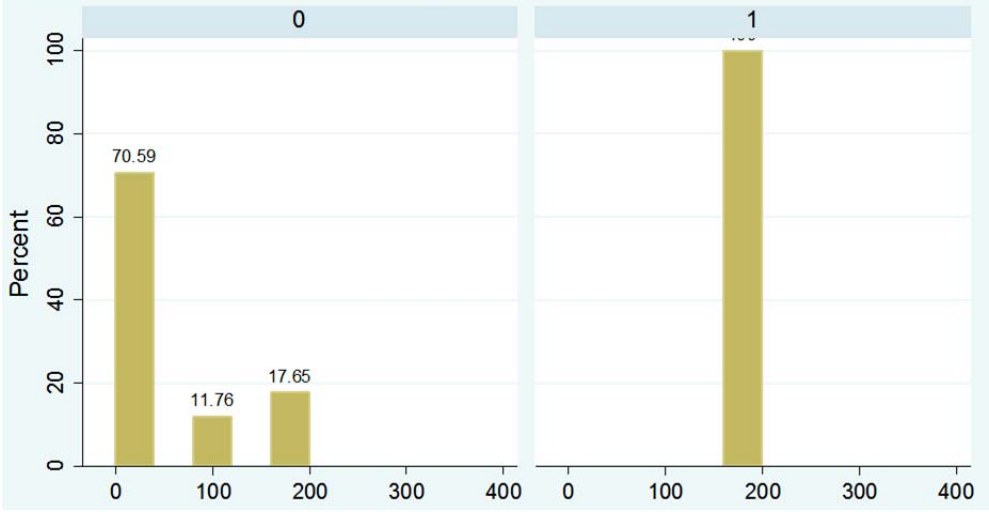


Figure J.7: Histograms to examine Distribution of offers in Treatment 8 Empowerment Game) by Male FMs with no spouse info:
When they do not empower the SMs (0-left panel) and when they empower the SMs (1-right panel)

Appendix J (cont.)

Figures J (1-7) show the average offers made by the male and female FMs across all 8 treatments. Figure J.1 considers the average offers in the Ultimatum Game when male and female FMs are given the information that their paired partner is their spouse (Treatment 1) and when they are not provided the spouse information (Treatment 2). The top left panel indicates the behavior of female FMs when they *know* that they are playing against their husbands in the Ultimatum Game. The top right panel indicates the behavior of male FMs when they *know* that they are playing against their wives in the Ultimatum Game. When female FMs know that they are playing with their husbands, 90% offer Rs 200 while 10% offer Rs 400. When male FMs know that they are playing with their wives, 72.73% offer Rs 200, 9.09% offer Rs 150, 9% offer Rs 250 and another 9% offer Rs 300. The bottom left panel indicates the behavior of female FMs when they *do not know* that they are playing against their husbands in the Ultimatum Game. The bottom right panel indicates the behavior of male FMs when they *do not know* that they are playing against their wives in the Ultimatum Game. In treatment 2 when female FMs are not aware that they are playing with their husbands, 83.33% send Rs 0, 16.67% send Rs 200. When male FMs are not aware that they are playing with their wives, 43 % send nothing and 57% send Rs 200.

Figure J.2 considers the average offers in the Dictator Game when male and female FMs are given the information that their paired partner is their spouse (Treatment 3) and when they are not provided the spouse information (Treatment 4). The top left panel indicates the behavior of female FMs when they *know* that they are playing against their husbands in the Dictator Game. The top right panel indicates the behavior of male FMs when they *know* that they are

playing against their wives in the Dictator Game. When female FMs know that they are playing with their husbands, 62.5% send Rs 0, 12.5% send Rs 100 and the remaining 25% send Rs 200. When male FMs know that they are playing with their wives, 62.5% send Rs 0, 12.5% send Rs 200 and 25% send Rs 300. The bottom left panel indicates the behavior of female FMs when they *do not know* that they are playing against their husbands in the Dictator Game. The bottom right panel indicates the behavior of male FMs when they *do not know* that they are playing against their wives in the Dictator Game. In treatment 2 when female FMs are not aware that they are playing with their husbands, 100% of these female FMs send nothing. When male FMs are not aware that they are playing with their wives, 53.85% send Rs 0, 30.77% send Rs 150, 8% send Rs 200 and another 8% send Rs 350.

