Brokering Votes With Information Spread Via Social Networks*

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July 2023

Politicians rely on political brokers to buy votes throughout much of the developing world. We investigate how social networks facilitate these vote-buying exchanges. Our model suggests that brokers should be particularly well-placed within the network to learn about non-copartisans' reciprocity in order to target transfers effectively. As a result, parties should recruit brokers who are central among non-copartisans. We combine village network data from brokers and citizens with broker reports of vote buying. We show that networks diffuse politically-relevant information about citizens to brokers who leverage it to target transfers. In particular, among those citizens who are not registered to their party, brokers target reciprocal citizens about whom they can learn more through their network. Moreover, recruited brokers are significantly more central than other citizens among non-copartisans, but not among copartisans. These results highlight the importance of information diffusion through social networks for vote buying, broker recruitment, and ultimately for political outcomes.

JEL Codes: D72, O12
Keywords: vote buying, brokers, social networks

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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 the almost universal adoption of the secret ballot, vote buying remains pervasive throughout the developing world and its persistence is not yet well understood.[1]

Political brokers play an important role in sustaining vote buying (Finan and Schechter, 2012; Larreguy, 2013; Lehoucq, 2007; Schaffer, 2007; Stokes, 2005). Candidates and political parties commonly 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 citizens through their social networks that enables them to buy votes using various complementary tactics.[2] But whether and how brokers leverage their social networks to sustain vote buying, and how this in turn shapes broker recruitment as a function of their location in these networks, has yet to be assessed empirically, due in large part to the lack of data on both the social networks and the vote-buying decisions of the political brokers themselves.

We propose a simple model of vote buying in social networks that predicts what type of citizens brokers should target and, consequently, what type of brokers parties should recruit. The model predicts that, in order to persuade and sometimes mobilize citizens to vote for their candidates,

[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 were offered between $1 and $30 in the 2010 elections (Cruz, 2019), 40% of respondents were offered a quarter of the minimum monthly wage during Uganda's 2016 general election (Blattman et al., 2022), and 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 citizens who are more likely to reciprocate (Finan and Schechter, 2012; Lawson and Greene, 2014), c) targeting of citizens who are likely copartisans but unlikely to vote (Nichter, 2008), and d) targeting of opinion leaders (Auerbach and Thachil, 2020; Cox, 2015; Schaffer and Baker, 2015).

brokers are more likely to target non-copartisan citizens who they hear (through the network) are most likely to be reciprocal. Moreover, because both turnout and party registration are publicly available information in our context, a broker's targeting of copartisans is independent of both how much they hear about the copartisans and the copartisans' reciprocity levels. The model then predicts that parties should recruit brokers who are central with respect to non-copartisan citizens.

To test the model's predictions, we use a novel survey of political brokers and citizens in rural Paraguay. First, we estimate the extent to which the network positions of brokers and citizens affect the brokers' knowledge about citizens and the brokers' targeting decisions. Second, we analyze the placement in the social network of brokers recruited by parties both with respect to copartisans and non-copartisans, measuring partisanship using publicly available data on citizens' party registration.

Following Banerjee et al. (2019), we compute a network statistic at the broker-citizen level called *hearing*. *Hearing* measures how much information a given broker might hear about a specific citizen. While other studies have measured the social networks of citizens or of candidates, this is, to our knowledge, the first study to systematically measure the social networks of political brokers. Moreover, in contrast to previous studies, our network measure captures the relative network position of brokers and citizens, rather than only measuring the network of one type of actor. This feature not only allows us to estimate the information-diffusion role of networks in facilitating vote-buying exchanges, but also offers insights into the importance of network position for who becomes a political broker.

A key feature of our survey is that, in addition to eliciting information about citizens from the citizens themselves, we also elicit information about citizens from the brokers. We take advantage of this information in three important ways. First, in contrast to the extant literature, we measure vote buying as reported by the brokers rather than by the citizens.[3] This allows us to use broker

[3]One notable exception is Ravanilla et al. (2021), who collect broker-reported measures of vote buying during the 2016 Philippine elections.

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 multiple political brokers within each village report vote buying about overlapping citizens, we also further restrict our analysis to within-citizen variation. With citizen fixed effects, we account for citizen-specific confounders such as the citizen's socioeconomic status and network position. Finally, we ask the same questions about citizen characteristics – including questions about politically-relevant information and about social preferences – to both brokers and citizens. Using these two reports of the same information, we can then test the extent to which information about citizens is diffused through the network to brokers.

Our broker-citizen measure of *hearing* significantly predicts who each political broker targets, as well as whether a citizen claims to support the broker's party thereafter. 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. We show that information diffusion through the network helps brokers choose which citizens to target. As evidence that networks transmit information from citizens to brokers, we show that *hearing* strongly predicts whether brokers know citizen characteristics that have been shown to be important for the targeting of vote-buying exchanges. As evidence that this information affects targeting, consistent with our model's predictions, we show that brokers are more likely to target reciprocal citizens not registered to their party, but about whose reciprocity level they can more easily learn due to the architecture of the social network. On the other hand, brokers target citizens registered to their own party regardless of their reciprocity level or their position in the network. We find no such pattern when we consider as a placebo outcome whether the broker and the citizen have engaged in a non-political informal transaction in the past year.

Because a broker's network position matters for their ability to deliver votes, a further implication of our model is that parties should recruit brokers with high levels of *hearing* among non-copartisans. Our data support this prediction. Average broker diffusion centrality (the sum of the broker's *hearing* with all citizens) is 20 percentiles greater than that of other households. Their diffusion centrality is significantly higher (40 percentiles) among non-copartisans, but no different among copartisans.

Information diffusion is only one of the many functions that networks serve. In other contexts, networks have been shown to contribute to the enforcement of informal contracts. *Hearing* might explain the likelihood of vote-buying transactions through its correlation with ease of transaction enforcement rather than information diffusion. To address this concern, we show that the impact of *hearing* is robust to the inclusion of network characteristics suggested by the literature as increasing enforcement ability.

We also test whether *hearing* captures other features of the network. For example, brokers may target citizens who are good at transmitting information and persuading others to vote for specific candidates (Auerbach and Thachil, 2020; Cox, 2015; Ravanilla et al., 2021; Schaffer and Baker, 2015). By targeting a well-positioned citizen, a broker could convince many citizens to vote for their candidate for the price of a single transfer. Our inclusion of citizen fixed effects ameliorates this concern. Nevertheless, we also create network measures of how well-placed a citizen 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 *hearing*.

Our results on broker knowledge and targeting are robust to the inclusion of broker and citizen fixed effects, and also to other identification concerns. For example, one concern is that brokers might target citizens who are similar to them and that, as a result of homophily, their similarity might be correlated with *hearing*. The richness of our data allows us to show that our results are robust to controlling for the similarity between a citizen and broker along various dimensions, including their socio-demographic characteristics and their positions in the network.[4]

We also dismiss concerns about the endogeneity of partisanship. Party registration exhibits a

[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).

remarkable level of persistence within families, as 90% of Paraguayans share the same partisan identity as at least one of their parents (Lachi and Rojas-Schaffer, 2018). In addition, most citizens align themselves with a political party when they first register to vote and display a limited inclination to change their affiliation over time.

Another potential concern is that the networks we measure might be political rather than social. However, our 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. A low Freeman segregation index (Freeman, 1978) suggests little partisan segregation in our village networks.

This study contributes to various literatures. First, it contributes to the research on the role of social networks in explaining vote buying and electoral outcomes. Some papers focus on citizens' social networks. For example, Cruz (2019) and Fafchamps and Labonne (2020) show that well-connected citizens are more likely to be targeted. Ravanilla et al. (2021) show that brokers target well-connected citizens when social networks are dense, but more reciprocal citizens 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 et al. (2017) suggest that more central candidates get more votes. In contrast with previous studies that focus on the network position of one individual (the citizen, broker, or candidate), we map out the complete network and create a broker-citizen level measure of the connection between the two. This allows us to study targeting using fixed effects at both the broker and citizen levels to control for important broker- and citizen-level confounders that have plagued previous studies. Moreover, we show that brokers' centrality with respect to non-copartisans matters for broker recruitment.[5]

Second, a growing literature studies the effects of social networks on political outcomes other

[5]This might explain why brokers are not more central than the average citizen in a context characterized by turnout buying (Brierley and Nathan, 2021).

than vote buying. Social networks affect perceptions and voting behavior through the dissemination of information about unemployment (Alt et al., 2022), electoral violence (Fafchamps and Vicente, 2013), and elections in general (Fafchamps et al., 2020). Similarly, Arias et al. (2019), Bond et al. (2012), Collier and Vicente (2014), and Enríquez et al. (2023) 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 citizens to brokers.

Third, there is a rich literature on the determinants of citizen targeting. Dixit and Londregan (1996) and Lindbeck and Weibull (1987) suggest that politicians target citizens 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 et al., 2016; Stokes et al., 2013) and the targeting of reciprocal citizens, supporters unlikely to turn out, and opinion formers (Auerbach and Thachil, 2020; 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 reciprocal citizens. Our study extends Finan and Schechter (2012) in at least three important ways. First, we show that brokers learn which citizens are reciprocal from information diffused through the social network. Second, we show that the average effect found in Finan and Schechter (2012) comes specifically from brokers targeting reciprocal non-copartisans about whom they can more easily learn information due to the network architecture. Third, we study brokers' placement in their social network and show that parties recruit brokers who are most central among citizens who are not registered to their party.

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., 2022; Banerjee et al., 2013, 2019), social learning (Chandrasekhar et al., 2020; Conley and Udry, 2010), and transaction enforcement (Bloch et al., 2008; Chandrasekhar et al., 2018; Jackson et al., 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 background information on political brokers and vote buying in Paraguay. Section 3 presents our vote-buying model and the predictions that we take to the data. In Section 4, we describe our data and the construction of the citizen-broker network measures. In Section 5, we describe our empirical strategy, and in Section 6 we present our main results, robustness checks, and tests for alternative mechanisms. Section 7 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.[6]

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 (New York Times, 2023; 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

[6]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.

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]." Vote buying is also becoming increasingly important to win elections, as 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 citizens, exchanging money and favors for promises to vote accordingly. Their ability to facilitate these exchanges is due, in large part, to how embedded they are within their community. 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 citizens, a Colorado broker in the municipality of General Aquino noted that "it is all about ñe'embegue (gossip)." Lachi (2009) concludes from his series of focus groups that political brokers "are essential for electoral campaigns and that their value is directly proportional to their integration within their communities." Political parties typically have multiple brokers operating within the same village. According to ethnographic work of Dosek (2019), brokers of the same party typically coordinate on which citizens to target.

Brokers leverage their local knowledge to target citizens. A Liberal party official in Asunción mentioned that brokers "know who [their] party supporters are." Similarly, a Liberal official in the governor's office of Coronel Oviedo argued that brokers know "which Colorado and Liberal voters would sell their vote." Importantly, brokers suggest that the citizens 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 citizens they target "always thank favors."

To win elections, brokers also find it necessary to target non-copartisan citizens in addition to their copartisan core supporters. For example, Liberal brokers from the municipality of General Morínigo recognize that their party "helps" non-copartisans more than their own copartisans. They confirm that elections are won with votes from non-copartisans, which is why they target citizens beyond their own party.

3 Model

In this section, we present a simple vote-buying model in the spirit of Gans-Morse et al. (2014).[7] The model provides a simple stylized theory of how brokers decide which citizens to target. Broker targeting depends on the extent to which the broker believes the citizen to be reciprocal, which is shaped by their relative positions in the network and the citizen's reciprocity, and whether the broker and citizen are copartisans. The model also highlights a party's interest in recruiting brokers who are centrally located among non-copartisans.

Citizens and parties

Consider an environment with N citizens and two political parties, an incumbent party and an opposition party. Each party has a fixed opposing platform on a uni-dimensional ideological spectrum and maximizes its vote share. To attract citizens, parties can offer targeted payments to citizens, subject to a limited budget B. As in Baland and Robinson (2008) and Gans-Morse et al. (2014), we assume for simplicity that the budget of the incumbent party relative to the opposition is sufficiently large that the incumbent can act as a monopolist in its targeting decisions. While this assumption might not hold across all settings, we conjecture that the main predictions of the model

[7] Our model differs from Gans-Morse et al. (2014) in that it: a) introduces contractible and non-contractible transfers, b) includes citizens with heterogeneous reciprocity levels, c) includes brokers who can learn about citizen reciprocity through the social network, d) abstracts from abstention buying, and e) analyzes broker recruitment by the incumbent party.

would continue to hold if we relaxed the assumption, as long as brokers working for different parties know sufficiently little about the information each other have.

Each citizen i receives expressive utility, $X_{ij}, j \in \{I, O\}$, for voting for the incumbent party I or the opposition party O. We can think of this utility as originating from the party's fixed opposing platform. We normalize expressive utility such that $X_{iI} + X_{iO} = 1$ and $X_{ij} \in \{0, 1\}$. This implies that each citizen gets expressive utility of 1 from voting for one of the parties and 0 from voting for the other. Citizens incur cost c_i to vote. For convenience, we assume that costs are distributed uniformly over the interval $[0, \bar{c}]$.

Citizens also receive utility from party transfers. Parties can offer two types of transfers, contractible and non-contractible. Contractible transfers, T_i^c, are payments conditional on an observable action, which in this setting is turning out to vote. Non-contractible transfers, T_i^{nc}, are monetary gifts that engender warm glow towards the party if the person is reciprocal, where reciprocity $\rho_i = \rho \in (0, 1]$ if the person is reciprocal and zero otherwise.

