Supplemental Information for "Crossing the Line: Local Ethnic Geography and Voting in Ghana" (Online Appendix)

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This appendix contains additional tables and figures for "Crossing the Line: Local Ethnic Geography and Voting in Ghana," including robustness checks and additional model specifications referenced in the main text.

Contents

1 Range of % Akan in 30km Radius in Brong Ahafo Region

Panel (a) of Figure 1 shows that the prevalence of Akans *around* each polling station in the Brong Ahafo Region, measured as the spatially weighed population proportion within a 30km radius, varies considerably at any level of prevalence of Akans *at* each polling station, measured as the population proportion in the polling station's "home" Enumeration Area (EA). Panel (b) shows that there are very few polling stations in the Brong Ahafo Region with roughly similar spatially weighted population shares of Akans and Ewes in the 30km radius around the polling stations, precluding the investigation of the turnout hypothesis discussed in our theory section.

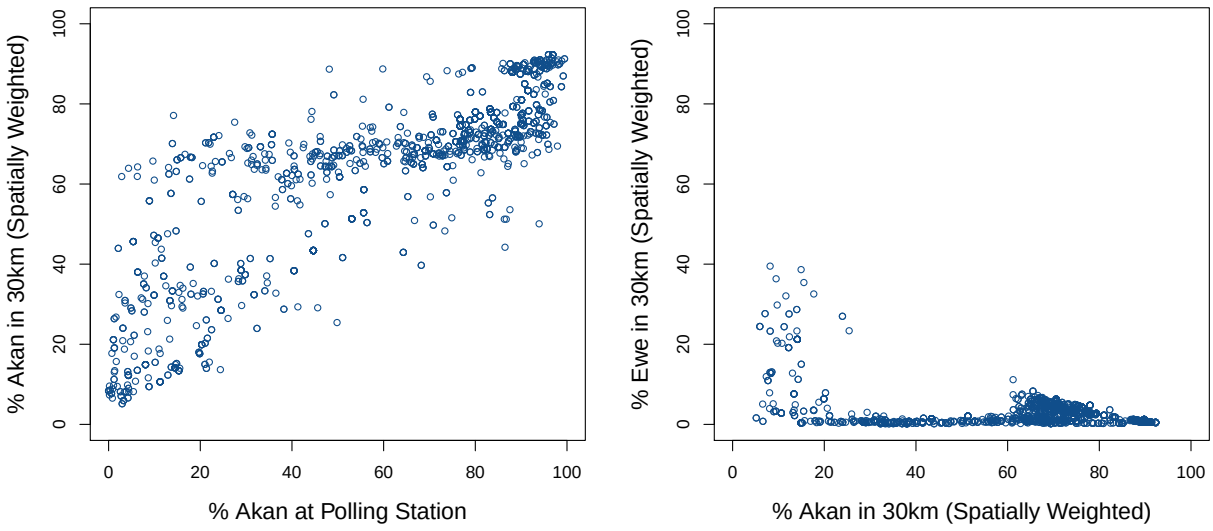

Figure 1: *Panel (a): Proportion Akan around polling station against proportion Akan at polling station, Brong Ahafo Region. Panel (b): Proportion Ewe around polling station against proportion Akan around polling station.*

2 Missing Polling Stations in Brong Ahafo Region

We are only able to locate 1635 of the 2374 polling stations from the Brong Ahafo Region for which we have 2008 election results. While most polling stations contained the name of the village or section of town in which they were located, some polling stations had unspecific names such as "Presby (Presbyterian) School" or "Cocoa Shed" or were otherwise impossible to locate. Because local ethnic geography cannot be calculated around polling stations that cannot be located, we dropped these polling stations from the analysis. There are no significant differences between the full sample (including the dropped polling stations) and the sample used in the analysis in Section 5 on observable characteristics, such as vote share of either the NPP or NDC or turnout. Figure 2 shows the distribution of the full (red, dashed) and located (blue, solid) samples for NPP vote share, NDC vote share, and turnout in the 2008 presidential election.

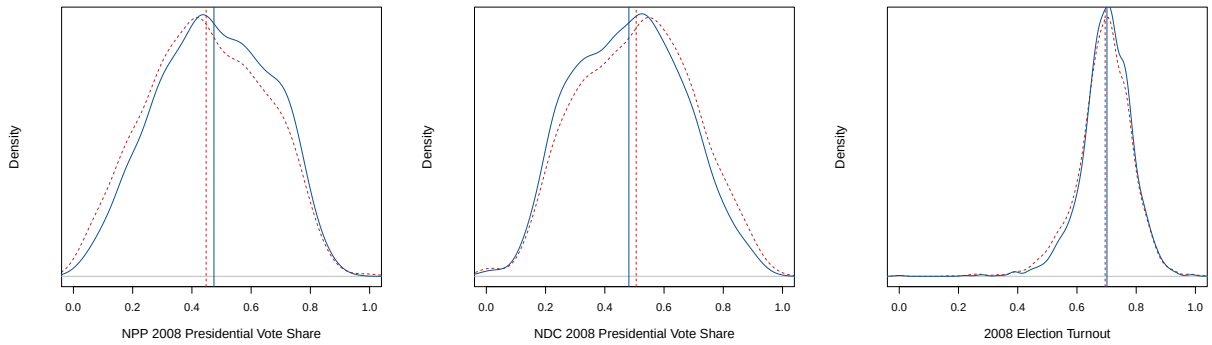

Figure 2: *2008 NPP Vote Share (left), NDC Vote Share (center), Turnout (right) in All (red, dashed) and Located (blue, solid) Polling Stations in Brong Ahafo Region*

