The fairer sex? Affirmative action, women leaders and strategic deception*

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Abstract

Do women as leaders behave differently from men? Using field experiments conducted in rural India, we show that women leaders are more deceptive compared to men. This is especially true in villages that have experienced a female village head as a result of an affirmative action policy designed to encourage greater representation of women in leadership positions. We find that the higher incidence of deception can be explained by female leaders correctly anticipating that men will cooperate with them at lower rates, as well as social norms where the social costs of deceptive behavior are comparatively lower for women leaders. Our findings suggest significant challenges to the effectiveness of women as leaders.

JEL Codes: O12, O53, C93, J16.

Keywords: Gender, Leaders, Governance, Deception, Affirmative action, Lab-in-the-field experiment, India.

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1 Introduction

Women are under-represented in leadership positions in government, corporate sector and academia. For instance, the Economist (2015) reports that women constitute only 7% of all heads of government, 4.8% of Fortune 500 company CEOs, 7% of central bank governors and 2.5% of self-made billionaires. Barriers to advancement of women remain pervasive in different spheres of life (NWLC, 2000). Gender equality in leadership positions is not just seen to be a moral imperative but also yields several tangible benefits since women often make different policy decisions compared to men (Eagly et al., 1995, Eagly and Carli, 2003). For example, firms with a greater proportion of women on their boards are less likely to enact policies that result in workforce reductions even though this may reduce short-term profits (Adams and Ferreira, 2009, Ahern and Dittmar, 2012, Matsa and Miller, 2013). In the context of policy making, female leaders are more likely to prioritize spending on vulnerable sections of the population (Chattopadhyay and Duflo, 2004b, Edlund and Pande, 2001, Lott and Kenny, 1999, Pande and Ford, 2012). Women are increasingly viewed as political cleaners, less corrupt than men and are more likely to act as whistle blowers when faced with unethical behavior (Goetz, 2007).

To increase the number of women in leadership positions, a number of countries have introduced affirmative action policies, including quotas that require a certain proportion of leadership positions to be held by women. Prominent examples of such quotas can be found in France, Spain, Norway and India. Indeed, of the 29 countries with at least 30% women's representation in parliament, at least 24 used quotas (UN, 2014). Evidence suggests that quotas are associated with increased competitiveness (Balafoutas and Sutter, 2012, Niederle et al., 2013) and representation of women in the political sphere.

While the literature points to fundamental differences between men and women in preferences towards risk, competitiveness and core values (Eckel and Grossman, 2008, Gneezy et al., 2003, Schwartz and Rubel, 2005), little is known about whether male or female leaders deceive more as leaders, or the reasons for this deception. This is an important question to investigate and is the goal of our paper, because deceptive behavior can lead to a breakdown in cooperative relationships, trust and contract enforcement, and consequently hinder economic growth. Further, we examine whether affirmative action policies that mandate the presence of women in leadership positions affect the behavior of male and female leaders.

These questions are typically difficult to answer using observational data for a number of reasons. First, the actions of the leader (of either gender) often cannot be separated from the social environment in which these actions occur. Second, differences in actions by men and women can be driven by differences in experience, preferences or constraints they face in policy making, rather than gender as such. Third, women who choose to become leaders might be self-selected based

on unobservable characteristics, and therefore be unrepresentative of women in the population. Fourth, reliable survey data on deception is difficult to obtain.

We examine the behavior of men and women acting as leaders in a lab-in-the-field experiment that feature participants with the same level of leadership experience.[1] We can therefore isolate and identify the actions of the leader without confounding selection issues. Additionally, the field experiment is conducted in villages located in Bihar, India, that allows us to exploit a national natural policy experiment where the gender of the elected village head is randomly determined based on a quota.[2] This allows an examination of deception when women's political leadership is imposed by affirmative action rather than a merit based open election that could include men.

Our main finding is that women are significantly more deceptive leaders, deceiving in 54% of cases as opposed to 44% for men. This difference is driven by variation in behavior in female-headed villages with no difference in the likelihood of deception by gender in male-headed villages. We also find that the magnitude of deception by female group leaders is greater in female-headed villages, with female group leaders contributing 26% less than what they propose in a pubic good game compared to a difference of 17% for male leaders. The extent of deception is unchanged with an increase in the intensity of exposure to female village leaders.

Examining the difference between sessions where the gender of the group leader is revealed versus not shows that female leaders expect that men will contribute less than the contribution proposal when they know that the leader is a woman. Thus, the economic cost of following their own proposal drives female deception. A second lab-in the field experiment that elicits beliefs and norms about social appropriateness of decisions shows that the social costs of deceptive behavior is lower for female leaders. Therefore, we conclude that deception by female leaders under affirmative action is driven by strategic concerns and social norms instead of representing inherent differences between men and women.

2 Research methods

We conduct two lab-in-the-field experiments and extensive post-experiment surveys to collect information on attitudes towards governance and corruption and on individual and household level demographic and socio-economic characteristics. To examine the effect of exposure to female leaders on the behavior of leaders in our experiment, we use a randomised natural policy experiment

[1] Behavior observed in economic experiments has been shown to be correlated with behavior outside the experimental domain (Karlan, 2005, Benz and Meier, 2008).

[2] Beaman et al. (2009) examine whether citizens' attitudes towards female leaders change following a woman's term as the village head under this policy. More broadly, researchers find mixed policy effects from exposure to female leaders as a result of these quotas (Ban and Rao, 2008, Beaman et al., 2012, Chattopadhyay and Duflo, 2004b, Gangadharan et al., 2016, Iyer et al., 2012, Afridi et al., 2013).

conducted in India. More details on this policy are presented in Section 3.