A non-reciprocal citizen who is offered transfers T_i^{nc} and T_i^c by party I will receive the following utility:

$$\begin{cases} X_{ij} + T_i^{nc} + T_i^c - c_i, & \text{if they vote, and} \\ T_i^{nc}, & \text{if they do not vote.} \end{cases}$$

A reciprocal citizen who is offered transfers by party I will receive the following utility:

$$\begin{cases} X_{iI} + (1+\rho) T_i^{nc} + T_i^c - c_i, & \text{if they vote for party } I \text{ ,} \\ X_{iO} + T_i^{nc} + T_i^c - c_i, & \text{if they vote for party } O \text{, and} \\ T_i^{nc}, & \text{if they do not vote.} \end{cases}$$

Citizens are heterogeneous in their cost of voting (c_i) and in whether they are reciprocal (ρ_i). This model distinguishes between four groups of citizens, N_g with $g \in \{iv, in, ov, on\}$. These groups are defined based on whether, in the absence of transfers, the citizen would turn out to vote and for whom.

- Incumbent Voter (N_{iv}): $X_{iI} - c_i \geq 0$ where $X_{iI} = 1$ (so $1 \geq c$);
- Incumbent Non-Voter (N_{in}): $X_{iI} - c_i < 0$ where $X_{iI} = 1$ (so $1 < c$);
- Opposition Voter (N_{ov}): $X_{iO} - c_i \geq 0$ and $X_{iO} = 1$ (so $1 \geq c$);
- Opposition Non-Voter (N_{on}): $X_{iO} - c_i < 0$ and $X_{iO} = 1$ (so $1 < c$).

Brokers

The incumbent party relies on brokers to target their transfers. We assume that brokers know the voting cost of each citizen, c_i. The voting cost usually depends on variables such as the distance to the polling station and the opportunity cost due to occupation, all of which are relatively easy to observe. Given the Paraguayan context, where party registration is publicly available, we assume that brokers know whether each citizen is a copartisan, X_{iI} and X_{iO}. Brokers do not, however, know for sure whether a citizen is reciprocal. They do know that a proportion ϕ of citizens are reciprocal, and they may receive signals about each citizen's reciprocity.

The number of signals that a broker receives about whether a specific citizen is reciprocal depends on their relative network positions. We define *hearing* H_{ib} as the number of times broker b receives a signal about citizen i's reciprocity ρ_i. The signal is correct with probability $\theta > 0.5$. Denote $\widehat{\phi}_{ib}(\rho, H_{ib})$ as the expected belief held by broker b that citizen i is reciprocal (has $\rho_i = \rho$) when that citizen is actually reciprocal given the level of *hearing* H_{ib} between the two. This expectation is:

$$\widehat{\phi}_{ib}(\rho, H_{ib}) = \frac{\phi \theta^{H_{ib}}}{\phi \theta^{H_{ib}} + (1-\phi)(1-\theta)^{H_{ib}}}$$

Note that if the broker receives no signals about the citizen ($H_{ib} = 0$), then $\widehat{\phi}_{ib}(\rho, H_{ib}) = \phi$ which is the share of reciprocal citizens in the population. If $H_{ib} > 0$ and the signal is perfectly accurate

($\theta = 1$), then $\widehat{\phi}_{ib}(\rho, H_{ib}) = 1$ and the broker is sure that a reciprocal citizen is in fact reciprocal. This is more generally captured by the following lemma.

Lemma 1 $\frac{\partial \widehat{\phi}_{ib}(\rho, H_{ib})}{\partial H_{ib}} > 0$ *as long as the signal is informative* ($\theta > 0.5$) *and as long as the citizen is reciprocal* $\rho_i = \rho$.

In words, in broker-citizen dyads with higher *hearing*, the broker's posterior about the likelihood that citizen is reciprocal is more accurate.

Targeting Strategies

The incumbent party and its brokers want to maximize their expected number of votes by offering targeted payments to citizens subject to a budget constraint B.

$$\max_{T_i^{nc}, T_i^c} \sum_{i \in N_{iv}} 1 \quad + \sum_{i \in N_{in}} [\widehat{\phi}_{ib} \mathbb{1}\{1 + \rho T_i^{nc} + T_i^c \geq c_i\} + (1 - \widehat{\phi}_{ib}) \mathbb{1}\{1 + T_i^c \geq c_i\}]$$
$$+ \sum_{i \in N_{ov}} \widehat{\phi}_{ib} \mathbb{1}\{\rho T_i^{nc} \geq 1\} \quad + \sum_{i \in N_{on}} \widehat{\phi}_{ib} \mathbb{1}\{\rho T_i^{nc} \geq 1\} \mathbb{1}\{\rho T_i^{nc} + T_i^c \geq c_i\}. \tag{1}$$

The first summation corresponds to the incumbent voters. These citizens turn out and vote for the incumbent without receiving any payments. The second summation consists of incumbent non-voters. These citizens vote for the incumbent as long as $1 + T_i^c \geq c_i$. The third summation consists of the opposition voters. These citizens turn out to vote regardless of payment, but only vote for the incumbent if they are reciprocal and $\rho T_i^{nc} \geq 1$. The last summation corresponds to the opposition non-voters. To convince opposition non-voters to vote for the incumbent, the broker has to target reciprocal citizens and offer them a contractible payment to turn out plus a non-contractible payment to change their vote.

To solve the problem in Equation (1), note that $T_i^{nc} = 0$ for all $i \in N_{in}$. The reason is simple. To get an incumbent non-voter to support the incumbent party, the broker needs to pay them their cost of voting. The broker would rather make this payment in the form of a contractible payment, which delivers a vote with certainty, versus a non-contractible payment that only matters if the citizen is reciprocal. Furthermore, given that $T_i^{nc} = 0$ for all $i \in N_{in}$, the second summation reduces to $\sum_{i \in N_{in}} 1\{1 + T_i^c \geq c_i\}$, implying that reciprocity does not affect a broker's decision to buy the turnout of incumbent non-voters.

Denote the cost for attempting to buy a vote for the incumbent party $C(c_i, \rho)$ as the sum of the contractible cost $C^c(c_i)$ and the non-contractible cost $C^{nc}(\rho)$. For $i \in \{N_{iv}, N_{ov}\}$, $C^c(c_i) = 0$, whereas for $i \in \{N_{in}, N_{on}\}$, $C^c(c_i) = c_i - 1$. Similarly, let $C^{nc}(\rho)$ denote a vector containing the cost per vote based on a non-contractible payment. For $i \in \{N_{ov}, N_{on}\}$, $C^{nc}(\rho) = \frac{1}{\rho}$.

For given c_i, ρ, and $\widehat{\phi}_i$, the cost (C) of attempting to buy the vote of each citizen type and the probability (π) that they turn out to vote for the incumbent are:

- Incumbent Voter: $C_{iv}(c_i, \rho) = 0$ and $\pi_{iv} = 1$;
- Incumbent Non-Voter: $C_{in}(c_i, \rho) = c_i - 1$ and $\pi_{in} = 1$;
- Opposition Voter: $C_{ov}(c_i, \rho) = \frac{1}{\rho}$ and $\pi_{ov} = \widehat{\phi}_{ib}$;
- Opposition Non-Voter: $C_{on}(c_i, \rho) = c_i - 1 + \frac{1}{\rho}$ and $\pi_{on} = \widehat{\phi}_{ib}$;

An optimal allocation is a vector of payments $T(c_i, \widehat{\phi}_{ib})$ such that no other allocation produces a greater number of expected votes. Given the linearity of the problem, to achieve this optimal allocation under the model's assumptions, the broker simply ranks each citizen from highest to lowest in terms of the ratio of the probability that they turn out to vote for the incumbent and the cost of buying their vote, $\frac{\pi_i}{C(c_i, \rho)}$. The broker provides the required transfers to the first N^* voters such that

$$\sum_{i=1}^{N^*} T(c_i, \widehat{\phi}_{ib}) \leq B.$$

Appendix Figure B1 plots the indifference curve between targeting an incumbent non-voter i with c_i and an opposition voter j with $\widehat{\phi}_{jb}$ for $\rho = 1$. It makes clear that it is optimal for brokers to buy the votes of all incumbent non-voters with $c_i \leq 2$ before buying the votes of any opposition voter. Moreover, when engaging in the latter, brokers should prioritize opposition voters with the highest expected reciprocity ($\widehat{\phi}_{jb}$).

Without loss of generality, assume that, among opposition voters and opposition non-voters, an opposition voter has the largest $\frac{\pi_i}{C(c_i,\rho)}$. This opposition voter then must have the largest $\widehat{\phi}_{jb}$, which we denote $\widehat{\phi}^{max}$. The next proposition characterizes the most empirically relevant equilibrium.

Proposition 1 *Suppose* $\frac{1-(\rho\widehat{\phi}^{max})^2}{2(\rho\widehat{\phi}^{max})^2\bar{c}} < B$*, then there exists an equilibrium in which the incumbent party engages in both vote buying and turnout buying. Conditional on such an equilibrium, the incumbent targets incumbent non-voters with the lowest voting cost* c_i*, opposition voters with the highest expected reciprocity* $\widehat{\phi}_{jb}$*, and opposition non-voters with both the lowest* c_i *and highest* $\widehat{\phi}_{jb}$*.*

Proof The broker should first target incumbent non-voters with $c_i < \frac{1+\rho\widehat{\phi}^{max}}{\rho\widehat{\phi}^{max}}$, which has a cost of $\int_1^{\frac{1+\rho\widehat{\phi}^{max}}{\rho\widehat{\phi}^{max}}} (c_i - 1)\frac{1}{\bar{c}}dc_i = \frac{1-(\rho\widehat{\phi}^{max})^2}{2(\rho\widehat{\phi}^{max})^2\bar{c}}$. If the budget is greater than such cost, the broker then targets opposition voters, starting with the one with $\widehat{\phi}_{jb} = \widehat{\phi}^{max}$. Then, the broker targets the voters with the largest $\frac{\pi_i}{C(c_i,\rho)}$ according to the following indifference curves $\frac{1}{c_i-1} = \rho\widehat{\phi}_{jb} = \frac{\widehat{\phi}_{kb}}{c_k-1+\frac{1}{\rho}}$ for incumbent non-voters i, opposition voters j, and opposition non-voters k. Given that $\frac{\partial\left(\frac{1}{c_i-1}\right)}{\partial c_i}, \frac{\partial\left(\frac{\widehat{\phi}_{kb}}{c_k-1+\frac{1}{\rho}}\right)}{\partial c_k} < 0$ and $\frac{\partial\left(\rho\widehat{\phi}_{jb}\right)}{\partial\widehat{\phi}_{jb}}, \frac{\partial\left(\frac{\widehat{\phi}_{kb}}{c_k-1+\frac{1}{\rho}}\right)}{\partial\widehat{\phi}_{kb}} > 0$, the broker targets incumbent non-voters and opposition non-voters with the smallest c_i and c_k, and opposition voters and opposition non-voters with the largest $\widehat{\phi}_{jb}$ and $\widehat{\phi}_{kb}$.

Proposition 1 highlights that the broker targets incumbent non-voters with the lowest turnout costs. More importantly, it indicates that, when buying from opposition voters and non-voters, the brokers focus on citizens who they believe are most likely to be reciprocal. Corollary 1 follows from Lemma 1 and Proposition 1.

Corollary 1 *Brokers are more likely to target opposition voters and opposition non-voters who are both reciprocal and with whom they have higher hearing. However, their targeting of incumbent non-voters is independent of their hearing and reciprocity.*

From Lemma 1, for reciprocal citizens, the more signals the broker receives about voters and non-voters, the higher his perceived likelihood that the reciprocal citizens are indeed reciprocal. Moreover, from Proposition 1, brokers are more likely to target reciprocal voters and non-voters who favor the opposition about whom they receive more signals. In turn, neither *hearing* nor reciprocity plays a role in the targeting of citizens who favor the incumbent.

There is an important consideration for bringing the model's predictions to the data. Given that we lack ex-ante measures of whether a citizen is a voter (someone who would turn out to vote in the absence of vote-buying transfers), we cannot assess, for example, whether brokers effectively target only incumbent non-voters. Thus, we instead focus on the model's overall implications for non-copartisans - brokers are more likely to target non-copartisans who are reciprocal and with whom they have higher *hearing*, and copartisans - brokers target copartisans irrespective of their reciprocity and *hearing*.

Broker Selection

As a result of Proposition 1 and Lemma 1, the expected return to vote buying by the incumbent is increasing in the number of signals a broker receives about citizens who favor the opposition. In contrast, the number of signals a broker receives about citizens that favor the incumbent is irrelevant to the expected return from vote buying since partisanship is observable and the broker can buy the turnout of incumbent non-voters through contractible transfers, which do not rely on reciprocity for enforcement. The incumbent party will then recruit brokers with the highest *hearing* among non-incumbent supporters.

In sum, this simple model provides three predictions that we test in the available data. First, neither a citizen's reciprocity level nor the broker's *hearing* with the citizen will affect the targeting of supporters. Second, conditional on an equilibrium in which brokers have the incentive to target opposition voters, brokers will target reciprocal opposition citizens with whom they are connected in the network in such a way that they can receive more signals. Third, conditional on the same equilibrium, the party will recruit brokers who, on average, have higher *hearing* among opposition supporters.[8]

4 Data

We test whether networks promote clientelistic exchanges through the transmission of information from citizens to brokers. We also test whether the architecture of the social network shapes broker recruitment. To do so, we combine vote-buying data from brokers and citizens originally collected for Finan and Schechter (2012), with 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 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 this section of the 2007 survey as the 'citizen' throughout the paper.

In 2010, we returned to ten of the original fifteen villages across two departments in Paraguay for a sixth time and asked the households in our original sample who the brokers working in

[8]In an alternative model, parties may instead choose a broker, who then invests in relationships that help him hear more about opposition supporters. However, we believe this alternative interpretation is less likely. *Hearing* does not just depend on the broker's direct connections with citizens, but on citizens' connections with one another. It seems unlikely that a broker can change the network architecture of the entire village.

their village were.[9] At this point, the villagers knew us well. We had conducted incentivized experiments with them multiple times, and in both 2002 and 2007 they had interacted with one co-author who is a Guaraní-speaking American.[10] Many of the enumerators had conducted multiple rounds of the survey, 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 inquiring about the brokers operating in the villages in which we worked.

Households identified 43 brokers working in the ten villages, and we were successful in interviewing 38 of them. 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 so we had indirect information about these brokers' social connections. Thus, we are only missing social network data for two of the surveyed brokers living in the villages in which we worked. Our results are robust to excluding brokers whose social ties are based solely on indirect information.