3 Linearity Assumption for Brong Ahafo Analysis

Our theory suggests a monotonically increasing, but not necessarily linear, relationship between the population share of an ethnic group around a voter (or polling station) and support for the political party associated with that ethnic group. We fit and report linear models in the polling station analysis section of the manuscript, which enable us to interpret the coefficients in a straightforward manner. We check the linearity assumption for Table 2 in the manuscript by fitting a generalized additive model, allowing local ethnic geography and ethnic group shares at the polling stations to enter the model non-parametrically. The model is: $NPPvoteshare_{ij} = \alpha_j + m_1(Akan30km_{ij}) + m_2(AkanPS_{ij}) + m_3(Mole - DagbonPS_{ij}) + m_4(OtherPS_{ij}) + \mathbf{X_{ij}}\delta + \epsilon_{ij}$. Figure 3, which plots $\hat{m_1}(Akan30km_{ij})$ against $Akan30km_{ij}$, indicates that the linearity assumption is justified.

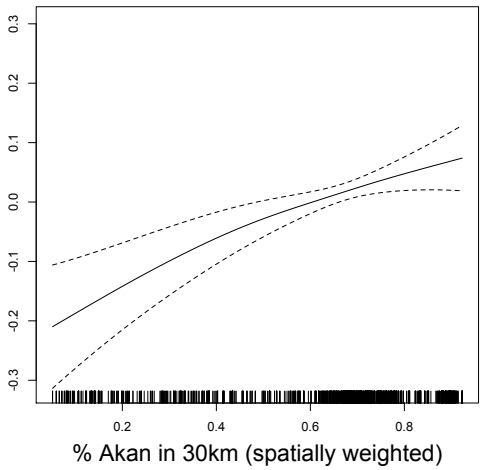

Figure 3: *Brong Ahafo Polling Stations:* $\hat{m_1}(Akan30km_{ij})$ *against* $Akan30km_{ij}$

4 Local Ethnic Geography at Additional Distances

We measure local ethnic geography as the spatially weighted population proportion of ethnic groups in a 30km radius of the polling station's or respondent's census Enumeration Area (EA). Our results are robust to calculating these spatially weighted averages for other radii. In Table 1, we replicate the models in Table 2 of the text using measures for local ethnic geography at 20km or 40km instead of 30km. The results are substantively the same when using the local ethnic geography measure for these other distances. As in the manuscript, all models in use weighted least squares with weights equal to total votes cast in the first round of the 2008 presidential election by polling station. All models include parliamentary constituency fixed effects (not reported).

Table 1: Local Ethnic Geography and NPP Vote Share in the 2008 Presidential Election, 20km and 40km radius

	(1)	(2)	(3)	(4)	(5)
% Akan at polling station	0.386^{***}	0.270^{***}	0.282^{**}	0.287^{***}	0.357^{***}
	(0.055)	(0.061)	(0.095)	(0.060)	(0.100)
% Mole-Dagbon at polling station	$0.120^{\dagger}$	0.081	0.081	0.066	0.068
	(0.063)	(0.064)	(0.064)	(0.065)	(0.065)
% Minor ethnic groups at polling station	0.228^{***}	0.269^{***}	0.271^{***}	0.259^{***}	0.266^{***}
	(0.054)	(0.054)	(0.056)	(0.054)	(0.055)
% Public sector employment	0.086	0.072	0.068	0.074	0.052
	(0.121)	(0.120)	(0.123)	(0.120)	(0.123)
Development Index	0.025^{***}	0.024^{***}	0.024^{***}	0.024^{***}	0.024^{***}
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
% Akan in 20km radius (weighted)		0.316^{***}	0.324^{***}		
		(0.074)	(0.085)		
% Akan in 20km (weighted) radius *			-0.018		
% Akan at polling station			(0.102)		
% Akan in 40km radius (weighted)				0.344^{***}	0.377^{***}
				(0.085)	(0.093)
% Akan in 40km radius (weighted) *					-0.098
% Akan at polling station					(0.113)
R^2	0.377	0.384	0.385	0.384	0.384

† significant at $p < .10$; $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. $n = 1590$.

Because the weights decline rapidly with distance from the home EA, the choice of radius (20km, 30km, 40km) does not significantly affect our measures. Figure 4 Panels (a) and (b) plot the spatially weighted proportion of Akans in 30km around each polling station in the Brong Ahafo Region against the weighted averages in 20km or 40km instead. In Panel (c), we plot the proportion of Akans in 30km using an alternative weighting function, $\phi(p,q) = (dist(p,q)+1)^{-1}$, against the proportion of Akans in 30km using the weighting function described in the text, $\phi(p,q) = (dist(p,q)+0.5)^{-1}$. The plots for the spatially weighted averages of Ewes around each polling station are also similar.

