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What Politicians Do Not Know Can Hurt You: The Effects of Information on Politicians' Spending Decisions

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Do well-informed politicians make more effective spending decisions? In experiments with 70% of all elected politicians in Malawi ($N = 460$), we tested the effects of information on public spending. Specifically, we randomly provided information about school needs, foreign aid, and voting patterns prior to officials making real decisions about the allocation of spending. We show that these information interventions reduced inequalities in spending: treatment group politicians were more likely to spend in schools neglected by donors and in schools with greater need. Some information treatment effects were strongest in remote and less populated communities. These results suggest that information gaps partially explain inequalities in spending allocation and imply social welfare benefits from improving politicians' access to information about community needs.

INTRODUCTION

Do well-informed politicians make more effective spending decisions? Despite implicit assumptions in many theories of spending, politicians are seldom comprehensively informed about the characteristics of their constituencies. Such gaps in politician knowledge are particularly problematic in developing countries, where development resources are limited and public officials lack the capacity to collect and disseminate information. In Malawi, the context of our study, we show that most politicians lack knowledge core to their official duties. For instance, over two-thirds are unable to answer questions about the distribution of school enrollments or foreign aid in their constituencies. These information gaps are greatest for communities that are distant from politicians' homes.

In this research, we document distortions in politicians' knowledge of their constituencies and explain how different types of information can change spending decisions. In doing so, we contribute to debates in theories of distributional politics, politician responsiveness, and politician knowledge. Theories of distributional politics have long suggested that decisions about whether to target core or swing voters, or rely on clientelism or patronage, are contingent on politician knowledge about voting intentions and needs. But we have too little basic evidence on the source and variation in such knowledge. Similarly, theories of government responsiveness have focused on the question of when spending decisions are welfare-maximizing, but often implicitly assumed away politicians' challenges at getting basic information about constituency needs. Finally, a growing body of scholarship has explored biases and gaps in politician priors and preferences. However, this work has rarely looked at real policy decisions or considered how effects might differ in contexts with high poverty and weak state capacity.

To evaluate the effects of information on spending allocation decisions, we conducted an experiment with 70% of elected politicians in Malawi.[1] In the experiment, which focused on the education sector, we randomly assigned politicians to receive or not receive three pieces of information about schools in their constituencies: need, aid, and voting. The Need Information Treatment provided information about class and teacher overcrowding and insufficient teacher housing. The Aid Information Treatment provided information about the number and types of aid projects at the schools. The Voting Information Treatment provided information about the percentage of votes the politician received in the last election at the nearest polling station to the school. These information treatments were randomly assigned within respondent blocks in a fully crossed factorial design.

After receiving (or not receiving) one or more of these information treatments, politicians made real decisions about the allocation of development resources (school supplies) to these same schools. Following the experiment, each politician's constituency was allocated school supplies in accordance with the politician's preferences and the outcome of a public lottery.

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[1] A pre-analysis plan (PAP) for this experiment was pre-registered prior to data analysis and is available at https://osf.io/kazfp. See Jablonski and Seim (2023) for replication data and code.

We find that the information treatments affected the allocation of spending. We estimate that politicians in the Need Information Treatment group are about 13% more likely to spend on schools in the highest quartile of need. Further, some information treatments had larger effects when politicians were making decisions about allocations in more remote communities. We provide evidence that politicians face high costs of gathering information in these remote communities and that these communities lack access to government officials. Politicians in the Aid Information Treatment group are about 8% less likely to spend on schools with an existing foreign aid project. However, politicians in the Voting Information Treatment group appear no more likely to spend on schools with a particular vote share.

Our results suggest that information gaps are an important and under-recognized reason why politicians allocate spending to some areas more than others. However, some caution is warranted in the interpretation of our findings. Due to the limited number of politicians in Malawi, our sample size—and, therefore, the power of our study to detect small- to medium-sized effects—is limited.[2]

CONTRIBUTION TO RESEARCH AND POLICY

This study speaks to three branches of research. First, we contribute to debates in distributional politics regarding the ways in which incomplete information affects spending strategies (Basurto, Dupas, and Robinson 2020; Diaz-Cayeros, Estévez, and Magaloni 2016; Dixit and Londregan 1996; Keefer and Vlaicu 2008; Oates 1999; Ravanilla, Haim, and Hicken 2022; Stokes et al. 2013). Whether politicians allocate to core or swing voters (or, more accurately, groups of voters) is widely regarded to be contingent on politicians holding accurate information about voter partisanship and needs (Dixit and Londregan 1996; Golden and Min 2013; Stokes et al. 2013). Dixit and Londregan (1996), for instance, propose that politicians target core voters in part due to the informational advantages that politicians have in understanding the needs of core voter communities. Yet there is limited research attempting to understand how politicians learn about their constituencies, or the impact of information interventions on spending targeting. We contribute to this body of work by providing experimental evidence of a relationship between information and spending outcomes. Our findings validate the premise that incomplete information shapes distributional strategies, and that providing information to politicians changes these strategies.

Our research is also aligned with work on the responsiveness of politicians to citizen needs and demands (Buntaine, Nielson, and Skaggs 2021; Golden, Gulzar, and Sonnet 2023; Grossman, Humphreys, and Sacramone-Lutz 2020; Hawkins, Wolferts, and Nielson 2018; Keefer and Khemani 2005; Liaqat 2020; Loewen, Rubenson, and McAndrews 2022; Todd et al. 2021). Much of this literature attempts to assess the conditions under which policy decisions respond to information about citizen demands. The findings of this literature have been mixed, with many finding little evidence that policy improves with new information. In our study, we provide one explanation for this heterogeneity: politician priors about community needs are more uncertain for some communities and policy domains than others. As a result, politicians tend to be more responsive to some citizens and some information types than others. We provide evidence suggesting that this heterogeneity in priors and responsiveness is related to the costs of collecting information in some communities and the role of biased heuristics.

In making this contribution, we also speak to policy debates around the best ways to improve responsiveness. Interventions such as decentralization and community-driven development are premised on the notion that politicians lack constituency knowledge (Bardhan and Mookherjee 2006; Mansuri and Rao 2013). Yet we have little data on when and how such knowledge gaps persist. We think it plausible that variation in politicians' access to and demand for information may help explain heterogeneity in the impacts of some of these policies. Relatedly, our research suggests that policy interventions to provide information to politicians about constituency needs—particularly about the needs of citizens with limited access to government officials—could improve the effectiveness of public spending. We elaborate in the Conclusion on how such interventions might be better designed in light of these findings.

We also contribute to research on distortions in politicians' access and response to information. Largely relying on survey data from the United States and Europe, this literature documents that public officials have distorted perceptions of constituency preferences and needs (Broockman and Skovron 2018; Erikson, Luttbeg, and Holloway 1975; Gulzar, Hai, and Paudel 2021; Hertel-Fernandez, Mildenberger, and Stokes 2019; Kalla and Porter 2021; Kertzer 2020; Pereira 2020; Rogger and Somani 2019). This literature points out that politicians often lack sufficient information to allocate resources efficiently. Politicians in the United States, for instance, often believe that the preferences of constituents are more ideologically extreme than they are in practice (Broockman and Skovron 2018; Hertel-Fernandez, Mildenberger, and Stokes 2019). In Sweden, politicians are more likely to misperceive the policy positions of low-status than high-status voters, likely due to greater exposure to the opinions of high-status voters (Pereira 2020). Similarly, Liaqat (2020) studies the effects of providing information about citizen preferences to Pakistani politicians. Mirroring some of our conclusions, Liaqat demonstrates that politicians' priors about citizen preferences are mostly inaccurate and that politician responses to information are greater for female constituents, for whom the costs of information collection are greater. We contribute to this discussion by examining the effect of information on politician decision-making in a context of high poverty and weak

[2] We provide power simulations for the study design in the Supplementary Material (SM) Section 4.1.

state capacity. We argue that in such contexts, perceptual biases are especially shaped by interpersonal networks and geographic and social disparities in access to political power. Our study also documents the likely policy consequences of such biases.

Finally, this research also extends work by Seim, Jablonski, and Ahlbäck (2020) who analyze one treatment arm in this set of experiments to estimate the crowding out effect of foreign aid and impacts on citizen welfare. We build on this research by considering how and when politicians respond to different kinds of information and by analyzing the consequences of information for spending allocations.

THEORY: HOW INFORMATION AFFECTS PUBLIC SPENDING ALLOCATION DECISIONS

Politicians often struggle to obtain sufficient information to efficiently allocate resources to constituents. To illustrate why this is, and the implications of knowledge gaps for spending decisions, consider a simple model. Suppose a politician wants to make an educational investment in one of two communities in her constituency. We assume she wants to maximize her chances of re-election; however, some results of our study are also consistent with politicians weighing community welfare for non-electoral reasons—for instance, to please nongovernmental organizations (NGOs) or aid donors. We discuss some of these alternatives below.

Let $c_i(a) > 0$ be the utility that a resident i of community j might get from the politician making an investment $a > 0$ in their school. Let $p_i \in [-\infty, \infty]$ be the prior utility that i might get from voting for a challenger over the incumbent. Let $d_i > 0$ be the resident's cost of voting. Following other theories of government responsiveness, we assume that citizens will weigh c against p and d when deciding how and whether to vote. If so, we can model a resident's utility from voting for the incumbent as $x_i = c_i(a) - p_i - d_i$. The politician's return on their investment a will equal the number of residents for whom the increase in utility they get from a exceeds the disutility they might get from voting for the incumbent:

$$v_j(a) = \sum_{i=1}^{n} 1(x_i > 0, p_i + d_i \geq 0). \quad (1)$$

A politician's decision problem is to choose a community with the highest return on votes: to choose the community that maximizes $\frac{\partial v_j}{\partial a_j}$. This might lead politicians to target in a socially optimal way (e.g., if voter preferences differ little across communities), but could also lead to socially suboptimal outcomes if electorally pivotal communities are not the neediest. Many studies have considered problems of this sort, often to derive the conditions under which voters with different political preferences or incomes might be targeted with spending, or to derive the conditions under which elections will improve welfare (see, e.g., Cox 2010; Diaz-Cayeros, Estévez, and Magaloni 2016; Dixit and Londregan 1996; Keefer and Vlaicu 2008; Stokes et al. 2013).