Next we examine the average offers by the male and female FMs who chose to be the dictator in these two treatments. Figure J.3 considers the average offers by the male and female FMs in the Dictator Game with role choice. The top left panel indicates the average offers by the female FMs when they *know* that they are playing against their husbands. The top right panel indicates the average offers by the female FMs when they *know* that they are playing against their wives. When female FMs know that they are playing with their husbands in treatment 5, 55% send nothing, 36% send Rs 200 while 9% send Rs 50. When male FMs know they are playing against their wives, 66.67% send nothing while 17% send Rs 200. The bottom left panel indicates the behavior of female FMs when they *do not know* that they are playing against their husbands in the Dictator Game. The bottom right panel indicates the behavior of male FMs when they *do not know* that they are playing against their wives in the Dictator Game. In treatment 6

when female FMs are not aware that they are playing with their husbands, over 89% send nothing while 5% send Rs 100. When male FMs are not aware that they are playing with their wives, 85% send Rs 0 and 15% send Rs 200.

Figures J.4 and J.5 consider the average offers by the FMs in the empowerment game when male and female FMs are given the information that their paired partner is their spouse (Treatment 7). 42% of the female FMs (10 out of 24 female FMs) choose to empower their husbands while 60% of the male FMs (15 out of 25 male FMs) choose to empower their wives. Among the female FMs who choose not to empower their husbands, 93% send nothing (13 out of the 14 female FMs) while 7% send Rs 200. Among the male FMs who choose not to empower their wives, 80% send nothing (8 out of 10 male FMs) while 20% send Rs 100. Across the same treatment 7, when the female FMs choose to empower their husbands, 60% send Rs 200 while 30% send their whole endowment of Rs 400. Among the male FMs who choose to empower their wives, 47% send their whole endowment of Rs 400, 7% send Rs 150, another 7% send Rs 300 while 40% send Rs 200.

Figures J.6 and J.7 consider the average offers by the FMs in the empowerment game when male and female FMs *are not provided* the information that their paired partner is their spouse (Treatment 8). In this treatment, 17% of the female FMs (4 out of 23 female FMs) choose to empower their paired SMs while 42% of the male FMs (10 out of 24 male FMs) choose to empower the SMs. 100% of the female FMs who choose not to empower their paired SMs send nothing (19 out of the 19 female FMs). Among the male FMs who choose not to empower their wives, 71% send nothing (12 out of 17 male FMs), 12% send Rs 100 while another 18% send Rs

Appendix J (cont.)

200. Across the same treatment 8, when the female FMs choose to empower their paired SMs, all of them send Rs 200 (4 out of 4 female FMs). Among the male FMs who choose to empower their paired SMs, all of them send Rs 200 (10 out of 10 male FMs).

Appendix K: Subject Instructions for Chapter III

Introduction

Welcome. Thank you for agreeing to participate in this experiment.

I will first read to you the Informed Consent Form. You can indicate your willingness to participate by signing/putting your thumb impression on the form.

I will now ask you to provide some information about yourself.

- You full name:
- Your address/village of residence:
- Your religion:
- Your caste:
- Your age;
- Your marital status and whether your spouse is present today (if not, please bring your spouse otherwise we cannot let you participate)
- Your education level:
- Your current occupation:
- Your voter id/ driving license no. /Ration card number/School leaving certificate number

Thank you very much for providing this information. Please go sit in the room.

Treatments 1 and 2

General Instructions for Treatments 1 and 2 (when all subjects have been seated) –

- No Talking Allowed. Now that the experiment has begun, we ask that you do not talk or communicate any longer with each other.
- **Please switch off your mobile phones.**
- In case there is something that you do not understand, you are kindly requested to raise your hand and ask questions.
- Today, I will ask you to participate in a research study, where you will have a chance to get paid money. This money has been given to me by my university.
- Each person in this room will be matched with 1 other person to form a group. Thus, each group will contain 2 individuals. One person will be Person A, and the other will be Person B.
- A sum of Rs 400 will be provided to one person, Person A.
- Person A must decide **whether to offer all, some or none of Rs 400** to Person B.
- Person B must decide **whether to accept or reject** the Person A's offer.
- If the Person B accepts the offer, then the Person B gets a payoff equal to the offer and the Person A gets a payoff equal to Rs 400 minus the offer. In addition each person will also get the show up fee (Rs 50).
- If the Person B rejects the offer, then both Person A and Person B get only the show up fee (Rs 50).

