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Together We Will: Experimental Evidence on Female Voting Behavior in Pakistan[†]

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In many emerging democracies women are less likely to vote than men and, when they do vote, are likely to follow the wishes of male household and clan heads. We assess the impact of a voter awareness campaign on female turnout, candidate choice and party vote shares. Geographic clusters within villages were randomly assigned to treatment or control, and within treated clusters, some households were not targeted. Compared to women in control clusters, both targeted and untargeted women in treated clusters are 11 percentage points more likely to vote, and are also more likely to exercise independence in candidate choice, indicating large spillovers. Data from polling stations suggests that treating 10 women increased female turnout by about seven votes, resulting in a cost per vote of US$3.1. Finally, a 10 percent increase in the share of treated women at the polling station led to a 7 percent decrease in the share of votes of the winning party. (*JEL* D72, J12, J16, O12, O17, Z13)

A basic premise of representative democracy is that those who are subject to policy should have a voice in its making. Although women account for half of the world's population, they have historically lagged behind men in legal and political rights. In recognition of this, during the twentieth century, suffrage was extended to women and de jure rights to political participation were granted.

Despite these improvements, women are still far less likely than men to stand for public office, even in developed countries with older democracies. In emerging democracies, they are also less likely to participate in the electoral process as voters or to exercise independence in candidate choice when they do vote. Women

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are, for example, far more likely than men to report voting in accordance with the preferences of a caste, clan, or household head (Congress of Local and Regional Authorities of Europe (CLRAE) 2002). In Pakistan, women constitute only 44 percent of registered voters nationally, and are 13 to 17 percentage points less likely to vote in an election (Government of Pakistan 2010). By international standards, turnout in Pakistan is one of the lowest (International IDEA 2002).

While women's relative absence from elected public office has received considerable policy attention in recent years, there have been fewer attempts to understand or reduce barriers to women's participation as voters. Although many factors affect the decision to vote, women in emerging democracies may face distinct barriers to participation. First, costs of participation may be too high, whether due to traditions or cultural stereotypes that discourage the exercise of own preferences, or mobility constraints that limit participation. If there are expectations of voter intimidation or violence, personal security concerns may also loom larger among females. Second, husbands may not want their wives to vote, or may seek to control whom they vote for, if this maintains their bargaining power within the household. Third, women may have fewer or poorer sources of information about the significance of political participation or the balloting process, perhaps due in part to illiteracy and limited mobility. Lack of information may also reinforce stereotypes that further disengage women from public life.

Female political participation is important because the mere act of participation may serve to weaken pejorative perceptions about female efficacy and enhance women's engagement in public life even if attitudes and social mores tend to change slowly (Beaman et al. 2009, Esteve-Volart and Bagues 2012, and Mansuri and Rao 2013).

We test these ideas by conducting a field experiment that provided information to women on the balloting process and the importance of voting, through a door-to-door nonpartisan voter information campaign just before the 2008 national elections in Pakistan.

In this context, women face substantial barriers to participation. Zia and Bari (1999) and Bari (2005), for example, report that women are often not registered as voters because they face opposition from male household heads and that female turnout is low because women lack knowledge about the electoral system and about voting.

Because adult literacy rates are quite low among rural women, the campaign was developed as a set of simple visual aids with two messages: the importance of voting, which focused on the relationship between the electoral process and policy; and the significance of secret balloting, which explained the actual balloting process. Targeted women received either the first message or both messages, allowing us to test whether knowledge about the voting process, including the fact that ballots are cast in an environment of secrecy, enhances female participation and independence in candidate choice.

The experiment was conducted is rural Sindh. Study villages were divided into geographical clusters, such that each cluster was entirely inside the catchment area of a polling station. Clusters were then randomly assigned to one of the two treatments or held as controls. The field-based assignment was designed to approximate

random assignment (i.e. equal probability of treatment assignment), but the geographical location of clusters and the overall number of clusters in the village led to unequal probabilities of assigning a particular cluster to a particular treatment.

Since voting is likely to be influenced by the behavior of those in one's peer group or social network, the measurement of information spillovers was a key aspect of the design.[1] As a result, only a *subset* of sample households within treated clusters were targeted for the information campaign. This allows us to measure information spillovers without confronting the usual set of identification problems (Manski 1993, 1995). Since clusters were defined entirely on geography, we have random variation in the number of targeted women in any sample polling station. We exploit this variation to study the impact of the campaign on turnout and party vote shares at the polling station level, by gender, using official election data.

We find that turnout increases between 9 and 13 percent for targeted women in treated clusters compared to women in control clusters, with larger and somewhat more precisely estimated effects for women exposed to both messages. While we lack balance on a few variables, the inclusion of controls does not affect the results. More importantly, we find comparable turnout rates for untargeted women in treated clusters, indicating substantial geographical spillovers.[2] Since cluster boundaries are arbitrary, we use the GPS location of households to estimate spillovers beyond the boundaries of treatment clusters and find even larger turnout effects. Finally, using administrative data on turnout at the polling-station level, we find that for every 10 targeted women (roughly 4 households), female turnout increases by 6.6 additional votes. Once we take this externality into account, the cost of the intervention drops from US$17.5 to about US$3.1 per additional vote. In contrast, using the same administrative data, we find no effect on male turnout, suggesting either that the provision of information on the electoral and balloting process is less salient for men or that men are simply not influenced by information provided to women.

We turn next to whether the campaign influenced candidate and party choice. We find that it did. Targeted women are significantly less likely to vote for the winning party. Once again, untargeted women in treated clusters behave similarly to targeted women. At the polling-station level, a 10 percent increase in the share of targeted women leads to a 6 percent decrease in the share of female votes for the winning party. These results suggest that the campaign could have influenced the share of votes at the constituency level, and thus the policy agenda, had it been implemented at a larger scale.

Targeted women are also more likely than women in control clusters to select a different candidate than the male household head. Once again, there are no differences between targeted and untargeted women in treated clusters in the odds of choosing a candidate that is different from the candidate chosen by the household head.

[1] On the relevance of peer pressure and social norms in the decision to vote, see Opp (2001). On the importance of talking to one's peers in choosing among candidates, see Lazarsfeld, Berelson, and Gaudet (1944).

[2] We note that the confidence intervals are large and therefore do not rule out effects on untargeted women that are half as large as those on targeted.

These results suggest that even the more nuanced message about the secrecy of the ballot was transmitted quite effectively through peer networks. This makes it less likely that the spillovers we detect are due to a conformity effect or pressure to vote by those targeted (Funk 2010).[3]

The paper contributes to two literatures. It adds to the nascent literature on pre-election voter information campaigns in developing countries and contributes to the burgeoning literature on social networks and peer effects.[4] While there is an extensive literature on the impact of Get-out the Vote (GOTV) campaigns in developed countries, and in the United States in particular (Gerber and Green 2000a, b), much less is known about the impact of such campaigns in developing countries where voters tend to have poorer access to information, institutionalized party structures are less developed, and voters are often engaged in clientelist relationships that influence voting decisions.[5] To our knowledge, this is also one of the first papers to systematically assess the impact of information externalities on voter turnout and candidate and party choice.[6] Understanding the scope for such spillovers is important for assessing the types of information that can be successfully transmitted through social networks and for measuring the cost-effectiveness of an information campaign.

The remainder of the paper is organized as follows. Section I describes the context, including political conditions at the time of the 2008 national election, and presents available data on voter registration and turnout rates of men and women in prior elections. Section II describes information campaign, the design of the experiment, and the data. Section III describes the empirical strategy and results. Section IIIA discusses the impact of the information campaign on turnout and assesses the size and significance of information spillovers. Section IIIB discusses the impact on the campaign on party and candidate choice. Section IIIC assesses the impact of the campaign on knowledge and perceptions. Section IV provides a cost-benefit analysis, and Section V concludes.

[3] While the objective of the campaign was to provide information rather than to persuade women to vote, we cannot claim that the campaign had no persuasive impact. One could also argue that the increase in turnout was due to the salience of the campaign (e.g., Zwane et al. 2011). However, at the time of the visit, households were already subject to multiple stimuli to vote. Indeed, over 75 percent of them reported receiving a visit prior to the election from party volunteers asking for their vote. Alternatively, one could argue that the visit itself could have motivated targeted women to vote (if they felt special for having been chosen and voted out of reciprocity), but this is unlikely because untargeted women in treated clusters have turnout rates comparable to targeted women.

[4] See, for example, Miguel and Kremer (2004); Duflo and Saez (2003); Kling, Liebman, and Katz (2007); and Bobonis and Finan (2009).

[5] See Aker, Collier, and Vicente 2013; Banerjee et al. 2011; and Guan and Green 2006. See Pande (2011) for a review. In developing countries there is a small experimental literature that has focused on electoral violence, clientelism, and vote buying; see Collier and Vicente (2014), Wantchekon (2003), and Vicente (2014).

