Working Paper No. 54

DEMOCRACY AND PRIMARY SCHOOL ATTENDANCE: AGGREGATE AND INDIVIDUAL LEVEL EVIDENCE FROM AFRICA

by David Stasavage

A comparative series of national public attitude surveys on democracy, markets and civil society in Africa.

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October 2005

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He would like to thank Shanker Satyanath for comments on an initial draft.

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DEMOCRACY AND PRIMARY SCHOOL ATTENDANCE:
AGGREGATE AND INDIVIDUAL LEVEL EVIDENCE FROM AFRICA

Abstract

It has been argued that democratically elected governments may have greater incentives than their authoritarian counterparts to provide primary education for their citizens. It has also been argued that primary education may, in turn, reinforce democracy by prompting individuals to adopt more democratic attitudes. This paper uses both aggregate and individual level data to examine whether there is evidence for either of these two effects in African countries. I find strong indications of a causal link running from democracy to greater primary education provision. This is observable at the aggregate level, when considering attendance rates, as well as at the micro level, where there is a clear correlation between individual evaluations of African presidential performance and regional variations in growth rates for primary school attendance. In contrast, there is less indication that primary education causes democracy by generating sizeable shifts in "democratic attitudes." While individuals with a primary education on average are more likely to support democracy, the substantive magnitude of this effect appears to be small. Based on this evidence, differences in education levels between African countries appear to explain relatively little of the cross-country variation we observe in support for democracy as a form of government.

DEMOCRACY AND PRIMARY SCHOOL ATTENDANCE: AGGREGATE AND INDIVIDUAL LEVEL EVIDENCE FROM AFRICA

Introduction

One of the core issues in the political economy of development involves empirically assessing whether and when governments in democracies have a greater incentive to provide basic public services when compared with governments in autocratic systems. Among the different basic services that a government can provide, primary education certainly ranks as one of the most important. The reasoning behind the argument why rulers in democracies might prioritize primary education is straightforward. In poor countries access to primary education is likely to be a potentially salient political issue for large segments of the population, and to the extent that democratically elected governments seek to capitalize on this issue in order to maximize their support, then they should logically devote greater budgetary resources to primary education when compared with their autocratic counterparts. There are, of course, a number of potential problems with this rosy scenario. Governments may instead choose to cultivate support through clientelistic mechanisms rather than broad programs, voters may select candidates based primarily on ethnic or regional considerations, and members of the public may also lack the information necessary to judge government policies in the area of education.[1] When one considers the example of African countries, recent experience suggests that primary education has been a prominent issue in several election campaigns. This has been the case in Uganda (1996), Malawi (1994), Tanzania (2001), and Kenya (2002). Despite this interesting fact, there has been relatively little effort by scholars to ask whether levels of primary education provision, measured in terms of attendance rates, have varied systematically between democracies and non-democracies in Africa.[2]

While there are reasons to believe that governments in democracies may do more than autocratic governments to provide primary education, there is of course also a well established argument in comparative politics that the causal link between democracy and education can run in the opposite direction. People who are more educated may have opinions that are more favorable to democracy, as opposed to other systems of government, and as a result, we may observe that democracy is more sustainable when citizens are educated (Lipset, 1959; Inkeles and Smith, 1974; Dewey, 1916). One possible channel for this effect to operate is if education fosters norms of tolerance for dissenting opinions. It may, of course, also be possible that there is a causal link between education and democracy that has nothing to do with attitudes. So, for example, if public provision of education satisfies redistributive demands, this may increase the stability of an existing democratic system. The predictions of modernization theory regarding income levels, education and democracy have been investigated recently by Przeworski, Alvarez, Cheibub, and Limongi (2000). While these authors conclude that levels of per capita income are the most important correlate of the survival of democratic regimes, they also find that after controlling for this income effect, it nonetheless remains the case that democracies with more educated populations are less likely to experience shifts towards authoritarianism. In strong contrast, Acemoglu, Johnson, Robinson, and Yared (2004) find, based on aggregate cross-country data, that once one controls for both time period and unobserved country effects, the statistical relationship between democracy and education is no longer significant.[3] In the more specific context of African countries,

[1] A number of recent papers have considered how different features of the political environment may influence decisions by democratically-elected politicians to favor public goods provision vs. clientelistic policies. See Acemoglu and Robinson (2005), Bates (2005), Bueno de Mesquita, *et al*., (2002, 2003), Keefer (2003), Keefer and Khemani (2003), van de Walle (2003, 2001), Wantchekon (2003).

[2] The exception here is the interesting paper by Brown (2000) which is discussed below. Stasavage (2005) considers political determinants of education spending in African countries, but not educational enrollments. Brown and Hunter (2004, 1999) consider education spending and regime type in Latin America.