Note that any such model of responsiveness has stringent requirements of politician knowledge. Accurately ranking communities on $v_j(a)$ often requires that politicians have well-informed priors on the community-level distribution of c, p, d, and n. This is not a reasonable assumption. While politicians may have the capacity to collect detailed information from citizens about political and spending preferences, the opportunity costs of being completely informed are prohibitive.

One major cost is time. As Robert Fenno noted of U.S. Congress, a politician's "scarcest and most precious" dilemma is the allocation of time (Fenno 1977). Such time constraints may be particularly binding in low-income contexts, where politicians are more likely to rely on personal communication as a primary means to learn about constituent needs, a fact we establish in the context of Malawi below.[3] As a result, gathering information is often more time-intensive in low-income contexts. Politicians will particularly struggle to get information about difficult-to-access communities where communication networks are limited.

Another significant source of information costs is coordination. In Malawi, governments have to coordinate their spending allocations across several layers of administrative and customary authority. But even more challenging is the problem of coordinating with the 36 official donors and over eight hundred registered NGOs engaged in development-related work (NGORA Malawi 2022). Official statistics on the totality of such spending is frequently incomplete and unreliable. When politicians fail to coordinate, resource allocation will often be duplicative and noncomplementary (Seim, Jablonski, and Ahlbäck 2020).

Politicians can use several strategies to fill information gaps. First, they can prioritize gathering information in areas where information costs are low. When information is collected interpersonally, politicians often find it particularly costly to gather information about remote and marginalized communities (Gwiriri and Bennett 2020). In African democracies, for instance, over 70% of members of parliament (MPs) consider the costs of constituency travel to be a burden (Barkan et al. 2010).[4] Likewise, transportation costs to visit or engage with politicians are unlikely to be paid by anyone other than the wealthiest and most invested citizens (Gwiriri and Bennett 2020).

A complementary strategy is to rely on heuristic shortcuts and intermediaries to learn about constituents. Politicians can infer voter preferences and voting behavior from employment, party memberships, ethnicity, geography, and other factors (Fenno 1977). In

[3] See also Bussell (2019), Grossman, Humphreys, and Sacramone-Lutz (2020), and Gulzar, Hai, and Paudel (2021) for evidence in other contexts.

[4] Malawian MPs estimate that they pay $1,256 for a single constituency visit: 12% of their official yearly income in 2020 (Barkan et al. 2010).

developing contexts, politicians often rely on local brokers to gather information about voter preferences and voting behavior (Stokes et al. 2013). Politicians also learn about constituency preferences from special interests, civic groups, constituent letters, and expert pollsters (Erikson, Luttbeg, and Holloway 1975; McClendon 2016; Pereira 2020).

The problem with these strategies is that the resulting information will often be imprecise and biased. When the interests and preferences of intermediaries differ from those of citizens, it is likely that politicians' beliefs and policy preferences will be likewise biased, often in favor of elites and politically influential groups (Broockman and Skovron 2018; Gilens and Page 2014; Pereira 2020). Further, if politicians prioritize gathering information where information costs are low, they will be particularly uninformed about areas with higher information costs, a point which we establish in the case of Malawi below.

The consequence of having uncertain and biased information about constituency characteristics and preferences is that spending allocation decisions will be inefficient. In the SM, we expand on this point and derive the conditions under which accuracy and uncertainty about v_j lead to inefficient spending.[5] Below, we expand on this theory to consider how spending allocation decisions change when politicians are provided with accurate information.

Hypotheses about Treatment Effects

Our experimental treatments provide politicians with information relevant for their assessment of needs, foreign aid, and voting preferences at schools in their constituency. As we justify below, we expect this information to be particularly useful for politicians seeking to efficiently allocate resources to constituents. After receiving these information treatments, politicians were asked to allocate NGO-funded school supplies to a school.

In this section, we explain our hypotheses about how information affects these allocation decisions.[6] We base our discussion on the theory of responsiveness outlined above and in Equation 1. We assume that politicians will allocate supplies to the school that maximizes politician utility (v_j). We further assume that the information treatments will cause politicians to update their beliefs about the distribution of voter preferences and consumption (c or p). Under these two assumptions, we expect the information treatments to cause politicians to be more likely to allocate supplies in a way that increases politician utility.[7]

Need Information

As we detail below, the Need Information Treatment provides information about the ranking of school needs in each community based on statistics about structural, facility, and teacher overcrowding. We expect that this treatment will increase the accuracy of politicians' beliefs about the mean consumption utility that residents get from spending at their school ($\overline{c}_j$). From Equation 1, it follows that politicians will likely expect greater utility from allocating to communities where consumption utilities are high (we assume $\frac{\partial v_j}{\partial \overline{c}_j} > 0$). If so, the Need Information Treatment will shift spending allocations toward schools which are ranked as having relatively greater need.

> **Hypothesis 1:** *When politicians receive information about school needs, they will be more likely to allocate to high-need schools.*

Aid Information

The Aid Information Treatment provides details on the number of foreign aid projects in each school as well as a categorization of the types of aid goods provided. Given the high costs of coordinating with development actors in Malawi, we expect that this information will allow politicians to better take alternative spending into account when making their allocation decision.

Existing research suggests competing hypotheses regarding how government spending might respond to foreign aid.[8] First, politicians might believe that the marginal returns to overlapping spending are negative ($c''(a) < 0$). If so, politicians seeking to maximize c should respond to aid information by reducing allocation in high-aid areas, leading to a "crowding out" effect of foreign aid on government allocation.

Alternatively, politicians might expect complementarity between foreign aid and government spending ($c''(a) > 0$)—for example, they might expect spending to be more effective where donor-funded infrastructure is in place. This would imply that the treatment will cause more spending allocations in high-aid areas. Thus, depending upon politician beliefs about the complementarities between aid and spending allocation, we expect the Aid Information Treatment to have one of two effects:

> **Hypothesis 2:** *When politicians receive information about foreign aid, they will be* less *likely to allocate to high-aid schools.*

> **Hypothesis 3:** *When politicians receive information about foreign aid, they will be* more *likely to allocate to high-aid schools.*

Voting Information

The Voting Information Treatment provides politicians with information about the percentage of votes

[5] See SM Section 2.
[6] In the SM, we test additional pre-registered hypotheses (SM Section 10).
[7] In the SM, we elaborate on the conditions necessary for these conclusions to hold (SM Section 2).
[8] For discussion of these debates and analysis of how foreign aid information might impact spending, see Seim, Jablonski, and Ahlbäck (2020).

they received in the community around each school. This information should increase the accuracy of politicians' beliefs about mean voting preferences in a community ($\overline{p}_j$). There are multiple ways this information might impact politicians' spending utility ($\frac{\partial v_j}{\partial \overline{p}_j}$). If voter mobilization costs (d) are low, better information could cause politicians to more efficiently target communities with a high density of swing voters (those for whom p_i is near 0) in order to persuade voters who are somewhat indifferent. Alternatively, if the costs of mobilization are high, politicians will instead have incentives to target supportive communities to encourage greater mobilization among their base.[9] In more complex models, such core and swing voter targeting decisions might also depend upon factors like the costs of coordinating brokers (Stokes et al. 2013), the costs of learning about efficient spending options in core versus swing communities (Dixit and Londregan 1996), or the credibility of campaign promises in core versus swing areas (Keefer and Vlaicu 2008).

Our pre-registered hypothesis is that voting information increases allocations to communities with greater support for the politician: those with core voters.[10] One reason for this preference might be that the costs of voting (d) are relatively large in Malawi and politicians (particularly at the local level) have strong incentives to mobilize supporters (Duwa 2014). Politicians' preference to target core voters in Malawi might also be shaped by low voter loyalty in Malawian local elections.[11] Where politicians cannot rely on core voters to remain loyal, politicians might prefer to invest in retaining their voting coalition rather than in persuading swing voters.

Hypothesis 4: *When politicians receive information about voting, they will be more likely to allocate to high-support schools.*

Hypotheses about Heterogeneous Effects

Transparency

In an independently randomized, overlaid experiment, we assign a fourth treatment that varies the level of transparency of the politician's decision (the Transparency Treatment). Politicians' decisions are either shared on local radio or distributed in a report to all major donors in Malawi (or both or neither). This treatment clarifies both attribution (who is responsible for the allocations) and recipient (which school is intended for the allocations).

To the extent voters and donors prefer to maximize social welfare and are willing to sanction politicians accordingly, transparency raises the costs for politicians of allocating along dimensions other than social welfare. Thus, this treatment effectively manipulates the weights that politicians put on consumption utilities versus political preferences ($c(a)$ vs. $p + d$). The implication is that transparency will magnify the effect of need information and diminish the effect of voting information, resulting in the following heterogeneous effects hypothesis:[12]

Hypothesis 5: *When politicians know that their decisions will be transparent, the effect of the Need Information Treatment will be larger and the effect of the Voting Information Treatment will be smaller.*

Information Costs

We theorize that politicians will be more uncertain about allocation decisions in communities where the costs of obtaining information are high. If so, the effects of the information treatments will increase with the costs of information.[13]

We consider three proxies for the costs of obtaining information. First, when politicians are resource-constrained and rely on personal interactions to gather information, information costs will be greatest in geographically remote communities. Second, information costs will be higher in less densely populated communities due to their often lower levels of political representation and political importance. Third, as politicians are likely to have more robust social networks in politically supportive communities, information costs will be lower in supportive areas and higher in areas with low support.

We test this argument in two steps. First, in the section that follows, we describe the Malawian local government context and use survey and interview data to evaluate how politicians' knowledge of their constituencies varies over space and correlates with these proxies for information costs. Second, we experimentally test whether the effects of the information treatments are larger in communities where information costs are higher, as measured by these proxies, which leads to the following hypothesis:

Hypothesis 6: *Information treatment effects will be greater where schools are: (a) further from a politician's hometown; (b) in less populous communities; or (c) in communities who are less supportive of the politician.*

A couple caveats are in order. First, to avoid priming effects, we did not measure politician priors or

[9] To see this, note that to persuade a voter, it must be the case that $c_i(a) > p_i + d_i$. The most efficient voter to target will, therefore, be the one for whom $p_i + d_i$ is nearest 0. Thus, as d increases, the value of p for this efficient voter must decrease.

[10] In the SM, we also consider and reject alternative swing voter hypotheses (SM Section 4.6).