[6] In an experiment in the United States where voters received postcards with information about their voting record, Gerber, Green, and Larimer (2008) finds that turnout increased by about 8 percent in households that were shown their voting records as well as that of their neighbors. This is comparable to the impact of direct canvassing. Our paper is perhaps closest, in spirit, to Nickerson (2008), which assesses information spillovers within the household. The paper reports on a door-to-door canvassing experiment, which targeted households with two registered voters. The author finds that the member that did not answer the door is nearly 60 percent as likely to vote as the directly treated member.

I. Context

Pakistan is a federal parliamentary democratic republic with a bicameral legislature at the national level that is composed of a directly elected lower house (National Assembly) and an upper house (the Senate) whose members are chosen by elected provincial legislators. National and provincial assemblies are elected at the same time in a general election that is supposed to be held every five years. In practice, however, military coups and long periods of military rule have been the norm, punctuated by short and unstable democratic governments.

Voting for the lower house is on a first-past-the-post constituency basis. There are 272 single member constituencies. Political constituencies lie within districts (the third tier of government). Ballots are cast in polling stations, which are mapped to specific constituencies.[7]

A. *The 2008 Elections*

The 2008 national elections were held in an environment that was politically charged. After eight years of military rule under General Musharraf, party based national elections were scheduled for early 2008. In October 2007, however, Musharraf held an indirect presidential election, which ensured him a second term as president. In November 2007, amid widespread opposition to his bid to retain power, Musharraf declared emergency rule. The constitution was suspended, sitting judges of the Supreme Court were dismissed and the government announced the possible postponement of elections by several months and up to a year. However, the government had to quickly retreat from this position, announcing a new election date of early January 2008. In the end, elections were held on February 18, 2008, the final delay occurring due to the assassination of Benazir Bhutto, the leader of the Pakistan Peoples Party Parliamentarians (PPPP) and a twice-elected Prime Minister, in late December 2007.

Due to the tense political situation, including concerns about electoral rigging and voter intimidation by the incumbent military government, there was an expectation of weak turnout, on the one hand, and a landslide among voters in favor of PPPP due to the assassination of Benazir Bhutto, on the other. The net effect of these tendencies on turnout and party choice was uncertain, particularly in the more contested districts of rural Sindh, like Sukkur and Khairpur—our study areas—where, the Pakistan Muslim League-Functional (PML-F), allied with Musharraf, also had a strong presence. In the end, the election finished with a somewhat lackluster turnout, including in rural Sindh, and relatively minor allegations of fraud or other disruptive activity.[8] The PPPP won 124 seats nationally, and 45 percent of

[7] There are also elected governments at the third (district) administrative tier. Elections at the third tier have been sporadic so far with periodic changes in the structure and function of local governments. See online Appendix Section OA1 for more details about Pakistan's electoral system.

[8] Using registered voters as the base, turnout was about 42 percent (using voting age population estimates, turnout was lower, at about 38.8 percent). Both are around the average for elections held over the 1990s and 2000s mostly under military dictatorships, but are well below turnout rates in the 1970s, as well as the 55 percent turnout rate in the subsequent 2013 national election.

the vote share in Sindh, and formed a coalition government with Pakistan Muslim League-Nawaz (PML-N).

B. *Electoral Participation by Women*

Although women's political rights are protected by law, their participation in all aspects of political life remains low. Women are much less likely to register to vote, and conditional on being registered, have substantially lower turnout rates. In the 2005 local government elections, for example, women constituted only 44 percent of registered voters and their turnout rate was 39.5 percent at the national level, compared to 56.8 percent for men. In Sindh, female turnout was closer to 26 percent. In the 2008 elections, the gender gap in registration rates remained high, with women still constituting about 44 percent of registered voters. While the gender-wise breakup of the turnout rate for the 2008 elections is not available nationally, polling station data from single gender polling stations (which are about half of all polling stations) indicates turnout rates at the national level of about 33 percent for women and 46 percent for men. In the study districts of Sukkur and Khairpur, turnout rates were similar at 34 and 47 percent, respectively.

Data collected as part of this study also reveal large differences among men and women in literacy, mobility, knowledge of current events and participation in public life. In study villages, only 18 percent of adult women reported any formal schooling (Table 1, panel C). This is comparable to literacy rates among rural women ages 15 and older, nationally. Women also report limited mobility, even within their own villages. Women in sample villages report being able to move with ease within their own neighborhood or settlement, but not in the rest of the village, where the accompaniment of other females is often required. Travel outside the village usually requires the presence of a male (Jacoby and Mansuri 2015).

Online Appendix Table OA2 presents gender differences in access to media, use of media, knowledge of current political events, and participation in public events, collected in the postelection survey. The sample in panel C of Table OA2 is confined to comparisons between the male head and his spouse. Women are far less likely to listen to local, national, or international news channels (11 percent of women report listening to BBC compared to 48 percent of men, for example) and are far less informed about political issues, including major events like the imposition of emergency, which only 10 percent of women knew about, as compared to 51 percent of men. Women are also less likely to be able to correctly identify political party signs and names. Interestingly, this difference is not due to differential access to TV or radio. Instead, it appears that men and women use media differently. Women are also less engaged with any aspect of village public life. They are far less likely, for example, to attend community meetings related to village development, attend demonstrations, or contact their local councillor or local party official for any matter. When they do engage, however, women tend to avoid formal authority and reach out to religious or traditional leaders (66 and 45 percent, respectively, among women compared to 49 and 32 percent among men).

TABLE 1—SUMMARY STATISTICS

	Observations (1)	Mean (2)	SD (3)	Pct. 10 (4)	Pct. 50 (5)	Pct. 90 (6)
Panel A. Polling station characteristics						
Number of women registered in each polling station	20	575.35	233.07	310.00	533.50	930.00
Number of targeted women in each polling station	20	93.50	54.61	17.00	92.00	169.00
Share of targeted women	20	0.18	0.14	0.02	0.17	0.37
Turnout for women	20	0.58	0.27	0.28	0.54	0.92
Turnout for men	20	0.49	0.16	0.31	0.49	0.67
Share of PPPP among female voters	20	0.64	0.24	0.38	0.68	0.93
Share PPPP among male voters	20	0.64	0.24	0.32	0.70	0.96
Percentage of women with access to cable in the polling station	20	0.35	0.26	0.07	0.27	0.76
SD of asset index	20	1.73	0.26	1.43	1.69	2.02
SD of distance index	20	0.70	0.44	0.09	0.68	1.18
Panel B. Household characteristics						
Household size	990	10.25	5.20	5.00	9.00	16.00
Number of women in the household[a]	1,015	2.76	1.52	1.00	2.00	5.00
Asset index	990	0.02	1.85	−2.03	−0.47	2.66
Total owned land (in acres)	990	2.57	7.47	0.01	0.05	7.02
Average monthly expenditure (in Rs. thousands)	990	8.82	4.74	3.00	9.00	12.50
House quality index	990	0.02	1.38	−1.62	−0.27	1.97
Low Zaat status	989	0.26	0.44	0.00	0.00	1.00
Distance to polling station (km)[a]	990	0.97	0.91	0.00	1.00	2.00
Distance between households within geographical cluster (meters)	8,263	194.20	283.87	27.90	107.07	456.55
Distance between households within village (meters)	48,430	1,472.92	1,304.92	109.38	1,070.52	2,962.75
Panel C. Woman characteristics						
Age	2,637	37.76	16.09	20	35	60
Woman has formal schooling (1 = yes)	2,637	0.18	0.39	0.00	0.00	1.00
Woman is married (1 = yes)	2,622	0.80	0.40	0.00	1.00	1.00
Number of children under 5 years old	2,637	0.86	1.19	0.00	0.00	3.00
Woman has a national identity card (NIC or CNIC) (1 = yes)	2,637	0.77	0.42	0.00	1.00	1.00
Woman voted in last local elections (1 = yes)[a]	2,735	0.70	0.46	0.00	1.00	1.00
Access to radio (1 = yes)	2,637	0.48	0.50	0.00	0.00	1.00
Access to TV (1 = yes)	2,637	0.70	0.46	0.00	1.00	1.00
Access to cable (1 = yes)	2,637	0.30	0.46	0.00	0.00	1.00
Mobility index (0 to 3)	2,637	2.09	0.63	1.33	2.00	3.00
Woman allowed to join an NGO (1 = yes)	2,637	0.73	0.44	0.00	1.00	1.00
Woman is a member of MRDO (1 = yes)[a]	2,735	0.11	0.31	0.00	0.00	1.00
Received visit from political party staff prior to election (1 = yes)	2,637	0.33	0.47	0.00	0.00	1.00
Attended political rally before intervention (1 = yes)	2,637	0.05	0.22	0.00	0.00	0.00
In the voter list[a]	2,637	0.74	0.44	0.00	1.00	1.00
Woman seeks advice from a religious leader or "Pir" (1 = yes)	2,637	0.64	0.48	0.00	1.00	1.00

Note: Variables are defined in online Appendix Table OA1.

[a] Indicates that the variable is created using only the sample from the preelection visit.

