Brokering Votes With Information Spread Via Social Networks*

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Throughout much of the developing world, politicians rely on political brokers to buy votes prior to elections. We investigate how social networks help facilitate vote-buying exchanges by combining village network data of brokers and voters with broker reports of vote buying. We show that networks diffuse politically-relevant information about voters to brokers who leverage it to target voters. In particular, we find that brokers target reciprocal voters who are not registered to their party and about whom they can hear more information through their social network. These results highlight the importance of information diffusion through social networks for vote buying and ultimately for political outcomes.

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1 Introduction

The secret ballot is a cornerstone of fair and free elections. It enables citizens to vote without intimidation or fear of reprisal and is thought to be an important check against vote buying (Baland and Robinson, 2008; Robinson and Verdier, 2013). Yet despite almost universal adoption of the secret ballot, vote buying remains pervasive throughout the developing world and what explains its persistence is not yet well understood.[1]

Several studies argue that political brokers play an important in role in sustaining vote buying (Finan and Schechter, 2012; Lehoucq, 2007; Schaffer, 2007; Stokes, 2005). It is common for candidates and political parties to use political brokers as intermediaries in the exchange of targeted benefits for votes. These brokers, who are often community leaders with extensive local knowledge, are thought to exploit their social connections to facilitate vote-buying exchanges. In particular, they are believed to acquire information about voters through their social networks that enables them to buy votes using various complementary tactics.[2] But whether social networks diffuse information about voters that brokers leverage to sustain vote buying has yet to be assessed empirically, due in large part to the lack of data on the social networks and vote-buying decisions of the political brokers themselves.

In this paper, we use a novel survey of political brokers and voters in rural Paraguay to map the social networks in which they are all embedded. We estimate the extent to which the network positions of brokers and voters affect the brokers' knowledge about voters and the brokers' target-

[1]While reliable data are hard to come by, the share of the population offered a vote-buying transfer and the amount they were offered is high across multiple countries. One third of respondents in the Philippines was offered an amount between $1 and $30 in the 2010 elections (Cruz, 2019), 40% of respondents were offered an average of a quarter of the minimum monthly wage during Uganda's 2016 general election (Blattman et al., 2019), and most recently 34% of respondents in Mexico were offered something for their vote in the 2018 general elections (Montes, 2018).

[2]These include a) monitoring of voter electoral behavior (Cruz, 2019; Stokes, 2005), b) targeting of voters who are more likely to reciprocate (Finan and Schechter, 2012; Lawson and Greene, 2014), c) targeting of voters who are likely copartisans but unlikely to vote (Nichter, 2008), and d) targeting of opinion leaders (Cox, 2015; Schaffer and Baker, 2015).

ing decisions. Following Banerjee et al. (2019), we compute a network statistic at the broker-voter level called *hearing*. *Hearing* measures how much information a given broker might hear about a specific voter in his network. While other studies have measured the social networks of voters or even political candidates, this is to our knowledge the first study to systematically measure the social network of political brokers, who are typically the key players buying citizens' votes. Moreover, in contrast to previous studies, our network measure captures the relative network position of brokers and voters, which allows us to estimate the information-diffusion role of networks in facilitating vote-buying exchanges.

A key feature of our survey is that we designed it to elicit information about voters not only directly from the voters, but also indirectly from the brokers. We take advantage of this information structure in three important ways. First, in contrast to the extant literature, we measure vote buying as reported by the brokers rather than reported by the voters.[3] This allows us to use broker fixed effects – exploiting only within-broker variation in vote buying – and thus control for broker-specific confounders such as their position in the network or their willingness to admit to vote buying. Second, because there are multiple political brokers within each village who all report vote buying about overlapping voters, we can also further restrict our analysis to within-voter variation. With voter fixed effects, we can account for voter-specific confounders such as the voter's socioeconomic status and network position. Finally, we ask the same questions about voter characteristics – including questions about politically-relevant information and about social preferences – to both brokers and voters. Using these two reports of the same information, we can test the extent to which brokers' knowledge about voters is diffused through the network and subsequently used by brokers for targeting.

We find that our broker-voter network measure of *hearing* significantly predicts who each political broker targets with vote buying, as well as whether a voter claims to support the broker's

[3]One notable exception is a recent study by Ravanilla, Haim and Hicken (2017) that collects broker-reported measures of vote buying during the 2016 Philippine elections.

party thereafter. This relationship holds using several different definitions of broker-reported vote buying, including an index for whether the broker offered the voter something of value during the electoral campaign or approached the voter to talk about the electoral campaign. The results of our preferred specification imply that a one-standard-deviation increase in *hearing* accounts for approximately 0.32 standard deviations of the vote-buying index. These results are robust not only to the inclusion of both broker and voter fixed effects, but also to other identification concerns.

One concern is that brokers might target voters who are similar to them and that, as a result of homophily, their similarity might be correlated with our *hearing* measure. Given the richness of our data, we can control for the similarity between a voter and broker along various dimensions. These attributes include their positions in the social network and socio-demographic characteristics. Our findings are robust to all such additional broker-voter level controls as well as other modeling and sampling choices.[4]

One might also be concerned that we measure political networks rather than social networks. However, our social network data are made up of solely non-political ties that develop outside of the political arena, such as family relationships, godparent relationships, and non-political gift giving and lending. Consistent with this, we find low levels of political segregation in social networks as measured by the Freeman segregation index (Freeman, 1978).

To directly substantiate the information-diffusion channel of social networks, we first show that networks help to transmit information from voters to brokers. In particular, we find that our measure of *hearing* strongly predicts whether the broker knows various voter characteristics which have been previously found to be important for the effective targeting of vote-buying exchanges. These characteristics include their partisan leanings and their social preferences. A one-standard deviation increase in *hearing* is associated with a 0.21 standard deviation increase in an index of overall-knowledge.

[4]We also show that our results are not driven by extreme values of *hearing*, parametric choices when computing *hearing*, or potential bias due to partial sampling of the networks (Chandrasekhar and Lewis 2016).

Second, we show that politically-relevant information explains the targeting of voters about whom brokers can hear more information. Whether a broker targets a specific voter should not simply be a function of how much he hears about that voter, but also what he hear about that voter. Previous work points to the importance of voter partisanship (Dixit and Londregan, 1996; Lindbeck and Weibull, 1987) and reciprocity (Finan and Schechter, 2012; Lawson and Greene, 2014) to explain voter targeting by brokers. We find that brokers are more likely to target voters registered to their party regardless of how much information they can hear about them, and regardless of whether the voter is reciprocal. In contrast, brokers are more likely to target reciprocal voters not registered to their party but about whom they can more easily learn information due to the architecture of their social networks. We interpret this to suggest that political brokers are more likely to target the voters who do not already support their party but who they have learned through the network would reciprocate.

Information diffusion is not the only function that networks serve. In other contexts where formal enforcement is lacking, networks have been shown to contribute to the enforcement of informal contracts. Our *hearing* measure might explain the likelihood of vote-buying transactions through its correlation with ease of transaction enforcement rather than information diffusion. To deal with this concern, we control for three types of broker-voter-level network measures that the literature suggests increase people's ability to enforce informal transactions between one another: social proximity (Chandrasekhar, Kinnan and Larreguy, 2018), the existence and the number of "support pairs" (Jackson, Rodriguez-Barraquer and Tan, 2012), and whether the broker and voter previously engaged in a non-political informal transaction. Not only is the impact of our *hearing* measure robust to the inclusion of these additional variables, but the effects of these alternative network measures are generally negative and insignificant, suggesting that our measure of information diffusion does not capture the enforcement role of social networks. Additional results indicate that the information-diffusion and transaction-enforcement roles of networks neither complement nor substitute each other. Specifically, we show that the interaction of *hearing* with social proximity, the existence and the number of support pairs, and an indicator for whether the broker and voter previously engaged in a non-political informal transaction are insignificant and generally small.

Another concern is that our measure of information diffusion captures other features of the network. For example, brokers may target those voters who are good at transmitting information to others and persuading them to vote for specific candidates (Cox, 2015; Ravanilla, Haim and Hicken, 2017; Schaffer and Baker, 2015). By targeting a well-positioned voter, brokers could potentially convince many individuals to vote for their candidates for the price of a single transfer. The concern is then that voters about whom brokers are more likely to hear information might also be good at persuading others. Our inclusion of voter fixed effects should ameliorate this concern. Nevertheless, we also create network measures of how well-placed a voter is to spread information, including degree centrality, eigenvector centrality, and diffusion centrality, and show that our results are not driven by the interaction of these variables with our *hearing* measure.

This study contributes to various literatures. First, recent research focuses on the role of social networks in explaining vote buying and electoral outcomes. Some papers focus on the social network of the voter. For example, Cruz (2019) and Fafchamps and Labonne (2019) show that well-connected voters are more likely to be targeted. Calvo and Murillo (2013) similarly show that voters with more ties to political party members have higher expectations of accessing targeted goods. Ravanilla, Haim and Hicken (2017) show that brokers target well-connected voters when social networks are dense, but more reciprocal voters when social networks are sparse. Other papers focus on the social network of the candidate or broker. For example, Szwarcberg (2012) argues that brokers' central position in non-political networks explains their ability to influence vote choice. Cruz, Labonne and Querubín (2017) suggest that candidates benefit electorally from higher centrality in family networks.

Different from previous studies that focus on measures of the position of one individual in the network (either the voter, broker, or candidate), we map out the complete network and create a broker-voter level measure of the connection between the two. Combining the network measure with broker-reported vote buying, we show that networks diffuse politically-relevant information from voters to brokers, and brokers use this information to guide their targeting. In addition, our fixed-effect approach allows us to control for important confounds at the broker- and voter-levels that have plagued previous studies.

Second, a growing literature studies the effects of social networks on a wide range of political outcomes other than vote buying. There is evidence that social networks affect perceptions and voting behavior through the dissemination of information about unemployment (Alt et al., 2019), electoral violence (Fafchamps and Vicente, 2013), and elections in general (Fafchamps, Vaz and Vicente, 2019). Similarly, Arias et al. (2019), Bond et al. (2012) and Collier and Vicente (2014) further show that social networks coordinate the electoral behavior of individuals, both explicitly and tacitly, around information campaigns. Our findings also highlight the importance of social networks in diffusing politically-relevant information, particularly from voters to brokers.

Third, there is a rich literature on the determinants of voter targeting. Dixit and Londregan (1996) and Lindbeck and Weibull (1987) suggest that politicians target voters with a weak ideological attachment, while Cox and McCubbins (1986) and Nichter (2008) argue that politicians target their core supporters. More recent work shows the importance of brokers (Larreguy, 2013; Larreguy, Marshall and Querubín, 2016) and the targeting of reciprocal voters, supporters unlikely to turn out, and opinion formers (Cox, 2015; Finan and Schechter, 2012; Lawson and Greene, 2014; Nichter, 2008; Schaffer and Baker, 2015).

We build off Finan and Schechter (2012) who show that, on average, brokers target voters who are likely to reciprocate. Our study extends Finan and Schechter (2012) in at least two important ways. First, we show that brokers are able to learn which voters are reciprocal, in large part because of information diffusion through the social network. Different brokers are able to learn more or less about specific voters depending on their relative network positions. Second, Finan and Schechter (2012) find an average effect that brokers target voters who are more reciprocal. In this paper, we show that this average effect comes specifically from brokers targeting reciprocal voters who are not members of the broker's party, but about whom brokers can more easily learn information due to the architecture of their social networks.