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%). Our

[9]The original survey was conducted in three departments, while the 2010 follow-up was only conducted in the two more easily accessible departments: Paraguarí (a traditional 'minifundia' department in which farmers farm small plots of land) and San Pedro (a department colonized by the government in the 60's). Five villages in each department were randomly chosen. Because the original survey was intended to study land reform and property rights, farmers owning more than 25 hectares of land were over-sampled in 1991.

[10]Guaraní is the indigenous language of Paraguay.

results are robust to excluding data from the two villages with the lowest direct sampling rates.

Social connections include family ties, godparenting ties, support networks, and non-political financial – monetary or in-kind – transactions in the last year, including informal transfers, gifts, and loans.[11] We include all types of social connections since restricting them to a particular type would lead to fewer inter-personal connections and disconnected sets of nodes. Figure 1 provides an 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). There are two brokers in that village. One resides in the household labeled 9, was directly surveyed, and has 14 direct connections. The other resides in the household labeled 73, was indirectly surveyed, and has 10 direct connections.

We measure the extent to which broker b hears information about citizen i using *hearing* as defined in Banerjee et al. (2019). We define T as the number of periods that information flows in the network and p as the probability with which it flows in a given period between two directly connected households after one household received the information in the previous period. Define the adjacency matrix $\mathbf{g}$ as the matrix where each row and column represents one household in the village and an element equals 1 if the row and column households are connected and 0 if they are not. The expected number of times that broker b hears a piece of information originating from citizen i if information is diffused according to this process is the ib^{th} entry of the matrix $\mathbf{H} = \sum_{t=1}^{T} (p\mathbf{g})^t$, or H_{ib}, which we call *hearing*. The broker's diffusion centrality, H_b, is the sum of their *hearing* with all citizens, or the sum of the elements of column b.

For the intuition on how this measure is computed, consider the process of diffusion of a piece of information originating from citizen i to broker b as illustrated in Figure 2. Sub-figure (a) shows

[11] 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.

the social network and the information in period 0. Sub-figure (b) shows that in the first period, the two nodes directly connected to i (colored in gray) find out the information with probability $p \in (0,1]$. Because broker b cannot hear the information in the first period, $H_{ib}(1) = 0$. 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 in gray) 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 number of times they could have received the information in the previous period.[12]

As shown in sub-figure (d), broker b's first chance to hear information originating from citizen i is in period 3. We see that $H_{ib}(3) = 0.09$ 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 periods, where T is a finite positive integer, as information likely loses relevance with the passage of time. *Hearing*, H_{ib} is thus the expected number of times that broker b would hear a piece of information originating from citizen 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 citizen 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 citizen would never reach some broker in their network. On the other hand, the greater the T, the more likely information from citizen 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.[13] In the example network shown in Figure 2,

[12]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 (2020).

[13]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.

the largest eigenvalue is 2.8 and so the probability of information transmission is $p = 0.36$.

We construct additional network statistics to address concerns associated with homophily and other potential confounders. At the citizen level, these measures include the clustering coefficient, degree centrality, betweenness centrality, diffusion centrality, and eigenvector centrality. At the broker-citizen level, these measures include the existence and number of support pairs (direct connections in common), an indicator of prior non-political informal financial transactions, and indicators for each value of social proximity. Jackson et al. (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 et al. (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 characteristics may be difficult to interpret in isolation. Comparing them with the values for the Indian villages studied in Banerjee et al. (2013), the households in our data have lower average degree (number of direct connections) but higher values of all other network measures. Thus, these villages are more inter-connected than the villages studied in India.[14]

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 citizens in the village where they lived and worked. This provides us with a sample of 295 citizens, none of whom lived in the same household as one another, and a total of 932 broker-citizen pair observations.[15]

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

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

Our main outcome variable is a broker-citizen level standardized index that sums two measures of vote buying as reported by brokers about each citizen. These measures are indicators for whether a broker approached a citizen and whether he offered the citizen something during the electoral campaign. The correlation between these indicator variables is 0.35 ($p < 0.0001$). An additional outcome is an indicator for whether the citizen 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.[16] As Table 1 indicates, the average broker approached 48% of the citizens and offered something to 27% of them. Citizens support the same party as the broker in 46% of observations.

To test whether *hearing* predicts how well a broker knows a citizen, we complement our broker survey with data collected from citizens in 2007. These data allow us to combine the answers to a series of questions about citizen characteristics that were asked to both brokers and citizens. Appendix A explains the coding of both the broker and citizen answers, as well as our criteria to categorize matching answers. We construct indices of brokers' knowledge about citizens along three dimensions and sum these three indices into an overall knowledge index.

The *covariates index* combines four indicators of a broker's general familiarity with the citizen. These are whether the broker states that he knows the citizen; the broker can correctly name the spouse of the citizen; the broker can accurately state the years of education of the citizen; and the broker can correctly state the amount of land the citizen owns. As Table 1 summarizes, brokers can identify the citizens and their spouses in 89% and 77% of cases, respectively. Similarly, they can correctly assess citizens' education and land 81% and 42% of the time, respectively.[17] The *political index* is an indicator for whether the broker correctly assesses the strength of the citizen's

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

[17]We consider the citizen's response to be the truth and a mismatch to signal that the broker did not know the information about the citizen. Of course, it could also be the case that a mismatch signals that the broker knew the right answer, but the citizen misrepresented the truth.

party preference. Brokers are accurate about how strongly citizens prefer a specific party 59% of the time.[18] Lastly, the *social preferences index* combines two variables that indicate a broker's knowledge about the social preferences of each citizen. These are indicators for whether the broker knows the extent to which the citizen would retaliate wrong-doing (59% match) and for whether the broker knows whether the citizen trusts at least half of those in their village (66% match).

Overall, brokers are very knowledgeable about citizens' general characteristics, political preferences, and social preferences. Such knowledge is substantively greater than random guessing as noted in Table II and Section 4.1 of Finan and Schechter (2012).[19] Also, because we tested brokers' knowledge on randomly selected villagers, these results are likely a lower bound of the extent to which brokers know their own clients.

Mediating variables

Beyond assessing how well brokers know citizens, we also test whether what they hear about citizens affects their targeting decisions. In particular, we focus on citizens' official party registration and their reciprocity, two characteristics that have been shown to explain citizen targeting. With respect to party registration, we use official, publicly-available data on citizens' political affiliations to create an indicator that the citizen is not registered to the same party for which the broker operates. In our sample, the proportion of registered Colorados and Liberals is 59% and 30%, respectively. [20]

[18]This measure of how strongly a citizen prefers a specific party is different from the citizen's official party registration, which is public information.

[19]This accurate assessment of fellow villagers by central people has also been documented in other settings. For example, Takasaki et al. (2000) find that village informants in the Peruvian Amazon can accurately state the physical and human capital of fellow villagers. Similarly, using network data from 631 Indonesian villages, Alatas et al. (2016) show that more connected people are better at ranking villagers in terms of their economic well-being. Alix-Garcia et al. (2021), in turn, find that household and informant-based asset indices are highly correlated, and their association does not vary systematically across informant characteristics.

[20]In terms of party registration, our sample is fairly representative of the two departments where the villages are located. The proportion of registered Colorados in those two departments is 63% and 65%, while the proportion of registered Liberals is 29% and 34%.

In the subsequent analysis, we treat this measure as exogenous for a few reasons. First, party registration is very persistent within families, with 90% of Paraguayans registering with the same party as at least one of their parents (Lachi and Rojas-Schaffer, 2018). Second, citizens tend to affiliate with a party when they first register to vote and rarely change their affiliation thereafter.

As our second mediating variable, we use the experimental measure of citizen reciprocity developed by Finan and Schechter (2012). In 2002, a sub-sample of the citizens in our dataset participated in a trust game. The first mover was given 8,000 Gs (1,000 Gs were worth about 20 cents at that time) and had to decide whether to send nothing, 2,000, 4,000, 6,000, or 8,000 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 6,000 Gs, 12,000 Gs, 18,000 Gs, and 24,000 Gs she would return), which was implemented accordingly. All players played once as a first mover and once as a 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 6,000 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 citizens and 271 broker-citizen observations in our sample.

5 Empirical Strategy

We use our data to answer three main questions. First, do social networks diffuse information about citizens that brokers leverage to sustain vote buying? Second, what useful information that the brokers learn through the network informs their targeting decisions? Third, does a broker's placement in the social network conform with the predictions on recruitment from the model? To answer the first and second questions, we use dyad-level data where each observation is a broker-citizen pair for the sample of all citizens whose households we interviewed, while to answer the third question we use individual-level data where each observation is a directly or indirectly surveyed household in the village.

To answer the first question, we estimate regressions of the following form:

$$y_{ib} = \alpha + \beta H_{ib} + \eta_b + \varepsilon_{ib}, \tag{2}$$

where y_{ib} is an outcome defined for citizen i and broker b, H_{ib} is the *hearing* measure that captures the information-diffusion role of social networks, and η_b is a broker fixed effect. In addition to restricting to within-broker variation, a more demanding specification also includes citizen fixed effects θ_i to address citizen-level confounders. We use two-way clustering of our standard errors, clustering at both the broker and citizen levels.[21] Outcomes include how well the broker knows the citizen and whether the broker targeted the citizen.

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

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

[21] Our final estimation sample contains 932 dyads representing 32 brokers and 295 citizens.

the brokers themselves. We were able to collect this type of information because of years of work in the villages that established trust between the researchers and brokers. Second, the inclusion of broker and citizen fixed effects allows us to control for any social desirability bias that is specific to each broker or to each citizen. For example, broker fixed effects control for any general tendency a broker may have to under-report vote buying. Similarly, citizen fixed effects control for the possibility that brokers may be more likely to remember having targeted citizens with a higher network centrality.

Another concern is homophily between brokers and citizens, for which we follow the approach of Chandrasekhar et al. (2018) and show robustness to including various broker-citizen-level controls. First, we include the absolute age difference between the broker and citizen, an indicator for them having the same gender, an indicator for the citizen being registered to the broker's party, and the geographic distance between the broker's and citizen'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 citizen's degree centrality, clustering coefficient, betweenness centrality, diffusion centrality, and eigenvector centrality.

We further address the concern that *hearing* is just one of many potentially correlated measures of the relative network position of brokers and citizens. We show robustness to controlling for other broker-citizen-level network measures, including indicators for each value of social proximity, the existence and the number of support pairs between a broker and a citizen, and whether a broker and a citizen have previously engaged in an informal non-political transaction. We add these controls both independently and jointly with all other controls. The robustness to controlling for these network measures highlights that *hearing* does not simply capture how close or accessible brokers and citizens are to each other.

To answer the second question, we measure how *hearing*, party registration, and reciprocity all differentially affect to whom brokers target their vote-buying transfers. To do so, we estimate the following dyad-level regression:

$$y_{ib} = \alpha + \beta_1 H_{ib} + \beta_2 R_i + \beta_3 P_{ib} + \beta_4 H_{ib} R_i + \beta_5 H_{ib} P_{ib} + \beta_6 R_i P_{ib} + \beta_7 H_{ib} R_i P_{ib} + \eta_b + \varepsilon_{ib}, \quad (3)$$

where R_i measures the citizen's level of reciprocity and P_{ib} measures whether the broker and citizen are not registered to the same political party as one another. In specifications in which we control for citizen fixed effects, we drop the separate control for citizen reciprocity. The model predicts that $\beta_7 > 0$, or that for citizens who are not registered to their party, brokers are most likely to target those who are reciprocal and about whom they can learn that personal information. The model also predicts that $\beta_4 = 0$. In other words, targeting decisions should not depend on the hearing and reciprocity levels of citizens registered to the same party as the broker. Unfortunately, we do not know whether citizens would turn out to vote in the absence of a transfer (i.e., whether they are voters or non-voters in the model's terminology) to test additional model implications.

Finally, to answer the third question, we use individual-level data to estimate regressions of the following form:

$$y_{iv} = \alpha + \beta B_{iv} + \gamma D_{iv} + \eta_v + \varepsilon_{iv}, \quad (4)$$

where y_{iv} are individual measures of centrality including degree centrality, betweenness centrality, eigenvector centrality, and diffusion centrality, all defined for citizen i in village v. The sample is all households in the village, whether or not we interviewed them. The most important outcome is diffusion centrality, the sum of the individual's *hearing* with all members of the village. A nice feature of diffusion centrality, as seen in the model in Section 3, is that one can separately calculate how much an individual hears from every individual who is registered to their own political party and how much they hear from every individual who is not. Thus, we consider as separate outcomes, diffusion centrality with those who are registered to the same party and those who are not. The main explanatory variable of interest, B_{iv}, measures whether the household contains a broker. We also control for village fixed effects and we control for D_{iv}, whether the household was directly surveyed (as opposed to our only knowing about their location in the social network through the reports of their fellow villagers). From this, we can test our prediction that parties recruit brokers who are more central than the average citizen, and are especially central with respect to citizens who are not registered to the same party as they are.

6 Results

We begin this section by showing that *hearing*, our measure of information diffusion between a broker and a citizen through their social networks, is robustly associated with whether the broker targets the citizen for vote buying (our primary outcome of interest) and whether the citizen claims to support the party of the broker just after the election. These results are robust to several potential identification and measurement concerns. We then provide evidence that what underlies these results is the diffusion of politically-relevant information from citizens to brokers through their social networks. Consistent with our theory, we find that brokers target citizens who are not registered to their party who they hear are more reciprocal, but that their targeting of citizens registered to their own party is unrelated to what they can hear about them through the network. Then, we rule out alternative explanations. We conclude with a descriptive analysis of the location of brokers within their social networks. Consistent with our model, we show that brokers are, on average, more centrally located within their networks than citizens, particularly among citizens who are not registered to the broker's party.