[3] See also Glaeser, *et al.*, (2004) for another recent contribution on this issue, focusing on cross-country data.

there has been relatively little recent effort to investigate to what extent the emergence and sustainability of a democratic regime has depended upon education levels in a country's population.[4]

In this paper I use both aggregate and individual level data to examine whether African democracies have greater incentives to provide primary education for their population, and whether in turn higher levels of education result in greater support for democracy in African countries. Aggregate cross-country data is useful for drawing broad comparisons between African countries, but it also has well-known limitations. The individual-level data I use allows for more directly testing several predictions about the link between democracy and primary education

In order to consider primary education provision, I rely on data from the Demographic and Health Surveys (DHS) on primary school attendance of 6-10 year olds for 28 African countries. This data, while little used by political scientists, is invaluable because it arguably provides a more accurate pictures of developments in primary education provision than do sources on education enrollments that are based on estimates produced by education ministries, rather than household surveys. Existing education enrollment data provided by UNESCO and the World Bank relies on the latter method. The DHS data usefully measures whether children are actually attending school, as opposed to whether they are simply officially enrolled. The DHS data also allow for examining the effect of variations in primary education both between countries and between regions within individual countries. This is particularly important because there appears to be as much variation in attendance rates within as there is between African countries. I combine the DHS data on primary education with political data from the twelve countries covered in Wave 1 of the Afrobarometer project. The Afrobarometer data provides information on the extent to which citizens in different countries rate their president's action favorably (which may depend upon primary education policies). It also provides data on the extent to which citizens in different African countries prefer democracy as a system of government (which may itself depend upon levels of education provision). Finally, in this paper I also rely upon aggregate cross-country data on political regime type and on education levels. The former is drawn from an updated version of the data collected by Przeworski *et al* (2000). For the latter, I rely upon data found in the Barro and Lee (2000) education dataset.

I arrive at similar conclusions with both the aggregate and individual level data. There is clear evidence that African democracies have a larger incentive than autocracies to provide primary education for their populations. We observe this both from cross-country differences in regime type and attendance rates, as well as from the fact that Africans in regions where primary education provision has expanded in recent years are more likely to rate their president's job performance highly. This latter result is robust to the inclusion of country fixed effects. Moreover, the individual-level data show that variations in primary education provision can account for a substantial fraction of the observed cross-country variation in ratings of presidential performance. A one standard deviation increase in the growth rate of primary school attendance would be associated with an increase in a president's job performance rating by one-third of a standard deviation.

When it comes to the effect of primary education on democracy, I also find statistically significant results with both the aggregate and individual level data. However, the substantive size of these effects is small. At the macro level, the higher the education level of a country's population, the greater the probability that a political system will be democratic, but the magnitude of this probability change is small. At the

[4] Three exceptions here are the recent book by Bratton, Mattes, and Gyimah-Boadi (2005) which interprets the results of Round 1 of the Afrobarometer survey, the study by Coren (2003), who uses individual level data and finds a strong association between education and support for democracy in Uganda, and the study by Englebert and Boduszynski (2005), who use aggregate data and identify a positive correlation between primary education levels and democracy in African countries.

micro level we observe that individuals with a primary education are more likely to favor democracy as a political system than are those without any formal education, but variation in primary education provision appears to account for only a small portion of the observed cross-country variation in attitudes towards democracy.

Finally, there is also a major difference of timing when one considers the effect of democracy on education, and of education on a democracy. If a country undergoes a rapid democratic transition involving the (re)establishment of free elections, then it appears that governments can face incentives to quickly increase primary education provision. In strong contrast, even a large and sudden increase in primary education provision will take several decades before it results in a significant shift in opinions within a country's adult population in favor of democracy as a preferred political system. As a result, the idea that the link between African democracy and primary education provision may be a self-reinforcing one seems to hold true only if one considers developments in the very long run.

In the remainder of the paper I first present the empirical results using aggregate data, followed by results using individual-level data.

Aggregate Evidence on Democracy and Education in Africa

The first step in my analysis is to consider evidence at the country level involving democracy and educational attainment. To do so I begin by investigating whether recent African democracies have sent a larger proportion of children to primary school than have non-democracies. I then consider the possibility that whether a country is a democracy or an autocracy is itself endogenous to the level of educational attainment in a country's population.