Between June 2014 and March 2015, we conducted two lab-in-the-field experiments. We refer to the first one as the *leadership experiment* and the second one as the *belief elicitation experiment*. The experiments took place in 61 randomly selected villages (40 for the leadership experiment and 21 for the belief elicitation experiment) in the districts of Gaya, Madhubani and Khagaria in Bihar, India. Bihar is a large state with approximately 10% of India's population, and the total population of the three districts is almost 11 million. Between 2003 and 2013, Bihar experienced one of the fastest rates of economic growth among Indian states. The three districts chosen are approximately equidistant from the capital city of Patna and are similar in terms of socio-economic, demographic and agro-climatic conditions. Sampled villages were drawn from a population of villages receiving funds from the Bihar Rural Livelihoods Project and matched in terms of village level observables using the 2011 census of India.

2.1 Leadership experiment

We conducted the leadership experiment in 40 villages and 956 individuals participated in these experimental sessions. Our design extends the standard linear public goods game, widely used to study cooperation and other social dilemma problems. In the experiment, subjects are randomly allocated into groups of four. Each group member i is given an endowment of Rs. 200 and they have to decide how much of this endowment to allocate to a group account. The rest goes to their private account. Each rupee allocated to the private account by the individual yields a return of one, while each rupee allocated to the group account generates a return of β to each group member. β is determined as follows: the total contribution to the group account by all the group members is aggregated ($G = \sum_i g_i$, where g_i is the amount allocated to the group account by member i), doubled and then divided equally among the group members irrespective of their contribution to the group account. Since each group consists of four members, $\beta = 0.5$. The earnings of each participant is given by $\pi_i = (E - g_i) + 0.5G$.

We implement a one-shot version of the game to avoid reputation and learning effects as well as to avoid subject fatigue. Avoiding subject fatigue is important since each session (including reading the instructions and the post experiment survey) took around four hours to complete. On an average participants earned Rs. 420, which is approximately two days wage for a semi-skilled laborer.[3]

Each group consists of four members, two men and two women. Information on group

[3]The experimental instructions were read out in the local language, Hindi and the English version is presented in the Appendix. Participants answered quiz questions after the instructions were read out to make sure that they understood the procedures. Subjects also participated in a separate trust game before the leadership experiment but were not given any feedback on this task. Subjects were paid for only one task, randomly chosen at the end of the experiment.

composition is public among the participants. One member in each group is randomly assigned to be the group leader. Each group therefore consists of one leader and three non-leaders (henceforth, citizens). All subjects are privately informed about their role in the experiment – leader or citizens. All decisions are made in private, and subjects are never informed of the identity of their group members.[4] In all sessions, half the groups have male leaders while the remaining groups have female leaders. Subjects are randomly assigned to different groups.

The experimental task had two decision stages. In the first stage, the leader proposes a non-binding contribution between Rs. 0 and Rs. 200 towards the group account, which is privately communicated to the other group members. In the second stage, all group members, including the leader, simultaneously contribute to the group account. Subjects are never informed of their fellow group members' actual contribution to the group account. The proposed contribution by the leader is non-binding, akin to cheap talk. Applying backward induction, the theoretical prediction for this task is that the proposed amount should have no impact on citizens contribution decision: $\beta < 1$ and therefore citizens' dominant strategy in stage 2 is to contribute zero. The leader also knows that the group members may not follow his/her proposal, and therefore has little incentive to follow it as well. We therefore expect low contributions to the group account and provision of public goods below the socially optimal level in all the treatments.[5]

The experiment consists of a treatment (Gender of group leader revealed) and a control (Gender of group leader not revealed). In all sessions, participants are given instructions sheets with own gender symbols on the front page making gender salient. This was done prior to the leader making his or her proposal. In the Gender of group leader revealed sessions, citizens are also informed of the leader's gender before the leader makes his or her proposal. The gender composition of the group and the proportion of male and female led groups is the same across treatment and control sessions.

The non-binding proposal made by the group leader and the subsequent actual contributions allow us to construct a number of different measures of deception on the part of the male and female leaders. These are: *deception* (D), which is 1 if the leader proposes more in the first stage than their own contribution in the second stage of the public good, and 0 otherwise; *strong deception* ($\tilde{D}$), which is 1 if the leader's proposed contribution to the group account exceeds the actual contribution by more than Rs. 10 and the magnitude of deception with the variable *percent deviation*, which is defined as $100 \times$ (Amount contributed to the group account – Amount proposed)/Amount

[4] All interactions with the participants were symmetric and no participant was singled out during distribution or collection of decisions sheets.

[5] Different aspects of leadership have been explored in the experimental literature (Meidinger and Villeval, 2002, Güth et al., 2007, Levy et al., 2011, Jack and Recalde, 2014, Grossman et al., 2015). Most of this literature focuses on a first mover sending a signal to other members of the group. The first mover or the leader's effort or contribution is commonly observed prior to other members' effort.

proposed. If the leader's actual contribution to the group account is greater than his/her proposed contribution, percent deviation is coded as zero.

2.2 Belief elicitation experiment

We measure the extent to which decisions are socially acceptable by conducting a second field experiment involving a coordination game and a belief elicitation task. We use an incentivized experimental methodology (Krupka and Weber, 2013) to identify whether participants consider decisions in the original leadership experiment as socially appropriate. The belief elicitation experiment was conducted in 21 villages, different from the original 40 villages where the leadership experiment was conducted, but located in the same sub-districts where the original leadership experiment sessions were conducted. The belief elicitation experiment was conducted approximately seven months after the leadership experiment and collected data from 267 participants. Approximately half the participants were women. The recruiting procedure was identical to that used for the leadership experiment.

