

Surrounded and Threatened: How Neighborhood Composition Reduces Ethnic Voting Through Intimidation*

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Abstract

Ethnic voting is an important phenomenon in the political lives of numerous countries. In the present paper, we propose a theory explaining why ethnic voting is more prevalent in certain localities than in others and provide evidence for it. We show that local ethnic geography affects ethnic voting by making voters of an ethnicity that finds itself in the minority fear intimidation by their ethnic majority neighbors. We provide empirical evidence for our claim using the data from the round 4 of the Afrobarometer survey in Ghana to measure the voters' beliefs that they are likely to face intimidation during electoral campaigns. Using geocoded data from rounds 3 and 4 of the Afrobarometer, as well as data from the Ghana Demographic and Health Survey, we find no evidence for local public goods provision as an alternative mechanism.

Keywords: Voter Intimidation, ethnic voting, neighborhood composition.

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1 Introduction

In this paper, we propose a theory of ethnic voting based on local ethnic geography. We advance the thesis that when members of an ethnic group surround another ethnic group in a neighborhood, a member of the ethnic group that is in the minority is likely to choose to vote for a candidate from the majority ethnic group rather than from her own group due to intimidation by the majority ethnic group or the fear of becoming a victim of intimidation should she fail to do so.

The desire and the perceived need of the minority ethnic group to vote for candidates from an ethnic group other than their own is due to the fact that, being surrounded by the majority ethnic group, it must necessarily interact with this group with a great frequency. This intensity of interaction is not achieved when both groups live in ethnically homogeneous communities and thus have fewer opportunities and incentives to communicate and engage in joint endeavors.¹

To support our claims, we make use of several variables from the Afrobarometer surveys in Ghana. First, we use the question that asks the respondents whether they fear becoming a victim of political intimidation during election campaigns and show that living in a neighborhood with a high percentage of Akans only makes an individual more likely to express the intention to vote for the NPP (the New Patriotic Party), the party known to advance the interests of Akans, candidate if this individual fears becoming a victim of political intimidation.

Second, we use the question that asks the respondents whether they believe that people have to be careful of what they say about politics. We show that being in an area that has a high number of Akans makes an individual more likely to express intention to vote for the NPP only if the individual believes that people have to be careful of what they say about politics.

We also address the most prominent alternative explanation for why individuals may

¹See [Blau 1977](#) for the argument that opportunities for interaction matter for the formation of social ties.

fail to vote along the ethnic lines: provision of local public goods. The instrumental theory of ethnic voting posits that individuals vote along ethnic lines because they expect that they will receive public goods only if they elect their coethnics (Ferree 2006, Carlson 2015). Recently, it has been suggested that provision of public goods may also explain why some individuals do not vote along ethnic lines: individuals living in a neighborhood where some ethnicity is in the majority may vote for the candidate of that ethnicity even if the candidate is not their coethnic because they anticipate that this candidate will provide non-excludable public goods in an area where the candidates' coethnics are in the majority (Ichino and Nathan 2013). We do not find support for this alternative explanation in the data.

Using geocoded data from rounds 3 and 4 of the Afrobarometer, as well as data from the Ghana Demographic and Health Survey (DHS), we show that the impact on the vote choice of living in a neighborhood with a high percentage of Akans does not vary depending on the presence of local public goods in the area, and that our finding that the percentage of Akans in the neighborhood only matters for the vote choice when the respondents fear intimidation is robust to controlling for local public goods provision (measured either in levels or changes). We also find that the percentage of Akans in the neighborhood has no statistically significant impact on the levels of local public goods provision.

The results in the present paper advance our understanding of ethnic voting and of the role of intimidation in the vote choice in developing countries. We show that the interaction between neighborhood composition and voters' concern about intimidation reduces ethnic voting. This finding implies that expressive motive for ethnic voting must be present. In particular, the minority group being less likely to vote along ethnic lines when it fears intimidation is consistent with expressive motive for ethnic voting, but not with an instrumental one.²

The results are especially relevant for those African countries which experience marked ethnic divides and recurrent episodes of electoral violence. Because we find that even in a

²See, for example, Posner 2005, Wantchekon 2003, Carlson 2012 on instrumental ethnic voting and, for example, Horowitz 1985 on expressive ethnic voting. Section 3 reviews the related literature on the theories of ethnic voting.

country like Ghana, which is considered to be one of the most stable democracies in Africa, voters' concern about intimidation impacts ethnic voting, our estimates are likely to be the lower bound on the estimates for a representative sample of developing countries. Thus the case of Ghana constitutes a hard test for our expectation that neighborhood composition affects ethnic voting by making voters of the minority ethnicity concerned about intimidation.

The rest of the paper proceeds as follows. Section 2 outlines the theory of ethnic voting that we propose. Moreover, section 2 provides qualitative evidence that voter intimidation is prevalent enough in Ghana to have an impact on the vote choice. Section 3 reviews the related literature. Section 4 describes the variables we use to measure voters' fear of political intimidation and their beliefs that people have to be careful in expressing their political opinions, as well as provides background information on ethnic groups and elections in Ghana. Section 5 presents empirical evidence that the percentage of Akans in a neighborhood affects vote choice through voters' concern about intimidation. Section 6 provides empirical evidence that the provision of local public goods does not explain the pattern found in the data. Section 7 concludes by discussing the implications of our findings for our understanding of ethnic voting and intimidation in elections in Africa.

2 Theory

2.1 Ethnic Voting and Intimidation

Our paper proposes a theory of ethnic voting based on local ethnic geography. We argue that, in order to avoid being intimidated by ethnic majority neighbors, members of the ethnic minority ethnicities vote for the parties associated with the ethnic majority. We argue that, moreover, were they not living in an area where they are in a minority, they would have instead voted for a party associated with their own ethnicity. Thus being surrounded by members of the majority ethnicity and desiring to avoid being intimidated by them causes ethnic minority voters to fail to vote along ethnic lines.

We define ethnic voting as the tendency of the voters belonging to an ethnic group to

vote for candidates from this ethnic group or candidates advancing the interests of this ethnic group. Thus absence of ethnic voting is understood as a failure of the voters to vote along ethnic lines. In the setting in the present paper, a tendency of individuals with non-Akan ethnicity to vote for the NPP, a party which is perceived to advance the interests of Akans, constitutes a voting pattern inconsistent with ethnic voting.

The patterns we find in the data suggest that the true preference of the individuals is to vote along ethnic lines: were individuals not to desire to vote along ethnic lines, fear of intimidation by ethnic majority neighbors would not have had a discernible impact on the vote choice of ethnic minorities living in the Akan-majority neighborhoods.³

The existing literature has argued that communities are able to enforce social norms through sanctions (Fehr and Gächter 2000, Masclet et al. 2003, Bursik and Grasmick 1993). Our contribution is to show that sanctions may be employed by the majority group towards the minority in order to advance the interests of the majority. For instance, if the preferred party of the majority ethnicity gains too few votes, the members of the minority ethnicity may experience intimidation aimed at inducing them to vote differently in the future. Because of the spatial proximity to the members of the majority ethnicity, this consideration is important for the minority voters.

We emphasize that the expectation that the ballot is not secret is not needed for the mechanism that we propose to work. To see why, consider the following example. Suppose that $2/3$ of the voters in a district are of the majority ethnicity, while $1/3$ are of the minority ethnicity, and it is known that each individual prefers to vote along ethnic lines. We call the party of the ethnic majority party A and the party of the ethnic minority party B . Suppose that with probability $2/3$ an individual experiences a preference shock causing her to vote for party A with probability $1/3$ and to vote for party B with probability $2/3$. Then if everyone votes for the majority ethnicity party (conditional on not experiencing a preference shock), its expected vote share is $5/9$, while if only the majority ethnicity voters vote for the majority party, its expected vote share is $4/9$. Thus if party A loses, the majority ethnicity can infer

³See Horowitz 1985, Chandra 2004 for theories of ethnic voting and additional empirical evidence for its presence.

that some members of the minority ethnicity failed to vote for it, which gives members of the majority ethnicity grounds for sanctioning members of the minority ethnicity.⁴

2.2 Evidence of Political Intimidation

The purpose of this section is to provide some evidence for the claim that the adverse consequences of political expression that voters of minority ethnicity can face may include electoral violence or political intimidation by the majority ethnic group.

There is qualitative evidence that intimidation is present in Ghanaian elections. According to the Freedom House report, “Ghanaian elections have been fraught with extreme tension, including intimidation, organized thuggery, and sporadic flare-ups of interparty violence” (Gyimah-Boadi and Brobbey 2012). The Carter Center, after observing the voter registration process for the 2008 presidential election in Ghana, reported that “In several areas visited by Center observers, it was clear that the lack of political tolerance produced an intimidating environment” (Carter Center 2008). Paul Nugent writes of the 2000 election in Ghana: “There was some pre-election violence in parts of Accra, significant bloodshed in Bawku during the first round of voting on 7 December and instances of intimidation at the time of the Presidential run-off on 28 December” (Nugent 2001, 406). Other scholarly (Gyimah-Boadi 2009) and journalistic (Kennedy 2011) accounts confirm the presence of political intimidation in the elections in Ghana.

Moreover, there is some qualitative evidence that a higher share of party supporters in a neighborhood facilitates voter intimidation. As one researcher writes, “The majority of the interviews and reported cases of violence in Ghana suggest that election-related violence often occurs in areas that are strongholds of one of the two larger parties, where minority supporters can easily be intimidated” (Amankwaah 2013, 14).

⁴A similar argument has been made in the vote buying literature, which finds that brokers can use aggregate electoral results to sanction groups instead of relying on observing the individuals’ votes (see, for example, Rueda 2017).

3 Related Literature

The present paper is related to the social psychology literature on intergroup relations, as well as to the literature on ethnic voting and its determinants.

3.1 Intergroup Relations

Within the social psychology literature, the contact hypothesis ([Allport 1954](#)) predicts that contact between different groups should reduce intergroup prejudice and thereby improve intergroup relations.

The literature also speaks to how local ethnic geography shapes contact between different ethnic groups. There is a sizable body of literature providing evidence that the smaller the numbers of an ethnic minority group in a neighborhood are, the greater are its social ties to the majority ethnicity (see, for example, [Martinovic, van Tubergen and Maas 2009](#), [Vervoort 2012](#)). The increased opportunities for contact with the majority group are a likely reason for this ([Blau 1977](#)).

Our paper also relates to the literature on the enforcement of social norms. This literature has shown through lab experiments that individuals are willing to forego material profits in order to punish behavior that they perceive as antisocial or deviating from the norm ([Fehr and Gächter 2000](#), [Masclét et al. 2003](#), [Nikiforakis and Normann 2008](#)). In sociology, social disorganization theory argues that the inhabitants of neighborhoods exercise informal social control over their neighbors, which reduces crime rates, and that socially cohesive neighborhoods are better at exercising such control ([Bursik and Grasmick 1993](#)).

Our paper relates to the above-mentioned strands of literature in the following ways. Our conclusions are more pessimistic than those suggested by the contact hypothesis: whereas the contact theory posits that intergroup interactions promote intergroup harmony through reducing prejudice, our results suggest that instead contact between groups may cause the minority group to not engage in ethnic voting because it fears being intimidated by the majority group. We theorize that the reason for this, as suggested in [Blau \(1977\)](#), is the increased opportunities for interpersonal interactions afforded by spatial proximity. In

contrast to the literature on the sanctioning of anti-social behavior, our results suggest that the majority group may employ sanctioning not only in order to deter anti-social behavior, but also to advance its group-specific interests.