Appendix K (cont.)

- The amounts can be sent in increments of Rs 50. So, the Person A can choose to send either Rs 0, 50, 100, 150,…, 400 to the Person B.
- So what you get paid today depends on what decision you make as well as what decision the other person makes.
- After everyone has made their decision, I will pay out everyone.
- You will get an amount based on the decisions made today. In addition, everyone will get an extra Rs 50 for showing up to the experiment today on time.
- Here is how we will do this: Once I finish explaining all instructions to you, I will request every one of you to come one by one to the second room to make your decision in private. The individuals designated as Person A will come to the room first and make their decision in private. Afterwards, the Person B individuals will also be called into the room and decide whether to accept or reject the other person's offer. Once my interaction with everyone is over, we will pay out everyone**.**

Appendix K (cont.)

Decision sheet – Treatment 1: Person A

First, I will verify your information and make sure your spouse is waiting in the other room.

You are Person A. The person B is your spouse. Your spouse will get to know that the paired Person A is their spouse.

Here is Rs 400. This is YOUR money.

Also - whatever amount you choose to send today will be reported to them. They will get to know that you, their spouse have sent them Rs ____.

Thereafter they will decide to accept or reject the offer.

- Suppose you offer an amount of Rupees to your spouse. This amount can be anything from 0, 50, 100, …400.
- If they accept, then you get Rs (400-the amount of Rupees offered) and they get the amount of Rupees you have offered them. Each of you will also get an additional Rs 50.
- If they reject, each of you get Rs 50 only.

Please think carefully and circle your decision in this sheet.

0 50 100 150 200 250 300 350 400

So you are giving your spouse Rs _____

So, if your spouse accepts the offer, you will get Rs (400 - _____ +50) =Rs ____ and your spouse gets Rs (___+50) = Rs _____.

But, if your spouse rejects the offer, you will each get Rs 50.

Please go sit in the other room.

Appendix K (cont.)

Decision sheet – Treatment 1: Person B

First, I will verify your information and make sure your spouse is waiting in the other room.

You are Person B. Person A is your spouse.

They were given Rs 400. They chose to send you Rs _____ today.

You now have one decision to make

- *Accept the offer*: You can accept the offer – if you accept, each of you gets an amount of money according to the division proposed by your spouse.
    - *So, you get Rs (____+50)=Rs___, while your spouse gets Rs(400-__+50)=Rs__*
- *Reject the offer*: You can also choose to reject the offer. In that case, each of you will get Rs 50.

What is your decision? Please <u>circle your choice</u>:

ACCEPT **REJECT**

ACCEPT: You have earned Rs (_____+50) =Rs _____.

Your spouse gets Rs _____

REJECT: You get Rs 50; your spouse gets Rs 50.

Appendix K (cont.)

Decision sheet – Treatment 2: Person A

First, I will verify your information.

You are Person A.

Here is Rs 400. This is YOUR money.

The person B will NOT know your identity. They will get to know that their paired Person A has sent them Rs ____.

Thereafter they will decide to accept or reject the offer.

- Suppose you offer an amount of Rupees to your paired person B. This amount can be anything from 0, 50, 100, …400.
- If they accept, then you get Rs (400-the amount of Rupees offered) and they get the amount of Rupees you have offered them. Each of you will also get an additional Rs 50.
- If they reject, each of you get Rs 50 only.

Please think carefully and circle your decision in this sheet.

0 50 100 150 200 250 300

350 400

So you are giving your paired Person B Rs _____

So, if the paired Person B accepts the offer, you will get Rs (400 - _____ +50)

=Rs _____. The person B will get Rs (__+50)=Rs ___

If your paired Person B rejects the offer, you will each get Rs 50.

Please go sit in the other room.

Appendix K (cont.)

Decision sheet – Treatment 2: Person B

First, I will verify your information

You are Person B.

Your paired Person A was given Rs 400. They chose to send you Rs _____ today.

You now have one decision to make

- *Accept the offer*: You can choose to accept – in that case, each of you gets an amount of money according to the division proposed by the Person A.
    - *So, you get Rs (____+50)=Rs___, while your paired person B gets Rs(400-__+50)=Rs__*

- *Reject the offer*: You can also choose to reject-in that case; each of you gets Rs 50.