Finally, we contribute more generally to a growing literature on the role social networks play in sustaining informal transactions. Networks play a key role in various settings (Chuang and Schechter, 2015; Jackson, 2014; Munshi, 2014) particularly for their role in information diffusion (Alatas et al., 2016; Alt et al., 2019; Banerjee et al., 2013, 2019), social learning (Chandrasekhar, Larreguy and Xandri, 2019; Conley and Udry, 2010), and transaction enforcement (Bloch, Genicot and Ray, 2008; Chandrasekhar, Kinnan and Larreguy, 2018; Jackson, Rodriguez-Barraquer and Tan, 2012; Schechter and Yuskavage, 2012). Our study provides further evidence of the effects of social networks on facilitating informal, and in this case illicit, transactions.

We structure the remainder of our paper as follows. In Section 2, we provide some background on political brokers and vote buying in Paraguay. Section 3 describes our data and the construction of our network measures, and presents descriptive evidence that indicates that political brokers are selected from households that are significantly more central in their networks. In Section 4, we describe our empirical strategy. Section 5 presents our main results, robustness checks, and tests for alternative mechanisms. Section 6 concludes.

2 Background

Paraguay was under the dictatorship of Alfredo Stroessner of the Colorado party from 1954 to 1989. Until 2008, when independent bishop Fernando Lugo won the presidency, the Colorado party had controlled the national government for sixty-one years. Paraguay is effectively a two-party system. The Colorado and Liberal parties are by far the strongest, although smaller parties have recently gained modest popularity. As a result of the 2006 municipal elections – the elections we study – half of the villages in our sample elected a Colorado mayor and the other half a Liberal mayor. Also, at least one Colorado broker and one Liberal broker operated in each of these villages.[5]

Political parties in Paraguay are not strongly ideological, and there is little policy differentiation between them (Lachi and Rojas-Schaffer, 2018; Parks, 2018). Political campaigns tend to be highly personalized, and vote buying is thought to be an effective electoral strategy (Paraguay, 2018). This was evident in the focus groups conducted with politicians and brokers by Lachi with Transparencia Paraguay in 2005 and by Lachi and Rojas-Schaffer in 2018. For example, a broker of the Liberal party in the municipality of General Morínigo commented that "elections in Paraguay are decided by the voters who are mobilized with money. A very small percentage of the voters are loyal. The incentivized voters define [the election]." Moreover, vote buying is becoming increasingly important to win elections. A broker of the Colorado party from the municipality of General Aquino explained "there are three groups of voters: the captive, the thinkers, and those that can be bought. Relative to previous elections the captive voters have declined, and the voters that can be bought have increased."

Political brokers, who in Paraguay are known as *operadores políticos*, act as intermediaries between candidates and voters, exchanging money and favors for promises to vote accordingly. The focus groups and interviews also highlighted the important role that brokers play in vote-buying exchanges. As a politician of the Liberal Party in the municipal council of San Lorenzo noted, "political brokers are fundamental since they know their zone well." When asked how brokers learn about voters, a Colorado broker in the municipality of General Aquino noted that "it is all about ñe'embegue (gossip)." Lachi (2009) concludes that political brokers "are essential for electoral campaigns and that their value is directly proportional to their integration within their communities."

Brokers leverage their local knowledge to target voters. A Liberal party official in Asunción mentioned that brokers "know who [their] party supporters are." Similarly, a Liberal official in the

[5] Among the smaller parties, the National Union of Ethical Citizens (UNACE), which was founded from a faction of the Colorado party, also has one broker who operates in a village in our sample.

governor's office of Coronel Oviedo argued that brokers know "which Colorado and Liberal voters would sell their vote." Importantly, brokers suggest that the voters who they target are likely to reciprocate with their vote. For example, a Liberal broker in the municipality of General Morínigo mentioned that, "while some voters take the money and vote for another candidate, the number of voters like that is small." A Colorado broker in the municipality of General Aquino further indicated that the voters they target "always thank favors."

3 Data

Political brokers employ strategies that require knowledge about voters in order to target vote-buying transfers. To test whether networks promote clientelistic exchanges through the transmission of information from voters to brokers, we combine vote-buying data from brokers and voters originally collected for Finan and Schechter (2012), and social network data originally collected for Ligon and Schechter (2012).

Households were selected to be surveyed as part of a panel data collection initiated in 1991 with subsequent rounds collected in 1994, 1999, 2002, and 2007. In 2002, incentivized experiments were also conducted. In 2007, more households were added such that in each village at least 30 households were surveyed. The 2007 survey also included a political section with questions about the 2006 Paraguayan municipal elections, which was conducted with the same household member who participated in the 2002 experiments whenever possible. We refer to the household member who answered the political section of the 2007 survey as the 'voter' throughout the paper.

In 2010, we returned to ten of the villages across two departments in Paraguay for a sixth time and asked the households in our original sample who the brokers working in their village were. At this point, the villagers knew us well. We had conducted incentivized experiments with them multiple times, and they had interacted with one co-author who is a Guaraní-speaking American in both 2002 and 2007.[6] Many of the enumerators had been the same in round after round, and over the decades the villagers had learned that there were no negative consequences from talking to us and that we were to be trusted. We then felt comfortable to inquire about the brokers operating in the villages in which we worked.

Households identified 43 brokers working in the ten villages, of whom we interviewed 38. Four of the interviewed brokers did not live in the villages in which they worked, and so we do not know how they fit in the village social network. It turned out that 20 of the interviewed brokers were members of households that were part of our panel data sample, and thus we had directly surveyed their social connections back in 2007. Other directly surveyed households mentioned an additional 12 brokers as social ties, and thus we had indirect information about these brokers' social connections. Thus, we only lack social network data for two of the surveyed brokers living in the villages in which we worked, who we thus cannot include in our analysis.

Network measures

Our data include social networks collected in 2007 from 10 villages. In each village, between 30 and 48 households were surveyed delivering direct sampling rates ranging between 12 and 91% (with a cross-village mean of 47%). If we also consider non-surveyed households who were mentioned as a social connection by at least one survey respondent, then we have network information on between 54% and 100% of households in each village (with a cross-village mean of 88%). These social connections include family ties, godparenting ties, support networks, and non-political transactions in the last year comprising transfers, gifts, and loans.[7] Figure 1 provides an

[6] Guaraní is the indigenous language of Paraguay.

[7] More specifically, we construct undirected village-level networks where two households are connected if a member of each household belongs to the same family (i.e., parents, children, siblings); a member of one household is the godparent of the child of someone in the other household; one household would go to the other for monetary assistance in times of need; if in the past year someone in the household provided monetary assistance when someone in the other household fell sick; or if in the past year someone in one household made a non-political monetary or in-kind transfer or lent money to someone in the other household.

example of the social network of the households in one of the villages in our data, representing 257 connections between 81 households (of which 39 were directly surveyed).

To measure the extent to which a given broker b might hear information about a voter i in his network, we construct a network statistic called *hearing* as in Banerjee et al. (2019). Define the adjacency matrix $\mathbf{g}$ as the matrix where each row and column entry represents one household in the village and an element equals 1 if the row and column household are connected and 0 if they are not. We define T as the number of periods that information flows and p as the probability with which it flows. In this case, *hearing* between the two individuals is defined as the ij^{th} entry of the matrix $\mathbf{H} = \sum_{t=1}^{T}(p\mathbf{g})^t$.

For the intuition behind the computation of this measure, consider the process of diffusion of a piece of information originating from voter i to broker b as illustrated in Figure 2. Sub-figure (a) shows the social network and a piece of information originating from voter i in period 0. Sub-figure (b) shows that in the first period, the two nodes directly connected to i (colored red) find out the information with probability $p \in (0,1]$. Because broker b cannot hear the information in the first period, $H_{i,b}(1) = 0$. Sub-figure (c) shows that in the second period, those who received the information in the first period transmit it to the nodes with which they are directly connected (colored red) with probability p. In subsequent periods, those who received the information in the previous period transmit it to the nodes with which they are directly connected with probability np, where n is the maximum number of times they could have received the information in the previous period.[8]

It is not until period 3, shown in sub-figure (d), that broker b has a chance of hearing information originating from voter i. We see that $H_{i,b}(3) = 0.09$ which means that, in the third period, we expect the broker to have heard that information 0.09 times. By period 5, which is the last period shown, we expect the broker to have heard that information 0.23 times. This process lasts for T

[8]Note that while the equation is the same, the description differs slightly from that given in Banerjee et al. (2019), as described in Bramoullé and Genicot (2018).

periods, where T is a finite positive integer, as information likely loses relevance with the passage of time. The *hearing* measure, H_{ib} is thus the expected number of times that broker b would hear a piece of information originating from voter i if information is diffused according to this process for T periods.

We set T equal to 7, which is the largest social distance between any voter and broker in our sample. The social distance between two nodes is defined as the length of the shortest path between them. If T were smaller than the largest social distance, information from some voters would never reach some broker in their network. On the other hand, the greater the T, the more likely information from voter i is to reach broker b more than once.

As in Banerjee et al. (2013), we set p equal to the inverse of the largest eigenvalue of the adjacency matrix for each village's social network.[9] In the example network shown in Figure 2, the largest eigenvalue is 2.8 and so the probability of information transmission in this case is $p = 0.36$.

We construct additional network statistics to address concerns associated with homophily and other potential confounders. At the individual level, these measures include the clustering coefficient, degree centrality, betweenness centrality, diffusion centrality, and eigenvector centrality. At the broker-voter level, these measures include social distance, the existence and number of support pairs, an indicator of prior non-political informal financial transactions, and social proximity. Jackson, Rodriguez-Barraquer and Tan (2012) show that informal exchanges between a pair of individuals that are locally enforceable and renegotiation-proof require that the pair is "supported" by a common tie. Chandrasekhar, Kinnan and Larreguy (2018) show that the social proximity between two individuals explains their ability to sustain informal exchanges in the absence of contract enforcement. We describe these measures in more detail in Appendix A.

Table 1 presents summary statistics for our network measures. The values of these network

[9] Choosing larger values of p leads to total diffusion as T increases, while choosing smaller values of p causes diffusion to die out as T increases. The inverse of the largest eigenvalue is the critical intermediate value between these two processes.

characteristics may be difficult to interpret on their own. If we compare them with the values for the Indian villages studied in Banerjee et al. (2013), we see that the households in our villages have lower average degree (number of connections) but higher values of all other network measures. Thus, these villages are more inter-connected than the villages studied in India.[10]

Outcome variables

We measure vote buying in the 2006 Paraguayan municipal elections as reported by 32 brokers in 2010. Each broker provided information for the same approximately 30 randomly chosen voters in their village. This provides us with a sample of 296 voters, none of whom lived in the same household as one another, and a total of 932 broker-voter pair observations.[11]

Our main outcome variable is a standardized index that sums two measures of vote buying as reported by brokers about each voter. These measures are indicators for whether a broker approached a voter or offered the voter something during the electoral campaign. Additionally, we also use as an outcome an indicator for whether the voter reports supporting the broker's party in the 2007 survey – conducted a few months after the 2006 elections. With this outcome, we test the political effects of vote-buying exchanges as facilitated by the information-diffusion role of networks.[12] As Table 1 indicates, the average broker approached 48% of the voters and offered something to 27% of them. Voters also support the same party as the broker in 46% of observations.

To test whether our *hearing* measure predicts how well a broker knows a voter, we complement our broker survey with data collected from voters in 2007. These data allow us to combine the answers to a series of questions about voter characteristics that were asked to both brokers and voters in a similar fashion. Appendix A explains the coding of both the broker and voter answers

[10] Some of the network measures may have lower values in both the Paraguayan and Indian villages since their calculation comes from a sample rather than a census of households.

[11] We exclude 16 broker-voter observations for which the broker and voter were either the same person or lived in the same household as one another.

[12] Unfortunately, our data does not allow us to analyze whether the voter voted for the broker's party because we do not know how he or she voted.

in detail, as well as our criteria to categorize answers as matching in each case.