3.2 The Determinants of Ethnic Voting

Theories of ethnic voting have argued that citizens engage in ethnic voting due to either instrumental reasons or expressive reasons. Instrumental ethnic voting is conceptualized as individuals voting for the candidates because the ethnicity of those candidates provides information about the groups to which these candidates are likely to deliver public goods and other benefits (Ferree 2006, Carlson 2015). In particular, individuals engaging in instrumental ethnic voting expect that politicians will provide benefits only to their coethnics, to the extent that these benefits are excludable. On the other hand, expressive ethnic voting is devoid of such concerns. Instead, it is seen as being akin to ideological voting (Wantchekon 2003), conceptualized as using the act of casting a vote as an affirmation of one's identity as a member of an ethnic group (Horowitz 1985) or is viewed as an effort to elect a coethnic candidate because having a coethnic candidate in power raises the status of the ethnic group that the voter belongs to (Chandra 2004).

By providing evidence that citizens can fail to engage in ethnic voting because they feel intimidated, the present paper contributes to a more nuanced understanding of ethnic voting. Thus it possible that individuals would like to engage in ethnic voting for expressive reasons but choose not to, for fear of adverse consequences of political expression in the localities where another ethnic group is in the majority.

Previous literature has identified the impact of local ethnic geography on ethnic voting. Ichino and Nathan (2013), using data from Ghana as we do, have shown that a higher percentage of citizens of a particular ethnicity in a neighborhood makes non-coethnics more likely to vote for the candidates of that ethnicity. They have suggested that this is due to the expectation that politicians will provide local public goods in the areas where their coethnics are in the majority and, because these public goods are locally non-excludable, individuals

of the minority ethnicities living in these areas will also benefit from them. However, Ichino and Nathan (2013) have not provided empirical evidence for the mechanisms through which local ethnic geography affects ethnic voting. The present paper confirms that neighborhood composition affects vote choice and provides evidence that this impact is due to the voters' concern about intimidation.

Thus literature on voter intimidation is related to the present paper. The literature on the vote choice in Africa has recognized the effectiveness of illicit tactics such as vote-buying and intimidation in influencing voters. Most of the authors theorize that when either the incumbent or the challenger has an opportunity to use voter intimidation, it could be optimal for him to do so in order to win. Moreover, the conditions under which candidates are expected to use voter intimidation are related to the electoral support of the candidates and their ability to identify swing voters (Collier and Vicente 2012; Chatuverdi 2005; Robinson and Torvik 2009; Ellman and Wantchekon 2000, Wantchekon 1999). These models, while providing insightful analyses, consider neither the interaction between neighborhood composition and voter intimidation, nor its impact on ethnic voting.⁵

4 Measuring Voters' Concerns

4.1 Main Independent Variables

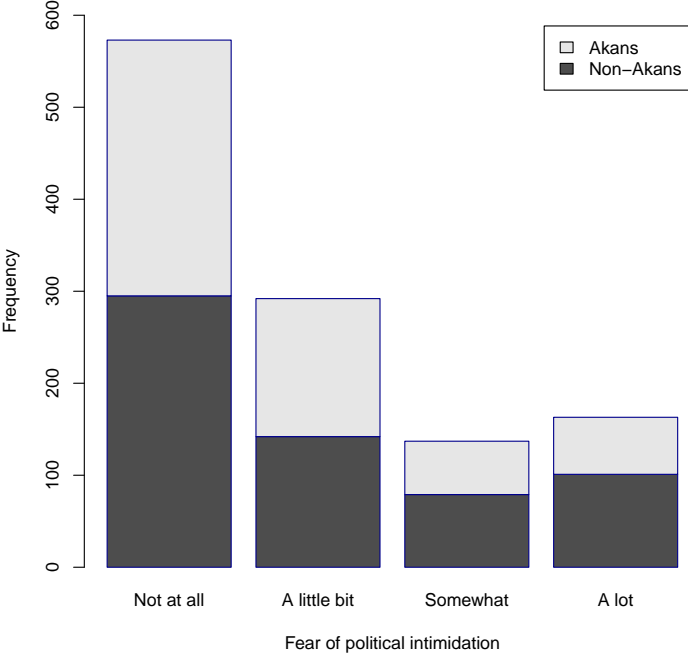
We use the following question from round 4 of the Afrobarometer to measure intimidation: "During election campaigns in this country, how much do you personally fear becoming a victim of political intimidation or violence?"⁶ Figure 1 shows the distribution of the fear of political intimidation. 51% of the 1200 respondents report that they fear political intimidation "A little bit," "Somewhat," or "A lot," while the remaining 49% do not fear

⁵An exception is Fafchamps and Vicente 2013. However, the focus of their work differs from ours: they are interested in the effects of anti-intimidation campaigns and the channels through which such campaigns work, including local interactions.

⁶We have recoded the responses so that 0 means "Not at all", 1 means "A little bit," 2 means "Somewhat," and 3 means "A lot". The original coding uses the same scale but goes in the reverse order. That is, in the original Afrobarometer coding, 0 means "A lot", 1 "Somewhat", 2 "A little bit", and 3 "Not at all". If the respondent answered "Don't know" or refused to answer, we treat the observation as missing.

being victim of political intimidation. A closer look at the distribution of the political intimidation variable reveals that 25% of the respondents fear political intimidation “A little bit,” 12% fear political intimidation “Somewhat,” and 14% of the respondents fear political intimidation “A lot.” Moreover, figure 1 reveals that non-Akans fear political intimidation to a greater extent than Akans.

Figure 1: Distribution of the fear of political intimidation expressed by Afrobarometer respondents

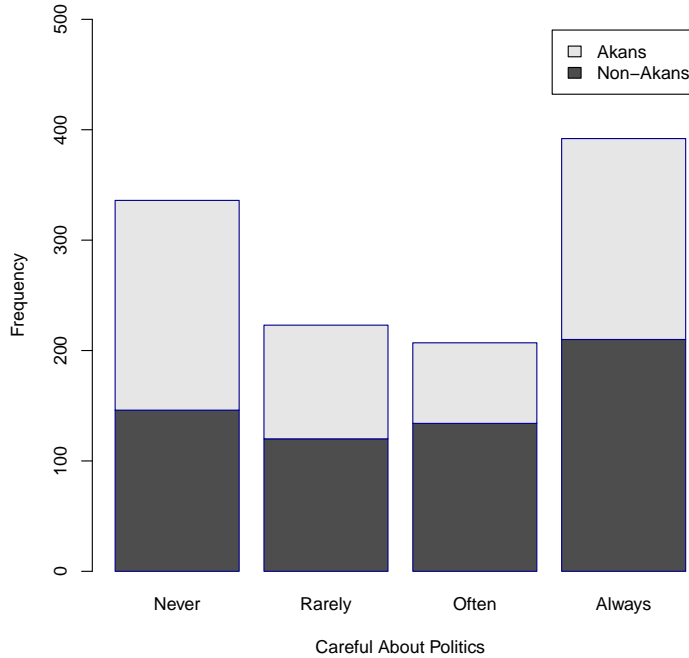


The following question from the Afrobarometer is used to measure the voters’ belief that they cannot express their political views freely: “In this country, how often do people have to be careful of what they say about politics?”⁷ Figure 2 shows the distribution of the belief that people have to be careful of what they say about politics as expressed by the respondents in round 4 of the Afrobarometer survey in Ghana. 52% of the respondents report that people have to be careful of what they say about politics “Often” or “Always”, while the remaining 48% of the respondents believe that people in Ghana “Rarely” or “Never”

⁷The responses are coded as follows: 0 means “Never”, 1 means “Rarely”, 2 means “Often” and 3 means “Always”.

have to be careful in expressing their political views.

Figure 2: Distribution of the belief that people have to be careful of what they say about politics



These descriptive statistics suggest that political intimidation and concerns about political expression are prevalent enough in Ghana to affect electoral outcomes and lend plausibility to our hypothesis that neighborhood composition affects vote choice through voters' fear of intimidation.⁸

4.2 Data

The main dependent variable in our analysis is a binary indicator that takes a value of 1 if the respondent indicated the intention to vote for the NPP and 0 otherwise. The main independent variables that we use are *Political Intimidation*, *Careful*, and the share of Akans

⁸These conclusions, based on the Afrobarometer data, are confirmed by other public opinion surveys. For example, in the 6th wave of the World Values Survey in Ghana (conducted in 2011) almost 50% of respondents said that "Voters are threatened with violence at the polls" "Often" or "Fairly often" (Question 228H).

in a 30 km radius around the respondent’s location. 1200 respondents participated in round 4 of the Afrobarometer in Ghana. Table 2 in the Appendix presents descriptive statistics for the variables used in our analysis.

We note that the Afrobarometer data is better suited for the analysis of the impact of the neighborhood composition on vote choice than other possible data sources, such as the polling station-level data. This is because, as we explain in greater detail in the Appendix, the use of aggregate data for explaining individual-level behavior is problematic. Consider the following example. If a higher share of Akans in a neighborhood was associated with a higher percentage fearing intimidation and a higher percentage voting for the NPP at a polling station, we could not be sure whether it is the individuals who fear intimidation, or a different set of individuals entirely, that were voting for the NPP. In other words, polling station-level data is subject to the ecological inference problem. As we show in the Appendix, once we properly account for the uncertainty in the estimates by clustering the standard errors by electoral districts, we find that the polling station-level data do not contain enough variation to precisely estimate the effects we are interested in.

4.3 Ethnic groups and Elections in Ghana

In this section we briefly summarize the facts about ethnic groups and elections in Ghana that are relevant to our arguments. Akans are the largest ethnic group in Ghana, comprising 44 percent of the population. The other sizable ethnic groups are Dagombe, Ewe and Ga, comprising 16, 12 and 8 percent of the population respectively ([Encyclopedic World Atlas 2002](#), 108).

Since 1992, parliamentary and presidential elections have been held in Ghana every four years. The National Patriotic Party (NPP) and the National Democratic Congress (NDC) emerged as the main contenders in the elections. The NDC won the election in 1992. Since then, power changed hands between the NDC and the NPP three times: in 2000, 2008 and 2016. The 2008 election was the closest in Ghana’s history, with the NDC presidential candidate winning the runoff election with 50.23% of the vote.

Ethnic voting has been prominent in Ghanaian elections, with the NPP being seen as the party associated with Akans. On this, Ziblim Iddi writes “In Ghana, the Ashanti and Volta regions are noted for voting largely along ethnic lines. The Akan votes in the Ashanti region largely go to the NPP, while the Ewe votes in the Volta region go to the NDC” (Iddi 2016, 80).

5 The Impact of the Concern about Intimidation

5.1 Main Results

Model (1) in table 1 estimates the impact of the percentage of Akans in the neighborhood on the intention to vote for the NPP candidate. We find that the impact of the percentage of Akans in the neighborhood on the intention to vote for the NPP candidate is not statistically significant.

Model (2) in table 1 adds to the specification used in model (1) an interaction of the percentage of Akans in the neighborhood and the *Intimidation* variable.⁹ We find that the percentage of Akans in the neighborhood has no statistically significant impact when *Intimidation* is 0 or 1 but has a positive and statistically significant impact when *Intimidation* takes values 2 and 3 on a scale that goes from 0 to 3. Substantively, increasing the percentage of Akans in the 30 km radius by 10% makes a respondent who fears becoming a victim of political intimidation or violence during an election campaign “Somewhat” 1.72% more likely to express an intent to vote for the NPP candidate, while if the respondent fears political intimidation “A lot”, the probability of expressing an intent to vote for the NPP candidate increases by 2.56%.

Model (3) in table 1 adds to the specification used in model (1) an interaction of the percentage of Akans in the neighborhood and the *Careful* variable. Similar to the impact of *Intimidation*, we find that the percentage of Akans in the neighborhood has no statistically

⁹We use the data for Akans and not for other ethnic groups because the variation in the percentage of an ethnic group in a neighborhood is the greatest for Akans, and this variation facilitates a more precise estimation.

significant impact when *Careful* is 0 or 1 but has a positive and statistically significant impact when *Careful* takes values 2 and 3 on a scale that goes from 0 to 3. Increasing the percentage of Akans in the 30 km radius by 10% makes a respondent who believes that he or she “Often” needs to be careful when expressing political views 1.38% more likely to express an intent to vote for the NPP candidate, while if the respondent believes that he or she “Always” needs to be careful in political expression, the respondent is 2.21% more likely to express an intent to vote for the NPP candidate.

