Who becomes a politician in a gender quota system? Evidence from India

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September 15, 2022

Abstract

Both broad representation and competent leaders are important when selecting representatives in a democracy. While gender quotas emphasize equal representation between genders, if elite classes are dominant and it is a challenge for women from non-elite classes to become politicians, then equal representation between social classes may be impeded. Gender quotas may also make the selection of competent leaders difficult if the number of qualified women is limited and if the opportunity cost of becoming a politician is high for such women. This study explores the random assignment of gender quotas across villages in India to examine the impact of gender quotas on the broadness of representation and the competence of candidates. We conducted a field survey in villages and collected information about cognitive and non-cognitive related skills and the socioeconomic background among voters and candidates in 2020 local elections. We find that while women candidates in a gender quota system on average have lower cognitive and non-cognitive skills compared to men candidates, women candidates with higher cognitive skills are more positively selected among voters compared to this consideration for men candidates. On the other hand, households with less leadership experience can participate in elections as candidates in a gender quota system. This implies that gender quotas can lead to broader representation. In addition, in a gender quota system, voters are more familiar with and value candidates' skills. These results suggest that the quota system has the potential to promote broad political participation and encourage meritocratic candidate selection.

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1. Introduction

Quota systems are intended to overcome the underrepresentation of women and certain ethnic and tribal groups, and to ensure broad representation in governance. India in particular has emphasized broad representation and has implemented quota systems on a large scale for women, lower status castes, and tribes in the decentralized government.[6]

However, there are two concerns related to guaranteeing representation for women. One is that, although the quota system is expected to promote broad representation, the gender quota system, in turn, may accelerate elite politics. It is difficult for women from non-elite classes to become politicians due to the existence of closed elite networks and the influence of the dominant classes in the political arena. Additionally, in situations where there are large gender and hierarchical disparities, the number of women who can potentially become politicians may be limited because non-elite class women have lower levels of education and fewer opportunities to become leaders (Duflo 2005; Karekurve-Ramachandra & Lee 2022; Lawless 2015). As a result, women belonging to the elite class may be more likely to become politicians, which may inhibit the representation of non-elite classes.

On the other hand, some studies have contended that women in higher castes experience more restrictions in movement and socialization than lower castes (Luke & Munshi 2011; Field et al. 2010). As a result, gender quotas have promoted the representation of lower caste women over upper caste women (Cassan & Vandewalle 2021).[7] In this case, gender quotas could reduce elite politics and encourage broad representation of various social strata.

Another concern is the impediment to meritocracy. While it is important that in a democracy qualified candidates are elected, the opportunity cost of becoming a politician is high for qualified persons with a high level of education and leadership experience. This would exacerbate the problem of lack of potential candidates in a situation where educated women are limited. In addition, in societies where gender inequality is severe and there is significant backlash against women becoming leaders, there is a concern that the opportunity cost would be high for many women.

On the other hand, men who have traditionally dominated politics are not always elected based on meritocracy (Murray 2014). It is possible that because of their limited political connections, women are selected on the basis of meritocracy rather than on the

[6] Pande (2011) and Clayton (2021) provide a comprehensive review of research on the influence of gender quotas.

[7] Some studies suggest that the quota system for ethnic groups has led to an increase in the number of women legislators belonging to such groups (Tan 2014; Celis et al 2014; Jensenius 2016).

basis of nepotism or elitism.

The purpose of this study is to investigate the impact of gender quotas on broad representation and the competency of politicians. While there are several studies that have analyzed the impact of gender quotas on the quality of politicians (Baltrnaite et al, 2014; Besley et al, 2017), these studies simply compare the quality of legislators between genders or before and after the introduction of quota systems. On the other hand, there is a lack of research on who become candidates or winners from among the citizens because of a dearth of data on eligible voters and candidates that include measures of competitiveness and representation. This study uses survey data that includes variables related to representation and the competence of eligible voters and candidates to investigate how women politicians are selected under the quota system.

To examine the selection of women politicians under a gender quota, we focus on the gender quota of local councils in rural India. In India's local councils, 33% of council members have been allocated, according to national government policy, to women since 1993, and in Karnataka, the state we examine, that has been raised to 50% since 2015. To analyze the relationship between the quota system and representation or meritocracy, we conducted a survey in the state of Karnataka and collected data on variables related to competitiveness and representation from both eligible voters and candidates. As Dal Bo et al. (2017) investigated the trade-off between the compete politicians and representation, we assess the competitiveness of all respondents with variables such as cognitive and non-cognitive abilities and education, and assess representation with household attributes such as household experience as leadership positions and the amount of land owned. We then compare the distribution of these variables among eligible voters with the distribution of candidates to ascertain the extent to which candidates are superior to eligible voters and the extent to which they are biased toward elite classes.

In the regression analysis, we examine potential differences in selection mechanisms between general constituencies, where anyone can be elected and most candidates are men, and women reserved constituencies, where only women can be elected. The important challenge that must be addressed in such an analysis is the endogeneity problem. For example, if women reserved constituencies are located in a region where the attitude of villagers towards women as leaders has improved, the difference in selection mechanism may not be due to the gender quota, but due to the changed attitudes of villagers. To identify the impacts of gender quotas on the selection mechanism, we use the random allocation of gender quota. Since the quota system for women in India is implemented through randomly assigning women reserved constituencies across villages, we are able to estimate the causal effect of the quota system on the selection process.

Our results suggest that households with less leadership experience can participate in elections as candidates in a gender quota system. This implies that gender quotas can lead to broader representation. The broader representation may impede the meritocratic selection of politicians. However, our results suggest that while men candidates are positively selected from among eligible voters in general constituencies, women candidate are more positively selected from among the better qualified eligible voters in women reserved constituencies. Therefore, there is little need for concern that increasing the number of women members will impede meritocracy. Since India is expected to make progress in women's education and social advancement in the future, the current difference in quality between men and women legislators is also expected to shrink.

In addition, we find that in women reserved constituencies, more competitive candidates, as measured by higher cognitive scores and higher reading skills, are on average more likely to be selected as council members, while competitiveness does not affect the outcome of elections for men candidates. Next, we asked voters to predict the candidates' rankings among other candidates in their constituencies with respect to their various abilities in order to determine whether voters correctly understood the competencies of candidates. The results show that voters were able to more accurately assess women candidates on indicators of competitiveness, such as educational level and cognitive ability, than for men candidates. This implies that voters are more familiar with and value women candidates' skills.

Finally, we examine the possibility of women candidates being proxy candidates. One critique of the quota system is that even if women are given seats in the legislature, they are in effect merely substitutes for their husbands or fathers. Although it is empirically difficult to identify whether they are proxy candidates, we used family political history and the women's voice in household decision making to examine whether women candidates are running according to their own decision. We find that women candidates had more of a family history of running for office, excluding themselves, than men candidates, and that women candidates generally had less voice in household decision making than women in the village. This suggests that competent women candidates with high cognitive ability do not necessarily become politicians according to their own volition.

We contribute to several strands of literature. First, this study contributes to the literature on political selection. Existing studies have analyzed how candidates run for office and how they are selected (Dal Bo et al. 2017; Finan and Dal Bo, 2017). This study speaks to this literature by investigating the selection of women.

Second, this study contributes to the literature on the quality of politicians (ex.