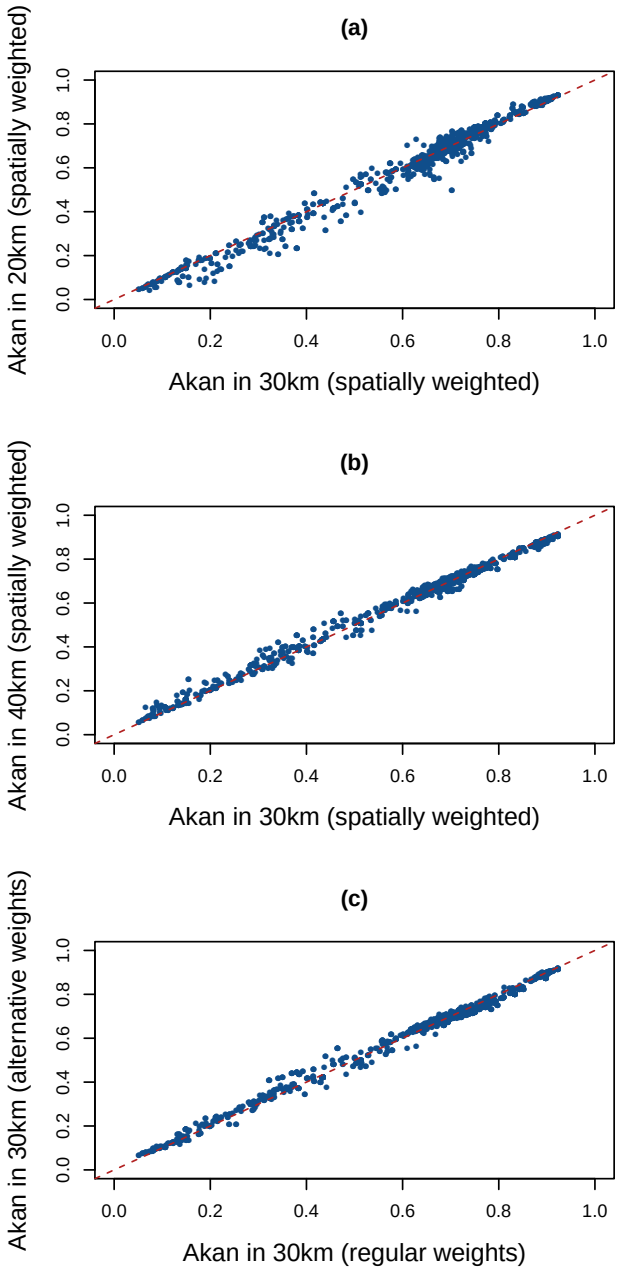

Figure 4: *Alternative Local Ethnic Geography Measures.* The dashed line in each panel represents where the points should fall if the distributions were exactly the same.

5 NPP Vote Share versus NDC Vote Share

Table 2 in the manuscript reports results from regression models with NPP vote share as the outcome. Third party support was negligible in the 2008 presidential election, so there is a very strong correlation between NPP and NDC vote share (Figure 5). Models with NDC vote share as the outcome yields nearly identical results to those reported in Table 2, only with opposite signs on the coefficients as shown in Table 2 below. As in the manuscript, all models use weighted least squares with weights equal to total votes cast in the first round of the 2008 presidential election by polling station. All models include parliamentary constituency fixed effects (not reported). Because of reporting or typographical errors in the returns from the Electoral Commission, 14 polling stations out of the 1590 analyzed in the text reported NPP vote shares and NDC vote shares that sum to a number greater than 1. These observations are not plotted in Figure 5. Re-running our analysis without these 14 observations does not affect any of the findings reported here or in the manuscript.

Table 2: Local Ethnic Geography and NDC Vote Share in the 2008 Presidential Election

	(1)	(2)	(3)
% Akan in 30km (spatially weighted)		-0.301^{***}	-0.315^{***}
		(0.082)	(0.091)
% Akan in 30km (spatially weighted) *			0.040
% Akan at polling station			(0.106)
% Akan at polling station	-0.381^{***}	-0.286^{***}	-0.315^{**}
	(0.054)	(0.059)	(0.096)
% Mole-Dagbon at polling station	-0.128^{*}	-0.085	-0.085
	(0.062)	(0.063)	(0.063)
% Minor ethnic groups at polling station	-0.243^{***}	-0.274^{***}	-0.278^{***}
	(0.053)	(0.053)	(0.054)
% Public sector employment	-0.071	-0.068	-0.058
	(0.118)	(0.118)	(0.120)
Development Index (EA)	-0.024^{***}	-0.023^{***}	-0.023^{***}
	(0.003)	(0.003)	(0.003)
R^2	0.352	0.358	0.358

† significant at $p < .10$; $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. $n = 1590$.