[11] For example, only 18% of incumbent councilors held their seats in 2019.

[12] Transparency could mediate the effect of the Aid Information Treatment, but in practice citizens have insufficient information about aid to sanction politicians (Seim, Jablonski, and Ahlbäck 2020). We find little evidence for such an interaction (SM Section 4.7).

[13] We demonstrate this point formally in SM Section 2.

posterior beliefs at the school level. We, therefore, cannot measure updating directly.[14] We do show evidence from post-treatment surveys that politicians learned from the information treatments and incorporated the information into their decision-making. Nonetheless, there are politicians who are ineligible to update because their priors were more accurate. Thus, our estimates should be interpreted as intent-to-treat effects.

INFORMATION AND SPENDING ALLOCATION DECISIONS IN MALAWI

Our experiment takes place among elected local councilors (LCs) and MPs in Malawi. Every 5 years, LCs and MPs are elected from single-member electoral wards (LCs) and constituencies (MPs). For simplicity, we refer to all electoral units as constituencies. The politicians in our experiment were elected in 2014. The experiment took place in 2017.

While Malawi has a multiparty system of government, party organizations tend to be weak and often fail to articulate clear programmatic policies (Lembani 2008). Most Malawians instead expect politicians to deliver public goods or development projects in exchange for electoral support. There are many ways politicians can control the allocation of development resources. At the local level, both MPs and LCs are members of the district councils. Councils have an average budget of approximately US$5 million, 11% of which is dedicated to education, the sector on which we focus our study.[15] Additionally, MPs each have access to a discretionary Constituency Development Fund (about $40,000 in 2016) for development projects in their constituencies. Finally, politicians rely on their influence with local and international development organizations to bring development projects to constituents.

In this section, we validate two assumptions underpinning our theory in the Malawi context. We first demonstrate that Malawian politicians seek information to aid them in allocation decisions, and that their ability to do so varies with information costs. We next demonstrate that politicians face gaps in their knowledge of constituency characteristics.

Assessing Politician Sources of Information

Prior to treatment, we explored how elected officials in Malawi gather information relevant to spending allocation decisions by conducting phone interviews with 101 LCs in Malawi.[16] We asked each to describe where they learn about the needs of their constituents. We summarize responses in Figure 1. Most commonly, councilors get information from Area Development Committees (ADCs) and Village Development Committees (VDCs). ADCs are oversight committees at the chiefdom level and VDCs are analogous committees at the village level. The primary role of these committees is to aggregate community preferences and liaise between communities and governments. Similar development-focused community associations exist around the world (Bardhan and Mookherjee 2006).

Another common information source is communication with citizens. This information channel relies on a politician's personal connections and the initiative of individual citizens, and is, therefore, also vulnerable to bias.

Interestingly, no councilor mentioned relying on any government or non-governmental data. It is possible that politicians did not expect such information to be useful; however, we think a more likely explanation is that these data are difficult to access. Partly due to inconsistent funding and capacity of statistical offices, it is very difficult for politicians in Malawi to access and consume disaggregated statistics on voting, school characteristics, and foreign aid. As we document below and in the SM, all of the data we use in the information treatments required considerable processing to be meaningful.

We also conducted in-person interviews with five MPs.[17] Given their greater resources, MPs were more likely to rely on government bureaucrats for information, especially the District Education Manager, who is responsible for managing education resources in the district. Others mentioned communication from chiefs, NGOs, or teachers.

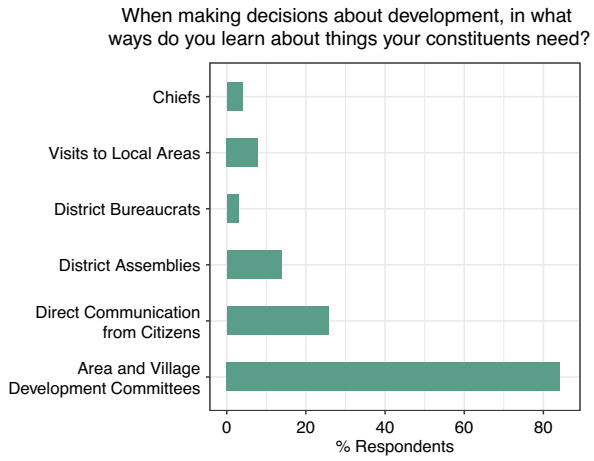
As discussed above, one implication of relying on personal networks is that information costs will be lower for communities proximate to the politician. In Malawi, for instance, many councilors complain that the government never fulfilled pledges to finance motorbikes to lower costs of travel to distant constituents (Chauwa 2016). To illustrate the implications of distance for constituency information gathering, we examine whether the number of citizen-reported politician visits to schools covaries with the school's distance to the politician's self-reported home town (Figure 2).[18] Councilors visited about 41% of villages within 6 km (the 25th percentile) from the councilor's home village, but they visited only 21% of villages more than 18 km away (the 75th percentile).

Assessing Politician Knowledge

In this section, we establish that politicians have incomplete knowledge of their constituencies and that this knowledge is biased in systematic ways. To measure knowledge, we asked the politicians enrolled in our

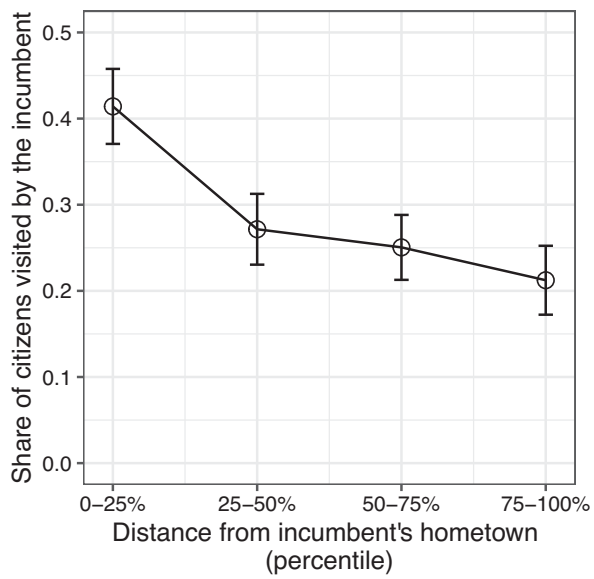
[14] As we demonstrate in SM Section 2, the direction of effects is unlikely ever to be conditional on biases in priors. We also consider the implications of biased updating (Adida et al. 2017).
[15] 2016 Ministry of Local Government data.
[16] See SM Section 7.1 for details on these interviews.
[17] See SM Section 7.1.
[18] Distance equals the most efficient driving or walking distance from politicians' self-reported home town per Google's API. See SM Section 7.2 for information about the survey of Malawian citizens and teachers on which these data are based.

FIGURE 1. Sources of Constituency Information for Elected Councilors



Note: This figure summarizes responses from a survey of a randomly selected sample of 110 councilors involved in this study.

FIGURE 2. Distance and Councilor Visits



Note: This figure shows the mean number of citizens reporting at least one visit from their councilor grouped by how far away (in percentiles) they are from the councilor's hometown. Vertical lines show 95% confidence intervals adjusted for village-level clustering. See SM Table S1 for tabular estimates.

experiment to take a post-treatment quiz about their constituencies. There were seven, mostly multiple-choice questions on this quiz. Each question asked politicians to evaluate traits of three randomly selected primary schools in their constituency. The quiz questions aligned with information provided in the Need Information Treatment, Aid Information Treatment, and Voting Information Treatment (described below). Since local councils are statutorily responsible for most education provision and coordination, these questions assess knowledge that is core to politicians' official duties. We nonetheless identify large gaps in knowledge.

We summarize the proportion of correct answers to each quiz question in Figure 3. In brief, politicians had relatively high levels of knowledge regarding constituency needs (school enrollment and classroom infrastructure), but relatively low levels of knowledge regarding the distribution of donor projects across the constituency. For instance, only 22% of politicians could identify the school with the most foreign aid projects, which is indistinguishable from answering randomly.

Knowledge of voting was mixed. Politicians were generally able to evaluate their support in a relative sense, with 33% able to identify the school where they received the fewest votes. However, they were less aware of their exact level of support in a given area.

Contrary to the theoretical literature on decentralization (see, e.g., Bardhan and Mookherjee 2006), we find little evidence that knowledge varies systematically by political office: on average, MPs got 31% of questions correct and LCs got 32% of questions correct.

Politicians' knowledge of their constituencies also varied over space. In SM Section 5.2, we assess how answers on this quiz vary depending on the features and locations of schools in a politician's constituency. Political support and distance are particularly strong predictors of knowledge. A standard deviation increase in distance from a politician's hometown is associated with a 4%–6% *decrease* in the proportion of correct answers ($p = 0.03$). Similarly, a one-standard-deviation increase in votes for a politician is associated with a 9% *increase* in the proportion of correct answers to questions about voting patterns ($p < 0.01$).

These data demonstrate that politicians have gaps in their understanding of their constituency, and that these gaps are greatest where communities are socially or geographically distant. This is consistent with politicians relying on biased heuristics when learning about their constituency.