Kotakorpi and Poutvaara, 2011; Jones and Olken 2005). In particular, our study is related to studies that have examined the impact of gender quotas on the quality of politicians (Baltrnaite et al, 2014; Besley et al, 2017). We add new evidence by exploring the selection of women politicians among eligible voters.

Finally, this study contributes to the discussion on gender quotas more broadly. In India, political reservation is a very controversial topic, and there are numerous studies related to the impact of women members on various factors such as representation of other affiliations such as ethnicity, castes, race and religious (Karekurve-Ramachandra and Lee 2002; Tan 2014; Celis et al 2014), public goods allocations (Chattopadhyay and Duflo, 2004; Ban and Rao 2008), their significance as role models for women (Beaman et al. 2012), and backlash against women (Beaman et al., 2009; Okimoto and Brescoll, 2010; Gangadharan et al., 2016). Our paper especially speaks to the literature related to the impact of gender quota on political participation of women (Beaman et al. 2009; Bhavnani, 2009).

The rest of the paper is structured as follows. In section 2 we explain the institutional background and our survey data. Section 3 presents the results related to gender quota and candidates' quality. Section 4 explores the selection through elections and voters' knowledge about candidates' abilities. Section 5 discusses the possibility of proxy candidates for women candidates. Then, section 6 concludes.

2. Institutional Framework and Data

2.1. Grama Panchayat and Political Reservation

A panchayat is the local government system in India, which can be traced back to ancient times. Local government system consists of a three-tiered council: a Grama Panchayat (GP) at the village level, a Taluk Panchayat (TP) at the taluk level, which is larger than village, and a Zilla Panchayat (ZP) at the district level. The 73rd Constitutional Amendment Act of India came into force in 1993, establishing a uniform system of Panchayats nationwide. Key features of the amendment Act include a guarantee to hold elections every five years and the reservation of elected government seats for women, Scheduled Castes (SCs) and Scheduled Tribes (STs). In particular, the share of council members in each council and the share of council presidents are stipulated to be 33% women.

This study focuses on the village level council, GP, in Karnataka. Each GP consists of several villages, and council members are elected from villages. Thus, a village is

virtually equivalent to a constituency.[8] The major responsibilities of the GP is to allocate local public goods and to implement government welfare schemes. Each council member is responsible for carrying out these functions for the village they represent.

Since 2015, the reservation system in Karnataka mandates that 50% of legislators must be women. Thus, half of the council seats are allocated for only women to be elected to fill. Since this study focuses on villages with populations of approximately 400 each that only one council member represent each of them, if the women's quota is allocated to this village, only women can run for office in this village. Allocations for women are made on a random basis. Reserved seats are also allocated to SCs, STs, and Other Backward Classes (OBCs), but this allocation is separate from women. This means that if a village in a single-seat constituency has no quota, anyone can run for the seat, but if a village in this study is designated as a reserved seat for SC and women, only an SC woman can be elected. This reservation allocation changes for each election.

2.2 Framework of the survey

We conducted two rounds of surveys in Karnataka. The first survey was undertaken from December 2019 to January 2020. The second survey, conducted after GP elections held in December 2020, began in February 2021 and ended in September 2021 after a few months interruption due to the spread of COVID-19. In the first survey, we asked households about their household background information, public goods allocations, and the knowledge of GPs.[9] In the second survey, 2020 election candidates were also included as respondents and evaluated on their cognitive and non-cognitive abilities. Households included in the first survey as respondents were also assessed on their cognitive and non-cognitive abilities. In order to effectively collect data related to gender, one woman and one man from each household was invited to participate in the second survey.[10]

For the first survey, a multi-stage sampling method was employed to select the constituencies and households to be included in the survey. First, two districts, Kolar and Tumkur, were selected from Karnataka. The selection of the districts was based on the existence of a sufficient number of single-seat constituencies in the district. Next, two

[8] The exceptional case is that of a hamlet, which is a regional classification for a population smaller than a village, which for government representative purposes is integrated into a closer village. Policies at the local level are implemented at the constituency level, where villages and hamlets are integrated. In this study, we will refer to them uniformly as "villages," even in these cases.

[9] Using the data from the first survey, we investigated the impacts of women council members on public goods allocation (Mori et al. 2022).

[10] This was not the case if there was no woman or man in the household or if the surveyed person was out of the house.

taluks from each district were selected based on the value of the Human Development Index (HDI), a measure of the development status of the taluks. We selected one taluk from each district with the highest and one with the lowest HDI rank. Then 50 GPs were randomly selected, each containing one constituency with one woman elected in the 2015 election and one constituency with one man elected in the 2015 election. Finally, 10 households are selected randomly from each constituency.

In the second survey, the same households in the same constituencies were surveyed. However, one constituency changed to a multi-person constituency after the 2020 election, and two constituencies were reclassified as urban areas, resulting in 97 constituencies being surveyed. Out of the 97 constituencies, 52 are general constituencies and 45 are women reserved constituencies. The composition of the households surveyed was 870 men and 877 women. The number of candidates was 111 men and 107 women. Of the 107 women, 9 ran in the general constituency, which means that the number of women candidates in the general election represents 7.5% of all candidates in the general election.

2.3. Variables of representation and competence

To investigate the gender quota on representation and competence of candidates, we collected variables that proxy for both.

Measures of representation

Representation means how the politicians represent broader social groups. This study uses household characteristics related to socioeconomic status, including landholding, the number of leadership experience, and the number of years of education of the household head. Leadership experience includes members of local governments such as ZP, TP, and GP, as well as members of milk producers' cooperatives. The number of leadership experiences is counted per household. Since these members are usually carried by the elite class of the village, households with more experience with these members are considered to be elite households.[11]

Measures of competence

There are various perspectives on how to measure and define the competence of politicians. Previous studies often used individual income (Besley et al., 2014 and Dal Bo et al., 2017), educational achievement (Baltrnaite et al, 2014), cognitive skills (Besley et al., 2014), or non-cognitive ability measured by Big five (Dal Bo et al., 2017). This study

[11] In addition, we use the primary occupation of the household" and household income as representation measures. Since the results are similar to the results of household head and land holding, we do not show these results in this study.

uses the following measures. First is cognitive skills as rated through quizzes that include mathematical calculations, reading ability in Kannada and English, reasoning capability, and memorizing ability. The questionnaire and detailed explanations of these variables are provided in the Appendix.[12] We constructed an index of cognitive ability by giving equal weight to the scores on the four items. In addition, we focus separately on Kannada reading abilities, which we consider to be the most important of the four items, since legislators are often required to read documents in their actual work in politics. Second measure is the number of years of formal education received. Third is non-cognitive skills such as self-assessed leadership scores and locus of control.[13] The questionnaire and detailed explanations of these variables are provided in the Appendix.

2.4. Randomness check

To assess the randomness of reservation assignment, Table 1 demonstrates a balance check by comparing women reserved constituencies and general constituencies on the following measured covariates. The first check is the difference in household characteristics between general and women reserved constituencies such as HH size, SC households, average age, education year, and the number of women. The second one is related to women empowerment, such as level of education, and a dummy variable for whether the woman surveyed works or not. Third, village characteristics such as total number of households, distance to town, and share of irrigated areas are also examined for checking the balance between the two types of constituencies. Fourth, we check the reservation status for other groups and the historical record of women reserved constituencies. Reservation for women was introduced in 1993 and the experience of women members might be different among villages. Although it is difficult to make a complete comparison because of several changes in the constituencies and lack of official records of reservation assignment, we examined the differences in the history of each village in terms of being a general or women reserved constituency.