6 Diversity in the Brong Ahafo Region

We also test whether NPP vote share is correlated with rising ethnic diversity more generally in the area around a polling station, not just with the presence of Akans. Table 3 adds ethnic fractionalization for the area around each polling station (calculated from the spatially weighted population proportions of each ethnic group on the census for the 30km radius around each polling station) to the model reported in column 2 of Table 2 in the manuscript. Ethnic fractionalization is measured as: $I = 1 - \sum_{n=1}^{N} \pi_n^2$, where π_n is the proportion of the population in each of N ethnic groups in the 30km radius around each polling station. As in the manuscript, we use weighted

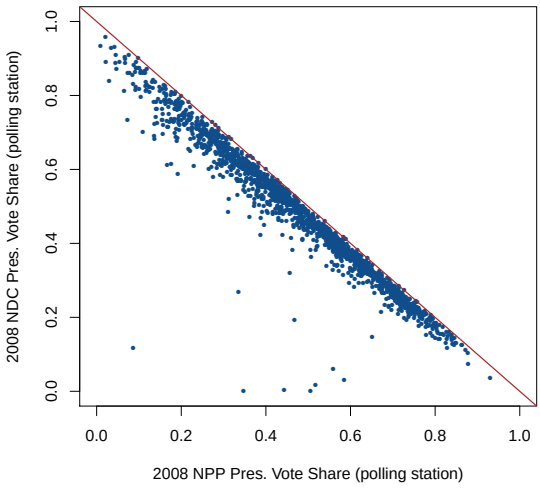

Figure 5: *NPP Presidential Vote Share against NDC Presidential Vote Share*: Polling stations in the Brong Ahafo Region. Points falling on the line represent polling stations where NPP and NDC vote share sum exactly to 1.

least squares with weights equal to total votes cast in the first round of the 2008 presidential election by polling station and include parliamentary constituency fixed effects (not reported). We find no relationship between ethnic fractionalization and NPP support, but the relationship with $Akan30km$ remains positive and statistically significantly different from 0.

Table 3: Ethnic Fractionalization and NPP Vote Share

Ethnic Fractionalization in 30km radius	-0.060
	(0.086)
% Akan in 30km radius (weighted)	0.279^{**}
	(0.099)
% Akan at polling station	0.280^{***}
	(0.061)
% Mole-Dagbon at polling station	0.075
	(0.064)
% Minor ethnic groups at polling station	0.252^{***}
	(0.056)
% Public sector employment	0.095
	(0.122)
Development Index	0.024^{***}
	(0.003)

† significant at $p < .10$; $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. $n = 1590$

7 Multi-level Model for the Brong Ahafo Region

One possible alternative explanation for our findings is that Akans coerce or intimidate nearby minority groups to vote for the NPP. This is unlikely to be the case, however, if NPP presidential vote share is increasing in $Akan30km$ even where Akans are in the minority overall, because it is improbable that Akans intimidate other groups into supporting the NPP when they are a minority in the area. To test this, we estimate a varying-slope, varying-intercept multi-level model which allows the direction and size of the coefficient on $Akan30km$ to vary across the 22 constituencies in the Brong Ahafo Region for which we have polling station data. This model is:

$$\begin{aligned} y_i &= \alpha_{j[i]} + \beta_{j[i]} Akan30km_i + \mathbf{X_i}\delta + \epsilon_i \\ \alpha_{j[i]} &= \gamma_0^{\alpha} + \eta_j^{\alpha} \\ \beta_{j[i]} &= \gamma_0^{\beta} + \eta_j^{\beta} \end{aligned}$$

where y_i is NPP presidential vote share at polling station i in constituency j and $\mathbf{X_i}$ is the population proportions of ethnic groups at the polling station ($AkanPS_{ij}$, $Mole\text{-}DagbonPS_{ij}$, $MinorGroupPS_{ij}$), the level of development ($Development_{ij}$), and the proportion of the population employed in the public or semi-public sector ($PublicSector_{ij}$) in each polling station's EA. In Figure 6 we display coefficient estimates for $Akan30km$ by constituency (with 95% confidence intervals) on the y-axis, with the Akan population proportion along the x-axis. The coefficient estimates for all constituencies remain positive and significant, including those areas with few Akans overall.

