'Press 1 for Roads': Constituency Service with New Communication Technology*

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Abstract: Politicians and voters in less developed countries use face-to-face interactions to solve chronic problems of state weakness. We supplement status quo interactions by experimentally providing Interactive Voice Response technology to politicians, allowing them to script and record questions for voters and allowing voters to respond on cell phones. The new technology changes the initiator, scope, content, scale, personalism, and frequency of two-way political communication. Although both groups appear eager to engage in this shift, politicians do not follow through with changes in subsequent behavior and voters' downstream political attitudes and behavior are unaffected. We discuss why this might be, while concluding that new technologies hold promise for improving democratic political processes in contexts of weak state capacity. [117 words]

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1 Introduction

In many developing democracies, politicians spend considerable time interacting directly with voters to help them navigate access to services and benefits. Face-to-face interactions to solve mundane problems of service delivery are burdensome for both parties. For the politician, they mean having to travel home from the capital and help voters one by one to solve problems that may be under the remit of another public office. There may be little the politician can do to help, and in the meantime his time and attention are distracted from parliamentary and legislative duties. For the voter, seeking face-to-face assistance means traveling to the politician's constituency office and making a direct and personal request of an authority figure. This may be economically and psychologically costly. Technological solutions to these problems already exist and are widely used in other, non-political domains. How is modern communication technology supplementing and perhaps in part replacing face-to-face political interactions? Is there scope to augment their scale, their frequency and their reach? And is technology improving some aspects of democratic processes and political representation?

A large and distinguished literature characterizes the interactions between politicians and voters in low-income democracies as infused with clientelism and corruption (e.g. Scott, 1972; Kitschelt and Wilkinson, 2007; Stokes et al., 2013). According to this view, weak state capacity and inadequate resources allow politicians to allocate goods and services using particularistic and partisan criteria. In this framework, voters are seen as competing supplicants in a constant struggle to gain goods and services for themselves and their families. In this struggle, local power brokers and elites are believed to enjoy advantages in accessing government officials (Bardhan and Mookherjee, 2000). But cracks have appeared in the clientelistic theory of distributive politics thanks to research showing that politicians often make disbursements using non-partisan criteria and that voters often make claims on government officials for goods and services for their communities rather than for themselves

(Kruks-Wisner, 2018; Bussell, 2019). Even so, the piecemeal, informal, and fundamentally arbitrary nature of personal interactions represents a challenge to the democratic ideals of fair and equitable representation as well as to the Weberian ideals of bureaucratic impartiality.

In this paper, we report results of a mixed-method research project conducted in a developing democracy that studies face-to-face status quo interactions and also implements an experiment that mimics and supplements status quo interactions with two-way technologically-based communications. The experiment, which uses Interactive Voice Response (IVR) technology, bundles a series of transformations: it increases the frequency, scale, scope, and reach of interactions; it shifts the burden of initiation from voters to politicians; it permits repeated two-way engagement; and it removes the possibility of particularism in claim-making and disbursements. Our aim here is to assess if IVR leads to more equitable and responsive political leadership as well as to greater voter satisfaction with the performance of elected officials. In other words, we seek to know if IVR improves democratic governance.

Most experimental studies aiming to improve political representation in low-income democracies intervene with the voter to initiate change. These studies provide voters information and some ask them to express unsolicited opinions to political representatives (Grossman, Humphreys and Sacramone-Lutz, 2014; Chong et al., 2015; Arias et al., 2019; Buntaine, Nielson and Skaggs, 2019; Dunning et al., 2019; Grossman, Humphreys and Sacramone-Lutz, 2020). The hope is that informing and motivating voters catalyzes a bottom-up process of change that will ultimately pressure politicians to become more responsive to voter concerns. However, efforts at improving responsiveness and accountability by asking voters to amplify their political voice have met limited success. Studies show that voters do not use the information provided to change their behavior; when they do, the intervention backfires; or offers of new communication technologies confront low and unrepresentative take-up (detailed in Table A.1).

In this study, we draw inspiration from and extend the line of inquiry initiated by these

experiments — but with significant modifications. We work with politicians rather than voters to initiate the process of change, and our intervention scales up and mechanizes existing two-way interactions rather than creating fundamentally new channels for voice. We use IVR to permit politicians to script and record questions, which are then disseminated as robocalls to voters' cell phones. Voters respond using the number keys on their phones. We then present the aggregate voter responses to the politician. The politician can follow up with an additional call that acknowledges and responds to what he learned about voter preferences. The follow-up call closes the communication loop by informing voters that they have been heard and their preferences recorded. We expect voters to respond to this new high-frequency, unsolicited, and two-way contact with their elected representative with greater political support for him and also by moving towards performance-based voting criteria. We expect politicians to respond to the opportunity to communicate more quickly with larger numbers of voters and to receive information on their policy preferences by improving service delivery.

Working in Pakistan, an understudied lower-middle income democracy and the fifth most populous country in the world, we present four key results. *First*, we document high levels of engagement with IVR technology on the part of both politicians and voters. Both sets of actors exhibit eagerness to use IVR to communicate with each other.

Second, IVR communication improves public engagement with elected officials on multiple dimensions. It speeds up political interactions, improves their spatial distribution, and reduces the scope for particularism. *Third*, however, neither group follows through in downstream attitudinal or behavioral changes. Politicians do not improve service delivery and voters to do not appear more satisfied with their elected representatives, although we find suggestive evidence that on-going and responsive IVR could improve the capacity of voters to use performance-based criteria for electoral choices. *Fourth*, we use a forecasting exercise to document that both the degree of active engagement and the downstream null results are

surprising to rather than expected by academic experts.

Overall, our results show that voters and politicians are willing and even eager to transform how they interact with each other and to adopt more efficient, equitable, and impersonal communication technologies. But whether this improves governance and political representation more broadly remains an open question.

Our paper proceeds as follows. First, we briefly review the literature on how politicians and voters interact and communicate and explain why we think that IVR could produce significant changes in the nature, scope, and frequency of interactions. Second, we present descriptive data we collected that allow us to characterize status quo interactions in our research setting. Third, we present the design of the IVR experiment that we implemented. Fourth, we document the degree of engagement with IVR by politicians and voters. In a fifth section, we turn to downstream attitudes and behavior to show neither party exhibited changes in these domains. We then present results of a forecasting exercise that documents that both engagement and downstream results are surprising to academic experts. In a final section, we step back to consider the overall importance of our findings and to suggest routes for further research.

2 Political Interactions between Voters and Legislators

2.1 Status quo interactions

The canonical theory of political accountability posits that democratic elections force elected officials to be accountable to voters on the condition that voters use retrospective sociotropic criteria in evaluating political performance (Ferejohn, 1986). In practice, accountability is compromised on multiple dimensions in democratic settings (Przeworski, Stokes and Manin, 1999). The major problem in developing countries specifically is that voters do not use

retrospective sociotropic performance-based criteria to make decisions about how to vote. Instead, lack of information about performance combined with the use of non-performance based voting criteria undermine the accountability connection. In less developed countries, voters are believed to allocate their votes based on the claims of personal, ethnic, and clan ties rather than by evaluating the performance of the incumbent. Thus, it is common to label less developed countries "patronage democracies" (Chandra, 2004) to highlight that these claims subvert the accountability relationship. The label reflects the frequency with which politicians disburse government resources on the basis of personalistic ties rather than universalistic criteria. And it suggests as well that voters reward patronage rather than performance, thereby reinforcing the political power of poorly performing public officials.

A common characteristic of these settings are the face-to-face interactions between voters and elected officials that are believed necessary for voters to obtain goods and services from government. These goods and services may formally be entitlements that in principle voters should receive automatically. In practice, however, weak state capacity undermines efficient policy implementation. This forces voters to make personal appeals to their elected representatives to receive ordinary government goods and services; in addition, given poverty in combination with weak redistributive systems, voters make constant appeals to politicians for help with all manner of problems ranging from jobs to school and hospital admissions. Thus, as recent research shows, even high-level politicians intervene directly and regularly to supply both constituency service and clientelistic disbursements to constituents (Nichter, 2018; Bussell, 2019).

Although cell phones are widely available in less developed countries and in principle could be used, appeals occur face-to-face. They require the politician visit his constituency office on an at least weekly basis, where he receives steams of supplicants. Estimates of the daily numbers involved range from a few dozen to a few hundred. Using assistants, the politician seeks to resolve as many problems as possible on the spot with phone calls to

bureaucrats or others. Other issues may require a second visit, or may be left unresolved. The issues that are brought to the politician may be classed into two types: requests for assistance with individual matters (financial assistance, employment, etc.) and requests for improvements of public infrastructure (road paving, water and sanitation, electricity and gas, etc.). The first are considered typical *clientelistic* disbursements when they involve resources to which the individual lacks entitlement or which are allocated using partisan criteria and *constituency service* when they are allocated using non-partisan and impartial criteria. The second have not been well theorized in contexts of inadequate infrastructure although in developed countries they are labelled *pork barrel*. We prefer the more neutral term *community* requests.

In less developed countries, these interactions are burdensome to both parties because, among other reasons, they require large time commitments. The politician must travel to his constituency and devote often personal resources to resolve problems at far remove from the legislative process. The voter must travel to the politician's constituency office and make a personal appeal. Theses interactions are thus inefficient. They are also inefficient in other ways: they involve individual appeals for what are often problems that could be solved simultaneously for many constituents with improved bureaucratic policy implementation, and solutions are ad hoc and discretionary rather than standardized and rule-observant. Finally, face-to-face requests allow voters to ask for goods and services to which they are not entitled and that could involve political corruption if disbursed to them; and even when that is not the case, they encourage personalistic partisan-based clientelistic decisions. Although personal requests take place in all democracies — to recover a lost pension or be accurately listed with a government agency — many of the interactions that currently occur face-to-face in less developed countries could be technologically based and be more efficiently and equitably delivered to groups.

2.2 How IVR may transform the status quo

As we implemented it, Interactive Voice Response technology changes interactions between voters and representatives on at least seven dimensions: (i) who initiates; (ii) geographic scope; (iii) content; (iv) scale; i.e. the numbers involved; (v) representativeness of voters involved; (vi) impersonality; and (vii) frequency. With IVR, politicians solicit responses from voters rather than burdening voters with approaching their representative. Thanks to our sampling techniques, voters who live far from the politician's home have equal access rather than disadvantaged, as is the case with face-to-face interactions. The content is decided by the politician and by definition involves aggregations of voters; thus, it excludes individualistic, partisan, and clientelistic interactions. Given that we select a random sample of male heads of households, politicians know they are communicating with a broad swath of voters, not only supporters.[1] The scale is larger, allowing more voters to interact with their representative than in the status quo. If there is socio-economic or partisan bias in the face-to-face interactions characteristic of the status quo, our intervention potentially "flattens" access (Grossman, Humphreys and Sacramone-Lutz, 2014). Interactions are not personally identifiable, potentially freeing the voter to express preferences that he might be reluctant to state in person to his representative. And finally, IVR allows follow-up calls to deepen the interaction.

We study two sets of IVR outcomes: *engagement* and *downstream outcomes*. The first consists of measuring changes effected by IVR over the status quo with regards to the geographic scope, scale, socio-economic representativeness, and frequency of interactions between voters and politicians. We also present descriptive information on the responses of voters and politicians to our requests for involvement with the IVR platform.

[1] As in other South Asian countries such as India, in Pakistan political participation is typically studied at the household level, where men's preferences dominate (Khan, 2017). Our study is not designed to confront the challenge of bringing women into the political realm as independent actors, which requires more targeted interventions, such as those reported in Giné and Mansuri (2018); Cheema et al. (2020).

We study experimental downstream outcomes to assess whether IVR initiates changes that could improve responsiveness and accountability. In particular, we study whether politicians use IVR involvement to improve service delivery to constituencies where voters receive phone calls and we study whether voters change their views of the politician, participate more in politics, and whether they adopt performance-based voting criteria.

2.3 Prior research offering technology-based political communication

Various prior studies offering voters access to information and communications technology (ICT) to express opinions and preferences to politicians have almost all used short-messaging systems (SMS) rather than IVR. IVR has advantages over SMS because the former removes the burden of initiation from the voter. Unlike SMS, IVR also works well in low-literacy environments. Perhaps because they use SMS, other studies show low take-up by citizens (see Table A.1), usually in the single digits. Our take-up rates are as high as the maximum rate ever observed in any other study, suggesting the promise of IVR in transforming interactions between voters and politicians in less developed countries.

3 Context and Status Quo Political Engagement

3.1 Local political context

Our research was conducted in Pakistan's third most populous of its four provinces, Khyber Pakhtunkhwa (KP). KP has a population of more than 35 million mainly rural inhabitants. Provincial literacy is 57 percent. At the time we conducted the experiment (2017–18), there were 99 directly elected Members of the Provincial Assembly, each representing a single-

member electoral district.[2] All directly-elected MPAs were men.