All of covariates, except for general or women reserved constituency history, are statistically insignificant. Regarding the historical records of the women reserved constituencies from 2000[14], it is confirmed that they were randomly determined until the 2015 elections. However, beginning with the 2020 election, many constituencies that

[12] We referred to Laajaj and Macours (2017) and Iyer and Mani (2019) to formulate the questionnaires related to cognitive skills and self-assessed leadership scores.
[13] In addition, we use the individual income and occupation of the household for competence measures. Since there are no differences in selection between two types of constituencies, we do not show these results in this study.
[14] We could only collect the information of reservation status from 2000 elections.

were reserved for women in 2015 became general constituencies in 2020, suggesting that women constituencies were partly determined by rotation in 2020. Finally, to assess whether there is any difference in the degree of political power or presence of elite households between general constituencies and women reserved constituencies, we also check the differences between them in terms of the number of leadership experiences and the level of education of the head of households, and find no statistically significant differences.

3. Comparison of quality between women and general constituencies

3.1. Comparison based on distribution

Figure 1 (a)-(c) depict the distribution of representation measures. The left figure in Figure 1 shows the distribution of representation measures of villagers' and candidates' households in the general constituencies, while the right figure shows the distribution of the representation measure of villagers' and candidates' households in the women reserved constituencies. Figure (a) shows the results of the total amount of land area that each surveyed household owns. The distribution of land holding area is almost the same between general constituencies and women reserved constituencies both for villagers and candidates. The distribution of number of experiences in a leadership position is shown in Figure (b). The households of women candidates without experience in local government or milk cooperatives are larger than those of candidates in general constituencies. As shown in Figure (c), the distribution of education of household's head among candidates is skewed right, but the difference between candidates and villagers are similar between the two types of constituencies.

Figure 2 (a) – (d) show the distribution of competence measures. In this study, we mainly use the cognitive score, Kannada reading skills, education, and self-assessed leadership score, as competence measures. The figures on the left show the distribution of scores for villagers including both genders, men villagers, and candidates in the general constituencies. Since some of the candidates in the general constituencies are women but most candidates are men, the distribution of men villagers is shown for comparison. The figures on the right show the distribution of scores for villagers including both genders, women villagers, and women candidates in the women constituencies.

Figure 2 (a) shows the distribution of cognitive scores. There is no apparent wide difference in the distribution of villagers between the general and women reserved constituencies. In contrast, the distribution of men villagers is more skewed to the right than that of women villagers, indicating that men generally score higher. Candidates in

the general constituencies have a more right-biased distribution shape than men villagers, indicating that candidates tend to score higher than men villagers. Women candidates also score higher than women villagers. Although some women candidates are found to have lower scores, the percentage of higher scores does not appear to be less than that of candidates in general constituencies.

Figure 2 (b) shows the distribution of scores on a five-point scale for reading ability in Kannada. Approximately half of the women villagers score 1, indicating that they cannot read at all. A higher percentage of women candidates can read more fluently than the villagers, but in contrast, approximately 30% cannot read at all. Figure 2 (c) shows the distribution of educational achievement. The tendencies are similar to those for Kannada language reading ability. Nearly half of the women villagers have no education, but the proportion of women candidates with no education is smaller, at less than 20%. On the other hand, the percentage of women candidates with higher education is smaller than that of candidates from the general constituencies. Women candidates have a remarkably higher percentage of those with 10 years of education compared to women villagers. Figure 2 (d) shows the scores for self-assessed leadership, and the graph is skewed to the right because most people tend to say they have leadership skills. Candidates in general constituencies have higher leadership scores. A higher percentage of women candidates also achieved higher scores, although not as high as men candidates.

3.2. Comparison based on regression analysis

To explicitly compare the differences in selection of politicians between the two types of constituencies, we perform a regression analysis. First, we define the following selection measure based on Dal Bo et al. (2017):

$$S_c^x = \sum_{k=1}^{K} p_{k,m} k - \sum_{k=1}^{K} p_{k,v} k$$

where S_c^x denotes the degree of selection based on index x in constituency c. x is a competence measure or representation measure with K categories.[15] k is the kth category, where a higher k value means more competitive and higher socioeconomic status. $p_{k,m}$ is the proportion of candidates who belong to category k among all candidates in

[15] How we define categories k from 1 to K depends on the variables. Education is also assigned in descending order of educational attainment. For cognitive score and land holding area, categories are created using quintiles of 20 and quintiles of 5, respectively, based on the distribution of villagers in the survey. The values for leadership scores and number of leadership experiences are used as categorical variables.

constituency c. $p_{k,v}$ is the proportion of villagers who belong to category k among all villagers in constituency c.

For example, since k takes a higher value the higher socioeconomic household a candidate belongs to, if the proportion of people belonging to high k is greater for the candidate than for the villagers, the first term is larger than second term. In this case, S is a positive value. Conversely, if the proportion of high k values is greater for villagers compared to candidates, S takes on a negative value. While section 3.1. compare the distribution of candidates and villagers by aggregating the observations for all constituencies, the analysis using S compares the distribution of candidates and villagers for each constituency. Thus, differences in the competitiveness and socioeconomic strength of candidates relative to villagers are evaluated by their relative position in the village. As we saw in the distribution in section 3.1., overall, candidates have higher socioeconomic status and higher competitive indicator values than villagers, so S is predicted to be positive on average.

The key consideration here is with whom to compare the distribution of candidates. When comparing candidates to villagers, including both men and women, it is expected that men candidates will be selected from among villagers who are more qualified and have a higher S since women candidates generally have a lower level of competence measure than men candidates. On the other hand, women candidates in women reserved constituencies are selected from among women, so perhaps candidates in women reserved constituencies should be compared to women villagers. Also, since candidates in the general constituencies are traditionally selected from among men, and in fact more than 90% of candidates in our data are men, candidates in the general constituencies may need to be compared to the distribution of men. Therefore, we define the comparison group of candidates in two ways: as each candidate and all villagers, and as men candidates and men villagers in the general constituencies, and women candidates and women villagers in the women reserved constituencies, and calculate S for each.

To investigate the potential difference in selection mechanism between women and general constituencies, we estimate the following model:

$$S_c = \beta_0 + \beta_1 women\ reservation_c + gp + \mu_c \quad (1)$$

where $women\ reservation_c$ is a dummy variable for women reserved constituencies, and gp is GP's fixed effects. If the S is calculated related to representation and β_1 is estimated as positive, this would imply that in the women reservation more elite households are more likely to be political candidates. If S is based on the competitive

measure and β_1 is estimated as positive, in the women reserved constituencies, candidates are more positively selected compared to that in the general constituencies.

The results for representation are shown in Table 2. The mean row shows the mean values of the dependent variables, S. Since Ss are positive in all columns, on average, many candidates tend to belong to relatively higher socioeconomic categories. As shown in column 3, the coefficient of women reservation is negative and statistically significant on leadership experience. This negative coefficient imply that women candidates are less likely to belong to households with much leadership experiences compared to candidates in general constituencies. As for land holdings, while the coefficient of women reservation is negative, it is not significant. The coefficient of women reservation on household head's education is positive but insignificant.