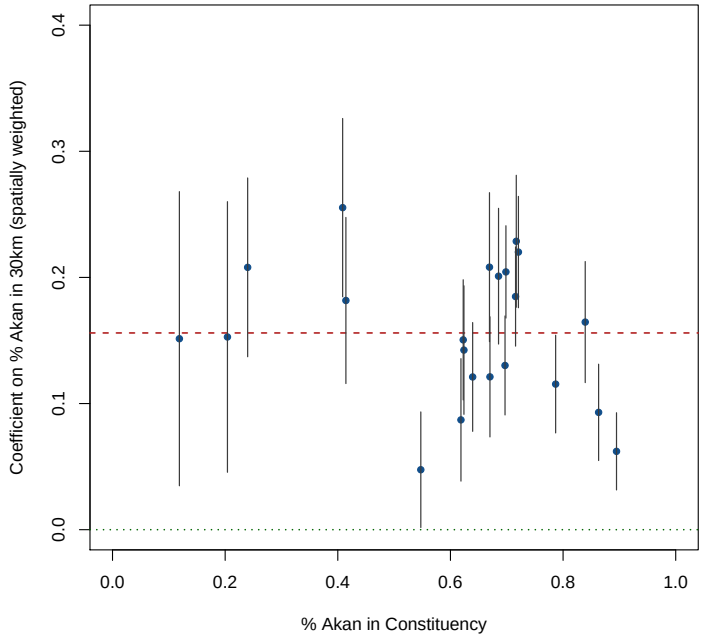

Figure 6: *Coefficients by Constituency: Multi-Level Model, Brong Ahafo Region.*

8 Afrobarometer Analysis, Urban Areas Only

Table 4 reports the full set of coefficients for the logistic regression models for urban respondents only using local ethnic geography measures with a 30km radius (Table 5 Panel (a) in the manuscript) and Table 5 reports the coefficients for the models using a 5km radius (Panel (b)). For both tables, data is from Rounds 3 and 4 of the Ghana Afrobarometer, $n = 387$ in 39 EAs. Urban respondents are those in local areas estimated to have more than 1000 people per square kilometer. Standard errors in parentheses are clustered at the Enumeration Area (EA) level.

Table 4: Local Ethnic Geography and Individual-Level Party Support: Urban, 30km

	(1) Support NPP	(2) Support NDC	(3) Support NPP	(4) Support NDC
% Akan in 30km (spatially weighted)	1.240	0.677		
	(0.704)	(0.849)		
% Ewe in 30km (spatially weighted)			−1.551	1.175
			(1.786)	(3.084)
Akan	0.590*	−0.508	0.678**	−0.454
	(0.276)	(0.323)	(0.259)	(0.327)
Ewe	−0.227	1.111***	−0.173	1.078**
	(0.327)	(0.312)	(0.352)	(0.344)
Dagomba (Mole)	0.084	−0.427	−0.328	−0.475
	(0.472)	(0.815)	(0.577)	(0.815)
Male	0.147	0.421	0.148	0.418
	(0.319)	(0.263)	(0.322)	(0.263)
Economic Approval	0.433***	−0.333**	0.430***	−0.340**
	(0.112)	(0.109)	(0.114)	(0.109)
Poverty (Individual)	−0.315*	0.083	−0.301*	0.099
	(0.122)	(0.133)	(0.119)	(0.131)
Development Index (EA)	−0.537***	0.022	−0.505***	0.041
	(0.131)	(0.199)	(0.129)	(0.188)
Round 4	−1.060***	0.280	−1.070***	0.291
	(0.240)	(0.266)	(0.242)	(0.269)
Intercept	−1.544**	−0.962	−0.794	−0.856
	(0.515)	(0.618)	(0.496)	(0.631)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5: Local Ethnic Geography and Individual-Level Party Support: Urban, 5km

	(1) Support NPP	(2) Support NDC	(3) Support NPP	(4) Support NDC
% Akan in 5km (spatially weighted)	1.240	0.216		
	(0.635)	(0.886)		
% Ewe in 5km (spatially weighted)			−0.987	2.327
			(1.279)	(1.227)
Akan	0.551*	−0.480	0.697**	−0.506
	(0.276)	(0.310)	(0.265)	(0.340)
Ewe	−0.253	1.107***	−0.148	0.936**
	(0.326)	(0.306)	(0.379)	(0.353)
Dagomba (Mole)	0.048	−0.517	−0.259	−0.468
	(0.458)	(0.767)	(0.559)	(0.830)
Male	0.147	0.421	0.150	0.401
	(0.320)	(0.263)	(0.322)	(0.262)
Economic Approval	0.432***	−0.336**	0.433***	−0.353***
	(0.113)	(0.110)	(0.115)	(0.106)
Poverty (Individual)	−0.308*	0.091	−0.290*	0.086
	(0.120)	(0.131)	(0.116)	(0.123)
Development Index (EA)	−0.574***	0.025	−0.510***	0.071
	(0.130)	(0.207)	(0.133)	(0.193)
Round 4	−1.036***	0.285	−1.064***	0.301
	(0.239)	(0.270)	(0.240)	(0.269)
Intercept	−1.487**	−0.755	−0.903	−0.990*
	(0.482)	(0.558)	(0.469)	(0.503)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

9 Social Desirability Bias

Table 6 shows that responses to the question of whether the Afrobarometer enumerators were sent by the government do not vary systematically with the respondent's ethnicity or the prevalence of Akans or Ewes in the surrounding area.

We also control for whether respondents believe enumerators were from the government in our main Afrobarometer models, interacting this indicator variable with our measures of local ethnic geography ($Akan30km$) and Central Region. Figure 5 panel (a) in the manuscript shows that our results are robust to controlling for whether respondents believe the enumerators came from the government. Table 7 reports coefficients from the logistic regression from which Figure 5 panel (a) in the manuscript was simulated. The sample is restricted to 950 non-Akan rural respondents in 164 EAs. Standard errors in parentheses are clustered at the Enumeration Area (EA) level.