Finally, model (4) in table 1 adds to the specification used in model (1) an interaction of the percentage of Akans in the neighborhood and the *Intimidation* variable and an interaction of the percentage of Akans in the neighborhood and the *Careful* variable. We find that if it is the case that a respondent both fears political intimidation “A lot” and believes that he or she needs to “Always” be careful to political expression, then increasing the percentage of Akans in the 30 km radius by 10% makes the respondent 5.55% more likely to express an intent to vote for the NPP candidate.

We test whether the effects we found differ in rural and urban areas. Tables 3 - 10 in the Appendix show the results. We find that, conditional on the respondents’ fearing political intimidation, the percentage of Akans in the 30 km radius and in the 5 km radius has a statistically significant impact on vote choice both in rural and in urban areas. Conditional on the respondents believing that they have to be careful in expressing opinions about politics, the percentage of Akans in the 30 km radius and in the 5 km radius has a statistically significant impact on vote choice in rural but not in urban areas. Conditional on the respondents both fearing political intimidation and believing that they have to be careful in political expression, we similarly find that the percentage of Akans in the 30 km radius and in the 5 km radius has a statistically significant impact on vote choice in rural but not in urban areas.

To test whether the mechanism we explore operates through the influence of Akans on non-Akan respondents, we split the sample into non-Akan and Akan respondents and repeat the analysis separately for each of the two samples. Tables 11 - 14 in the Appendix show the

Table 1: The impact of percent Akan in the 30 km radius on the intent to vote for NPP without and with intimidation

(1)				
<i>No Interactions</i>				
Marginal Effect of <i>Akan30</i>	0.089			
Standard Error	(0.079)			
(2)				
	<i>Intimidation = 0</i>	<i>Intimidation = 1</i>	<i>Intimidation = 2</i>	<i>Intimidation = 3</i>
Marginal Effect of <i>Akan30</i>	-0.037	0.072	0.172**	0.256**
Standard Error	(0.095)	(0.080)	(0.088)	(0.110)
(3)				
	<i>Careful = 0</i>	<i>Careful = 1</i>	<i>Careful = 2</i>	<i>Careful = 3</i>
Marginal Effect of <i>Akan30</i>	-0.043	0.049	0.138*	0.221***
Standard Error	(0.108)	(0.086)	(0.080)	(0.092)
(4)				
	<i>Intimidation = 0 and Careful = 0</i>	<i>Intimidation = 0 and Careful = 3</i>	<i>Intimidation = 3 and Careful = 0</i>	<i>Intimidation = 3 and Careful = 3</i>
Marginal Effect of <i>Akan30</i>	0.007	-0.041	-0.173	0.555***
Standard Error	(0.124)	(0.132)	(0.137)	(0.116)

*** p<0.01, ** p<0.05, * p<0.10.

Model (1) does not include interaction terms. Model (2) includes an interaction term for *Akan30* and *Intimidation*. Model (3) includes an interaction term for *Akan30* and *Careful*. Model (4) includes interaction terms for *Akan30* and *Intimidation*, as well as for *Akan30* and *Careful*. Table 38 in the appendix shows additional results from model (4), providing marginal effects of *Akan30* conditional on different combinations of the levels of *Intimidation* and *Careful*. All models include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

Note that the coefficients presented in the table are marginal effects with continuous variables held at means and binary variables held at median values.

results. We find that the interaction of political intimidation and the percentage of Akans in the 30 km radius has a statistically significant impact on vote choice only for non-Akan respondents. We also find that, conditional on the respondent believing that one has to be careful in political expression and fearing political intimidation, the percentage of Akans in the 30 km radius has a statistically significant impact on vote choice for both Akan and non-Akan respondents.

As an alternative measure of the voters' concern about political intimidation and freedom of political expression, we conduct factor analysis on the variables *Intimidation* and *Careful* and obtain the new variable *Factor*. Using the variable *Factor* in the analysis, we find that the interaction of the belief that one has to be careful in political expression, fear

of political intimidation and the percentage of Akans in the 30 km radius has a statistically significant impact on vote choice only for non-Akan respondents. On balance, our results are consistent with Akans employing political intimidation to induce non-Akans to vote for the NPP.

5.2 How Large does the Surrounding Group Have to Be?

How large does the number of the members of the surrounding ethnicity have to be in order for the members of other ethnicities to change their vote choice due to the fear of political intimidation? We show that there is a positive relationship (conditional on intimidation) between the share of Akans in a neighborhood and the probability of voting for the NPP only in the areas where Akans are in the majority.

To establish this, we estimate a generalized additive model (GAM). We use a GAM as it does not impose a particular functional form on the relationship between the share of Akans in a neighborhood and the probability of voting for the NPP.¹⁰ For the areas where Akans are in the minority, we do not find any relationship between the share of Akans in a neighborhood and the probability of voting for the NPP.

This holds for the specification where we do not control for intimidation or the belief that one has to be careful in political expression (as shown in figure 4 in the Appendix) and for the specifications where we restrict the sample to the observations with the maximum value of *Intimidation* (*Intimidation*=3) and to the observations with the minimum value of *Intimidation* (*Intimidation*=0) (as shown in figure 5 in the Appendix). When we use the specifications where we restrict the sample to the observations with the maximum value of *Careful* (*Careful*=3) and to the observations with the minimum value of *Careful* (*Careful*=0) (as shown in figure 6 in the Appendix), we find that the result holds for the sample restricted to the observations with the maximum value of *Careful*.

¹⁰GAMs are similar to generalized linear models (GLMs), but differ in that GAMs use smooth functions of the covariates to model the relationship between the predictors and the outcome of interest, whereas GLMs impose a particular functional form, such as a linear function or a cubic polynomial, on the relationship between the outcome and the predictors.

6 The Lack of the Impact of Local Public Goods Provision

Theoretically, the existing literature suggests that the public goods provision mechanism is unlikely to explain the relationship found in the data. This is because the feasibility of promises of public goods provision as an electoral strategy is contingent on a history of credible commitments by political parties, something that is unlikely to be satisfied in a country such as Ghana, which had only relatively recently become democratic (for a similar argument see [Bratton 2008](#), [Keefer and Vlaicu 2008](#)).

Empirically, in this section we provide evidence showing that the effect of the percentage of Akans in a neighborhood does not operate through local public goods provision, as captured in the Afrobarometer questions. In principle, it is possible that the Afrobarometer questions do not capture local public goods provision with sufficient accuracy. It is also possible that voters care about local public goods which are different from those used in the Afrobarometer questions. Finally, it is possible that voters expect that the winning party will provide local public goods in the areas where its coethnics are in the majority, but the party does not in fact do this, so that the voters are wrong in their expectations.

We attempt to allay these concerns through a variety of robustness checks. In order to show that our findings about the lack of impact of public goods provision do not rely on the use of the Afrobarometer dataset, in [section 6.1](#) we repeat the analysis using questions from 2008 Ghana Demographic and Health Survey (DHS). In order to show that our findings do not rely on the use of levels of public goods provision, in [section 6.2](#) we show that the dynamics of local public goods provision do not explain the impact of the neighborhood composition on the vote choice. In order to try to address the possibility that it is expectations of public goods provision that matter, in [section 6.3](#) we repeat the analysis using questions from Afrobarometer that may serve as proxies for expectations of public goods provision.

The possibility remains that, in spite of the robustness checks we conduct, local public

goods provision impacts voting for the party of the ethnic majority in a neighborhood. Because our analysis does not detect this impact, at the very least, the magnitude of this impact cannot be so large as to show in the indicators of public goods provision in one of the most commonly used datasets. Moreover, to the extent that the results about the lack of impact of public goods provision might be viewed as more convincing than the results about the lack of impact of expectations of public goods provision, our analysis shows that, if public goods provision matters for the ethnic voting, it is likely to matter through the *incorrect* expectations of the voters. If we expect voters to learn over time, so that in equilibrium they correctly anticipate that public goods will not be provided, then this implies that the impact of the expectations of public goods provision is likely to be only short-term. We view both of these points as contributions providing insight into the relationship between ethnic voting and local public goods provision.

6.1 The Presence of Local Public Goods

We focus on three local public goods: paved roads, schools, and health clinics. These goods are geographically targetable and locally non-excludable and thus might, in principle, mediate the impact of the percentage of Akans in a neighborhood on the vote choice.

We use the following three questions from the Afrobarometer to measure the level of local public goods provision within an enumeration area:

1. “Thinking of your journey here: Was the road at the start point in the PSU/EA paved/tarred/ concrete?” We assign the value of 1 to the variable *Road* if the answer is “Yes” and the value of 0 if the answer is “No”.
2. “Are the following facilities present in the primary sampling unit/enumeration area, or within easy walking distance: School?” We assign the value of 1 to the variable *School* if the answer is “Yes” and the value of 0 if the answer is “No”.
3. “Are the following facilities present in the primary sampling unit/enumeration area, or within easy walking distance: Health clinic?” We assign the value of 1 to the variable *Health clinic* if the answer is “Yes” and the value of 0 if the answer is “No”.

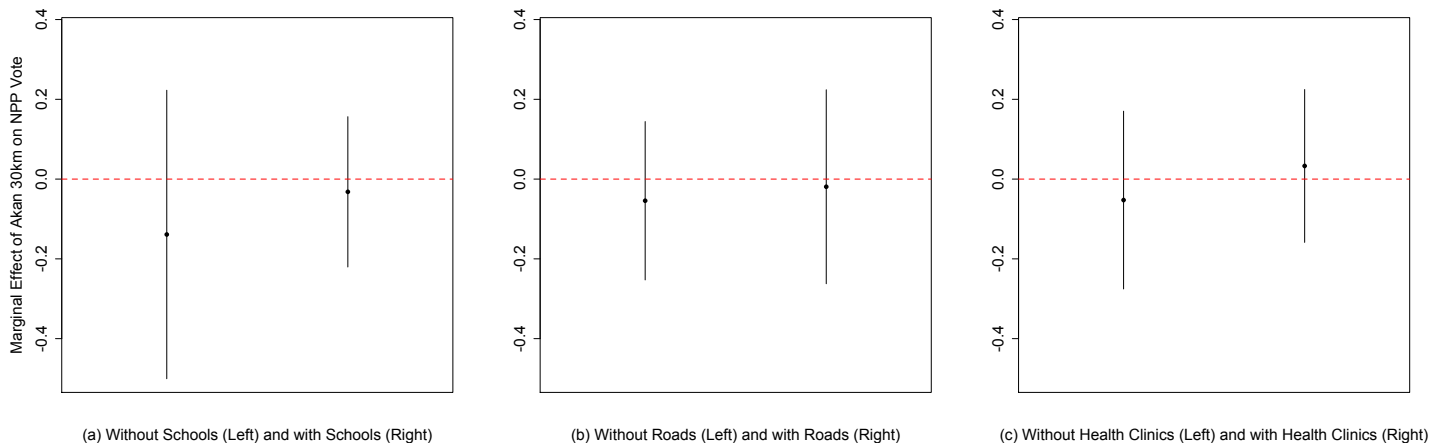
We first analyze the impact of the presence of local public goods and being surrounded by Akans on the intention to vote for the NPP.¹¹ Tables 15 - 26 in the Appendix show the results for roads, schools and health clinics. In each of the tables, models (1) and (2) use the percentage of Akans in the 30 km radius, while models (3) and (4) use the percentage of Akans in the 5 km radius. Models (1) and (3) include the variable for the local public good and the interaction of this local public good with the percentage of Akans in the neighborhood. Models (2) and (4) also include the variable *Careful* and the interaction of *Careful* with the percentage of Akans in the neighborhood (tables 15, 19, 23), the variable *Intimidation* and the interaction of *Intimidation* with the percentage of Akans in the neighborhood (tables 16, 20, 24), both of these variables and interactions (tables 17, 21, 25), and, finally, a three-way interaction of these variables (with all the lower interactions and constituent terms included, tables 18, 22, 26).¹²

Neither the presence of local public goods nor the interaction of the local public goods with the percentage of Akans in the neighborhood has a statistically significant effect on the intention to vote for the NPP candidate in any of the specifications in tables 15 - 26. In contrast, the result that the fear of political intimidation and the belief that one has to be careful in political expression mediate the effect of the percentage of Akans in the neighborhood is robust: in all specifications, the percentage of Akans in the neighborhood has a statistically significant effect on the intention to vote for the NPP candidate when the respondents fear political intimidation and believe that one has to be careful of what one says about politics. Figure 3 summarizes the results by plotting the marginal effect of

¹¹If being surrounded by Akans impacts vote choice through local public goods provision, then it is those districts with high proportions of Akans that had also received local public goods when the NPP controlled the presidency in 2000-2008 that should be most likely to vote for the NPP. While it is a possibility that the local public goods recorded in the survey had been provided by the NDC before 2000, this concern is alleviated insofar as the NDC is hypothesized to have little incentive to provide local public goods to Akan-majority districts. To further alleviate this concern, we analyze the dynamics of local public goods provision in section 6.2.