We construct indices of brokers' knowledge about voters along three dimensions and sum these three indices into an overall knowledge index. First, we compute a *covariates index* that combines four different indicators of a broker's general familiarity with the voter. These are indicators for whether the broker states that he knows the voter; the broker can correctly name the spouse of the voter; the broker can accurately state the years of education of the voter; and the broker can correctly state the amount of land the voter owns. As Table 1 summarizes, brokers can respectively identify the voters and their spouses in 89% and 77% of cases. Similarly, they can correctly assess voters' education and land 81% and 42% of the time, respectively.

Second, we compute a *political index* that combines two variables indicating a broker's knowledge of politically-relevant voter information. This includes whether the broker can correctly guess the partisanship of the voter, and whether the broker accurately knows whether the voter voted in the most recent election. Brokers are accurate about voters' partisanship 59% of the time and accurately know whether voters turned out in 63% of cases.

Third, we construct a *social preferences index* that combines two variables that indicate a broker's knowledge about the social preferences of each voter. These are indicators for whether the broker knows the extent to which the voter would retaliate wrong-doing and for whether the broker knows whether the voter trusts at least half of those in his or her village. Brokers know the extent to which voters would retaliate and whether voters trust others in their village respectively 59% and 66% of the time. Overall brokers exhibit significant knowledge about the voters in their villages.

Mediating variables

Beyond assessing how well brokers know the voters, we also test whether what they hear about voters affects their targeting decisions. In particular, we focus on voters' official party registration and their reciprocity, two characteristics which have been shown to explain voter targeting (Dixit and Londregan, 1996; Finan and Schechter, 2012; Lawson and Greene, 2014; Lindbeck and

Weibull, 1987). First, we use official publicly-available data on voters' political affiliations to create an indicator that the voter is not registered to the same party for which the broker operates.[13] Since voters largely affiliate to a party when they first register to vote, this measure is less likely to be endogenous relative to the measure of party support reported by voters in the 2007 survey and mentioned as one of our outcome variables in the previous subsection.[14] On average 59% of voters are not registered to the same party as the broker.

Second, we use the experimental measure of voter reciprocity developed by Finan and Schechter (2012). In 2002, Finan and Schechter (2012) ran a trust game with a sub-sample of the voters in our dataset. In the game, a first mover was given 8000 Gs (1000 Gs were worth about 20 cents at the time of the experiment) and had to decide whether to send nothing, 2000, 4000, 6000, or 8000 Gs to a second mover, who received the amount tripled. The second mover could keep all the money or return as much as she wanted. Before finding out how much money she would receive, the second mover had to outline a contingency plan (i.e., how much of 6000 Gs, 12,000 Gs, 18,000 Gs, and 24,000 Gs she would return), which was implemented accordingly. All players played once as first and once as second mover. To separate pure altruism from reciprocity, Finan and Schechter (2012) calculate the reciprocity of a second mover by subtracting the share that she would return if she received 6000 Gs from the average share that she would return if she received 12,000, 18,000, or 24,000 Gs. They censor this measure below zero. This measure is only available for 85 voters and 271 broker-voter observations in our sample. Average reciprocity in these observations is 0.043.

Broker selection

Before turning to our main empirical analysis, in this section, we present some descriptive analysis on political broker social networks. If brokers need to know voters well in order to buy votes, and

[13]Due to the public availably of these data, brokers do not need to use the social network to learn voters' official party registration.

[14]Indeed, the correlation between party affiliation and party support is far from perfect – the correlation is 0.58 for the Colorado party and 0.65 for the Liberal party.

if they acquire this information through their networks, then we might expect brokers to be, on average, more centrally located within their networks. This is precisely what we see in Figure 3, which plots kernel density estimates of within-village percentiles of degree centrality, betweenness centrality, diffusion centrality, and eigenvector centrality for broker households (32 observations) and voter households (1,000 observations).[15] Brokers mostly come from the upper quartile of the network centrality distributions, with very few brokers selected from households in the lower tails.

In Table 2, we refine this analysis further by regressing network measures of centrality on an indicator for whether a household contains a broker as well as village fixed effects. We include all households in the village that were either directly or indirectly sampled and control for an indicator for whether the household was directly sampled in our network survey. In Panel A, we consider overall standardized centrality measures as outcomes,[16] while in Panel B we consider the within-village percentile of each centrality measure. Results in Panel A show that, on average, broker households have a significantly higher network centrality ranging from a 0.10 standard deviation higher betweenness centrality to 0.60 standard deviation higher eigenvector centrality. Results in Panel B further indicate that broker household centrality is, on average, between 8 (betweenness centrality) and 21 (eigenvector centrality) percentiles greater than that of other households.[17]

4 Empirical Strategy

Our baseline regressions are of the following form:

$$y_{ibv} = \alpha + \beta H_{ibv} + \eta_{bv} + \varepsilon_{ibv}, \tag{1}$$

[15]Appendix Figure B1 plots the analogous figures for the levels of the standardized network measures rather than their percentiles.

[16]In Appendix Table B1, we present the summary statistics for the non-standardized centrality measures.

[17]These results are consistent with Ravanilla, Haim and Hicken (2017), who find that brokers in the Philippines exhibit higher than average betweenness centrality compared to a random sample of villagers.

where y_{ibv} is an outcome defined for voter i and broker b in village v, H_{ibv} is the *hearing* measure that captures the information-diffusion role of social networks, and η_{bv} is a broker fixed effect. In addition to restricting to within-broker variation, a more demanding specification also includes voter fixed effects θ_{iv} to address individual-level confounders. We use two-way clustering of our standard errors, clustering at both the broker and voter levels.[18]

Our research design innovates on previous work in that the inclusion of broker and voter fixed effects allows us to flexibly control for observable and unobservable broker- and voter-specific factors. In particular, we can control for broker-level determinants of a brokers' ability to engage in vote buying such as their relative importance in their social network (Szwarcberg, 2012). Similarly, we can control for voter-level determinants of vote buying including partisanship, the likelihood that the voter turns out to vote (Nichter, 2008), the voter's social preferences (Finan and Schechter, 2012; Lawson and Greene, 2014), and the voter's relative importance in their social network (Schaffer and Baker, 2015). In the absence of broker and voter fixed effects, *hearing* might simply capture the effect of observable and unobservable confounders.

To deal with the concern that our results capture homophily between brokers and voters, we follow the approach of Chandrasekhar, Kinnan and Larreguy (2018) and show robustness to including various broker-voter-level controls. First, we include the absolute age difference between the broker and voter, an indicator for them having the same gender, and the geographic distance between the broker's and voter's homes. Second, we add the absolute difference in their degree centrality, clustering coefficient, betweenness centrality, diffusion centrality, and eigenvector centrality. Third, we further include broker fixed effects interacted with the voter's degree centrality, clustering coefficient, betweenness centrality, diffusion centrality, and eigenvector centrality.

We further address the concern that *hearing* is just one of many potential measures of the relative network position of brokers and voters, and its effect may be confounded. We show robustness to controlling for other broker-voter-level network measures, including social proximity, the exis-

[18]Our final estimation sample contains dyads representing 32 brokers and 295 voters.

tence and the number of support pairs between a broker and a voter, and whether a broker and a voter have previously engaged in an informal non-political transaction. We add these controls both independently and jointly with all other controls.

5 Results

In this section, we begin by showing that *hearing*, our measure of information diffusion between a broker and a voter through their social networks, is robustly associated with whether the broker targets the voter for vote buying (our primary outcome of interest) and whether the voter claims to support the party of the broker just after the election. These correlations are robust to several potential identification and measurement concerns. We then provide direct evidence that these effects are driven by the diffusion of politically-relevant information from voters to brokers through their social networks, information which brokers leverage to target voters. Lastly, we rule out some alternative explanations.

Results on vote buying

In Table 3, we report the association of *hearing* and an index that measures the targeting of vote buying by a broker to a voter, as reported by the broker. This vote-buying index takes the sum of the indicators for whether the broker offered the voter something during the electoral campaign and whether the broker approached the voter to talk about the electoral campaign, and is standardized to have mean 0 and standard deviation 1. Column (1) includes only broker fixed effects, whereas column (2) additionally includes voter fixed effects. Continuing with this more robust specification, in columns (3) and (4) we present estimates of the effects of *hearing* on each component of the vote-buying index.

Throughout columns (1) to (4), *hearing* is positively associated with the vote-buying index and its constituent elements. Our preferred specification in column (2) implies that a one-standard-deviation increase in *hearing* accounts for a 0.32-standard-deviation increase in the vote-buying index. These results suggest that the diffusion of information through social networks plays an important role in determining which brokers target which voters.

If social networks enable brokers to target voters effectively, then the voters who brokers hear more about should also be more likely to support that broker's party near the time of the election. We test this in column (5) using our preferred specification from column (2) with both broker and voter fixed effects. We see that *hearing* is positively associated with the likelihood that the voter supports the broker's party. A one-standard-deviation increase in *hearing* is associated with a 12 percentage point (28%) increase in the likelihood that the voter supports the broker's party. While we lack data on which party voters cast their ballots for, this result suggests that the vote buying mediated by the information-diffusion role of networks is effective at persuading voters to support the broker's party.

Whether a broker targets a given voter might depend not only on what he hears about that voter, but also about how much the other competing brokers hear about that same voter. To explore the possibility of strategic interactions between brokers, Appendix Table B2 reports coefficients from regressions similar to those in column (2) of Table 3 but that additionally control for the *hearing* of the voter with brokers from the other party. We can additionally control for its interaction with the broker's own *hearing* with that voter. To measure the *hearing* of the voter with brokers from the other party, we consider either the mean or the maximum of their *hearing* with all brokers from other parties. The coefficients on the *hearing* of other brokers is small and statistically insignificant. This suggests that only a broker's own *hearing* matters for whether he targets the voter, and that the *hearing* of other brokers does not affect a broker's targeting.

Identification and measurement concerns

Identification concerns

In this section, we explore whether our main findings are robust to a series of identification concerns. A central concern in the vote-buying literature is that self-reported measures of vote buying are subject to social desirability bias, which may itself be correlated with the explanatory variable of interest, in our case *hearing*. This is unlikely to be a source of bias in our setting for at least two reasons. First, in contrast to the previous literature, our measures of vote buying are reported by the brokers themselves. We were able to collect this type of information because of years of work in the villages that helped to establish trust between the researchers and brokers.

Second, because our social network measure of *hearing* varies at the broker-voter level, we can include both broker and voter fixed effects to exploit within-broker and within-voter variation. This allows us to control for any social desirability bias that is specific to each broker and to each voter. For example, broker fixed effects control for any general tendency a broker may have to underreport vote buying. Similarly, voter fixed effects control for the possibility that brokers may be more likely to remember having targeted voters with a higher network centrality.

Another concern is that brokers' ability to engage in vote buying is correlated with their ability to hear information about voters in their social network. For example, focusing on the case of a single network in Argentina, Szwarcberg (2012) argues that a broker's network centrality is what allows her to successfully mobilize voters for her party. Our use of broker fixed effects addresses this concern, in addition to any other broker-specific characteristics that may be correlated with *hearing*. Another related concern is that *hearing* is correlated with voter-specific traits that brokers may target on. The literature has emphasized traits such as a voter's partisanship, her likelihood of turnout, her social preferences, and her relative importance in the social network. The fact that our results are robust to including voter fixed effects indicates that this concern is not driving our results.

An additional concern is that our social networks are centered on party lines. This is unlikely to be the case for two reasons. First, as we mentioned above, we constructed these social networks based on non-political ties. Second, we explicitly test for sorting along party lines using the Freeman segregation index (FSI) (Freeman, 1978). This index measures the extent of segregation among those registered to the same party in our village networks. Given two distinct groups in a population, the FSI is defined as $1 - \frac{p}{\pi}$, where p denotes the observed proportion of between-group connections and π the expected proportion if connections were generated randomly. The FSI ranges between 0 (a randomly generated network) and 1 (a network with fully segregated groups). The average FSI in our networks is 0.126 indicating that partisan segregation is low in our village networks. As a benchmark, the FSI of partisan segregation within Twitter networks in the 111th United States Congress is 0.590 (Sparks, 2010).