Next, we restrict our analysis only to candidates who won their respective elections in order to investigate the selection effects through elections. In this analysis, we exclude the constituencies where we could not survey to the winner of the elections. The coefficients of women reservation are almost same as these before restriction sample to winners. Thus, this result implies that a socioeconomic affiliation may not matter in the election outcomes.

The results of competence measure are shown in Table 3. The coefficient of women constituencies on cognitive score is negative in column 1 of Panel A, although not statistically significant. This implies that candidates in the general constituency are more cognitively competent than those in the women constituency from among the villagers. This negative effect of women reservation may be due to the fact that in the women constituencies, candidates were originally selected from women with a lower overall distribution of cognitive ability.

In column 2, since women candidates are selected from women in the women reserved constituencies, women villagers as the reference group for comparison of the distribution of candidates in women constituencies. Regarding in the general constituencies, we assume that candidates are selected from the men villagers for the general constituencies and compare the men candidate distribution with the men villager distribution. In this analysis, we exclude the women candidates in general constituencies and constituencies where we could not survey to the winner of the elections. The dummy for the women reservation would have a negative (positive) coefficient if men (women) candidates are selected more meritocratically than women (men) candidates. Our results in column 2 show that women reservation is positive and statistically significant. This imply that meritocratic selection is taking place in the sense that the women candidates who decide to run for office generally have higher cognitive score among women

villagers.

In column 3, we restrict our analysis only to candidates who won their respective elections in order to investigate the selection effects through elections. The coefficient is larger than that in column 2. Thus, it is found that cognitively competence exhibits a greater weight in the winning candidates in women reserved constituencies compared to the winners of the elections in the general constituencies.

The results for Kannada reading skills are as same as these for cognitive score as shown in columns 4-6 of Panel A. The results for education and self-assessed leadership score are shown in Panel B. The coefficients on education become negative to positive after the reference groups are changed from all villagers to villagers of the same gender, while these are not significant. The coefficients on self-assessed leadership score are as same as those for cognitive score. When reference group is villagers of the same gender, the coefficient of women reservation is positive, and when candidates are restricted to winner of the elections, the coefficient of women reservation is positive and statistically significant. Thus, leadership exhibits important in the winning candidates in women reserved constituencies compared to the winners of the elections in the general constituencies. These results imply that although gender quota promotes the political participation of non-elite classes, meritocratic selection exist in the women reserved constituencies.

4. Elections

4.1. The effects of candidates' quality on election results

To explore the selection of council members through voting, we use the data from election results. According to the results on the candidates who won the elections shown in Table 3, it appears that competitive indexes such as cognitive ability or education affect the election results more in the women reserved constituencies than in the general constituencies. In this section, we estimate the following model to examine the difference in the relationship between representation or competitive measure of candidates and election results.

$$elected_{pc} = \alpha_0 + \alpha_1 Index_{pc} + \alpha_2 Index_{pc} \times women\ reservation_c + gp_g + \epsilon_{pc} \quad (2)$$

where $elected_{pc}$ is a dummy variable whether a candidate p in constituency c won the 2020 elections or not. $Index_{pc}$ is the competitiveness or representation measure of candidate p. The index is normalized using the mean and standard deviation of the index

among each reservation type as follows:

$$normalized\ index_{pr} = \frac{(index_{pr} - \mu_r)}{\sigma_r}$$

To estimate the different effects of the index between the two constituency types, an interaction term between each normalized index and women reservation is added to explanatory variables.

The results are shown in Table 4. The coefficients of the *index* represent the effects of each index on the probabilities of winning, while interaction term between index and women reservation represents the difference effects of each index on the probabilities of winning between women reserved constituencies and general constituencies. The coefficient of cognitive score is negative (in column 1), while the coefficient of the interaction term is positive and statistically significant. This means that in women reserved constituencies, candidates with higher cognitive scores are more likely to win the elections. The results were similar for Kannada reading skills variable and self-assessed leadership score. On the other hand, no indexes related to household social and economic status such as land holding area, leadership experience and head's education, were found to be statistically significant in relation to likelihood of winning an election in either type of constituency. This implies that socioeconomic status does not impact election results. These results are consistent with the results discussed in section 3.1, where the competence measure is important in the election of council members in women's constituencies, but the representation measure is not.

4.2. Voter knowledge of candidate abilities

The analysis in the previous section shows that people vote in women constituencies with a focus on cognitive ability. But are people really voting based on their knowledge of women's competence? Women are less likely than men to hold leadership positions, and it may be difficult for voters to know as much about women candidates as they do about men candidates. To investigate whether voters are familiar with candidates' abilities, we examine voters' perceptions of which candidates are more competent. We first asked respondents to select the most important qualities of a candidate from a list of seven items: education, intelligence, income/social status, leadership, willingness to enact reforms, a concern about the poor or equality, and "acceptability", which encompasses a candidate's overall perceived kindheartedness and goodwill towards everyone. We then asked them

to rank the candidates in each constituency on the selected items. The same questions were asked for the second most important item and the third most important item.

Since our survey includes variables for the seven items listed above for each candidate, we can estimate the candidate's rank on each item. Specifically, for intelligence, we use cognitive ability and Kannada reading ability; for education, we use years of education; for social status, we use income, land holdings, and number of leadership experiences; for leadership, we use self-assessed leadership score; and for willingness to enact reforms, we use locus of control. The concern for the poor/equality and acceptability variables are excluded from the analysis here because they have quite limited variance. While the ways in which respondents conceive or measure these qualities may not exactly correspond to the standards we use in our estimations, our estimations can still serve as rough proxies. Using these proxy indicators, we measure the accuracy of respondents' knowledge of the candidates by comparing our estimated rankings to the respondents' rankings.

To examine the difference in degree of accuracy between voters' perceptions about candidate attributes between women reserved constituencies and general constituencies, we define dummy variable $correct_v$ to indicate whether a voter v correctly guesses the best candidate, i.e. the highest ranking candidate according to our estimations, for each item. Then, with "*correct*" as the dependent variables, we estimate the following regression equation[16]:

$$correct_v = \delta_0 + \delta_1 women\ reservation_c + \delta_2 gap_c + \delta_3 number\ of\ candidates_c + gp + \omega_{vc} \quad \ldots..(3)$$

where gap_c is defined as the difference in score between first ranked candidates and second ranked candidates since it is difficult for voters to answer correctly if the gap is smaller. we controlled for the size of the pool of candidates that respondents needed to consider with the variable $number\ of\ candidates_c$ which is the number of candidates in constituency *c,* since it is more difficult for voters to answer correctly if the number of candidates is higher.

Before examining the impact of women reservation on *correct*, we identify what voters consider to be important qualities among seven items by using regression analysis.

[16] If there is only one candidate in the constituency or only one candidate surveyed in the constituency, the respondents who belong to such constituencies are excluded from the sample. If a candidate who was not included into our survey data was mentioned in response to a ranking question, the correct answer is determined by excluding that candidate.

The dependent variables are defined by whether voters ranked each of the seven items as the first to third most important. The results are shown in Table 5. As the mean statistics indicate, voters consider leadership, intelligence, and concern for poor/equality as the most important qualities compared to other items. The coefficient of women reservation is negative on leadership, while it is positive on willingness to enact reforms.