What is your decision? Please circle a choice:

ACCEPT **REJECT**

ACCEPT: You have earned Rs (_____+50) =Rs _____.

Your paired person A gets Rs _____

REJECT: You get Rs 50.

Your paired person A gets Rs 50.

Appendix K (cont.)

Treatments 3 and 4

General Instructions for Treatments 3 and 4 (when all subjects have been seated) –

- No Talking Allowed. Now that the experiment has begun, we ask that you do not talk or communicate any longer with each other.
- **Please switch off your mobile phones.**
- In case there is something that you do not understand, you are kindly requested to raise your hand and ask questions.
- Today, I will ask you to participate in a research study, where you will have a chance to get paid money. This money has been given to me by my university.
- Each person in this room will be matched with 1 other person to form a group. Thus, each group will contain 2 individuals. One person will be Person A and the other will be Person B.
- A sum of Rs 400 will be provided to Person A. This is Person A's money.
- Person A may choose to share all, some or none of this money between his/herself and the other person (person B).
- The amounts can be sent in increments of Rs 50. So, the Person A can choose to send either Rs 0, 50, 100, 150,…, 400 to the Person B.
- How the division occurs will depend entirely on person A. So Person A has one decision to make.
- Person B has NO decision to make.
- So what you get paid today depends on what decision you make (if you are Person A) or what decision the other person makes (if you are Person B).
- I will pay out everyone at the end. You will get an amount based on the decisions made today. In addition, everyone will get an extra Rs 50 for showing up to the experiment today on time.
- Here is how we will do this: Once I finish explaining all instructions to you, I will request every one of you to come one by one to the second room to make your decision in private. I will call the individuals designated as Person A to the room first to make their decision in private. Afterwards, the Person B individuals will also be called into the room and I will inform them of how much they have earned today. Once my interaction with everyone is over, we will pay out everyone**.**

Appendix K (cont.)

Decision sheet – Treatment 3: Person A

First, I will verify your information and make sure your spouse is waiting in the other room.

You are Person A. The person B is your spouse. Your spouse will get to know that the paired person A is their spouse.

Here is Rs 400. This is YOUR money.

Also - whatever amount you choose to send today will be reported to them. They will get to know that you, their spouse have sent them Rs ____.

- Suppose you offer some amount of Rupees to your spouse. This amount of Rupees can be anything from 0, 50, 100, …400.
- So you will get Rs (400-the amount of Rupees offered) today and they get the amount of Rupees you have offered them.
- Each of you will also get an additional Rs 50.
- But your spouse will have NO decision to make.
- You will now make the decision about how much to send to Person B - your spouse.

Please think carefully and circle your decision in this sheet.

0 50 100 150 200 250

300 350 400

So you are giving your spouse Rs _____. They will get Rs (___+50)=Rs ____

So, you will get Rs (400 - _____ +50) =Rs _____.

Please go sit in the other room.

Appendix K (cont.)

Decision sheet – Treatment 3: Person B

First, I will verify your information and make sure your spouse is waiting in the other room.

You are Person B.

Your paired Person A is your spouse.

They were given Rs 400 and chose to send you Rs _____ today.

So you get Rs (_____+50) =Rs _____

Your spouse received Rs (400-_____+50) =Rs_____today.

You have **NO** decision to make.

Appendix K (cont.)

Decision sheet – Treatment 4: Person A

First, I will verify your information.

You are Person A.

Here is Rs 400. This is YOUR money.

The person B will NOT know your identity. They will just get to know that the paired Person A have sent them Rs ____.

They will get to know whatever amount you choose to send today will be reported to them.

- Suppose you offer some amount of Rupees to your paired person B. This amount of Rupees can be anything from 0, 50, 100, …400.
- So you will get Rs (400-the amount of Rupees offered) today and they get the amount of Rupees you have offered them.
- Each of you will also get an additional Rs 50.
- But your paired person B will have NO decision to make.
- You will now make the decision about how much to send to Person B.

Please think carefully and circle your decision in this sheet.

0 50 100 150 200 250

300 350 400

So you are giving your paired Person B Rs _____

So, you will get Rs (400 - _____ +50) =Rs _____.

Please go sit in the other room.

Appendix K (cont.)

Decision sheet – Treatment 4: Person B

First, I will verify your information

You are Person B.