¹²We treat intimidation as a continuous variable in tables 3 - 26. This means that a unit change in intimidation has a constant impact on the latent propensity of voting for the NPP. As a robustness check, we allow the effect of intimidation to differ by intimidation levels. Tables 36 and 37 present the main results from tables 3 - 26, treating each level of intimidation as a different category. Our results are robust to this change in specification.

Figure 3: The impact of percent Akan in the 30 km radius on the intention to vote for the NPP without and with local public goods



The figures show the coefficients and the corresponding confidence intervals. The coefficients are marginal effects with continuous variables held at means and binary variables held at median values.

Akan30 on the intention to vote for the NPP candidate when a local public good is present and when it is not.

In light of the finding that local public goods do not affect vote choice directly and do not mediate the effect the percentage of Akans in the neighborhood, we estimate a model testing whether the percentage of Akans in the neighborhood affects the provision of local public goods. If non-Akan voters in Akan-majority areas vote for the NPP due to the higher likelihood of receiving public goods from the NPP, then NPP-affiliated politicians should be more likely to provide local public goods in the areas where the percentage of Akans is higher. Because the variable for the provision of local public goods does not vary by the respondent and instead varies by the enumeration area, we collapse the data to the means by enumeration area. Table 27 in the Appendix shows the results. Models (1), (3) and (5) use the percentage of Akans in the 30 km radius, while models (2), (4) and (6) use the percentage of Akans in the 5 km radius. We see that the percentage of Akans in the neighborhood has no statistically significant impact on local public goods provision.

In order to make sure that our finding that the percentage of Akans in the neighborhood does not impact local public goods provision is robust to using different datasets, we use the

2008 Ghana Demographic and Health Survey (DHS) as an alternative source of the measures of local public goods provision. Because measuring demographic and health indicators is the primary purpose of the DHS, we expect the measures of such indicators recorded in the DHS to be more accurate than those recorded in the Afrobarometer. We geocode the enumeration areas included in round 4 of the Afrobarometer and, using the geocoded references, we match the enumeration areas in round 4 of the Afrobarometer survey to the closest enumeration areas in the DHS, matching only the enumeration areas that are no more than 20 kms apart.¹³¹⁴

Because the DHS does not directly measure the presence of local public goods, we use questions from the DHS that can serve as plausible proxies for local public goods. We use two variables as proxies for the presence of a hospital in an area: *Delivery in a hospital* and *Antenatal care in a hospital*.¹⁵ We argue that distance to a hospital and whether the family has the means to pay for the use of health facilities are the main determinants of whether a woman gives birth to a child in a hospital rather than at home and whether she receives antenatal care in a hospital. Because we control for poverty, the proportion of births in the area given in a hospital is likely to be a good proxy for the presence of a hospital easily accessible by the residents in the area. As table 28 shows, our results are robust to the use of the DHS data. That is, the percentage of Akans in the neighborhood does not have an impact on the presence of local public goods.¹⁶

¹³Using the data shared by the Afrobarometer project, which includes localities names for round 4, we were able to geocode the enumeration areas for that round using multiple sources, among them: Google Maps, GeoNames, and the Fallingrain Global Gazetteer.

¹⁴Distance is defined as the length of the shortest curve between two points along the surface of the Earth. For implementation see the R package `gmt`.

¹⁵The wording of the question used to construct the variable *Delivery in a hospital* is as follows: “Where did you give birth to (NAME of son/daughter)?” The response options are: 1. At home; 2. Someone else’s home; 3. Public sector hospital (includes government hospitals, and health centers); 4. Private sector hospital. We recoded categories 1 and 2 as 0, and 3 and 4 as 1. The wording of the question used to construct the variable *Antenatal care in a hospital* is as follows: “Where did you receive antenatal care for this pregnancy?” The response categories and the recoding labels are the same as for *Delivery in a hospital*. Both questions ask about the pregnancies that a woman experienced in the 5 years before the survey. If a woman experienced more than one pregnancy in the 5 year period prior to the survey, we focus on the most recent pregnancy.

¹⁶Our results are robust to different definitions of closeness between enumeration areas such as using cutoffs of 10 or 15 km instead of 20 km. The results with alternative cutoffs are available from the authors upon request.

6.2 Dynamics of Local Public Good Provision

Alternatively, it can be the case that the impact of the percentage of Akans in a neighborhood affects the dynamics of local public good provision, and not the levels. It is possible that the longer the NPP is in power, the more local public goods the areas with a high share of Akans in a neighborhood receive. It is also possible that the NPP provides local public goods to the areas where there is more need for such goods, so that, if we were to just compare the levels of local public goods, we would mistakenly conclude that the NPP is less likely to provide such goods to the areas surrounded by Akans. To explore this possibility, we estimate the effect of the share of Akans in a neighborhood on the changes in local public goods provision between 2005 and 2008, using the data from round 3 (2005) and round 4 (2008) of the Afrobarometer.

In order to obtain measures of local public goods provision in the same areas at two points in time, we geocoded and then matched the enumeration areas included in round 3 and round 4 of the Afrobarometer by their geographical proximity. Once paired, we compared the changes in our three measures of local public provision.¹⁷ Since in many instances the enumeration areas differ between the rounds, we selected only those enumeration areas in round 3 that are less than 20 kms away from the ones included in round 4. In doing so, we are treating the presence of public goods in a matched enumeration area from round 3 as a proxy for the presence of public goods in 2005 for those enumeration areas included in round 4.¹⁸

As a result, we can compare the provision of local public goods at two points in time, that is, we can compare those enumerations areas that did not receive a local public good in either 2005 or 2008 to those which received it either in 2008 or both in 2005 and 2008.¹⁹

¹⁷The geocoded references for round 3 at the enumeration area level were generously provided by XXX and YYY.

¹⁸As a robustness check, in table 30 we present the results using different distances (5 kms, 10 kms, and 15 kms) to match the enumeration areas. Our results are robust to using different distances. (There is no variation in *School* when we use distances smaller than 20 kms, so we present the results for *Road* and *Health clinic* only.)

¹⁹The dependent variable takes a value of 1 if a local public good was present in the enumeration area in either 2008 or both 2005 and 2008; it takes a value of 0 if a local public good was present in the enumeration area neither in 2005 nor 2008. Our results are robust to treating the dependent variable as

Since round 4 was conducted before the 2008 election where the NPP lost, the NPP is in power in both periods included in the dataset. If the impact of local ethnic geography is due to public goods provision, then we should see a positive impact of the share of Akans in a neighborhood: that is, the longer the NPP is in power, the more local public goods should be provided to the areas surrounded by Akans. Table 29 shows that the impact of the percentage of Akans in a neighborhood does not explain changes in the provision of local public goods. The coefficient is only significant for *Roads*, but its sign (negative) goes in the direction not consistent with the public goods explanation.

6.3 The Expectations of Local Public Goods Provision

We have found that the presence of local public goods and the dynamics of local public goods provision have no impact on the vote choice and are not correlated with the percentage of Akans in the neighborhood. We now explore the possibility that it is not the local public goods that are already present in an area but the expectations of receiving local public goods in the future that drive the vote choice.²⁰

Ideally, we would like to have access to a variable that measures citizens' expectations of access to local public goods in the event that the NPP or the NDC candidate wins. Since neither the Afrobarometer nor any other surveys that we are aware of ask this question, we use the questions in the Afrobarometer that can plausibly proxy for expectations of local public goods provision. In particular, we use the following questions:

1. "In your opinion, how likely is it that you could get together with others and make: Your elected Assembly man/woman listen to your concerns about a matter of importance to the community?" and,

having three categories (receiving the public good in neither period, only in 2008 and both in 2005 and 2008) and estimating an ordered logit (the results are available from the authors upon request).

²⁰It seems implausible that expectations of receiving local public goods are in no way connected to the actual presence of local public goods and the dynamics of local public goods provision, since, should voters find that the reality does not match their expectations, they are likely to adjust their expectations. Yet it may be the case that incorrect expectations persist in the short term, or that measurements of the expectations of local public goods provision are more precise than measurements of the presence or dynamics of local public goods. For this reason, we examine the relationship between expectations of receiving local public goods and vote choice.

2. “In your opinion, how likely is it that you could get together with others and make: Your Member of Parliament listen to your concerns about a matter of importance to the community?”

The responses to these questions are coded so that 0 means “Not at all likely”, 1 means “Not very likely”, 2 means “Somewhat likely” and 3 means “Very likely.”

Since access to local public goods is likely to be a matter of importance to the community, the belief of the citizens that they can make their representatives listen to their concerns about such matters can plausibly be interpreted as expectations that they will receive local public goods in the future.

Additionally, we use the following question: “Do you approve or disapprove of the way the following people have performed their jobs over the past twelve months, or haven’t you heard enough about them to say: The President.” The responses are coded so that 1 means “Strongly Disapprove”, 2 means “Disapprove”, 3 means “Approve”, and 4 means “Strongly Approve.”

If the president is favoring his co-ethnics in the distribution of local public goods, the beneficiaries of such favoritism should be more likely to approve of the president, either because they have benefited from the favoritism themselves or because they have heard that their co-ethnics benefited and expect to benefit in the future. The use of *Presidential Approval* to infer whether local public goods were expected and provided here relies on the assumption that such expectations are at least partially correct. This assumption seems plausible, since, should the reality consistently fail to match the voters’ beliefs, they are likely to adjust their beliefs.

We repeat the analysis above using the proxies for expectations of local public goods provision instead of the variables measuring local public goods provision. Tables 31 - 34 in the Appendix show the results. We find that the interaction of the proxies with the percentage of Akans in the neighborhood has no impact on the intention to vote for the NPP candidate. The variables *Can make councillor listen* and *Can make MP listen* have no impact on the vote choice. The variable *Presidential Approval* raises the probability of

expressing intention to vote for the NPP only in the areas where the percentage of Akans in the neighborhood is zero, which suggests that the expectations of public goods provision by the NPP are not related to the share of Akans in the neighborhood.

Additionally, as table 35 in the Appendix shows, we find that the percentage of Akans in the neighborhood has no statistically significant impact on the proxies for expectations of local public goods provision.

7 Conclusion

Previous literature showed that neighborhood composition can impact ethnic voting. While it showed that neighborhood composition affects vote choice, it did not provide empirical evidence for the mechanism through which this happens. We have provided empirical evidence that neighborhood composition reduces ethnic voting by making voters of the minority ethnicity concerned about intimidation. Moreover, we have shown that data does not support the alternative explanation which posits that neighborhood composition reduces ethnic voting through local public goods provision.

The finding that it is the minority ethnicity voters' concern about intimidation that is driving the impact of neighborhood composition on ethnic voting advances our understanding of both ethnic voting and the role of intimidation in elections in developing countries. Our findings imply that expressive motive for ethnic voting is present in the voting behavior in Ghana, yet voters who would like to vote along ethnic lines for expressive reasons may nevertheless refrain from doing so due to fear of being intimidated by their ethnic majority neighbors.