Effects of *hearing* on vote buying and party support

In Table 2, we report the association between *hearing* and an index that measures the targeting of vote buying by a broker to a citizen, as reported by the broker. This vote-buying index takes the sum of the indicators for whether the broker offered the citizen something during the electoral campaign and whether the broker approached the citizen to talk about the electoral campaign. It is standardized to have mean 0 and standard deviation 1. Column (1) includes only broker fixed effects, whereas column (2) additionally includes citizen 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.[22]

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.[23] These results suggest that the diffusion of information through social networks plays an important role in determining who brokers target with vote buying.

If social networks enable brokers to target citizens effectively, then the citizens 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 citizen fixed effects. We see that *hearing* is positively associated with the likelihood that the citizen 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 citizen supports the broker's party. While we lack data on which party citizens cast their ballots for, this result suggests that the vote buying mediated by the information-diffusion role of networks is effective at persuading citizens to support the broker's party.

Whether a broker targets a particular citizen might depend not only on how much he hears about the citizen, but also on how much any other brokers from his party hear about that citizen. In addition, it will depend on whether he expects the other brokers from his own party to target the citizen and whether he expects competing brokers to also target that same citizen. We explore this possibility of strategic interactions between brokers both of the same party and of different parties

[22]Appendix Table C1 shows that our results in Table 2 are robust to multiple hypothesis adjustments proposed by List et al. (2019).

[23]Appendix Tables B1 and B2 show no differential effects for incumbent party brokers or Colorado party brokers, respectively.

by assessing whether the *hearing* and the targeting of other brokers within the same village affects the targeting of a citizen.

Table 3 reports coefficients from regressions similar to those in column (2) of Table 2 but also controls for the standardized mean *hearing* of brokers from the same party, the standardized mean *hearing* of brokers from other parties, and their interactions with the broker's *hearing* in Panel A. In Panel B, more descriptively, we instead control for the standardized mean vote-buying targeting index of brokers from the same party, the standardized mean vote-buying targeting index of brokers from other parties, and their interactions with the broker's *hearing*.

The results in Panel A in Table 3 show that the *hearing* of brokers from the same party, but not that of brokers from other parties, is positively associated with the vote-buying index. This implies that brokers from the same party share information with one another, which helps in targeting, while brokers from opposing parties do not share information with one another. In contrast, the results in Panel B descriptively indicate that the mean targeting both of brokers from the same party and of brokers from other parties is negatively associated with a broker's own targeting of the same citizen. While brokers from the same party share information, which helps ensure vote-buying transfers are targeted to the right citizens, they also make sure not to duplicate their efforts and both make transfers to the same person. Brokers from opposing parties are even less likely to target the same citizens. This highlights a result from the model, about which we will also see more evidence later: brokers target many citizens registered to their own party rather indiscriminately and then must pick and choose more strategically which citizens who are not registered to their party to target. In column (2), when we interact these terms with *hearing*, we find that none of the coefficients on the interaction terms are statistically significant.

Identification concerns

While broker and citizen fixed effects deal with broker- and citizen-specific characteristics that might confound our estimates, there still remains the possibility that broker-citizen-specific factors are biasing our results. In particular, brokers might target citizens who share similar traits and, due to homophily, the similarity in traits might correlate with *hearing*. In column (1) of Table 4, we test the robustness of the results presented in column (2) of Table 2 to the addition of broker-citizen controls as described in detail in Section 5. These controls capture similarity in age, gender, party registration, geographic proximity, and network centrality. As we see in column (1), the addition of these broker-citizen controls leaves our original point estimate essentially unchanged, even though the R^2 increases by 20 percent.

Relatedly, it is worth noting that our social networks are not centered on party lines. Recall that we constructed these social networks based on non-political ties. In addition, we can 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 one of the two main parties in our village networks.[24] 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 0.112, 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).

The ability of brokers and citizens 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 indicators for each value of social proximity between the broker and citizen, the existence and the number of support pairs between the broker and citizen, and whether the broker and citizen 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

[24]Due to endogeneity concerns, we use official party registration, as opposed to reported party support. As a result, we compute the FSI only for the citizens who are officially registered to a party.

robust to the inclusion of all of these variables. In addition, none of these alternative network transaction measures predicts which citizens are targeted by which brokers even though in some cases they are highly correlated with *hearing*.[25] 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 ($p < 0.0001$). The results in Table 4 suggest that neither homophily, how close or accessible brokers and citizens are to each other, nor the transaction-enforcement role of networks are confounding our main findings.

Measurement concerns

We next address three measurement concerns. First, there is a possible concern that our results are driven by extreme values in the *hearing* measure. To deal with this concern, Figure 3 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 of *hearing*.

Second, we test whether our results are robust to our choice of T (the number of periods we allow for information originating from a citizen to circulate through the network) and p (the probability that nodes pass on information) used to compute *hearing*. Recall that we set T equal to 7, which is the largest social distance between a citizen and a broker in any village network in our sample and p to between 0.08 and 0.14, which is the inverse of the largest eigenvalue of the adjacency matrix for each village's social network. We conduct two complementary exercises to show that our results are not driven by the choice of T. In Panel A in Appendix Table B3, we set T equal to the maximum social distance between brokers and citizens 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 4a, we show how the effect of *hearing* in our main specification

[25]The robustness to controlling for whether the broker and citizen have engaged in an informal non-political financial transaction in the year surrounding the election further dismisses concerns about the endogeneity of the network to vote-buying exchanges.

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 $T = 10$. Similarly, to show that our results are not driven by the choice of p, in Figure 4b we show how the effect of *hearing* in our main specification varies as p goes from 0.05 to 0.50 at intervals of 0.05. The effect peaks at around $p = 0.10$, and remains significant from 0.05 to 0.50. Appendix Figure B2 summarizes the results of Figures 4a and 4b through a heat map, with lighter colors denoting larger coefficients. The coefficient is maximized at $T = 5$ and 10 and $p = 0.10$ and 0.15, which coincides with our choice of $T = 7$ and p between 0.08 and 0.14.

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.[26] In addition, our villages include some network information (either direct or indirect) for 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 Appendix Table B3 indicates that our estimates remain largely unchanged in terms of size and significance. A related concern is that the ties of some of the brokers in our sample (12 out of 32) were indirectly surveyed. Panel C of Appendix Table B3 shows robustness of our estimates to restricting the sample to broker-citizen observations involving brokers whose ties were directly surveyed.

Information diffusion and vote buying

Thus far, we have provided robust evidence that brokers target citizens about whom they are able to hear more information through their network. This finding raises two questions. First, do brokers

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

know more information about citizens with whom they have a higher value of *hearing*? Second, what type of (private) information matters for brokers' targeting decisions? While there are many characteristics about a citizen that a broker may want to learn, the model in Section 3 assumes that brokers rely on their network to learn about the reciprocity levels of the citizens, particularly among citizens who are not registered to their party.

Table 5 reports the effects of *hearing* on different measures of a broker's knowledge about each citizen. As previously discussed, we construct indices measuring brokers' knowledge of demographics, politically-relevant information, and social preferences.[27] We also construct an index that sums all three indices. In odd columns, we only include broker fixed effects, and in even columns, we also add citizen fixed effects.

The coefficient on *hearing* is significant, positive, and robust across all outcomes and specifications reported in Table 5. These results suggest that information diffusion from a citizen to a broker through their social network facilitates the broker's acquisition of information about citizens. A one standard deviation increase in *hearing* is associated with a 0.21 standard deviation increase in overall knowledge (column 2), a 0.17 standard deviation increase in knowledge of demographic characteristics (column 4), a 0.20 standard deviation increase in politically-relevant information (column 6), and a 0.14 standard deviation increase in knowledge about citizen social preferences (column 8).

Table 6 provides direct evidence that information flows explain how brokers choose which citizens to target. As we stated in Corollary 1, brokers are more likely to target opposition voters and non-voters who both are reciprocal and with whom they have higher *hearing*. Moreover, their targeting of incumbent non-voters is independent of the citizen's *hearing* and reciprocity. Brokers have access to voter rolls and know which citizens are registered to their party. On average, brokers target citizens registered to their party 62% of the time, and citizens not registered to their party

[27] In Appendix Table B4, we present results on the constituent components of the indices measuring brokers' knowledge about citizens. Appendix Table C2 also shows how these results are robust to multiple hypothesis adjustments.

the other 38% of the time. Among citizens not registered to their party, brokers strategically target reciprocal citizens who will return the favor. To know who is reciprocal, the broker needs to hear about the citizen through his social network. We test these predictions by including the double and triple interactions of *hearing*, voter reciprocity, and whether the voter is registered to the broker's party as in equation (3).

Columns (1) and (2) of Table 6 replicate the same columns in Table 2 but for the smaller sample of broker-citizen pairs for which we have the experimental measure of citizen reciprocity. Columns (3) and (4) add this measure of citizen reciprocity, along with its interaction with *hearing*. In columns (5) and (6), we instead add an indicator for whether the citizen is not registered to the broker's party as well as its interaction with *hearing*. Citizens usually register for a party at the same time that they first register to vote and do not often change official party registration, which lessens concerns that party registration is endogenous. Lastly, columns (7) and (8) add the triple interaction.

Our findings in columns (3) and (4) suggest that, on average, brokers target citizens that they learn through the network are more reciprocal. In other words, it is not enough for a citizen to simply be reciprocal to be targeted. A reciprocal citizen must be connected to a broker in such a way that the broker hears about the citizen's reciprocity. Results in columns (5) and (6) further support the fact that information about citizens' party affiliation is publicly known. In other words, information diffusion through the network is not necessary for brokers to learn about citizens' party registration. Brokers are more likely to target citizens registered to their party no matter what they hear about them through the network.

We then look at the joint effects of citizen reciprocity and party registration. We interpret the positive coefficient on the triple interaction in columns (7) and (8) as indicating that the targeting of reciprocal citizens is concentrated among citizens not registered to the broker's party, but about whom the brokers can learn the citizen's reciprocity level.[28] Also consistent with the model, the

[28]Results are qualitatively similar if the outcomes are whether the broker reported offering something to the citizen

interaction between *hearing* and reciprocity does not predict the targeting of citizen's registered to the broker's party. Overall, these findings suggest that brokers leverage the information diffused through their social network to guide their targeting in a way that is consistent with our theory.

Table 7 follows the same structure of Table 6, but uses as an outcome an indicator for whether the citizen 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 citizens to brokers is effective at persuading targeted citizens to vote for the broker's party. Lastly, to further dismiss endogeneity concerns, Appendix Table B5 follows the same structure of Table 6, but uses as an outcome an indicator for whether a non-political informal transaction took place between the broker's and citizen's households in the year surrounding the election. In contrast to the result in Table 6, while *hearing* is naturally also associated with non-political transactions, its association is not mediated by either citizen reciprocity or party registration.

Alternative interpretation

In this section, we rule out the alternative interpretation that our results are driven by brokers targeting citizens who are good at transmitting information to other citizens and persuading them to vote for specific candidates. Specifically, the concern is that better-connected citizens might also be able to persuade more citizens in the village. While controlling for citizen fixed effects largely deals with this concern, columns (1) to (4) in Table 8 sequentially add the interaction of *hearing* with citizen eigenvector centrality, betweenness centrality, degree, and diffusion centrality (the sum of an individual's *hearing* with all other individuals). These variables capture the ability of a citizen to spread information. The coefficients on these interaction terms are always negative, small in magnitude, and usually not statistically significant, further dismissing the idea that brokers are differentially targeting more well-connected citizens in an attempt to purchase persuasion.

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and whether the broker reported approaching the citizen.

Broker selection within village networks

As the model in Section 3 highlights, parties have an incentive to select brokers who are, on average, more centrally located within their networks. Figure 5 plots kernel density estimates of standardized degree centrality, betweenness centrality, eigenvector centrality, and diffusion centrality for broker households (32 observations) and citizen households (1,000 observations). In each plot, the density for brokers lies clearly to the right of that of the citizens.

In Table 9, we refine this analysis by regressing the network measures of centrality on an indicator for whether a household contains a broker as well as village fixed effects.[29] In columns (1) to (4), 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 columns (5) and (6), we focus on the households for which we have party registration data and recalculate the diffusion centrality among the copartisans and non-copartisans of each household.[30] In Panel A, we consider overall standardized centrality measures as outcomes,[31] while in Panel B we consider the within-village percentile of each centrality measure to provide a better sense of the magnitude of the differences in centrality.

Results in columns (1)-(4) of 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 columns (1)-(4) of 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.[32]

[29]Appendix Table C3 shows that the results in Table 9 are robust to multiple hypothesis adjustments.

[30]We do not distinguish between copartisans and non-copartisans for eigenvector centrality or betweenness because these are network-level structures. In contrast, diffusion centrality and degree centrality are measures that sum over relationships with different types of people and thus can be split. To economize on space, we only report the effects on diffusion centrality, as it is the sum of *hearing*.

[31]Appendix Table B6 presents the summary statistics for the non-standardized centrality measures for all households, whether or not they were interviewed.

[32]These results are consistent with Ravanilla et al. (2021), who find that brokers in the Philippines exhibit higher

In columns (5) and (6), we see that brokers' diffusion centrality is only significantly higher among citizens not registered to their party. Brokers do not have higher *hearing* with copartisans than does the average citizen. This is consistent with the narrative in Section 2, the model's predictions, and the previous results in this section. Brokers have an incentive to target non-copartisans who they believe to be reciprocal. If brokers hear this information about citizens through their social networks, then parties will select brokers who have high *hearing* with non-copartisans.[33] These results suggest that political parties recruit brokers with high diffusion centrality, particularly among non-copartisans.

7 Conclusion

Vote buying is pervasive throughout the developing world, and political brokers are key intermediaries in this exchange. We use data on village networks and vote-buying to show that both the amount and content of the information a political broker hears about a citizen through the social network predicts whether the broker tries to buy the citizen's vote. We also show that the more information a broker hears about a citizen, the more the broker learns politically-relevant information about her, including her political leanings and even social preferences. Importantly, our results indicate that brokers' targeting decisions depend not only on how much information they hear, but also on the content of that information. Only among the citizens 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. In this context, in which party registration and turnout are observable, brokers target citizens registered to their party irrespective of their reciprocity levels and what they can hear about them through the network. Lastly, we show that this results in parties recruiting

than average betweenness centrality compared to a random sample of villagers. In results not shown here, we find that centrality measures are similar for brokers of the two main parties.