II. Experiment Design and Data

A. *The Voter Education Campaign*

The campaign was designed as a set of simple visual aids accompanied by a well-rehearsed and limited script. It included two nonpartisan messages: the first focused on the importance of voting and the relationship between electoral process and policy, including village development outcomes; while the second focused on the actual balloting process, including the structure of a typical voting station and booth, the fact that male and female booths were separate, the secrecy of the ballot, and the appearance of the ballot paper.[9] Since the objective of the second message was to inform women about the balloting process as a whole, we cannot separately identify the impact of ballot secrecy, from other aspects of the process. The information campaign did not mention any political party or candidate by name. It is worthwhile stressing that unlike most GOTV campaigns, whose main objective is to increase turnout by persuading subjects to vote, the objective of the voter education campaign was to inform women about their rights in the electoral process and how to exercise them. Online Appendix Section OA3 contains the translation of the script and online Appendix Section OA4 contains the translated visual aids.[10,11]

B. *Experimental Design*

The campaign was designed to be delivered door-to-door, by a female only team with only women of the targeted household in attendance.[12] Door-to-door visits, which provided a high degree of control over which households received the campaign and which did not, were critical for measuring information spillovers as well as the cost-effectiveness of the intervention. Available evidence from the United States also suggests that door-to-door GOTV campaigns are more effective than other strategies like phone calls and direct mailings.[13] In our context, door-to-door visits were also the most feasible choice given the low levels of literacy and cell-phone ownership among women, combined with low female mobility.

[9] Even in developed democracies where ballot secrecy is perfectly enforced, Gerber et al. (2013) find that some 25 percent of respondents in a nationally representative survey in the United States do not believe that their ballot choices are kept secret.

[10] A GOTV campaign can be partisan or not, though a number of experimental studies have shown that partisan messages are less successful in motivating turnout. Cardy (2005), for example, finds that neither partisan direct mail nor partisan phone calls—used independently or together—managed to garner a significant voter response. In a similar vein, Gerber and Green (2000b) find that nonpartisan messages are particularly effective in mobilizing unaffiliated past voters.

[11] See online Appendix Section OA2 for details about the partners in the experiment.

[12] In many cases, men were not at home at the time of the visit, which took place during the morning and early afternoon. If men were home, they were requested to allow the female team members to meet with the women alone. In most cases, this did not pose a problem since men are not usually present in an all-women's gathering. In the few cases where men were reluctant to leave, the male supervisor discussed the information campaign in general terms with them and obtained agreement.

[13] Gerber and Green (2000a) report on a randomized GOTV campaign through personal canvassing, direct mailings, and telephone calls. The study found that personal canvassing had a substantially greater impact on voter turnout as compared with other modes of contact. Green, Gerber, and Nickerson (2003) and Michelson (2003) find similar results.

The campaign was carried out in the rural areas of districts Sukkur and Khairpur in the southern province of Sindh. The districts were selected because of sharp electoral competition between PPPP and PML-F. The initial sample included 12 revenue or administrative villages, 6 from each district, and 24 polling stations. A revenue village is the sixth and lowest tier of government in rural areas. An average revenue village has about 300 households, though revenue villages can be as large as a 1,000 households and as small as 80 households. The two study districts have 5 constituencies with 1,254 polling stations. The sample villages are located in two of these constituencies. Three villages (four polling stations) had to be dropped before the rollout of the information campaign because the safety of the canvassing teams could not be guaranteed. All candidates from both parties in these two constituencies were male.[14]

Online Appendix Table OA3 uses the Pakistan Mouza (village) census of 2008 to compare sample villages to other villages in the study districts, and in Sindh province as a whole.[15] The table suggests that sample villages are similar to others in almost all available characteristics. Study villages appear to have more cultivated land area, but only in comparison to all other villages in Sindh.

In each sample village, clusters of households were randomly assigned to receive the importance of voting message (T_1), or T_1 plus the voting process message (T_2), or were left as controls (C). All women within a household were given the same treatment. Clusters were based solely on geography, because social interactions are mostly dictated by physical proximity given the restrictions on female mobility.

To identify clusters, the field team first divided each village into geographical clusters. Inhabited clusters consisted of segments of one or two contiguous streets and were forced to fall within the catchment area of a polling station. All open spaces were also mapped and used as gap clusters. This yielded one to nine inhabited clusters per polling station, with an average of 3.2 clusters.

The survey team then numbered all inhabited clusters and picked the first cluster by drawing a number from a box with numbered clusters. This was selected for T_1. The team moved in a random direction (east, west, north, or south) from this point (assuming there were available clusters in that direction) and selected the first available inhabited cluster for T_2 or C, based on a coin toss. A gap cluster was left on all sides of each selected cluster to ensure that two selected clusters would never be contiguous. The team then chose again a random direction and selected a third cluster for the remaining treatment (if available).[16] The whole process of visiting three clusters (leaving gap clusters on all sides) was repeated, by following each time a random direction from the last cluster selected, until all available clusters were

[14] Twelve of these 20 polling stations were from constituency NA-199 (Sukkur) while the remaining 8 were from NA-215 (Khairpur). Together, these 2 constituencies had 512 polling stations. See http://www.ecp.gov.pk/ for more information.

[15] In particular, we take 100 random draws of 9 villages each, generating 100 mean outcomes for each census variable. We then construct a 95 percent confidence interval around the difference of means between the sample villages and that of each of the 100 draws. If the confidence interval contains a zero, we conclude that sample villages are not significantly different, on average, than other villages in the two sample districts or in the rest of the province of Sindh.

[16] If the outcome of the coin toss was to assign T_2 (C) in the second cluster, then C (T_2) was assigned to the third cluster. If there was no available cluster in the chosen direction (because the edge of the village was reached, for example), a new direction was chosen at random from among those available.

exhausted. This field-based selection process randomly assigns clusters to treatment or control groups with varying probability that depends on the number of clusters and the geographical location of the cluster in the village. See online Appendix Section OA5 for details on how the probabilities are computed and online Appendix Table OA7 for a list of the probabilities by cluster.

All T_1 and T_2 clusters were surveyed in the preelection visit, and all treated households in these clusters were given the information campaign. However, due to time and budget constraints, only one of the control clusters in each village was included in the preelection survey, with the exception of one large village in which two control clusters were selected. The control cluster to be surveyed in each village was always the second identified by the field team, and in the large village, the third control cluster identified was also selected. All subsequent data collection (i.e., the verification of ink marks and the postelection survey) was done only in the clusters surveyed during the preelection visit.

A typical sample village had about nine inhabited geographical clusters, plus a varying number of uninhabited clusters. Of these, seven were included in the study sample, on average (3 T_1, 3 T_2, and 1 C), with the rest serving as gap clusters. The final sample has 67 clusters in total, 30 T_1, 27 T_2, and 10 C. The number of treated clusters in a polling station ranges from zero to seven, yielding an average of 2.7 treated clusters per polling station.

Within each selected cluster, irrespective of the specific treatment, every fourth household was selected and surveyed, starting at either end of the cluster. In T_1 and T_2 clusters, all selected households were assigned the respective treatment, with the exception of every fifth selected household, which was left as a control. This generated two to four control households in each T_1 and T_2 cluster in addition to the households selected in control clusters. In this regard, our paper is perhaps closest to Duflo and Saez (2003) in that the peer group is fixed by location and only a subset of the peer group in a treatment cluster is treated.

It is important to stress that the border of a given cluster does not coincide with the beginning or end of a street or the village. In other words, households in the periphery of the randomly generated cluster are on average similar to households in the center of the cluster. This generates exogenous variation in the number of treated households near each household that will be exploited in some specifications.[17]

The campaign was implemented by eight teams, each consisting of two women that were new to the village. The timeline of the study is shown in online Appendix Figure OA2. The information campaign was carried out in the two weeks preceding the elections, once the voter registration period had concluded. Each sample village was covered in approximately two days, including the village mapping into clusters.

[17] A comparison of households in the periphery to those in the center, defined by whether or not they are closer than the median household to the cluster center, yields no significant differences among the 10 household characteristics of panel B in Table 1. Alternatively, we regress an indicator variable, which takes the value 1 if the household's distance to the cluster center is smaller than the median household distance to the cluster center on all 10 household characteristics. The *p*-value of an *F*-test that all household variables are jointly 0 is 0.83. This further confirms that the location of the cluster center is random and that households in the center and periphery of the cluster are comparable. See online Appendix Figure OA1 for a section of a study village.

C. *Data*

A typical sample cluster yielded about 15 sample households and 41 sample women. In total, 2,736 women from 1,018 households were reached. During the door-to-door visit, basic data on each sample household was collected, including the GPS location of the house and a basic roster of all adult women with their past voting record and the name and address of their closest friend or confidant in the village. The confidant was selected as follows: in every even numbered household, the confidant of a woman who was either a daughter or a daughter-in-law of the household head was selected, while in every odd numbered household, the confidant of the household head (if the head was a woman) or the head's wife, sister, mother, or aunt was selected. Not all households yielded at least one "eligible" woman using this rule, so the final sample includes 797 confidants. Of these, almost all were in the same cluster as the sample women who identified them, but only 18 confidants were also in a sampled household.