In contrast to the situation in Pakistan's other provinces, KP's provincial legislators face genuine competition retaining their seats from one election to the next. Sixty percent of MPAs elected in KP in 2013 had never been previously elected to a provincial or the national assembly (compared with 50 in Balochistan and Sindh and only 43 in Punjab).[3] Traditional patronage and dynastic networks, although important elsewhere in the country (Chaudhry and Vyborny, 2013; Cheema, Javid and Naseer, 2013; Liaqat et al., 2016), appear less binding in KP, and we report various types of evidence later that show the limited extent of clientelistic interactions in KP between voters and politicians.

The households we study fall outside traditional elite structures: only 21 percent of respondents report (in a baseline survey) that they feel they can influence what government does at least a little. However, 84 percent of respondents replied that it was important or very important to them that Pakistan be governed by representatives elected by the people, documenting powerful democratic aspirations. Finally, access to telecommunications is expanding rapidly; the Pakistan Telecommunication Authority reports that cell phone penetration in the province rose from 42 percent in 2012 to 79 percent in 2020. This combination of marginalization from the political arena, strong democratic aspirations, and newly-won access to modern communications makes KP a good site to investigate whether novel forms of politician-initiated communication improve the scope, efficiency, and equity of constituency service.

[2]Additionally, there were 25 seats reserved for women and minority members; these representatives are elected province-wide using proportional representation. We do not admit these MPAs into our sample because they do not have clearly geographically-demarcated constituencies and are not named on the ballot.

[3]The average margin of victory for MPAs in KP was 11 percentage points, whereas it was 16 percentage points in Balochistan and Punjab and 30 in Sindh.

3.2 Status quo interactions between citizens and politicians

In the province of Khyber Pakhtunkhwa, households seek all manner of assistance from their political representatives. MPAs (and politicians generally) are key conduits for assistance with both personal and community problems. In our baseline survey, 55 percent of respondents report that the MPA is able to get roads fixed in their communities and 49 precent say that an MPA can help their family members get a job.

To obtain assistance, citizens make direct, face-to-face requests of their representative. Thus, politicians return to their constituency offices on a weekly basis where, as one observer wrote, "crowds of applicants wait outside to see the politician or a personal assistant in order to get the all-important 'chit' of paper . . . " (Wilder, 1999, p. 199). Another study reports that the most important attributes of candidates was that they be "helpful in personal needs and community development" (Wilder, 1999, p. 195). Semi-structured interviews by one of us with more than three dozen current and former Khyber Pakhtunkhwa MPAs and MNAs encountered similar views, as well as regular complaints about the constant need to visit their constituencies to attend "weddings and funerals"[4] and to spend the day in their *hujra*, the walled-off area outside the home where the male head of household receives other male visitors.[5] The literature reports that in Pakistan, politicians work from their constituency offices (often the *hujra* or equivalent) to directly interact with anywhere from 20 to more than a hundred supplicants over the course of a day (Wilder, 1999, p. 199). These interactions are the modal way for voters to request help of government.

[4]For a discussion of the political importance of weddings and funerals, see Lyon (2004, pp. 194–96).

[5]The *hujra* is a part of traditional male Pashtun culture; status is represented by the number of other men who visit one's *hujra* in the course of an evening (Barth, 1965). In other parts of Pakistan, such as Punjab, anthropologists find that landlords use equivalent sites to receive information and dispense favors in response to requests for help (Elgar, 1960). Lyon (2004, p. 57) reports that in the part of Punjab where he worked, the *hujra* was called the *déra*.

Direct contacts between Pakistani voters and politicians are reported to be skewed towards higher-income male co-partisans (Liaqat, Cheema and Mohmand, 2020). This is part of a larger political culture in which "leaders redirect public resources to benefit kin, friends and clients" (Martin, 2016, p. 67). In a setting that anthropologists characterize as one of asymmetric factional hierarchies based on status and power (Barth, 1965; Lyon, 2004), politicians seek to assemble large clienteles but, as our semi-structured interviews in KP repeatedly revealed, limited resources mean they are unable to provide assistance to most who request it. Since politicians thus must make discretionary allocative decisions, "those who are richer and part of the village elite have greater bargaining power vis-à-vis leaders than poorer, non-elite members ..." (Mohmand, 2019, p. 24).

Such phenomena are standard across South Asia. In the Indian state of Rajasthan, one scholar reports that 76 of surveyed households were engaged in "claim-making" of some kind on politicians (Kruks-Wisner, 2018, p. 15). Another study, drawing on field research from three Indian states, documents that politicians spend 25 percent of their time on face-to-face service-oriented interactions with voters (Bussell, 2019, p. 25).

3.3 Existing use of mechanized communication tools

Although the technology that features in our experiment is widely deployed by political parties and private sector businesses across the developing world, to the best of our knowledge it has not been studied in the context of voter-politician interactions. In other work with political parties in neighboring India, we observed that IVR is frequently used as a campaign and outreach tool by politicians at local and higher levels.[6] Even before our research began,

[6]Author interviews with political party representative, India, 2019. The technology and associated market are so well-established in India that the mobile vendor we used for our experiment is regionally headquartered there with only one staffer seconded to Pakistan.

IVR had emerged organically in the public sector in Pakistan.[7] Politicians in provinces other than KP were already experimenting with its use to improve their standing with voters. In KP, IVR had not been previously deployed by politicians, who instead relied on their personal networks and face-to-face interactions to gather information about public opinion and communicate with voters. Prior to our research efforts, MPAs had no way to contact voters other than their own loyalists whose phone numbers they had personally collected.

4 Experimental Design and Implementation

4.1 Sources of data

Our study uses data from eight data collection instruments (see Table E). We began in 2018 with a (i) *baseline* survey to enroll 14,400 voters into the study; in 2019 we conducted an (ii) *endline* survey to collect information on experimental outcomes. We merged these data with 2019 polling station level (iii) *election* information we collected. In 2019, we also conducted face-to-face semi-structured (iv) *interviews* with approximately three dozen MPAs and MNAs from KP. During the course of the intervention, we surveyed 240 (v) *key informants* across the 20 treated constituencies. In 2020, we conducted a (vi) *descriptive* telephone survey of 3,600 respondents subsampled from the initial 14,400 to collect information on pre-existing (status quo) political communication.[8] In addition, we surveyed 2,000 students, academics, and policy implementors in advanced countries and in Pakistan in 2019 to collect information for a (vii) *forecasting* exercise. Finally, the IVR experiment generated (viii) *intervention* data on content, take-up, and response rates. We use these eight labels to identify each type of data in our analysis.

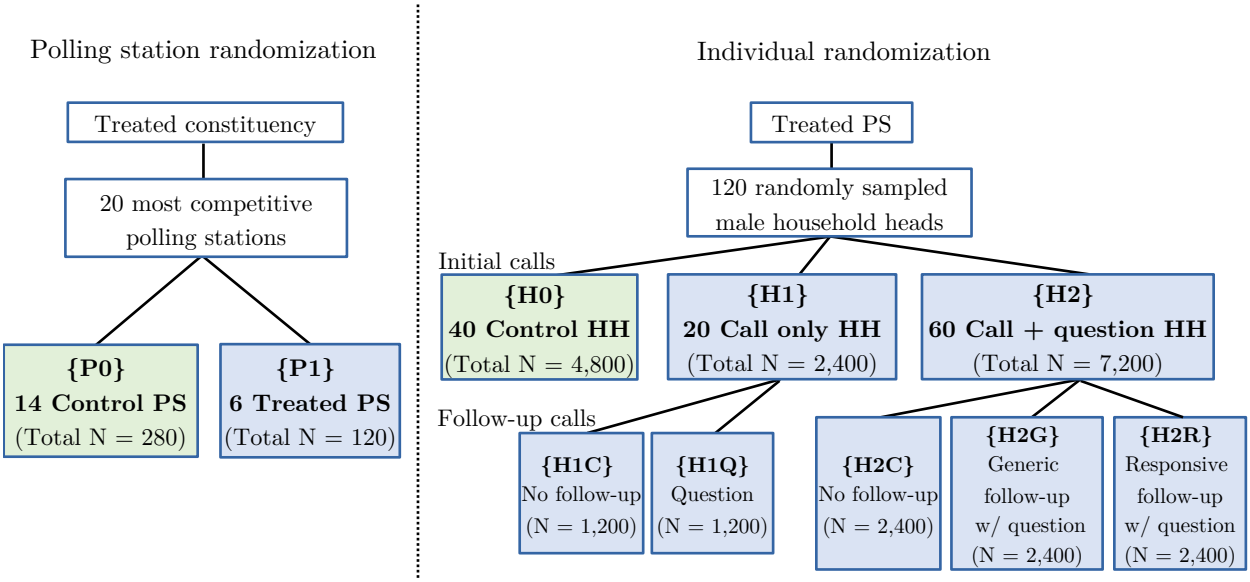
[7] See https://www.economist.com/special-report/2009/09/26/eureka-moments, accessed Aug 21, 2019.

[8] Because of COVID-19, face-to-face surveying was not possible at that time.

4.2 Randomization

Of the 99 directly-elected MPAs in the KP assembly, our implementing partner identified an initial 47 who expressed interest in working with us and using IVR to interact with voters. The 47 MPAs generally come from slightly more competitive and urban constituencies than their uninterested counterparts. We randomly select 20 of the 47 MPAs — blocking on political party — to enroll into treatment and thus give access to the IVR technology through our research team. Figure 1 provides a diagram of the randomization process at both the polling station and household levels.

Figure 1: Experimental design at the polling station and household levels



The MPAs in our sample are elected from constituencies with between 50 and 294 polling stations (PS). The median number of registered voters per KP PS is 1,333; each MPA represents an average of 300,000 people. Within each treated constituency, we select the 20 polling stations with the smallest margin of victory of the incumbent MPA.[9] Among these 20 PS, we randomize six polling stations into treatment {P1} and 14 into control {P0} in

[9]Margin of victory is the PS-level difference in vote shares between the incumbent MPA and the best challenger in the most recent election (either the 2013 general elections or a subsequent bye-election). We exclude female-only polling stations.

a two-step process. We first randomly sample 12 polling stations out of the 20 and then, for those 12 polling stations, create matched pairs using a Mahalanobis distance score that incorporates the total number of registered voters and raw vote totals for large parties.[10] We assign one of each pair to treatment and the other to control.[11]

The right panel of Figure 1 shows show household level randomization. A random walk sampled 120 households within each treated PS area, starting at a central location in the PS catchment area. We enroll male heads of household only, owing to obstacles collecting phone numbers of women.[12] We refer interchangeably to respondents as heads of household, households, individuals, and respondents. Our total sample is 14,400 male heads of household whom we survey once before (baseline) and once after (endline) the intervention. Blocking on co-partisanship with the MPA, 40 of the 120 are placed into a control condition and receive no contact other than the surveys {H0}, 20 receive an IVR call with a credit-claiming message but no question(s) {H1}, and 60 receive a credit-claiming message as well as an IVR question(s) {H2}. Total sample sizes are reflected by the N values in each box.

A second stage splits those who receive first-stage calls to either receive no follow-up call or receive a follow-up call containing specific components. Respondents in {H1C} and {H2C} receive no follow-up call, while all other respondents receive a follow-up call in which the MPA asks a new question via IVR {H1Q, H2G, H2R}. Respondents in {H1Q} receive only the new IVR question, while respondents in {H2G} and {H2R} also receive a *generic* or *responsive* message, respectively, where the MPA acknowledges the first stage IVR question. The *responsive* message details how the MPA will act based on the information collected in

[10] A large party is any party that received more than 100 votes in any of the 12 PSs or that received an average of 20 votes across all 12 PSs in the 2013 elections.

[11] For analyses of electoral outcomes, we compare the six treated PSs with all 14 control PSs, but owing to cost constraints we can only compare the matched PSs when analyzing MPA effort using key informant interviews.

[12] Using female enumerators, ninety percent of the women we asked refused to provide their phone numbers or did not have regular access to a phone. The exclusion of women may raise ethical issues. These are discussed in Appendix C.

the initial robocall in which he asked for constituent input while the *generic* message simply thanks them for their input. The main goal of these randomizations is to estimate the total effect of the most interactive and deepest IVR communication we could generate {H2R} as well as marginal effects of call components.

4.3 Content of the IVR calls

Each first-stage call contains two sections. First, the MPA introduces himself and credit-claims for recent achievements. Second, he asks a question seeking voter feedback. The average initial recording lasted two minutes, which with the MPA's permission we edited down to an average of 85 seconds for clarity and to retain voter interest. A sample call illustrating the credit-claiming message and providing the modal question is:

Stage One Scripts

Introduction and Credit Claiming: Assalam U Alaikum. I am [MPA NAME], your elected MPA. In the past nine years, girls' degree college, boys' degree college, and hundreds of primary, middle, high and higher secondary schools have been built. I have constructed a link road. In addition to this, gas lines to each house have been or will be completed. Furthermore, I have worked hard to speak for the people and their rights on the floor of the assembly.