Our findings have implications for the optimal districting in countries where ethnic voting is prevalent. To the extent that it is undesirable to have individuals change their vote choice due to fear of intimidation, our results suggest that this phenomenon can be reduced through creation of electoral districts where either no single ethnic group is in the majority or a district is populated exclusively with members of one ethnic group.

Our finding that it is concern about intimidation that makes individuals less likely to

engage in ethnic voting may seem surprising for a country like Ghana, which is considered to be one of the most stable democracies in the Sub-Saharan Africa. We conjecture that had Ghana not experienced such marked improvements in democracy and the rule of law, the effect that we find would have been larger. As such, one can think of the effect found for Ghana as a lower bound for the impact of neighborhood composition on the vote choice through enabling intimidation. Because of this, we would expect the effect for countries like Kenya and Nigeria, which have suffered from more severe episodes of electoral violence, to be larger. It is thus likely that the extent to which neighborhood composition affects vote choice depends on the political environment that allows for or inhibits the influence of the majority ethnic groups member on the minority ethnic groups members.

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Online Appendix

7.1 Additional Tables

In this section we present additional figures and tables that we refer to in the paper as follows:

Figures:

Figure 4: The probability of voting for the NPP by share of Akans in 30 km radius without controlling for *Intimidation* and *Careful*

Figure 5: The probability of voting for the NPP by share of Akans in 30 km radius, maximum and minimum levels of *Intimidation*

Figure 6: The probability of voting for the NPP by share of Akans in 30 km radius, maximum and minimum levels of *Careful*

Tables:

Table 2: Summary Statistics

Table 3: The impact of being surrounded by Akans in all, rural and urban areas, 30 km radius (Careful)

Table 4: The impact of being surrounded by Akans in all, rural and urban areas, 30 km radius (Intimidation)

Table 5: The impact of being surrounded by Akans in all, rural and urban areas, 30 km radius (Intimidation and Careful)

Table 6: The impact of being surrounded by Akans in all, rural and urban areas, 30 km radius (Factor: Intimidation and Careful)

Table 7: The impact of being surrounded by Akans in all, rural and urban areas, 5 km radius (Careful)

Table 8: The impact of being surrounded by Akans in all, rural and urban areas, 5 km radius (Intimidation)

Table 9: The impact of being surrounded by Akans in all, rural and urban areas, 5 km radius (Intimidation and Careful)

Table 10: The impact of being surrounded by Akans in all, rural and urban areas, 5 km radius (Factor: Intimidation and Careful)

Table 11: The impact of being surrounded by Akans - for non-Akan and Akan respondents (Careful)

Table 12: The impact of being surrounded by Akans - for non-Akan and Akan respondents (Intimidation)

Table 13: The impact of being surrounded by Akans - for non-Akan and Akan respondents (Intimidation and Careful)

Table 14: The impact of being surrounded by Akans - for non-Akan and Akan respondents (Factor: Intimidation and Careful)

Table 15: The impact of roads and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Careful)

Table 16: The impact of roads and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Intimidation)

Table 17: The impact of roads and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Intimidation and Careful)

Table 18: The impact of roads and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Factor: Intimidation and Careful)

Table 19: The impact of schools and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Careful)

Table 20: The impact of schools and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Intimidation)

Table 21: The impact of schools and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Intimidation and Careful)

Table 22: The impact of schools and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Factor: Intimidation and Careful)

Table 23: The impact of health clinics and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Careful)

Table 24: The impact of health clinics and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Intimidation)

Table 25: The impact of health clinics and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Intimidation and Careful)

Table 26: The impact of health clinics and being surrounded by Akans on the intention to vote for NPP, 30 and 5 km radius (Factor: Intimidation and Careful)

Table 27: The impact of neighborhood composition on local public goods provision, 30 and 5 km radius

Table 28: The impact of neighborhood composition on local public goods provision (DHS data), 30 and 5 km radius

Table 29: The impact of neighborhood composition on the dynamics of local public goods provision

Table 30: The impact of neighborhood composition on the dynamics of local public goods provision: Results using different distances to match Enumeration Areas

Table 31: The impact of proxies for expectations of local public goods provision and being surrounded by Akans on the intention to vote for NPP (Careful)

Table 32: The impact of proxies for expectations of local public goods provision and being surrounded by Akans on the intention to vote for NPP (Intimidation)

Table 33: The impact of proxies for expectations of local public goods provision and being surrounded by Akans on the intention to vote for NPP (Intimidation and Careful)

Table 34: The impact of proxies for expectations of local public goods provision and being surrounded by Akans on the intention to vote for NPP (Factor: Intimidation and Careful)

Table 35: The impact of neighborhood composition on proxies for expectations of local public goods provision

Table 36: The impact of being surrounded by Akans (30km radius) by different

levels of intimidation

Table 37: The impact of being surrounded by Akans (5km radius) by different levels of intimidation

Table 39: Polling Station-Level Analysis: Brong-Ahafo region

Figure 4: Probability of voting for the NPP by share of Akans in 30 km radius without controlling for either *Intimidation* or *Careful*

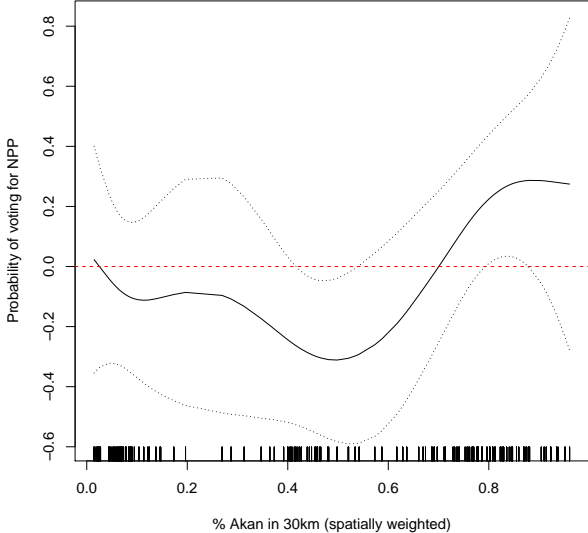
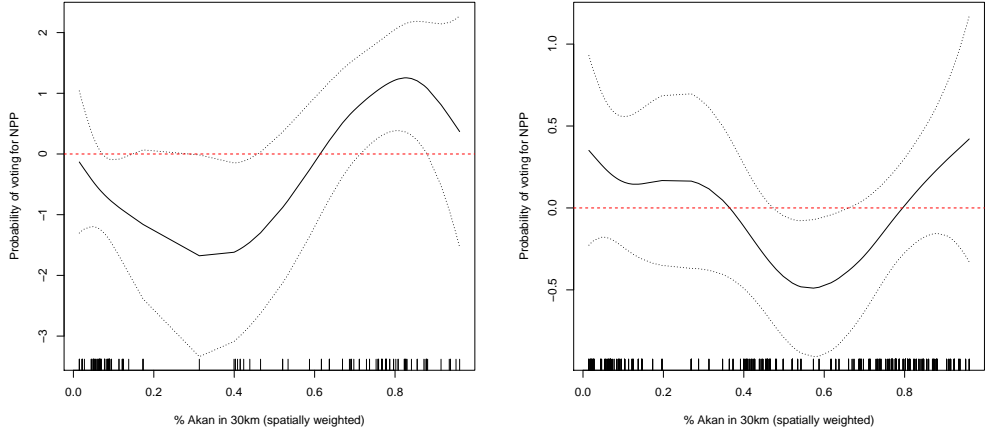
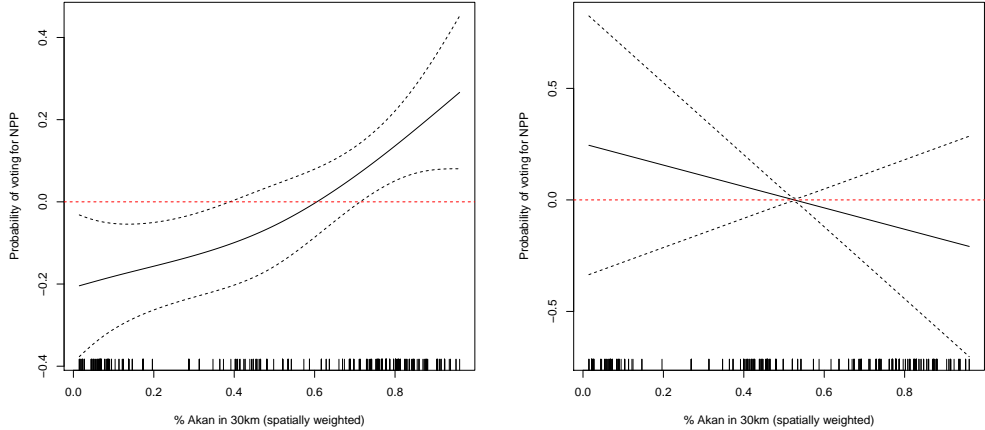


Figure 5: Probability of voting for the NPP by share of Akans in 30 km radius, maximum and minimum levels of *Intimidation*



In the left panel the sample is restricted to the observations with the maximum value of *Intimidation* (*Intimidation*=3) (163 observations). In the right panel the sample is restricted to the observations with the minimum value of *Intimidation* (*Intimidation*=0) (573 observations).

Figure 6: Probability of voting for the NPP by share of Akans in 30 km radius, maximum and minimum levels of *Careful*



In the left panel the sample is restricted to the observations with the maximum value of *Careful* (*Careful*=3) (386 observations). In the right panel the sample is restricted to the observations with the minimum value of *Careful* (*Careful*=0) (221 observations).

Table 2: Summary Statistics (Afrobarometer Data, round 4)

	Mean	Std. Dev.	Min	Max
Vote NPP	0.46	0.50	0	1
% Akan in 5km	0.50	0.50	0.01	0.94
% Akan in 30km	0.49	0.31	0.01	0.96
Akan	0.46	0.49	0	1
Ewe	0.13	0.34	0	1
Dagomba (Mole-Dagbon)	0.06	0.25	0	1
Male	0.50	0.50	0	1
Economy approval	3.21	1.07	1	5
Poverty	0.00	1.00	-1.12	1.85
Urban	0.20	0.40	0	1
Central Region	0.09	0.29	0	1
Local level of development	-0.07	1.00	-1.14	2.99
Political Intimidation	2.09	1.08	0	3
Careful	1.56	1.22	0	3
Health Clinics	0.61	0.48	0	1
Schools	0.92	0.27	0	1
Roads	0.48	0.50	0	1
Presidential Approval	3.31	2.09	1	9
Make MP listen	2.02	2.09	0	9
Make Councilor listen	2.18	1.79	0	9
Number of Observations	1200			

Table 3: The impact of being surrounded by Akans in all, rural and urban areas, 30 km radius

	Vote for NPP		
	All	Rural	Urban
Akan30	-0.007 (0.396)	-0.250 (0.385)	3.063*** (0.536)
Careful	-0.546** (0.258)	-0.534** (0.264)	-0.248 (0.991)
Akan30 × Careful	0.828** (0.416)	0.945** (0.427)	-0.519 (1.672)
Constant	-1.025*** (0.373)	-0.840** (0.393)	-3.384*** (0.667)
Observations	1, 133	904	229

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 4: The impact of being surrounded by Akans in all, rural and urban areas, 30 km radius

	Vote for NPP		
	All	Rural	Urban
Akan30	-0.157 (0.387)	-0.309 (0.393)	1.293 (1.067)
Political intimidation	-0.409*** (0.112)	-0.412*** (0.114)	-0.833 (0.624)
Akan30 \times Political intimidation	0.461** (0.192)	0.417** (0.196)	1.622* (0.922)
Constant	-0.827** (0.369)	-0.640* (0.387)	-2.625*** (0.907)
Observations	1,141	912	229

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 5: The impact of being surrounded by Akans in all, rural and urban areas, 30 km radius