The door-to-door visit took 20 to 25 minutes for treated households and 5 to 10 minutes for control households. No selected household refused to be interviewed, although in a few cases, a repeat visit took place on the same day. None of the households refused to participate in the awareness campaign.

The paper does not rely on self-reported voting behavior. Instead, we took advantage of the requirement in Pakistan of marking a voter's finger with indelible ink.[18] A local woman in each village, usually a primary school teacher, was identified during the awareness campaign and preelection survey. This woman was provided the list of sample women whose finger ink stain had to be verified on election day and the day after the election. This list included all surveyed women and their confidants.

Voter verification took place between the evening of February 18, election day, and all day February 19. On the evening of February 19, the survey firm sent out a field team to each village to check 10 percent of the verifier's assignment at random. They found no significant differences. However, the village-based vote verifiers were unable to locate 99 sample women (in 27 households), roughly 3 percent of the sample. The final sample, therefore, has 2,637 women and 991 households. All 797 confidants were found and their vote verified. Attrition is, therefore, quite low and unrelated to treatment assignment (see panel A, online Appendix Table OA8).[19] In addition, 158 women claimed to have cast a vote but did not have the requisite ink mark. To be conservative, we treat these women as not having voted, although the results do not change when these women are coded as voters.

Verification was followed by a postelection survey in March 2008. We ensured that the team of enumerators that visited a given household at follow-up was different from the one that had delivered the awareness campaign. The survey was administered to all women in the household above 18-years-old, as well as the male household head or the male spouse if the head was a woman. It collected

[18] The Representation of the People Act of 1976 states in Paragraph 33.2.cc that the voter "shall be required to receive a personal mark, made with indelible ink, on any finger of either hand as indicated by the Commission."

[19] When treatment clusters are broken down by T_1 and T_2, women in T_1 clusters are marginally more likely to attrit, while women in T_2 clusters are marginally less likely to attrit, as compared to control clusters (see panel B of online Appendix Table OA8).

information on household demographics, recall of the door-to-door visit, access to and use of various media, knowledge about the balloting process and about political candidates, among other issues. Finally, we collected official polling station level electoral results by gender, candidate, and political party for each of the 20 polling stations that served our sample villages. Turnout data by gender is easy to compile in Pakistan since polling booths are always separate for men and women, even when polling stations are shared or "combined." Results are also tabulated by gender at the polling booth and polling station level. As discussed above, however, official election results still do not provide a gender-wise breakdown of turnout. To deal with this, our local partner worked with local election commission officials to obtain polling booth-level turnout results for our polling stations, more than half of which were "combined."

A comparison of study polling stations to others in the relevant constituencies of districts Khairpur and Sukkur helps place our results in a broader context. Panel A of online Appendix Table OA9 compares registration rates among men and women. This shows that there was no difference in registration rates between study villages and study constituencies. The relevant *p*-values are 0.73 and 0.43 for men and women, respectively. Both are also comparable to national registration rates. Turnout data looks quite different, however. While male turnout in study polling stations, at 49 percent, remains comparable to polling stations in the study constituencies (45 percent, *p*-value 0.28) and nationally (46 percent), this is not the case for women. While female turnout in the other polling stations in the 2 study constituencies was 31 percent, and national turnout was 33 percent, turnout in the study polling stations was 58 percent (and 67 percent among women registered to vote). This difference of 27 percentage points (p-value $= 0.00$, Table OA9, panel B, row 2) was clearly not driven by differences in registration rates, as discussed above.

Based on this, and the similarity in village characteristics discussed above, it seems reasonable to conclude that study polling stations (and study villages) are similar to other polling stations and villages in the study districts and in the country. It also presages the large turnout effects of the intervention that we report below.

Table 2 reports differences in household and woman characteristics across treatment arms. Column 1 provides the mean in control clusters. Columns 2 and 3 compare targeted households and women in T_1 and T_2, respectively, to households and women in control clusters. Columns 4 and 5 do the same for untargeted households. Online Appendix Table OA1 provides definitions of the variables used in the paper. There are some differences in household characteristics across arms (panel A of Table 2). Households in treated clusters, both targeted and untargeted, are about 0.3 km farther away from their polling stations compared to households in control clusters. Since the mean distance to the polling station for control households is about 0.7 km (a 12–15 minute walk), this implies an additional 3–5 minutes of walking for households in treated clusters. Treated households also have a little more land but poorer housing quality than control households; in some comparisons, though, there are no differences in assets or expenditure. The *p*-value of an *F*-test that all variables are jointly insignificant, however, is rejected for some comparisons. In panel B of Table 2, the same comparisons are reported for woman characteristics. Women in treated households are somewhat younger in some comparisons and have

TABLE 2—DIFFERENCES BY TREATMENT STATUS

	Mean	Difference relative to C			
		Targeted		Untargeted	
	C	T_1	T_2	T_1	T_2
	(1)	(2)	(3)	(4)	(5)
Panel A. Household characteristics					
Household size	9.90	0.453	0.311	0.991	−0.189
		(0.430)	(0.450)	(0.723)	(0.704)
Number of women in the household [a]	2.68	0.140	0.093	0.066	−0.028
		(0.161)	(0.135)	(0.231)	(0.177)
Asset index	0.03	0.030	−0.095	−0.099	−0.149
		(0.198)	(0.228)	(0.240)	(0.301)
Total owned land (in acres)	1.98	1.391	0.538	0.164	−0.472
		(0.630)	(0.568)	(0.500)	(0.406)
Average monthly expenditure	8,646.9	308.5	286.7	−278.7	−403.2
		(617.954)	(562.418)	(555.074)	(670.096)
House quality index	0.18	−0.243	−0.162	−0.393	−0.271
		(0.140)	(0.141)	(0.154)	(0.196)
Distance to polling station (km)[a]	0.71	0.329	0.362	0.268	0.199
		(0.165)	(0.179)	(0.159)	(0.166)
Low Zaat status	0.20	0.054	0.074	0.073	0.127
		(0.106)	(0.080)	(0.094)	(0.078)
Observations		559	474	251	236
p-value *F*-test joint significance		0.0417	0.206	0.0567	0.477
Panel B. Woman characteristics					
Age	39.0	−1.520	−1.281	−0.628	−2.452
		(0.714)	(0.674)	(0.769)	(1.006)
Woman has formal schooling (1 = yes)	0.16	0.007	0.034	0.002	0.039
		(0.030)	(0.029)	(0.045)	(0.047)
Woman is married (1 = yes)	0.81	−0.027	−0.004	−0.023	−0.009
		(0.015)	(0.021)	(0.032)	(0.028)
Number of children under 5 years old	0.71	0.173	0.116	0.256	−0.001
		(0.055)	(0.061)	(0.108)	(0.106)
Woman has a national identity card (NIC or CNIC) (1 = yes)	0.73	0.038	0.047	0.027	0.041
		(0.037)	(0.032)	(0.039)	(0.041)
Woman voted in last local elections (1 = yes)[a]	0.66	0.018	0.056	0.038	0.022
		(0.032)	(0.030)	(0.038)	(0.049)
Access to radio (1 = yes)	0.50	0.011	−0.034	−0.066	−0.024
		(0.044)	(0.048)	(0.055)	(0.063)
Access to TV (1 = yes)	0.68	0.049	0.008	0.113	−0.060
		(0.051)	(0.060)	(0.061)	(0.057)
Access to cable (1 = yes)	0.40	−0.121	−0.096	−0.084	−0.135
		(0.069)	(0.060)	(0.064)	(0.059)
Mobility index (0 to 3)	2.08	0.042	−0.010	0.031	−0.110
		(0.054)	(0.051)	(0.089)	(0.103)
Woman allowed to join an NGO (1 = yes)	0.74	−0.005	−0.037	−0.009	−0.053
		(0.030)	(0.037)	(0.048)	(0.049)
Woman is a member of MRDO (1 = yes)[a]	0.08	0.045	0.003	0.116	0.026
		(0.038)	(0.035)	(0.059)	(0.049)
Woman seeks advice from a religious leader or "Pir" (1 = yes)	0.68	−0.043	−0.093	0.029	−0.135
		(0.048)	(0.057)	(0.066)	(0.067)
Received visit from political party staff prior to election (1 = yes)	0.30	0.003	0.045	0.063	0.024
		(0.041)	(0.046)	(0.054)	(0.054)
Attended political rally before intervention (1 = yes)	0.03	0.020	−0.005	−0.002	0.017
		(0.016)	(0.011)	(0.016)	(0.014)
In the voter list[a]	0.67	0.046	0.082	0.085	0.086
		(0.030)	(0.025)	(0.037)	(0.036)
Observations		1,494	1,244	612	589
p-value *F*-test of joint significance		0.188	0.003	0.019	0.275

Note: Variables are defined in online Appendix Table OA1.