[33]There is no significant correlation between brokers' years of experience and brokers' diffusion centrality. There is also no significant correlation between the citizens' partisanship and diffusion centrality.

brokers who have high diffusion centrality among non-copartisans.

Overall, our results highlight how the diffusion of information through social networks can help 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. However, 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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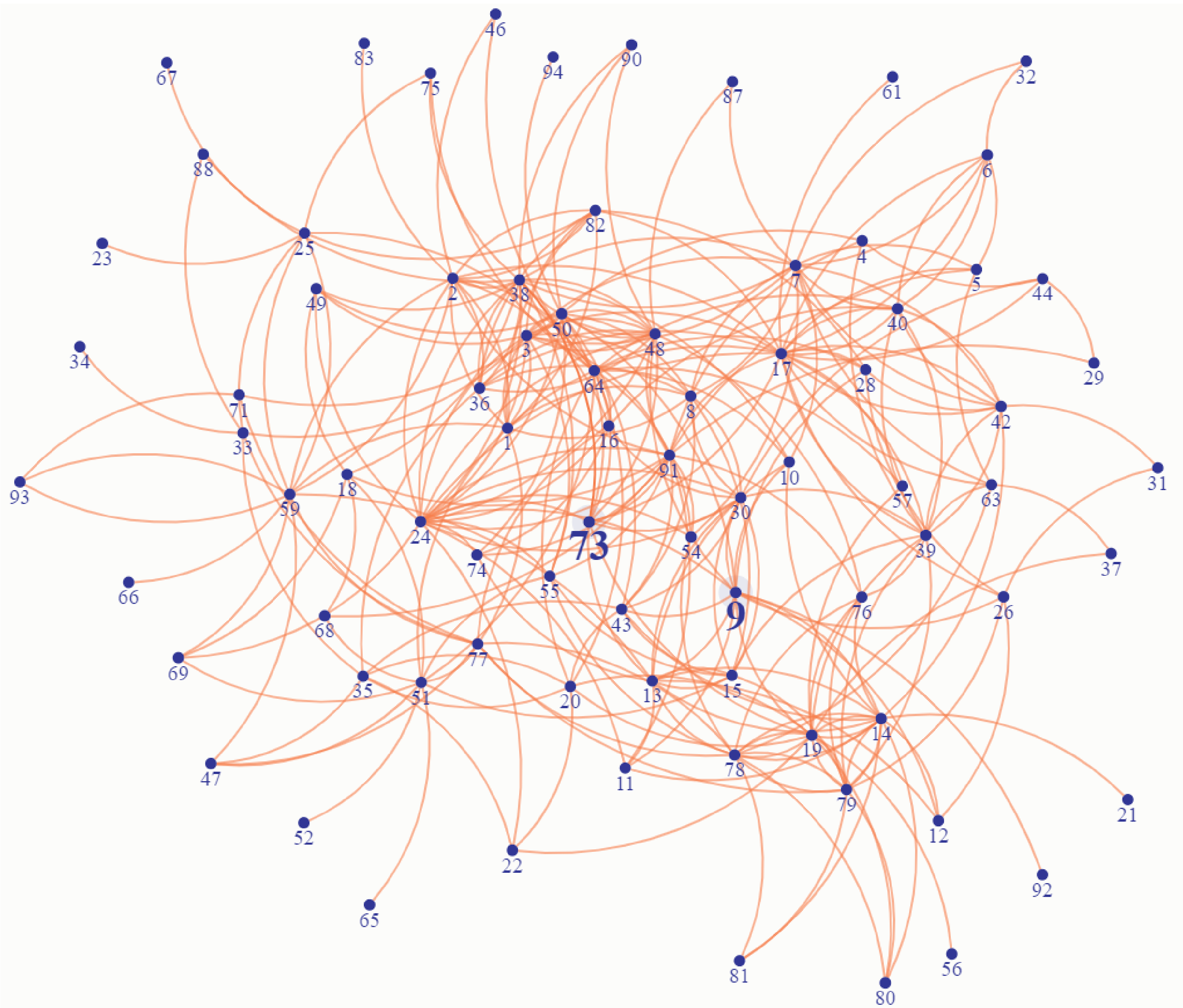
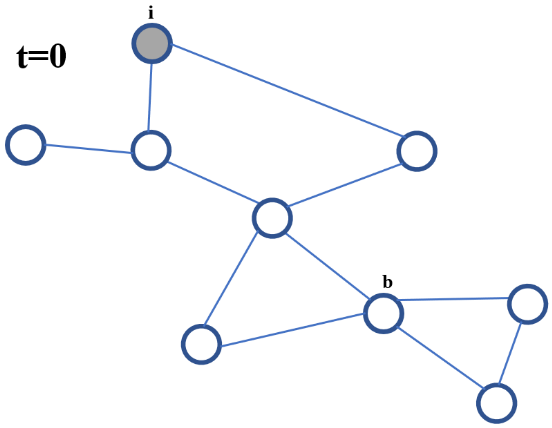
Tables and Figures

Figure 1: Social network mapping of households in one village

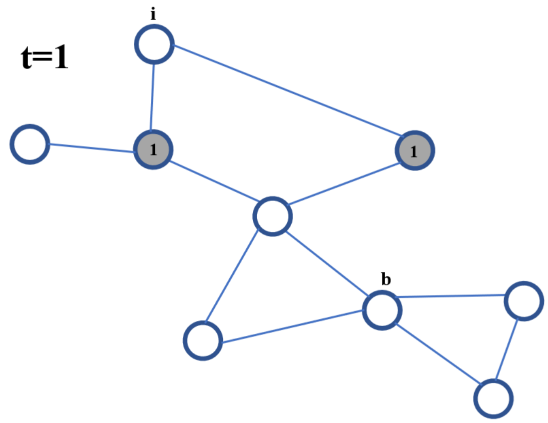


Notes: The graph represents the social network in one of the villages in our sample. It shows all connections between households (brokers and citizens) directly or indirectly sampled within the village. The two brokers live in households 9 and 73, which are labeled in larger and bold font.

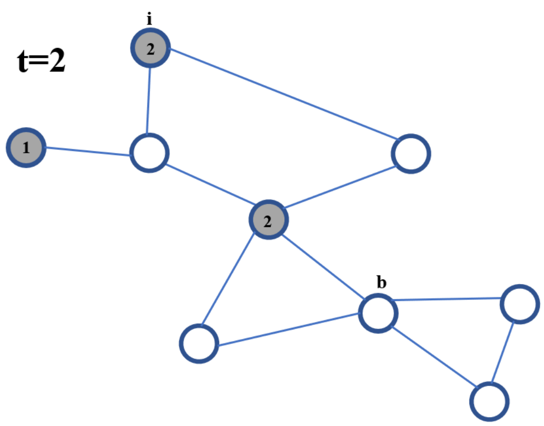
Figure 2: Illustration of the computation of *hearing* between citizen i and broker b



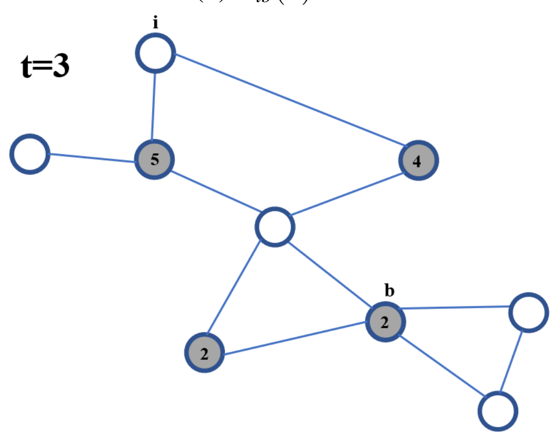
(a) $H_{ib}(0) = 0$



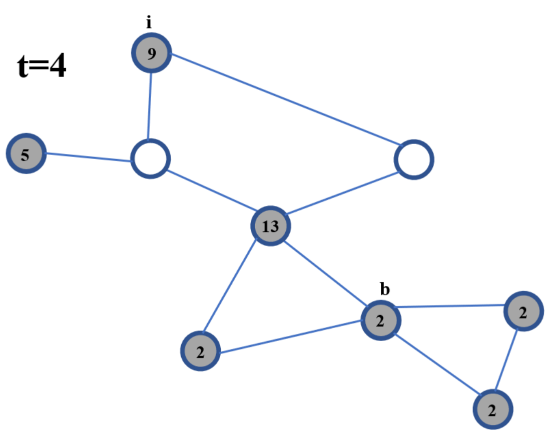
(b) $H_{ib}(1) = 0$



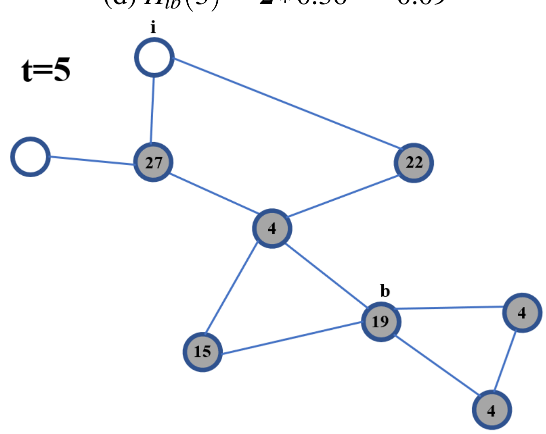
(c) $H_{ib}(2) = 0$



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



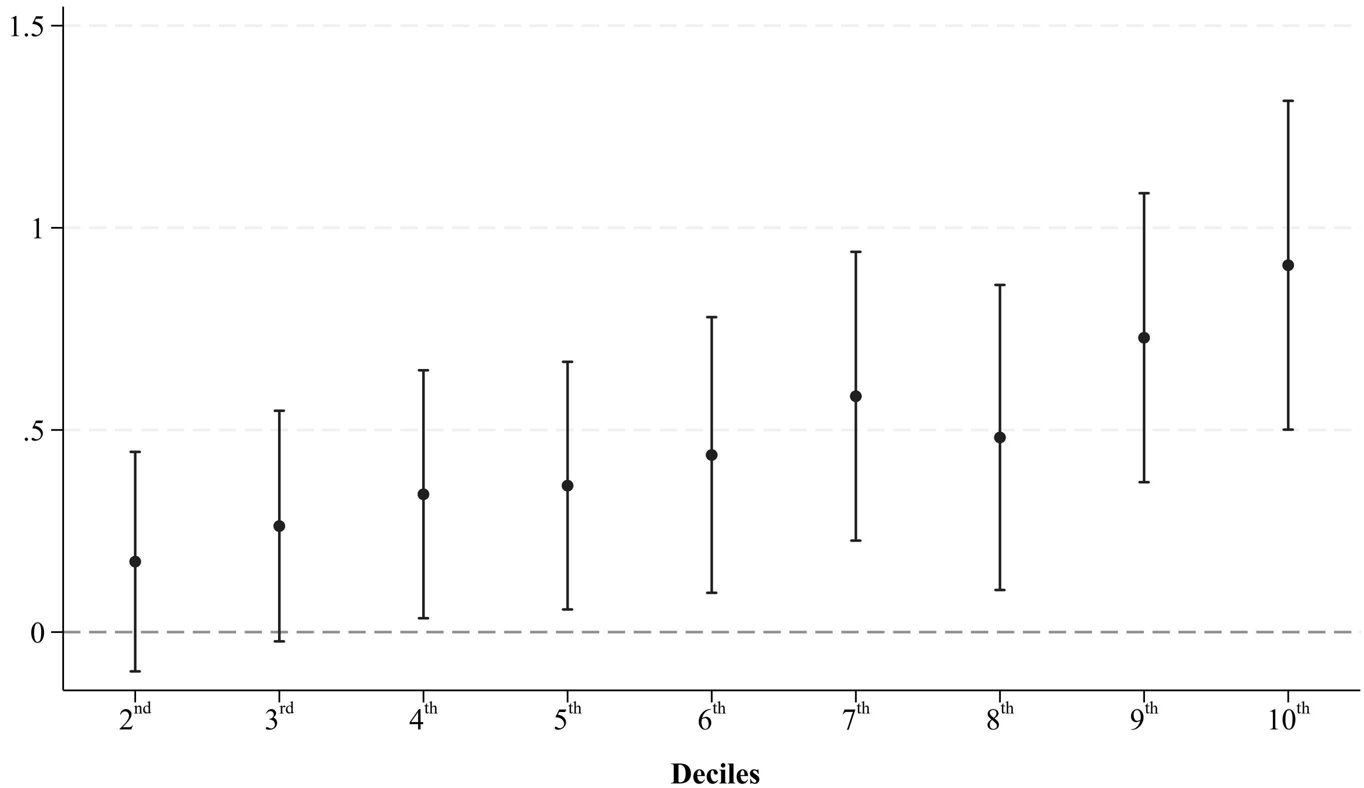
(e) $H_{ib}(4) = \mathbf{2} * 0.36^3 + \mathbf{2} * 0.36^4 = 0.12$



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

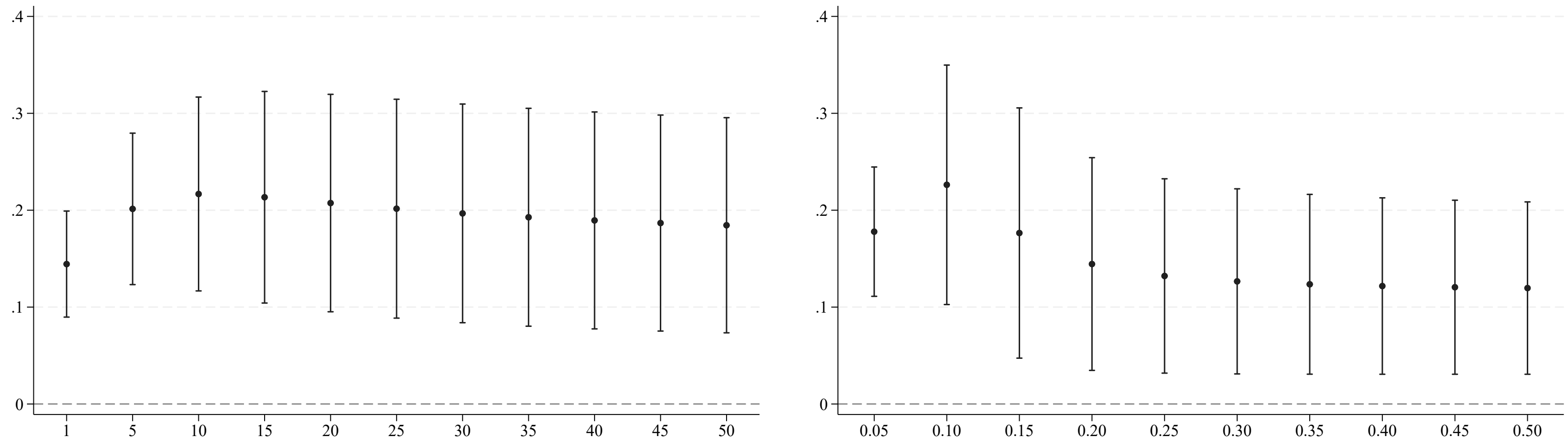
Notes: The caption in each subfigure shows the computation of *hearing* between citizen i and broker b for each period t. We consider p to be the inverse of the largest eigenvalue of the adjacency matrix, 2.8 (i.e., $p = 1/2.8 = 0.36$). The numbers in the nodes colored in gray indicate the maximum number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

Figure 3: Effects of *hearing* deciles on vote-buying targeting (with 95% confidence intervals)



Notes: Estimates are from one regression with a specification equivalent to the one in column (1) of Table 2, with the exception that we include indicators for each of the *hearing* deciles as regressors, as opposed to the continuous measure of *hearing*. The baseline (omitted) group is the first decile. Standard errors are computed using two-way clustering at the broker and citizen levels.