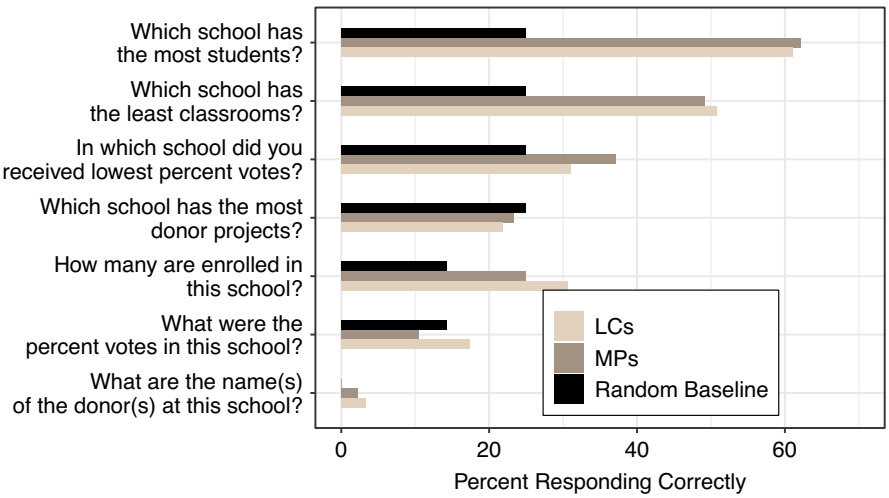
RESEARCH DESIGN

To study the effects of information on spending allocation decisions, we reached out to all the MPs and LCs in Malawi. We successfully recruited 125 in-office MPs and 335 in-office LCs in Malawi, or 63% and 73% of each population, respectively. We show a map of sampled constituencies in Figure 4.[19]

In partnership with a U.K.-based NGO (Tearfund), we offered each politician the opportunity to allocate school supplies to schools in their constituency. In face-to-face interactions with Malawian research assistants (RAs), each politician was presented with a map of

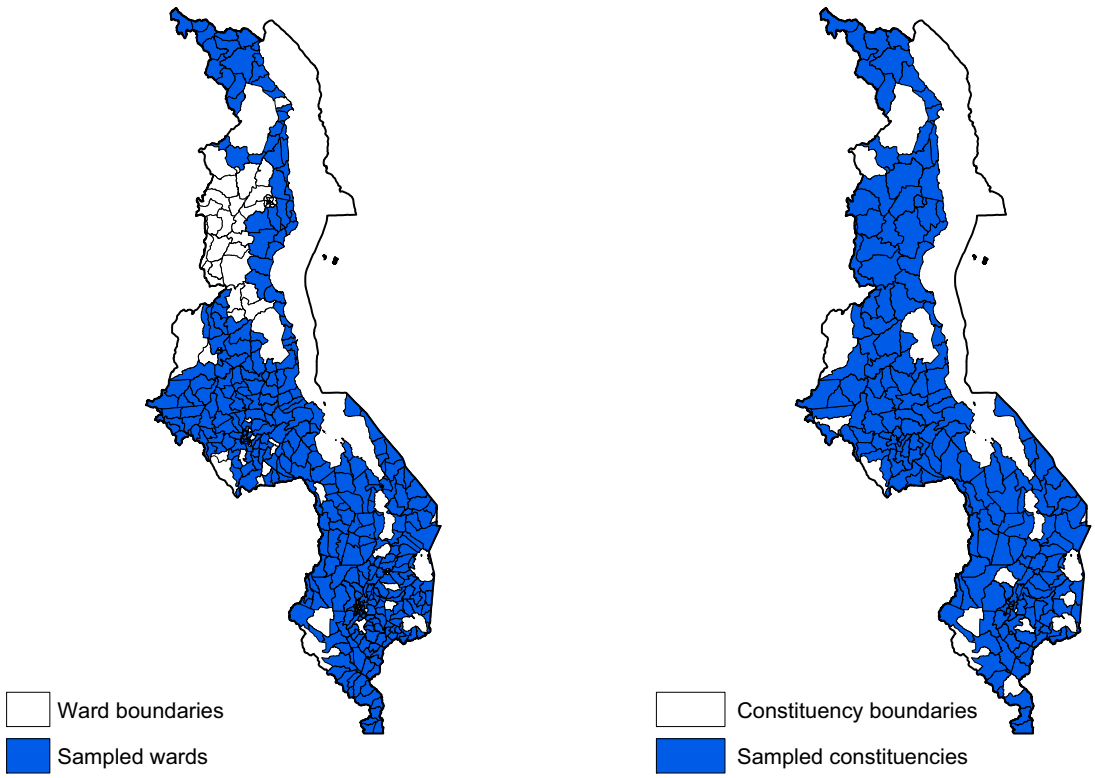
[19] See SM Section 6 for sample and attrition statistics.

FIGURE 3. School Knowledge Questions



Note: The *x*-axis shows the percentage of politicians responding correctly to questions about the characteristics of three randomly selected schools in their constituencies. All questions are multiple-choice except for the question on the name of the donor. The top dark line shows the proportion of correct answers we would expect if politicians answered randomly.

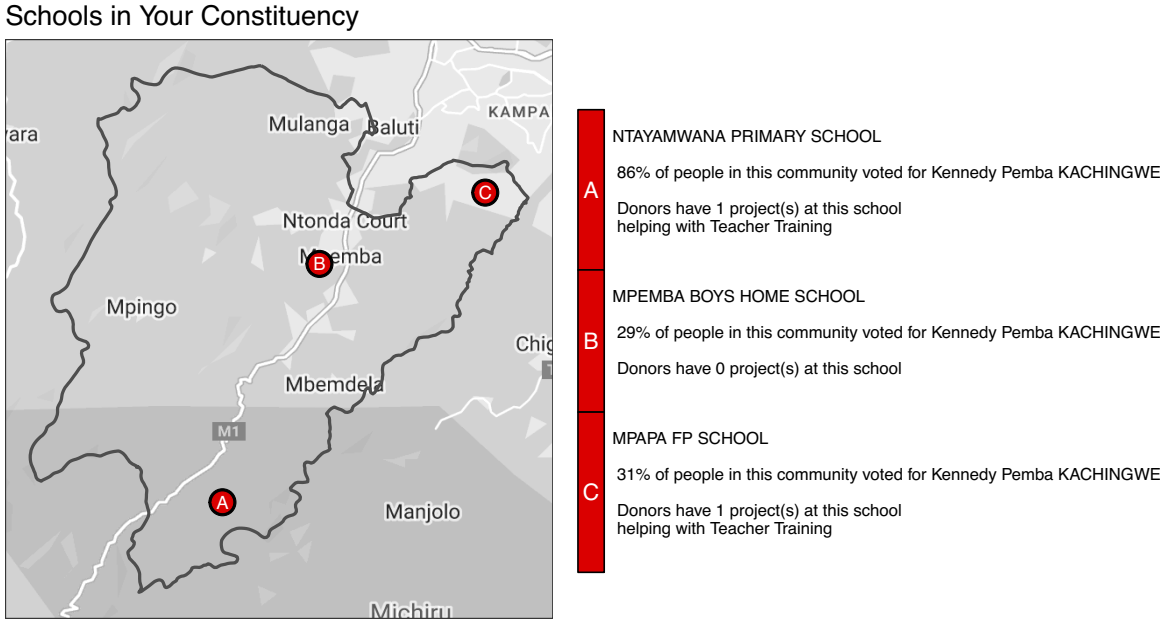
FIGURE 4. Sampled Constituencies



Note: This figure shows the constituencies of politicians in the sample.

their constituency with three schools marked on it. The three schools that appeared on the map were randomly selected from the government's list of primary schools in the constituency. The politician was then asked to decide which of the three schools should be allocated a type of school supplies. Specifically, the decision prompt was: "When you are ready, please tell me which school you would like to choose to receive a set of

FIGURE 5. Example Map with School Need and Voting Information



[*school supply*]. Please take your time in making this decision." The maps, an example of which is shown in Figure 5, were shown to the politician on portable tablets and could be studied by him or her in detail before the allocation decision was made.[20]

Each politician repeated this process three times, so they ultimately selected three schools out of nine to receive school supplies.[21] Each decision involved the allocation of a different type of school supply—either a set of 10 solar lamps, 10 teacher supply kits, or 10 English dictionaries. Our focus group discussions with project stakeholders suggest that these school supplies are valued by politicians and schools. The portable, stand-alone solar lamps are useful to allow students and teachers to work after dark. The dictionaries are helpful in lesson planning and studying. The teacher supply kits consisted of a box of chalk, rubbers, pens, notebooks, and tote bag—basic supplies considered necessary for teachers to carry out their work.[22] The ordering of maps, supplies, and schools was random.

These were not hypothetical decisions. Following the experiment, the selected schools were entered into a public lottery. Approximately 20% of the selected schools were chosen in this lottery to receive supplies. The details of the lottery were provided to politicians before they made their decisions. Politicians appeared to value the school supplies and make the decisions about allocation carefully. About a third of our sample either participated in the lottery or called to inquire about the results. Many also showed up at schools to participate in delivery. The funds for school supplies were provided by research grants.

The decisions in the experiment mimic decisions politicians make as part of their official duties. Almost all politicians we interviewed pre-experiment mentioned working with NGOs.[23] When asked to cite an example of a development project they brought to their constituency, most politicians mentioned a project implemented (and funded) in partnership with an NGO rather than one implemented directly by the government. As one MP described, "I also have a close relationship with [an education NGO]. Using my influence, they have constructed 18 school blocks in my constituency." A councilor stated, "I interact with donors on [a] monthly basis and they consult when they want to come up with a project."

Further, much of the education budget for councils comes from donors. For example, an average of approximately $200,000 within each district is allocated to individual schools through the USAID School Improvement Grants program.[24] In fact, so much of the local budget comes from donor funding, neither politicians nor voters consider the funding source when thinking of government projects. For example, in a survey of teachers in Malawi, 27% could identify a particular project completed at their school that they attributed to an elected official. Out of these, the majority (71%) were projects that could have been funded by either an NGO or government (or by the

[20] This design draws on methods used in the choice experiment literature to model consumer preferences (see Clark et al. 2014). We show example maps for all information treatment combinations in SM Section 8.2.
[21] Because of the small number of schools in some constituencies, some politicians (21%) received fewer than three maps.
[22] See SM Section 8.4 for more details and pictures.
[23] See SM Section 7.1.
[24] Data collected by authors from District Education Managers.

official personally). Only 4% were identified as government-funded projects, and 24% were identified as NGO-funded projects.[25] In light of the equivalence of different funding sources in the Malawian context, we cannot tie the effects we report below to a particular funding source: it is possible the effects would be different if the source of funding was specified or primed before the allocation decisions were made.

Treatment Assignment

Prior to making the allocation decisions, politicians were informed about the transparency of their decisions. Specifically, we randomly assigned politicians to two transparency treatments in a crossed-factorial design within paired blocks. Politicians in one of the transparency treatment groups were told (truthfully) that their allocation decisions would either be announced on local radio and/or compiled in a report for distribution to major donors.[26] To ensure that politicians understood the transparency treatments, they were played a sample radio broadcast and/or shown a sample report to donors.[27,28]

Once politicians were informed of their transparency treatment conditions, they went on to make the allocation decisions based on the maps described above. Three information treatments were independently and randomly assigned at the map level within respondent-level blocks: Need Information, Aid Information, and Voting Information. The treatment was assigned factorially, so each map received between zero and three information treatments. We chose this set of information treatments based on the theories discussed above and extensive year-long pre-experiment scoping activities. Specifically, before the experiment, we conducted 32 semi-structured interviews with LCs, MPs, District Commissioners, and ADCs, as well as four focus group discussions with Malawian citizens. We also conducted phone interviews with 101 randomly selected LCs to further evaluate how they gather information about their constituencies and make allocation decisions, and then we ran a pilot of the experimental protocol. Finally, we conducted a survey of over two thousand citizens and teachers associated with 180 schools across Malawi to assess community needs and preferences. Further details on these activities are in the SM.