The belief elicitation experiment involved four tasks. Prior to the first task, a description of the leadership experiment and all possible actions were described. Participants in the belief experiment did not make any decisions relating to the leadership experiment. They were informed that villagers, similar to them and residing in villages similar to theirs, had already participated in that experiment.

The first task (Task 1) was designed to elicit beliefs about the actions of subjects in the original leadership experiment. Specifically, subjects were asked to estimate the decisions made by both male and female citizens under both a male and female leader in the original leadership experiment. Participants were paid Rs. 200 if their decisions were within Rs. 10 of the average in the original experiment.

The next two tasks (Tasks 2 and 3) measure beliefs about how socially acceptable a certain action is considered to be by the majority of participants. The tasks described possible decisions made by subjects in the original leadership experiment, and then required participants to rate the social appropriateness of these decisions. Specifically, participants were asked to rate the social appropriateness of a leader of gender g (where g is either male or female) contributing Rs. 50/100/150 if the same leader proposed Rs. 100. Participants were asked to rate the social appropriateness of the decisions of the leader as being very socially inappropriate, somewhat socially inappropriate, somewhat socially appropriate or very socially appropriate, which were then converted to numeric scores with very socially inappropriate (= 1) and very socially appropriate (= 4). Higher scores implied that people viewed a particular action as more socially appropriate. The only difference between Tasks 2 and 3 was the method of payment for each task. Participants in Task 2 (3) were

paid Rs. 200 if they gave the same response as that most frequently given by men (women) in a baseline village. Task 2 can therefore be interpreted as what villagers think men believe is socially appropriate, while Task 3 is what villagers think women believe is socially appropriate. If the participant's answer did not match the majority answer, he/she received nothing for this task.

The fourth task (Task 4) differs from the other three tasks by eliciting general measures of social norms and identity in the village context. Participants were given different vignettes on topics ranging from the role of women in the household to gender identity (the Belief Elicitation Instructions in the Appendix report the list of the questions asked). Again, participants were asked to rate the social appropriateness of each of these vignettes. This task was also incentivized with participants receiving Rs. 200 in accordance with the modal response of villagers in a baseline village.[6]

2.3 Risk and time preference

As part of our post-experiment survey, we collected data on risk and time preference of the participants. Each participant was given an endowment of Rs. 20 and they had to choose the amount x they wished to allocate to a risky asset (that returned $3x$ with probability 0.5 or 0 with probability 0.5). They retained whatever they did not allocate to the risky assest. The proportion of the endowment assigned to the risky asset can be interpreted as a measure of the risk preference of the individual. We also collected data on time preference of the participants, though this specific task was not incentivized. Each participant was asked whether they would prefer Rs. 100 in a month or Rs. 150 in 3 months. Those who reported preferring the first were categorized as present biased.

On average female leaders allocated 63% of their endowment to the risky asset, compared to 68% by male leaders, although the difference is not statistically significant. On the other hand, 61% of female leaders are categorized as present biased compared to 71% of male leaders and the difference is marginally statistically significant (p-value = 0.09).

2.4 Recruitment

Recruitment procedures were identical across the two experiments. To recruit participants two members of the research team (one male and one female) visited each village the day before the scheduled session. Each visit involved meeting with village council leaders and then informing villagers of the event by distributing flyers containing information about participation requirements

[6]In addition to the 21 villages where we conducted the belief elicitation experiment, we selected one village from each district, which we refer to as the baseline villages. We use the data from these villages as a reference group for payment purposes in Tasks 2, 3 and 4. In the baseline villages, participants were paid depending on decisions made by others in the same session. Subjects in the belief elicitation experiment were paid for one randomly chosen decision in each of the four tasks and the average payment was Rs. 380 including the show up fees.

including eligibility (18 or older and literate), remuneration, time and location of the experimental session. Flyers were posted at major village landmarks such as community centers, bus stops, tea-shops, schools, community halls, temples and mosques. The research assistants were not aware of the particular research questions we were interested in.

3 Affirmative action policy

Each village within Bihar (and India) is governed by a village council or Gram Panchayat (GP). Council elections are held every five years. The village council is responsible for village infrastructure such as public buildings, the resolution of local disputes and for identifying government program beneficiaries. While the village councils do not have powers of taxation and the activities of the village councils are financed by state and national grants, the head of the village council (known as the Pradhan, Mukhiya or Sarpanch) exerts substantial influence on the decisions of the council and is therefore an important official.

Through the 73^{rd} constitutional amendment enacted in 1992, the Indian government legislated that at least one third of councillor positions including the position of the village head must be reserved for women in each village council election. The actual implementation of the legislation was however the responsibility of the states. In 2004, the Bihar government increased the quota for women in positions of village head to 50%. Bihar held its first village council election in 2001, followed by a second in 2006 and a third in 2011.

The assignment of female heads to village councils is determined randomly (Chattopadhyay and Duflo, 2004b). Prior to every election, village councils in a district are randomly assigned serial numbers across three lists: reserved for SC, reserved for ST, and unreserved. One third of all serials numbers in each individual list is reserved for women (as mentioned above this changed to one half after 2004 in Bihar). Serial numbers are randomly reassigned prior to every election. As a result, village councils can be reserved for women twice in a row. A village could be either: never reserved, reserved only once or reserved at least twice. In Bihar, women are unlikely to be elected as village heads without reservation. For instance, following the 2006 elections, 50.06% of all positions of village head were occupied by women, not different from the mandated 50%, implying that the village council heads gender is indeed determined exogenously by the reservation quota. There is evidence of considerable discretionary power enjoyed by the head of the village council (Chattopadhyay and Duflo, 2004a, Besley et al., 2012).