Figure 4: Effects of *hearing* by choice of T and p (with 95% confidence intervals)

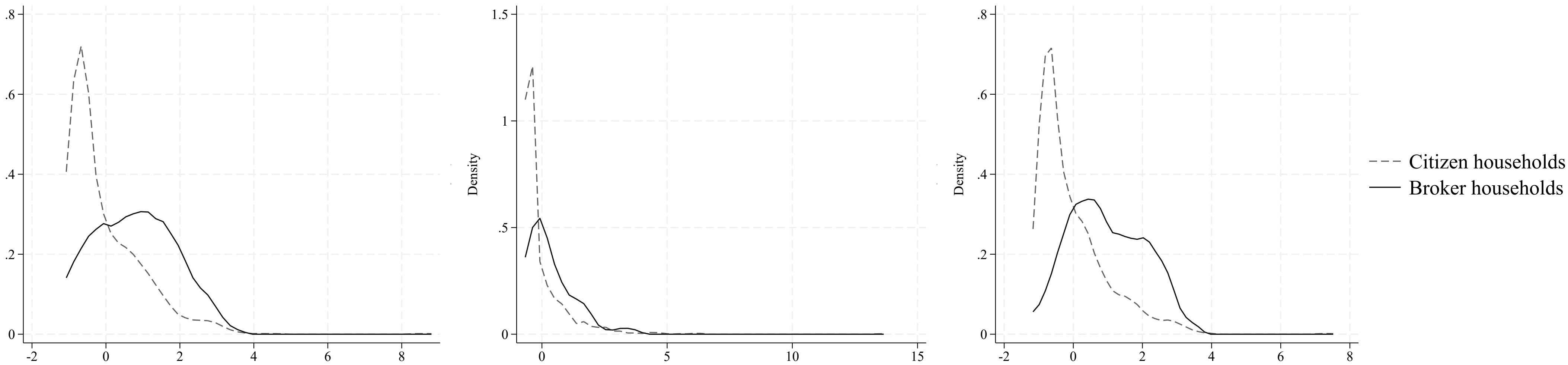


(a) Choice of T

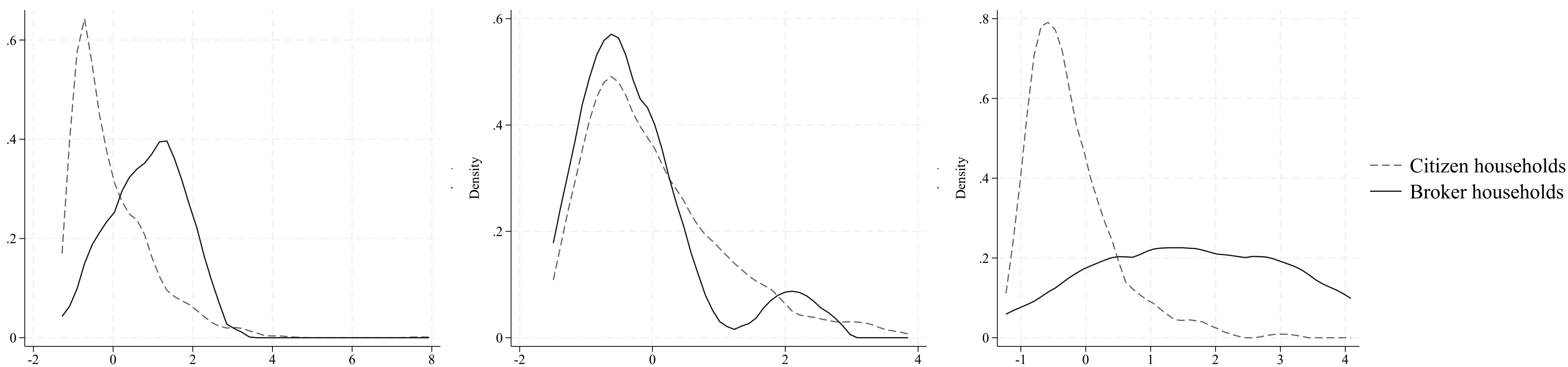
(b) Choice of p

Notes: Estimates in Panel (a) are from eleven regressions with a specification equivalent to the one in column (1) of Table 2, with the exception that the T varies from 1 to 50 at intervals of 5 periods. Estimates in Panel (b) are from ten regressions with a specification equivalent to the one in column (1) of Table 2, with the exception that the p varies from 0.05 to 0.50 at intervals of 0.05. Standard errors are computed using two-way clustering at the broker and citizen levels.

Figure 5: Kernel density estimates of household centrality measures



(a) Degree Centrality (b) Betweenness Centrality (c) Eigenvector Centrality



(d) Diffusion Centrality (e) Diffusion Centrality among copartisans (f) Diffusion Centrality among non-copartisans

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

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
Citizen's degree centrality	295	8.875	4.508
Citizen's clustering coefficient	295	0.255	0.190
Citizen's betweenness centrality	295	0.044	0.049
Citizen's eigenvector centrality	295	0.122	0.082
Citizen's diffusion centrality	295	8.742	5.302
Citizen's diffusion centrality among copartisans	245	3.093	2.536
Citizen's diffusion centrality among non-copartisans	245	2.556	2.476
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 eigenvector centrality	932	0.081	0.061
Absolute difference in diffusion centrality	932	5.456	4.279
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	85	0.044	0.076
Not registered to the broker's party	932	0.568	0.496
Additional Controls			
Absolute age difference	932	16	12
Broker and citizen have the same gender	932	0.580	0.494
Distance in kilometers between the broker's and citizen's residences	932	1.409	0.901
Outcome Measures			
Vote-buying Measures			
Citizen supports the broker's party	932	0.461	0.499
Components of the vote-buying targeting index:			
Broker approached citizen during electoral campaign	932	0.477	0.500
Broker offered citizen something	932	0.273	0.446
Knowledge Measures			
Components of the covariates index:			
Broker knows citizen	932	0.887	0.316
Broker knows citizen's spouse	932	0.773	0.419
Broker knows citizen's years of education	932	0.807	0.395
Broker knows citizen's amount of land	932	0.421	0.494
Components of the political index:			
Broker knows strength of citizen's party preference	932	0.593	0.491
Components of the social preferences index:			
Broker knows the frequency with which citizen would retaliate	932	0.586	0.493
Broker knows whether the citizen generally trusts others in the village	932	0.656	0.475

Table 2: Effect of *hearing* on vote-buying targeting

	Vote-buying targeting index		Broker offered citizen	Broker approached citizen	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)	(0.0388)
Mean of Dependent Variable	-0.0000	-0.0000	0.2725	0.4775	0.4614
Broker FE	X	X	X	X	X
Citizen 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 citizen something during the electoral campaign and whether the broker approached the citizen to talk about the electoral campaign. "Support the same party" is an indicator that the citizen claims to support the broker's party shortly after the election. *Hearing* is standardized. Standard errors use two-way clustering at the broker and citizen levels.

Table 3: Effect of *hearing* on vote-buying targeting, by other party and same party *hearing* and targeting

	Vote-buying targeting index	
	(1)	(2)
Panel A: Mean *hearing*		
Hearing	0.4149***	0.4717***
	(0.1036)	(0.1381)
Mean same-party brokers' *hearing*	0.1499*	0.2348*
	(0.0748)	(0.1171)
Hearing × Mean same-party brokers' *hearing*		-0.0264
		(0.0405)
Mean other-party brokers' *hearing*	0.0606	0.2305
	(0.1291)	(0.2445)
Hearing × Mean other-party brokers' *hearing*		0.0162
		(0.0360)
Mean of Dependent Variable	-0.0000	-0.0000
Observations	932	932
R^2	0.6218	0.6234
Panel B: Mean targeting		
Hearing	0.0642**	0.0751**
	(0.0252)	(0.0301)
Mean same-party brokers' targeting	-0.6736***	-0.6776***
	(0.0660)	(0.0638)
Hearing × Mean same-party brokers' targeting		0.0396
		(0.0254)
Mean other-party brokers' targeting	-1.2420***	-1.2466***
	(0.0777)	(0.0771)
Hearing × Mean other-party brokers' targeting		0.0354
		(0.0239)
Mean of Dependent Variable	-0.0000	-0.0000
Broker FE	X	X
Citizen FE	X	X
Observations	932	932
R^2	0.9268	0.9291

Notes: All specifications include broker and citizen fixed effects. The vote-buying targeting index is a standardized index that takes the sum of indicators for whether the broker offered the citizen something during the electoral campaign and whether the broker approached the citizen to talk about the electoral campaign. *Hearing* is standardized. "Mean same-party brokers' *hearing* (targeting)" represents the standardized average value of *hearing* (the vote-buying targeting index) of other brokers from the same party with the same citizen. "Mean other-party brokers' *hearing* (targeting)" represents the standardized average value of *hearing* (the vote-buying targeting index) of brokers from another party with the same citizen. In cases when there is no data on same-party or other-party brokers either because there is no such broker or we don't have their data, we set mean *hearing* and targeting to zero and include indicators for those cases (as well as the indicators interacted with *hearing* in column (2)) as controls. Standard errors use two-way clustering at the broker and citizen levels.

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	0.3127***	0.2590*	0.3456***	0.3709***	0.3208***	0.3191*
	(0.0757)	(0.1298)	(0.0586)	(0.0767)	(0.0568)	(0.1824)
Existence of a support pair			-0.0989			
			(0.1086)			
Previous transaction					0.0048	-0.2251
					(0.1345)	(0.1490)
Mean of Dependent Variable	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
Broker FE	X	X	X	X	X	X
Citizen FE	X	X	X	X	X	X
Broker-Citizen Controls	X					X
Social Proximity Controls		X				X
Support Pair Controls				X		X
Observations	932	932	932	932	932	932
R^2	0.7335	0.6168	0.6136	0.6195	0.6129	0.7470

Notes: All specifications include broker and citizen fixed effects. The dependent variable is a standardized index that takes the sum of indicators for whether the broker offered the citizen something during the electoral campaign and whether the broker approached the citizen to talk about the electoral campaign. Columns (1) and (6) control for the following variables at the broker-citizen level: a) an indicator for the broker and citizen having the same gender; b) indicators for the citizen being registered to the broker's party; c) standardized geographical distance between the broker's and citizen's residences; d) standardized absolute difference in age, degree centrality, clustering coefficient, betweenness centrality, diffusion centrality, and eigenvector centrality; and e) broker fixed effects interacted with citizen's degree centrality, clustering coefficient, betweenness centrality, diffusion centrality, and eigenvector centrality. Social proximity controls include indicators for each value of social proximity. Support pair controls include indicators for each value of the number of support pairs. The coefficient for the existence of a support pair is absorbed by the support pair controls on Column (6). All network measures (except the indicator variables) are standardized. Standard errors use two-way clustering at the broker and citizen levels.

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

	Overall knowledge index		Covariates index		Political index		Social preferences index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hearing	0.2864***	0.2111***	0.2692***	0.1703***	0.1954***	0.1975***	0.1621***	0.1401***
	(0.0416)	(0.0355)	(0.0425)	(0.0411)	(0.0541)	(0.0714)	(0.0500)	(0.0442)
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
Citizen FE		X		X		X		X
Observations	932	932	932	932	932	932	932	932
R^2	0.1546	0.6395	0.1737	0.6237	0.1308	0.5362	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 citizen in three categories. The covariates index aggregates indicators for whether the broker knows the citizen, whether the broker knows the citizen's spouse's name, whether the broker knows how much land the citizen owns, and whether the broker knows the citizen's years of education. The political index corresponds to an indicator for whether the broker knows the strength of the citizen's party preference. The social preferences index aggregates indicators for whether the broker knows whether the citizen generally trusts others in the village, and whether the broker knows the frequency with which the citizen 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 citizen levels.