Question: What do you think I should focus on going forward?

- Education and health, press 1
- Development works, press 2
- Legislation, press 3
- If you want to listen again, press 9

Thank you for taking your valuable time. Good bye.

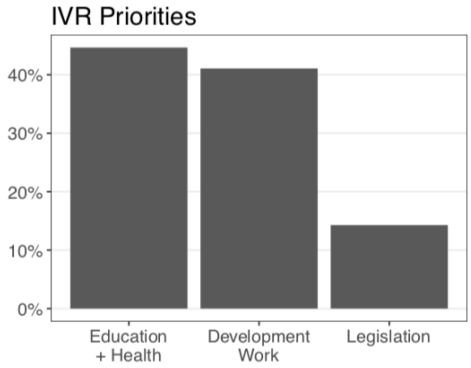
We use automated recall patterns to call multiple times staggered throughout the day until the respondent answers. Respondents in the IVR question treatment condition who answer the phone but not the question are contacted again to give them an opportunity to respond to the question. After calls are completed, we collate responses and report aggregate demographics from our baseline survey as well as aggregate IVR responses to the MPA. Part of

one such report is shown in Figure 2.

Figure 2: MPA sample report

Participating Settlements

Polling Station	Settlement
GGPS Gheba	Gheba
GGPS Gheba	Gheba Maira
GGPS Pandak	Pandak
GHS Sarai Saleh	Feroz Khan
GHS Sarai Saleh	Machis Factory
GHS Sarai Saleh	Maki Masjid
GHS Sarai Saleh	Masjid Bilal
GHS Sarai Saleh	Moh Eid gah
GHS Sarai Saleh	Moh Jadeed
GHS Sarai Saleh	Railway Station
GHS-Pharalla	Pharalla
GHS-Thanda Choha	Thanda Choha
GPS Kehka	Kehka



After receiving first-stage responses, MPAs record follow-up calls and second IVR questions. These go out to respondents using a similar strategy of recalling those who did not initially answer. Details on the intervention timeline appear in Appendix D.

5 Communication Transformations Offered by IVR

In this section, we report descriptive results comparing what we call status quo communication with the IVR technology we deployed. Status quo political communication consists of face-to-face citizen-instigated meetings with political representatives; use of other forms of communication (e.g. phone calls, email, etc.) by ordinary voters is almost completely unknown in our context. Status quo communication is thus inherently limited to individuals willing and able to access the MPA in person, usually in his constituency office but occasionally also at public occasions (weddings and funerals).

5.1 Geographic scope: Where are the locations where voters communicate with their MPA?

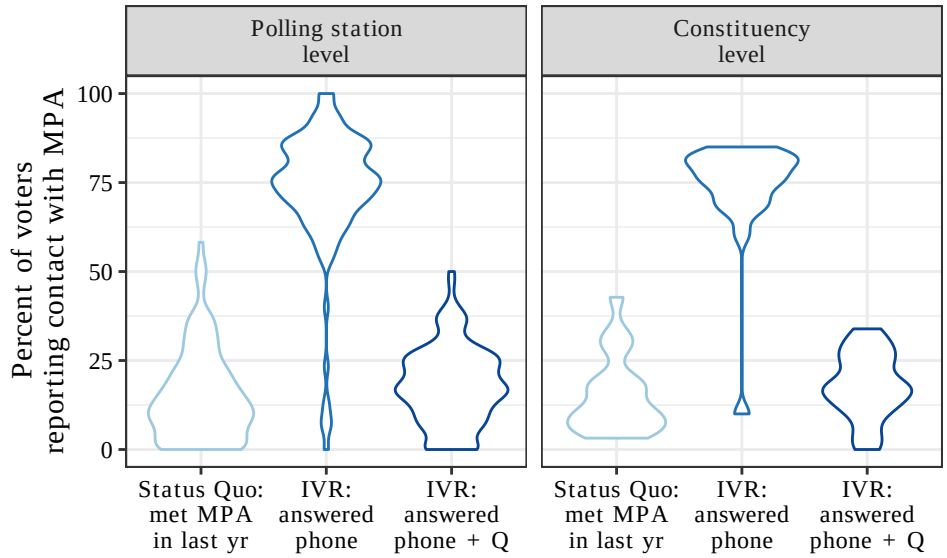
We first examine if community characteristics correlate with who interacts with an MPA. If interactions are geographically concentrated under the status quo, other geographic areas will be potentially underserved.

To study this, we examine data from the *descriptive* survey. In Figure 3, we depict the distribution of in-person interactions and IVR calls across polling stations (left) and constituencies (right). There are substantial numbers of polling stations where no one reports having met his MPA in person in the last year. This number goes to almost zero for IVR contact, defined by answering the phone; IVR thus reaches all locations, including those excluded from direct political access. If we restrict attention to only IVR respondents who answer a question, contact still improves under IVR. Results of one-sided F-tests demonstrate that the variance in polling station status quo contact is greater than the variance in polling station IVR question response rates ($p = 0.036$) but not IVR phone response rates ($p = 1$). Results are similar if we consider the constituency level differences instead of polling station level differences.[13] Thus, IVR contact is more evenly spread across geography than in-person contact by our random sample.

Table 1 follows up with results from two sets of polling station level regressions, distinguished according to whether the respondent reports having met his MPA in person in the last year or whether he answered an IVR question. The regressions study the relationship between distance to an MPA's constituency office and each type of contact with the MPA. We measure distance as the geodesic distance between the respondent's polling station and the MPA's

[13]Note that in order to make the comparison between modes of communication equivalent, we estimate the variance and the distribution of contact rates on the same follow-up subsample. If we estimate the variance in PS-level IVR contact rates from the full baseline sample, then it will have mechanically lower variance.

Figure 3: Distribution of contact rates across polling stations (left) and constituencies (right)



Notes: Each violin plot shows a distribution of contact rates between politicians and voters. For example, in the left panel, polling stations with no reported contact lie at zero, and those where everyone reports contact with their MPA lie at 100.

constituency office.[14] We specify distance in two different ways, controlling for constituency level effects in two different ways to deal with the variation in constituency size in our sample: in the first column for each outcome we regress the percent of respondents reporting contact with the MPA on distance with constituency fixed effects; in the second column we instead aggregate respondents into terciles of the distance of the respondent's polling station within each constituency. In both cases, there is evidence that distance to the MPA more strongly predicts status quo contact rates than IVR and that IVR thus reaches a more geographically diverse set of constituents. In the first column, the coefficient on distance shows that for each kilometer further from the MPA's constituency office, 0.2 percentage point fewer respondents met in person with the MPA; moving from the 25th percentile (4km) to the 75th percentile on distance (15km) corresponds to a 2.5 percentage point decrease in the percent of respondents

[14]For IVR communication, the MPA is located at his 2013 constituency office whereas for status quo communication he is located at his 2018 constituency office. Using the 2018 MPA's constituency office for the distance calculations for IVR produces substantively similar results.

who report meeting face-to-face with the MPA. Thus, voters who live further from the MPA's constituency office are disadvantaged by the need to travel for face-to-face meetings.

Table 1: Distance to MPA's constituency office and average interactions rates, by PS area

	Outcome			
	Status quo		IVR	
	% who met MPA in last yr		% who answer IVR question	
Intercept	16.699***		17.750***	
	(2.854)		(2.461)	
Middle 2 PS	−1.441		−0.250	
	(1.252)		(1.646)	
Furthest 2 PS	−3.026†		0.750	
	(1.699)		(1.709)	
Distance (km)		−0.225*		0.004
		(0.104)		(0.102)
Constituency FEs		Yes		Yes
Num. Obs.	120	120	120	120
R2	0.009	0.704	0.002	0.710

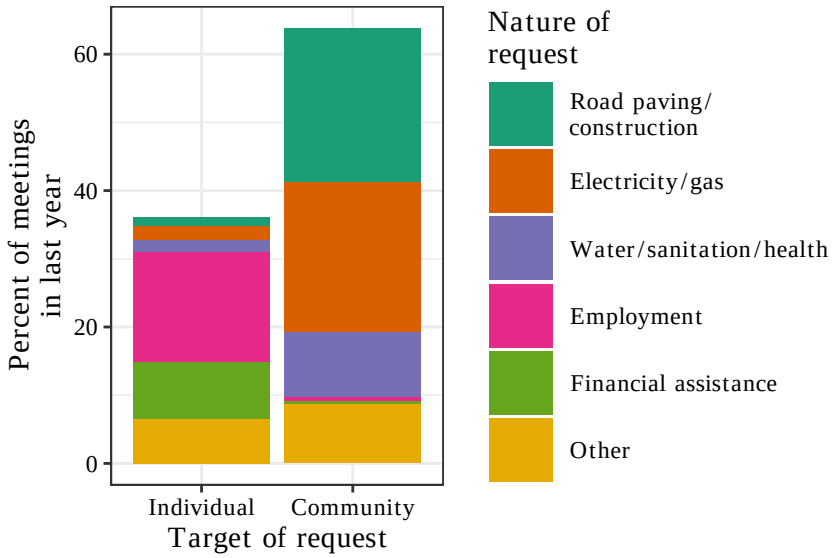
Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. Standard errors clustered by constituency in parentheses. The first and third models have indicators for polling station distance by tercile within constituency. The omitted category is the first tercile, which includes the two closest polling stations.

5.2 Content: What gets communicated to the MPA?

In Figure 4, we present data from the *descriptive* survey that shows the target and nature of requests made by individuals who report having met face-to-face with their MPA. We separate requests on the basis of whether respondents ask for goods or services for the individual (or household) or for the community. Two-thirds of requests seek community improvements rather than individual clientelistic goods. These data show that even in face-to-face interactions, voters more frequently request basic public infrastructure than clientelistic goods. This contrasts sharply with a large literature that depicts political interactions in the global south as oriented mainly towards clientelism and patronage (Chandra, 2004; Kitschelt and Wilkinson, 2007; Nichter, 2018; Bussell, 2019). Like this large literature, our data confirm

that requests targeted to individuals mainly involve jobs or financial assistance. But most voters who meet with their MPA do so to ask for improvements in roads, electricity, or water for their communities.

Figure 4: Target and nature of requests made to MPA in status quo meetings



Notes: Data are subset to respondents who report meeting their MPA in the last year.

As the modal IVR call content documented (reported in Section 4.3), IVR content involves broad policy orientations and priorities; it could potentially be adapted to poll communities on infrastructure conditions.

5.3 Scale: How many people communicate with their MPA?

The third dimension we investigate is the total number of constituents who interact with their elected representative in any given period. In Table 2, we show contact rates using data from the *descriptive* survey: only nine percent of respondents report meeting their MPA in-person over the last six months and only 15 percent report meeting him over the last year. Thus, status quo interactions involve small proportions of voters.

IVR data show improvements in the numbers of voters who interact with their representative.

Fully 73 percent of the population in our random IVR sample of 14,400 answer the phone to accept a call from their MPA. About 17 percent of respondents stay on the phone long enough to hear and answer a question, signaling substantial engagement with the communication system and the MPA. Phone calls initiated by a politician to communicate with voters are thus highly effective in establishing contact and eliciting feedback.

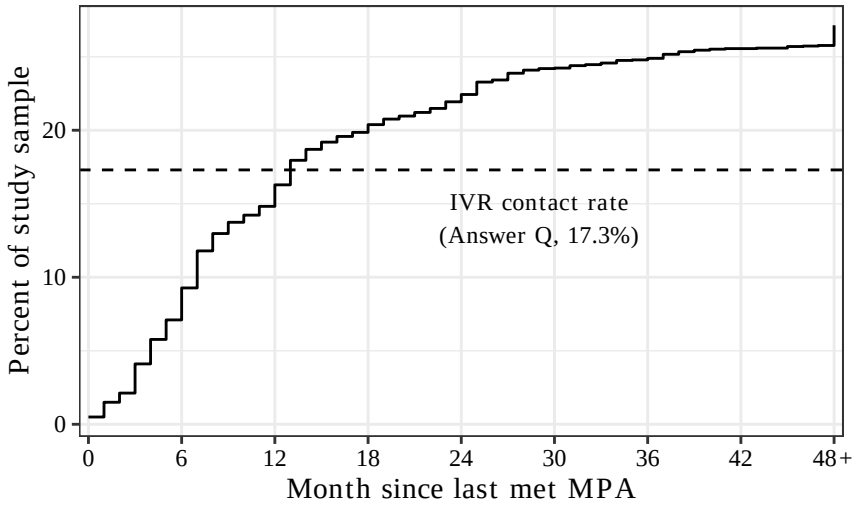
Table 2: Status quo and IVR interaction rates

Interaction type	Interaction percentage	Source
Status quo face-to-face (1 yr)	14.8%	Descriptive survey
Status quo face-to-face (6 mos)	9.0%	Descriptive survey
IVR: answer phone	73.1%	Experimental sample {H1, H2}
IVR: answer phone and question	17.3%	Experimental sample {H2}

Status quo interactions by time. Status quo rates of contact vary significantly over time. In data gathered in the *descriptive* survey of the subsample of respondents in the {H2} condition, citizens report when they most recently met their MPA. We plot the data in Figure 5. Only about a third of all households report *ever* meeting their MPA in person; we take this as the upper-limit on face-to-face interactions over any period of time. Second, IVR is not only able to more than double the rate of interaction with just a single round of calls, it is also establishes as much two-way interaction in one round of calls as occurs face-to-face over a full year. This is shown by the intersection between the dotted and solid lines. Since IVR calls are automated, require about a week to roll out via the technology provider, and cost at most a few U.S. cents per call, this represents the enormous gains in scale that can occur if IVR is used to boost interactions between an MPA and constituents.