4 Descriptive statistics

Column 1 of Table 1 report descriptive statistics for the full sample. The participants in the study are on average 27 years old, from an average household size of 7.7 and close to half the sample has completed high school. The sample is predominantly Hindu (91%), with a mix of upper caste, Scheduled Caste and Other Backward Castes. Thirty nine percent of participants report being in paid employment.

Table 1 also presents tests for sample balance in the characteristics of the participants. Column 4 shows no observable differences between individuals assigned to be leaders and those assigned to be citizens. Column 7 shows that there are no observable differences between individuals assigned to the gender of group leader revealed (treatment) and gender of group leader not revealed (control) sessions. The F-statistics indicate that the observables are not jointly statistically significant.

Table 2 presents the results of several randomization tests that check if the sample villages are matched on different dimensions in terms of observable village level characteristics. Column 3 shows that the sample is balanced across male and female-headed villages on observable characteristics. Column 7 shows the sample is balanced on observable characteristics by the number of female heads over the last three elections: the χ^2 statistic cannot reject the null hypothesis that the observable characteristics are similar on average across the different categories of villages. Column 10 shows that the sample is balanced depending on whether it was a treatment (gender of group leader revealed) or a control (gender of group leader not revealed) village. The F-statistics indicate that there are no differences in village level characteristics across groups. The tests described in this section indicate that the sample is balanced along several dimensions and allows us to make causal interpretations in the results section.

We conducted the belief elicitation experiment in 21 villages. As we show in Table 3, these 21 villages were similar in terms of observable characteristics to the 40 villages where we conducted the original leadership experiment.

5 Results

5.1 Gender and deception

Using our definition of deception, Panel B of Table 4 shows that women are significantly more deceptive leaders: deceiving in 54% of cases as opposed to 44% for men (p-value = 0.028). It could be argued that women are not necessarily deceptive, instead they might be proposing higher contribution levels so as to encourage or motivate their group members to contribute more. An

examination of leaders' proposals (Panel A of Table 4) however shows that proposed contributions do not differ significantly by gender (p-value = 0.31). This suggests that female leaders may be acting opportunistically and strategically contributing less than male leaders.

To further understand the behavior of female leaders, we analyze deception by the group leader using a multivariate regression approach that can control for village fixed effects and individual and household level controls, which helps avoid the confounding implications of heterogeneity across villages. We estimate the following Ordinary Least Square equation:

$$D_{jk} = \alpha_0 + \alpha_1 L^f_{jk} + \gamma \mathbf{Z}_{jk} + \eta_k + \varepsilon_{jk} \tag{1}$$

The outcome variables of interest are deception (D_{jk}) and strong deception ($\tilde{D}_{jk}$). Finally, a Tobit regression helps examine the magnitude of deception with percent deviation as the outcome variable. In equation (1), L^f_{jk} denotes a female group leader; α_1 denotes the average difference in the likelihood of deception by female group leaders. We include a set of individual controls ($\mathbf{Z}_{jk}$: primary and secondary school completion, occupational status, income, age, religion, caste, household size and father's school completion) as well as village fixed effects (η_k) in the specification. In additional regression results that are available on request, we control for the risk preference and present biasedness of the leaders as additional explanatory variables. Our results are qualitatively and quantitatively unaffected by the inclusion of these two variables.

Panel A in Table 5 presents the results from estimating equation (1). On average female leaders are 20 percentage points more likely to deceive compared to male leaders (p-value = 0.02) and 19 percentage points more likely to deceive strongly (p-value = 0.04). In terms of magnitude, female leaders contribute 18 percent less than proposed (p-value = 0.04).

5.2 Do female leaders behave differently under a quota system?

Does exposure to female heads under a quota system affect the behavior of male and female leaders in the field experiment? Female village heads may act as role models to other females, influencing how they behave as leaders. We classify villages into two categories: a female-headed village, which has had at least one female head following the last three village council elections, spanning 15 years. As reported in Panel C of Table 4, we find that female group leaders are deceptive in 61% of cases in female-headed villages compared to 41% in male-headed villages (p-value = 0.02). Villages that have never been exposed to a female village head show no difference in the likelihood of deception of male and female group leaders (p-value = 0.57). We also find that the magnitude of deception by female group leaders is greater in female-headed villages, with female group leaders contributing 26 percent less than what they proposed compared to a difference of 17 percent for male leaders (p-value = 0.03).

We also examine this issue in a multivariate regression framework that controls for a range of individual and household level controls and also includes village fixed effects. The estimating equation, which is an extension of equation (1), is given by

$$D_{jk} = \alpha_0 + \alpha_1 L^f_{jk} + \alpha_2 H^f_k + \alpha_3 (L^f_{jk} \times H^f_k) + \gamma \mathbf{Z}_{jk} + \eta_k + \varepsilon_{jk} \tag{2}$$

Here H^f_k is a dummy variable that takes the value of 1 if the village has been exposed to a female head and 0 otherwise. In this equation α_1 denotes the additional deception by a female leader (relative to a male leader) in a male-headed village, while $\alpha_1 + \alpha_3$ denotes the additional deception by a female leader (again relative to a male leader) in a female-headed village. The regression results, which are presented in Panel B of Table 5, confirm the descriptive statistics presented in Table 4. Female leaders are significantly more deceptive (column 1, p-value = 0.00), more strongly deceptive (column 2, p-value = 0.00) and deceive in larger magnitude (column 3, p-value = 0.00) than male leaders in female-headed village but not in a male-headed village.