The results based on equation 3 are shown in Table 6. The coefficients of women reservation are positive and statistically significant on education and cognitive score. These results imply that voters understand candidates' abilities in women reserved constituencies better than those of candidates in general constituencies.

5. Women's voice

The results described above show that qualified women with high cognitive ability are often selected as politicians in the women reserved constituencies. However, this does not guarantee that women are able to exercise their authority as politicians. One major concern is that they may be "proxy candidates", i.e. they are actually representing the positions of their fathers, husbands, etc., and have no real authority. This issue of proxy candidates is often raised as a concern about quotas for women (Chattopadihya and Duflo 2004; John 2007). This section examines the proxy candidates among women using the family's previous candidacy history and the measure of women's voice in household decisions.

It is difficult to actually identify whether a women candidate is a proxy candidate.[17] In this study, we focus on one of the attributes of proxy candidates: to what degree their family members have exhibited political ambitions and have run for local government elections. For men who want to become politicians, reservation for women is an opportunity to get involved in politics through their women relatives. We asked each candidate about his or her family's previous history of running for local council. Table 7 summarizes the differences in the candidacy history of the candidates and their families in the general, and women reserved constituencies. The first row represents the candidacy history of candidates' family including candidates themselves. Approximately half of the candidates' family in both the general and women reserved constituencies have had candidacy experience, and the difference is not statistically significant. On the other hand, the second row shows the candidacy history of only the candidates. While 28% of the candidates in the general constituencies have run for office themselves, only 15% of the candidates in the women reserved constituencies have run for office. Looking at the

[17] Karekurve-Ramachandra & Lee (2022) used lack of a bank account and candidates' occupation as housewife for identifying "proxy candidates".

history of family members other than the candidate, 42% of women candidates have previous experience running in an election, which is higher than in the general constituencies. These results indicate that men candidates have more experience running for office themselves, while women candidates have family members with more experience running for office. Although this tendency is not evidence of proxy candidates, it does indicate that for women candidates, their family's experience in the political arena has a significant impact on their decision to run for office.

Next, we compare women candidates and women villagers in terms of women's voice in household decisions. The women's voice in household decisions was measured with the following three questions;

1. I can decide to spend money on medical care for myself.
2. I can take a decision on spending money on education of my daughter.
3. I can take a decision on spending money on household repairs.

For each question, respondents reported their degree of agreement with each statement using a three-point scale (agree, neither agree nor disagree, and disagree). We assigned a value of 2 for agreement, 1 for neither, and 0 for disagreement. If a women candidate is motivated and runs for office of her own volition, she is expected to have a higher value than the average woman in the village. On the other hand, if the candidate is a proxy candidate, the candidate's voice in the family would be curtailed. The results are shown in Panel B of Table 7. The score of voice in household decisions for women candidates is lower than that for women villagers. Although more women are running for office from non-elite caste groups as shown in previous sections, politicians in general tend to be from elite caste groups. Women from lower caste groups work outside the home and have a variety of interactions with people outside the family, whereas women from elite groups are less mobile and may not be involved in decision-making within the family. The result of this study is consistent with other studies showing that upper castes face greater restrictions in mobility and interacting with others in India (Luke & Munshi 2011; Cassan & Vandewalle 2021; Field et al 2010). While these results do not provide evidence of proxy candidates, there is no suggestion that women candidates were strong-willed and made their own choices to be potential candidates.

The analysis in this section suggests that women candidates tend to run on behalf of their families and become proxy candidates who represent the will of their families. However, the analysis in this study only shows an average trend and does not negate the existence of women who run for office of their own volition and are willing to reform

society. In any case, even if women candidates are competent, it may not be enough to give them seats in legislatures to exercise authority in a male-dominated political arena.

6. Concluding Remarks

This study investigates the impact of gender quotas on representation and candidate competitiveness. We focus on small Indian constituencies with a potentially small number of women candidates and find the following results. First, gender quotas encourage participation in politics by non-elite classes with little leadership experience in the village. Thus, gender quotas may not accelerate elite politics, but rather open up opportunities for political participation for many households. Second, we find that gender quotas do not impede competitiveness, but rather women are selected more meritocratically in terms of cognitive ability. Although concerns have been raised that expanding political opportunities to non-elite groups may inhibit meritocratic selection, our study indicates no evidence to support this concern.

While talented women can be politicians in gender quota systems, whether women are able to effectively exercise their abilities as a council member is another important issue. Mori et al. (2022), which included the same region in their analysis, showed that women council members perform as well as men council members in the allocation of many public goods and the implementation of government projects, but perform worse than men council members on the distribution of water facilities. This study raised the possibility of "proxy candidates" who decide to run for office at the behest of their families as a factor that prevents competent women from exercising power. Future research is needed to determine what institutional designs are desirable to ensure that the most qualified women are elected and that they are empowered to perform to their full potential.

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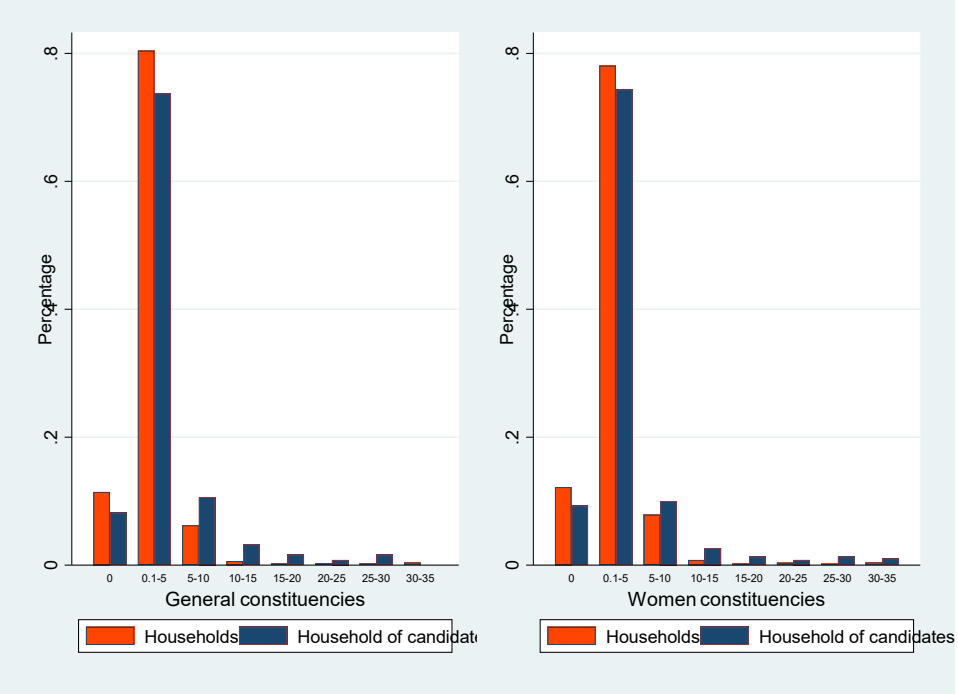
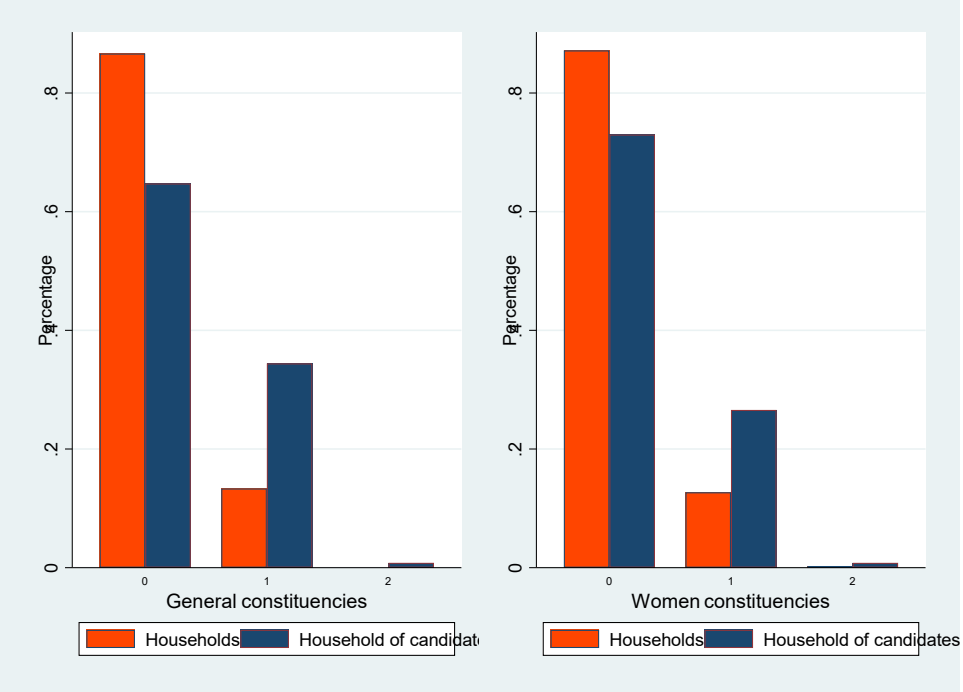
Figure 1. Distribution of variables related to representation