IVR interactions over call-time. In Figure 6, we present information on the proportion of constituents IVR retains at all stages of the phone call. We see that of the 100 percent of respondents who were called, nearly 80 percent answer the phone. There is then a gradual reduction in respondents still on the phone as the MPA first makes a credit-claiming state-

Figure 5: Status quo by contact window

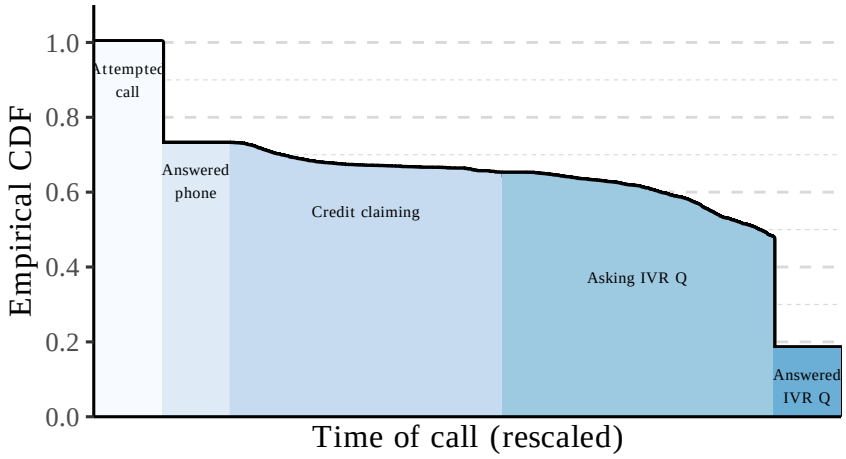


Notes: The solid line plots the cumulative distribution of time since survey respondents last met their MPA in person. The dashed line is the average rate of contact under IVR (answered question).

ment and then asked his question. By the time the MPA finishes asking a question, about half the respondents are still on the call. This is often more than a minute and a half into call time. The biggest drop-off occurs when respondents are asked to answer a question which, as we have already noted, is completed by only 17.3 percent of those called.[15] Whether this is a large or small proportion depends on one's baseline; compared to other ICT interactions (reported in Table A.1) and with our *descriptive* data on rates of face-to-face interactions, it is excellent.

[15]Because IVR is still not in general use in Pakistan, even in the private sector, this may signal that citizens are still familiarizing themselves with how it works; thus, there remain a large number whose voices could potentially be heard once they become more familiar with the mechanics of answering questions using IVR.

Figure 6: IVR contact by length of call



Notes: The figure shows the proportion of respondents who remain on the phone at various stages of the IVR call. The x-axis is rescaled for illustrative purposes to account for differing call lengths across MPAs.

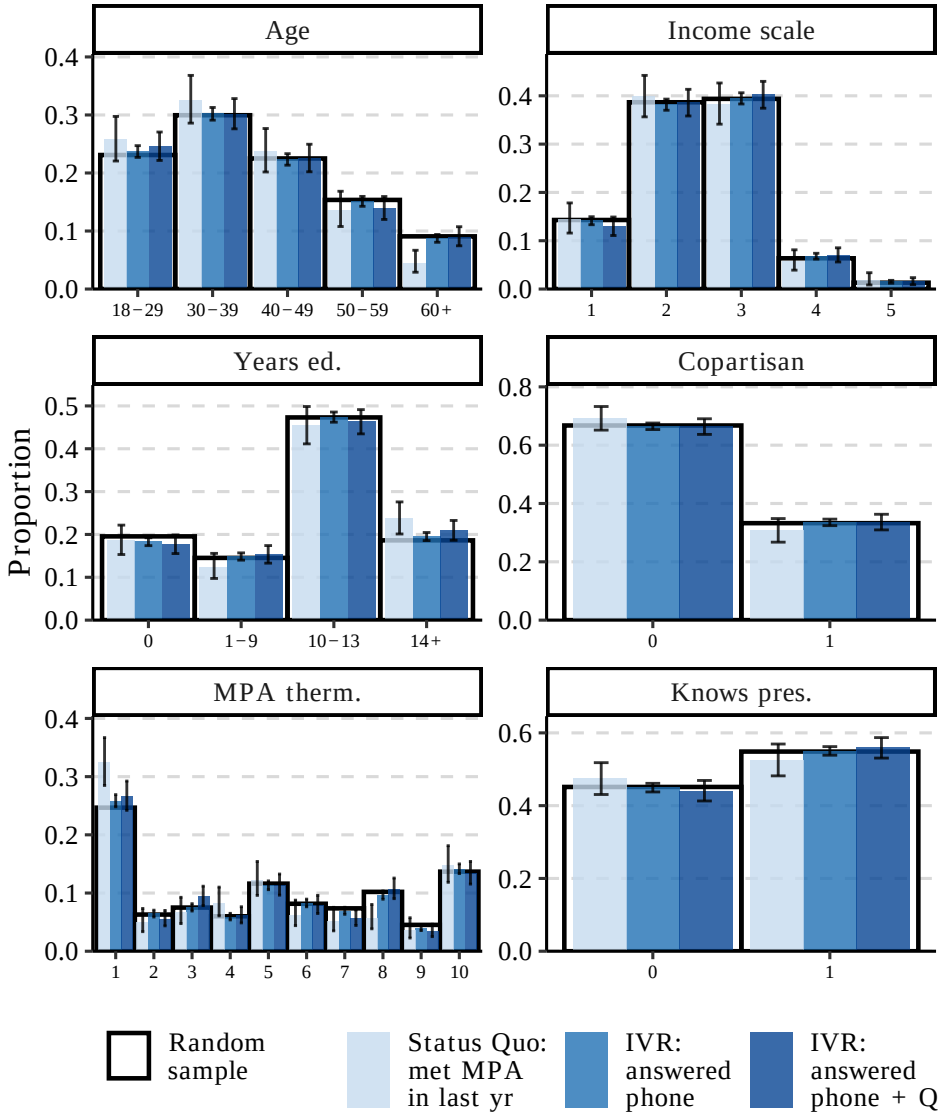
5.4 Socio-economic and partisan representativeness: Who communicates with their MPA?

A fourth dimension we study concerns *whom* MPAs are able to reach using IVR. Figure 7 compares the characteristics of three groups: (i) people who report in our *descriptive* survey having met their MPA in person at any time in the last year; (ii) randomly sampled respondents enrolled in IVR who answer a question (based on *intervention* data); and (iii) randomly sampled respondents enrolled in IVR (using data from the *baseline* survey). Perhaps surprisingly, we find that *all* modes of communication do a good job reaching constituents who are representative along we measure, including demographics (age), socio-economic status (income and education), partisanship (co-partisan and MPA thermometer scale), and political knowledge (whether the respondent accurately identifies Pakistan's president).[16] Face-to-face interactions are not elite-biased and IVR replicates the pattern of reaching a

[16]All methods also do an equally bad job reaching women as independent voters in the household. Neither the status quo nor IVR are designed to counter Pakistan's massive gender imbalances in political communication (Khan, 2017).

representative sample both in terms of who picks up the phone and who answers a question.

Figure 7: Constituent characteristics by mode of contact (with 95 percent confidence intervals)



5.5 Discussion

Overall, we find that in the setting we study, status quo interactions involve a small number of constituents but these individuals are representative of the broader male population. Perhaps because they were sited in areas of the country that are known to have deep clientelistic

networks, other studies conducted in Pakistan (Cheema et al., 2020) — like those conducted in Africa (Grossman, Humphreys and Sacramone-Lutz, 2020) — report socio-economic bias for face-to-face interactions that we do not find. However, status quo methods are relatively slow in reaching constituents: in person contact under the status quo takes about a year to reach as many people as does one wave of IVR calls in a week. In other words, IVR can be powerful in spring-boarding regular and timely interactions between the MPA and his constituents, enlarging the *scale* of interactions. In addition, IVR also can flatten access across space, thereby improving the *scope* of interactions, which is important if interest articulation is a necessary condition for gaining public infrastructure from the state. Finally, IVR modifies the *content* of interactions because it is inhospitable to clientelistic and personalistic transactions. Thus, IVR offers improvements on three dimensions of interaction: scope, scale, and content.

6 Downstream Results of IVR Communication

In this section, we look beyond who uses IVR and ask whether it shows effects on individual attitudes and self-reported political behavior and on politician service delivery. Except as noted below and detailed in Appendix B, outcome measures, equation specifications, and treatment effects were pre-registered.

6.1 Effects on individual attitudes and behavior

Data: Our main study sample comprises 14,399 male heads-of-household.[17] Of the 14,399 individuals for whom we have baseline data, we were unable to recontact 411 (2.9 percent)

[17]We baselined 14,400 respondents; one was dropped after randomization due to a duplicate phone number.

at endline.[18] As a result, we have 13,988 individuals in our *endline* dataset which, combined with the *baseline* dataset, constitute the data analyzed in this section.[19]

Outcomes: At the individual level — the male heads-of-household — we focus on three main indices of outcomes. First, we study effects of the intervention on *evaluations of the incumbent*. The index comprises four outcomes: (1) a feeling thermometer for the MPA himself (1–10); (2) a feeling thermometer for the MPA's party (1–10); (3) a binary indicator for whether the respondent claimed to have voted for the MPA (or the incumbent MPA's party if he did not run again); and (4) the inverse of the ranking of the MPA among his top four challengers in the 2018 elections. Second, we study effects of the intervention on *political participation*. This index consists of three outcomes: (1) a binary indicator for whether or not the respondent voted in the 2018 election; (2) a binary indicator for whether or not the respondent attended a rally in the period leading up to the 2018 elections; and (3) a binary indicator for whether or not the respondent attended a political meeting before the 2018 elections. Third, we study effects of the intervention on *prospects for electoral accountability*. This index is made up of three outcomes: (1) a measure of self-stated political efficacy (1–5); (2) how important incumbent performance is to an individual's vote choice (1–6); (3) the number of conversations the respondent had about politics in the two weeks before the endline survey. The third index is conceptually the most complex. The first item is included because we think voters are more likely to attempt to evaluate the performance of the incumbent when they have higher levels of political efficacy. We include the second item to measure whether the voter thinks that performance criteria should be used when deciding for whom to vote. The final item is included because we contend that voters cannot enforce

[18]The p-value for an F-test of the joint significance of a regression of attrition on the two first stage treatment dummies is 0.77, indicating that attrition is not predicted by treatment condition.

[19]As a robustness check, we replicate our main analysis (reported in Table 3) using inverse probability of attrition weights (see Table G.1). Results are nearly identical due to the large sample size and relatively low rate of attrition.

political accountability without some political engagement that includes discussing issues.[20]

Estimation: We estimate effects on the indices and constituent outcomes using an OLS specification:

$$Y_{hpm(t=1)} = \tau D_h + \alpha Y_{hpm(t=0)} + \beta^{'} \mathbf{H}_{hpm(t=0)} + \lambda_p + \epsilon_h,$$

where $Y_{hpm(t=1)}$ is the outcome Y for household h in polling station p at endline ($t = 1$), D_h is a binary indicator for treatment status, $Y_{hpm(t=0)}$ is the pre-treatment outcome Y collected in the baseline (if available), and λ_p is a polling station fixed effect. The vector of household variables, $\mathbf{H}_{hpm(t=0)}$, is a set of pre-treatment variables selected from {age by decade, an income scale, education bins, an index of political knowledge, a set of indicators for the party the respondent supports, a binary measure of reported turnout in 2013, and a binary measure of support for the MPA's party} if they predict the outcome in the control group.[21] We use heteroskedasticity-consistent standard errors (HC2), since the treatments of interest are assigned at the household level.