Democracy and Primary School Attendance Rates

As suggested in the introduction, the argument that democracy might prompt governments to provide improved access to primary education is intuitive. It is also dependent on a number of assumptions that may or may not be satisfied in the context of African countries. Voters may lack information about incumbent performance, they may choose candidates based primarily on based on ethnic or regional affiliations, and candidates may choose to cultivate support through clientelistic mechanisms rather than through promises of broad public goods provision (such as primary education). Wantchekon (2003) has recently investigated these mechanisms in an experimental context in one African state.[5] A full assessment of the extent to which African electoral competitions hinge primarily upon clientelistic promises or on broader promises involving public goods is beyond the scope of this paper, but it is worth noting that the idea that open electoral competition may prompt governments to emphasize primary education provision is supported by several recent country experiences. In Uganda in 1996 and Malawi in 1994, incumbent presidents during election campaigns made promises, which they subsequently fulfilled, to abolish all fees for primary schooling. Abolition of fees resulted in a huge increase in primary enrollments in each country, and in the Ugandan case in particular there is clear evidence that the Universal Primary Education (UPE) program has been an important determinant of the government's subsequent popularity.[6] The Ugandan government's political success with UPE appears to have influenced subsequent election campaigns in neighboring countries. In 2001, Tanzania's president also abolished primary school fees, following an election promise, and at the beginning of 2003 Kenya's newly elected president also carried out an election pledge to abolish all primary school fees.[7] As had

[5] See also Van de Walle (2003, 2001) and the review article by Keefer (2003).
[6] See Stasavage (2005b) for a review of the Ugandan case.
[7] *The Guardian,* Dar es Salaam, November 1, 2001. For a discussion of several other recent cases see, "In Africa, Free Schools Feed a Different Hunger," *The New York Times*, October 24, 2004.

previously been the case in Uganda and Malawi, this decision triggered a large and immediate increase in the proportion of Kenyan children attending primary school.[8]

Though recent evidence from individual country cases suggests a possibly strong link between electoral competition and primary education provision, it has not yet been established that there is a systematic correlation between regime type and primary education provision for African countries.[9] Considering primary enrollment data for the period up to the 1980s, Brown (2000) found that Africa was different from other regions in the developing world in that there was no clear correlation between regime type (democracy vs. non-democracy) and enrollment levels. One reason for this finding might be that before the 1990s, very few African countries could be classified as democracies. One other problem with investigating primary enrollments across countries, as Brown himself emphasizes, is that there are known to be potentially serious sources of measurement error. The "primary enrollment" and "primary completion" rates collected by UNESCO and reported by agencies like the World Bank rely on self-reporting by individual developing country governments, and they are based on estimates produced by central education ministries rather than household surveys.

In order to circumvent these problems, my analysis relies on an alternative data source for primary school attendance. The Demographic and Health Surveys (DHS) project has in recent years conducted large-scale household surveys in twenty-eight African countries. While they focus on health issues, these surveys also provide valuable data on school attendance for members of each household. Lloyd and Hewett (2003) have suggested that the DHS surveys can provide a useful alternative to the standard primary education attainment statistics collected by UNESCO. One further advantage of the DHS data, which I will exploit in the next section, is that because it provides information on attendance at the household level, the DHS survey results can be used to consider both cross-country and within-country variation in levels of primary education provision. Finally, the DHS data on primary school attendance is also very useful for my purposes, because it provides a "flow" measure for education that should respond quite quickly to any actual change in educational provision.

Table 1 reports OLS estimates of equation (1). The dependent variable is the percentage of children of age 6 to 10 who are currently attending primary school, based on the DHS survey results. For each of the 28 countries, I use aggregate figures derived from the most recently completed survey. Since only one DHS survey is available for the bulk of the DHS countries, I am restricted to a cross-sectional investigation here. A full list of attendance rates is reported in Appendix A. For the regression estimates (though not for the appendix table) I have rescaled these attendance rates to take account of the fact that starting ages for primary school vary for the sample countries.[10]

$$attend_i = \alpha + \beta_1 regime_i + \beta_2 gdp/cap_i + \beta_3 french_i + \beta_4 aid_i + \beta_5 complete_{i1990} + \varepsilon_i \quad (1)$$

[8] On the Kenyan government's recent decision, see "Free Primary Education is on, Says President Kibaki," *Daily Nation*, Nairobi, 3 January 2003, as well as "Free Education: Kenya's Schools Overwhelmed," *The East African*, Nairobi, 20 January 2003. A recent World Bank report confirms that the abolition of school fees in Kenya has been accompanied by an increase in government budgetary resources allocated to primary schools. See "Kenya: Strengthening the Foundations of Education and Training in Kenya," World Bank Report No.28064-KE, March 2004. However, there have been complaints about government funding for building and maintenance of school buildings. See "Kibaki's About-Turn on Free Schools Deal," *Daily Nation*, Nairobi, 9 December 2004.

[9] Stasavage (2005a) considers whether there is a relationship between democracy and spending on primary education.

[10] In 18 of the countries primary school begins at age 6. In the remaining 10 it begins at age 7. For those countries in which school begins at age 7, the original DHS attendance rate for 6-10 year olds was divided by 0.8, since this is the proportion of 6-10 year olds we would expect to be attending school if there was "full" attendance.