All the estimates reported below reflect within-respondent and within-map treatment estimates. In Figure 6, we show a CONSORT diagram that depicts the broader experimental design. In Table 1, we summarize the information provided in each treatment, and next we discuss each information treatment in detail.

Need Information Treatment

The goal of the Need Information Treatment is to improve politicians' assessments of the welfare and consumption consequences of spending allocations at a particular school. We chose the information to include in this treatment based on pre-experiment piloting activities. In a survey of teachers, we asked teachers to prioritize the needs at their schools. The highest priority issues (named by over 60%) were overcrowding in classrooms and teacher houses, both of which suggest a need for infrastructural support. Teachers also frequently mentioned needing more staff, more learning materials, and various facility improvements, including electricity.[29] Similarly, in our interviews with politicians about how they make development decisions in the education sector, they most frequently mention considering enrollment levels, the number of classrooms, and the number of teachers' houses.[30] Other politicians consider the "look of the infrastructure," or "the nature of the school."

Accordingly, maps in the Need Information Treatment show politicians information about three dimensions of school need: structural overcrowding (number of students per classroom), teacher overcrowding (number of students per teacher), and the quality of classrooms at each school (the ratio of temporary to permanent classrooms).[31] To simplify the interpretation and analysis of this information, we also use these three dimensions of need to provide politicians with an ordinal ranking of the needs in each school relative to others in the constituency as illustrated in Figure 5.

Education statistics reinforce the importance of these dimensions of need: on average, primary school classrooms have 138 students each, though some have more than 300. Due to chronic problems of low or unpaid salaries, teachers in Malawi are often heavily overcommitted and underpaid. Primary school teachers are expected to teach 75 students on average, though some have more than 200. The quality of temporary classrooms varies, but these are often of extremely poor quality, sometimes consisting of lean-to structures and borrowed residences.

Though not an exhaustive assessment of school need, the aforementioned dimensions are three highly visible characteristics of need. In addition, the number of students per classroom and the number of students per teacher are robustly linked to education quality (Birdsall, Levine, and Ibrahim 2005).

To construct the ordinal ranking of needs, we create an index, *School Need Index*, which is equal to the sum of the z-scores of the three measures of school need.[32]

[25] See SM Section 7.2.
[26] The radio broadcast occurred 10 months after data collection on Zodiak radio. The donor report was disseminated 10 months after data collection to 13 donor agencies.
[27] See examples in SM Section 8.5.
[28] An additional 83 maps were excluded post-treatment due to discrepancies in constituency boundaries or issues in plotting. See SM Section 6.4.2.
[29] See SM Section 7.2.
[30] See SM Section 7.1.
[31] The data for these three measures come from 2014 official school-level statistics from the Education Management Information System at the Malawi Ministry of Education Science and Technology.
[32] $SchoolNeed = \frac{x-\mu_1}{\sigma_1} + \frac{x-\mu_2}{\sigma_2} + \frac{x-\mu_3}{\sigma_3}$, where μ_i and σ_i indicate the within-constituency means and standard deviations of students per teacher, students per classroom, and proportion of temporary classrooms for all available primary schools in Malawi.

FIGURE 6. Experiment CONSORT Diagram

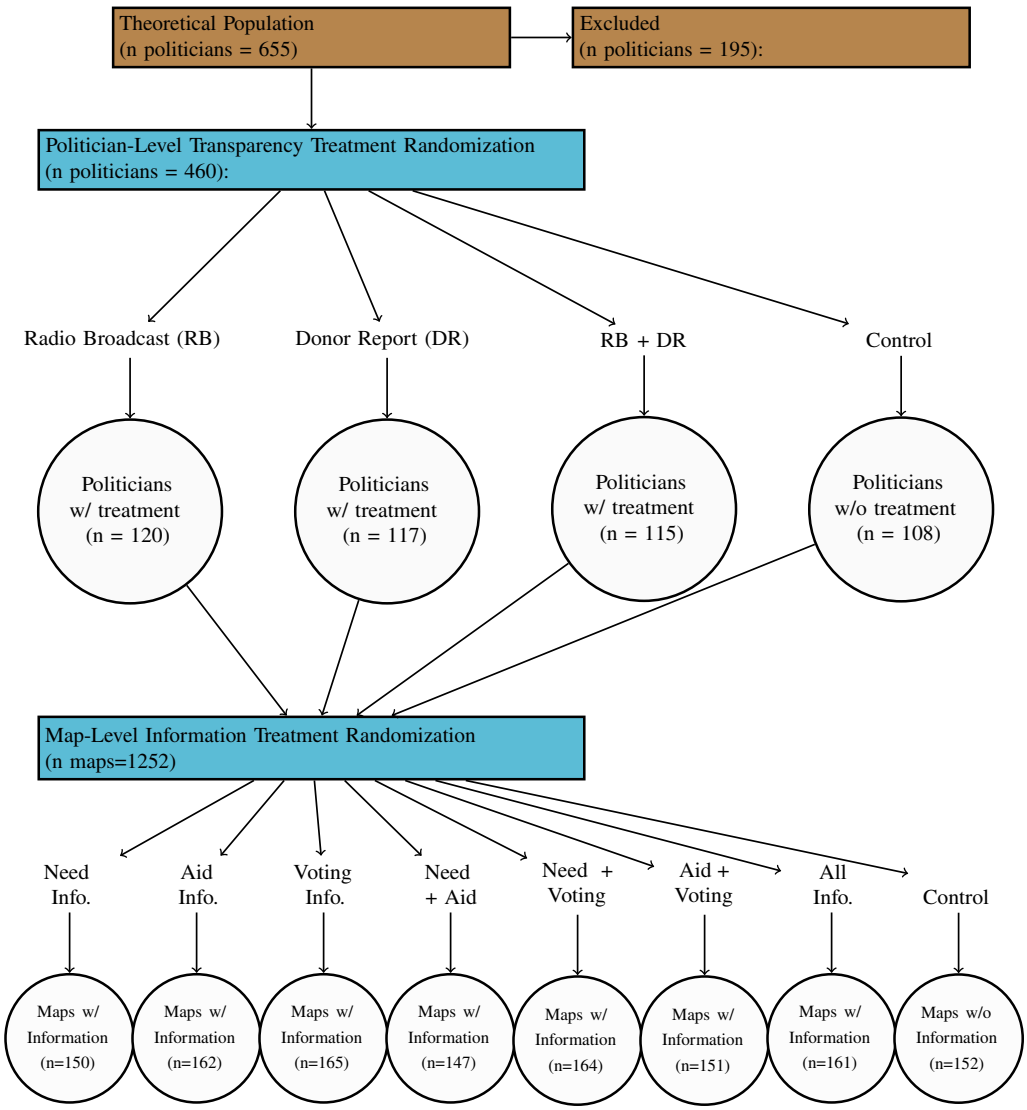


TABLE 1. Summary of Information Treatments

Information Treatment	Information Provided
Need Information	A Need Information Treatment map shows the ranking of school needs, the number of students per classroom, the number of students per teacher, and the number of temporary and permanent classrooms at each school.
Aid Information	An Aid Information Treatment map shows the number and type of aid projects supported by international donors at each school in the past 5 years.
Voting Information	A Voting Information Treatment map shows the percentage of votes received by the politician in the polling station nearest to each school.

Aid Information Treatment

The Aid Information Treatment is designed to improve politicians' ability to assess the international development interventions at each school. Such considerations are highly relevant to spending allocation decisions in Malawi, which is among the most aid dependent countries in the world (Seim, Jablonski, and Ahlbäck 2020). Between 2011 and 2016, donors directly funded projects in approximately 34% of primary schools, which is

roughly comparable to the percentage of schools (38%) that received projects funded by the local government.[33] As noted above, many government-allocated projects in schools are still funded by donors through budgetary support.

To collect information on school-based aid interventions, we focused on the 11 international donors active in the education sector.[34] We asked each donor to provide data on their project activities since 2011, including the type of intervention and the name and location of the recipient school(s).

In total, 3,151 primary schools received 4,566 foreign aid projects from this set of donors between 2011 and 2016. The number of foreign aid projects in each school varied from 0 to 4. We use these data to populate maps in the Aid Information Treatment with details on the number of foreign aid projects (*Aid Project Count*) and the number of development goods types (*Aid Good Types*) at each school (see, e.g., SM Section 8.2).[35] Seventy-three percent of the Aid Information Treatment maps contained variation across schools in the number of foreign aid projects. Since politicians might care about both the volume and breadth of donors' involvement in a school, we consider both the number of projects and the number of goods types in our analysis below (as pre-specified).

Voting Information Treatment

The Voting Information Treatment improves politicians' ability to assess the political preferences of their constituencies. Our interviews and piloting activities suggest that politicians often consider voter preferences when making spending allocation decisions.[36] For instance, in an interview, one District Commissioner said, "Whenever [we] conduct a meeting with the elected officials to identify the area where the development should go, most of them choose the area where he got more votes." Politicians also justify their decisions similarly. One politician, when asked to justify his allocation decisions in our piloting activities, explained that he "was taking into consideration how people voted for [him] so [he] wanted to please [his] people."

In order to measure voter preferences at the community level, we collect polling station-level data on the votes received by all politicians in the most recent (2014) election. A large proportion (68%) of the schools in our sample are also polling stations, allowing us to directly measure voter preferences in those communities. For those schools in our sample which are not used as polling stations (32%), we measure voter preferences by using the geographically nearest polling station to the school. In the Voting Information Treatment, we use these data to populate maps with the percentage of votes politicians received at or near each school shown (*Percent Votes*).[37]

Estimation

To test our hypotheses, we estimate how Need Information, Aid Information, and Voting Information change the odds a politician allocates to a school with certain traits.