Your paired Person A was given Rs 400 today and has chosen to send you Rs _____ today.

So you get Rs (_____+50) =Rs _____

Your paired Person A received Rs (400-_____+50)

=Rs_____today.

You do **NOT** have any decision to make.

Appendix K (cont.)

Treatments 5 and 6

General Instructions for Treatments 5 and 6 (when all subjects have been seated) –

- No Talking Allowed. Now that the experiment has begun, we ask that you do not talk or communicate any longer with each other.
- **Please switch off your mobile phones.**
- In case there is something that you do not understand, you are kindly requested to raise your hand and ask questions.
- Today, I will ask you to participate in a research study, where you will have a chance to get paid money. This money has been given to me by my university.
- Each person in this room will be matched with 1 other person to form a group. Thus, each group will contain 2 individuals. One person will be Person A, and the other will be Person B.
- A sum of Rs 400 will be provided to one person. This is THEIR money.
- This person may choose to share all, some or none of this money with the other person.
- How the division occurs will depend entirely on the person making the decision.
- The amounts can be sent in increments of Rs 50. So, the person who makes the decision can choose to send Rs 0, 50, 100, 150,…, 400 to the other person.
- Who will get to decide?
- Either you or the person you are paired with will be asked to make this decision. This will be chosen randomly.
- **You may be given that choice. Or, your paired person may instead be given that choice. In that case, you do not get the choice. But you will still be told the decision the other person has undertaken.** But note - **whoever is made the decision-maker gets to choose - whether or not to give up power to decide to the paired person.**
- So you can either be told:
    - you get to choose: to be the decision-maker or not.
    - the other person received the choice and chose to be the decision-maker.
    - the other person received the choice, and chose to make you the decision-maker.
- Once the roles have been decided, the decision-maker will decide whether or not to send to the other person.
- The amounts can be sent in increments of Rs 50. So, the decision-maker can choose to send either Rs 0, 50, 100, 150,…, 400 to the other person.
- So what you get paid today depends on what decision you make and/or what decision the other person makes.

Appendix K (cont.)

- After everyone has made their decision, I will pay out everyone.
- You will get an amount based on the decisions made today. In addition, everyone will get an extra Rs 50 for showing up to the experiment today on time.
- Here is how we will do this:
- Once I finish explaining all instructions to you, I will request every one of you to come one by one to the second room to make your decision in private. Some individuals chosen randomly will come to the room first and get to choose to be the decision-maker. Afterwards, the rest of the individuals will be called into the room. Once my interaction with everyone is over, we will pay out everyone**.**

Appendix K (cont.)

Decision sheet – Treatment 5: Person A

First, I will verify your information and make sure your spouse is waiting in the other room.

You are Person A. The person B is your spouse. Your spouse will get to know that their paired Person A is their spouse.

You have to choose: you may or may not give up power to decide to your spouse.

If you give up this power to your spouse, then you will not have any decision to make today. Your spouse will make the decision of how to divide Rs 400 between the two of you.

Whatever decision you make **will be reported** to your spouse. So whether you choose to give them the decision-making power or keep it yourself, they will be informed. Also, in the 2nd case, they will get to know the amount you choose to send today.

Here is Rs400. This is YOUR money.

So now please choose: do you want to give the power to your spouse to make the decision?

YES: I give the power to decide to my spouse.

OK, please go and sit in the other room. You do NOT have any further decision to make.

NO: I do NOT give the power to decide to my spouse.

OK, now YOU have to decide whether or not you want to send some money.

Suppose you offer some amount of Rupees to your spouse. This amount of Rupees can be anything from 0, 50, 100, …400. So you will get Rs (400-the amount of Rupees offered) today and they get the amount of Rupees you have offered them. Each of you will also get an additional Rs 50.

Please make the decision about whether or not to send money to your spouse.

0 50 100 150 200 250 300 350 400

So you are giving your spouse Rs _____. So they will get Rs (__+50)=Rs ____

So, you will get Rs (400 - _____ +50) =Rs _____.

Please go sit in the other room.

Appendix K (cont.)

Decision sheet – Treatment 5: Person B

First, I will verify your information and make sure your spouse is waiting in the other room.

You are Person B. Person A is your spouse. He/she was given Rs 400 and could choose to send some of the Rs 400 to you.