While broker and voter fixed effects deal with broker- and voter-specific characteristic that might confound our estimates, there still remains the possibility that broker-voter-specific factors are biasing our results. In particular, brokers might target voters who share similar traits and, due to homophily, the similarity in traits might correlate with the network measure of *hearing*. In column (1) of Table 4, we test the robustness of the results presented in column (2) of Table 3 to the addition of broker-voter controls as described in detail in Section 4. These controls capture similarity in age, gender, geographic proximity, and network centrality. As we see in column (1), the addition of these broker-voter controls leaves our original point estimate essentially unchanged, even though the R^2 increases by 15 percent.

The ability of brokers and voters to use their social network to enforce informal transactions, such as vote buying, might also confound our results. To address this concern, we control for network measures that the literature suggests capture the ability of individuals to enforce informal transactions with one another. In particular, we control for social proximity between the broker and voter, the existence and the number of support pairs between the broker and voter, and whether the broker and voter have engaged in an informal non-political financial transaction in the year surrounding the election. We add these controls to our main specification independently in columns (2) to (5) of Table 4, and jointly in column (6). The magnitude and significance of the coefficient on *hearing* is robust to the inclusion of all of these variables. In addition, none of these alternative network transaction measures predicts which voters are targeted by which brokers even though in some cases they are highly correlated with our *hearing* measure. For example, the correlation between *hearing* and social proximity is 0.86 ($p < 0.0001$), and between *hearing* and having engaged in a non-political financial transaction is 0.41 ($p < 0.0001$). Given the results in Table 4, we think that it is unlikely that either homophily or the transaction-enforcement role of networks are confounding our main findings.

In Appendix Table B3, we also test whether the transaction-enforcement role of networks complements or substitutes the effect information diffusion has on targeting. We do so by including interactions between *hearing* and social proximity, the existence and the number of support pairs, and an indicator for whether the broker and voter previously engaged in non-political informal transactions. Overall, we find no evidence that the importance of information diffusion for vote buying varies according to the ability of brokers and voter to enforce informal transactions.

Measurement concerns

We next address three measurement concerns. First, there is a possible concern that our results are driven by extreme values in our *hearing* measure. To deal with this concern, Figure 4 illustrates how the effect of *hearing* on vote-buying targeting varies nonparametrically. Specifically, it shows the effect of each *hearing* decile on vote buying. The fairly linear effect across deciles dismisses the concerns that our results are driven by extreme values in our *hearing* measure.

Second, we test whether our results are robust to our choice of T (i.e., the number of periods we allow for information originating from a voter to circulate through the network and reach a broker) used to compute *hearing*. Recall that we set T equal to 7, which is the largest social distance between a voter and a broker in any village network in our sample. We conduct two complementary exercises to show that our results are not driven by this choice of T. In Panel A in Table B4, we set T equal to the maximum social distance between brokers and voters in each village's network, which varies between 3 and 7 across the villages. Our results are robust to allowing T to vary by village in this manner. In Figure 5, we show how the effect of *hearing* in our main specification varies as T goes from 1 to 50 at intervals of five. The effect is robust to the choice of T and starts out increasing before it flattens out at around $T = 10$.

A third possible concern is that we have a partial sampling of households in the village networks, which may bias our estimates (Chandrasekhar and Lewis, 2016). We note, however, that the average direct sampling rate in our villages is 47% which is higher than most of the network literature in developing countries.[19] In addition, our villages include some network information (either direct or indirect) about 83% of households, on average. To address this potential concern, we assess how our estimates are affected when we drop the two villages with the lowest direct sampling rates (12% and 24%). Despite losing a considerable part of the baseline sample (27%), Panel B of Table B4 indicates that our estimates remain largely unchanged in terms of size and significance when focusing on the villages with larger sampling rates, and thus it is unlikely that our findings are driven by our imperfect network sampling.

Results on broker's knowledge about voters

To substantiate the information-diffusion channel, we conduct two additional empirical exercises. First, we look at whether brokers know more information about voters with whom they have a higher value of *hearing*. Table 5 reports the effects of *hearing* on different measures of the broker's knowledge about each voter. As previously discussed, we construct indices measuring knowledge of demographics, of politically-relevant information, and of voter social preferences.[20] We also

[19] According to Chandrasekhar and Lewis (2016), papers using social network data in developing countries have a median sampling rate of 42%, and only a bit over a quarter of them have sampling rates above 47%.

[20] In Appendix Table B5, we present results on the constituent components of the indices measuring brokers' knowledge about voters.

construct an index that sums all three indices. In odd columns, we only include broker fixed effects, and in even columns, we also add voter fixed effects.

The coefficient on *hearing* is significant, positive, and robust, across all outcomes and specifications reported in Table 5.[21] These results suggest that information diffusion from a voter to a broker through their social network facilitates the broker's acquisition of information about voters. Moreover, the estimates are sizable. A one standard deviation increase in *hearing* is associated with a 0.21 standard deviation increase in overall knowledge (column (2)), 0.17 standard deviation increase in knowledge of demographic characteristics (column (4)), a 0.21 standard deviation increase in politically-relevant information (column (6)), and a 0.14 standard deviation increase in knowledge about voter social preferences (column (8)).

Second, Table 6 provides direct evidence that information flows explain how brokers choose which voters to target. Brokers should not just target those about whom they hear more information, but should target voters about whom the information they hear makes them think a vote-buying transfer will be more effective. To explore whether it matters what specifically the broker hears about the voter, we add *hearing*'s interactions with politically-relevant voter characteristics —voter reciprocity and whether the voter is registered to the broker's party.

Columns (1) and (2) of Table 6 replicate the same columns in Table 3 but for the smaller sample of broker-voter pairs for which we have the experimental measure of voter reciprocity used in Finan and Schechter (2012). Columns (3) and (4) add this measure of voter reciprocity, along with its interaction with *hearing*. In columns (5) and (6), we instead add an indicator for whether the voter is not registered to the broker's party as well as its interaction with *hearing*. Individuals usually register for a party at the same time that they first register to vote, and they do not often change official party registration. Party affiliation is public information to which middlemen should have access. Lastly, columns (7) and (8) include the triple interaction, as well as the lower-order

[21] Appendix Table B6 shows that the results on the overall knowledge index are robust to considering the specifications in the Table 4 for vote buying.

interactions and levels, of *hearing*, voter reciprocity, and the indicator for whether the voter is registered to the broker's party.

Findings in columns (3) and (4) suggests that, on average, brokers target voters that they learn through the network are more reciprocal. In other words, it is not enough for a voter to simply be reciprocal to be targeted. A reciprocal voter must be connected to a broker in such a way that the broker hears about the voter's reciprocity. Results in columns (5) and (6) suggest that information diffusion through the network is not necessary for brokers to learn about voters' official party registration, as would be expected since this is not private information. Brokers are more likely to target voters who are registered with their party no matter how they are connected in the network.

We then look at the joint effects of voter reciprocity and party registration. Results in columns (7) and (8) highlight that the targeting of reciprocal voters is concentrated among voters that are not registered to the same party as the broker, but about whom the brokers can learn the voter's reciprocity level. We interpret the positive coefficient on the triple interaction as indicating that political brokers are more likely to target the voters who are not affiliated with their party if they have learned through the network that the voter is reciprocal. Altogether, these findings suggest that brokers leverage the voter information that is diffused via their social network to guide their targeting.

Table 7 follows the same structure of Table 6, but uses as an outcome an indicator for whether the voter reports she supports the broker's party after the election. The results follow the same pattern as those in Table 6. We take this as further indication that the vote buying guided by the information that social networks diffuse about voters to brokers is effective at persuading targeted voters to vote for the broker's party.

Alternative interpretation

Lastly, we rule out the alternative interpretation that our results are driven by brokers targeting those voters who are good at transmitting information to other voters and persuading them to vote for specific candidates. Specifically, the concern is that better-connected voters might also be able to persuade more voters in the village. While controlling for voter fixed effects largely deals with this concern, columns (1) to (4) in Table 8 sequentially add the interaction of *hearing* with voter eigenvector centrality, betweenness centrality, degree, and diffusion centrality. These variables capture the ability of a voter to spread information. These interactions are always negative and two of them are statistically insignificant, further dismissing the idea that brokers are differentially targeting more well-connected voters in an attempt to purchase more persuasion.

6 Conclusion

Vote buying is pervasive throughout the developing world, and political brokers are key intermediaries in this exchange. We use village network and vote-buying data to show that the amount of information a political broker hears about a voter through the social network predicts whether the broker tries to buy the voter's vote. We also show that the more information a broker hears about a voter, the more the broker learns politically-relevant information about the voter, including her political leanings and even social preferences. Importantly, our results indicate that the targeting decisions of brokers depend not only on how much information the broker hears, but also on the type of information. Specifically, we find that, among the voters who are not registered to the broker's party and about whom a broker can hear more information, brokers are more likely to target the reciprocal.

Overall, our results highlight how the diffusion of information through social networks can help to sustain an electoral practice that is widely believed to weaken political accountability and limit the provision of public goods. Much of the previous literature has focused on the positive impacts of information diffusion in networks on outcomes such as technology adoption. But, information diffusion through networks can also help sustain informal and illegal transactions such as insider trading, organized crime, and terrorism (Ahern, 2017; Calvó-Armengol and Zenou, 2004; Patacchini and Zenou, 2008).

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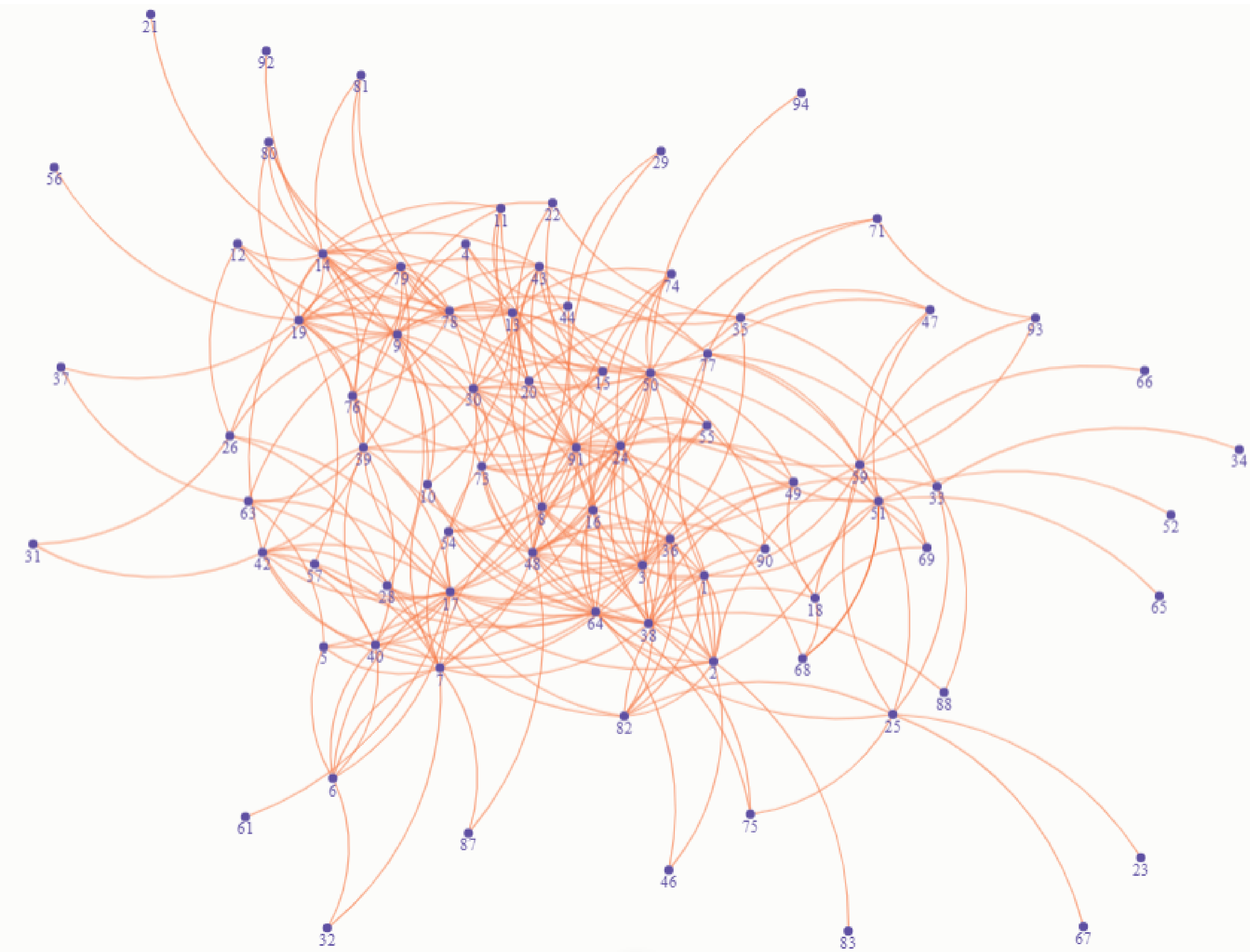
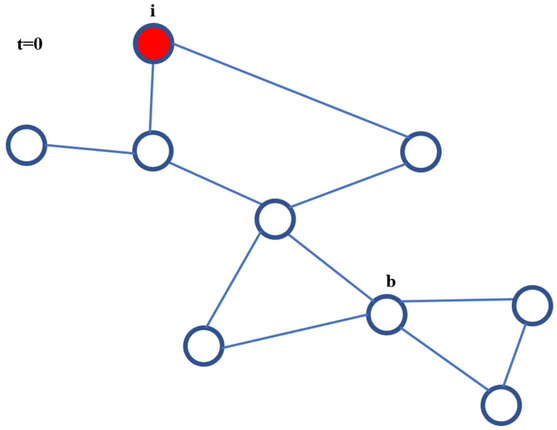
Tables and Figures