Table 1: Primary School Attendance and Regime Type in Africa (current)

	(1)	(2)	(3)	(4)
Regime	-14.0	-12.5		
	(5.82)	(5.33)		
	.025	.029		
Regime2			-5.72	-5.00
			(5.93)	(5.64)
			.345	.385
Log GDP per capita	17.0	14.3	15.1	11.5
	(3.11)	(3.73)	(3.98)	(5.11)
	.000	.001	.001	.035
Former French colony	-21.0	-15.6	-21.79	-13.8
	(5.41)	(7.46)	(5.91)	(8.27)
	.001	.048	.001	.109
Aid, as percent of GDP	.146	.247	-.011	.162
	(.200)	(.237)	(.247)	(.269)
	.473	.308	.964	.553
Completion rate in 1990		.202		.296
		(.202)		(.209)
		.326		.170
Constant	-27.8	-24.9	-21.3	-18.1
	(22.2)	(21.3)	(27.5)	(27.2)
	.225	.255	.447	.512
R^2	0.67	0.68	0.59	0.63
Prob>F	<0.01	<0.01	<0.01	<0.01
N=	28	28	28	28

Heteroskedastic-consistent standard errors in parentheses, with p-values for each coefficient reported below.

I regress the attendance rate for 6-10 years olds on the binary measure of regime type (democracy/autocracy) developed by Przeworski, *et al.*, (2000), and updated in Cheibub and Gandhi (2004). In the first regression I use the variable *regime,* produced by Przeworski and his colleagues, where democracy depends on the presence of multiparty electoral competition, as well as on the fact that a current incumbent party is eventually unseated in an election. *Regime* takes a value of 0 for democracies. Of the 28 countries in this cross-section, 10 are classified as democracies using this definition.[11] This measure means that in an African country like Botswana, where the same party has been in power since independence, the country is classified as a non-democracy even though other requirements for democracy have been satisfied. Because this classification system excludes many new African democracies in which there has not yet been a change in incumbent government, I also consider a modified version of the Przeworski, *et al*. measure, *regime2*, which follows their classification system while dropping the alternation rule. As a result, countries like Botswana are now included in the group of democracies. Based on this alternative definition, 20 of the 28 sample countries were democracies at the time the DHS surveys were conducted.

I also include two further covariates in the regressions. First, the log of per capita GDP in constant US dollars is included based on the logic that there will be a strong positive correlation between income per capita and primary school attendance. Second, I include a dummy variable for countries that are former

[11] The political system was classified based on the year in which the DHS survey was conducted. In the updated dataset, the coding for Namibia appears to be inconsistent with that used for other new states, and as a result I have altered its value for *regime* to 1, to reflect the fact that there has not yet been a government transition under democracy in this country.

French colonies.[12] It has been observed that different colonial powers in Africa established educational systems with different priorities. For the case of French colonies it has been argued that there was less emphasis on primary education than was the case in British colonies, and Mingat and Suchaut (2003), Cogneau (2002), and Brown (2000) have provided empirical evidence to support this received wisdom, based on educational attainment data at the time of independence. There is also evidence that educational differences inherited from the colonial period have persisted, and in some cases become magnified over time. Though the reasons for this gap are not fully understood, Mingat and Suchaut (2003) have suggested that the higher unit costs of primary education in Francophone countries (primarily due to higher teacher salaries) may provide one important explanation.[13] This is especially true of the poorer Sahelian countries (Mali, Burkina Faso, Chad and Niger), where unit costs of education (measured relative to per capita GDP) have historically been very high.

The Table 1 regressions also include aid (as percent of GDP) as a control variable. I include aid in order to demonstrate that any conclusions regarding the effect of regime type are not biased by the failure to control for levels of development assistance. However, it should be emphasized that it is unclear what correlation we should expect to observe between aid and attendance rates in a cross-section like this. To the extent that donors place a high priority on achieving increases in primary attendance rates (as has been instituted in the Millennium Development Goals), we might expect to see aid produce higher attendance rates. This would be true if governments use aid to facilitate access to education, in particular by abolishing primary school fees. But if aid flows above all to countries that have the poorest education outcomes to date, then we might expect to observe a negative correlation between current aid and current attendance rates. Finally, it is also worth observing that in recent cases of African countries that have significantly expanded primary education provision, the bulk of increases in government expenditure appear to have been funded by existing budgetary resources rather than new foreign financing. A recent World Bank (2003) projection of external assistance needed to achieve universal primary education in African countries relies on the assumption that the bulk of increased expenditure on education will be financed by domestic resource mobilization. Even in very recent primary education expansion programs, such as that announced in Kenya at the beginning of 2003, increased primary education expenditures have been met primarily through a reallocation of existing budgetary resources.[14]

A final control variable in the regressions captures the state of primary education provision in 1990. The idea here is to control for the possibility that any positive correlation between democracy and primary school attendance is attributable to educational policies implemented before the movement towards democracy in Africa of the early 1990s. Since DHS survey data is not available for the pre-democracy period, I have instead included an alternative indicator, the estimated percentage of children completing primarily school in each African country in 1990 (drawn from World Bank, 2003). The pair-wise correlation between the current attendance rate for 6-10 year olds (as measured by the DHS) and the completion rate in 1990 (as measured by the World Bank) is very high (0.70). As a result, while no lagged dependent variable is available for the regression, this is a reasonable proxy.[15]

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[12] This variable takes a value of 1 for countries that were exclusively under French colonial control (Cameroon and Togo have more complex colonial histories).