Table 6: Believe Enumerator Sent by Government, rural respondents only

By ethnic group:		By *Akan*30*km*:		By *Ewe*30*km*:	
Akans	67%	1st quintile	60%	1st quintile	62%
Ewes	62%	2nd	66%	2nd	67%
Dagomba	69%	3rd	64%	3rd	66%
		4th	67%	4th	70%
		5th	71%	5th	65%

Table 7: Controlling for Enumerator Sent by Government, rural non-Akans only

	(1) Support NPP	(2) Support NDC
% Akan in 30km (spatially weighted)	1.442**	−1.532**
	(0.469)	(0.545)
Enumerator Sent by Government	0.584**	−0.074
	(0.216)	(0.202)
Central Region	−13.037***	−13.893***
	(3.507)	(3.488)
% Akan 30km * Central Region	−1.562	1.152
	(6.698)	(7.268)
% Akan 30km * Enumerator	−1.028	0.441
	(0.555)	(0.611)
Central Region * Enumerator	16.007***	12.962***
	(3.458)	(3.010)
% Akan 30km * Central * Enumerator	−3.622	−0.097
	(6.860)	(6.964)
Male	0.008	0.104
	(0.145)	(0.131)
Economic Approval	0.194**	−0.129
	(0.072)	(0.070)
Poverty (Individual)	−0.137	0.090
	(0.080)	(0.083)
Development Index (EA)	−0.214	0.051
	(0.114)	(0.120)
Intercept	−1.741***	0.035
	(0.276)	(0.285)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. $n = 950$ in 164 EA clusters. Rural, non-Akan respondents only.

10 Sorting

Table 8 reports the logistic regression coefficients from which the predicted probabilities in Figure 5 panel (b) in the manuscript were simulated. The models include trust in other ethnic groups, interacted with the spatially weighted proportion of Akans within 30km. The sample is restricted to the 431 non-Akan rural respondents in Round 3, since the question was not included in the Round 4 Afrobarometer in Ghana. Standard errors in parentheses are clustered at the Enumeration Area (EA) level (80 clusters). Because only a handful of respondents are in Central Region, we omit this indicator variable and its interaction with $Akan30km$ from these models.

Table 8: Controlling for Trust in Other Groups

	(1) NPP Support	(2) NDC Support
% Akan in 30km (spatially weighted)	1.266^{*}	$-1.193^{\dagger}$
	(0.521)	(0.629)
Trust Other Groups	0.409	0.025
	(0.348)	(0.290)
Trust Other Group * % Akan in 30km (spatially weighted)	0.145	0.034
	(0.622)	(0.765)
Male	0.243	-0.326
	(0.227)	(0.189)
Economic Approval	0.467^{***}	-0.265^{*}
	(0.109)	(0.117)
Poverty (Individual)	-0.153	0.085
	(0.122)	(0.127)
Development Index (EA)	-0.056	0.017
	(0.143)	(0.176)
Intercept	-2.288^{***}	0.448
	(0.414)	(0.419)

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. $n = 431$ in 80 EA clusters. Round 3 rural, non-Akan respondents only.

11 Socialization

Table 9 reports summary statistics of responses to the question on trust in other ethnic groups as reported on the Afrobarometer. Levels of trust do not vary across ethnic groups overall. The table also shows the proportion of non-Akans who report trust in other groups by quartile of $Akan30km$ and the proportion of non-Ewes who report trust by quartile of $Ewe30km$. Reported trust in other groups does not appear to vary systematically across these explanatory variables. We estimate logistic regression models with local ethnic geography as the key explanatory variable and trust in other ethnic groups as the outcome to address the alternative socialization argument, restricted to rural respondents in Round 3 who were asked this question on trust in other ethnic groups (Table 10). We also control for trust in the respondent's own ethnic group in the logistic regressions

Table 9: Trust Other Ethnic Groups

By ethnic group:		By $Akan30km$:		By $Ewe30km$:	
Akans	43%	1st quintile	47%	1st quintile	50%
Ewes	42%	2nd	29%	2nd	44%
Dagomba	49%	3rd	49%	3rd	40%
		4th	56%	4th	46%
		5th	48%	5th	47%

Share of Afrobarometer respondents who answer that they trust members of other ethnic groups, by respondent's ethnic group and quintile of local ethnic geography variables. Round 3 rural respondents only.

reported in Table 11. We find no support for the first stage of the socialization argument. For both tables, the sample is all rural Round 3 respondents in columns 1 and 3, non-Akan respondents only in column 2, and non-Ewe respondents only in column 4. Standard errors in parentheses are clustered at the Enumeration Area (EA) level.

Table 10: Trust in Other Ethnic Groups

	(1) All	(2) Non-Akans	(3) All	(4) Non-Ewes
% Akan in 30km (weighted)	0.168	0.464		
	(0.232)	(0.424)		
% Ewe in 30km (weighted)			−0.469	0.096
			(0.341)	(1.065)
Central Region	−0.239	−1.188**	−0.228	−0.196
	(0.227)	(0.443)	(0.230)	(0.229)
Male	0.133	0.451*	0.127	0.020
	(0.129)	(0.185)	(0.130)	(0.137)
Poverty (Individual)	0.124	0.270*	0.118	0.107
	(0.077)	(0.118)	(0.076)	(0.084)
Intercept	−0.323*	−0.546**	−0.182	−0.179
	(0.157)	(0.192)	(0.106)	(0.116)
n	911	434	911	796
Clusters (EA)	117	80	117	108

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Round 3 rural respondents only.