Figure 1: Social network mapping of households in a sample village

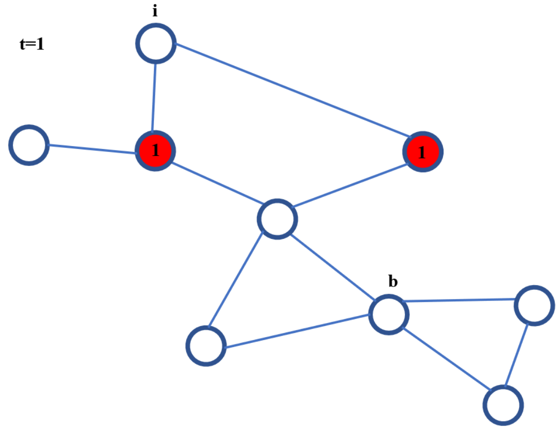


Notes: The graph represents the social network in one of the villages in our sample. It shows all connections between households (brokers and voters) directly or indirectly sampled within the village.

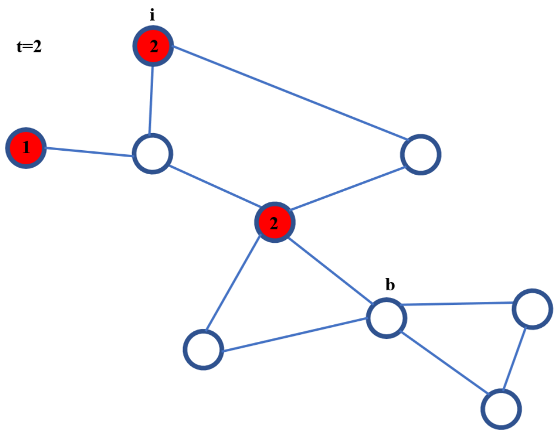
Figure 2: Illustration of the computation of the *hearing* measure between a voter i and a broker b



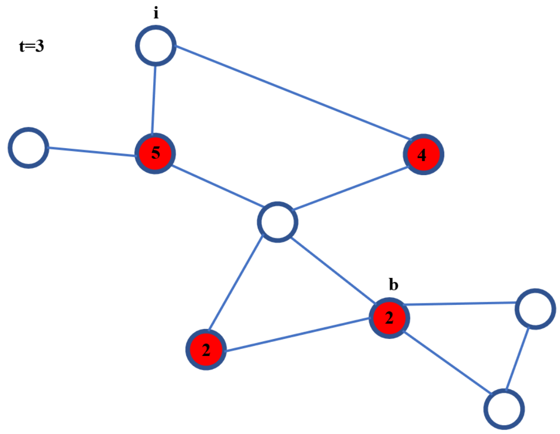
(a) $H_{i,b}(0) = 0$



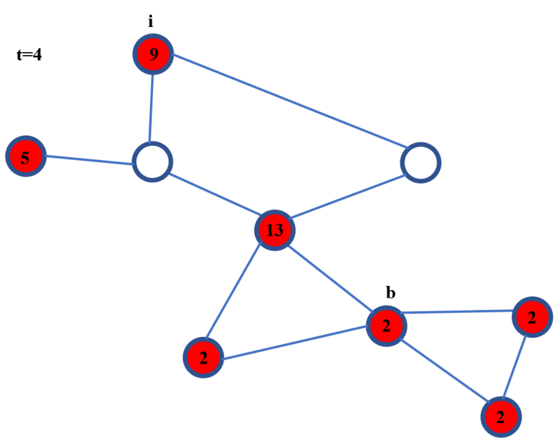
(b) $H_{i,b}(1) = 0$



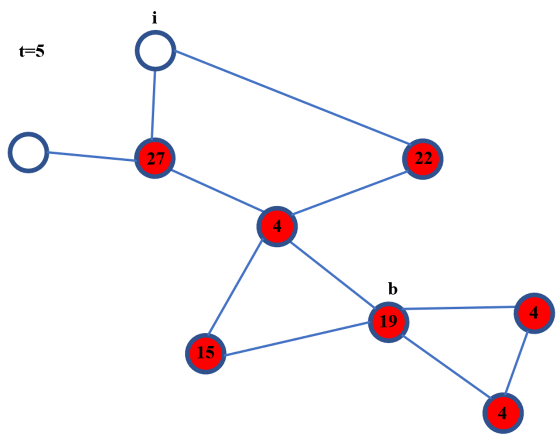
(c) $H_{i,b}(2) = 0$



(d) $H_{i,b}(3) = \mathbf{2} * 0.36^3 = 0.09$



(e) $H_{i,b}(4) = \mathbf{2} * 0.36^3 + \mathbf{2} * 0.36^4 = 0.12$

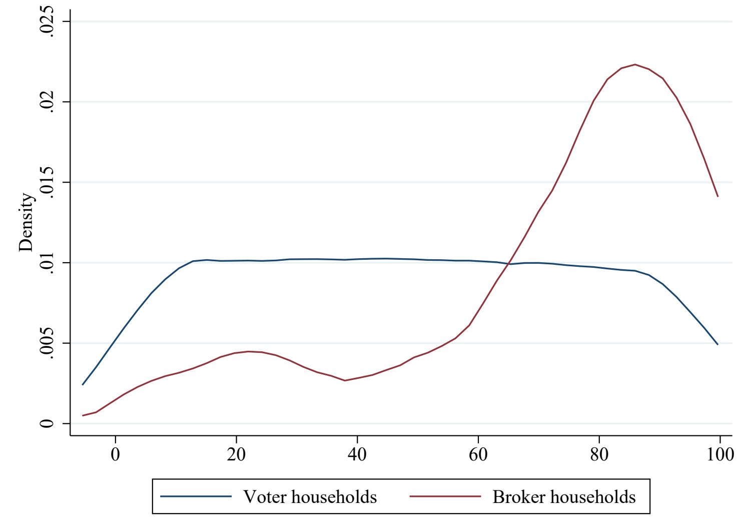


(f) $H_{i,b}(5) = \mathbf{2} * 0.36^3 + \mathbf{2} * 0.36^4 + \mathbf{19} * 0.36^5 = 0.23$

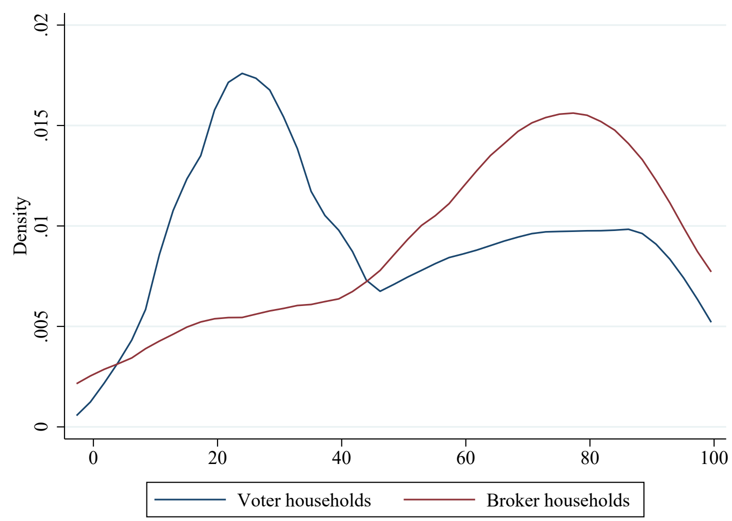
Notes: The caption in each subfigure shows the computation of *hearing* between voter i and broker b for each period t. We consider p to be the inverse of the largest eigenvalue of the adjacency matrix, 2.8 (i.e., $p = 1/2.8 = 0.36$). The numbers in the nodes colored in red indicate the maximum number of times that information about voter i might have been transmitted to a node in the previous period.

Figure 3: Kernel density estimates of within-village percentiles of household centrality measures