Individual level effects: We present treatment effects for receiving any part of the IVR treatment (groups {H1} and {H2}) as well as receiving the deepest, or "full" responsive IVR intervention ({H2R}) in Table 3. In the first column, we present the control mean; because this is the reference group to which we scaled all indices, the mean is 0 and the standard deviation 1 by design. The second set of columns presents the treatment effect

[20] We report how we build these indices in Appendix F. We also examine whether adding this outcome to the political participation index changes any of the conclusions throughout the paper. It does not, and we report these alternative index results in Table G.2.

[21] We admit pre-treatment household characteristics into the specification if the F-statistic of a regression of the outcome on that pre-treatment variable is significant at the 0.05 level. For variables like age, where we have a set of dummies for the decade of the respondent, we admit all of the age dummies if the p-value on the joint test of their significance is less than 0.05

of any call, along with total sample size used in estimating that treatment effect. The absolute values of all treatment effects are smaller than 0.02 standard deviations, and all are statistically indistinguishable from zero. We find no effects of receiving any kind of IVR call on individual attitudes for any of the indices. Even when we split out the indices into their component measures (see Appendix I), there are no treatment effects on any outcome despite the large sample size. Furthermore, local average treatment effects among compliers are also substantively small and remain statistically insignificant (see Table G.3).

Table 3: Effects of any IVR call and effects of full IVR treatment on household head outcomes

	Control mean: no call {H0}	ITT: any call {H1, H2} vs. {H0}		ITT: full responsive treatment {H2R} vs. {H0}	
Outcome indices	μ	τ	N	τ	N
Incumbent evaluations index	0.000	−0.009	13757	−0.016	6539
	(1.000)	(0.009)		(0.013)	
Political participation index	0.000	−0.020	13780	0.004	6551
	(1.000)	(0.016)		(0.025)	
Prospects for accountability index	0.000	0.004	13759	0.025	6539
	(1.000)	(0.017)		(0.026)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses.
Pre-treatment control variables not displayed; see text for details.Because our preferred specification includes pre-treatment covariates and the baseline measure of the outcome may have some missingness and because there is some missingness on the outcomes themselves, the sample sizes in the tables below do not represent the full 13,988 individuals for whom we collect both baseline and endline data.
The letters in braces refer to the experimental groups described in Figure 1.

In the third set of columns, we consider the effect of the full and responsive IVR intervention, whose respondents received an initial call with an IVR question and also a follow-up call that acknowledges first stage responses. Although we did not pre-register this comparison, we include it here because we consider this to be the deepest usage of the IVR tool deployed. We have the greatest expectation for positive treatment effects for this group of respondents. Nonetheless, we again see small treatment effects, with the largest absolute standard deviation treatment effect of +0.25 standard deviations on the prospects for accountability index. Again, no treatment effects are statistically significant. Other results analyzing differences between various treatment arms are reported in Appendix I. The IVR intervention appears

to have little effect on individual attitudes or self-reported political behaviors.

6.2 Effects on aggregate electoral outcomes

We now turn to effects on aggregate electoral outcomes. One of the features of our experimental design was the ability to identify the effects of saturating one PS area with IVR calls while leaving other PS areas untouched. This allows us to estimate whether voters reward or punish their MPA for communicating via IVR with dozens of households in a PS area, as well as whether increased communication changes the turnout rate at the polling station level. Unsurprisingly, given the lack of individual level effects, we find no evidence of any intervention effect on vote shares for our partner MPA (or his party) and turnout. We present the full specification and results in Appendix J.

6.3 Effects on politician behavior

We evaluate whether IVR had effects on politician behavior by examining the kinds of messages they crafted during the *intervention* as well as whether they invested more effort in service delivery in treated localities, according to *key informant* interviews.

For the IVR calls, we allowed partner MPAs to craft messages of their choosing. We anticipated that this would permit politicians to tailor communication to treated localities. However, politicians on average did not invest in crafting messages that were likely to resonate with voters. The modal question (see Section 4.3) was, by our reading not very specific and was consequently of low potential interest interest to voters. Indeed, 16 of our 19 partner MPAs who recorded a question asked identical questions, recycling one of two prompts our staff provided to assist MPAs in crafting questions. So although politicians appeared eager to engage and we had more than double the number of MPA volunteers than we could work with, they shied away from using the opportunity to deepen their interactions with voters

more than superficially.

In addition, politicians do not use the new IVR channel to enlarge other complementary interactions with voters. The politicians who enrolled in our study interacted repeatedly with us in the nine months preceding an election. This could have encouraged them to exert more effort and improve service delivery in the polling station areas where voters received IVR calls, perhaps with a view towards augmenting the enhanced political visibility brought by IVR calls. This additional effort could have created a second channel for voters to receive new information about their representative. But MPAs did not exert additional effort.

To measure this, we administer *key informant* interviews in the six treated polling station areas in each constituency where voters receive IVR and in six of the 14 control polling station areas where they do not. We conduct key informant interviews before and after the intervention. Key informants were generally salaried individuals (school teachers, for instance) who had no personal or professional relationship with the MPA and who were not involved in campaigning for any political party. Enumerators selected two key informants in each polling station area, both of whom were deemed likely to be available for repeated interviews.

We ask key informants whether politicians visit the polling station area: the goal is to evaluate whether they visit areas more where we direct their IVR phone calls. We also ask key informants whether politicians exert effort in delivering public services, including schools, roads, health facilities, employment conditions, electricity provision, gas provision, water provision, rubbish collection, and general security.

We estimate effects on these outcomes with OLS using the following specification:

$$Y_{pm(t=1)} = \tau D_p + \alpha Y_{pm(t=0)} + \lambda_m + \epsilon_{pm},$$

where $Y_{pm(t=1)}$ is outcome Y at polling station p at endline ($t = 1$), D_p is a binary indicator

for treatment status, $Y_{pm(t=0)}$ is the pre-treatment outcome Y collected in the baseline (if available), and λ_m is a constituency fixed effect. We use heteroskedasticity-consistent standard errors (HC2) since the the treatments of interest here are assigned at the polling station level, the same level as the outcomes.

Table 4 shows that there is little evidence of effects on politician effort in places they administer IVR, although estimates are not very precisely estimated due to the relatively small number of observations. Key informants report that, in control areas, MPAs made some effort in only 0.48 of the nine public goods domains. In addition, on average, politicians are reported as making some kind of effort in just over a quarter of areas (the control mean is 0.27), and there is almost no effect of treatment on this. Very few areas (only 0.05) saw their MPA visit in June, again virtually unaffected by treatment. Overall, we observe little effect on politician behavior from being enrolled in treatment: their low levels of effort remain as before.

Table 4: ITT effects of IVR calls on MPA effort in polling station areas

	Control mean: control PS {P0}	ITT: treated PS {P1} vs. {P0}	
Outcome	μ	τ	N
N of domains where MPA made effort	0.483	0.017	240
	(1.004)	(0.090)	
Any MPA effort (0/1)	0.267	0.050	240
	(0.444)	(0.047)	
Any MPA visit in June (0/1)	0.053	0.035	240
	(0.153)	(0.022)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses. Pre-treatment control variables not displayed; see text for details.

Finally, there is other (non-experimental) evidence that some politicians in our sample may

have deliberately disengaged from the experiment, despite having volunteered to participate in it. In the first stage of the intervention, one MPA refused to record an IVR question, claiming he already knew everything there was to know about his constituency. In the second stage, three MPAs were either unwilling to record the different components of the phone call as per the experimental design or were unavailable. In Table 5 we code these four MPAs as "partial" compliers and compare them to the rest of the directly-elected MPAs in the KP Assembly on a host of covariates. Although the sample is obviously small, the data show that partial compliers are in safer seats, have longer parliamentary tenure, and are less likely to be affiliated with the Pakistan Tehreek-e-Insaf (PTI), a newer party that took power in KP in 2013; moreover, non-compliers exhibit lower attendance in parliament. One plausible interpretation of these patterns is that politicians facing less electoral competition see little need to use new or augmented forms of communication with voters. More surprising, however, even politicians who faced more serious reelection problems and volunteer for IVR treatment do not use it to leverage their standing, status, and visibility with voters by improving service delivery and visiting treated areas.

Table 5: Observable differences among MPAs by degree of experimental compliance

		Average				
MPA type	N	Vote share	Victory margin	Tenure	Legislative attendance	Member PTI
In sample						
Partial compliance	4	0.44	0.22	1.50	42.5	25.00
Full compliance	16	0.27	0.05	1.31	66.9	56.25
Out of sample	79	0.36	0.12	1.35	62.5	36.71

Notes: "In sample" MPAs are our 20 treated partners and "out of sample" are the remaining 79 directly-elected KP MPAs. PTI is Pakistan Tehreek-e-Insaf, the then-governing party in KP.

6.4 Evidence of voter engagement

Despite the null effects of treatment on voter attitudes and behavior, there is evidence that some components of the intervention affect voter engagement. In Table 6, we present data us to evaluate whether citizens are interested in engaging with politicians using IVR. The data shows that when citizens receive a call from their MPA that includes a question — as opposed to an exclusively credit-claiming call — they are more likely to answer a subsequent call from the same politician. This suggests that citizens appreciate being included in policy discussions with politicians and would like to continue the conversation. Although this improvement is not large enough to change downstream voter outcomes (see Table I.2), it suggests that on-going IVR interactions could gradually affect political attitudes and behavior. Potential changes were not sufficient to be visible in the timeframe of our study, however.

Table 6: ITT effects of initial call type on follow-up pickup rates

	Control mean: call only {H1}	ATE: effect of getting asked IVR question vs. call only {H2} vs. {H1}	
Outcome	μ	τ	N
Answered follow-up phone call (0/1)	0.787	0.036*	3718
	(0.410)	(0.015)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001.
Notes: Heteroskedasticity-consistent (HC2) standard errors in parentheses.Because nothing about a respondent's treatment condition is revealed before picking up the phone, initial call treatment status (e.g. {H1} or {H2}) only affects the respondent once he answers the initial call. Therefore, we subset the analysis to respondents who answer the first call.

To futher explore this, we study downstream outcomes when respondents receive a single call from their MPA compared to also receiving an additional follow-up call. The results reported in Table 7 show suggestive evidence that repeated contact boosts citizens' prospects for accountability. When combined with the evidence just reported that voters like to engage

in more substantive interactions that includes a question, these results document nascent willingness among voters to engage on policy with politicians. But politicians apparently have to repeat their efforts to communicate with and hear from voters, and they have to demonstrate that they are responsive to feedback.

Table 7: Marginal effects of any follow-up call versus only initial call on household head outcomes

	Control mean: only stage 1 call {H1C, H2C}	ITT: marg effect of follow-up call {H1Q, H2G, H2R} vs. {H1C, H2C}	
Outcome indices	μ	τ	N
Incumbent evaluations index	0.004	−0.001	7777
	(0.987)	(0.011)	
Political participation index	0.004	0.008	7792
	(0.985)	(0.021)	
Prospects for accountability index	−0.066	0.042†	7779
	(1.006)	(0.022)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses. Pre-treatment control variables not displayed; see text for details.

6.5 Robustness of null effects: power calculations

One concern with the null results reported in this section is that the experiment might have been statistically underpowered and therefore unable to detect effects even if they exist. Although this may be the case at the polling station level, it is unlikely to be true at the household level, where we have a large sample. We can formalize this by computing equivalence confidence intervals, as proposed in Hartman and Hidalgo (2018). Equivalence confidence intervals represent the range of hypothetical treatment effects consistent with the data; treatment effects outside these intervals are rejected as too large given the data. Equivalence confidence intervals for the main effects of the intervention at the household

level (reported in Table 3) all have upper bounds at or below 0.05 standard deviations (see Appendix H). In other words, if the true treatment effect were 0.05 standard deviations or larger, we would only get our observed treatment effects less than 5 percent of the time. This shows that large treatment effects are highly implausible, making it unlikely that the null results on downstream outcomes result from lack of power.