[13] Another contribution by Colclough and Al-Samarrai (2000) supports this conclusion.

[14] See "Kenya: Strengthening the Foundations of Education and Training in Kenya." World Bank Report No.28064-KE, March 2004.

[15] One might also consider adding additional variables to the Table 1 regressions. Given that Mingat and Suchaut (2003) suggest that differences in enrollment rates may be explained in part by higher teacher salaries in former French colonies, I added a variable which measures average teacher salaries as a multiple of per capita GDP. The coefficient on this variable was not statistically significant when added, and its inclusion did not substantially change the estimates of the other regression coefficients. The same was true for a variable measuring the unit cost of primary education. Finally, I also found that a variable measuring population density (which may be inversely related to costs of providing primary education) was not statistically significant in the Table 1 regressions.

Regression (1) in Table 1 shows that there is a highly significant correlation between regime type and primary school attendance. In a democracy, the percentage of 6-10 year olds attending school will be roughly 14 percentage points higher than in an autocracy. In addition, there is a strong positive correlation between log income per capita and school attendance. Consistent with other studies, one also observes that former French colonies are estimated to have lower attendance rates for 6-10 years olds than those observed in other countries. The size of this effect is particularly large (21 percentage points), even when controlling for other covariates like per capita income and aid. If former French colonies are divided between the poor Sahelian and non-Sahelian countries, we continue to observe a negative effect for both groups, and the same result applies if a dummy is included for former British colonies.[16] Finally, we observe that the coefficient on foreign aid is not statistically significant. This may reflect the counteracting causal effects described above whereby aid facilitates primary education provision, but it also tends to flow to countries with poorer education track records.

Regression (2) adds the primary completion rate in 1990 to the estimation. Despite the high pair-wise correlation between this variable and the current attendance rate as measured by the DHS, the coefficient on the lagged completion rate is not statistically significant. It does have the expected sign, though, and it is large in magnitude. As can be seen, when the lagged completion rate is added to the estimation, the conclusions regarding the effects of democracy and per capita GDP remain quite similar.

Regressions (3) and (4) in Table 1 repeat the exercise while substituting the alternative definition of regime type, *regime2*. We observe here that while the coefficients on per capita income, French colonization, and the primary completion rate in 1990 remain very similar, the coefficient on regime type is now much smaller and it is no longer statistically significant. This suggests that while there is a strong correlation between democracy and primary school attendance when one defines democracy in terms of countries where a democratically elected government has actually lost an election, the correlation disappears when one drops the "alternation rule" from the definition. Very similar results are obtained if one simultaneously includes two separate dummy variables, one for democracies that satisfy the alternation rule (*regime*=0) and one for democracies that do not satisfy the alternation rule (*regime*=1 and *regime2*=0).

The regression results in Table 1 show a strong statistical correlation between democracy and primary education provision, but they of course do not necessarily demonstrate that there is a causal link flowing from the former to the latter. There are a number of reasons to believe that democracy is itself endogenous. For one, both education and democracy could be endogenous to fixed country factors or initial conditions of the sort identified by Acemoglu, Johnson, and Robinson (2001). These authors have argued that mortality rates facing colonial settlers helped determine what institutions colonists created, thus influencing future possibilities for economic development. While it would be intriguing to explore whether settler mortality rates might explain differences within the group of African countries considered here, unfortunately settler mortality data is only available for 15 of the sample countries. Moreover, since settler mortality may have directly influenced both the educational and the political institutions that colonizers established, it would not be a valid instrument for the regression context I am considering here.

A second possibility, which I will explore in greater depth below, is that democracy is endogenous to the level of educational attainment in a country's population. There is a long and well-known tradition which suggests that education is critical to the stability of a democracy because it prompts people to develop

[16] The dummy variable for former British colonies was not significant and was excluded. If separate dummy variables are included for the four poor states of the Sahel (Burkina Faso, Chad, Mali, and Niger) and for the non-Sahelian former French colonies, the coefficient and standard error for the Sahel group is –27.5 (4.1), and the coefficient for the non-Sahelian group is –17.6 (7.2).

attitudes more favorable to democracy as opposed to other forms of government.[17] To the extent that the causal effect of education on democracy depends primarily upon attitudes, this would imply that there should be little risk of simultaneity bias in my Table 1 regressions, since the attendance of current 6-10 year olds would not logically have any effect on the current stability of a democracy. This also suggests that in order to investigate the effect of education on democracy we should turn away from education variables that capture current attendance in favor of variables that capture the accumulated "stock" of education in a country's adult population. In the next sub-section I adopt this approach.