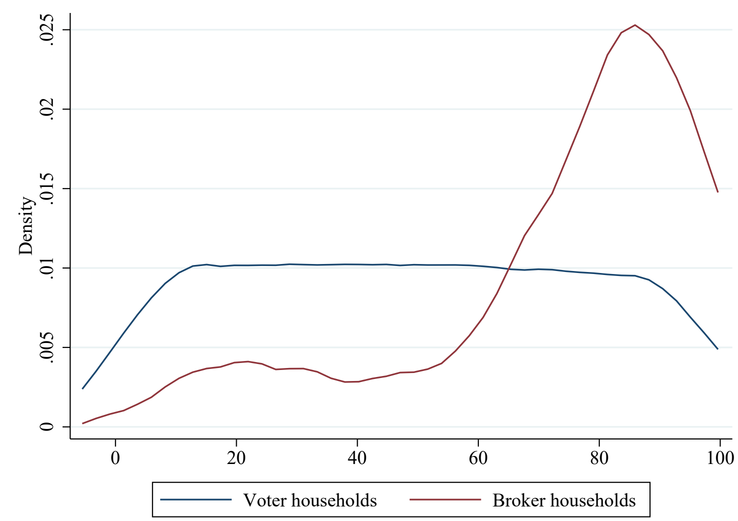
(a) Degree Centrality Percentile



(b) Diffusion Centrality Percentile



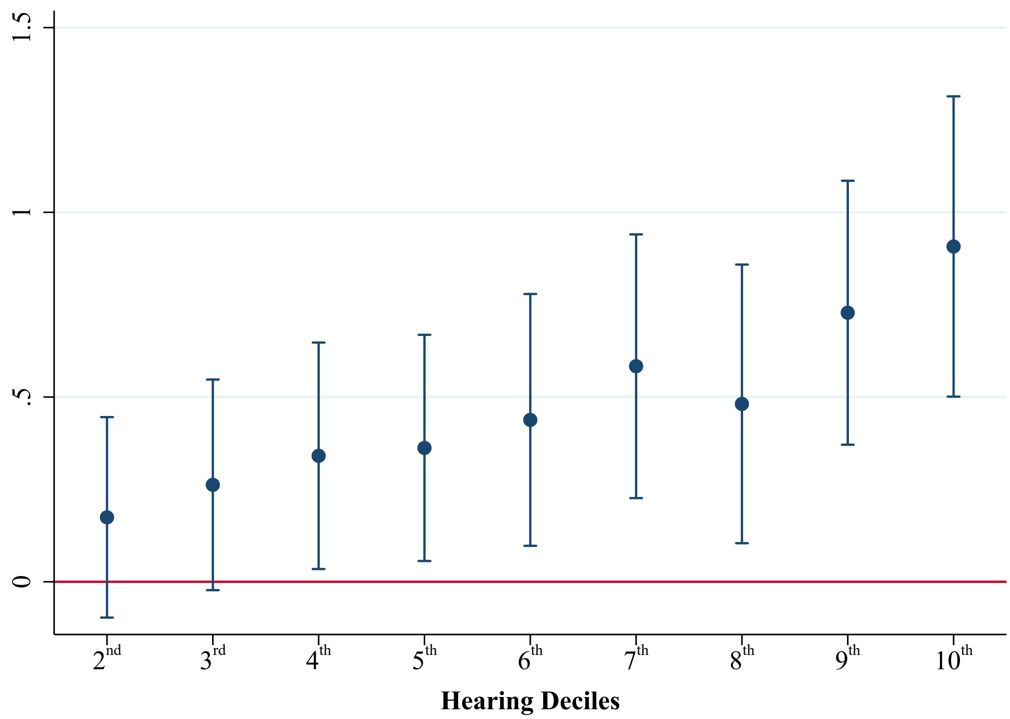
(c) Betweenness Centrality Percentile



(d) Eigenvector Centrality Percentile

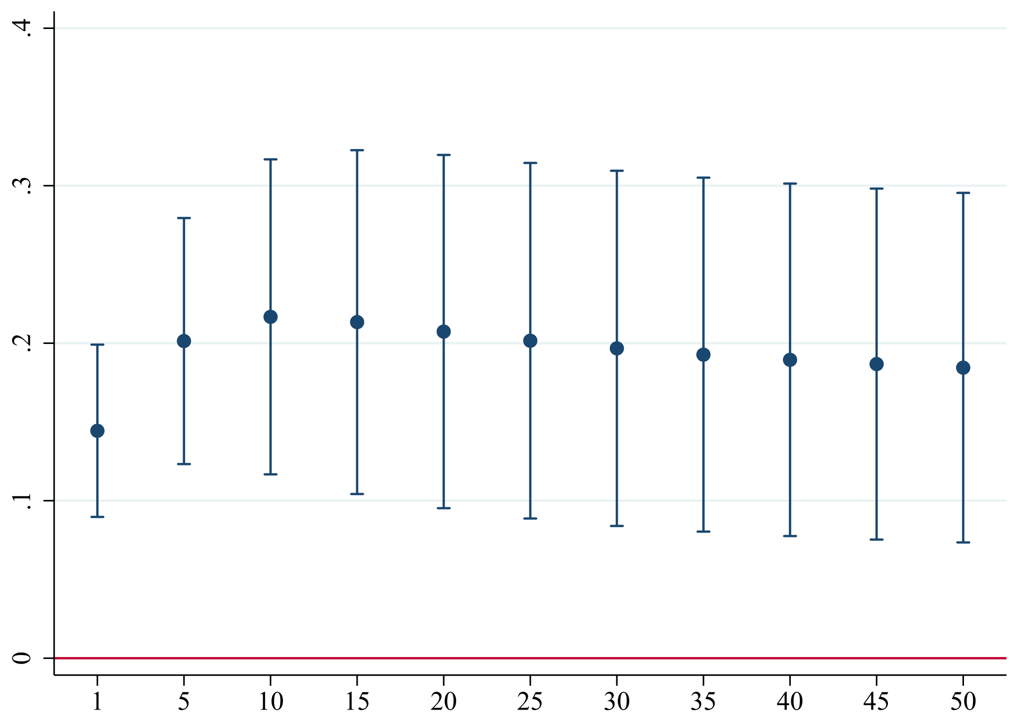
Notes: Each plot shows the Epanechnikov kernel density of within-village percentiles of household centrality measures separately for voters and brokers.

Figure 4: Effect of *hearing* deciles on vote-buying targeting (with 95% confidence interval)



Notes: All estimates are from a specification equivalent to the one in Column (1) of Table 3, with the exception that we consider indicators for each of the *hearing* deciles, as opposed to the continuous version of *hearing*, as regressors. The baseline (omitted) group is the first decile. Standard errors are computed using two-way clustering at the broker and voter levels.

Figure 5: Effect of *hearing* by choice of T (with 95% confidence interval)



Notes: All estimates are from a specification equivalent to the one in Column (1) of Table 3, with the exception that the T varies from 1 to 50 at intervals of 5 periods. Standard errors are computed using two-way clustering at the broker and voter levels.

Table 1: Summary statistics

	Observations	Mean	Standard Deviation
Non-standardized Network Measures			
Hearing	932	0.120	0.128
Social proximity	932	0.494	0.253
Voter's degree centrality	932	8.935	4.548
Voter's clustering coefficient	932	0.244	0.188
Voter's betweenness centrality	932	0.045	0.050
Voter's diffusion centrality	932	8.956	5.426
Voter's eigenvector centrality	932	0.121	0.081
Absolute difference in degree centrality	932	4.921	4.141
Absolute difference in clustering coefficient	932	0.202	0.223
Absolute difference in betweenness centrality	932	0.042	0.046
Absolute difference in diffusion centrality	932	5.456	4.279
Absolute difference in eigenvector centrality	932	0.081	0.061
Existence of a support pair	932	0.529	0.499
Number of support pairs	932	1.351	1.852
Previous transaction	932	0.060	0.238
Mediating Measures			
Experimental reciprocity	271	0.043	0.075
Not registered to the same party	805	0.504	0.500
Additional Controls			
Absolute age difference	932	16	12
Broker and voter have the same gender	932	0.580	0.494
Distance in kilometers between the broker's and voter's residences	932	1.409	0.901
Outcome Measures			
Vote-buying Measures			
Voter supports the broker's party	932	0.461	0.499
Components of the vote-buying targeting index:			
Broker approached voter during electoral campaign	932	0.477	0.500
Broker offered voter something	932	0.273	0.446
Knowledge Measures			
Components of the covariates index:			
Broker knows voter	932	0.887	0.316
Broker knows voter's spouse	932	0.773	0.419
Broker knows voter's years of education	932	0.807	0.395
Broker knows voter's amount of land	932	0.421	0.494
Components of the political index:			
Broker knows voter's partisanship	932	0.593	0.491
Broker knows whether the voter votes	932	0.629	0.483
Components of the social preferences index:			
Broker knows the frequency with which voter would retaliate	932	0.586	0.493
Broker knows whether the voter generally trusts others in the village	932	0.656	0.475

Table 2: Brokers' differential relative position within their village social network

	Degree centrality (1)	Betweenness centrality (2)	Diffusion centrality (3)	Eigenvector centrality (4)
Panel A: Overall standardized centrality measures				
Broker	0.3844***	0.1046	0.5739***	0.6021***
	(0.1233)	(0.1538)	(0.1457)	(0.1428)
Mean of Dependent Variable	-0.0000	0.0000	-0.0000	0.0000
Village FE	X	X	X	X
Directly surveyed FE	X	X	X	X
Observations	1,032	1,032	1,032	1,032
R^2	0.5406	0.2850	0.3581	0.3840
	(1)	(2)	(3)	(4)
Panel B: Within-village percentiles of centrality measures				
Broker	13.4666***	7.8281**	19.8667***	21.4197***
	(3.5972)	(3.6530)	(4.4525)	(4.6490)
Mean of Dependent Variable	50.0964	50.0160	49.9816	49.9884
Village FE	X	X	X	X
Directly surveyed FE	X	X	X	X
Observations	1,032	1,032	1,032	1,032
R^2	0.4998	0.4722	0.2827	0.2173

Notes: Sample includes household-level observations for all households directly and indirectly sampled in our villages. All specifications include village fixed effects and control for whether the household was surveyed directly about their network ties. The dependent variables in Panel A are standardized (mean 0, s.d. 1), while those in Panel B are the within-village percentiles (ranging from 1 to 100) for each corresponding outcome. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Effect of *hearing* on vote-buying targeting

	Vote-buying targeting index		Broker offered voter	Broker approached voter	Support the same party
	(1)	(2)	(3)	(4)	(5)
Hearing	0.2114***	0.3215***	0.0720**	0.1833***	0.1174***
	(0.0436)	(0.0574)	(0.0270)	(0.0309)	(0.0387)
Mean of Dependent Variable	-0.0000	-0.0000	0.2725	0.4775	0.4614
Broker FE	X	X	X	X	X
Voter FE		X	X	X	X
Observations	932	932	932	932	932
R^2	0.3983	0.6129	0.6688	0.5181	0.4167

Notes: All specifications include broker fixed effects. The vote-buying targeting index is a standardized sum of indicators for whether the broker offered the voter something during the electoral campaign and whether the broker approached the voter to talk about the electoral campaign. "Support the same party" is an indicator that the voter claims to support the broker's party shortly after the election. *Hearing* is standardized. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Effect of *hearing* on vote-buying targeting, controlling for homophily and network measures that predict the enforcement ability of the network

	Vote-buying targeting index					
	(1)	(2)	(3)	(4)	(5)	(6)
Hearing	0.3341***	0.2474*	0.3456***	0.3656***	0.3208***	0.3729**
	(0.0869)	(0.1241)	(0.0586)	(0.0740)	(0.0568)	(0.1490)
Social proximity		0.0607				0.0352
		(0.0961)				(0.1023)
Existence of a support pair			-0.0989			-0.1499
			(0.1066)			(0.1395)
Number of support pairs				-0.0761		-0.0582
				(0.0853)		(0.1216)
Previous transaction					0.0048	-0.1720
					(0.1335)	(0.1683)
Mean of Dependent Variable	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
Broker FE	X	X	X	X	X	X
Voter FE	X	X	X	X	X	X
Broker-Voter Controls	X					X
Observations	932	932	932	932	932	932
R^2	0.7053	0.6133	0.6136	0.6135	0.6129	0.7075

Notes: All specifications include broker and voter fixed effects. The dependent variable is a standardized index that takes the sum of indicators for whether the broker offered the voter something during the electoral campaign and whether the broker approached the voter to talk about the electoral campaign. Columns (1) and (6) control for the following variables at the broker-voter level: a) an indicator for the broker and voter having the same gender; b) standardized geographical distance between the broker's and voter's residences; c) standardized absolute difference in age, degree centrality, clustering coefficient, betweenness centrality, diffusion centrality, and eigenvector centrality; and d) broker fixed effects interacted with voter's degree centrality, clustering coefficient, betweenness centrality, diffusion centrality, and eigenvector centrality. All network measures (except the indicator variables) are standardized. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Effect of *hearing* on brokers' knowledge about voters

	Overall knowledge index		Covariates index		Political index		Social preferences index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hearing	0.3203***	0.2145***	0.2692***	0.1703***	0.3293***	0.2088***	0.1621***	0.1401***
	(0.0426)	(0.0343)	(0.0425)	(0.0411)	(0.0524)	(0.0508)	(0.0499)	(0.0441)
Mean of Dependent Variable	0.0000	0.0000	0.0000	0.0000	-0.0000	-0.0000	0.0000	0.0000
Broker FE	X	X	X	X	X	X	X	X
Voter FE		X		X		X		X
Observations	932	932	932	932	932	932	932	932
R^2	0.1668	0.6565	0.1737	0.6237	0.1338	0.6571	0.0725	0.6942