[a] Indicates that the variable is created using only the sample from the preelection visit.

Table 3—Intervention Check

	Observations (1)	All (2)	Targeted T_1 (3)	Targeted T_2 (4)	Untargeted T_1 (5)	Untargeted T_2 (6)	Controls C (7)
Panel A. Information about visit							
Received visit and information before elections (1 = yes)	2,505.00	0.71	1.00	1.00	0.00	0.00	0.00
Neighbors joined during visit (1 = yes)	1,754.00	0.11	0.08	0.15	—	—	—
Issues raised during visit							
Importance of voting	1,759.00	0.64	0.98	0.19	—	—	—
Balloting process and secrecy of ballot	1,759.00	0.06	0.02	0.12	—	—	—
Both	1,759.00	0.30	0.01	0.69	—	—	—
Discussed visit with neighbors (1 = yes)	1,756.00	0.41	0.35	0.50	—	—	—
Panel B. Political discussions with women in the neighborhood							
Discuss political issues (1 = yes, frequently)	2,637.00	0.39	0.35	0.42	0.51	0.37	0.38
Issues raised during conversations							
Party/candidate positions	1,915.00	0.90	0.90	0.91	0.91	0.83	0.91
Importance of voting	1,916.00	0.61	0.61	0.63	0.58	0.61	0.59
Importance of voting in accordance to own preferences	1,915.00	0.86	0.85	0.86	0.89	0.83	0.88
Panel C. Political discussions with male family member							
Discuss political issues (1 = yes, frequently)	2,637.00	0.54	0.52	0.55	0.64	0.51	0.56
Issues raised during conversations							
Party/candidate positions	2,203.00	0.92	0.91	0.92	0.94	0.88	0.92
Importance of voting	2,203.00	0.64	0.65	0.65	0.62	0.59	0.63
Importance of voting in accordance to own preferences	2,203.00	0.88	0.90	0.88	0.84	0.85	0.90

Notes: Data come from the follow-up survey. Columns 1 and 2 provide the number of observations and the sample mean. Columns 3–4 report data for targeted women. Columns 5–6 report data for untargeted women. Column 7 reports data for women in control clusters.

more young children as a result. They also appear to have less access to cable TV, but are somewhat more likely to state that they are registered to vote. An F-test that all woman-level variables are jointly insignificant is again rejected in some comparisons. There is thus some evidence of lack of balance across treatment arms. We address this by controlling for relevant household and woman characteristics for all results that rely on survey data.

Panel A of Table 3 suggests that the intervention was successfully implemented: all treated women correctly recall having received a visit in which information about the electoral process was provided. Almost all women in the T_1 treatment group correctly recalled that the issues raised during the visit concerned the importance of voting, while 69 percent of women assigned to the T_2 treatment group correctly recalled that the visit included information on the importance of voting and the actual balloting process. In contrast, control households recall a visit but none report having received information about the electoral process. There are no differences, however, between targeted, untargeted, and control women when it comes to talking to women in their neighborhood, or the males in their own household, about party and candidate positions, the importance of voting in accordance with one's own preferences, etc. (panels B and C). It is also clear that women are just as likely to talk to males in their own household about these matters as they are to other

women. Online Appendix Table OA10 shows that the results for confidants, and other women in the household, are similar.

Follow-up data also suggest that there were no major incidents on election day in the study villages. Virtually all sample women had possession of their National Identification Cards (NICs) before they left for the polling station and 90 percent of the women who voted also found that the instructions in the polling station were appropriately displayed and that no one else was present inside the booth when they cast their vote.[20] While most women (61 percent) walked to their polling station, a quarter report using transportation provided by a political party, which is legal in Pakistan. However, almost all women went to the polling station with others. Most were accompanied by other female household members (62 percent) or a female friend or relative (25 percent). Only 11 percent went with their spouse or another household male.

III. Empirical Strategy and Results

A. *Turnout and Information Spillovers*

The impact of the information campaign on female turnout is estimated using the following weighted least squares (WLS) regression equation:

$$Y_i = \beta_1 T_1 + \beta_2 T_2 + \gamma X + v + \varepsilon_i, \tag{1}$$

where Y_i indicates whether woman i is verified as having voted (1 = Yes), and T_1 and T_2 are indicator variables for treatment status. The coefficients β_1 and β_2 capture the impact of treatment on turnout and are the main coefficients of interest; X is a vector of predetermined polling station, household, and woman characteristics; v is a village fixed effect; and ε_i is a mean-zero error term. Because the probability of treatment assignment varies by cluster, we run WLS instead of OLS with the weights given by the inverse probability of assignment to T_1. This procedure is suggested in section 4.5 of Gerber and Green (2012) and in Humphreys (2009). Intuitively, if the probability of assignment to T_1 varies by cluster and if this probability is correlated with outcomes of interest, then unweighted regressions may produce biased estimates. Online Appendix Section OA6 reports other robustness checks that assess this potential bias. We find that the treatment assignment probability is uncorrelated with cluster-level characteristics and outcomes. Since the unit of randomization is the geographical cluster, standard errors are always clustered at this level (Moulton 1986).[21] The vector X is selected using the method of Least Absolute Shrinkage and Selection Operator (LASSO). [22] In practice, it makes little difference whether we

[20] In contrast, media reports from the northwest of the country indicate that several female polling stations remained empty because village elders actively prevented women from voting (Gannon 2008).

[21] We note that in some households more than one woman was treated. While the intra- and inter-household correlation within a cluster could differ, we only allow for a unique within-cluster correlation.

[22] We use the STATA command *lars*, *a*(*lasso*) that implements the Least Angle Regression method described in Efron et al. (2004). This method uses the Mallows' *Cp* criterion as the penalty. In particular, the number of variables selected is determined by the combination that minimizes Mallows' *Cp* criterion. The following variables were used in the LASSO procedure: the number of registered female voters in the woman's polling station, standard

Table 4—Effect on Female Turnout

	Targeted (1)	Untargeted (2)
Importance of voting (T_1)	0.088	0.094
	(0.069)	(0.065)
Importance of voting and secret balloting (T_2)	0.125	0.113
	(0.070)	(0.080)
R^2	0.198	0.198
Observations	2,304	767
Mean dependent variable among C	0.523	0.523
Mean dependent variable for the 2 study constituencies excluding the 20 study polling stations	0.340	0.340
p-value ($T_1 = T_2$)	0.448	0.813
p-value (F-test for joint significance of T_1 and T_2)	0.212	0.248

Notes: The dependent variable takes the value 1 if a woman reports having voted in the February 2008 elections and had a verifiable ink mark on her thumb. Standard errors are reported in parentheses below the coefficient and are clustered at the geographic cluster level. All specifications use a weighted least squares estimator based on Gerber and Green (2012) and Humphreys (2009) for when treatment assignment probabilities vary by cluster. All specifications include village fixed effects and the following controls, which were selected using the LASSO method: the number of registered female voters in the woman's catchment polling station, whether woman has a NIC or CNIC, the woman's age, access to television, number of children under five years of age, household size, the woman's index of mobility, and whether the woman seeks advice from a religious leader. Variables are defined in online Appendix Table OA1.

include vector X or not. Column 1 of online Appendix Tables OA11 to OA14 and panel A of Table OA15 report the main results without including any covariates.

Table 4 reports the impact of treatment on turnout. In order to capture the importance of within-cluster spillovers, columns 1 and 2 report results for targeted and untargeted women in treatment clusters. The overall impact of treatment on turnout among targeted women is noisy. While the impact of T_2 is larger and significant at conventional levels, we are unable to detect statistically different effects between T_1 and T_2 among targeted women. In addition, untargeted women in treated clusters are about as likely to vote as directly targeted women. Using a pooled regression (online Appendix Table OA16), the p-value of a t-test that the coefficients for targeted and untargeted women are equal is 0.75 and 0.87 for T_1 and T_2, respectively. The standard errors are large, however, making it difficult to rule out an effect on untargeted women that was half as large as that on targeted women.[23]

deviation of the distance to the polling station, household size, number of women in the household, asset index, total land owned, high *zaat* (caste) status, distance to the polling station, woman's age, the square of the woman's age, whether the woman has any formal schooling, whether woman is married, number of children under five years of age, whether woman has a NIC or CNIC, access to radio, access to cable, access to TV, mobility index, whether woman is member of the MRDO, and whether the woman seeks advice from a religious leader. Among these variables, the LASSO procedure chose the following variables: the number of registered female voters in the woman's catchment polling station, whether woman has a NIC or CNIC, the woman's age, access to television, number of children under five years of age, household size, the woman's index of mobility, and whether the woman seeks advice from a religious leader.

[23] The impact on turnout for confidants is in the same range as that for other untargeted women in treated clusters, ranging from 10 to 12 percent. This is not surprising given that the vast majority of confidants reside in the same cluster as the woman who identified them as her friend. Results available upon request.