7 What Did We Expect? A Forecasting Exercise

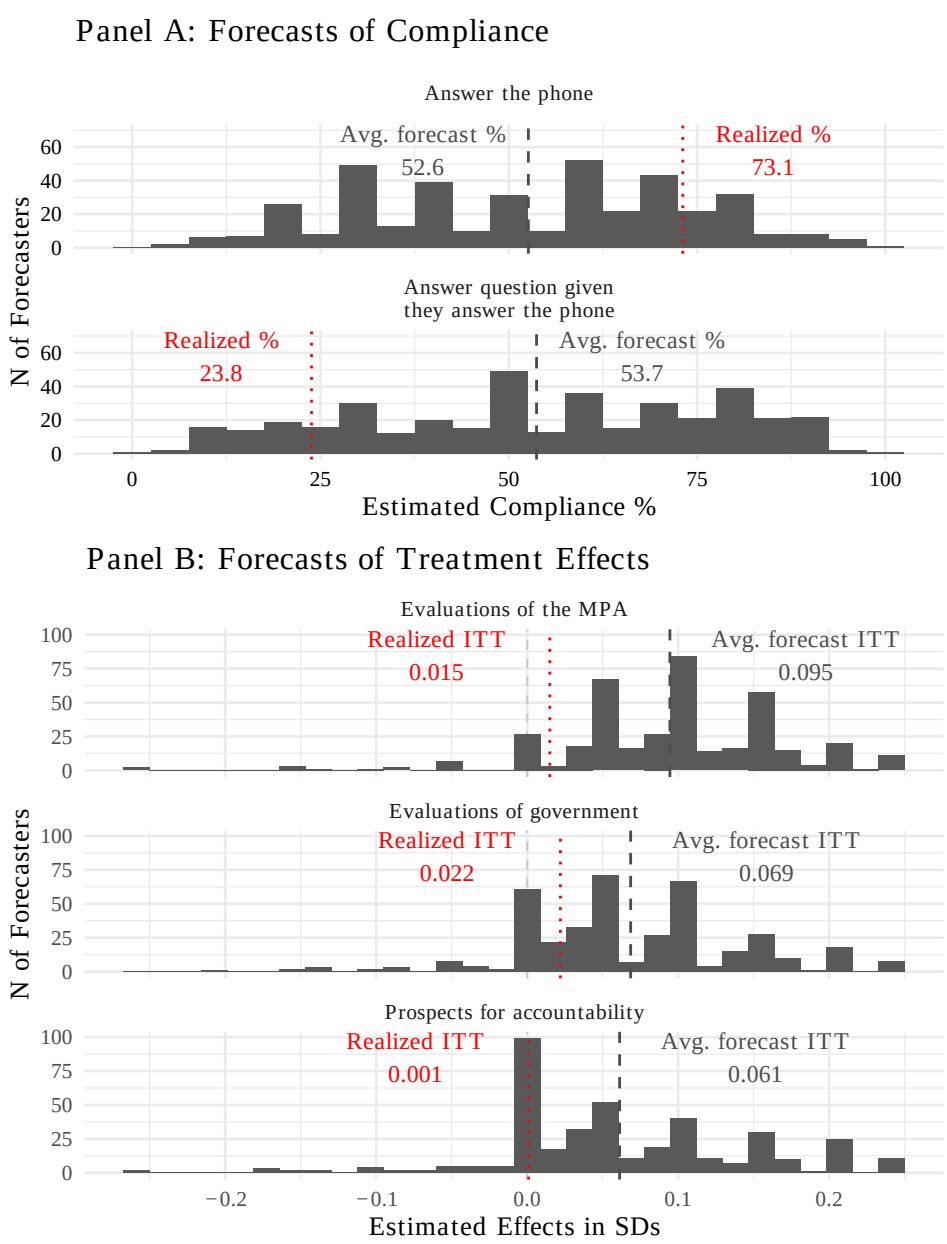
Were the mixed results we observe obvious ex ante? We now present results of a forecasting exercise where we poll potential users of this research in Pakistan and from academia in the United States and Europe, asking them about their beliefs on the impacts of the experiment before seeing results. Our aim is not to get a representative set of forecasters but rather to capture the ex ante beliefs of those who express an interest in the research by volunteering their time.[22] We assume interest and relative expertise among such volunteers.

We analyze results from two sets of forecasts: a first with 283 (out of 1,584 solicited) academic experts in or associated with the United States[23] and a second with 117 (out of 172 solicited) university students, faculty, and policy practitioners in Pakistan, for a total of 400 responses. The two waves allow examination of differences between local and global expertise (Casey et al., 2018). After briefly describing the context and the experiment, we ask respondents to provide forecasts on the take-up rates for the IVR calls as well as impacts on downstream results on the three key voter indices analyzed above.

[22]The exercise follows DellaVigna and Pope (2018), which documents the utility of using expert forecasts to understand what we can learn from experiments. Recent work in political science has followed a similar approach (Dunning et al., 2019; Humphreys, Sanchez de la Sierra and van der Windt, 2019).

[23]Academics "associated" with the United States were members of the American Political Science Association's Organized Section in Comparative Politics.

Figure 8: Forecast and realized compliance and treatment effects



Notes: All differences between the average forecast and realized estimates are statistically significant with p<0.001.

Results: Panel A in Figure 8 shows that, on average, nearly 40 percent more people answer the phone than forecasters predict. However, conditional on whether the IVR call was answered, forecasters were more likely to think that respondents would answer an IVR question than the number who actually did. That is, forecasters underestimated whether

respondents would answer the phone but overestimated whether respondents would answer an IVR question.

Panel B contrasts the forecasts against realized results on the three downstream outcome indices. Forecasters were asked to predict the intent-to-treat effect for each index. Forecasters overestimate the size of all effects: in every case, average forecasts were substantially (and statistically significantly) above realized average treatment effects. In other words, forecasters generally expect the intervention to produce relatively large results.

Of course, forecasts of field experiments might generally be overly optimistic. One reason lies with publication bias: almost all field experiments that get published report successful interventions. Those that produce null results are typically exceedingly difficult or even impossible to publish (Christensen, Freese and Miguel, 2019). Perhaps in part for this reason, forecasting shows that the results of the intervention we report were not predicted by interested experts. Experts expect take-up to be less than was the case and they expect downstream results to be larger than those obtained. These differences show the intervention produced unanticipated results.

8 Conclusions

Politicians in developing countries spend a lot of time on constituency service. Yet modes of service have tended to remain stagnant over the last few decades, relying primarily on face-to-face communication that occurs at the politician's constituency office. Modern communications tools that have transformed other fields such as marketing are slowly being deployed by enterprising politicians across South Asia and beyond. This paper is a first attempt to examine the efficacy of such tools in the large, important, and understudied context of Pakistan.

Our mixed results suggest that IVR has greater potential than ICT methods previously

used to engage citizens in less developed democracies. It also exhibits reach across large geographic areas. When politicians call voters, voters pick up the phone and most of them go on to listen to what their representative has to say. A sizable fraction of respondents even use IVR to answer and a sizable fraction pick up the phone when the politician calls again. This suggests that many voters are eager to engage on policy matters, a finding that aligns with the descriptive data we present showing that most voters who meet in person with their representative make requests on behalf of their communities rather than on behalf of themselves. These disparate kinds of evidence inform our understanding of contemporary Pakistani politics as less clientelistic than often believed. Reinforcing the surprising nature of our findings is the fact that they are substantially different than what local or international experts expect.

Our findings also introduce some new and unanswered theoretical questions. First, we contribute to a large literature on patronage and clientelistic democracies in the developing world (Chandra, 2004; Kitschelt and Wilkinson, 2007; Stokes et al., 2013; Hicken and Nathan, 2020). We suggest that scholars refocus some attention from clientelism in developing democracies to the possible signs of programmatic politics that may already exist. Doing so may allow us to boost changes that are emerging organically instead of imposed externally.

Second, we also contribute to a new literature that examines how communication between politicians and citizens can be improved (Grossman, Humphreys and Sacramone-Lutz, 2014; Chong et al., 2015; Arias et al., 2019; Buntaine, Nielson and Skaggs, 2019; Dunning et al., 2019; Grossman, Humphreys and Sacramone-Lutz, 2020). While our study shows that politician instigated contact carries potential in terms of citizen take-up, it leaves some questions open for the long term efficacy of arriving at a new communication equilibrium. In our opinion, such technologies can fundamentally transform local politics and citizens' access to politicians. The mode and extent of how these changes may happen are all open questions.

Third, given standard theories of rational career-minded legislators (Ferejohn, 1986; Prze-

worski, Stokes and Manin, 1999), we find aspects of politician behavior to be puzzling. Politicians engaged in a tentative fashion with the opportunity to use IVR, and a few refused outright to do so — despite having volunteered to participate. Is this because they lack control of their schedules? Or does it reveal deeper hesitation to speak directly to large numbers of voters? How can politicians be encouraged to communicate more effectively and regularly with more voters, and to use the information they receive in making policy decisions? Much remains to be understood.

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Appendices

A Take-up rates of other technology-based political communication interventions

Table A.1: Take-up rates and modes of communication across studies

Study authors	Country location	Mode of communication	Take-up rate
Grossman, Humphreys and Sacramone-Lutz (2014)	Uganda	SMS	5.8%
Leo et al. (April 2015)	Various	IVR	4.3%
Ferrali et al. (2016)	Uganda	SMS	2 to 7%
Grossman, Michelitch and Santamaria (2017)	Uganda	SMS	4.8%
Erlich et al. (2018)	South Africa	SMS+	2 to 14%
Blair, Littman and Paluck (2019)	Nigeria	SMS	0.1%
Buntaine, Hunnicutt and Komakech (2020)	Uganda	SMS	10%
Grossman, Humphreys and Sacramone-Lutz (2020)	Uganda	SMS	<0.1%
Shaul-Cohen and Lev-On (2020)	Israel	SMS	4 to 18%

Notes: SMS refers to short-messaging systems. SMS+ refers to a 5-channel study.

B Registry of changes from the pre-analysis plan (PAP)

Key informant interviews used in Table 4: We originally intended to conduct multiple waves of key informant interviews but were prevented from doing so when field activities were interrupted by government security services. As a result, we deviate from the PAP in two ways. We use heteroskedasticity-consistent standard errors (HC2) rather than clustered standard errors, since the the treatments of interest are assigned at the polling station level, the same level as outcomes. We also remove wave fixed effects since we have none.

Measuring PS level effects: We deviate from our pre-specified analysis, where we had a post-treatment variable (whether the MPA ran again) on the right hand side. We removed that variable in the analysis.

C Ethics of the intervention

Prior to any field activities involving human subjects, we sought permission from Institutional Review Board (IRB) at the University of California at Los Angeles (UCLA). Stanford University's IRB had agreed to subordinate to UCLA.

Our intervention raises at least three major ethical concerns. The first two are of general relevance to the political science discipline. The American Political Science Association's has a Guide to Professional Ethics regarding human subjects protection (APSA Ad Hoc Committee on Human Subjects, 2019). That Guide raises issues of partisanship and possible interference in the democratic process that are potentially relevant to our study. A third issue concerns the gender imbalance of our study.

- Partisanship: A first ethical concern is that we partner with incumbent MPAs and do not offer IVR communication to challengers. This might bias the political process in favor of incumbents or their parties.

  There were practical reasons for working exclusively with sitting MPAs. Our experiment was rolled out in the nine months prior to our best guess of when the next election would be held. Because of the lead time required for the experiment, it was not feasible to undertake it immediately prior to the election. At the time the experiment was conducted, the identity of assembly candidates in the upcoming 2018 elections was unknown. (Indeed, 25 percent of the incumbents we work with did not run again.) In addition, our funding agency (J-PAL) prohibited us from conducting research that could have been construed as interfering with or participating in the election campaign. For both of these reasons, it was not possible to work in the month just prior the election when campaigning was underway and when the candidates had been selected and their identities known.

  These logistical considerations explain the timing of our research, but do not necessarily

speak directly to the ethics of working with sitting MPAs. Some might worry that our work would shore up their political power. We were relatively unconcerned about this, however. The reason is that the MPAs we work with did not constitute an entrenched political elite. Indeed, 60 percent of those enrolled in the IVR treatment had never served previously in the provincial or national assembly, and 50 percent of them did not get reelected (either because they were not on the ballot or because they did not win the seat). Similarly, elections in KP are often closely fought; the average margin of victory in 2013 was 11 percent, considerably lower than in Pakistan's other three provinces. Indeed, we considered that providing a new way for MPAs to communicate with voters might encourage a largely inexperienced group of politicians to learn to do their jobs more effectively and thus might improve political representation in KP.

- Political interference: A second ethical concern is that our intervention might have affected political outcomes. This issue is explicitly raised by APSA Ad Hoc Committee on Human Subjects (2019). However, our sample sizes are too small for this to have been possible. For evidence, see the discussion in Section 6.2.

- Gender: A final ethical concern is that we work only with men and exclude women. As we note however (see fn. 12), even when we sent female staff to approach women voters, they were unwilling to provide their phone numbers and participate in the study. Even though our study thus excluded women, we do not think that our activities harmed them. The reason is that we do not believe that providing a representative sample of male voters new ways to express political and policy opinions is necessarily detrimental to female voters. We would have considered the intervention to carry more problematic ethical implications if it had given voice to an unrepresentative sample of wealthier, older, or more conservative male voters, for instance. That said, we remain troubled by the failure to enroll female respondents in the study and hope to examine how these barriers can be overcome in future work.