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	0.2275***	0.2757***	0.2283***	0.2643**	0.1179*	0.1221	0.1135*	0.1497*
	(0.0597)	(0.0985)	(0.0550)	(0.1059)	(0.0662)	(0.0860)	(0.0611)	(0.0797)
Experimental reciprocity			-0.0595				0.1300	
			(0.0659)				(0.1462)	
Not reg. to broker's party					-0.6944***	-0.8182***	-0.7192***	-0.8451***
					(0.1314)	(0.1735)	(0.1410)	(0.1809)
Experimental reciprocity × *Hearing*			0.1346**	0.1243			-0.0623	-0.0549
			(0.0653)	(0.1417)			(0.0854)	(0.1321)
Experimental reciprocity × Not reg. to broker's party							-0.1707	-0.2424
							(0.1710)	(0.2283)
Not reg. to broker's party × *Hearing*					0.0949	0.0286	0.1028	0.0558
					(0.0972)	(0.1326)	(0.0925)	(0.1303)
Not reg. to broker's party × *Hearing* × Experimental reciprocity							0.2674**	0.2775*
							(0.1089)	(0.1531)
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
Citizen FE		X		X		X		X
Observations	271	271	271	271	271	271	271	271
R^2	0.4839	0.6253	0.5002	0.6310	0.5769	0.6984	0.5995	0.7153

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 citizen something during the electoral campaign and whether the broker approached the citizen to talk about the electoral campaign. "Not reg. to broker's party" indicates the citizen is not officially registered to 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 citizen fixed effects. *Hearing* and experimental reciprocity are standardized. Standard errors use two-way clustering at the broker and citizen levels.

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

	Support same party							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hearing	0.1290***	0.1779**	0.1323***	0.1737**	0.0493	0.0413	0.0408	0.0505
	(0.0349)	(0.0695)	(0.0330)	(0.0714)	(0.0406)	(0.0516)	(0.0362)	(0.0520)
Experimental reciprocity			-0.0620				0.0770**	
			(0.0398)				(0.0357)	
Not reg. to broker's party					-0.6324***	-0.8742***	-0.6405***	-0.8824***
					(0.0712)	(0.0732)	(0.0719)	(0.0715)
Experimental reciprocity × *Hearing*			0.0681*	0.0453			-0.0192	-0.0175
			(0.0359)	(0.0544)			(0.0206)	(0.0165)
Experimental reciprocity × Not reg. to broker's party							-0.1163**	-0.0627
							(0.0497)	(0.0549)
Not reg. to broker's party × *Hearing*					0.0444	-0.0459	0.0514	-0.0389
					(0.0556)	(0.0608)	(0.0546)	(0.0589)
Not reg. to broker's party × *Hearing* × Experimental reciprocity							0.0817*	0.0871***
							(0.0447)	(0.0314)
Mean of Dependent Variable	0.4280	0.4280	0.4280	0.4280	0.4280	0.4280	0.4280	0.4280
Broker FE	X	X	X	X	X	X	X	X
Citizen FE		X		X		X		X
Observations	271	271	271	271	271	271	271	271
R^2	0.2408	0.4464	0.2645	0.4495	0.5482	0.7773	0.5617	0.7835

Notes: All specifications include broker fixed effects. The dependent variable is is an indicator that the citizen claims to support the broker's party shortly after the election. "Not reg. to broker's party" indicates the citizen is not officially registered to 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 citizen fixed effects. *Hearing* and experimental reciprocity are standardized. Standard errors use two-way clustering at the broker and citizen levels.

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

	Vote-buying targeting index			
	(1)	(2)	(3)	(4)
Hearing	0.3569***	0.3598***	0.3353***	0.3324***
	(0.0622)	(0.0729)	(0.0701)	(0.0557)
Citizen's degree centrality × *Hearing*	-0.0696**			
	(0.0311)			
Citizen's diffusion centrality (with $T = 10$) × *Hearing*		-0.0563		
		(0.0409)		
Citizen's eigenvector centrality × *Hearing*			-0.0237	
			(0.0466)	
Citizen's betweenness centrality × *Hearing*				-0.0514*
				(0.0258)
Mean of Dependent Variable	-0.0000	-0.0000	-0.0000	-0.0000
Broker FE	X	X	X	X
Citizen 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 citizen fixed effects. The dependent variable is a standardized index that takes the sum of indicators for whether the broker offered the citizen something during the electoral campaign and whether the broker approached the citizen to talk about the electoral campaign. The coefficients for citizen's degree centrality, eigenvector centrality, and diffusion centrality are absorbed by the citizen fixed effects. Network measures are standardized. Standard errors use two-way clustering at the broker and citizen levels.

Table 9: Brokers' differential relative position within their village social network

	Degree centrality	Betweenness centrality	Eigenvector centrality	Diffusion centrality: Overall	Diffusion centrality: Among copartisans	Diffusion centrality: Among non-copartisans
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Overall standardized centrality measures						
Broker	0.3844***	0.1046	0.6021***	0.5739***	-0.1868	2.1281***
	(0.1233)	(0.1538)	(0.1428)	(0.1457)	(0.1740)	(0.1644)
Mean of Dependent Variable	-0.0000	0.0000	0.0000	-0.0000	-0.0000	0.0000
Village FE	X	X	X	X	X	X
Directly surveyed FE	X	X	X	X	X	X
Observations	1,032	1,032	1,032	1,032	245	245
R^2	0.5406	0.2850	0.3840	0.3581	0.5096	0.5618

	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: Within-village percentiles of centrality measures						
Broker	13.4666***	7.8281**	21.4197***	19.8667***	-3.2361	39.9104***
	(3.5972)	(3.6530)	(4.6490)	(4.4525)	(7.1397)	(6.5212)
Mean of Dependent Variable	50.0964	50.0160	49.9884	49.9816	48.6286	48.6286
Village FE	X	X	X	X	X	X
Directly surveyed FE	X	X	X	X	X	X
Observations	1,032	1,032	1,032	1,032	245	245
R^2	0.4998	0.4722	0.2173	0.2827	0.0090	0.1733

Notes: Sample for columns (1) to (4) includes all households directly and indirectly sampled. Columns (5) and (6) include all households for which we have party registration data. Column (4) presents diffusion centrality (the sum of *hearing*) across all households, column (5) presents diffusion centrality only among copartisans of the household, and column (6) presents diffusion centrality only among non-copartisans of the household. All specifications include village fixed effects and control for whether the household was surveyed directly about their network ties. Copartisanship is determined by whether citizens were registered to the same party. 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.

For Online Publication

A Variable Construction

A.1 Variables using broker and citizen responses

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

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

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

Broker knows the strength of the citizen's party preference: an indicator that the broker is accurate when stating the strength of the citizen's party preference. The brokers were asked to indicate where they would situate citizens 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 citizen stated after the election 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 assigns the same value to the citizen's feelings toward both parties and the citizen states after the 2006 election that he supports another party (UNACE or Patria Querida) or no party, we also indicate this as accurate. Note that this is different from official party registration, which is publicly available information to which brokers have access.

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

Broker knows if citizen generally trusts others in the village: an indicator that the broker accurately knows if the citizen would trust at least half of those in their village. Citizens were asked what share of their village-mates they trust from 1 (nobody), to 3 (half), to 5 (everyone). The indicator captures whether the broker accurately knew if the citizen would trust at least half of those in their village.

Absolute age difference: the absolute value of the difference between the broker's and the citizen's ages.

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

Geographical distance between broker's and citizen's residences: geographical distance in kilometers between the broker's and citizen's residences.

A.2 Variables only using broker responses

Broker knows citizen: an indicator variable that the broker states that he knows the citizen.

Broker offered the citizen something: an indicator that the broker states his candidate or his campaign offered the citizen at least one of the following: food, medicines, paying their bills, free plowing of land, or money during the electoral campaign.

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

A.3 Variables only using citizen responses

Citizen supports the broker's party: an indicator that, in 2007 a few months after the 2006 elections, the citizen states he supports the party that the broker works for.

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

Experimental reciprocity: a measure of reciprocity computed using data from individual trust games played with citizens in 2002 as described in Finan and Schechter (2012) and as described in Section 4.

A.4 Network variables

***Hearing*:** the expected number of times that a broker b hears a piece of information originating from a citizen i if information is diffused with probability p 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 citizen and any broker in all the village networks in our sample, and p equal to the inverse of the largest eigenvalue of the adjacency matrix representing the social network in each village.

Diffusion centrality: the sum of *hearing*. That is, the sum of the number of times that an individual would expect to hear pieces of information originating from each of the 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 citizen, 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 citizen share a common friend. Jackson et al. (2012) propose support as a measure of enforcement ability.

Number of support pairs: the number of shared friends in common between a broker and a citizen.

Previous transaction: an indicator for whether one of the following non-political informal transactions took place between the broker's and citizen'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.

Degree centrality: the number of individuals to which a broker/citizen is directly connected.

Betweenness centrality: the proportion of shortest paths between any two individuals that pass through the broker/citizen.

Eigenvector centrality: a recursively defined measure such that the centrality of a broker/citizen is proportional to the centrality of the individuals to which the broker/citizen is directly connected.

Clustering coefficient: the number of actual connections between the nodes within a broker/citizen'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 citizen.

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

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

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

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

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: Indifference curve between targeting an incumbent non-voter i with c_i and an opposition voter j with $\widehat{\phi}_{jb}$ for $\rho = 1$

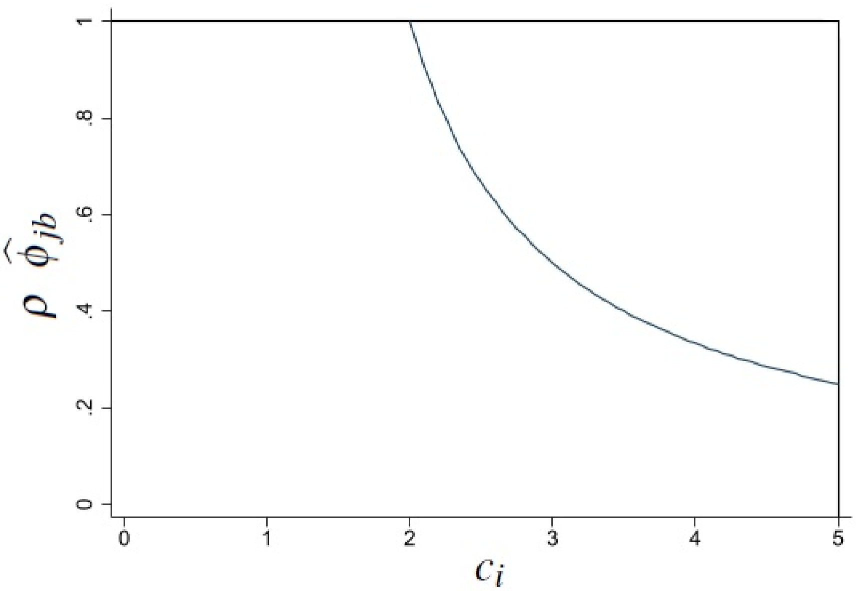
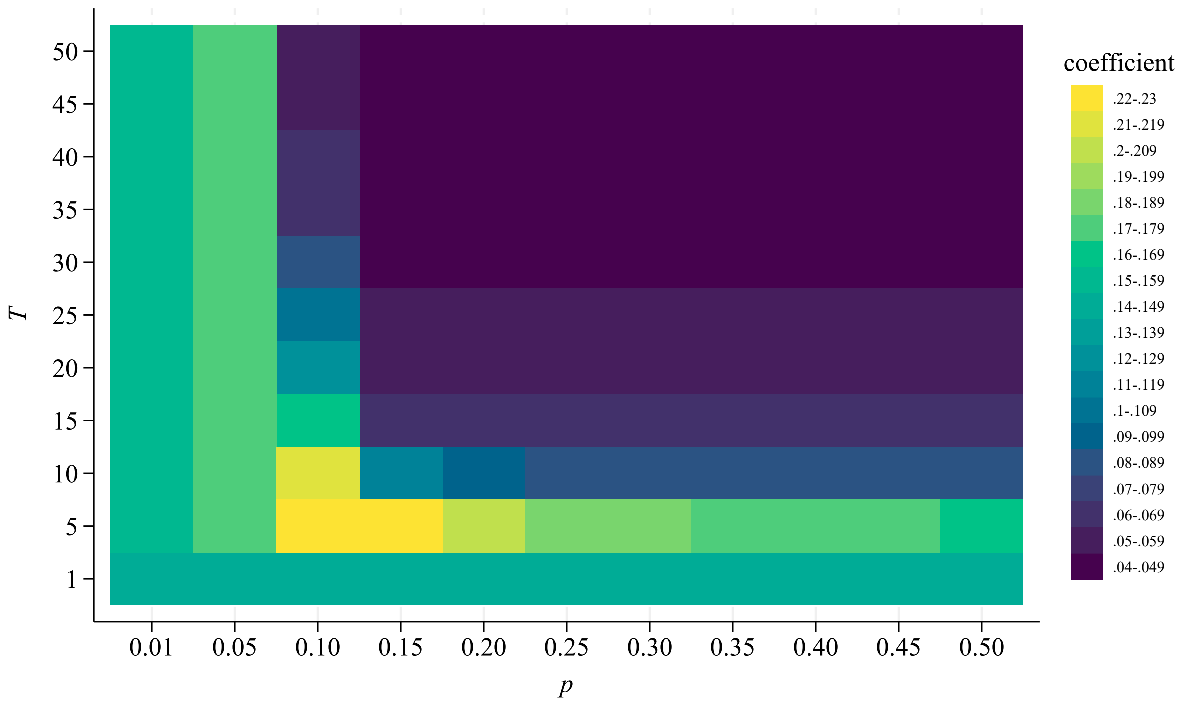


Figure B2: Heat map of *hearing* coefficient magnitude by choice of T and p



Notes: Lighter colors denote larger coefficients.