While this strategy allows us to assess spillovers within treatment clusters, it does not account for spillovers beyond the geographical cluster. The design included gap clusters to ensure that control clusters were isolated from treated clusters, but because clusters were artificial geographic constructs within a village, it is quite possible that targeted and untargeted women in treated clusters spoke to women outside the geographical cluster, especially those located near cluster boundaries. If this was the case, the estimates of column 2 in Table 4 could be downward biased.

We therefore follow Miguel and Kremer (2004) to study spillover effects beyond the geographical cluster and rely on exogenous variation in the local density of treated women, by virtue of the cluster-level randomization. Specifically, we construct nonoverlapping concentric rings that are 200 meters wide around each sample woman. For each ring (or band) we compute the number of treated women within the band, as well as the total number of sample women. Since the median distance between any two households in the village is about one kilometer, the bands start at 0–200 meters and extend up to 1,200 meters.[24] The regression specification in this case is

$$(2) \qquad Y_i = \beta T + \sum_{dD} \left(\alpha_{dD} NT_{dD} + \tau_{dD} N_{dD} \right) + \lambda W + \gamma X + \nu + \varepsilon_i.$$

Here, NT_{dD} is the number of treated women between distance d and D from each sample woman, N_{dD} is the number of sample women between distance d and D from each sample woman, and W is the number of targeted over sample women in the cluster. The rest of the terms are as defined in equation (1) and standard errors are clustered at the geographical cluster level. The estimates for α_{dD} can be used to estimate the average spillover gain for sample women from having targeted women residing in close proximity.

The coefficients are reported in column 2 of Table 5. Spillover effects are significant at the 1 percent level up to 600 meters and at the 10 percent level between 600–800 meters. The mean number of targeted women ranges from 40 at 0–200 meters to just under 8 at 1,000–1,200 meters (column 1, Table 5). Using only the coefficients that are significant up to the 1 percent level (0-600 meters), we estimate a mean increase in the odds of voting of 44 percent. This increases to 51 percent if we include all significant coefficients (0–800 meters).[25] Consistent with our earlier results, once proximity to other treated women is controlled for, the residual effects of being directly targeted, as well as treatment intensity in one's own cluster, are essentially nil.

Spillover effects of the voter information campaign can also be checked using official election results from polling stations. These data also provide turnout information for men allowing for a comparison of turnout by gender.

[24] The average distance between any two sample households in a cluster is 194.2 meters (0.12 miles) and the median distance is roughly 100 meters. In contrast, the median distance between any two surveyed households in a village is roughly one kilometer (0.67 miles) (see Table 1).

[25] To see this, note that the spillover gain is the average number of treated women located within 0–200 meters times the average effect of having an additional treated woman in this range (α_{0-200}), plus the analogous spillover effects due to targeted women located between 200–400, 400–600, and 600–800 meters from a woman.

Table 5—Spillover Effects Using Distance

	Mean (1)	Coefficients (2)
Targeted (1 = yes)		0.018
		(0.033)
Number of targeted women within 0–200 radius	40.40	0.005
		(0.002)
Number of targeted women within 200–400 radius	20.47	0.008
		(0.002)
Number of targeted women within 400–600 radius	11.91	0.006
		(0.002)
Number of targeted women within 600–800 radius	15.50	0.005
		(0.003)
Number of targeted women within 800–1,000 radius	11.08	0.004
		(0.003)
Number of targeted women within 1,000–1,200 radius	7.88	0.001
		(0.003)
Number of sample women within 0–200 radius	56.78	−0.002
		(0.001)
Number of sample women within 200–400 radius	29.84	−0.004
		(0.001)
Number of sample women within 400–600 radius	18.33	−0.004
		(0.002)
Number of sample women within 600–800 radius	21.28	−0.003
		(0.002)
Number of sample women within 800–1,000 radius	15.81	−0.003
		(0.002)
Number of sample women within 1,000–1,200 radius	11.50	0.001
		(0.002)
Number of targeted women over sample women per cluster	0.68	0.067
		(0.084)
Observations		2,637
R^2		0.226

Notes: The dependent variable takes the value 1 if a woman reports having voted in the February 2008 election and had a verifiable ink mark on her thumb. Standard errors, reported in parentheses, are clustered at the geographic cluster level. The regression uses a weighted least squares estimator based on Gerber and Green (2012) and Humphreys (2009) for when treatment assignment probabilities vary by cluster. The regression includes village fixed effects and the following controls, which were selected using the LASSO method: the number of registered female voters in the woman's catchment polling station, whether woman has a NIC or CNIC, the woman's age, access to television, number of children under five years of age, household size, the woman's index of mobility, and whether the woman seeks advice from a religious leader. Variables are defined in online Appendix Table OA1.

We use the following regression specification:

$$Y_p = \beta ST_p + \varepsilon_p. \tag{3}$$

The turnout rate Y_p in polling station p is the number of votes cast by women (men) divided by the number of registered women (men). Correspondingly, the impact of treatment, ST_p, is the share of targeted women measured as the number of women targeted in polling station p divided by the number of registered women in that polling

Table 6—Spillovers at the Polling-Station Level

	Female (1)	Male (2)
Panel A. Turnout		
Share of targeted women	0.658	0.089
	(0.254)	(0.212)
R^2	0.272	0.010
Mean of dependent variable	0.456	0.559
Panel B. Share of PPPP		
Share of targeted women	−0.733	−0.559
	(0.353)	(0.367)
R^2	0.194	0.115
Mean of dependent variable	0.638	0.644
Polling station controls	No	No
Observations	20	20

Notes: The dependent variable in panel A is the share of valid votes cast by women and men over the total number of registered women (men). In panel B, the dependent variable is the share of votes obtained by PPPP over the total number of valid votes. Share of targeted women is calculated by dividing the total number of women targeted, in a polling station, by the number of registered women in the same polling station. Robust standard errors are in parentheses.

station.[26] Recall that the intervention took place after the voter registration period had ended. This ensures that registration is orthogonal to treatment assignment.

The results are shown in panel A of Table 6. While there is no impact on male turnout, female turnout increases by 66 percent. These results are extremely close to those from Table 5 and imply that for every 10 women targeted (about 3.7 households) by the information campaign, almost 7 additional women turned out to vote.

We can use turnout rates in the constituencies from which we draw sample villages and polling stations to estimate the implied turnout rate. A 66 percent increase in the odds of turnout, translates into a 20 to 22 percentage point increase in the turnout rate and a total turnout of between 51 to 56 percent. Similarly, using Table 5 results, there would be an increase of 18 to 22 percentage points in the turnout rate for women, implying a total turnout of between 49 and 56 percent.[27] These results are comparable to the overall female turnout rate of 58 percent in study polling stations using official data in panel B of online Appendix Table OA9. Importantly, there is no impact on male turnout, which remains comparable with turnout in other district constituencies and nationally. The fact that men are not influenced by information provided to women could reflect men's greater exposure to political information, wider networks, or simply lack of effective communication between men and women on political issues. As we note above though, 54 percent of sample women frequently discussed political issues with male family members, while 39 percent discussed political issues with other women in the neighborhood (Table 3). As a

[26] The variable ST_p ranges from 0 to 0.77, with 94 treated women per polling station, on average.

[27] While Table 4 relies on the impact on sample women (registered or not), Table 6 includes all registered women. Based on self-reported information (Table 1), close to 75 percent of sample women were registered to vote.

result, the lack of impact on men cannot simply be due to the absence of communication. What is perhaps more likely is that men tend to disregard information that comes to them through women, consistent with other research from Pakistan (Giné, Mansuri, and Picón 2011; Giné and Mansuri 2017).

B. *Candidate Choice*

We turn next to the impact of the awareness campaign on candidate and party choice. For the study polling stations, we have the breakdown of these shares by gender and for other polling stations in the study constituencies, we can use data from single gender polling stations. Finally, from the postelection survey, we have self-reported information for sample women on the party they voted for.

The polling station level results reported in panel B of Table 6 indicate that a 10 percent increase in the share of treated women leads to a reduction of 7 percent in the share of PPPP female votes. However, as with turnout results, it appears that the campaign had little impact on the PPPP male vote share, though the estimates are noisy.

The vote share of the PPPP in study polling stations can also be compared with other polling stations in the two constituencies from which they are drawn, as we do with turnout above. This indicates a 9 percentage point decline in the vote share of the PPPP among female voters in study polling stations, as compared to other polling stations, and the difference is significant (p-value $= 0.06$). The results are in panel C of online Appendix Table OA9. In contrast, there is only a 3 percentage point decline in the male PPPP vote share in study polling stations, and the difference is not significant (p-value $= 0.52$).

When we compare these results with self-reports on candidate choice by sample women, we find similar effects. The results are reported in Table 7, using equation (1). Dependent variable Y_i now indicates whether a woman reported voting for PPPP, and the sample is confined to women who were verified as having voted. The campaign reduced the odds of a targeted woman voting for the PPPP by 16 to 22 percentage points, for T_1 and T_2, respectively.[28] The impacts for T_2 are again larger in absolute value and more precisely estimated than those of T_1, but we cannot reject the null that T_1 and T_2 are equal. The point estimates for untargeted women are similar, as expected, and the difference between targeted and untargeted women is also not statistically significant (p-value $= 0.52$ and 0.64 for T_1 and T_2, respectively—online Appendix Table OA17).