(a) Total land holding



(b) Leadership experiences



(c) Education of household head

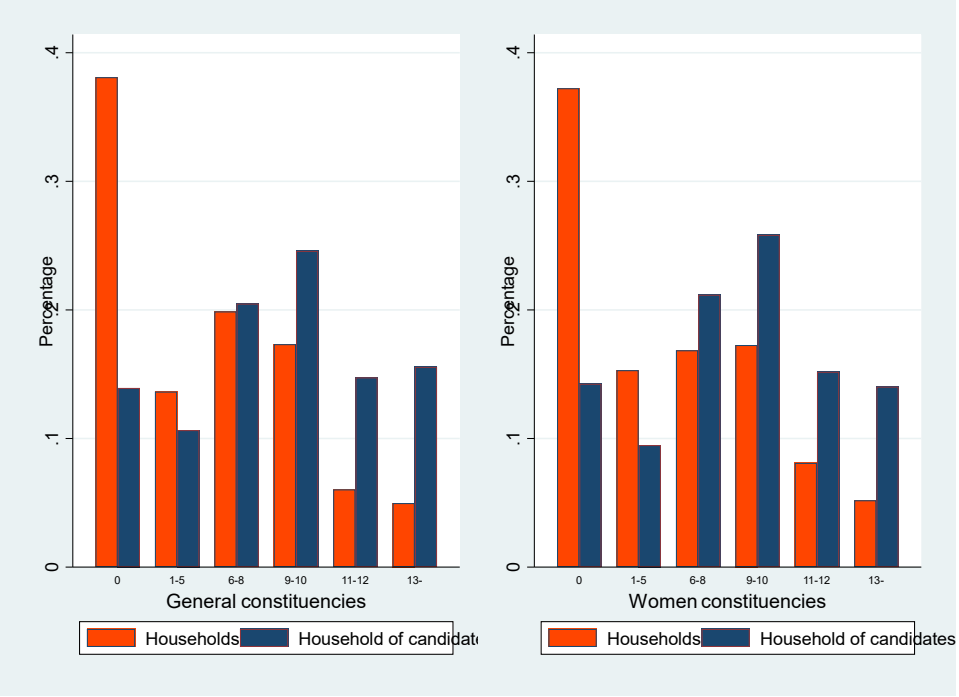
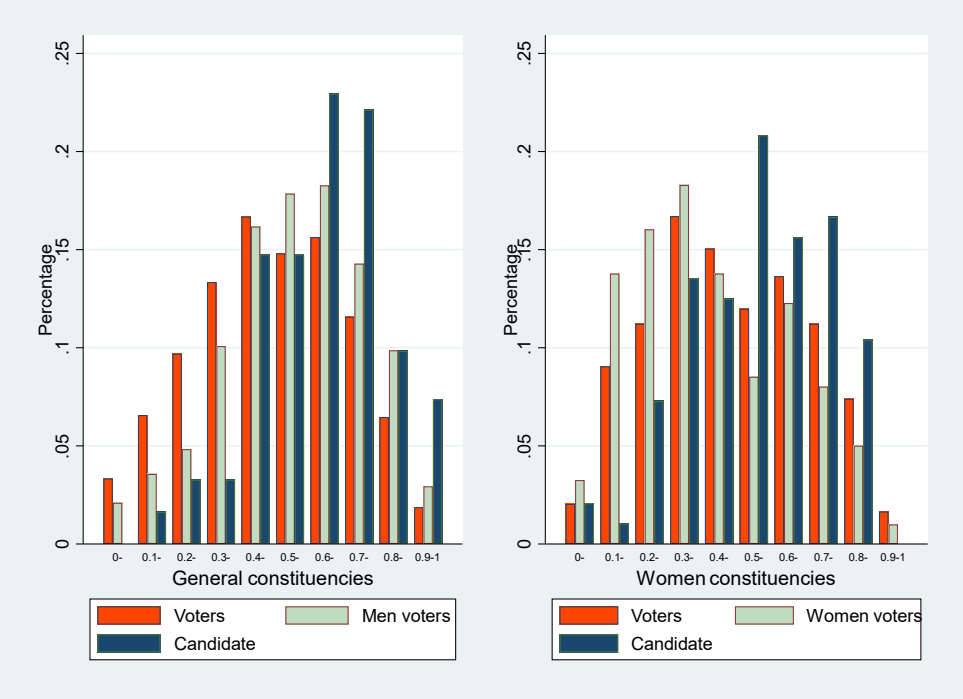
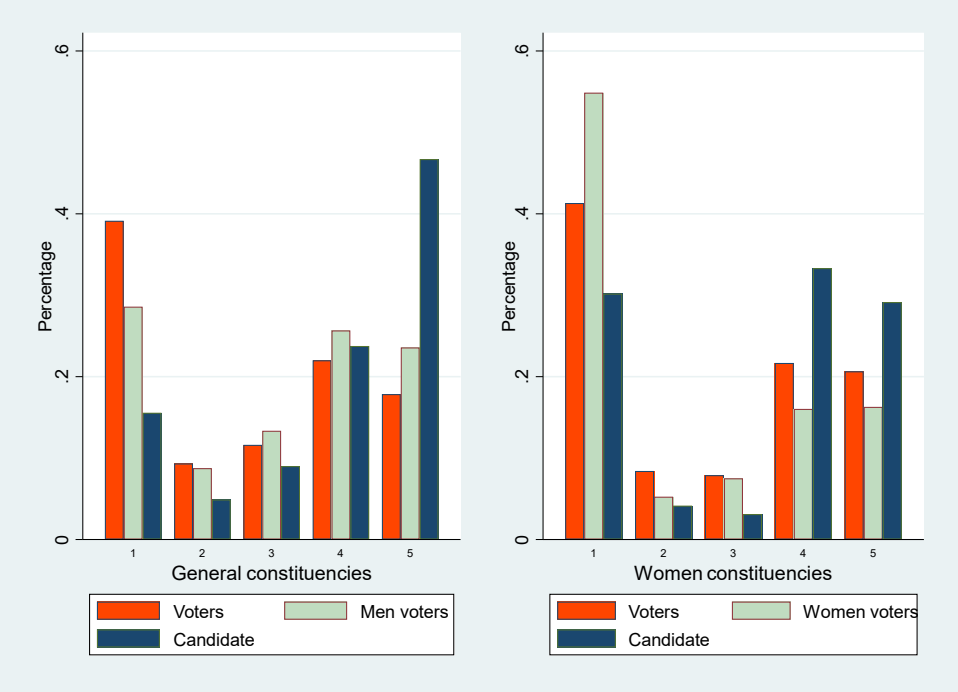