Education as a Determinant of Democracy in Africa

In order to empirically investigate whether education has been a determinant of democracy in Africa, I once again use the regime classification developed by Przeworski, *et al.*, *regime*, as well as the alternative classification variable, *regime2*. I consider a sample of 27 African countries for which data are available on both regime type and educational attainment for the years 1960-2000. I use observations taken at five year intervals for each country (1965….2000).[18] The possibility of using lagged variables in this sample controls for the possibility of simultaneity bias, though as I acknowledge at the end of this sub-section, there are other limitations involving the possibility that both regime type and education provision are endogenous to country fixed effects (other than those captured by the French colonial dummy).

$$\Pr(regime_{it} = 1) = F(\alpha + \beta_1 completed_{it-1} + \beta_2 gdp/cap_{it-1} + \beta_3 french_i + u_t) \quad (2)$$

Table 2 presents logit estimates of equation (2) for the determinants of regime type. For the first independent variable, I include the lagged value of the percentage of the population over 25 that has completed primary school, *completed*.[19] This variable is drawn from the Barro-Lee dataset (Barro and Lee, 2000). Given that the vast majority of Africans who have received any formal education have received only a primary education, *completed* is, not surprisingly, very highly correlated with the average level of schooling in years, which is another commonly used measure of education levels.[20] It should be noted that the variable *completed* measures the "stock" of primary education in a country, and it is thus different from both the DHS primary school attendance variable used in the Table 1 regressions, as well as the "primary completion rate" reported by the World Bank. The latter two variables capture education flows, since they measure the percentage of a given age cohort attending (or completing) primary school. A variable measuring the stock of education in the adult population is most appropriate for testing a hypothesis about the effect of education on democratic attitudes (and thus regime type), since such attitudes will depend upon the history of educational provision for all age groups in a country's population.

In addition to including primary education levels as an independent variable, I include the lagged value of log GDP per capita (constant US dollars) in order to control for the possibility that higher levels of economic development are more favorable to the development of democracy. I also include a dummy variable for French colonial heritage. Given the observation that French colonial heritage has been associated with lower levels of primary school attendance, one might also want to control for the possibility that French colonial heritage has had direct effects on the probability that a country is a

[17] See Lipset (1959), Inkeles and Smith (1974), and Dewey (1916). See also the review by Hannum and Buchanan (2003) on this point.

[18] As suggested by Acemoglu, Johnson, Robinson, and Yared (2004), with variables that are highly persistent over time this procedure will result in little loss of information and will induce less serial correlation in the data than does averaging over five-year time periods.

[19] While there may be arguments for using the percentage of the population over 15 with a primary education, rather than the population over 25, I use the latter for purposes of comparability with Barro (1999) and with other existing papers in the literature.

[20] The pair-wise correlation between the two variables is 0.93.

democracy. The results presented in Table 2 do not depend on this specification. Finally, regressions (2) and (4) include a set of decade time dummies u_t. These control for the possibility that the shift towards (or away from) democracy has been triggered by international or Africa-wide events, rather than by individual country characteristics.[21] At the end of this sub-section, I discuss the issue of the inclusion of country fixed effects in these logit estimates.

Table 2: Education as a Determinant of African Democracy
(logit estimates, regime=0 for democracies)

Dependent variable →	*regime*		*regime2*	
	(1)	(2)	(3)	(4)
Percent who have	-.183	-.097	-.128	-.022
completed	(.040)	(.053)	(.038)	(.048)
primary school (lag)	.000	.067	.001	.650
Log GDP per capita	1.06	.459	-.109	-1.01
(lag)	(0.35)	(.395)	(.289)	(0.39)
	.003	.246	.707	.010
former French colony	-1.28	-1.07	-.657	-.362
	(0.52)	(0.58)	(.405)	(.415)
	.013	.067	.105	.383
Decade 2 (1975, 1980)		1.49		.298
		(1.22)		(.629)
		.223		.635
Decade 3 (1985, 1990)		1.31		.239
		(0.78)		(.623)
		.093		.701
Decade 4 (1995, 2000)		-1.63		-2.41
		(0.70)		(0.68)
		.020		.000
Constant	-2.51	0.55	2.82	8.01
	(1.75)	(2.01)	(1.54)	(2.33)
	.152	.786	.067	.001
Log likelihood	-71.23	-56.77	-99.39	-81.76
Prob>Chi2	<0.01	<0.01	<0.01	<0.01
N=	180	180	180	180

Heteroskedastic-consistent standard errors in parentheses, with p-values for each coefficient.