	Vote for NPP		
	All	Rural	Urban
Akan30	0.027 (0.498)	-0.265 (0.495)	2.905*** (0.928)
Political intimidation	-0.158 (0.157)	-0.181 (0.158)	-0.276 (1.082)
Careful	-0.057 (0.145)	-0.056 (0.146)	-0.112 (0.631)
Careful \times Political intimidation	-0.134* (0.076)	-0.127* (0.075)	-0.115 (0.473)
Akan30 \times Political intimidation	-0.312 (0.274)	-0.294 (0.281)	0.188 (1.785)
Akan30 \times Careful	-0.067 (0.225)	0.007 (0.227)	-0.515 (0.828)
Akan30 \times Careful \times Political intimidation	0.432*** (0.136)	0.395*** (0.136)	0.579 (0.851)
Constant	-0.823** (0.406)	-0.623 (0.425)	-3.198*** (0.775)
Observations	1,116	890	226

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 6: The impact of being surrounded by Akans in all, rural and urban areas, 30 km radius

	Vote for NPP		
	All	Rural	Urban
Akan30	0.353 (0.333)	0.178 (0.319)	2.544** (0.990)
Factor	-0.331** (0.138)	-0.323** (0.142)	-0.163 (0.518)
Akan30 \times Factor	0.477** (0.221)	0.534** (0.227)	-0.223 (0.846)
Constant	-1.267*** (0.342)	-1.083*** (0.360)	-3.394*** (0.780)
Observations	1,116	890	226

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 7: The impact of being surrounded by Akans in all, rural and urban areas, 5 km radius

	Vote for NPP		
	All	Rural	Urban
Akan5	0.016 (0.479)	-0.176 (0.470)	1.922* (1.120)
Careful	-0.649** (0.299)	-0.606** (0.307)	-1.308 (1.155)
Akan5 \times Careful	1.024** (0.494)	1.070** (0.507)	1.435 (1.860)
Constant	-1.046*** (0.406)	-0.871** (0.424)	-2.703*** (0.752)
Observations	1,133	904	229

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 8: The impact of being surrounded by Akans in all, rural and urban areas, 5 km radius

	Vote for NPP		
	All	Rural	Urban
Akan5	-0.114 (0.453)	-0.231 (0.465)	0.956 (1.104)
Political intimidation	-0.425*** (0.124)	-0.418*** (0.128)	-0.851 (0.533)
Akan5 × Political intimidation	0.502** (0.215)	0.435* (0.223)	1.706** (0.754)
Constant	-0.855** (0.403)	-0.674 (0.421)	-2.376*** (0.851)
Observations	1,141	912	229

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 9: The impact of being surrounded by Akans in all, rural and urban areas, 5 km radius

	Vote for NPP		
	All	Rural	Urban
Akan5	-0.007 (0.647)	-0.211 (0.656)	1.380 (1.378)
Political intimidation	-0.164 (0.184)	-0.160 (0.187)	-0.515 (0.806)
Careful	-0.084 (0.175)	-0.061 (0.177)	-0.718 (0.664)
Careful \times Political intimidation	-0.134 (0.088)	-0.138 (0.087)	0.115 (0.386)
Akan5 \times Political intimidation	-0.314 (0.335)	-0.350 (0.348)	0.804 (1.405)
Akan5 \times Careful	-0.018 (0.279)	0.011 (0.283)	0.536 (0.910)
Akan5 \times Careful \times Political intimidation	0.444*** (0.161)	0.428*** (0.161)	0.147 (0.757)
Constant	-0.819* (0.475)	-0.647 (0.495)	-2.302*** (0.819)
Observations	1, 116	890	226

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 10: The impact of being surrounded by Akans in all, rural and urban areas, 5 km radius

	Vote for NPP		
	All	Rural	Urban
Akan5	0.451 (0.377)	0.300 (0.362)	2.414** (1.128)
Factor	-0.390** (0.160)	-0.364** (0.164)	-0.718 (0.625)
Akan5 × Factor	0.591** (0.263)	0.606** (0.270)	0.800 (0.987)
Constant	-1.324*** (0.354)	-1.140*** (0.369)	-3.279*** (0.805)
Observations	1, 116	890	226

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 11: The impact of being surrounded by Akans for non-Akan and Akan respondents

	Non-Akan		Akan	
Akan30	-0.783 (0.733)		0.399 (0.874)	
Akan5		-1.061 (0.845)		1.152 (1.018)
Careful	-0.253** (0.118)	-0.305** (0.145)	-0.540** (0.267)	-0.442 (0.314)
Akan30 × Careful	0.563* (0.298)		0.695* (0.371)	
Akan5 × Careful		0.646* (0.340)		0.606 (0.458)
Constant	-0.633 (0.500)	-0.491 (0.565)	-0.694 (0.769)	-1.214 (0.834)
Observations	601	601	532	532

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 12: The impact of being surrounded by Akans for non-Akan and Akan respondents

	Non-Akan		Akan	
Akan30	-0.542 (0.499)		1.266 (0.868)	
Akan5		-0.732 (0.530)		2.098*** (0.773)
Political intimidation	-0.460*** (0.123)	-0.486*** (0.137)	-0.161 (0.428)	-0.066 (0.342)
Akan30 \times Political intimidation	0.678** (0.321)		0.102 (0.559)	
Akan5 \times Political intimidation		0.645** (0.329)		-0.002 (0.478)
Constant	-0.468 (0.469)	-0.367 (0.504)	-1.300* (0.770)	-1.858*** (0.681)
Observations	609	609	532	532

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 13: The impact of being surrounded by Akans for non-Akan and Akan respondents

	Non-Akan		Akan	
Akan30	-0.571 (0.778)		1.371 (1.041)	
Akan5		-0.985 (0.928)		2.088* (1.223)
Careful	-0.054 (0.155)	-0.106 (0.190)	-0.260 (0.417)	-0.307 (0.465)
Political intimidation	-0.207 (0.163)	-0.240 (0.195)	1.067 (0.929)	0.798 (0.880)
Akan30 × Careful	0.090 (0.352)		0.124 (0.552)	
Akan5 × Careful		0.216 (0.405)		0.170 (0.658)
Akan30 × Political intimidation	-0.636 (0.626)		-1.897 (1.210)	
Akan5 × Political intimidation		-0.438 (0.582)		-1.684 (1.251)
Careful × Political intimidation	-0.129 (0.080)	-0.120 (0.092)	-0.479 (0.415)	-0.316 (0.404)
Akan30 × Careful × Political intimidation	0.579** (0.256)		0.889* (0.538)	
Akan5 × Careful × Political intimidation		0.473* (0.241)		0.767 (0.584)
Constant	-0.445 (0.509)	-0.261 (0.601)	-1.212 (0.887)	-1.646* (0.962)
Observations	593	593	523	523

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 14: The impact of being surrounded by Akans for non-Akan and Akan respondents

	Non-Akan		Akan	
Akan30	0.447 (0.397)		1.596** (0.660)	
Akan5		0.246 (0.442)		2.178*** (0.656)
Factor	-0.931*** (0.228)	-1.051*** (0.262)	-0.771 (0.596)	-0.572 (0.593)
Akan30 × Factor	1.616*** (0.586)		0.859 (0.803)	
Akan5 × Factor		1.741*** (0.628)		0.676 (0.850)
Constant	-1.160** (0.471)	-1.096** (0.475)	-1.664*** (0.610)	-1.999*** (0.586)
Observations	593	593	523	523

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 15: The impact of roads and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.335 (0.358)		-0.049 (0.436)	
Akan5		0.604 (0.377)		0.119 (0.525)
Road	0.057 (0.327)	0.214 (0.360)	0.099 (0.350)	0.251 (0.393)
Careful			-0.538** (0.257)	-0.622** (0.300)
Akan30 × Road	0.070 (0.503)		0.061 (0.526)	
Akan5 × Road		-0.259 (0.571)		-0.268 (0.615)
Akan30 × Careful			0.835** (0.417)	
Akan5 × Careful				0.995** (0.499)
Constant	-1.300*** (0.355)	-1.429*** (0.355)	-1.081*** (0.392)	-1.165*** (0.419)
Observations	1,172	1,172	1,133	1,133

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 16: The impact of roads and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.335 (0.358)		-0.221 (0.414)	
Akan5		0.604 (0.377)		-0.058 (0.468)
Road	0.057 (0.327)	0.214 (0.360)	-0.016 (0.319)	0.122 (0.347)
Political intimidation			-0.410*** (0.112)	-0.422*** (0.122)
Akan30 \times Road	0.070 (0.503)		0.144 (0.482)	
Akan5 \times Road		-0.259 (0.571)		-0.148 (0.545)
Akan30 \times Political intimidation			0.463** (0.193)	
Akan5 \times Political intimidation				0.497** (0.214)
Constant	-1.300*** (0.355)	-1.429*** (0.355)	-0.827** (0.383)	-0.908** (0.410)
Observations	1, 172	1, 172	1, 141	1, 141

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 17: The impact of roads and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.335 (0.358)		0.002 (0.535)	
Road	0.057 (0.327)	0.214 (0.360)	0.085 (0.340)	0.246 (0.375)
Political intimidation			-0.159 (0.157)	-0.168 (0.184)
Careful			-0.055 (0.145)	-0.078 (0.175)
Akan30 × Road	0.070 (0.503)		0.040 (0.504)	
Akan5 × Road		-0.259 (0.571)		-0.305 (0.580)
Careful × Political intimidation			-0.134* (0.076)	-0.130 (0.088)
Akan30 × Political intimidation			-0.311 (0.272)	
Akan30 × Careful			-0.066 (0.225)	
Akan30 × Careful × Political intimidation			0.431*** (0.136)	
Akan5 × Political intimidation				-0.311 (0.335)
Akan5 × Careful				-0.026 (0.281)
Akan5 × Careful × Political intimidation				0.439*** (0.162)
Constant	-1.300*** (0.355)	-1.429*** (0.355)	-0.873** (0.427)	-0.936* (0.495)
Observations	1,172	1,172	1,116	1,116

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 18: The impact of roads and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.335 (0.358)		0.291 (0.357)	
Akan5		0.604 (0.377)		0.486 (0.390)
Road	0.057 (0.327)	0.214 (0.360)	0.007 (0.331)	0.117 (0.373)
Factor			-0.330** (0.138)	-0.383** (0.161)
Akan30 × Road	0.070 (0.503)		0.136 (0.506)	
Akan5 × Road		-0.259 (0.571)		-0.111 (0.591)
Akan30 × Factor			0.482** (0.222)	
Akan5 × Factor				0.583** (0.266)
Constant	-1.300*** (0.355)	-1.429*** (0.355)	-1.278*** (0.352)	-1.373*** (0.353)
Observations	1,172	1,172	1,116	1,116

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 19: The impact of schools and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.106 (0.677)		-0.478 (0.674)	
Akan5		0.577 (0.694)		-0.221 (0.706)
School	-0.123 (0.284)	-0.023 (0.322)	-0.337 (0.298)	-0.273 (0.332)
Akan30 × School	0.293 (0.692)		0.515 (0.662)	
Careful			-0.554** (0.254)	-0.659** (0.295)
Akan5 × School		-0.062 (0.720)		0.266 (0.693)
Akan30 × Careful			0.836** (0.412)	
Akan5 × Careful				1.031** (0.489)
Constant	-1.155*** (0.399)	-1.324*** (0.442)	-0.719* (0.409)	-0.803* (0.454)
Observations	1, 172	1, 172	1, 133	1, 133

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 20: The impact of schools and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.106 (0.677)		-0.562 (0.757)	
Akan5		0.577 (0.694)		-0.265 (0.776)
School	-0.123 (0.284)	-0.023 (0.322)	-0.248 (0.303)	-0.156 (0.340)
Political intimidation			-0.417*** (0.113)	-0.430*** (0.125)
Akan30 × School	0.293 (0.692)		0.432 (0.715)	
Akan5 × School		-0.062 (0.720)		0.163 (0.727)
Akan30 × Political intimidation			0.474** (0.195)	
Akan5 × Political intimidation				0.509** (0.218)
Constant	-1.155*** (0.399)	-1.324*** (0.442)	-0.593 (0.455)	-0.713 (0.513)
Observations	1, 172	1, 172	1, 141	1, 141