Figure 2. Distribution related to competitiveness

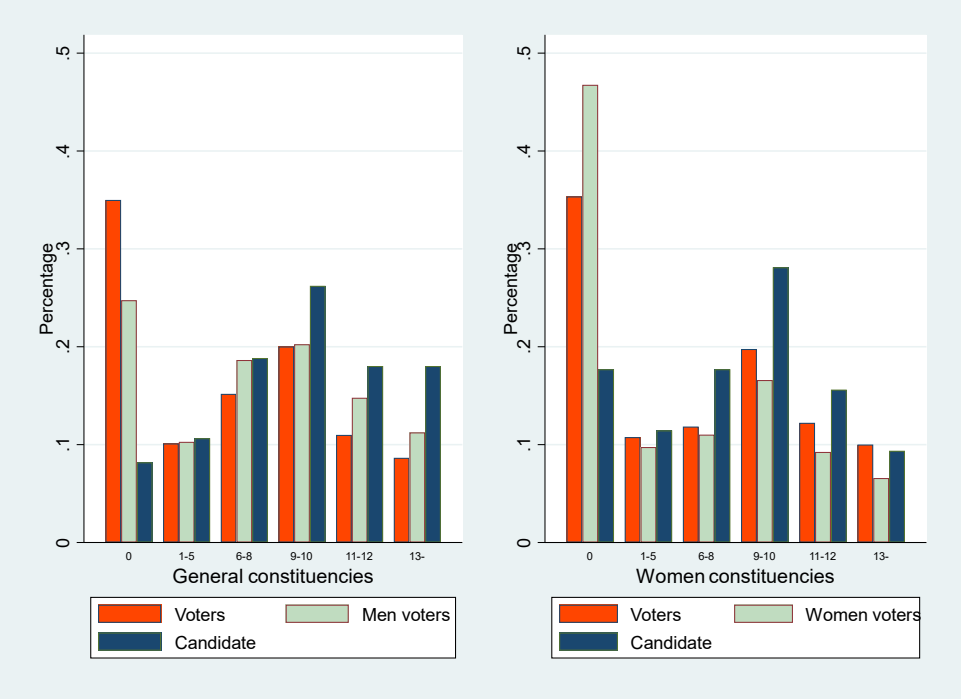
(a) Cognitive score



(b) Kannada reading score



(c) Education



(d) Self-assessed leadership score

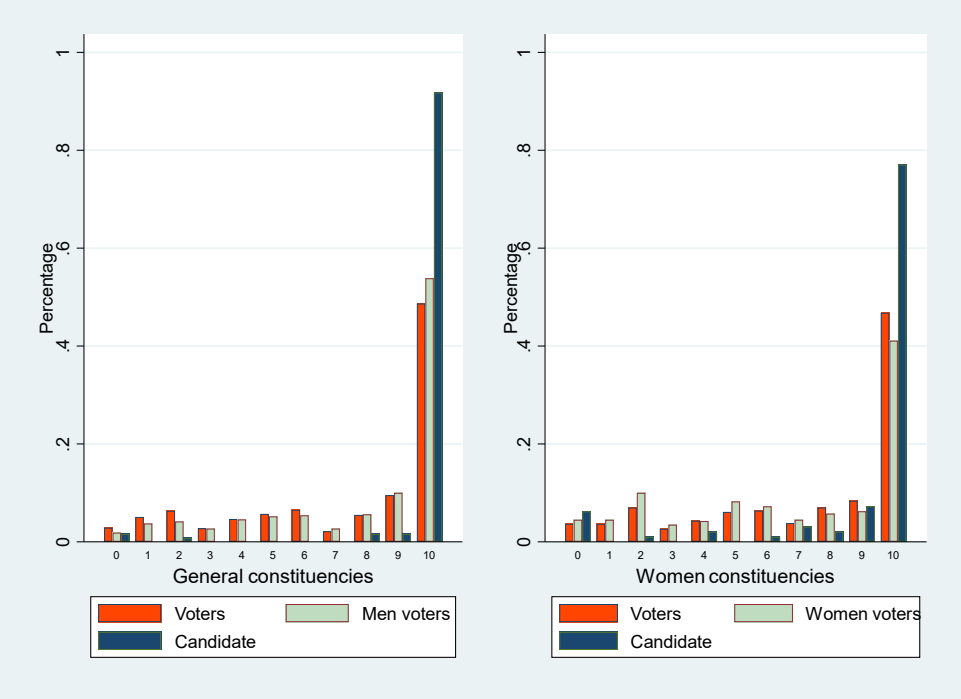


Table 1. Randomness check

	General Constituencies		Women constituencies		
	N	mean	N	mean	difference
Variables		(1)		(2)	
Household size	530	4.77 (2.31)	439	4.96 (2.30)	-0.21 (0.19)
SC household	530	0.23 (0.42)	439	0.22 (0.41)	0.06 (0.05)
Average age	530	37.62 (11.74)	439	37.71 (11.36)	0.11 (0.84)
Number of women	530	2.32 (1.39)	439	2.48 (1.33)	-0.19 (0.12)
Experience of SHG	530	0.49 (0.50)	439	0.55 (0.50)	-0.07 (0.05)
Year of education	1770	6.14 (5.27)	1545	6.27 (5.39)	-0.11 (0.33)
Employment status	906	0.51 (0.50)	807	0.46 (0.50)	0.03 (0.04)
Year of education of women	873	4.99 (5.17)	775	4.99 (5.27)	0.25 (0.29)
Total households	53	99.52 (39.29)	44	102.21 (30.66)	-5.06 (7.46)
Distance to nearest town	53	5.77 (4.15)	44	5.95 (4.17)	-0.46 (0.79)
Share of irrigated area	53	0.30 (0.18)	44	0.26 (0.18)	-0.05 (0.04)
Reservation for SC/ST/OBC	53	0.42 (0.50)	44	0.52 (0.51)	0.03 (0.12)
History of reservation, 2000-2015	53	2.45 (1.10)	44	1.84 (1.26)	0.95 (0.28)
Hisotiry of reservation, 2000-2010	53	1.68 (0.96)	44	1.70 (1.15)	0.11 (0.24)
Land holdings	530	2.51 (3.14)	439	2.47 (2.91)	0.08 (0.28)
Political Experience	530	0.11 (0.31)	439	0.10 (0.30)	0.00 (0.03)
Education year of head	530	5.08 (4.81)	439	5.41 (4.95)	-0.04 (0.44)

Note. Columns (1)-(2) report means with standard deviations in parenthesis. Column (3) reports tests of differences of means across columns (1) and (2). Standard errors are in parentheses. Tests are based on regressions with GP fixed effects and standard errors are clustered by GP.