Overall, it appears that the awareness campaign encouraged women supporters of PML-F to turn out in greater numbers, increasing the vote share of PML-F and tightening the race. In the context of the 2008 election, one could argue that there was a strong underdog effect in favor of the PPPP, which was only strengthened following the assassination of its leader Benazir Bhutto. However, this was also an election with overall low turnout. The strong increase in turnout in the study polling

[28] The percentage point difference is calculated using the PPPP vote share from the remaining polling stations (0.75) in the two study constituencies, which is substantially lower than the PPPP vote share reported by control women.

Table 7—Effect on Female PPPP Vote

	Targeted (1)	Untargeted (2)
Importance of voting (T_1)	−0.157	−0.210
	(0.078)	(0.104)
Importance of voting and secret balloting (T_2)	−0.220	−0.258
	(0.070)	(0.088)
R^2	0.184	0.260
Observations	974	299
Mean dependent variable among C	0.950	0.950
Mean dependent variable for the study constituencies	0.750	0.750
p-value ($T_1 = T_2$)	0.403	0.593
p-value (F-test for joint significance of T_1 and T_2)	0.009	0.017

Notes: The dependent variable takes the value 1 if a woman reports having voted for PPPP in the February 2008 elections and was verified as having voted. Standard errors are reported in parentheses below the coefficient and are clustered at the geographic cluster level. All specifications use a weighted least squares estimator based on Gerber and Green (2012) and Humphreys (2009) for when treatment assignment probabilities vary by cluster. All specifications include village fixed effects and the following controls, which were selected using the LASSO method: the number of registered female voters in the woman's catchment polling station, whether woman has a NIC or CNIC, the woman's age, access to television, number of children under five years of age, household size, the woman's index of mobility, and whether the woman seeks advice from a religious leader. Variables are defined in online Appendix Table OA1.

stations suggests that the information campaign increased the marginal benefit of voting, but that the boost in turnout was relatively higher among supporters of the PML-F, which in this case was effectively the incumbent party, who may have been otherwise discouraged by the anticipated landslide for the PPPP (see Myatt 2015). This dampening of the "underdog effect" can also be understood in the context of the clientelist setting of rural Sindh. Women in the study villages, as discussed, were far more inclined than men to seek the advice of spiritual leaders for addressing local problems and for conflict resolution (online Appendix Table OA2), and PML-F candidates in study districts were also influential due to their claim to spiritual leadership (as "pirs").

Given the emphasis of T_2 on ballot secrecy, an interesting question is whether male heads in targeted and untargeted households also have less knowledge about whom women in their household voted for. In the follow-up survey, the male head was asked about whether or not each woman in the household had voted and, if she had, whom she had voted for. The same information was elicited from each woman about all the other women in the household. Using these unique data, we can check the extent to which these cross-reports, i.e., the respondent's report of the candidates a given woman had voted for, are in agreement with the candidate's choice reported by the woman herself. The indicator of agreement takes the value 1 if the two reports match, and is 0 otherwise.[29] Candidate choice information is available

[29] If the reporter stated that a woman did not vote when she reported voting and was verified as doing so, the agreement indicator is coded as missing. This is the case for less than 5 percent of the reports by men and roughly 1 percent of the reports by other women. Likewise, if the reporter answers "I don't know" when asked whom a given

for all women who self-report having voted, but we restrict the sample to women who were verified as having voted. The final sample includes 3,713 cross reports and 1,220 women, with the number of observations per woman varying by household size.[30] We focus on cross-reports about candidate choice rather than voter turnout because all reporters guessed correctly whether the reportee had voted or not, suggesting that the act of voting is public (and easily verified, given the finger mark), but candidate choice is not.

We test the accuracy of information possessed by the male head using the following regression:

$$(4)\quad M_{ij} = \beta_1 T_1 + \beta_2 T_2 + \beta_3 H_i + \beta_4 (T_1 \times H_i) + \beta_5 (T_2 \times H_i) + \gamma X + v + \varepsilon_i,$$

where M_{ij} is an indicator that takes the value 1 if the report of individual i on individual j's choice of candidate is correct (according to j's self-report); H_i is an indicator for whether reporter i is the male head; and X is reporter i's vector of polling station, household and individual characteristics selected via LASSO. The error term is likely to be correlated across all observations with the same reporter i and reportee j, but we still cluster standard errors at the geographical cluster level, which is more conservative than using QAP (Krackhardt 1988) or the correction in Fafchamps and Gubert (2007).

The results are presented in Table 8. The coefficients of interest, β_4 and β_5, capture the differential effect of treatment on the quality of male reports about the candidate choice of women in the household. The results indicate that male knowledge about women's chosen candidates was 7 percentage points lower among targeted women in T_1 and T_2. As before, effects are somewhat larger and measured more precisely for T_2. And again as before, untargeted women in treated clusters have a similar response. If anything, the reduction in male knowledge is somewhat larger among untargeted women in T_2 clusters. However, a pooled regression finds no difference among targeted and untargeted women in either T_1 or T_2.

It is also possible, of course, that the information campaign itself affected whether women reported their candidate choice truthfully to enumerators. As we note above, the survey-based PPPP vote share among control women was 0.95, which is substantially larger that the party's vote share in the two study constituencies (0.75 using polling station data). While this inflation in the PPPP vote share reported by controls might be real, it is also possible that control women were more likely to report voting for the PPPP candidate during the postelection survey—given that the PPPP had won the election—while women in treated clusters were more willing to

woman voted for, we code the agreement indicator as missing. This is the case for 7 out of 1,421 reports by men (less than 0.5 percent) and only 1 report by other women. We follow this approach because lack of knowledge about a woman's voting behavior could reflect either indifference or freedom to select whomever she desires. Given the low percentage, results do not change if we recode them with a value of 0. Note that out of the 1,220 women who report having voted, and were verified as doing so, only one declined to answer whom she voted for.

[30] Among the 2,637 women in the sample, 1,543 were verified as having voted. Twenty-one percent of women that were verified as having voted self-reported as not having done so. These women appear as voters in the turnout analysis of Table 4 but are not used in the analysis of candidate choice because we do not know whom they voted for. Interestingly, we also find evidence of conformity bias (Silver, Anderson, and Abramson 1986; Harbaugh 1996) since treated women that had not voted are significantly more likely to self-report as having done so compared to women in control clusters (40.6 percent versus 34.8 percent, p-value $= 0.00$).

TABLE 8—EFFECT ON CANDIDATE CHOICE USING CROSS REPORTS FROM FAMILY MEMBERS

	Targeted (1)	Untargeted (2)
Importance of voting (T_1)	−0.028	−0.004
	(0.026)	(0.024)
Importance of voting and secret balloting (T_2)	−0.010	0.000
	(0.026)	(0.024)
Man reporting about sample woman	−0.034	−0.032
	(0.027)	(0.029)
Man reporting × T_1	−0.066	−0.010
	(0.042)	(0.043)
Man reporting × T_2	−0.072	−0.159
	(0.038)	(0.088)
R^2	0.077	0.138
Observations	3,200	914
Mean dependent variable among C	0.983	0.983
p-value ($T_1 = T_2$)	0.493	0.877
p-value (Male report × T_1 = male report × T_2)	0.899	0.101

Notes: The dependent variable takes the value 1 if a woman's self-report about candidate choice matches the report of the reportee, who is either another woman in the household or the male head. Each observation is therefore a pair with several observations for each woman. If a reporter believes that a woman did not vote or does not know whom she voted for, the dependent variable is coded as missing. Standard errors are reported in parentheses below the coefficient and are clustered at the geographic cluster level. All specifications use a weighted least squares estimator based on Gerber and Green (2012) and Humphreys (2009) for when treatment assignment probabilities vary by cluster. The specification includes village fixed effects and the following controls, which were selected using the LASSO method: the number of registered female voters in the woman's catchment polling station, whether woman has a NIC or CNIC, the woman's age, access to television, number of children under five years of age, household size, the woman's index of mobility, and whether the woman seeks advice from a religious leader. Variables are defined in online Appendix Table OA1.

accurately report their candidate choice to enumerators, even when voting for the losing candidate.

Table 9 complements these results by assessing the extent to which the electoral behavior of women corresponds to that of their household head. As before, the comparison focuses on targeted and untargeted women in T_1 and T_2 clusters, and compares each of the four groups with women in control clusters. What stands out is that targeted women are far more likely than women in control clusters to vote for a different party than the male head. As before, these results also hold for untargeted women, but are somewhat weaker.