Table B1: Effect of *hearing* on incumbent vote-buying targeting and brokers' knowledge for incumbent and opposition party brokers

	Vote-buying targeting index (1)	Overall knowledge index (2)
Hearing	0.2774***	0.2241***
	(0.0621)	(0.0516)
Incumbent broker × *Hearing*	0.0693	-0.0205
	(0.0524)	(0.0540)
Mean of Dependent Variable	-0.0000	-0.0000
Broker FE	X	X
Citizen FE	X	X
Observations	932	932
R^2	0.6135	0.6396

Notes: All specifications include broker and citizen fixed effects. The indicator for incumbent broker is absorbed by the broker fixed effects. Incumbent brokers are those working for the municipal mayor's party, while opposition brokers are those not working for the municipal mayor's party. The vote-buying targeting index is a standardized sum of indicators for whether the broker offered the citizen something during the electoral campaign and whether the broker approached the citizen to talk about the electoral campaign. The overall knowledge index is a standardized index that aggregates what the broker knows about the citizen in three categories: covariates, political, and social preferences. *Hearing* is standardized. Standard errors use two-way clustering at the broker and citizen levels.

Table B2: Effect of *hearing* on incumbent vote-buying targeting and brokers' knowledge for Colorado and other party brokers

	Vote-buying targeting index (1)	Overall knowledge index (2)
Hearing	0.3047***	0.1877***
	(0.0722)	(0.0386)
Colorado broker × *Hearing*	0.0311	0.0432
	(0.0568)	(0.0506)
Mean of Dependent Variable	-0.0000	-0.0000
Broker FE	X	X
Citizen FE	X	X
Observations	932	932
R^2	0.6130	0.6397

Notes: All specifications include broker and citizen fixed effects. The indicator for Colorado broker is absorbed by the broker fixed effects. The vote-buying targeting index is a standardized sum of indicators for whether the broker offered the citizen something during the electoral campaign and whether the broker approached the citizen to talk about the electoral campaign. The overall knowledge index is a standardized index that aggregates what the broker knows about the citizen in three categories: covariates, political, and social preferences. *Hearing* is standardized. Standard errors use two-way clustering at the broker and citizen levels.

Table B3: Effect of *hearing* with T set to the maximum broker-citizen social distance for each village, after dropping villages with lowest sampling rates, or restricting to broker observations with direct network data

	Vote-buying targeting index (1)	Overall knowledge index (2)
Panel A: T set to the maximum broker-citizen social distance for each village		
Hearing (set to village max. broker-citizen social distance)	0.2379***	0.1459***
	(0.0449)	(0.0259)
Mean of Dependent Variable	-0.0000	-0.0000
Broker FE	X	X
Citizen FE	X	X
Observations	932	932
R^2	0.6129	0.6384

	(1)	(2)
Panel B: Dropping villages with lowest sampling rates		
Hearing	0.4093***	0.2331***
	(0.0614)	(0.0463)
Mean of Dependent Variable	0.0000	-0.0000
Broker FE	X	X
Citizen FE	X	X
Observations	698	698
R^2	0.6258	0.6304

	(1)	(2)
Panel C: Excluding brokers without direct network data		
Hearing	0.4374***	0.2233***
	(0.0718)	(0.0501)
Mean of Dependent Variable	-0.0000	-0.0000
Broker FE	X	X
Citizen FE	X	X
Observations	488	488
R^2	0.6411	0.7042

Notes: All specifications include broker and citizen fixed effects. The outcome variables and *hearing* are standardized within each sample. All panels run similar specifications to those in Tables 2 and 5. In Panel A, we calculate *hearing* by setting T equal to the maximum social distance between any citizen and broker in the village network. In Panel B, we exclude the two villages with the lowest sampling rates. In Panel C, we keep only those observations for brokers whose network connections were directly surveyed. Standard errors use two-way clustering at the broker and citizen levels.

Table B4: Effect of *hearing* on constituent components of the indices of brokers' knowledge about citizens

	Knows citizen (1)	Knows citizen's spouse (2)	Knows citizen's amount of land (3)	Knows citizen's years of education (4)
Panel A: Covariates index component measures				
Hearing	0.0344***	0.0784***	0.0603**	0.0404**
	(0.0103)	(0.0219)	(0.0281)	(0.0186)
Mean of Dependent Variable	0.8873	0.7725	0.4206	0.8069
Broker FE	X	X	X	X
Citizen FE	X	X	X	X
Observations	932	932	932	932
R^2	0.6359	0.5789	0.5524	0.6090

	Knows strength of citizen's party preference (1)	Knows the frequency with which the citizen would retaliate (2)	Knows whether the citizen generally trusts others in the village (3)
Panel B: Political and Social Preferences index component measures			
Hearing	0.0971***	0.0500*	0.0554***
	(0.0351)	(0.0272)	(0.0138)
Mean of Dependent Variable	0.5933	0.5858	0.6556
Broker FE	X	X	X
Citizen FE	X	X	X
Observations	932	932	932
R^2	0.5362	0.6524	0.7760

Notes: All specifications include broker and citizen fixed effects. *Hearing* is standardized. Standard errors use two-way clustering at the broker and citizen levels.

Table B5: Placebo test of effect of *hearing* on having a previous non-political informal transaction, by party registration and experimental reciprocity

	Previous transaction							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hearing	0.1544***	0.1983***	0.1546***	0.1942***	0.1555***	0.2031***	0.1578***	0.2034***
	(0.0358)	(0.0602)	(0.0362)	(0.0570)	(0.0473)	(0.0656)	(0.0512)	(0.0644)
Experimental reciprocity			-0.0075	0.0000			-0.0202	0.0000
			(0.0120)	(0.0000)			(0.0294)	(0.0000)
Not reg. to broker's party					-0.0056	0.0161	0.0023	0.0150
					(0.0408)	(0.0423)	(0.0396)	(0.0430)
Experimental reciprocity $\times$ *Hearing*			0.0140	0.0446			0.0242	0.0290
			(0.0177)	(0.0281)			(0.0273)	(0.0383)
Experimental reciprocity $\times$ Not reg. to broker's party							0.0169	-0.0189
							(0.0312)	(0.0319)
Not reg. to broker's party $\times$ *Hearing*					-0.0033	-0.0056	-0.0058	-0.0044
					(0.0613)	(0.0532)	(0.0622)	(0.0524)
Not reg. to broker's party $\times$ *Hearing* $\times$ Experimental reciprocity							-0.0167	0.0268
							(0.0428)	(0.0391)
Mean of Dependent Variable	0.0849	0.0849	0.0849	0.0849	0.0849	0.0849	0.0849	0.0849
Broker FE	X	X	X	X	X	X	X	X
Citizen FE		X		X		X		X
Observations	271	271	271	271	271	271	271	271
R^2	0.3395	0.6768	0.3419	0.6863	0.3396	0.6773	0.3428	0.6882

Notes: All specifications include broker fixed effects. The dependent variable is an indicator for whether a non-political informal transaction took place between the broker's and citizen's households in the year surrounding the election. "Not reg. to broker's party" indicates the citizen is not officially registered to 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 citizen fixed effects. *Hearing* and experimental reciprocity are standardized. Standard errors use two-way clustering at the broker and citizen levels.

Table B6: Summary statistics of network centrality measures for all households, and by broker and citizen 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
Eigenvector centrality	32	0.136	0.073
Diffusion centrality	32	9.351	4.247
Diffusion centrality among copartisans	31	2.524	2.305
Diffusion centrality among non-copartisans	31	6.565	3.488
Citizen Network Measures			
Degree centrality	1,000	4.585	4.304
Betweenness centrality	1,000	0.019	0.036
Eigenvector centrality	1,000	0.066	0.070
Diffusion centrality	1,000	5.111	4.749
Diffusion centrality among copartisans	214	3.175	2.562
Diffusion centrality among non-copartisans	214	1.975	1.622
Broker and Citizen Network Measures			
Degree centrality	1,032	4.690	4.349
Betweenness centrality	1,032	0.019	0.036
Eigenvector centrality	1,032	0.068	0.071
Diffusion centrality	1,032	5.243	4.789
Diffusion centrality among copartisans	245	3.093	2.536
Diffusion centrality among non-copartisans	245	2.556	2.476

Notes: Broker diffusion centrality among copartisans and non-copartisans has one fewer observation because one broker belongs to the UNACE party.

C Multiple Hypothesis Adjustments

Table C1: Multiple hypothesis adjustment for the effect of *hearing* on vote-buying targeting and brokers' knowledge about citizens

Outcome	**Coeff.**	***p*-values**			
		Unadjusted	Multiplicity adjusted		
		Remark 3.1	Theorem 3.1	Bonferroni	Holm
Vote-buying targeting index	0.3215	0.0003***	0.0003***	0.0027***	0.0023***
Broker offered citizen	0.0720	0.0040***	0.0040***	0.0320**	0.0040***
Broker approached citizen	0.1833	0.0003***	0.0003***	0.0027***	0.0027***
Support the same party	0.1174	0.0030***	0.0057***	0.0240**	0.0060***
Overall knowledge index	0.2111	0.0003***	0.0003***	0.0027***	0.0020***
Covariates index	0.1703	0.0007***	0.0017***	0.0053***	0.0027***
Political index	0.1975	0.0003***	0.0003***	0.0027***	0.0017***
Social preferences index	0.1401	0.0027***	0.0073***	0.0213**	0.0080***

Notes: This table replicates the regressions from Tables 2 and 5 which include both broker and citizen fixed effects with the multiple hypothesis testing correction methodology developed by List et al. (2019) using the mhtreg Stata command introduced in Barsbai et al. (2021). The coefficients displayed in the "coeff." column are that on *hearing*. The vote-buying targeting index is a standardized sum of indicators for whether the broker offered the citizen something during the electoral campaign and whether the broker approached the citizen to talk about the electoral campaign. "Support the same party" is an indicator that the citizen claims to support the broker's party shortly after the election. The additional outcomes are standardized indices that aggregate what the broker knows about the citizen in three categories. The Covariates index aggregates indicators for whether the broker knows the citizen, whether the broker knows the citizen's spouse's name, whether the broker knows how much land the citizen owns, and whether the broker knows the citizen's years of education. The Political index corresponds to an indicator for whether the broker knows the strength of the citizen's party preference. The Social preferences index aggregates indicators for whether the broker knows whether the citizen generally trusts others in the village, and whether the broker knows the frequency with which the citizen 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 citizen levels. *, **, and *** indicate that the corresponding *p*-values are less than 10%, 5%, and 1%, respectively.

Table C2: Multiple hypothesis adjustment for the effect of *hearing* on constituent components of the indices of brokers' knowledge about citizens

Outcome	**Coeff.**	***p*-values**			
		Unadjusted	Multiplicity adjusted		
		Remark 3.1	Theorem 3.1	Bonferroni	Holm
Knows citizen	0.0344	0.008***	0.0287**	0.0560*	0.0320**
Knows citizen's spouse	0.0784	0.0003***	0.0003***	0.0023***	0.0023***
Knows citizen's amount of land	0.0603	0.0460**	0.1310	0.3220	0.1380
Knows citizen's years of education	0.0404	0.0487**	0.0957*	0.3407	0.0973*
Knows strength of citizen's party preference	0.0971	0.0003***	0.0003***	0.0023***	0.0017***
Knows the freq. with which the citizen would retaliate	0.0500	0.0853*	0.0853*	0.5973	0.0853*
Knows whether citizen generally trusts other villagers	0.0554	0.0003***	0.0003***	0.0023***	0.0020***

Notes: This table replicates the regressions from Table B4 which include both broker and citizen fixed effects with the multiple hypothesis testing correction methodology developed by List et al. (2019) using the mhtreg Stata command introduced in Barsbai et al. (2021). The coefficients displayed in the "coeff." column are that on *hearing*. *Hearing* is standardized. Standard errors use two-way clustering at the broker and citizen levels. *, **, and *** indicate that the corresponding *p*-values are less than 10%, 5%, and 1%, respectively.

Table C3: Multiple hypothesis adjustment for brokers' differential relative position within their social network

Outcome	**Coeff.**	***p*-values**			
		Unadjusted	Multiplicity adjusted		
		Remark 3.1	Theorem 3.1	Bonferroni	Holm
Panel A: Columns (1)-(4) of Table 9					
Degree centrality	0.3844	0.002***	0.0037***	0.0160**	0.006**
Betweenness centrality	0.1046	0.4820	0.4820	1.0000	0.4820
Eigenvector centrality	0.6021	0.0003***	0.0003***	0.0027***	0.0027***
Diffusion centrality	0.5739	0.0003***	0.0003***	0.0027***	0.0023***
Degree centrality (percentile)	13.4666	0.0003***	0.0003***	0.0027***	0.0013***
Betweenness centrality (percentile)	7.8281	0.0573*	0.0907*	0.4587	0.1147
Eigenvector centrality (percentile)	21.4197	0.0003***	0.0003***	0.0027***	0.0017***
Diffusion centrality (percentile)	19.8667	0.0003***	0.0003***	0.0027***	0.0020***

Outcome	**Coeff.**	***p*-values**			
		Unadjusted	Multiplicity adjusted		
		Remark 3.1	Theorem 3.1	Bonferroni	Holm
Panel B: Columns (5)-(6) of Table 9					
Diffusion centrality among copartisans	-0.1868	0.4257	0.5190	1.0000	0.8513
Diffusion centrality among non-copartisans	2.1281	0.0003***	0.0003***	0.0013***	0.0013***
Diffusion centrality among copartisans (percentile)	-3.2361	0.6817	0.6817	1.0000	0.6817
Diffusion centrality among non-copartisans (percentile)	39.9104	0.0003***	0.0003***	0.0013***	0.0010***

Notes: This table replicates the regressions from Table 9 with the multiple hypothesis testing correction methodology developed by List et al. (2019) using the mhtreg Stata command introduced in Barsbai et al. (2021). The coefficients displayed in the "coeff." column are that on the broker indicator. The sample for Panel A includes all households directly and indirectly sampled. The sample for Panel B includes all households for which we have party registration data. Copartisanship is determined by whether villagers were registered to the same party (for the observations not involving brokers) or a villager is registered to the broker's party (for the observations involving brokers). All specifications include village fixed effects and control for whether the household was surveyed directly about their network ties. The first four outcomes are standardized (mean 0, s.d. 1), while the last four are the within-village percentiles (ranging from 1 to 100) for each corresponding outcome. *, **, and *** indicate that the corresponding *p*-values are less than 10%, 5%, and 1%, respectively.