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 21: The impact of schools and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.106 (0.677)		-0.598 (0.799)	
Akan5		0.577 (0.694)		-0.460 (0.895)
School	-0.123 (0.284)	-0.023 (0.322)	-0.392 (0.327)	-0.334 (0.360)
Political intimidation			-0.195 (0.168)	-0.200 (0.194)
Careful			-0.070 (0.143)	-0.099 (0.173)
Careful \times Political intimidation			-0.122 (0.078)	-0.121 (0.089)
Akan30 \times School	0.293 (0.692)		0.640 (0.705)	
Akan5 \times School		-0.062 (0.720)		0.450 (0.739)
Akan30 \times Political intimidation			-0.262 (0.286)	
Akan5 \times Political intimidation				-0.260 (0.346)
Akan30 \times Careful			-0.051 (0.224)	
Akan5 \times Careful				0.002 (0.277)
Akan30 \times Careful \times Political intimidation			0.417*** (0.140)	
Akan5 \times Careful \times Political intimidation				0.425*** (0.164)
Constant	-1.155*** (0.399)	-1.324*** (0.442)	-0.438 (0.501)	-0.492 (0.577)
Observations	1, 172	1, 172	1, 116	1, 116

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 22: The impact of schools and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.106 (0.677)		0.064 (0.661)	
Akan5		0.577 (0.694)		0.490 (0.662)
School	-0.123 (0.284)	-0.023 (0.322)	-0.161 (0.287)	-0.063 (0.319)
Factor			-0.333** (0.137)	-0.392** (0.159)
Akan30 × School	0.293 (0.692)		0.319 (0.679)	
Akan5 × School		-0.062 (0.720)		-0.036 (0.692)
Akan30 × Factor			0.480** (0.220)	
Akan5 × Factor				0.592** (0.262)
Constant	-1.155*** (0.399)	-1.324*** (0.442)	-1.121*** (0.393)	-1.270*** (0.428)
Observations	1, 172	1, 172	1, 116	1, 116

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 23: The impact of health clinics and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.261 (0.428)		-0.279 (0.466)	
Akan5		0.725 (0.462)		0.007 (0.564)
Health clinic	-0.116 (0.292)	0.092 (0.294)	-0.227 (0.308)	-0.053 (0.324)
Careful			-0.608** (0.262)	-0.729** (0.307)
Akan30 × Health clinic	0.374 (0.442)		0.609 (0.457)	
Akan5 × Health clinic		-0.028 (0.463)		0.266 (0.497)
Akan30 × Careful			0.897** (0.419)	
Akan5 × Careful				1.120** (0.503)
Constant	-1.348*** (0.405)	-1.579*** (0.417)	-1.038** (0.422)	-1.180** (0.463)
Observations	1, 140	1, 140	1, 101	1, 101

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 24: The impact of health clinics and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.261 (0.428)		-0.218 (0.470)	
Akan5		0.725 (0.462)		0.162 (0.536)
Health clinic	-0.116 (0.292)	0.092 (0.294)	-0.066 (0.292)	0.129 (0.306)
Political intimidation			-0.377*** (0.109)	-0.377*** (0.119)
Akan30 × Health clinic	0.374 (0.442)		0.352 (0.437)	
Akan5 × Health clinic		-0.028 (0.463)		-0.024 (0.472)
Akan30 × Political intimidation			0.409** (0.189)	
Akan5 × Political intimidation				0.419** (0.207)
Constant	-1.348*** (0.405)	-1.579*** (0.417)	-0.957** (0.432)	-1.150** (0.476)
Observations	1,140	1,140	1,109	1,109

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 25: The impact of health clinics and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.261 (0.428)		-0.207 (0.565)	
Akan5		0.725 (0.462)		0.054 (0.735)
Health clinic	-0.116 (0.292)	0.092 (0.294)	-0.140 (0.306)	0.049 (0.333)
Careful			-0.112 (0.144)	-0.154 (0.174)
Political intimidation			-0.148 (0.159)	-0.142 (0.187)
Careful \times Political intimidation			-0.116 (0.076)	-0.111 (0.087)
Akan30 \times Health clinic	0.374 (0.442)		0.508 (0.452)	
Akan5 \times Health clinic		-0.028 (0.463)		0.143 (0.505)
Akan30 \times Political intimidation			-0.322 (0.274)	
Akan5 \times Political intimidation				-0.350 (0.338)
Akan30 \times Careful			0.002 (0.224)	
Akan5 \times Careful				0.074 (0.278)
Akan30 \times Careful \times Political intimidation			0.403*** (0.136)	
Akan5 \times Careful \times Political intimidation				0.408** (0.160)
Constant	-1.348*** (0.405)	-1.579*** (0.417)	-0.864* (0.459)	-0.999* (0.546)
Observations	1, 140	1, 140	1, 084	1, 084

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 26: The impact of health clinics and being surrounded by Akans on the intention to vote for the NPP, 30 and 5 km radius

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	0.261 (0.428)		0.255 (0.419)	
Akan5		0.725 (0.462)		0.637 (0.465)
Health clinic	-0.116 (0.292)	0.092 (0.294)	-0.118 (0.291)	0.059 (0.299)
Factor			-0.358** (0.141)	-0.423** (0.165)
Akan30 × Health clinic	0.374 (0.442)		0.370 (0.438)	
Akan5 × Health clinic		-0.028 (0.463)		0.017 (0.468)
Akan30 × Factor			0.502** (0.224)	
Akan5 × Factor				0.623** (0.269)
Constant	-1.348*** (0.405)	-1.579*** (0.417)	-1.355*** (0.398)	-1.550*** (0.408)
Observations	1,140	1,140	1,084	1,084

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 27: The impact of neighborhood composition on local public goods provision, 30 and 5 km radius

	Road		School		Health clinic	
	(1)	(2)	(3)	(4)	(5)	(6)
NPP vote	1.477 (1.036)	1.467 (1.023)	-0.993 (1.851)	-0.785 (1.765)	-0.181 (1.112)	-0.070 (1.116)
Akan30	-0.599 (1.197)		-3.015 (1.785)		-1.386 (1.340)	
Akan5		0.322 (1.115)		-0.121 (1.975)		-1.280 (1.214)
Constant	-0.178 (1.729)	-0.508 (1.709)	2.738 (2.475)	0.899 (2.465)	0.300 (1.613)	0.206 (1.606)
Observations	143	143	120	120	139	139

Robust standard errors in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akan, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Data collapsed to the means by enumeration area.

Logit coefficients shown in the table.

Table 28: The impact of neighborhood composition on local public goods provision (DHS Data), 30 and 5 km radius

	Delivery in a hospital		Antenatal care in a hospital	
	(1)	(2)	(3)	(4)
NPP vote	-2.263 (1.777)	-2.219 (1.798)	-0.207 (1.616)	-0.240 (1.572)
Akan30	-3.231 (2.262)		0.100 (1.588)	
Akan5		-3.209 (2.161)		-0.255 (1.802)
Constant	3.101 (4.644)	3.527 (4.241)	3.959 (3.397)	3.924 (3.412)
Observations	62	62	60	60

Robust standard errors in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Data collapsed to the means by enumeration area.

Logit coefficients shown in the table.

Table 29: The impact of neighborhood composition on the dynamics of local public goods provision

	Road	School	Health clinic
	(1)	(2)	(3)
Vote for NPP	-1.294 (1.345)	-1.782 (3.438)	-0.814 (1.287)
Akan30	-3.049* (1.490)	-7.716 (4.005)	0.336 (1.307)
Constant	0.921 (1.981)	13.219* (5.424)	-0.486 (2.065)
Observations	104	79	107

The dependent variable takes a value of 1 if a local public good was present in the enumeration area in either 2005 or both 2005 and 2008; it takes a value of 0 if a local public good was present in the enumeration area neither in 2005 nor 2008.

Robust standard errors in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akan, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Data collapsed to the means by enumeration area.

Logit coefficients shown in the table.

Table 30: The impact of neighborhood composition on the dynamics of local public goods provision: Results using different distances to match enumeration areas

	Road	Health clinic
	(1)	(2)
Enumeration areas 5 km apart		
Akan30	5.783 (3.293)	-5.278 (4.102)
Observations	33	35
Enumeration areas 10 km apart		
Akan30	1.132 (1.900)	-5.316 (2.565)
Observations	49	53
Enumeration areas 15 km apart		
Akan30	0.799 (1.888)	-2.192 (1.719)
Observations	64	70

The dependent variable takes a value of 1 if a local public good was present in the enumeration area in either 2008 or both 2005 and 2008; it takes a value of 0 if a local public good was present in the enumeration area neither in 2005 nor 2008. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Data collapsed to the means by enumeration area.

Logit coefficients shown in the table.

Table 31: The impact of proxies for expectations of local public goods provision and being surrounded by Akans on the intention to vote for the NPP

	Vote for NPP					
	(1)	(2)	(3)	(4)	(5)	(6)
Akan30	0.662 (0.451)	0.224 (0.496)	0.405 (0.406)	0.082 (0.471)	0.484 (0.716)	-0.288 (0.914)
Can make councilor listen	0.091 (0.079)	0.078 (0.081)				
Akan30 × Can make councilor listen	-0.130 (0.128)	-0.108 (0.131)				
Careful		-0.558** (0.255)		-0.553** (0.255)		-0.483* (0.265)
Akan30 × careful		0.848** (0.412)		0.831** (0.414)		0.786* (0.422)
MP listen			0.056 (0.061)	0.073 (0.062)		
Akan30 × MP listen			-0.013 (0.103)	-0.041 (0.105)		
Presidential Approval					0.329*** (0.121)	0.342** (0.142)
Akan30 × Presidential Approval					-0.086 (0.217)	0.031 (0.266)
Constant	-1.486*** (0.401)	-1.203*** (0.428)	-1.389*** (0.374)	-1.185*** (0.410)	-2.220*** (0.435)	-1.990*** (0.496)
Observations	1172	1133	1172	1133	1172	1133

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** p<0.01, ** p<0.05, * p<0.10

Logit coefficients shown in the table.

Table 32: The impact of proxies for expectations of local public goods provision and being surrounded by Akans on the intention to vote for the NPP

	Vote for NPP					
	(1)	(2)	(3)	(4)	(5)	(6)
Akan30	0.662 (0.451)	0.122 (0.478)	0.405 (0.406)	-0.172 (0.458)	0.484 (0.716)	-0.133 (0.773)
Can make councilor listen	0.091 (0.079)	0.087 (0.085)				
Akan30 × Can make councilor listen	-0.130 (0.128)	-0.129 (0.136)				
Political intimidation		-0.416*** (0.114)		-0.406*** (0.113)		-0.356*** (0.111)
Akan30 × Political intimidation		0.474** (0.196)		0.451** (0.193)		0.418** (0.191)
MP listen			0.056 (0.061)	0.036 (0.066)		
Akan30 × MP listen			-0.013 (0.103)	0.013 (0.111)		
Presidential Approval					0.329*** (0.121)	0.317** (0.124)
Akan30 × Presidential Approval					-0.086 (0.217)	-0.041 (0.221)
Constant	-1.486*** (0.401)	-1.029** (0.416)	-1.389*** (0.374)	-0.910** (0.408)	-2.220*** (0.435)	-1.783*** (0.480)
Observations	1172	1141	1172	1141	1172	1141

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** p<0.01, ** p<0.05, * p<0.10

Logit coefficients shown in the table.