In regression (1) from Table 2 we observe that *regime* is significantly correlated with primary education levels, with the expected sign, even when controlling for income, the lagged value of per capita GDP, and colonial background. In this regression the dummy variable for former French colonies is negative and statistically significant, while the coefficient on per capita GDP is actually positive and significant, which runs counter to standard predictions. When we repeat the same specification in regression (2) while adding decade dummies, we observe that the overall goodness of fit of the regression improves considerably. The coefficient on average schooling remains negative, but it is also smaller in magnitude, and the coefficient on per capita GDP is no longer statistically significant.[22] This result strongly suggests

[21] The use of decade dummies, rather than a dummy variable for each year, is necessitated by the fact that inclusion of a dummy for 1975 otherwise perfectly predicts autocracy.

[22] My findings with regard to the importance of primary education, and the relative unimportance of per capita GDP, as correlates of African democracy closely parallel those from a recent study by Englebert and Boduszynski (2005), which uses a different dataset.

that when it comes to determining whether or not an African country is a democracy, there have been important factors at play that are not linked to individual country conditions. One obvious possibility involves the changing role of the international community. A second possibility involves the role of demonstration effects between African countries. This was arguably quite an important factor during the early 1990s.[23] The results of regressions (3) and (4) suggest that the alternative definition of regime type, *regime2*, is significantly correlated with education levels when not controlling for time effects, but this coefficient is no longer significant once decade dummies are included.

The regressions in Table 2 provide some evidence of a statistically significant correlation between education levels and the probability that an African country will have a democratic government. But in order to get a sense of the substantive significance of these results we need to consider a hypothetical change in education levels. Take the case of an African country in the late 1990s that has an average level of GDP per capita, which is not a former French colony, and where primary education levels are at the mean for the 1960-2000 sample (12 percent of the population has completed primary school). Based on regression (2) in Table 2, this country would have a 37 percent probability of being a democracy.[24] If the percentage of the adult population with a primary education was increased by one standard deviation (+8.4 percent) then the estimated probability of democracy would increase to 57 percent. At face value, this suggests that the substantive effect of primary education is large, and therefore we might conclude that African countries with higher education levels have higher probabilities of being democracies. However, when judging the size of this effect it is very important to consider what actual short-run change in primary attendance would be needed in order to increase the total percentage of adults with primary education by one standard deviation, and over what time-frame. One of the largest increases in primary attendance in African countries in recent years occurred in Uganda after 1996 as the percentage of 6-10 year olds attending primary school increased by 15.4 percent within a few years. Taking this short-run increase as an extreme example, and using data on the age profile of the population in a typical African country, we can observe that even an increase in the attendance rate by 15.4 percent will take almost three decades to translate into a one standard deviation increase in the percentage of individuals over 15 years old who have a primary education.[25] In other words, the causal effect of primary education on democracy will only operate with a considerable lag time.

One potentially serious omission from the Table 2 regressions involves country fixed effects, which are not controlled for. As noted above, Acemoglu, Johnson, Robinson and Yared (2004) argue that once one includes country fixed effects in a cross-country regression of democracy on education, the statistical relationship between the two variables breaks down. They take this as an indication that there is no causal relationship in the short-run whereby changes in education lead to changes in democracy. But in concluding, they also acknowledge that this causal process may still exist if one considers a longer time horizon, on the order of 50 or 100 years. Inclusion of fixed effects in my Table 2 regressions is complicated by the fact that a number of sample countries have remained autocracies throughout the period considered, and in a logit estimation any inclusion of fixed effects would result in these observations being dropped from the sample. I did perform a number of tests to examine whether changes in regime type are correlated with changes in levels of primary education, and found little evidence that this was the case, which is consistent with the conclusions of Acemoglu, *et al.* (2004).

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[23] See Bratton and Van de Walle (1997) for a discussion of how international trends affected African democratization during the 1990s.

[24] All estimated probabilities from the logit and ordered logit models in this paper were produced using the CLARIFY package written by King, Tomz and Wittenberg (2000). I used the default number of 1000 simulated sets of parameters.

[25] Age profile data for African countries was produced by the United States Bureau of the Census. It would, of course, take even longer for a short-run increase in primary attendance to translate into a substantial change in the stock of education for the adult population over 25.

However, it should also be apparent from my arguments that the causal link between education and democracy will indeed only operate over a considerable lag time, and as a result, the failure to observe a correlation between short-run changes in education and changes in democracy should not necessarily be taken as indicating that the former does not cause the latter. What my Table 2 regressions do suggest is that even if there is an effect of education on democracy via attitude change, it will take both a dramatic increase in primary education provision and a number of decades before an educational change leads to a significant change in attitudes towards democracy in a country's population.

Summary

The aggregate cross-country evidence presented in this section suggests both that democracy can give African governments an incentive to improve primary education provision, and that higher education levels in turn appear to increase the probability that a country is a democracy. But while the former effect appears to be quite large in magnitude, the latter effect is less so. Moreover, it needs to be recognized that while a country's primary attendance rate can be significantly increased within a few years, this change will take much longer to feed through into a change in overall education levels for the adult population, and thus potentially into a change in democratic attitudes.