Formally, let $P(Y_{nsi} = 1)$ indicate the probability politician n chooses school i in map s. In the absence of any information treatment, we expect that this probability will vary depending on the levels of *School Need Index*, *Aid Project Count*, *Aid Good Types*, and *Percent Votes*, as defined above. Let these characteristics of each school equal z_{is}. Let X_{is} be a vector of school-specific controls.

To estimate information treatment effects, we evaluate how the effects of z_{is} vary with treatment assignment. Let $t_s \in [0, 1]$ be our randomly assigned treatments of information at the map level. Our treatment equals one if map s has been assigned to a treatment group and zero if it is in a control group. To estimate the effects of treatment, we interact t_s with z_{is} as in the following equation:

$$P(Y_{nsi} = 1) = \phi(\beta_1 z_i + \beta_2 t_s z_i + \gamma X_{is} + e_{nsi}). \quad (2)$$

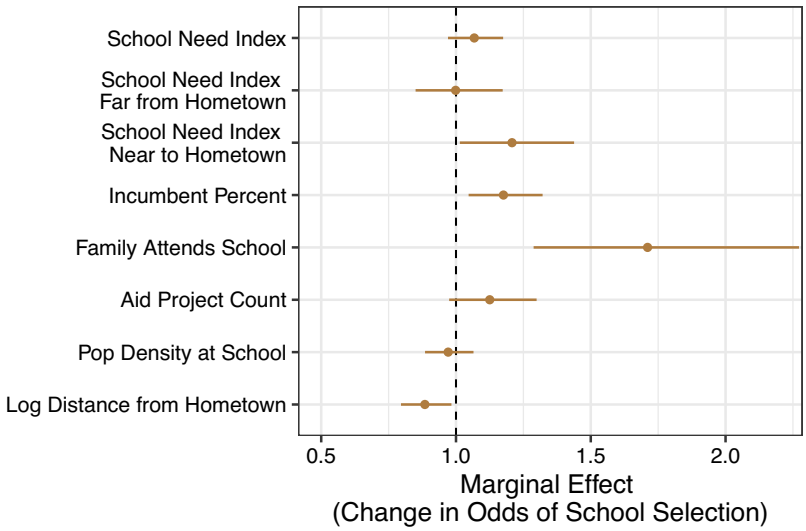
We estimate ϕ using a conditional logit model (conditioned on map s). The conditional logit is an extension of the logit model for discrete choice experiments where individuals make decisions between more than two outcomes (McFadden 1973). The estimates from a conditional logit estimator are generally less biased than alternative estimators in this setting.[38] In SM Section 4.9, we also show consistent estimates using a linear probability model with fixed effects for each s. The conditional logit model averages the odds of a school being selected for allocation within each choice map, so variables that do not vary within s drop out of the estimating equation (such as t_s). Since politicians each make more than one choice, we cluster our errors at the politician level. Conservatively, we use two-tailed hypothesis tests throughout.

Below we show estimates from three separate equations, one for each t_s and z_{is} pair. In SM Section 4.7, we also show results jointly estimating all treatment effects and their interactions. We are primarily interested in β_2, which corresponds to the change in the effect of z_{is} in treatment versus control.

We are also interested in estimating how the information treatment effects vary with information costs. We estimate these conditional average treatment effects using a triple interaction term. That is, for each conditioning variable w_i, we estimate the following equation and then analytically calculate the treatment effect and standard error conditional on w_i:

[33] See SM Section 7.2.
[34] An additional four donors did not respond to our queries. See SM Section 8.3 for the protocol and donor list.
[35] We classified the goods into capacity building, construction, health services, food provision, community support, gender issues, and teacher training. Some projects encapsulate multiple types.
[36] See SM Section 7.1.
[37] See SM Section 8.2.
[38] For a discussion of trade-offs in the estimation of discrete choice experiments, see Clark et al. (2014) and McFadden (1973).

FIGURE 7. Association between School Characteristics and School Selection



Note: This figure shows exponentiated coefficients from separate conditional logistic regressions of school selection on each variable. The sample is limited to maps that do not contain the information treatment related to each school characteristic. Ninety-five percent confidence intervals are shown in the horizontal lines. Standard errors are clustered on politician. Continuous variables are normalized for comparison purposes. See SM Tables S2–S7 for tabular estimates.

$$P(Y_{nsi}=1) = \phi\Big(\beta_1 z_i + \beta_2 w_i + \beta_3 t_s z_i + \beta_4 t_s w_i + \beta_5 z_i w_i + \beta_6 t_s z_i w_i + \gamma X_{is} + e_{nsi}\Big). \quad (3)$$

We include estimates with and without control variables. Our pre-specified controls include *Log Permanent Classrooms, Log Temporary Classrooms, Log Teacher Houses Permanent, Log Teacher Houses Temporary, Opposition Percent Votes (for MP and LC), Log Enrollment, Number of Aid Projects, Family Attends School, Incumbent Percent at Polling Station*, and *School Need Index*.[39] We normalize continuous variables in our analysis; coefficients can be interpreted as the effects of a standard deviation change in a continuous variable (or a one-unit change in a count variable) on the odds or log odds of a school being selected for allocation by the politician. We also discuss within-sample predictions on a probability scale.

RESULTS

Allocation Patterns in the Absence of Information

We begin by considering patterns in the allocation decisions of politicians when information about the schools is not provided. In Figure 7, we show the coefficients from eight different regressions of school selection on school characteristics. In each regression, we subset the data to include only maps in the relevant control group: those maps without information about that school characteristic (e.g., the regression of school selection on school needs excludes maps with the Need Information Treatment).

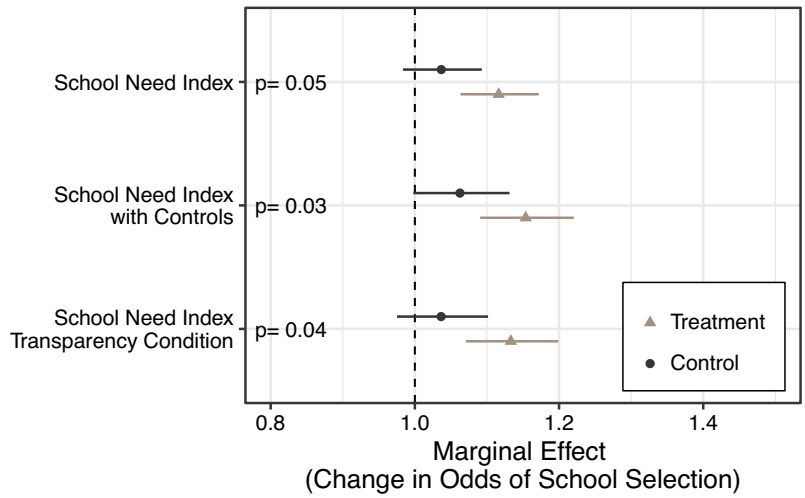
These estimates are not causally identified; however, they are consistent with our assumption that politicians prefer to spend in areas we identify as having greater need and areas that are more electorally supportive. Each standard deviation increase in *School Need Index* is associated with an increase of 1.07 in the odds that politicians select a school, though this effect is not significant ($p = 0.17$). However, consistent with our argument about information costs, these odds increase to 1.21 when a school is a standard deviation closer than average to a politician's hometown (14 km). This observations implies that politicians are most responsive to the needs of communities that are geographically proximate.

Likewise, schools in electorally supportive communities are also more likely to be selected—as we would expect if politicians weigh the electoral consequences of their actions. A standard deviation increase in percent votes for a politician (21 pp) is associated with a 1.18 increase in the odds of a school being selected.

Geographic and familial proximity are also associated with higher odds of allocation. For each standard deviation increase in distance from a politician's hometown, the odds of a school being selected decrease by 0.12. The odds that a school with a family member is selected are nearly double (1.7 times) the odds that a school without a family member is selected.

[39] Summary and coding details are in SM Section 6.

FIGURE 8. Effects of Need Information on School Selection



Note: Circles indicate estimated effects of *School Need Index* on the odds of a school being selected in the control group (those appearing on maps without the Need Information Treatment). Triangles indicate estimated effects in the treatment group (those appearing on maps with the Need Information Treatment). Horizontal lines indicate 95% confidence intervals. The *p*-values on the left indicate the probability our treatment estimate is consistent with a null effect. For estimates in tabular form, see SM Tables S8 and S9.

These results might seem unexpected in light of the fact that politicians score relatively low in tests of constituency knowledge. However, considered together, we think that these results are consistent with politicians relying on biased heuristics rather than government data. A politician might infer from talking to village leaders whether a community is politically supportive and that politician will be able to effectively—even if unintentionally—target based on voting patterns. Such a politician, however, might still do quite poorly in differentiating between communities that voted for her, for example, at 20% as opposed to 30%, or in identifying needs in less proximate areas.

Effects of Need Information

We next consider the tests of our hypotheses regarding the effects of the information treatments. We first hypothesized that the Need Information Treatment would cause politicians to be more likely to allocate to high-need schools (H1).

For ease of interpretation, we plot our treatment estimates in Figure 8. The figure shows the estimated effect of a standard deviation change in *School Need Index* on the odds a school is selected by the politician. We show effects among schools included in the Need Information Treatment group in light-colored lines. We show effects among schools omitted from the Need Information Treatment group in dark-colored lines. The *p*-values on the left show the probability the effect of the Need Information Treatment is consistent with a null effect. Coefficients are presented in Table 2.

The results are broadly consistent with our hypotheses. A standard deviation increase in *School Need Index* increases the odds of a school being selected by 1.04 in control and 1.12 in treatment, for a net treatment effect of the Need Information Treatment of 0.08 ($p = 0.05$).[40] These effects imply a potentially large shift in the allocation of resources among politicians with better information. In within-sample predictions, we estimate that politicians are about 13% more likely to select a school in the highest quartile of the *School Need Index* when they are exposed to need information.

We fail to see evidence that treatment effects are significantly larger among politicians in the combined transparency treatment (H4), or in the individual Donor Report and Radio Broadcast transparency arms. We discuss in the Conclusion some potential explanations for the weak effect of transparency.

Effects of Aid Information

We hypothesized that the Aid Information Treatment would cause politicians to be less likely to select schools with more foreign aid projects or more types of aid goods. Our estimates in Figure 9 and Table 3 are consistent with this "crowding out" effect. On average, Aid Information decreases the odds of a school with one foreign aid project being selected by 0.21 ($p = 0.05$).[41] In our sample, we estimate that receiving the Aid Information Treatment reduces the probability of allocating to a school with at least one aid project by 8%.