5.3 Effect of increased exposure

Bihar's three village council elections allow us to examine the effect of intensity of exposure to a female village head. We categorize the villages into three groups: no female head (42.5%), one female head (40%) and two or more female heads (17.5%). We estimate an extended version of equation (2)

$$D_{jk} = \alpha_0 + \alpha_1 L^f_{jk} + \alpha_2 H^{1f}_k + \alpha_3 (L^f_{jk} \times H^{1f}_k) + \alpha_4 H^{2f}_k + \alpha_5 (L^f_{jk} \times H^{2f}_k) + \gamma \mathbf{Z}_{jk} + \eta_k + \varepsilon_{jk} \tag{3}$$

Here, H^{1f}_k is a dummy variable that takes the value of 1 if the village has been exposed to one female head and 0 otherwise; H^{2f}_k is a dummy variable that takes the value of 1 if the village has been exposed to two or more female heads and 0 otherwise. The reference category is that the village has never been exposed to a female head. In this equation α_1, $\alpha_1 + \alpha_3$ and $\alpha_1 + \alpha_5$ denote respectively the additional deception by a female leader (relative to a male leader) in a village with no female head, one female head and two or more female heads. The regression results, presented in Panel C of Table 5 show using all three measures that female leaders engage in deceptive behavior when the village has been exposed to a female head and the extent of deception is unchanged with an increase in the extent of exposure.

6 Explanation of results

In this section, we discuss some mechanisms behind the deceptive behavior of female leaders.

Female leaders may expect that men will contribute less than what they proposed to the group account when they know that the leader is a woman. Hence, a female leader's optimal decision in the second stage is to contribute less than what she proposed. Evidence of female leaders expectation of negative male behavior can be found by comparing the deceptive behavior of female leaders in the gender revealed treatment to when their gender is not revealed. We expect female leaders to be more deceptive when their gender is revealed and in particular in a female-headed village as there is a higher probability of observing male citizens responding negatively in female headed villages.

As Table 4 shows, both these arguments are validated using the data. We find that the likelihood of deception by female leaders is statistically significantly higher in the gender revealed sessions (p-value = 0.06) but not in the gender not-revealed sessions (p-value = 0.20). Additionally, this behavior is stronger in female-headed villages.

We also use a multivariate regression approach to examine whether this result holds after controlling for a range of individual and household characteristics and also village fixed effects. Specifically we estimate the following regression

$$D_{jk} = \alpha_0 + \alpha_1 L^f_{jk} + \alpha_2 T_k + \alpha_3 (L^f_{jk} \times T_k) + \gamma \mathbf{Z}_{jk} + \eta_k + \varepsilon_{jk} \tag{4}$$

Here, T_k takes the value of 1 if the village is a treatment village (i.e., a gender revealed village) and 0 otherwise. In this equation, α_1 denotes the additional deception by female leaders (compared to that by male leaders) in a control village while $\alpha_1 + \alpha_3$ denotes the additional deception by female leaders in a treatment village. The results presented in Panel A of Table 6 show that, consistent with our hypothesis, female group leaders are significantly more likely to deceive than men in the treatment (gender revealed) villages but not in the control (gender not revealed) villages.

To examine whether this result is stronger in the female-headed villages, we estimate an extended version of equation (4) as follows:

$$\begin{aligned} D_{jk} = {} & \alpha_0 + \alpha_1 L^f_{jk} + \alpha_2 T_k + \alpha_3 (L^f_{jk} \times T_k) + \alpha_4 H^f_k + \alpha_5 (L^f_{jk} \times H^f_k) + \alpha_6 (T_k \times H^f_k) \\ & + \alpha_7 (L^f_{jk} \times T_k \times H^f_k) + \gamma \mathbf{Z}_{jk} + \eta_k + \varepsilon_{jk} \end{aligned} \tag{5}$$

We are interested in the sign and significance of $\alpha_1 + \alpha_3$ and $\alpha_1 + \alpha_3 + \alpha_5 + \alpha_7$, which give the additional deception by female group leaders in male and female-headed treatment villages respectively. The regression results presented in Panel B of Table 6 show that our hypothesis is satisfied: female group leaders are significantly more likely to deceive than male group leaders in female-headed treatment villages. There is no evidence of this additional deception in male-headed treatment villages. To summarize, our results show that only when their gender is known

(in the gender revealed treatment), female leaders anticipate male backlash and engage in deceptive behavior. The expectation by female leaders that male citizens will not cooperate with them is borne out in the analysis of citizen behavior (Gangadharan et al., 2016).

Alternatively, social norms can influence behavior of male and female leaders. To examine the social appropriateness of leaders contributing less than the amount they proposed we use the data from the belief elicitation experiment. This approach uses an incentivized methodology to identify social norms separately from realized behavior.

Since our aim is to understand the behavior of women leaders, we focus on the responses from Task 3 of the belief elicitation experiment, i.e., what villagers think women believe is socially appropriate. Table 7 presents the average female beliefs on the social appropriateness of contributing Rs. 50/100/150 when the leader has proposed Rs. 100. We find that only in female-headed villages, women believe that it is significantly more socially appropriate for female leaders than for male leaders to contribute Rs. 50 to the group account even when they proposed to contribute Rs. 100 (p-value = 0.00). There is however no difference in female beliefs on the social appropriateness of male and female leaders contributing Rs. 100 or Rs. 150 when they proposed Rs. 100 (p-value = 0.45). In female-headed villages, therefore, it seems more socially acceptable for women to be deceptive relative to men. Hence, the social cost to women leaders from acting deceptively is less than the corresponding cost to men.