Table 2. The impact of women reservation on representation

	Land holding		Leadership experience		Head's education	
	(1)	(2)	(3)	(4)	(5)	(6)
women reservation	-0.32	0.37	-0.21*	-0.23+	0.34	0.54
	(0.31)	(0.40)	(0.1)	(0.13)	(0.33)	(0.44)
Mean	0.4	0.73	0.21	0.21	1.1	1.16
N	97	92	97	92	97	92

Note. Standard errors clustered at GP in parentheses. All specification a historical record of women reserved constituencies, and GP fixed effects. ** p<0.01, * p<0.05, + p<0.1

Table 3. The impact of women reservation on competence.

Panel A. Competence measured by cognitive score and Kannada reading abilities.

	Cognitive Score			Kannada reading abilities		
	(1)	(2)	(3)	(4)	(5)	(6)
women reservation	-0.91	2.11+	3.65*	-0.16	0.66+	1.32**
	(1.07)	(1.17)	(1.46)	(0.33)	(0.36)	(0.44)
Mean	2.84	2.84	1.93	0.85	0.81	0.82
N	97	92	92	97	92	92

Panel B. Competence measured by individual education and self-assessed leadership score.

	Education			Self-assessed leadership score		
	(1)	(2)	(3)	(4)	(5)	(6)
women reservation	-0.41	0.28	0.74	-0.49	0.55	1.13+
	(0.33)	(0.32)	(0.44)	(0.45)	(0.52)	(0.56)
Mean	0.85	0.86	0.92	1.97	1.95	2.18
N	97	92	92	97	92	92

Note. Standard errors clustered at GP in parentheses. All specification a historical record of women reserved constituencies, and GP fixed effects. ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 4. The correlation between candidates' quality and probability of winning.

Index	cognitive score	Kannada reading abilities	education	self-assessed leadership	total land	leadership experience	head education
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
index	-0.12*	-0.09	-0.02	-0.03	0.02	0.04	-0.00
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
index*women	0.19*	0.21*	0.13	0.16+	-0.07	0.00	0.04
reservation	(0.08)	(0.09)	(0.09)	(0.08)	(0.09)	(0.09)	(0.09)
Mean	0.44	0.44	0.44	0.44	0.44	0.44	0.44
N	209	209	209	209	209	209	209

Note. Standard errors clustered at GP in parentheses. All specification a historical record of women reserved constituencies, and GP fixed effects. ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 5. The difference in important quality between general and women constituencies.

	(1) education	(2) intelligence	(3) status/income	(4) leadership	(5) willingness to reform	(6) caring for poor	(7) acceptability
women reservation	-0.05	0.02	-0.00	-0.10**	0.07+	0.02	0.03
	(0.04)	(0.04)	(0.01)	(0.03)	(0.04)	(0.04)	(0.05)
Mean	0.38	0.49	0.05	0.60	0.36	0.72	0.39
N	1747	1747	1747	1747	1747	1747	1747

Note. Standard errors clustered at GP in parentheses. All specification include GP fixed effects.

** p<0.01, * p<0.05, + p<0.1

Table 6. The difference in voters' knowledge about candidates' quality

Quality	education	intelligence			status/income		leadership	willingness to reform
Index	education	cognitive	Kannada reading	HH income	leadership experience	head's education	self-assessed leadership	locus of control
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
women reservation	0.44**	0.26*	0.14	-0.36+	-0.01	0.25	-0.19+	0.11
	(0.10)	(0.10)	(0.10)	(0.21)	(0.12)	(0.35)	(0.10)	(0.18)
number of candidates	-0.01	0.05	-0.01	-0.01	0.09	0.07	0.00	-0.11
	(0.07)	(0.09)	(0.10)	(0.25)	(0.13)	(0.26)	(0.05)	(0.09)
Mean	0.73	0.39	0.70	0.53	0.75	0.53	0.90	0.71
N	483	596	596	68	68	68	713	452

Note. Standard errors clustered at GP in parentheses. All specification include a difference between the first-place candidate and the second-place candidate, a historical record of women reserved constituencies, and GP fixed effects. ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7. Family's previous candidacy history

	Candidates in general constituencies (1)	Candidates in women reserved constituencies (2)	Difference (1)-(2)
Any family members	0.48	0.57	-0.09
	(0.05)	(0.05)	(0.07)
Only candidates	0.28	0.15	0.12**
	(0.04)	(0.04)	(0.06)
Any family members except candidates	0.21	0.42	-0.21**
	(0.04)	(0.05)	(0.06)
N	120	98	218

Note. Standard errors reported in parentheses. ** p<0.01, * p<0.05, + p<0.1

Table 8. Women's voice in household decision making

	Women villavers (1)	Women candidates (2)	Difference (1)-(2)
Women's voice in household decision making	2.95	1.83	1.11 **
	(0.10)	(0.27)	(0.30)
N	677	80	757

Note. Standard errors reported in parentheses. ** p<0.01, * p<0.05, + p<0.1

Appendix

A1. Definition of Variables

1. Cognitive Score

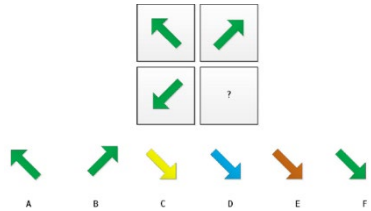
Cognitive ability consists of four scores: the first is calculation ability, the second is reading ability in English and Kannada, the third is reasoning ability, and the fourth is memorization ability. The example of quizzes for each is as follows.

Examples.

(a) calculation: 2Rs. + 3Rs =

(b) reading ability in English: It was a Sunday. Arun and Rohit spent the day by the Vasanth Nagar swimming pool. ….

(c) reasoning ability



(d) memorization ability

Respondents are requested to memorize these numbers; 4, 2, 7, 3, 1.

2. Self-assessed leadership score

The self-assessed leadership score is constructed using the questions in Table A1. We added up all questions, assigning 2 to high confidence, 1 to somewhat confidence, and 0 to no confidence.

Table A1. Questions of self-assessed leadership score.

1.	Determine the direction of activities for a group	1) high confidence 2) somewhat confidence 3) no confidence
2.	Change attitudes and behaviors of group members	1) high confidence 2) somewhat confidence 3) no confidence
3.	Choose group members to build an effective and efficient team	1) high confidence 2) somewhat confidence 3) no confidence
4.	Delegate specific tasks to specific members identify own strengths and weaknesses	1) high confidence 2) somewhat confidence 3) no confidence
5.	Get things done	1) high confidence 2) somewhat confidence 3) no confidence