[40] Here, we report uncorrected *p*-values for each of our hypotheses. In SM Section 4.2, we show our estimates after correcting for multiple comparisons within each family of hypotheses. The *p*-values on our treatment effects are larger after these corrections. However, particularly in specifications with controls, *p*-values on H1 and H2 remain near 0.10 (0.05 in a one-tailed test) after correction.

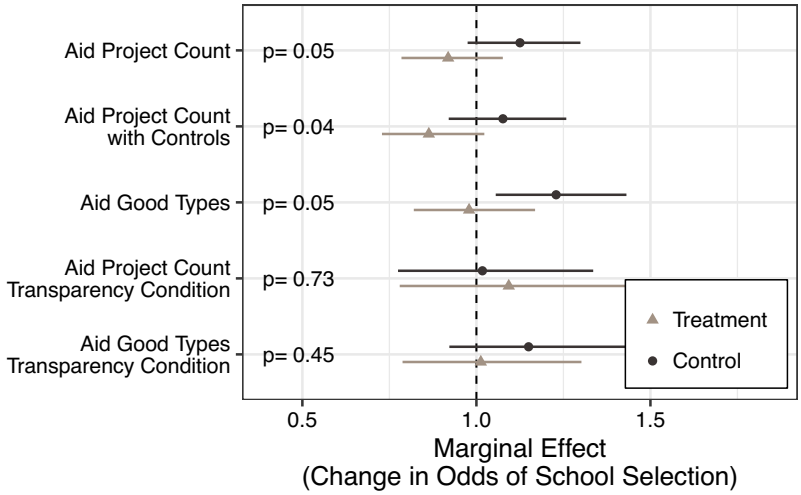
[41] On average, schools have 0.9 aid projects.

TABLE 2. The Effect of School Need Information on School Selection

	(1)	(2)
Need Treatment × School Need Index	0.074**	0.082**
	(0.038)	(0.039)
School Need Index	0.036	0.061*
	(0.027)	(0.031)
Controls	No	Yes
N Maps	1,164	1,164
N Schools	3,492	3,492
Pseudo-R^2	0.005	0.020

Note: This table shows the coefficients (in log odds) from conditional logit regressions of school selection. Standard errors are clustered on politician. See SM Section 3.3 and Table S8 for complete model results. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

FIGURE 9. Effects of Aid Information on School Selection



Note: Circles indicate estimated effects of *Aid Project Count* or *Aid Good Types* on the odds of a school being selected in the control group (those appearing on maps without the Aid Information Treatment). Triangles indicate estimated effects in the treatment group (those appearing on maps with the Aid Information Treatment). Horizontal lines indicate 95% confidence intervals. The *p*-values on the left indicate the probability our treatment estimate is consistent with a null effect. For estimates in tabular form, see SM Tables S10 and S11.

In addition to the number of aid projects, we consider the effect of information about the number of donor-provided goods types (*Aid Good Types*). We find that when a politician learns from the Aid Information Treatment that there are three types of goods being delivered by donors at a school (the average is 2.6), the odds of the politician allocating to that school decrease by 0.91 ($p = 0.05$).

We see little evidence of a different treatment response for politicians in the Transparency Treatment group.

Effects of Voting Information

Finally, in Figure 10 and Table 4, we consider the effects of the Voting Information Treatment. We see little evidence that information about voting changes politicians' allocation decisions (H3).

These weak effects are somewhat surprising given the low-level of knowledge about voting that politicians exhibited in our knowledge quiz (Figure 3). One possible explanation is that politicians can obtain voting information at low cost from party and election politicians, which would imply the Voting Information Treatment did not fill any unmet demand. Alternatively, information about voting in 2014 may have been too stale to be useful due to rapidly changing voter preferences (most councilors ended up losing their seats in 2019). In SM Section 4.8, we consider a number of subgroup interactions in an attempt to distinguish between these explanations. Among other things, we evaluate whether treatment effects differ when politicians anticipate contesting elections or when they have more experience in the constituency. We do not see effects inconsistent with the null hypothesis in any subgroup.

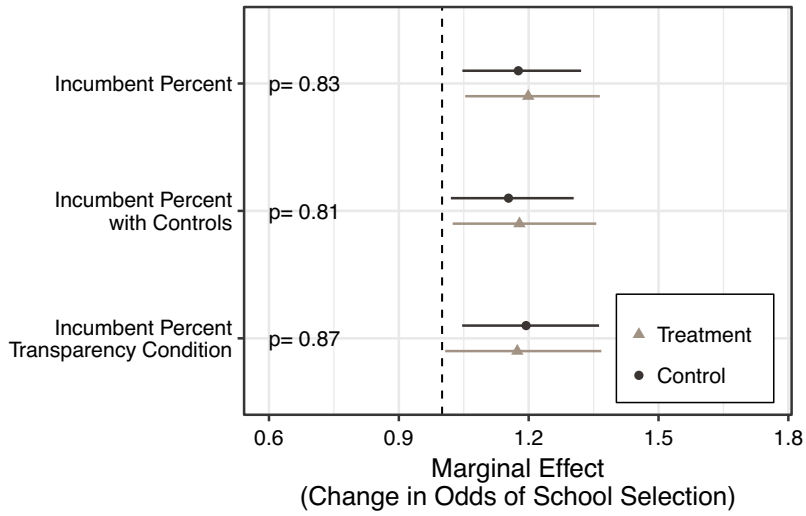
A final possibility is that there are other unmeasured ways in which politicians are incorporating voting information. It is difficult to rule this out entirely; however,

TABLE 3. The Effect of Foreign Aid Information on School Selection

	(1)	(2)	(3)	(4)
Aid Treatment × Aid Project Count	−0.203*	−0.220**		
	(0.113)	(0.115)		
Aid Project Count	0.118	0.073		
	(0.079)	(0.083)		
Aid Treatment × Aid Good Types			−0.227*	−0.239*
			(0.120)	(0.122)
Aid Good Types			0.206***	0.165**
			(0.086)	(0.089)
Controls	No	Yes	No	Yes
N Maps	1,164	1,164	1,164	1,164
N Schools	3,492	3,492	3,492	3,492
Pseudo-R^2	0.001	0.019	0.002	0.019

Note: This table shows the coefficients (in log odds) from conditional logit regressions of school selection. Standard errors are clustered on politician. See SM Section 3.3 and Table S10 for complete model results. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

FIGURE 10. Effects of Voting Information on School Selection



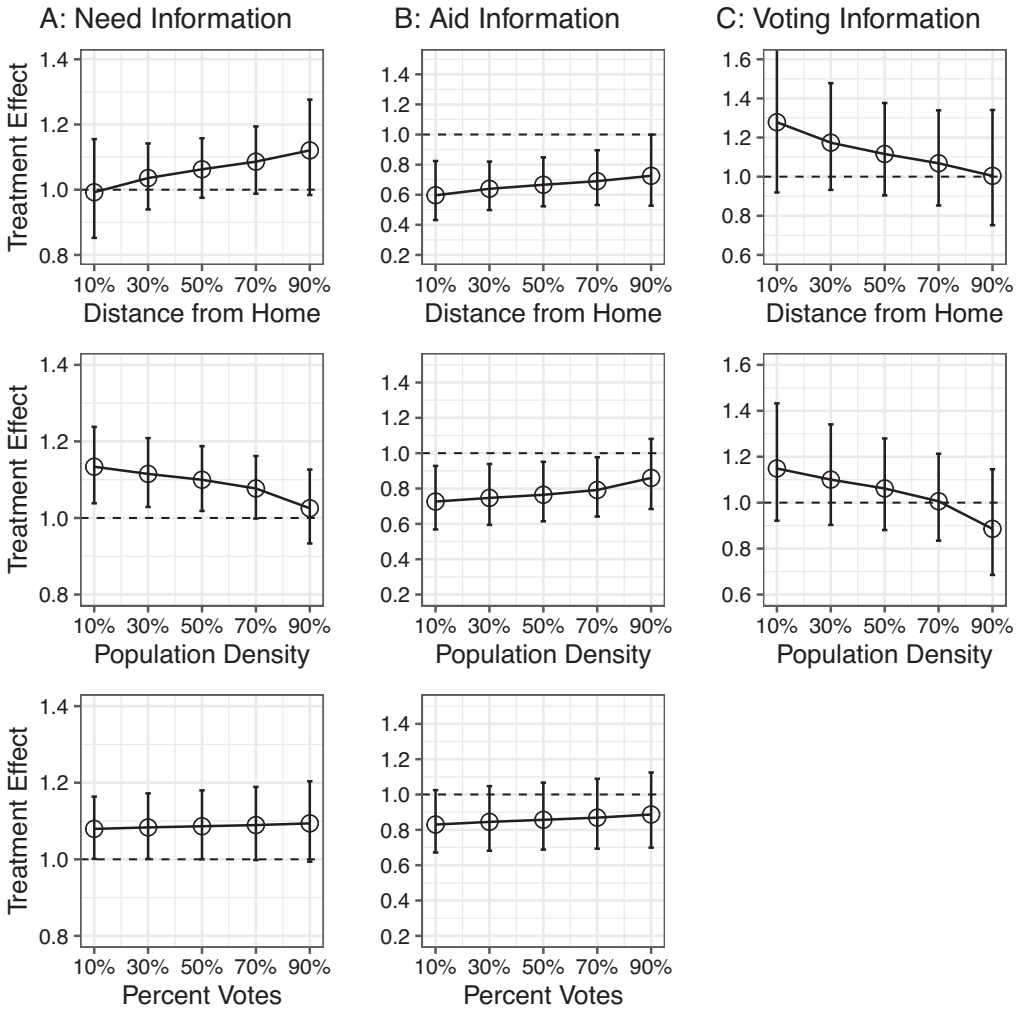
Note: Circles indicate estimated effects of *Percent Votes* on the odds of a school being selected in the control group (those appearing on maps without the Voting Information Treatment). Triangles indicate estimated effects in the treatment group (those appearing on maps with the Voting Information Treatment). Horizontal lines indicate 95% confidence intervals. The *p*-values on the left indicate the probability our treatment estimate is consistent with a null effect. For estimates in tabular form, see SM Tables S12 and S13.