Another possible explanation is that women leaders may be bad role models. With the introduction of quotas, women have the opportunity to observe females in leadership positions. In particular, women might observe female heads acting deceptively and this might change their perceptions about the appropriate behavior of female leaders. For this explanation to be true, women in female-headed villages should expect female leaders to deceive more often compared to male leaders. Using the beliefs elicited in Task 1, we find that there is no statistical difference in women's beliefs in female-headed villages about the relative deceptive behavior by male and female leaders (p-value = 0.27). Deceptive behavior by women leaders in the experimental set-up therefore cannot be explained by women acting as poor role models.

Our data supports two explanations for the deceptive behavior by female leaders. First, a female leader's optimal decision in the second stage is to contribute less than what she proposed, as she anticipates that men will contribute less to the group account when they know that the leader is a woman. The potential economic cost of following their own proposal therefore drives their deceptive behaviour. Second, the behavior of female leaders is consistent with female beliefs about the social appropriateness of contribution decisions made by female leaders. The social costs of deception are relatively lower for female leaders. Therefore the high economic cost of not being deceptive and the low social cost of being deceptive together help explain the behavior of female leaders.

7 Conclusion

Using a lab-in-the-field experiment conducted in rural India, we show that women leaders are more deceptive compared to men. This is especially true in villages that have experienced a female village head as a result of an affirmative action policy designed to encourage greater representation of women in leadership positions. We then conduct an incentivized beliefs elicitation experiment to understand this pattern in behavior and show that the social cost to women leaders from acting deceptively is less than the corresponding cost to men. This, in addition to the anticipation of low contributions by men in female led groups, can explain the higher incidence of deception by women.

Our findings are consistent with previous research from developing countries that offers little evidence to suggest that women are less corrupt than men, and instead finds that females behave opportunistically when reneging on contracts (Swamy et al., 2001, Alatas et al., 2009, Lambsdorff and Boehm, 2011). Evidence from the World Values Survey (on acceptability of receiving a bribe) indicates that women in many parts of the world are as likely as men to report that accepting a bribe in the course of their duties is justified.

While gender equality and the greater representation of women in public life results in tangible policy changes, increasing the representation of women in leadership positions through quotas might not necessarily improve development outcomes. This is particularly important when social norms do not necessarily support the appointment of women to such positions of power. If leaders are deceptive, trust and cooperative relationships might break down, hindering economic development. Greater deception by women may also reinforce gender-based discrimination such as male backlash leading to deterioration in trust, further threatening women leaders' ability to govern. Thus, our investigation suggests that behavioral factors can act as major barriers to the empowerment of women.

Our findings point to the limits of strong policy measures in changing outcomes for women. If attitudes towards women in leadership positions drive strategic deception by female leaders, then the remedy is perhaps in changing basic gender attitudes instead of mandating female leadership. Research on the formation of pro-women gender attitudes is sparse,[7] especially in the context of attitudes towards female leaders. Our paper indicates the need for more investigation into the formation of attitudes towards women in leadership positions, as well as the effectiveness of policies and programs to change those attitudes positively.

[7] For instance, see Dhar et al. (2015) on how parents influence children's gender attitudes in India, and Fernandez et al. (2004) on the changes in attitudes towards female workforce participation in the United States as a result of increased women's employment during the Second World War.

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Table 1: Randomization at individual level

	Full Sample	Role in Experiment			Gender of Group Leader		
		Citizen	Leader	Diff.	Revealed	Not Revealed	Diff.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
No Schooling	0.295	0.300	0.280	0.020	0.309	0.282	0.027
	(0.456)	(0.459)	(0.450)		(0.463)	(0.45)	-0.03
Primary Schooling	0.228	0.226	0.234	-0.008	0.228	0.229	-0.001
	(0.420)	(0.419)	(0.424)		(0.42)	(0.421)	-0.027
Secondary Schooling	0.150	0.149	0.151	-0.001	0.173	0.126	0.047**
	(0.357)	(0.357)	(0.358)		(0.379)	(0.332)	-0.023
Higher Secondary Schooling	0.277	0.281	0.268	0.013	0.246	0.309	-0.062**
	(0.448)	(0.450)	(0.444)		(0.431)	(0.462)	-0.029
Father: No Schooling	0.381	0.378	0.389	-0.011	0.361	0.401	-0.04
	(0.486)	(0.485)	(0.489)		(0.481)	(0.491)	-0.031
Father: Primary Schooling	0.238	0.243	0.222	0.021	0.255	0.221	0.034
	(0.426)	(0.429)	(0.416)		(0.436)	(0.415)	-0.028
Age	27.024	27.122	26.732	0.389	27.303	26.743	0.56
	(10.812)	(10.807)	(10.844)		(10.771)	(10.857)	-0.7
Household Size	7.770	7.862	7.494	0.368	7.263	8.279	-1.016***
	(3.661)	(3.714)	(3.493)		(3.038)	(4.138)	-0.235
Hindu	0.907	0.904	0.916	-0.013	0.887	0.926	-0.039**
	(0.291)	(0.295)	(0.277)		(0.317)	(0.261)	-0.019
General Caste	0.257	0.268	0.223	0.045	0.241	0.273	-0.033
	(0.437)	(0.443)	(0.417)		(0.428)	(0.446)	-0.028
Scheduled Caste	0.240	0.240	0.239	0.001	0.215	0.265	-0.049*
	(0.427)	(0.428)	(0.428)		(0.412)	(0.442)	-0.028
Other Backward Caste	0.425	0.409	0.471	-0.061*	0.448	0.401	0.046
	(0.495)	(0.492)	(0.500)		(0.498)	(0.491)	-0.032
Currently Working	0.387	0.378	0.414	-0.036	0.407	0.368	0.039
	(0.487)	(0.485)	(0.494)		(0.492)	(0.483)	-0.032
No income in past 30 years	0.631	0.634	0.623	0.010	0.603	0.66	-0.057*
	(0.483)	(0.482)	(0.486)		(0.49)	(0.474)	-0.031
F-Test of Joint Significance			1.11			0.42	

Notes: This table shows the *ex post* balance in the characteristics of participants in the experiments. The F-test for joint significance indicates that the samples are balanced overall. $^{***}p < 0.01$,** $p < 0.05$,* $p < 0.10$.