Notes: All specifications include broker fixed effects. The dependent variables are standardized indices that aggregate what the broker knows about the voter in three categories. The Covariates index aggregates indicators for whether the broker knows the voter, whether the broker knows the voter's spouse's name, whether the broker knows how much land the voter owns, and whether the broker knows the voter's years of education. The Political index aggregates indicators for whether the broker knows the voter's partisan leanings, and whether the broker knows if the voter turned out to vote in the previous election. The Social preferences index aggregates indicators for whether the broker knows whether the voter generally trusts others in the village, and whether the broker knows the frequency with which the voter would retaliate wrongdoing. The Overall knowledge index aggregates indicators from all three knowledge categories: covariates, political and social preferences. *Hearing* is standardized. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Effect of *hearing* on vote-buying targeting, by party registration and experimental reciprocity

	Vote-buying targeting index							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hearing	0.2405***	0.2836***	0.2349***	0.2659**	0.1555**	0.1157	0.1488**	0.1381*
	(0.0545)	(0.0999)	(0.0516)	(0.1067)	(0.0612)	(0.0799)	(0.0569)	(0.0743)
Experimental reciprocity			-0.0636				0.1454	
			(0.0659)				(0.1421)	
Not reg. to same party					-0.6664***	-0.7726***	-0.6918***	-0.8127***
					(0.1266)	(0.1671)	(0.1372)	(0.1764)
Experimental reciprocity × Hearing			0.1272*	0.1215			-0.0808	-0.0556
			(0.0668)	(0.1376)			(0.0814)	(0.1280)
Experimental reciprocity × Not reg. to same party							-0.2100	-0.2485
							(0.1615)	(0.2210)
Not reg. to same party × Hearing					0.0558	0.0400	0.0515	0.0515
					(0.0994)	(0.1410)	(0.0912)	(0.1387)
Not reg. to same party × Hearing × Experimental reciprocity							0.2870**	0.2836*
							(0.1046)	(0.1436)
Mean of Dependent Variable	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
Broker FE	X	X	X	X	X	X	X	X
Voter FE		X		X		X		X
Observations	244	244	244	244	244	244	244	244
R^2	0.4940	0.6229	0.5106	0.6292	0.5823	0.6991	0.6089	0.7192

Notes: All specifications include broker fixed effects. The dependent variable is a standardized index that takes the sum of indicators for whether the broker offered the voter something during the electoral campaign and whether the broker approached the voter to talk about the electoral campaign. "Not reg. to same party" indicates the voter is not officially registered with the broker's party. "Experimental reciprocity" is the experimental measure of reciprocity used in Finan and Schechter (2012). The coefficients for experimental reciprocity in Columns (4) and (8) are absorbed by the voter fixed effects. *Hearing* and experimental reciprocity are standardized. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Effect of *hearing* on voter support for the broker's party, by party registration and experimental reciprocity

	Support same party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hearing	0.1080***	0.1897**	0.1081***	0.1836**	0.0219	0.0240	0.0126	0.0327
	(0.0354)	(0.0699)	(0.0326)	(0.0721)	(0.0367)	(0.0452)	(0.0343)	(0.0452)
Experimental reciprocity			-0.0569				0.0656*	
			(0.0401)				(0.0356)	
Not reg. to same party					-0.6889***	-0.8719***	-0.6950***	-0.8850***
					(0.0635)	(0.0680)	(0.0638)	(0.0662)
Experimental reciprocity × Hearing			0.0707*	0.0420			-0.0104	-0.0168
			(0.0356)	(0.0542)			(0.0256)	(0.0223)
Experimental reciprocity × Not reg. to same party							-0.0913*	-0.0538
							(0.0472)	(0.0502)
Not reg. to same party × Hearing					0.0537	-0.0426	0.0582	-0.0442
					(0.0573)	(0.0632)	(0.0570)	(0.0593)
Not reg. to same party × Hearing × Experimental reciprocity							0.0660	0.0949***
							(0.0451)	(0.0326)
Mean of Dependent Variable	0.4426	0.4426	0.4426	0.4426	0.4426	0.4426	0.4426	0.4426
Broker FE	X	X	X	X	X	X	X	X
Voter FE		X		X		X		X
Observations	244	244	244	244	244	244	244	244
R^2	0.2310	0.4287	0.2565	0.4317	0.6110	0.8050	0.6217	0.8130

Notes: All specifications include broker fixed effects. The dependent variable is is an indicator that the voter claims to support the broker's party shortly after the election. "Not reg. to same party" indicates the voter is not officially registered with the broker's party. "Experimental reciprocity" is the experimental measure of reciprocity used in Finan and Schechter (2012). The coefficients for experimental reciprocity in Columns (4) and (8) are absorbed by the voter fixed effects. *Hearing* and experimental reciprocity are standardized. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Effect of *hearing* on vote-buying targeting, by voter-diffusion measures

	Vote-buying targeting index			
	(1)	(2)	(3)	(4)
Hearing	0.3569***	0.3598***	0.3353***	0.3324***
	(0.0622)	(0.0728)	(0.0701)	(0.0556)
Voter's degree centrality × Hearing	-0.0696**			
	(0.0310)			
Voter's diffusion centrality (with $T = 10$) × Hearing		-0.0563		
		(0.0408)		
Voter's eigenvector centrality × Hearing			-0.0237	
			(0.0464)	
Voter's betweenness centrality × Hearing				-0.0514*
				(0.0257)
Mean of Dependent Variable	-0.0000	-0.0000	-0.0000	-0.0000
Broker FE	X	X	X	X
Voter FE	X	X	X	X
Observations	932	932	932	932
R^2	0.6144	0.6137	0.6130	0.6139

Notes: All specifications include broker and voter fixed effects. The dependent variable is a standardized index that takes the sum of indicators for whether the broker offered the voter something during the electoral campaign and whether the broker approached the voter to talk about the electoral campaign. The coefficients for voter's degree centrality, eigenvector centrality, and diffusion centrality are absorbed by the voter fixed effects. *Hearing* and voter diffusion measures are standardized. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A Variable Construction

A.1 Variables using broker and voter responses

Broker knows the spouse of the voter: an indicator that the broker can correctly name the spouse of the voter.

Broker knows the voter's years of education: an indicator that the broker can accurately state the years of education of the voter within a 3-year margin of error. To estimate this, we cross-checked the voter's response regarding his years of education with the broker's corresponding estimate.

Broker knows the voter's amount of land: an indicator variable that the broker can correctly state how many hectares of land the voter owns within a 25% or 1-hectare margin of error. To estimate this, we cross-checked the voter's response regarding his land ownership with the broker's corresponding estimate.

Broker knows the partisanship of the voter: an indicator that the broker is accurate when stating the voter's partisanship. The brokers were asked to indicate where they would situate voters along "feeling thermometers" for both the Colorado and Liberal parties ranging from very cold (0) indicating strong opposition to very hot (40) indicating strong support. If the broker assigned a higher value to the Colorado party and the voter stated that he supports the Colorado party, we code the broker's response as accurate. We do the same for the Liberal party. If the broker puts the same value on both parties' feeling thermometers and the voter states he supports another party (UNACE or *Patria Querida*) or no party, we also indicate this as accurate.

Broker knows if voter turned out to vote: an indicator that the broker accurately knows whether the voter turned out to vote in the 2006 election. To estimate this, we cross-checked the voter's response with the broker's corresponding statement.

Broker knows the frequency with which the voter would retaliate: an indicator that the broker accurately states the frequency with which the voter would retaliate wrongdoing. In particular, voters were asked the following question: “If someone puts you in a difficult situation, would you do the same to her/him?” Answers were always, sometimes, or never. Similarly brokers were asked the same question about each voter.

Broker knows if voter generally trusts others in the village: an indicator that the broker accurately knows if the voter would trust at least half of those in his or her village.

Absolute age difference: the absolute value of the difference between the broker’s and the voter’s ages.

Broker and voter have the same gender: an indicator that the voter and broker have the same gender.

Geographical distance between broker’s and voter’s residences: Geographical distance in kilometers between the broker’s and voter’s residences.

A.2 Variables only using broker responses

Broker knows voter: an indicator variable that the broker states that he or she knows the voter.

Broker offered the voter something: an indicator that the broker offered the voter either food, medicines, paying his or her bills, free plowing of land, or money during the electoral campaign. The relevant survey question asked about all of these items at once, therefore we cannot create a variable for the specific type of good offered.

Broker approached the voter: an indicator that the broker approached the voter during the electoral campaign to speak about the election.

A.3 Variables only using voter responses

Voter supports the broker’s party: an indicator that, in 2007 a few months after the 2006 elections, the voter states he supports the party that the broker works for.

Not registered to the same party: an indicator that the voter is not registered to the party for which the broker works, which also includes the case where the voter is not registered to any political party.

Experimental reciprocity: a measure of reciprocity computed using data from individual trust games played with voters in 2002 as described in Finan and Schechter (2012) and as described in Section 3.

A.4 Network variables

Hearing: the expected number of times that a broker j might hear a piece of information originating from a voter i if information is diffused with probability p_i for T periods. Following Banerjee et al. (2019), as our baseline we set T equal to 7, which is the maximum social distance between any voter and any broker in all the village networks in our sample, and p_i equal to the inverse of the largest eigenvalue of the adjacency matrix representing the social network in each village.

Broker/Voter's diffusion centrality: the average expected total number of times that a piece of information originating from a broker/voter node is heard by all individuals in the network if information diffuses for T periods (Banerjee et al., 2013). Following Banerjee et al. (2019), we set T equal to 10, which is the diameter, or maximum social distance between any two individuals in all the village networks in our sample.

Social Proximity: the inverse of social distance. Social distance is the length of the shortest path between a broker and a voter, when these can reach each other through their network. In the case of unreachable pairs, social proximity is coded as zero.

Existence of a support pair: an indicator for whether a broker and a voter share a first-degree connection (i.e., whether they share a common friend). The construct of support is proposed by Jackson, Rodriguez-Barraquer and Tan (2012) as a measure of enforcement ability in social networks.

Number of support pairs: the number of shared first-degree connections between a broker and a voter.

Previous transaction: an indicator for whether one of the following non-political informal transactions took place between the broker's and voter's households in the year surrounding the election:

- a member of one individual's household provided assistance when a member of the other individual's household fell sick, or
- a member of one individual's household provided a member of the other individual's household with a monetary or in-kind transfer, or
- a member of one individual's household lent money to a member of the other individual's household.

Broker/Voter's degree centrality: the number of individuals to which a broker/voter is directly connected.

Broker/Voter's betweenness centrality: the proportion of shortest paths between any two individuals that pass through the broker/voter.

Broker/Voter's eigenvector centrality: a recursively defined measure where the centrality of a broker/voter is positively correlated with the centrality of the individuals with which the broker/voter is directly connected.

Broker/Voter's clustering coefficient: the number of actual connections between the nodes within a broker/voter's neighborhood divided by the total possible number of connections between them.

Absolute difference in diffusion centrality: the absolute difference in the diffusion centrality of the broker and voter.

Absolute difference in degree centrality: the absolute difference in the degree centrality of the broker and voter.

Absolute difference in betweenness centrality: the absolute difference in the betweenness centrality of the broker and voter.