TABLE 4. The Effect of Political Information on School Selection

	(1)	(2)
Voting Treatment × Incumbent Percent	0.019	0.022
	(0.090)	(0.091)
Incumbent Percent	0.162***	0.143**
	(0.065)	(0.069)
Controls	No	Yes
N Maps	1,161	1,161
N Schools	3,482	3,482
Pseudo-R^2	0.004	0.019

Note: This table shows the coefficients (in log odds) from conditional logit regressions of school selection. Standard errors are clustered on politician. See SM Section 3.3 and Table S12 for complete model results. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

FIGURE 11. Interaction Effects of Information Treatments and Distance, Population, and Voting



Note: This figure shows conditional average treatment effects of each information treatment (in odds). In columns A, B, and C, we show the effects for Need Information, Aid Information, and Voting Information, respectively. In rows 1, 2, and 3, we show how these conditional average treatment effects vary by the school's distance from the politician's hometown, population density at the school, and the percentage of votes for the politician at the nearest polling station to the school. All *x*-axes are shown in percentiles. For estimates in tabular form, see SM Tables S14–S16.

in SM Section 4.6, we consider if information causes more targeting of marginal communities, as one would expect if politicians were targeting swing voters. We do not see evidence consistent with this alternative.

HETEROGENEOUS EFFECTS BY INFORMATION COSTS

In H5, we posit that the effects of information vary with the costs associated with obtaining information in the absence of our treatments: the treatment effects will be greater when the costs of otherwise obtaining information are higher. We anticipate that it is particularly costly to obtain information about areas far away from the politician's home town, areas with lower population density, and areas where the politician received fewer votes.

In Figure 11, we depict the conditional average treatment effect estimates for each combination of the information treatments and the proxies for information costs. The estimated treatment effect in odds is shown on the *y*-axis and the percentile of the conditioning variable is shown on the *x*-axis.

The results are mixed yet broadly consistent with H5. The effects of the Need Information Treatment are larger in communities that are farther from a politician's hometown or in areas with low population density. In communities that are at the 70th percentile of distance, for instance, we estimate the conditional average treatment effect of *School Need Index* is 1.09 times higher in treatment versus control. In contrast, in nearby communities (those around the 10th to 30th percentiles of

distance), we estimate conditional average treatment effects near zero. We do not see evidence that treatment effects differ for communities with more supporters of the politician.

The conditional average treatment effects of the Aid Information Treatment are mixed. While this treatment is no more likely to shift spending allocations to near or far schools, we do see a larger conditional average treatment effect in less densely populated and lower vote communities.

These different effects of the Aid Information and Need information Treatments may be due to the different ways in which politicians collect information about aid and school needs. While citizens have institutionalized means to communicate community needs to politicians, there is no similar mechanism for politicians to learn about foreign aid. It may be that politician knowledge about foreign aid is better predicted by politicians' networks with elites and development actors, as proxied by population density and political support.

Consistent with our results elsewhere, we do not see meaningfully different conditional average treatment effects for the Voting Information Treatment.

EVALUATING MECHANISMS AND GENERALIZABILITY

We consider several alternative explanations for our effects of information. One possibility is that our estimates are influenced by social desirability or experimenter/donor demand. While we emphasized that there were "no restrictions" on the politicians' decisions and that selected schools would be randomly selected to receive school supplies in a public lottery, some politicians still may have believed that a donor, their constituents, or the research team expected a particular decision. Relatedly, responses might be influenced by Hawthorne effects: that is, politicians may have made different decisions because they knew they were being observed.

It is difficult to rule out such effects entirely. The intention of our study was to mimic fairly typical interactions between NGOs and politicians rather than to provide information in a lab-like setting. The value of this setting is that our treatment effects are likely generalizable to similar kinds of real-world decision contexts. However, the cost is that it is difficult to identify the motivations underlying politicians' decisions. It is certainly possible that the behavior we observe is specific to the decision context and we caution against generalizing the findings to vastly different decisions—for example, those made in a legislative context.

Nonetheless, there are reasons to think that politicians' decisions were primarily motivated by the consequences of their spending decisions for constituents. First, politicians did not always allocate goods in ways that donors or NGOs would consider desirable. Politicians allocated more to political supporters and family members and often justified their decisions with reference to electoral consequences. Moreover, politicians responded to aid information in a way that is contrary to the way donors usually portray their interests. Donors often take steps to avoid exactly the kind of re-allocation of resources we observe in this experiment (Morrissey 2015). Moreover, we see no evidence from our Transparency Treatment that sharing politician decisions with donors altered decision-making. Nor did decisions differ among politicians with more interaction with donors or those who knew our partner NGO.[42] We also think it unlikely that politicians were responding to the interests of the research team. Because implementation was done through an NGO and RAs identified themselves (honestly) as NGO representatives, it seems unlikely that politicians would align their behavior with research expectations.

Politicians' post-treatment behavior also suggests that they took the decision seriously and were motivated by concerns for their constituents. Many politicians followed up with our research team to learn details of the lottery and delivery and a number physically attended one or both. Additionally, when asked to justify their allocation decisions, only five politicians specifically mention our partner (Tearfund) and only six mention "you" (the RA). Instead, many politicians refer specifically to the information provided during the experiment and justify their decision with reference to constituent needs.[43] For instance, 174 politicians outright said that they were choosing a school because it had *not* been supported by donors. That said, to the extent donor and voter preferences are aligned, it is impossible to fully eliminate the concern that donors, in addition to or instead of voters, are affecting politician decision-making.

One might question whether our findings would generalize to other settings. While the decisions of politicians in our experiment might seem removed from traditional budgetary processes, politicians make these kinds of budgetary decisions with donors and NGOs on a regular basis in many low-income countries. The kind of decision setting is also similar to the ways politicians make other forms of discretionary spending decisions. For instance, the allocation of constituency development funds frequently requires politicians to select among multiple competing projects and locations and make binding recommendations (Harris and Posner 2019). Still, an important caveat to our results is that we cannot say for certain that results would not differ if the decisions were over budgetary allocations or if funds came from government budgets or tax revenue. It is also possible that the preferences of the NGO (or donors in general) may be given more weight in decisions about NGO funding due to the perceptions of greater donor oversight or concerns about repercussions for "incorrect" decision-making.

One might also question whether our findings would generalize to policy interventions that use alternative modes of information dissemination. One potentially important difference is that some policy interventions

[42] See SM Section 4.3.
[43] See SM Section 5.1.

rely on empowering citizens to communicate with politicians rather than providing information to politicians directly (see, e.g., Grossman, Humphreys, and Sacramone-Lutz [2020]; Gulzar, Hai, and Paudel [2021]). Such interventions may cause politicians to respond based on the status of voters rather than on the type of information (Grossman and Slough 2021). Additionally, the fact that we deliver highly targeted information at the point of decision-making may be important. Other interventions that focus on lowering the costs of information through dashboards or regular reporting sometimes may find different effects due to higher search costs and the fact that politicians can opt-in or out of being well-informed.

CONCLUSION AND POLICY IMPLICATIONS

Our study establishes that providing information to in-office politicians shifts the allocation of spending. Need information increases allocation to high-need areas and aid information reduces allocation to high-aid areas. However, voting information does not affect allocations across high- and low-support areas. Information appears to have a larger effect on politician spending decisions in harder-to-access (and, therefore, harder to learn about) areas, such as those far from the politician's hometown or those in an area with low population density. These heterogeneous effects suggest that information gaps may explain disparities in public spending, and imply that information has the potential to reduce these disparities.

We do not find that transparency makes politicians respond differently to information. This may be because our study is relatively under-powered to detect such effects. Our power to identify the moderating effect of transparency is less than half that of our main hypotheses.[44] Another possibility is that citizens and donors are not willing to sanction politicians for ineffective allocations. But, contrary to this explanation, our focus groups with citizens suggest a high degree of willingness to sanction politicians for targeting political supporters or family members. Instead, we think that a likely explanation is that citizens themselves lack sufficient information to sanction politicians. Citizens' ability to assess community needs, public spending, and foreign aid outside their own community is quite weak. Indeed, in our survey, we find that only 10% of citizens were aware of anything a councilor had done outside of their own community.[45] Donors likewise often struggle to stay informed of the activities of governments (Easterly and Pfutze 2008).

Certainly, we need more research and theoretical refinement to answer some of the questions we have posed. Our sample is relatively small and we cannot confidently rule out the null hypothesis for some of our treatments. We are especially under-powered to answer some questions about interactions across treatments, or to estimate heterogeneous effects. We think that there is productive work to be done to better understand the source of knowledge distortions among politicians and politicians' incentives to consume new information. Future research might also explore alternative types of information and modes of information delivery.

Still, from a policy perspective, our study provides evidence that programs to increase administrative capacity and lower the costs of information could have welfare benefits, especially for communities which have been marginalized in their access to government. Programs that make it easier to learn about areas of their constituency that are socially or geographically distant could be particularly effective. Likewise, the effects of foreign aid information in our study suggest that mechanisms for more substantial coordination and information dissemination between donors and government officials could improve the efficiency of policy.

Our results also suggests some reasons why policies to lower the costs of information might fail. The heterogeneity in responsiveness we document suggests that such interventions need to take context and incentives into account. Information is likely to be most effective when it aligns with officials' policy priorities, when politicians do not already have access to alternative and cheap sources of information, and when officials are able to easily and immediately consume relevant information while making policy decisions. We think a useful area of future research is to explore the ways in which such programs might influence officials' demand for information. Programs which help empower marginalized citizens and civic groups with better information to sanction poor spending decisions may be a particularly effective mechanism to incentivize well-informed policy.

SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit https://doi.org/10.1017/S0003055423001132.

DATA AVAILABILITY STATEMENT

Research documentation and data that support the findings of this study are openly available at the American Political Science Review Dataverse: https://doi.org/10.7910/DVN/HS5R5S.

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[44] See discussion in SM Section 4.1.
[45] See SM Section 7.2.

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CONFLICT OF INTEREST

The authors declare no ethical issues or conflicts of interest in this research.

ETHICAL STANDARDS

The authors declare the human subjects research in this article was reviewed and approved by the London School of Economics Research Ethics Committee and the Malawi National Commission on Science and Technology of Malawi and certificate numbers are provided in the SM. The authors affirm that this article adheres to the APSA's Principles and Guidance on Human Subject Research.

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