D Timeline of the intervention

Owing to weather and security constraints, we implemented the intervention in five phases. Our implementing partner put four of the 20 sampled constituencies into treatment in each stage, and then rolled out the baseline and recordings of messages with MPAs on a staggered basis. The timing of all activities — baseline survey, two stages of phone calls, and endline survey — is reported in Table D.1. In each constituency, households were recruited, provided informed consent, and baselined over a two week period. Simultaneously, meetings with MPAs were ongoing to enroll them in the project, introduce the technology to them, and work with them to script and record their initial calls to constituents. Recordings were made either with field staff on site or later on the MPA's own time. Because of the nature of the meetings and because some MPAs recorded their calls later when they found more time, many recordings were made on mobile phones, although we edited the files for clarity afterwards. Follow-up calls were made in similar fashion. The endline survey was rolled out after the general elections were held on July 25, 2018, also in phases due to the weather as well as security concerns.

Table D.1: Phased implementation of intervention and surveys

Phase	Baseline survey	Initial calls	Follow-up calls	Endline survey
1	December 2017 - February	February	May - July	August - September
2	January - February	March	May - June	September - October
3	February	April - May	June - July	August - October
4	February - April	May	July	September - October
5	March - April	May	July	August - October

Notes: All activities took place in 2018 unless noted otherwise. Constituency numbers (e.g. "PK-50") were assigned after redelimitation for the 2002 elections. These numbers were changed following a 2018 redelimitation.

E Analysis datasets and relevant tables and figures

Table E.1 details the datasets used in the paper. The main sources of data are: (i) a series of three surveys conducted at the individual respondent level; (ii) key informant interviews conducted at the polling station level; (iii) electoral data to measure outcomes at the polling station area level; (iv) forecasting data collected from external experts; and (v) data generated by the intervention itself. The information in the table clarifies which dataset, and which subsets, are used in each table and figure in the paper.

Table E.1: Analysis datasets for each table and figure in the paper

Dataset	Sample size	Notes	Tables & Figures
Respondent level			
Baseline survey	14,399 HHs	Every respondent baselined (except for one duplicate phone number). Some tables use only a subset (e.g. {H2}) when appropriate. Often IVR compliance statistics (e.g. answering the IVR question) come from this data as it is available regardless of whether we can endline them.	Tables 2 (rows 3 and 4), 6; Figures 6, 7 (random sample and IVR communicators)
Endline survey	13,988 HHs	Every respondent we could reach for the endline. Note that some tables that use this data only use a subset (e.g. {H2}) when appropriate and is noted in the table/table notes.	Tables 3, 7, G.1, G.2, G.3, I.1, I.2, I.3; Figure H.1
Descriptive survey	2,863 HHs	Those we could reach via phone survey out of 3,600 HHs randomly subsampled from the experimental group assigned to {H2}.	Table 2 (rows 1 and 2); Figures 5, 7 (status quo communicators), 4, 3
Polling station area level			
Key informant survey	240 PS areas	PS level data largely from mean responses of two key informants in each of the 6 matched pairs of treatment and control polling station areas per MPA.	Table 4
Electoral data	300 PS areas	The max set of polling stations for which electoral data could be available (broader than key informant data due to cost of interviewing key informants)	Table J.1
Politician/constituency level			
All 99 directly-elected KP Members of the Provincial Assembly	99 MPAs		Table 5
Interviews	35 KP MPAs and MNAs		NA
Other			
Expert *forecasts*	400 respondents	Solicited in-person and over email. Includes undergraduate students, research/development practitioners, and academics around the world.	Figure 8

F Household level index construction

At the household level we build each index following Kling, Liebman and Katz (2007). We first standardize all of the component outcomes by the mean and standard deviation of the outcome in the group that received none of the IVR intervention calls {H0}. We then impute all missing component outcome means to the average of that component outcome in the stage one household treatment group. Note that if there is missingness on all component outcomes for an index for a particular individual, none of the outcomes is imputed and that individual is dropped. We restandardize the indices with respect to the control group (always defined as {H0}), so that effects are interpretable in standard deviation units of the index.[24] Furthermore, because we restandardize only once and with respect to the control households, when we make comparisons between treatment arms, the standard deviation in the comparison group is not always equal to one.

G Alternative specifications for downstream household results

In this section we present the robustness of the null experimental results presented in Table 3 to (i) attrition, (ii) alternative specifications of two indices, and (iii) considering compliance rates by estimating local average treatment effects among compliers.

First, we present robustness of the main results to attrition. The results in Table G.1 replicate the main, downstream household level results in Table 3 but account for attrition using inverse probability of attrition weights. Using the full experimental sample we first estimate the probability a respondent attrited and then use these estimated probabilities to weight the non-attritors to overrepresent the respondents who have similar characteristics to those respondents who attrited. If the model estimating the probability of attrition is

[24]The original indices were interpretable as an average of standard deviation unit treatment effects on the component measures, rather than as a standard deviation treatment effect on the index itself (Kling, Liebman and Katz, 2007).

well-specified, then these weights will unbiasedly estimate the treatment effect among the full sample, including attriters. While we do not expect our model to be perfect, this is a common approach to dealing with attrition, especially when treatment status does not predict attrition and when it is not severe.

The weights for non-attriters used in the analysis below are

$$w_i = \frac{1}{\hat{p}_i}$$

where $\hat{p}_i$ is predicted probability of non-attrition from a regression of non-attrition on co-partisanship, age bins, income scale groups, education bins, political knowledge, and MPA feeling thermometer bins.

Second, political conversations could instead be considered political participation rather than a precursor to accountable electoral politics. As such, we rebuild the indices with political conversations moved to the political participation index and present the results in Table G.2.

Third, compliance with the full IVR treatments was around 17 percentage points. As such, local average treatment effects among compliers will be larger than intent to treat effects. We present local average treatment effects among compliers in Table G.3 where we define compliance with getting any call {H1, H2} as answering the first stage phone call and we define compliance with the full, responsive treatment {H2R} as answering the first stage IVR question and answering the second stage phone call. For all analyses, we use the same specifications as the main results and instrument for the binary indicator of compliance with the treatment assignment. Even with these fairly restrictive definitions of compliance, the treatment effects remain substantively small and, unsurprisingly given the nature of the estimating local treatment effects among compliers, they remain statistically insignificant.

Table G.1: Effect of any IVR call and effect of full IVR treatment on household head outcomes - including index component measures and weighted for attrition

	Control mean: no call {H0}	ITT: any call {H1, H2} vs. {H0}		ITT: full responsive treatment {H2R} vs. {H0}	
Outcome	μ	τ	N	τ	N
Incumbent evaluations index	0.000	−0.009	13757	−0.016	6539
	(1.000)	(0.009)		(0.013)	
MPA feeling thermometer (1-10)	4.864	−0.056	13753	−0.087	6536
	(3.340)	(0.038)		(0.058)	
MPA party feeling thermometer (1-10)	4.536	−0.018	13758	−0.019	6538
	(3.501)	(0.035)		(0.056)	
Voted for MPA (0/1)	0.337	−0.004	13753	−0.010	6538
	(0.473)	(0.004)		(0.007)	
Inverse rank of MPA (1-5)	2.661	−0.001	13309	−0.012	6307
	(1.478)	(0.018)		(0.027)	
Political participation index	0.000	−0.021	13780	0.004	6551
	(1.000)	(0.016)		(0.025)	
Voted (0/1)	0.985	−0.001	13260	0.002	6282
	(0.122)	(0.002)		(0.003)	
Attended rally (0/1)	0.239	−0.008	13760	−0.001	6539
	(0.427)	(0.007)		(0.011)	
Attended political meeting (0/1)	0.180	−0.007	13780	−0.002	6551
	(0.385)	(0.006)		(0.010)	
Prospects for accountability index	0.000	0.004	13759	0.025	6539
	(1.000)	(0.017)		(0.026)	
Political efficacy (1-5)	3.781	0.003	13930	0.058†	6618
	(1.163)	(0.020)		(0.030)	
Vote choice based on performance (1-6)	4.267	−0.007	13703	−0.020	6514
	(1.684)	(0.025)		(0.039)	
N political conversations	3.739	0.030	13978	0.029	6642
	(2.466)	(0.040)		(0.062)	
Global index	0.000	−0.015	13950	0.005	6629
	(1.000)	(0.013)		(0.020)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses. Pre-treatment control variables not displayed; see Section 6.1 for details.Control means, treatment effects, and all estiamtes of uncertainty are weighted using inverse probability of attrition weights. These weights were generated using a linear model incorporating income, education, age, political knowledge, MPA feeling thermometers, and copartisanship with the MPA.

Table G.2: Effect of any IVR call and effect of full IVR treatment on household head outcomes - moving conversations to participation index

	Control mean: no call {H0}	ITT: any call {H1, H2} vs. {H0}		ITT: full responsive treatment {H2R} vs. {H0}	
Outcome	μ	τ	N	τ	N
Incumbent evaluations index	0.000	−0.009	13757	−0.016	6539
	(1.000)	(0.009)		(0.013)	
MPA feeling thermometer (1-10)	4.864	−0.056	13753	−0.087	6536
	(3.340)	(0.038)		(0.058)	
MPA party feeling thermometer (1-10)	4.536	−0.018	13758	−0.019	6538
	(3.501)	(0.035)		(0.056)	
Voted for MPA (0/1)	0.337	−0.004	13753	−0.010	6538
	(0.473)	(0.004)		(0.007)	
Inverse rank of MPA (1-5)	2.661	−0.001	13309	−0.012	6307
	(1.478)	(0.018)		(0.027)	
Political participation index (w/ convs.)	0.000	−0.012	13780	0.009	6551
	(1.000)	(0.016)		(0.024)	
Voted (0/1)	0.985	−0.001	13260	0.002	6282
	(0.122)	(0.002)		(0.003)	
Attended rally (0/1)	0.239	−0.008	13760	−0.001	6539
	(0.427)	(0.007)		(0.011)	
Attended political meeting (0/1)	0.180	−0.007	13780	−0.002	6551
	(0.385)	(0.006)		(0.010)	
N political conversations	3.739	0.030	13978	0.028	6642
	(2.466)	(0.040)		(0.062)	
Prospects for accountability index (no convs.)	0.000	−0.004	13759	0.023	6539
	(1.000)	(0.016)		(0.025)	
Political efficacy (1-5)	3.781	0.003	13930	0.059†	6618
	(1.163)	(0.020)		(0.030)	
Vote choice based on performance (1-6)	4.267	−0.007	13703	−0.020	6514
	(1.684)	(0.025)		(0.039)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses.
Pre-treatment control variables not displayed; see Section 6.1 for details.

Table G.3: Effect of any IVR call and effect of full IVR treatment on household head outcomes — local average treatment effects among compliers

	Control mean: no call {H0}	LATE: any call (answered phone) {H1, H2} vs. {H0}		LATE: full responsive treatment (answered first q and second call) {H2R} vs. {H0}	
Outcome	μ	τ	N	τ	N
Incumbent evaluations index	0.000	−0.012	13757	−0.108	6539
	(1.000)	(0.012)		(0.091)	
MPA feeling thermometer (1-10)	4.864	−0.077	13753	−0.596	6536
	(3.340)	(0.052)		(0.399)	
MPA party feeling thermometer (1-10)	4.536	−0.024	13758	−0.128	6538
	(3.501)	(0.048)		(0.385)	
Voted for MPA (0/1)	0.337	−0.006	13753	−0.066	6538
	(0.473)	(0.006)		(0.047)	
Inverse rank of MPA (1-5)	2.661	−0.001	13309	−0.084	6307
	(1.478)	(0.024)		(0.187)	
Political participation index	0.000	−0.028	13780	0.027	6551
	(1.000)	(0.022)		(0.171)	
Voted (0/1)	0.985	−0.001	13260	0.011	6282
	(0.122)	(0.003)		(0.023)	
Attended rally (0/1)	0.239	−0.011	13760	−0.004	6539
	(0.427)	(0.009)		(0.073)	
Attended political meeting (0/1)	0.180	−0.009	13780	−0.014	6551
	(0.385)	(0.009)		(0.067)	
Prospects for accountability index	0.000	0.006	13759	0.174	6539
	(1.000)	(0.023)		(0.177)	
Political efficacy (1-5)	3.781	0.004	13930	0.401†	6618
	(1.163)	(0.027)		(0.209)	
Vote choice based on performance (1-6)	4.267	−0.010	13703	−0.137	6514
	(1.684)	(0.034)		(0.267)	
N political conversations	3.739	0.041	13978	0.196	6642
	(2.466)	(0.055)		(0.428)	
Global index	0.000	−0.020	13950	0.037	6629
	(1.000)	(0.018)		(0.135)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses.