Table 33: The impact of proxies for expectations of local public goods provision and being surrounded by Akans on the intention to vote for the NPP

	Vote for NPP					
	(1)	(2)	(3)	(4)	(5)	(6)
Akan30	0.662 (0.451)	0.263 (0.576)	0.405 (0.406)	0.084 (0.568)	0.484 (0.716)	-0.421 (0.956)
Can make councilor listen	0.091 (0.079)	0.078 (0.084)				
Akan30 × Can make councilor listen	-0.130 (0.128)	-0.117 (0.133)				
Political intimidation		-0.166 (0.158)		-0.161 (0.160)		-0.104 (0.153)
Akan30 × Political intimidation		-0.299 (0.274)		-0.307 (0.275)		-0.383 (0.263)
Careful		-0.063 (0.143)		-0.061 (0.142)		-0.027 (0.146)
Akan30 × Careful		-0.056 (0.222)		-0.065 (0.220)		-0.109 (0.221)
Careful × Political intimidation		-0.133* (0.076)		-0.132* (0.076)		-0.144* (0.079)
Akan30 × Careful × Political intimidation		0.430*** (0.136)		0.427*** (0.135)		0.462*** (0.138)
MP listen			0.056 (0.061)	0.059 (0.061)		
Akan30 × MP listen			-0.013 (0.103)	-0.022 (0.103)		
Presidential approval					0.329*** (0.121)	0.293** (0.133)
Akan30 × Presidential approval					-0.086 (0.217)	0.110 (0.260)
Constant	-1.486*** (0.401)	-0.995** (0.451)	-1.389*** (0.374)	-0.953** (0.444)	-2.220*** (0.435)	-1.715*** (0.523)
Observations	1172	1116	1172	1116	1172	1116

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** p<0.01, ** p<0.05, * p<0.10

Logit coefficients shown in the table.

Table 34: The impact of proxies for expectations of local public goods provision and being surrounded by Akans on the intention to vote for the NPP

	Vote for NPP					
	(1)	(2)	(3)	(4)	(5)	(6)
Akan30	0.662 (0.451)	0.684 (0.452)	0.405 (0.406)	0.409 (0.403)	0.484 (0.716)	0.430 (0.717)
Can make councilor listen	0.091 (0.079)	0.102 (0.081)				
Akan30 × Can make councilor listen	-0.130 (0.128)	-0.149 (0.131)				
Factor Analysis		-0.340** (0.136)		-0.332** (0.136)		-0.300** (0.142)
Akan30 × Factor		0.493** (0.219)		0.475** (0.220)		0.450** (0.224)
MP listen			0.056 (0.061)	0.061 (0.062)		
Akan30 × MP listen			-0.013 (0.103)	-0.023 (0.104)		
Presidential Approval					0.329*** (0.121)	0.319*** (0.121)
Akan30 × Presidential Approval					-0.086 (0.217)	-0.076 (0.217)
Constant	-1.486*** (0.401)	-1.512*** (0.399)	-1.389*** (0.374)	-1.401*** (0.368)	-2.220*** (0.435)	-2.187*** (0.436)
Observations	1172	1116	1172	1116	1172	1116

Robust standard errors clustered by enumeration area in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** p<0.01, ** p<0.05, * p<0.10

Logit coefficients shown in the table.

Table 35: The impact of neighborhood composition on proxies for the expectations of local public goods provision

	Can make councilor listen	Can make MP listen	Presidential Approval
	(1)	(2)	(3)
Vote for NPP	0.380 (0.222)	0.430 (0.244)	0.283*** (0.062)
Akan30	0.068 (0.223)	0.166 (0.257)	0.014 (0.088)
Constant	4.650*** (0.736)	4.221*** (0.858)	0.686** (0.251)
R^2	0.211	0.219	0.514
Observations	143	143	143

Robust standard errors in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akan, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Data collapsed to the means by enumeration area.

Table 36: The impact of being surrounded by Akans (30 km radius) by different levels of intimidation

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan30	-0.045 (0.409)	-0.490 (0.768)	-0.118 (0.431)	-0.092 (0.485)
Intimidation=1	-0.339 (0.292)	-0.353 (0.294)	-0.334 (0.291)	-0.286 (0.295)
Intimidation=2	-0.579 (0.368)	-0.587 (0.370)	-0.581 (0.367)	-0.490 (0.359)
Intimidation=3	-1.358*** (0.373)	-1.390*** (0.373)	-1.360*** (0.375)	-1.270*** (0.367)
Intimidation=1 × Akan30	0.044 (0.494)	0.063 (0.496)	0.029 (0.498)	-0.078 (0.497)
Intimidation=2 × Akan30	0.606 (0.648)	0.624 (0.654)	0.609 (0.647)	0.474 (0.640)
Intimidation=3 × Akan30	1.615* (0.646)	1.665* (0.650)	1.623* (0.647)	1.472* (0.638)
School		-0.269 (0.309)		
School × Akan30		0.475 (0.708)		
Road			-0.019 (0.320)	
Road × Akan30			0.169 (0.486)	
Health clinic				-0.085 (0.288)
Health clinic × Akan30				0.359 (0.435)
Constant	-0.855* (0.377)	-0.602 (0.473)	-0.857* (0.391)	-0.982* (0.434)
Observations	1141	1141	1141	1109

Robust standard errors in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 37: The impact of being surrounded by Akans (5 km radius) by different levels of intimidation

	Vote for NPP			
	(1)	(2)	(3)	(4)
Akan5	-0.001 (0.475)	-0.231 (0.800)	0.037 (0.488)	0.289 (0.557)
Intimidation=1	-0.363 (0.323)	-0.376 (0.325)	-0.357 (0.324)	-0.308 (0.330)
Intimidation=2	-0.587 (0.401)	-0.591 (0.401)	-0.582 (0.399)	-0.466 (0.387)
Intimidation=3	-1.428*** (0.408)	-1.449*** (0.407)	-1.419*** (0.404)	-1.292** (0.395)
Intimidation=1 × Akan5	0.092 (0.547)	0.109 (0.550)	0.078 (0.555)	-0.050 (0.555)
Intimidation=2 × Akan5	0.622 (0.713)	0.629 (0.716)	0.611 (0.710)	0.415 (0.699)
Intimidation=3 × Akan5	1.810* (0.729)	1.843* (0.732)	1.797* (0.724)	1.583* (0.708)
School		-0.189 (0.347)		
School × Akan5		0.246 (0.726)		
Road			0.111 (0.352)	
Road × Akan5			-0.101 (0.554)	
Health clinic				0.116 (0.304)
Health clinic=1 × Akan5				-0.020 (0.474)
Constant	-0.888* (0.408)	-0.714 (0.527)	-0.938* (0.415)	-1.181* (0.476)
Observations	1141	1141	1141	1109

Robust standard errors in parentheses. All the specifications include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Logit coefficients shown in the table.

Table 38: The impact of percent Akan in the 30 km radius on the intent to vote for NPP

(4)				
	<i>Intimidation = 0 and Careful = 0</i>	<i>Intimidation = 0 and Careful = 1</i>	<i>Intimidation = 0 and Careful = 2</i>	<i>Intimidation = 0 and Careful = 3</i>
Marginal Effect <i>Akan30</i>	-0.037	0.072	0.172**	0.256**
Standard Error	(0.095)	(0.080)	(0.088)	(0.110)
(4)				
	<i>Intimidation = 1 and Careful = 0</i>	<i>Intimidation = 1 and Careful = 1</i>	<i>Intimidation = 1 and Careful = 2</i>	<i>Intimidation = 1 and Careful = 3</i>
Marginal Effect <i>Akan30</i>	-0.043	0.049	0.138*	0.221***
Standard Error	(0.108)	(0.086)	(0.080)	(0.092)
(4)				
	<i>Intimidation = 2 and Careful = 0</i>	<i>Intimidation = 2 and Careful = 1</i>	<i>Intimidation = 2 and Careful = 2</i>	<i>Intimidation = 2 and Careful = 3</i>
Marginal Effect <i>Akan30</i>	0.007	-0.041	-0.173	0.555***
Standard Error	(0.124)	(0.132)	(0.137)	(0.116)
(4)				
	<i>Intimidation = 3 and Careful = 0</i>	<i>Intimidation = 3 and Careful = 1</i>	<i>Intimidation = 3 and Careful = 2</i>	<i>Intimidation = 3 and Careful = 3</i>
Marginal Effect <i>Akan30</i>	-0.043	0.049	0.138*	0.221***
Standard Error	(0.108)	(0.086)	(0.080)	(0.092)

*** p<0.01, ** p<0.05, * p<0.10. Model (4) includes interaction terms for *Akan30* and *Intimidation* and *Akan30* and *Careful*. This table shows all the marginal effects of *Akan30* conditional on different combinations of the levels of *Intimidation* and *Akan30*. All models include the following additional controls: indicators for major ethnic groups in Ghana (Akans, Ewe, Dagomba), gender, perception of the economy, poverty, local level of development and indicators for a central region and for urban and rural areas. Note that the coefficients presented in the table are marginal effects with continuous variables held at means and binary variables held at median values.

7.2 Polling Station-Level Analysis

A related paper by Ichino and Nathan (2013) uses both the individual-level Afrobarometer data and the polling station-level data in their analysis. We draw only on the individual-level Afrobarometer data in our main analysis, for several reasons.

First, there is no data on intimidation at the polling station-level, and thus we are not able to use the polling station-level data to test our hypothesis.

Second, even had there been data on intimidation at the polling station-level, the results using this data would have been of limited use, since aggregate data are not well-suited for testing individual-level hypotheses. As noted above, if, for example, a higher share of Akans in a neighborhood was associated with a higher percentage fearing intimidation and a higher percentage voting for the NPP at a polling station, we could not be sure whether it is the individuals being intimidated, or a different set of individuals entirely, that were voting for the NPP. Thus due to the ecological inference problem, using polling station-level data, we cannot tell whether neighborhood composition affects ethnic voting through intimidation.

Third, in our case, the aggregate polling station-level data does not have enough variation to precisely estimate the effects we are interested in. In particular, the only variables that vary at the polling-station level are the parties' vote share and the percentage of Akans in the neighborhood, while all the other variables vary at the enumeration area level. Furthermore, enumeration areas are contained in electoral districts. This makes it necessary to cluster standard errors by electoral districts to properly account for the uncertainty in our estimates. Since the number of clusters (22) is small, it is not sufficient to

use cluster-robust standard errors, and either cluster bootstrap or wild cluster bootstrap is needed. Cluster bootstrap cannot be implemented due to the lack of variation within clusters during the resampling. We thus use wild cluster bootstrap (Cameron, Gelbach and Miller 2008), which estimates the p-values for the coefficients based on the empirical distribution of the t-statistics. Wild cluster bootstrap overcomes the lack of within-cluster variation in the covariates by resampling the residuals instead.

We thus replicate the polling station-level analysis in the Ichino and Nathan (2013) paper using wild cluster bootstrap. Table 39 presents the results. We find that the coefficient on the percentage of Akans in a neighborhood is not statistically significant at the conventional level anymore in both of the specifications used by Ichino and Nathan (models (2) and (3) in table 39). We thus see that the polling station-level data does not allow us to estimate the effect of interest precisely once we properly account for the uncertainty in the estimates.

Table 39: Polling Station-Level Analysis: Brong-Ahafo region

	NPP Vote share		
	(1)	(2)	(3)
Share of Akans	0.368 (0.000)	0.290 (0.000)	0.275 (0.015)
Share of Moledagbon	0.075 (0.205)	0.043 (0.332)	0.043 (0.328)
Share of other ethnicities	0.205 (0.000)	0.230 (0.000)	0.228 (0.000)
Public and semi-public employment	0.154 (0.738)	0.161 (0.685)	0.167 (0.693)
Development	0.025 (0.000)	0.024 (0.000)	0.024 (0.000)
Akan30		0.257 (0.072)	0.250 (0.117)
Akan30 \times Share of Akans			0.021 (0.878)
Constant	0.212 (0.000)	0.089 (0.237)	0.094 (0.197)
Observations	1590	1590	1590

p-values are in parentheses.

p-values are obtained using wild cluster bootstrap at the electoral district-level, with 1200 replications.

Regression specifications include electoral district-level fixed effects.