They also had the option to give up their right of making the decision (of dividing this money). If they did not give up the power, they also had to choose how to divide Rs 400 between you.

They have chosen to:

- **NOT GIVE you the power.**
- So Person A-your spouse still has the right to divide the money.
- Your spouse has sent you Rs _____ today.
- So today you get Rs (_____+50) =Rs _____; while your spouse gets Rs (400-___+50)=Rs ____
- You do NOT have any decision to make.

They have chosen to:

- **GIVE you the power.**
- Hence now YOU have to decide how to divide the money.
- Here is Rs 400 – this is YOUR money. Now YOU have to decide whether or not you want to send some money.
- Suppose you offer some amount of Rupees to your spouse. This amount of Rupees can be anything from 0, 50, 100, …400.
- So you will get Rs (400-the amount of Rupees offered) today and they get the amount of Rupees you have offered them.
- Each of you will also get an additional Rs 50.

OK, now please make the decision about how much to send to your spouse.

0 50 100 150 200 250 300

350 400

So you are giving your spouse Rs _____. So your spouse will get Rs (__+50)=Rs ___
You will get Rs (400 - _____ +50) =Rs _____.

Please go sit in the other room.

Appendix K (cont.)

Decision sheet – Treatment 6: Person A

First, I will verify your information

You are Person A. You have to choose: you may or may not give up power to decide to paired person B.

If you give up this power to your paired person B, then you will not have any decision to make today. Your paired person B will make the decision of how to divide Rs 400 between the two of you.

Your identity will NOT be revealed to person B. But whatever decision you make **will be reported** to your paired person B. So whether you choose to give them the decision-making power or keep it yourself, they will be informed. Also, in the 2nd case, they will get to know the amount you choose to send today.

Here is Rs 400. This is YOUR money.

So now please choose: do you want to give the power to your paired person B to make the decision?

YES: I give the power to decide to person B.

OK, please go and sit in the other room. You do NOT have any further decision to make.

NO: I do NOT give the power to decide to person B.

OK, now please make the decision about how much money to send to your paired person B.

Suppose you offer some amount of Rupees to paired Person B. This amount of Rupees can be anything from 0, 50, 100, …400. So you will get Rs (400-the amount of Rupees offered) today and they get the amount of Rupees you have offered them. Each of you will get an additional Rs 50.

Please make the decision about whether or not to send money to your paired person B.

0 50 100 150 200 250 300

350 400

So you are giving your paired person B Rs _____. They will get Rs __+50) =Rs_____

So, you will get Rs (400 - _____ +50) =Rs _____.

Please go sit in the other room.

Appendix K (cont.)

Decision sheet – Treatment 6: Person B

First, I will verify your information.

You are Person B. The paired person A was given Rs 400 and could choose to send some of the Rs 400 to you.

They were also given the option to give up their right of making the decision (of dividing this money). If they did not give up the power, they also had to choose how to divide Rs 400 between the two of you.

Person A has chosen to:

- **NOT GIVE you the power.**
- So Person A still has the right to divide the money.
- Person A has sent you Rs _____ today.
- So today you get Rs (_____+50) =Rs _____; while your paired person B gets Rs (400-___+50)=Rs ____
- You do NOT have any decision to make.

Person A has chosen to:

- **GIVE you the power.**
- Hence now YOU have to decide how to divide the money.
- Here is Rs 400 – this is YOUR money. Now YOU have to decide whether or not you want to send some money.
- Suppose you offer some amount of Rupees to your person A. This amount of Rupees can be anything from 0, 50, 100, …400.
- So you will get Rs (400-the amount of Rupees offered) today and they get the amount of Rupees you have offered them. Each of you will get an additional Rs 50.

OK, now please make the decision about how much to send to Person A.

0 50 100 150 200 250 300 350 400

So you are giving your paired Person A Rs _____. So your paired person A will get Rs (__+50) =Rs ___
So, you will get Rs (400 - _____ +50) =Rs _____.

Please go sit in the other room.

Appendix K (cont.)