Table 2: Randomization at village level

	Gender of Village Head			Number of Female Heads				Gender of Group Leader		
	Male	**Female**	**Diff.**	**0**	**1**	**2**	**K-W Stat.**[†]	**Revealed**	**Not Revealed**	**Diff.**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Number of households	614.13	501.06	113.07	501.05	629.06	580	0.125	580.55	551.6	28.95
Total population	3250	2481.30	769.14	3250	3332.44	3063	0.154	3133.9	2713.2	420.7
Male to female ratio	1.05	1.06	-0.015	1.06	1.04	1.06	0.535	1.06	1.04	0.02
Fraction Scheduled Caste	0.36	0.29	0.07	0.29	0.36	0.34	1.412	0.33	0.32	0.01
Fraction Scheduled Tribe	0.00	0.00	0.00	0.00	0.00	0.00	0.141	0.00	0.00	0.00
Fraction literate	0.44	0.43	0.01	0.43	0.46	0.39	1.642	0.44	0.43	0.01
Fraction male literate	0.50	0.52	-0.02	0.51	0.54	0.48	1.00	0.49	0.55	0.06
Fraction female literate	0.35	0.35	0.00	0.35	0.37	0.30	3.228	0.32	0.38	0.06**
Fraction workers	0.40	0.35	0.05*	0.35	0.40	0.40	3.722	0.38	0.38	0.00
F-Test of Joint Significance		0.99							0.58	

Notes: This table shows the *ex ante* balance in the characteristics of villages chosen for experiments. [†]: Kruskal-Wallis (K-W) Statistic is distributed as $\chi^2(2)$. Gender of village head is female if the village has had at least one female head following the last three village council elections. Gender of village head is male if the village has never been exposed to a female head. No female head consists of villages, which have had no female head following the last three village council elections. One female head consists of villages, which have had one female head following the last three village council elections. Two or more female heads consists of villages, which have had two or three female heads following the last three village council elections. The gender revealed (treatment) village is one where the gender of the group leader is revealed to the citizens. The F-test for joint significance indicates that the samples are balanced overall. $^{***}p < 0.01$,** $p < 0.05$,* $p < 0.10$. Data source: Census of India, 2011.

Table 3: Village level balance between leadership and belief elicitation experiment villages

	Pooled			Village Head Gender					
				Female			Male		
	Belief Elicit. Exp.	Leadership Exp.	Diff.	Belief Elicit. Exp.	Leadership Exp.	Diff.	Belief Elicit. Exp.	Leadership Exp.	Diff.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Number of Households	836.71	566.07	270.6	919.64	614.13	305.4	702.12	501.05	201.06
Total Population	4405.5	2923.5	1482	4749.2	3250.4	1498.79	3847.12	2481.29	1365.83
Male to female ratio	1.06	1.05	0.006	1.07	1.04	0.02	1.04	1.06	0.02
Fraction Scheduled Caste	0.248	0.328	0.08	0.261	0.356	0.095	0.226	0.29	0.064
Fraction literates	0.481	0.435	0.046*	0.472	0.438	0.035	0.497	0.431	0.066
Fraction male literates	0.566	0.517	0.049	0.553	0.523	0.029	0.588	0.509	0.079
Fraction female literates	0.392	0.349	0.043	0.385	0.349	0.036	0.403	0.349	0.054
Fraction workers	0.365	0.38	0.01	0.372	0.404	0.031	0.353	0.347	0.006
F-Test of Joint Significance		0.93			0.54			1.49	

Notes: This table shows the *ex ante* balance in the characteristics of villages chosen for the different sets of experiments. Gender of village head is female if the village has had at least one female head following the last three village council elections. Gender of village head is male if the village has never been exposed to a female head. Data source: Census of India, 2011. The F-test for joint significance indicates that the samples are balanced overall. $^{***}p < 0.01$,$^{**}p < 0.05$,$^{*}p < 0.10$.

Table 4: Amount proposed and deception by leaders

		Female (1)	Male (2)	Difference (3)
Panel A: Proposed contribution to the group account				
1.	All	111.70	118.74	-7.03
2.	Female-headed village	116.25	117.86	-1.61
3.	Male-headed village	105.31	119.90	-14.60
4.	Gender Revealed	108.41	117.62	-9.22
5.	Gender not revealed	115.00	119.87	-4.87
6.	Gender Revealed, Female-headed village	109.41	114.55	-5.14
7.	Gender Revealed, Male-headed village	107.22	121.25	-14.03
Panel B: Deception				
8.	All	0.57	0.43	0.14**
9.	Female-headed village	0.61	0.41	0.20**
10.	Male-headed village	0.51	0.45	0.06
11.	Gender Revealed	0.58	0.41	0.17*
12.	Gender not revealed	0.56	0.44	0.12
13.	Gender Revealed, Female-headed village	0.59	0.39	0.20
14.	Gender Revealed, Male-headed village	0.55	0.43	0.13
Panel C: Percent deviation				
15.	All	-21.75	-18.16	-3.58
16.	Female-headed village	-26.00	-16.61	-9.39**
17.	Male-headed village	-19.80	-18.71	-1.09
18.	Gender Revealed	-21.76	-19.35	-2.42
19.	Gender not revealed	-22.57	-18.49	-4.08
20.	Gender Revealed, Female-headed village	-25.24	-16.74	-8.50
21.	Gender Revealed, Male-headed village	-17.64	-22.41	4.77