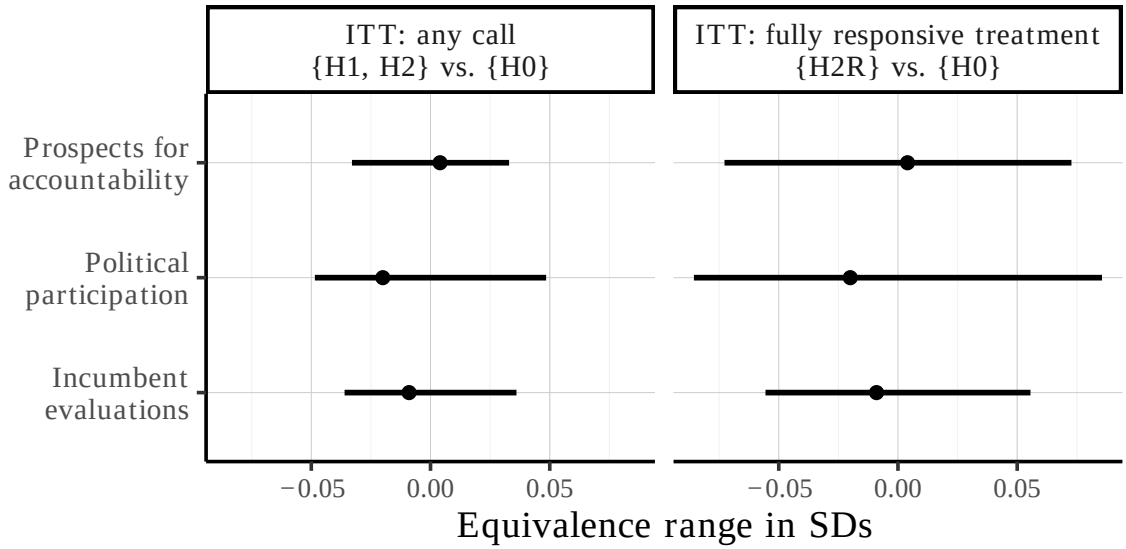
H Robustness of null findings in downstream results

In this section, we report equivalence tests demonstrating the power of our design to detect null downstream household level findings. We follow Hartman and Hidalgo (2018) and estimate equivalence confidence intervals that contain treatment effects that are small enough that we cannot reject the null that they are too large. In other words, the values within the equivalence confidence intervals that we report in Figure H.1 are small enough to be consistent with the data; larger treatment effects can be rejected as too large given the data at our given significance level (here, 0.05). Therefore, instead of relying on failing to reject the null to establish a null effect, these confidence intervals allow us to find the largest treatment effects — those on the ends of the equivalence confidence intervals — that we cannot reject as too large. For the effect of receiving any call in the left panel, all treatment effects on individual attitudes and self-reported behavior larger than |0.05| sds can be rejected as too large, while effects larger than |0.08| sds are inconsistent with the observed effect of the full treatment (as seen in the right panel). These "largest possible effects" are quite small and reflect the substantial power of our design to detect meaningful individual level effects.

I Additional downstream results

We preregistered other analyses between various treatment arms: the marginal effect of receiving an initial call with questions (H2) versus receiving the initial call with no questions (H1); the marginal effect of receiving a responsive follow-up call (H2R) versus a generic follow-up call (H2G); and the marginal effect of receiving *any* follow-up call (H1G + H2G + H2R) versus no follow-up call (H1C + H2C). The first two analyses report similar treatment effects , where we find no large substantive effects with no statistically significant treatment effects. The only treatment effect that is statistically significant at even the 0.1 level comes when considering the marginal effect of receiving any follow-up call.

Figure H.1: Equivalence confidence intervals for main household level treatment effects



This figure contains the realized treatment effects and equivalence confidence intervals (Hartman and Hidalgo, 2018) for the two main analyses we report in Table 3. The points are the realized treatment effects and the equivalence confidence intervals are built at the 0.05 level. Our three main outcome indices are on the y-axis and the treatment effects in the original units of the outcomes, standard deviations, are on the x-axis. The equivalence confidence intervals represent the range of hypothetical treatment effects that are consistent with our data and estimated treatment effects. Any hypothetical treatment effect outside these intervals can be rejected by an equivalence test as too large at the 0.05 level.

This section expands tables in the main paper to include index components, and it includes additional treatment group comparisons.

Table I.1: Effect of any IVR call and effect of full IVR treatment on household head outcomes including index component measures

	Control mean: no call {H0}	ITT: any call {H1, H2} vs. {H0}		ITT: full responsive treatment {H2R} vs. {H0}	
Outcome	μ	τ	N	τ	N
Incumbent evaluations index	0.000	−0.009	13757	−0.016	6539
	(1.000)	(0.009)		(0.013)	
MPA feeling thermometer (1-10)	4.864	−0.056	13753	−0.087	6536
	(3.340)	(0.038)		(0.058)	
MPA party feeling thermometer (1-10)	4.536	−0.018	13758	−0.019	6538
	(3.501)	(0.035)		(0.056)	
Voted for MPA (0/1)	0.337	−0.004	13753	−0.010	6538
	(0.473)	(0.004)		(0.007)	
Inverse rank of MPA (1-5)	2.661	−0.001	13309	−0.012	6307
	(1.478)	(0.018)		(0.027)	
Political participation index	0.000	−0.020	13780	0.004	6551
	(1.000)	(0.016)		(0.025)	
Voted (0/1)	0.985	−0.001	13260	0.002	6282
	(0.122)	(0.002)		(0.003)	
Attended rally (0/1)	0.239	−0.008	13760	−0.001	6539
	(0.427)	(0.007)		(0.011)	
Attended political meeting (0/1)	0.180	−0.007	13780	−0.002	6551
	(0.385)	(0.006)		(0.010)	
Prospects for accountability index	0.000	0.004	13759	0.025	6539
	(1.000)	(0.017)		(0.026)	
Political efficacy (1-5)	3.781	0.003	13930	0.059†	6618
	(1.163)	(0.020)		(0.030)	
Vote choice based on performance (1-6)	4.267	−0.007	13703	−0.020	6514
	(1.684)	(0.025)		(0.039)	
N political conversations	3.739	0.030	13978	0.028	6642
	(2.466)	(0.040)		(0.062)	
Global index	0.000	−0.014	13950	0.005	6629
	(1.000)	(0.013)		(0.020)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses.
Pre-treatment control variables not displayed; see Section 6.1 for details.

Table I.2: Marginal effect of IVR question in initial call on household head outcomes including index component measures

	Control mean: credit claiming call only {H1}	ITT: marg effect of IVR q {H2} vs. {H1}	
Outcome	μ	τ	N
Incumbent evaluations index	−0.018	0.004	9164
	(1.007)	(0.012)	
MPA feeling thermometer (1-10)	4.778	0.014	9162
	(3.377)	(0.051)	
MPA party feeling thermometer (1-10)	4.480	0.031	9166
	(3.486)	(0.046)	
Voted for MPA (0/1)	0.331	−0.002	9160
	(0.471)	(0.005)	
Inverse rank of MPA (1-5)	2.646	0.009	8866
	(1.473)	(0.023)	
Political participation index	−0.014	−0.009	9179
	(0.987)	(0.021)	
Voted (0/1)	0.985	−0.001	8834
	(0.123)	(0.003)	
Attended rally (0/1)	0.234	−0.001	9167
	(0.423)	(0.009)	
Attended political meeting (0/1)	0.176	−0.003	9179
	(0.381)	(0.008)	
Prospects for accountability index	−0.003	0.016	9166
	(0.995)	(0.022)	
Political efficacy (1-5)	3.789	−0.003	9283
	(1.146)	(0.026)	
Vote choice based on performance (1-6)	4.257	0.010	9129
	(1.681)	(0.033)	
N political conversations	3.723	0.054	9312
	(2.357)	(0.052)	
Global index	−0.022	0.006	9293
	(1.009)	(0.017)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses.
Pre-treatment control variables not displayed; see Section 6.1 for details.

Table I.3: Marginal effect of responsive vs. generic follow-up call on household head outcomes including index component measures

	Mean: Generic Follow-up {H3G}	ITT: Marg. Effect of Responsive Follow-up {H3R} vs. {H3G}	
Outcome	μ	τ	N
Incumbent Evaluations Index	0.000	−0.016	6539
	(1.000)	(0.013)	
MPA Feeling Thermometer (1-10)	4.864	−0.087	6536
	(3.340)	(0.058)	
MPA Party Feeling Thermometer (1-10)	4.536	−0.019	6538
	(3.501)	(0.056)	
Voted for MPA (0/1)	0.337	−0.010	6538
	(0.473)	(0.007)	
Inverse Rank of MPA (1-5)	2.661	−0.012	6307
	(1.478)	(0.027)	
Political Participation Index	0.000	0.004	6551
	(1.000)	(0.025)	
Voted (0/1)	0.985	0.002	6282
	(0.122)	(0.003)	
Attended rally (0/1)	0.239	−0.001	6539
	(0.427)	(0.011)	
Attended political meeting (0/1)	0.180	−0.002	6551
	(0.385)	(0.010)	
Prospects for Accountability Index	0.000	0.025	6539
	(1.000)	(0.026)	
Political efficacy (1-5)	3.781	0.059†	6618
	(1.163)	(0.030)	
Vote choice based on performance (1-6)	4.267	−0.020	6514
	(1.684)	(0.039)	
N political conversations	3.739	0.028	6642
	(2.466)	(0.062)	
Global Index	0.000	0.005	6629
	(1.000)	(0.020)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses.
Pre-treatment control variables not displayed; see Section 6.1 for details.

J Polling station level treatment effects

Here we analyze downstream results at an aggregate level: polling station level electoral returns. As these results are realized after both voters and politicians have acted in response to treatment, results represent short-term equilibrium experimental outcomes. We compare outcomes for the six treated polling stations to those for the 14 polling stations that we did not treat within the set of 20 most competitive polling stations for each MPA. Thus, all polling stations are within a partner MPA's constituency although the MPA only used IVR to households in the six treated polling stations.

Data: Since we randomize across 20 polling stations in 20 MPA areas, we should have outcome data from 400 polling stations. We successfully collected official election data from only 341 constituencies. The remaining data are missing because: (i) some .psf format returns released by the Election Commission are illegible; (ii) in some instances we were unable to match our polling stations with polling stations resulting from a subsequent redelimitation; and (iii) initial results for 20 polling stations in one constituency were annulled because of low female turnout and the later results have not been made publicity available by the Election Commission.

Estimation: We estimate effects using OLS and the following specification:

$$Y_{pm(t=2018)} = \tau D_p + \alpha Y_{pm(t=2013)} + \lambda_m + \epsilon_{pm},$$

where $Y_{pm(t=2018)}$ is the outcome Y for polling station p in MPA constituency m in the 2018 election, D_p is a binary indicator for treatment status, $Y_{pm(t=2013)}$ is the pre-treatment outcome Y in the 2013 election, and λ_m is an MPA constituency fixed effect. As before, we use HC2 standard errors, since the treatment assignment is at the polling-station level.

We estimate effects on two outcomes at the polling station level: the vote share for the incumbent (partner) MPA and the turnout rate. Because of re-delimitation and because some of our partner MPAs did not seek office again, our partner MPAs were not candidates in 2018 in every polling station in our sample. In cases where the partner MPA was not a candidate for any party, we code for the candidate from the party with which our partner MPA was last associated.

Effects within treated constituencies: Table J.1 presents intervention effects from treated polling stations compared to control polling stations within treated MPA constituencies.

Table J.1: ITT effects of IVR calls on polling station voting outcomes

	Control mean: control PS {P0}	ITT: treated PS {P1} vs. {P0}	
Outcome	μ	τ	N
Incumbent MPA vote share	0.332	0.002	341
	(0.165)	(0.016)	
Turnout share	0.477	0.006	288
	(0.109)	(0.012)	

Notes: †, p-value < 0.1; *, p-value < 0.05; **, p-value < 0.01; ***, p-value < 0.001. *Notes:* Heteroskedasticity-consistent (HC2) standard errors in parentheses.
Notes: Results presented here are ITT effects estimated using OLS.

On average, evaluation of incumbents and turnout in elections in control areas remain low; about 33 percent and 47 percent respectively. The low vote shares received by incumbent MPAs are consistent with the generally low reelection rates of incumbents across the developing world (Golden, Nazrulleava and Wolton, 2018). Elections in KP often have more than two competitive candidates, meaning the local political environment is unstable and highly competitive, which feeds into low reelection rates.

In general, we do not find evidence to suggest that treatment affected election results, either in terms of stated incumbent vote share — whose point estimate is very close to zero — or voter turnout. Due to high attrition in the sample of polling stations, we are unable to state that we have estimated a precise null effect of the intervention on voting behavior, however.

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