Treatments 7 and 8

General Instructions for Treatments 7 and 8 (when all subjects have been seated) –

- No Talking Allowed. Now that the experiment has begun, we ask that you do not talk or communicate any longer with each other.
- **Please switch off your mobile phones.**
- In case there is something that you do not understand, you are kindly requested to raise your hand and ask questions.
- Today, I will ask you to participate in a research study, where you will have a chance to get paid money. This money has been given to me by my university.
- Each person in this room will be matched with 1 other person to form a group. Thus, each group will contain 2 individuals. One person will be Person A –and the other will be a Person B.
- A sum of Rs 400 will be provided to one person. This is THEIR money.
- Who gets the money will be chosen randomly.
- This person may choose to share all, some or none of this money with the other person.
- The amounts can be sent in increments of Rs 50. So, the person who makes the decision can choose to send either Rs 0, 50, 100, 150,…, 400 to the other person.
- How the division occurs will depend entirely on the person making the decision.
- This person will have another decision to make:
- They must decide whether or not they would like to empower the paired person to have the right to accept or reject the offer.
    - If the paired person is **not empowered** to accept or reject the offer, then he/she simply keeps whatever amount the decision-maker offers. The decision-maker keeps the rest.
    - If the paired person is **empowered** to accept or reject the offer, then he/she must decide whether to accept or reject the decision-maker's offer.
    - If the offer is accepted, then the payoffs will be as follows:
        - The decision maker gets a payoff equal to Rs (400-__+50)=Rs ____
        - The paired person gets Rs (____+50)=Rs ____
    - If the offer is rejected, then the payoffs will be as follows:
        - The decision maker gets a payoff equal to Rs 50
        - The paired person gets Rs 50.
- After everyone has made his/her decision, I will pay out everyone.
- You will get an amount based on the decisions made today. In addition, everyone will get an extra Rs 50 for showing up to the experiment today on time.
- Here is how we will do this: Once I finish explaining all instructions to you, I will request every one of you to come one by one to the second room to make your decision in private. Some individuals chosen randomly will come to the room first and get to choose to be the decision-maker. Afterwards, the rest of the individuals will be called into the room. Once my interaction with everyone is over, we will pay out everyone**.**

Appendix K (cont.)

Decision sheet – Treatment 7: Person A

First, I will verify your information and make sure your spouse is waiting in the other room.

You are Person A. Your paired person B is your spouse. Your spouse will get to know that her paired person A is her spouse.

Here is Rs 400. This is YOUR money.
You have to make 2 decisions:

- Choose whether you want to give your spouse the power to reject or accept your offer
- You also have to choose how to divide the Rs 400.

Now YOU have to decide whether or not you want to send some money. Suppose you offer some amount of Rupees to your spouse. This amount of Rupees can be anything from 0, 50, 100, …400.
Your spouse will be informed about the offer. If you empower them, they will have the choice to accept or reject your offer. If they accept, you will get Rs (400-the amount of Rupees offered) today and they get the amount of Rupees you have offered them. Each of you will also get an additional Rs 50. If they reject, each of you will get Rs 50. If you do NOT empower them, they will get whatever you decide for them today.
Please make the decision about whether or not to send money to your spouse.
Whatever decision you make **<u>will be reported</u>** to your spouse. So whether you choose to give them the power to accept or reject, she/he will be informed. Also, she/he will get to know the amount you choose to send today.

Now please choose: do you want to empower your spouse or not? Circle one:

I WILL EMPOWER MY SPOUSE
OK, now please choose the amount to offer to your spouse.
0 50 100 150 200 250 300 350 400
Your spouse will be informed about the decision. **Thereafter they will have the choice to ACCEPT or REJECT the offer.**

Once you have completed the decision, please go and wait outside.

Appendix K (cont.)

I WILL NOT EMPOWER MY SPOUSE
OK, now please choose the amount to offer to your spouse.
0 50 100 150 200 250 300 350 400
Your spouse will be informed about the division.
But they have NO decision to make.

Appendix K (cont.)

Decision sheet – Treatment 7: Person B

First, I will verify your information and make sure your spouse is waiting in the other room.

You are Person B. Your paired person A is your spouse.

He/she was given Rs 400 and could choose to send some of the Rs 400 to you.

Your spouse could also give you the power to accept or reject an offer. If you accept the offer made by your spouse, then you will both get an amount of money according to the division proposed by your spouse. If you reject, neither of you get the Rs 400 – you will each only get Rs 50 (the show up fee).

Your spouse has chosen to:

- **NOT give you the power.**
- Your spouse has sent you Rs _____ today.
- So today you get Rs(_____+ 50) =Rs _____.
- You do NOT have any decision to make.