We then check whether the information campaign affected women who had no prior voting experience. The results in panel B and C of Table 9 suggest that this is not the case. The campaign appears to have increased independence in candidate choice and turnout mainly among women who claimed to have voted in the past. As it turns out, women without a prior voting history are also much less likely to possess National Identity Cards (NIC) or be registered to vote and are significantly younger. Given that the time between the information campaign and the election was too short to allow for the acquisition of an NIC or a change in registration status,

Table 9—Impact on Women's Participation and Candidate Choice

	Targeted		Untargeted		Controls	*p*-value of t-test (1)–(5)	*p*-value of t-test (2)–(5)	*p*-value of t-test (3)–(5)	*p*-value of t-test (4)–(5)
	T_1 (1)	T_2 (2)	T_1 (3)	T_2 (4)	C (5)	(6)	(7)	(8)	(9)
Panel A. All women									
Percentage of women who									
Voted for the same party as male head	44.34	41.56	49.44	45.81	41.71	0.466	0.561	0.056	0.403
Voted for different party from head	8.44	11.18	9.55	6.45	2.76	0.073	0.024	0.208	0.908
Voted but male head did not	5.29	6.64	5.06	8.39	3.69	0.419	0.197	0.612	0.118
Did not vote	41.28	40.05	35.96	39.35	50.92	0.027	0.004	0.003	0.043
Observations	1,078	859	178	155	434	2,637	2,637	2,637	2,637
Panel B. Not voted in the past									
Percentage of women who									
Voted for the same party as male head	15.08	11.21	11.54	17.39	11.64	0.132	0.343	0.123	0.099
Voted for different party from head	1.54	3.27	0.00	0.00	1.37	0.999	0.197	0.312	0.175
Voted but male head did not	2.15	0.93	1.92	2.17	2.74	0.966	0.348	0.616	0.913
Did not vote	80.31	84.58	86.54	80.43	84.25	0.187	0.382	0.384	0.17
Observations	325	214	52	46	146	783	783	783	783
Panel C. Voted in the past									
Percentage of women who									
Voted for the same party as male head	58.37	55.87	65.08	57.79	56.94	0.850	0.963	0.158	0.821
Voted for different party from head	11.70	14.93	13.49	9.17	3.47	0.043	0.028	0.096	0.499
Voted but male head did not	6.80	9.23	6.35	11.01	4.17	0.237	0.069	0.490	0.065
Did not vote	22.58	19.13	15.08	22.02	34.03	0.025	0.007	0.002	0.049
Observations	735	596	126	109	288	1,854	1,854	1,854	1,854

Notes: *p*-values are from regressions with village fixed effects. The regressions use a weighted least squares estimator based on Gerber and Green (2012) and Humphreys (2009) for when treatment assignment probabilities vary by cluster. Standard errors are clustered at the geographic cluster level. Control variables selected using the LASSO method are: the number of registered female voters in the woman's catchment polling station, whether woman has a NIC or CNIC, the woman's age, access to television, number of children under five years of age, household size, the woman's index of mobility, and whether the woman seeks advice from a religious leader. Variables are defined in online Appendix Table OA1.

this is perhaps not surprising. However, it is also possible that these women face other barriers to participation.

C. *Knowledge and Perceptions*

The large effects on turnout and candidate choice just reported raise an important question about the extent to which the campaign also affected women's knowledge about political issues, perceptions, and other political behavior. Each cell in Table 10 reports the coefficient from a regression analogous to equation (3) for targeted and untargeted women. The dependent variables are described in the online Appendix Table OA1. The first two indices are intended to capture knowledge of important political facts/events and pro-democracy views. A higher value of the index indicates more knowledge of political events and a more pro-democracy viewpoint. The remaining three questions are focused on the election: whether the woman

Table 10—Effect on Knowledge and Perceptions

	Observations (1)	Index of knowledge of current events (2)	Index of opinion on democracy (3)	Woman checked voter list after intervention (4)	Woman believes elections were free and fair (5)	Woman witnessed or heard about violence in village (6)
Targeted	2,304	−0.027	0.059	0.056	0.072	−0.095
		(0.083)	(0.046)	(0.029)	(0.034)	(0.040)
Untargeted	767	−0.037	0.015	0.062	0.039	−0.106
		(0.099)	(0.056)	(0.036)	(0.041)	(0.050)
Mean dependent variable among C		−0.050	−0.033	0.548	0.834	0.313

Notes: Standard errors are reported in parentheses below the coefficient and are clustered at the geographic cluster level. All specifications use a weighted least squares estimator based on Gerber and Green (2012) and Humphreys (2009) for when treatment assignment probabilities vary by cluster. All specifications include village fixed effects and the following controls, which were selected using the LASSO method: the number of registered female voters in the woman's catchment polling station, whether woman has a NIC or CNIC, the woman's age, access to television, number of children under five years of age, household size, the woman's index of mobility, and whether the woman seeks advice from a religious leader. Variables are defined in online Appendix Table OA1.

checked her name in the voter list after the intervention and before the election; whether the woman believes that elections were free and fair, and finally, whether the woman had witnessed or heard about instances of violence in the village.

The results indicate that women in treated clusters, both targeted and untargeted, were more likely to check if their name was in the voter list but were not more knowledgeable about current events nor did they have more pro-democracy views. However, both targeted and untargeted women were significantly more likely to report that elections were free and fair and were much less likely to report having seen or heard about incidents of violence on the day that the election was held. This suggests that the information campaign may have increased confidence in the legitimacy of the voting process.

IV. Cost-Benefit Analysis

The estimates from Tables 4 and 6 can be used to evaluate the cost-effectiveness of the information campaign. The initial development of the campaign cost $3,600. The training of the canvassing team cost $753 and the delivery of the information campaign cost $5,671. This last amount includes the costs of collecting basic information about treatment and control households, which would not be incurred in practice if research were not being conducted. Since roughly two-thirds of sample households were treated, we impute the costs to include two-thirds of this amount in the intervention cost. This gives us a total intervention cost of roughly $8,130, including the costs of developing the information campaign and training enumerators. This is an overestimate since the development of the information campaign and the training of canvassing teams represents a fixed cost that can be sizeable if the scale is small. In our case, it constitutes over 50 percent of the overall cost—which, if the campaign were scaled up, would be distributed over a much larger population base. We therefore present the cost under two

scenarios: inclusive of the development of the campaign and enumerator training costs, and without it. Both estimates include the labor and transport costs of delivering the campaign.

Since we have 673 targeted households, we get a cost of about $5.6 per household using variable costs only, and $12 per household if we include fixed costs. A household has 2.7 women on average, so we treat about 10 women for every 3.7 households visited. Since the cost of treating 3.7 households is about $21 ($44 if we include fixed costs), and this yields about 7 additional votes, the implied cost per vote is about $3.1 ($6).[31] If we ignore spillover effects and use woman-level estimates, we would obtain a cost per vote of $17.5 ($36.7).[32]

V. Conclusions

This paper examines the role of preelection voter information campaigns in inducing broader participation in one of the largest new democracies of the world, and one where women's political participation continues to lag substantially behind that of men. We focus on two related questions: does a lack of information on the electoral process and voting procedures constitute an important barrier to political participation by women? And, to what extent can social interactions among women be instrumental in fostering participation beyond those directly targeted by an information campaign?

We find positive answers to both questions. Turnout among women that received the information campaign increased by about 11 percent on average, which amounts to little more than 1 additional female vote for every 10 women targeted. We also find evidence of large spillover effects dictated by geographic proximity. Untargeted women in treated clusters respond to cluster treatment assignment about as much as directly targeted women do. Moving beyond clusters, we examine spatial spillovers more generally and find still larger peer effects. At the polling station level, the campaign induced 7 additional female votes for every 3.7 targeted for treatment. The presence of significant spillovers also alters the cost-benefit analysis substantially. An additional vote costs almost six times as much in the absence of spillovers. Given the relatively low cost of an additional vote ($3.1 using variable costs only), once spillovers are accounted for, information campaigns appear to provide a relatively cost-effective mechanism for enhancing the participation of rural women in the democratic process.

The importance of spillover effects and peer pressure resonates well with the theoretical literature on voter turnout that emphasizes the role of the group in coordinating participation either because group members are rewarded by leaders or because they each believe they are ethically obliged to vote and reinforce one another (see Shachar and Nalebuff 1999 and Feddersen 2004 for a review).

[31] This is about Rs. 208 (Rs. 402 including fixed costs), using the exchange rate in 2008.

[32] Green and Gerber (2004) provide a nice summary of the price-per-vote in the United States using various methods. They estimate the cost of a vote in door-to-door campaigns, which are perhaps closest to what we do, to be around $19 per vote using contract labor but ignoring spillover effects.

We also find evidence of independence in candidate choice. In treated clusters, men were significantly less likely to correctly assess the candidate choices made by women in their households. In addition, women in treated clusters were more likely to vote for a different party than the male head, especially if they had voted in the past. The campaign also induced a shift in party vote shares in favor of the incumbent but less favored party. Among women who had not voted in the past, the campaign was less effective. To some extent, this was due to the timing of the awareness campaign, which took place after the voter registration period. That said, more intensive interventions may be required for such women, including assistance with voter registration.

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