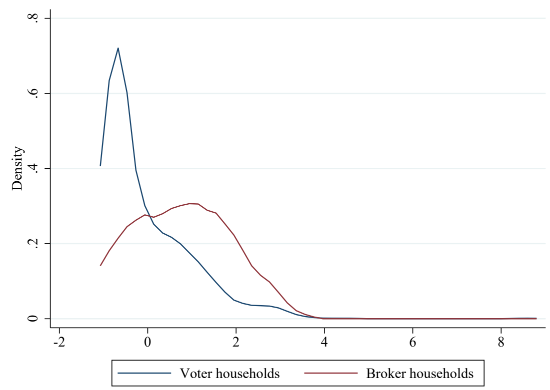
Absolute difference in eigenvector centrality: the absolute difference in the eigenvector centrality of the broker and voter.

Absolute difference in clustering: the absolute difference in the clustering coefficient of the broker and voter.

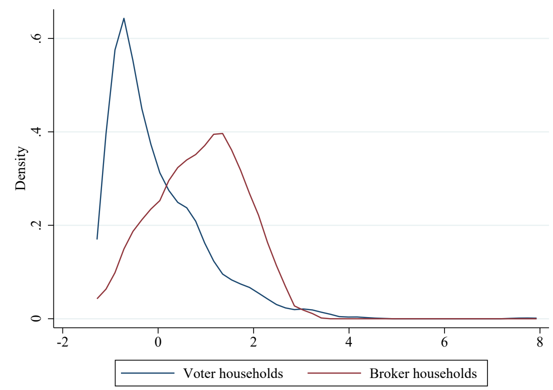
Freeman segregation index (FSI): given the affiliation to two political parties, $\text{FSI} = 1 - \frac{p}{\pi}$, where p is the observed proportion of between-party connections and π is the expected proportion given that connections are generated randomly. It ranges between 0 (random network) and 1 (fully segregated partisan groups). Although p could be greater than π, the index truncates negative values, which correspond to networks in which the proportion of between-group connections is greater than what would be expected by chance.

B Additional Tables and Figures

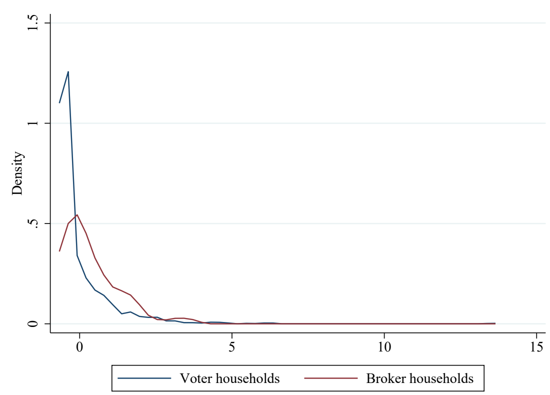
Figure B1: Kernel density estimates of household centrality measures



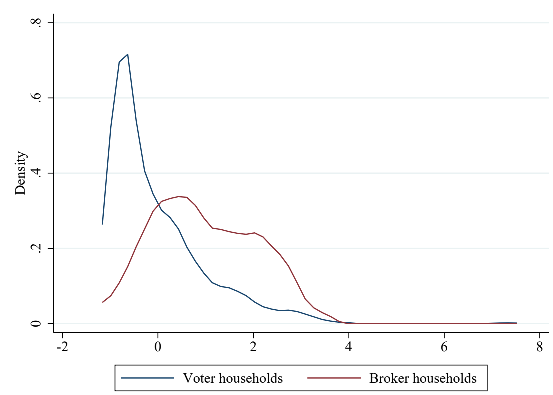
(a) Degree Centrality



(b) Diffusion Centrality



(c) Betweenness Centrality



(d) Eigenvector Centrality

Notes: Each plot shows the Epanechnikov kernel density estimates of standardized household centrality measures separately for voters and brokers.

Table B1: Summary statistics of network centrality measures for all households in our villages, and by broker and voter households

	Observations	Mean	Standard Deviation
Non-standardized Network Measures			
Broker Network Measures			
Degree centrality	32	7.969	4.540
Betweenness centrality	32	0.031	0.032
Diffusion centrality	32	9.351	4.247
Eigenvector centrality	32	0.136	0.073
Voter Network Measures			
Degree centrality	1,000	4.585	4.304
Betweenness centrality	1,000	0.019	0.036
Diffusion centrality	1,000	5.111	4.749
Eigenvector centrality	1,000	0.066	0.070
Broker and Voter Network Measures			
Degree centrality	1,032	4.690	4.349
Betweenness centrality	1,032	0.019	0.036
Diffusion centrality	1,032	5.243	4.789
Eigenvector centrality	1,032	0.068	0.071

Table B2: Effect of *hearing* on vote-buying targeting and brokers' knowledge about voters, by other party *hearing*

	Vote-buying targeting index		Overall knowledge index	
	(1)	(2)	(3)	(4)
Panel A: Mean Other Party Hearing				
Hearing	0.2786***	0.2649***	0.2186***	0.2308***
	(0.0632)	(0.0674)	(0.0491)	(0.0560)
Mean other party hearing	-0.1020	-0.1146	0.0096	0.0213
	(0.0912)	(0.0923)	(0.0770)	(0.0839)
Hearing × Mean other party hearing		-0.0017		-0.0026
		(0.0426)		(0.0505)
Mean of Dependent Variable				
Broker FE	X	X	X	X
Voter FE	X	X	X	X
Observations	932	932	932	932
R^2	0.6135	0.6139	0.6565	0.6572
Panel B: Maximum Other Party Hearing				
Hearing	0.2715***	0.2689***	0.2218***	0.2336***
	(0.0603)	(0.0652)	(0.0512)	(0.0566)
Max. other party hearing	-0.1037	-0.1088	0.0152	0.0227
	(0.0854)	(0.0818)	(0.0623)	(0.0639)
Hearing × Max. other party hearing		-0.0592		-0.0063
		(0.0464)		(0.0456)
Mean of Dependent Variable				
Broker FE	X	X	X	X
Voter FE	X	X	X	X
Observations	932	932	932	932
R^2	0.6140	0.6150	0.6566	0.6573

Notes: All specifications include broker and voter fixed effects. The vote-buying targeting index is a standardized index that takes the sum of indicators for whether the broker offered the voter something during the electoral campaign and whether the broker approached the voter to talk about the electoral campaign. The Overall knowledge index is a standardized index that aggregates indices from all the three knowledge categories: covariates, political, and social preferences. *Hearing* is standardized. "Mean other party hearing" represents the standardized average value of *hearing* of brokers from the other party. "Max. other party hearing" is the standardized highest value of *hearing* of brokers from the other party. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B3: Effect of *hearing* on vote-buying targeting, by transaction-enforcement measures

	Vote-buying targeting index			
	(1)	(2)	(3)	(4)
Hearing	0.1919	0.3606***	0.1926	0.3199***
	(0.1540)	(0.0742)	(0.1189)	(0.0569)
Social proximity	0.0468			
	(0.0937)			
Number of support pairs		-0.0953		
		(0.1083)		
Existence of a support pair			-0.0317	
			(0.1166)	
Previous transaction				-0.1072
				(0.2981)
Social proximity × Hearing	0.0435			
	(0.0508)			
Existence of a support pair× Hearing		0.0173		
		(0.0403)		
Number of support pairs × Hearing			0.1800	
			(0.1303)	
Previous transaction × Hearing				0.0720
				(0.1496)
Mean of Dependent Variable	-0.0000	-0.0000	-0.0000	-0.0000
Broker FE	X	X	X	X
Voter FE	X	X	X	X
Observations	932	932	932	932
R^2	0.6138	0.6137	0.6147	0.6130

Notes: All specifications include broker and voter fixed effects. The dependent variable is a standardized index that takes the sum of indicators for whether the broker offered the voter something during the electoral campaign and whether the broker approached the voter to talk about the electoral campaign. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B4: Effect of *hearing* with T set to the maximum broker-voter social distance for each village and after dropping villages with lowest sampling rates

	Vote-buying targeting index (1)	Overall knowledge index (2)
Panel A: T set to the maximum broker-voter social distance for each village		
Hearing (set to village max. broker-voter social distance)	0.2379***	0.1502***
	(0.0449)	(0.0253)
Mean of Dependent Variable	-0.0000	0.0000
Broker FE	X	X
Voter FE	X	X
Observations	932	932
R^2	0.6129	0.6556
	(1)	(2)
Panel B: Dropping villages with lowest sampling rates		
Hearing	0.4093***	0.2387***
	(0.0614)	(0.0445)
Mean of Dependent Variable	0.0000	-0.0000
Broker FE	X	X
Voter FE	X	X
Observations	698	698
R^2	0.6258	0.6488

Notes: All specifications include broker and voter fixed effects. The index dependent variables are standardized. *Hearing* is standardized. Panel A runs similar specifications to those in Tables 3 and 5 while calculating *hearing* by setting T equal to the maximum social distance between any voter and broker in the village network. Panel B runs the similar specifications to those in Tables 3 and 5 while excluding the two villages with the lowest sampling rates, which account for 27% of the sample. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B5: Effect of *hearing* on constituent components of the indices of brokers' knowledge about voters

	Knows voter (1)	Knows voter's spouse (2)	Knows voter's amount of land (3)	Knows voter's years of education (4)
Panel A: Covariates index component measures				
Hearing	0.0344***	0.0784***	0.0603**	0.0404**
	(0.0103)	(0.0219)	(0.0280)	(0.0186)
Mean of Dependent Variable	0.8873	0.7725	0.4206	0.8069
Broker FE	X	X	X	X
Voter FE	X	X	X	X
Observations	932	932	932	932
R^2	0.6359	0.5789	0.5524	0.6090
	Knows voter's partisanship (1)	Knows whether the voter votes (2)	Knows the frequency with which the voter would retaliate (3)	Knows whether the voter generally trusts others in the village (4)
Panel B: Political and Social Preferences index component measures				
Hearing	0.0971***	0.0632***	0.0500*	0.0554***
	(0.0351)	(0.0222)	(0.0272)	(0.0138)
Mean of Dependent Variable	0.5933	0.6288	0.5858	0.6556
Broker FE	X	X	X	X
Voter FE	X	X	X	X
Observations	932	932	932	932
R^2	0.5362	0.7056	0.6524	0.7760

Notes: All specifications include broker and voter fixed effects. *Hearing* is standardized. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B6: Effect of *hearing* on brokers' overall knowledge, controlling for homophily and network measures that predict the enforcement ability of the network

	Overall knowledge index					
	(1)	(2)	(3)	(4)	(5)	(6)
Hearing	0.1986**	0.2361**	0.1879***	0.1942***	0.2138***	0.3287*
	(0.0730)	(0.0960)	(0.0380)	(0.0418)	(0.0360)	(0.1697)
Social proximity		-0.0176				-0.0953
		(0.0747)				(0.1285)
Existence of a support pair			0.1095			0.2246
			(0.0875)			(0.1411)
Number of support pairs				0.0350		-0.0976
				(0.0490)		(0.0781)
Previous transaction					0.0053	0.0381
					(0.0734)	(0.1110)
Mean of Dependent Variable	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Broker FE	X	X	X	X	X	X
Voter FE	X	X	X	X	X	X
Broker-Voter Controls	X					X
Observations	932	932	932	932	932	932
R^2	0.7114	0.6566	0.6574	0.6567	0.6565	0.7131

Notes: All specifications include broker and voter fixed effects. The dependent variables is a standardized index. The Overall knowledge index aggregates indicators from all the three knowledge categories: covariates, political, and social preferences. Columns (1) and (6) control for the following variables at the broker-voter level: a) an indicator for the broker and voter having the same gender; b) standardized geographical distance between the broker's and voter's residences; c) standardized absolute difference in age, degree centrality, clustering coefficient, betweenness centrality, diffusion centrality, and eigenvector centrality; and d) broker fixed effects interacted with voter's degree centrality, clustering coefficient, betweenness centrality, diffusion centrality, and eigenvector centrality. All network measures (except the indicator variables) are standardized. Standard errors use two-way clustering at the broker and voter levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.