12 Shared World View

Another alternative explanation for our findings is that a member of group B surrounded by members of group A may hold a world view that is more similar to those of group A, making

Table 11: Trust in Other Ethnic Groups, Controlling for Trust in Own Group

	(1) All	(2) Non-Akans	(3) All	(4) Non-Ewes
% Akan in 30km (weighted)	0.144	0.122		
	(0.292)	(0.612)		
% Ewe in 30km (weighted)			−0.598	−0.384
			(0.461)	(1.241)
Trust own ethnic group	3.277***	3.266***	3.284***	3.349***
	(0.228)	(0.281)	(0.230)	(0.251)
Central Region	−0.268	−1.240*	−0.274	−0.250
	(0.301)	(0.505)	(0.301)	(0.305)
Male	0.111	0.203	0.113	0.065
	(0.173)	(0.243)	(0.171)	(0.188)
Poverty (Individual)	0.088	0.140	0.088	0.085
	(0.097)	(0.138)	(0.095)	(0.105)
Intercept	−2.477***	−2.493***	−2.340***	−2.401***
	(0.267)	(0.324)	(0.225)	(0.247)
n	911	434	911	796
Clusters (EA)	117	80	117	108

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Round 3 rural respondents only.

B more likely to vote in favor of A's candidate. This is unlikely in Ghana because the main political parties compete on providing "development" and do not have clear ideological programs. Still to check this argument, we examine responses to the Afrobarometer question that we believe best captures political ideology. This questions asks respondents which of two statements they agree with more strongly: "(1) People should look after themselves and be responsible for their own success in life. (2) The government should bear the main responsibility for the well-being of people." This was asked only in Round 3 (2005). We code this variable (*Responsible*) as 1 if the respondent agrees or agrees strongly with the first statement and 0 if the respondent agrees or agrees strongly with the second statement, which may indicate beliefs about the appropriate role of government in society. Because Akans are more likely than other groups to agree with the first statement, even after controlling for differences in poverty rates across groups (Akans are wealthier on average), we test whether those with more exposure to Akans become more likely to share the more common Akan view on this issue, with the idea that holding these views also leads to greater support for the Akan-associated NPP.

For our rural, non-Akan respondents in Round 3, we estimate logistic regression models with *Responsible* as the outcome variable and local ethnic geography as the explanatory variable, along with models for support for the NPP that include *Responsible* as an additional explanatory variable (Table 12). Standard errors in parentheses are clustered at the Enumeration Area (EA) level. In columns 1 and 2, we find that only Ewes are more likely to agree with the statement that people should be responsible for their own success in life when surrounded by more Akans. But column 3 shows that our main results relating local ethnic geography to support for the NPP still holds for Ewe respondents. We then add *Responsible* to the our main model in column 4. This shows that

Table 12: Shared Worldview: People Responsible Own Success

	(1) Responsible for Self	(2) Responsible for Self	(3) Support NPP	(4) Support NPP	(5) Support NPP
% Akan in 30km	0.064	−0.121	1.612***	1.583***	1.559***
(spatially weighted)	(0.435)	(0.433)	(0.411)	(0.414)	(0.416)
% Akan 30km * Central	1.350	1.038	−3.532	−3.560	−3.506
	(2.761)	(2.699)	(2.700)	(2.833)	(2.793)
Responsible for Own Success				0.287	0.212
				(0.211)	(0.241)
Responsible * Ewe					0.284
					(0.446)
Ewe	−1.262***	−1.345***	−0.074	−0.051	−0.196
	(0.350)	(0.331)	(0.246)	(0.247)	(0.381)
Dagomba	0.022	0.116	0.607	0.591	0.586
	(0.369)	(0.353)	(0.321)	(0.327)	(0.325)
% Akan 30km * Ewe	3.357**	3.412***			
	(1.031)	(1.000)			
% Akan 30km * Dagomba	0.097	−0.331			
	(1.418)	(1.452)			
Male			0.366	0.366	0.368
			(0.193)	(0.193)	(0.192)
Economic Approval			0.426***	0.429***	0.432***
			(0.098)	(0.099)	(0.101)
Poverty (Individual)		−0.412***	−0.202*	−0.174	−0.171
		(0.101)	(0.101)	(0.102)	(0.103)
Development Index (EA)			−0.057	−0.051	−0.053
			(0.102)	(0.104)	(0.104)
Central Region	−0.557	−0.188	2.067*	2.062*	2.040*
	(1.016)	(1.109)	(0.854)	(0.891)	(0.880)
Intercept	0.172	0.324	−2.233***	−2.393***	−2.351***
	(0.220)	(0.212)	(0.340)	(0.382)	(0.381)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Rural, non-Akans respondents from Round 3. $n = 543$ in 104 EAs. Standard errors in parentheses.

while the local geography variable is still strongly associated with NPP support in the expected direction, ideological views about government responsibility for success are not associated with changes in the probability of supporting the NPP. Column 5 shows that this remains the case when including an interaction with an indicator for respondents from the Ewe group. Therefore, it appears unlikely that convergence to a shared worldview or ideology as captured on this question can account for our findings.