Your spouse has chosen to:

- **GIVE you the power**. They sent you: Rs _____
- Hence now YOU can decide –whether to accept or to reject.
- ***Accept*: you and your spouse get the money as per the division proposed by your spouse.**
- ***Reject*: you each get Rs 50.**

What is your decision? Please circle a choice:

ACCEPT **REJECT**

ACCEPT: You have earned Rs (_____+50) =Rs _____.

Your spouse gets Rs _____

REJECT: You get Rs 50; your spouse gets Rs 50.

Appendix K (cont.)

Decision sheet – Treatment 8: Person A

First, I will verify your information.

You are Person A. Your paired person B will NOT be informed of your identity.

Here is Rs 400. This is YOUR money.

You have to make 2 decisions:

- Choose whether you want to give your person B the power to reject or accept your offer
- You also have to choose how to divide the Rs 400.

Now YOU have to decide whether or not you want to send some money. Suppose you offer some amount of Rupees to your person B. This amount of Rupees can be anything from 0,50, 100, …400.

Your paired person B will be informed about the offer. If you empower them, they will have the choice to accept or reject your offer. If they accept, you will get Rs (400-the amount of Rupees offered) today and they get the amount of Rupees you have offered them. Each of you will also get an additional Rs 50. If they reject, each of you will get Rs 50. If you do NOT empower them, they will get whatever you decide for them today.

Please make the decision about whether or not to send money to your paired person B.

Whatever decision you make **<u>will be reported</u>** to your paired person B. So whether you choose to give them the power to accept or reject, she/he will be informed. Also, she/he will get to know the amount you choose to send today.

Now please choose: do you want to empower paired person B or not? Circle one:

I WILL EMPOWER PAIRED PERSON B
OK, now please choose the amount to offer to your spouse.
0 50 100 150 200 250 300 350 400
Your paired person B will be informed about the decision. **Thereafter they will have the choice to ACCEPT or REJECT the offer.**

Appendix K (cont.)

Once you have completed the decision, please go and wait outside.

I WILL <u>NOT</u> EMPOWER PAIRED PERSON B
OK, now please choose the amount to offer to your spouse.
0 50 100 150 200 250 300 350 400
Your paired person B will be informed about the division.
But they have NO decision to make.

Once you have completed the decision, please go and wait outside.

Appendix K (cont.)

Decision sheet – Treatment 8: Person B

First, I will verify your information

You are Person B. Your paired Person A was given Rs 400 and could choose to send some of the Rs 400 to you.

Your paired person A was given a choice – they could give you the power to accept or reject an offer. If you accept the offer made by your Person A, then you will both get an amount of money according to the division proposed by person A. If you reject, neither of you get the Rs 400 – you will each only get Rs 50 (the show up fee).

Your paired person A has chosen to:

- **NOT give you the power.**
- Person A has sent you Rs _____ today.
- So today you get Rs(_____+ 50) =Rs _____.
- You do NOT have any decision to make.

Your paired person A has chosen to:

- **GIVE you the power**. They sent you: Rs _____
- Hence now YOU can decide –whether to accept or to reject.
- ***Accept*: you and your spouse get the money as per the division proposed by your spouse.**
- ***Reject*: you each get Rs 50.**

What is your decision? Please circle a choice:

ACCEPT REJECT

ACCEPT: You have earned Rs (_____+50) =Rs _____.

Your paired person A gets Rs _____

REJECT: You get Rs 50; your paired person A gets Rs 50.

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Urmimala is the proud recipient of several distinguished awards and scholarships during her graduate studies including being presented with the Best Student Paper Award (3rd prize) for the second chapter of her dissertation titled "Competition and Cooperation in Rural India: An Experimental Study on Gender and Caste" by an international association of experimental economists, psychologists and decision theorists at the Joint International Conference of the Society for the Advancement of Behavioral Economics (SABE), the International Association for Research in Economics & Psychology (IAREP) and the International Confederation for the Advancement of Behavioral Economics and Economic Psychology (ICABEEP) in 2013. She was been nominated as a Scholar for the Center for Economic Analysis of Risk (CEAR) for three consecutive years and received the best doctoral Third-Year Paper Award in Economics for the first chapter of her dissertation titled “Caste, Efficiency and Fairness with Public Goods and Common Pool Resources” from the Department of Economics at Georgia State University.

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