Notes: In Panel A, columns 1 and 2 show the average proposal by female and male leaders, respectively. Column 3 shows the difference in means (3 = 1 2) using a t-test. In Panel B, columns 1 and 2, show the average likelihood of the leader contributing less than what she/he proposed (deception). Column 3 shows the difference in means in deception by female and male leaders (3 = 1 2). In Panel C columns 1 and 2 show the average difference between actual and proposed contributions by female and male leaders if the leaders choose to deceive. Column 3 presents the corresponding difference in means in this magnitude of deception (3 = 1 2). Statistical significance computed using a two-sided t-test. Gender of village head is female if the village has had at least one female head following the last three village council elections. Gender of village head is male if the village has never been exposed to a female head. The gender revealed (treatment) village is one where the gender of the group leader is revealed to the citizens. Significance: $^{***}p < 0.01$,$^{**}p < 0.05$,$^{*}p < 0.10$.

Table 5: Deceptive behavior by leaders

	Deception (1)	Strong Deception (2)	Percent Deviation (3)
Panel A: All villages			
Female Leader Male Leader	0.200**	0.184**	-18.180**
	(0.085)	(0.087)	(8.691)
Panel B: Gender of village head and group leader behavior			
Female Leader - Male Leader	0.125	0.110	-5.112
(Male-headed Village)	(0.131)	(0.142)	(13.883)
Female Leader - Male Leader	0.252***	0.236***	-26.957***
(Female-headed Village)	(0.181)	(0.081)	(7.793)
Panel C: Intensity of exposure to female village head and group leader behavior			
Female Leader - Male Leader	0.130	0.107	-4.904
(0 Female Head)	(0.133)	(0.141)	(13.743)
Female Leader - Male Leader	0.264**	0.241**	-30.064***
(1 Female Head)	(0.995)	(0.103)	(9.265)
Female Leader - Male Leader	0.225*	0.233*	-21.160*
(2 or more Female Head)	(0.120)	(0.117)	(12.893)
Sample Size	238	238	238

Notes: Difference estimates from OLS (Linear Probability) regression presented in columns 1 and 2 and estimates from Tobit regressions presented in column 3. All regressions include dummies for gender of the leader, a treatment dummy on treatment, set of individual and household characteristics (age, own educational attainment, fathers educational attainment, current work status, income earned in the last month, caste and religion, household size), amount proposed by the leader and for village fixed effects. Regressions in Panel B also include the interaction of the gender of the group leader and the gender of the village head. Gender of village head is female if the village has had at least one female head following the last three village council elections. Gender of village head is male if the village has never been exposed to a female head. Regressions in Panel C include the interaction of the number of female village heads following the last 3 elections. Sample restricted to group leaders. Standard errors clustered at the session (village) level in parenthesis. Significance: $^{***}p < 0.01$,$^{**}p < 0.05$,$^{*}p < 0.10$.

Table 6: Deceptive leader behavior in treatment and control

	Deception (1)	**Strong Deception** (2)	**Percent Deviation** (3)
Panel A: All villages			
Female Leader - Male Leader	0.230**	0.226**	-20.316*
(Gender Revealed)	(0.112)	(0.110)	(11.385)
Female Leader - Male Leader	0.168	0.141	-15.977
(Gender not Revealed)	(0.100)	(0.111)	(10.740)
Panel B: Gender of village head (Gender revealed (Treatment) villages only)			
Female Leader - Male Leader	0.259**	0.237*	-25.934**
(Female-headed Village)	(0.127)	(0.129)	(12.021)
Female Leader - Male Leader	0.192	0.221	-13.280
(Male-headed Village)	(0.173)	(0.170)	(18.265)
Sample Size	238	238	238

Notes: Difference estimates from OLS (Linear Probability) regression presented in columns 1 and 2 and estimates from Tobit regressions presented in column 3. All regressions include dummies for gender of the leader, set of individual and household characteristics (age, own educational attainment, fathers educational attainment, current work status, income earned in the last month, caste and religion, household size), amount proposed by the leader and for village fixed effects. Panel B reports results for the gender revealed treatment only. Regressions in Panel B also include the interaction of the gender of the group leader and the gender of the village head. Gender of village head is female if the village has had at least one female head following the last three village council elections. Gender of village head is male if the village has never been exposed to a female head. Sample restricted to group leaders. Standard errors clustered at the session (village) level in parenthesis. Significance: $^{***}p < 0.01$,** $p < 0.05$,* $p < 0.10$.

Table 7: Female beliefs on social appropriateness of contributions of male and female leaders when leader proposed Rs. 100 in female-headed villages

Contribute	Female Leader (1)	Male Leader (2)	Difference (3)
Panel A: Female-headed villages			
50	1.84	1.56	0.28***
100	3.58	3.53	0.05
150	3.26	3.21	0.05
Panel B: Male-headed villages			
50	1.86	1.70	0.16
100	3.68	3.67	0.01
150	3.45	3.47	-0.02

Notes: The cell values denote the average social appropriateness score based on female beliefs (Task 3). A higher score denotes that females believe that a particular contribution decision is more socially appropriate. Sample in Panel A is from female-headed villages and that in Panel B is from male-headed villages. Gender of village head is female if the village has had at least one female head following the last three village council elections. Gender of village head is male if the village has never been exposed to a female head. Statistical significance of difference in means presented in column 4 computed using a Wilcoxon sign rank test. Significance: $^{***}p < 0.01$,$^{**}p < 0.05$,$^{*}p < 0.10$. Sample Sizes: 86 in Panel A and 51 in Panel B.