13 Segregation and Vote Choice

An additional extension of the socialization argument centers on segregation of ethnic groups in the area around each respondent. Using Afrobarometer data from Kenya, Kasara (2012) finds that after controlling for the ethnic composition of a respondent's local area, respondents in more ethnically segregated areas report less trust in other groups. This may be because there is less social interaction and contact across groups where residents are more segregated. If this socialization mechanism accounts for our results, then conditional on a given level of Akans (Ewes) in the area surrounding a respondent, non-Akan (non-Ewe) respondents should be less likely to support the NPP (NDC) as segregation rises, because they will have less social interaction with the Akans (Ewes) in their vicinity. Moreover, this implies a statistically significant interaction term between the segregation around each respondent and our explanatory variables, $Akan30km$ or $Ewe30km$, with a stronger effect of local ethnic geography on vote choice at lower levels of segregation, where there is more interaction across group lines.

We test both of these implications in a series of logistic regressions reported in Table 13. For space, coefficient estimates on the control variables are not reported in this table. The models in Panel (a) add a variable for the segregation of the area in a 30km radius around each respondent ($Segregation$) to the models from Table 4 in the manuscript, but restricts the sample to non-Akan respondents when including $Akan30km$ and non-Ewe respondents when including $Ewe30km$ as the local ethnic geography measure.

As in Kasara (2012), we use the spatial "Information Theory" index for segregation (Reardon and O'Sullivan 2004), which ranges from 0 (no segregation) to 1 (full segregation). This index measures the difference in ethnic diversity in each EA in which a respondent is located from the overall ethnic diversity in the area defined by a 30km radius from the respondent. The information theory index of segregation is $H = \sum_{j=1}^{J} \frac{t_j}{TE}(E - E_j)$, where t_j is the total population in each local unit, T is the total population in the larger unit, E is the entropy of the larger unit, and E_j is the entropy of each of the j local units. Entropy is a measure of the local diversity in each unit, similar to measures for ethnic fractionalization. It is defined as $E = \sum_{m=1}^{M} \pi_m ln(\frac{1}{\pi_m})$, where π is the population proportion for each of M ethnic groups. $E = 0$ if everyone is from a single group and is maximized when all groups are represented evenly in the population. As the entropy E_j in each of the smaller units falls, H grows because the environment is more segregated when its component local areas are each less diverse. We define the larger unit as all census EAs that fall within 30km of each respondent.

The results in Table 13 do not support these implications of the socialization argument. First, controlling for $Akan30km$ or $Ewe30km$, we find that the level of segregation in the area around each respondent does not predict different probabilities of support for the NPP or NDC candidate in Panel (a), even though there is likely to be more interaction of these respondents and Akans and Ewes in less segregated areas. In addition, we test whether the relationship between our explanatory variables changes with segregation by including interaction terms between $Akan30km$ or $Ewe30km$ and $Segregation$ in Panel (b). None of these interaction terms are statistically significant, however, implying that the effect of local ethnic geography on vote choice does not vary with segregation.

Table 13: Segregation and Individual-Level Party Support

	(1) NPP	(2) NDC	(3) NPP	(4) NDC
Panel(a): No Interaction				
Segregation in 30km (H)	−0.315	1.069	−0.719	1.135
	(0.992)	(0.772)	(0.930)	(0.852)
% Akan in 30km (spatially weighted)	0.691*	−0.942**		
	(0.287)	(0.339)		
% Akan in 30km (spatially weighted) * Central Region	−4.471**	0.597		
	(1.434)	(2.421)		
% Ewe in 30km (spatially weighted)			−1.278	2.561***
			(0.723)	(0.709)
Panel (b): Interaction				
Segregation in 30km (H)	0.154	1.206	−1.128	1.596
	(1.266)	(0.971)	(1.191)	(1.080)
% Akan in 30km * Segregation	−2.756	−0.955		
	(2.886)	(2.850)		
% Ewe in 30km * Segregation			5.737	−5.674
			(6.049)	(4.803)
% Akan in 30km (spatially weighted)	0.915*	−0.865		
	(0.385)	(0.457)		
% Akan in 30km (spatially weighted) * Central Region	−4.500**	0.588		
	(1.454)	(2.428)		
% Ewe in 30km (spatially weighted)			−1.940	3.232***
			(1.000)	(0.957)
n	950	950	1611	1611
Clusters (EA)	164	164	206	206
	Non-Akans	Non-Akans	Non-Ewes	Non-Ewes

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Logistic regression coefficients with standard errors clustered at EA level in parentheses. Outcome is NPP or NDC support, for rural respondents only. Controls variables are not shown for space and are the same is in Tables 4 and 5 in the text. Restricted to non-Akan respondents in columns 1-2 and 5-6, and non-Ewes in columns 3-4 and 7-8. Segregation is measured as the Information Theory Index (H) calculated for the 30km radius around each polling station's EA (see Reardon and O'Sullivan (2004)).)