Individual-Level Data on Democracy and Education

I next consider evidence from individual-level data, which allows for more directly testing several hypotheses about the link between democracy and primary education in Africa. Drawing on results from the DHS surveys and from Round 1 of the Afrobarometer project, which was conducted in 12 African nations, I first test whether recent changes in primary education provision are correlated with a chief executive's overall popularity rating. If the argument that competitive elections give governments an incentive to provide primary education to citizens is accurate, then we would expect to observe that in those countries in which primary attendance rates have risen in recent years, there should be a higher level of approval for the country's president. For countries in which primary education is not yet universal, the logic behind focusing on the change in primary attendance, rather than the level, is the same as that for focusing on economic growth, rather than the level of GDP when considering government popularity. Executives in all 12 of the countries in the Afrobarometer survey were subject to multi-candidate elections.[26] It should be noted that in any case, the test of this hypothesis is not contingent on the assumption that the survey countries are full democracies. To the extent that respondents are willing to speak freely to interviewers, we should observe that changes in primary education provision have effects on a president's approval rating in both non-democracies and democracies. The difference would be that in the former cases popular dissatisfaction could be measured by surveyors, but they would not translate into an election loss. The next section then uses the Afrobarometer data to consider the reverse argument, i.e., that primary education helps consolidate democracy by prompting people to have more "democratic attitudes."

The empirical conclusions I draw from the individual-level data are very similar to those derived from the aggregate cross-country data in above. First, there is strong evidence of an effect of democracy on incentives to provide primary education; presidential popularity is higher in those countries where there has been a significant increase in primary school attendance during the 1990s. Moreover, the substantive effect of changes in primary education appears to be quite large, and they can account for a significant part of the cross-country variation in observed presidential popularity levels. Since the DHS data on primary attendance is available at the regional level, I am also able to show that this positive correlation holds when one includes country fixed effects in the regression, thus focusing exclusively on within-

[26] Zimbabwe is the survey country for which one would be most likely to suggest that recent restrictions on political competition have been the most significant. See Lindberg (2003) for a recent survey of the qualities of competitive elections in African countries.

country variation. Second, there is also evidence from the individual-level data that educational attainment is associated with more democratic attitudes. The Afrobarometer data show that those individuals who have received a primary education are more likely to suggest that democracy is preferable to alternative political regimes. However, while this latter effect is statistically significant, the regression results also suggest that its substantive magnitude is quite small.

Primary Education and Presidential Approval

The Afrobarometer surveyors collected data on presidential approval ratings in 10 of the 12 survey countries. In each case, respondents were asked to rate their president's performance on a four-point scale: 1=strongly disapprove, 2=disapprove, 3=approve, and 4=strongly approve.[27] There were very significant variations in response to this question across countries. For example, 60 percent of Ugandan respondents gave their president a 4 rating, but only 15 percent of respondents in Zambia did the same. There was also very significant variation in responses between regions within countries. To take one particularly dramatic example, in Malawi's Chiradzulu District, 59 percent of respondents said they "strongly approve" of their president's performance, while this was true of only 4 percent of respondents in Mzimba District. Given the large variations observed in presidential approval both between and within countries, it seems worthwhile to ask whether this variation might be explained in part by different degrees of primary education provision. Appendix A provides a list of the country mean responses to the approval question for the survey countries.

There are two main alternatives for judging whether performance with regard to education has influenced presidential approval ratings. The first option is to examine whether survey responses with regard to overall presidential performance are correlated with subjective responses to Afrobarometer questions regarding government performance in the area of education. Using this method, it is possible to show that performance in the area of education is very highly correlated with overall popularity for African presidents. However, it is not entirely clear exactly what this indicates. It might be that responses regarding a government's education performance help to determine responses to questions about overall presidential performance. But the reverse could also be true. In responding to questions about performance in specific policy areas, members of the public may be guided by prior opinions about their president. As a result, inferences based on this method would be subject to the same sort of simultaneity bias identified by Kramer (1983), who argued that, in the US context, biased estimates result from regressing individuals' votes for presidential candidates on individual opinions regarding the state of the economy.[28]

In order to get a clearer sense of whether progress in the area of primary education provision has influenced presidential approval ratings, I focus on investigating whether *objective* changes in primary education provision, region by region, have been correlated with levels of presidential approval. There should be less worry of simultaneity bias using this type of regression, because it would be difficult to argue that the *current* approval evaluation by one individual will have an effect on the past increase in primary attendance in their region. As described above, the DHS surveys provide data at the regional level on primary attendance. For a number of countries, more than one survey wave has been conducted, allowing for observation of how primary school attendance has changed over time. This is the case for six of the countries where the Afrobarometer asked questions about presidential popularity. In addition, for those countries in which only one DHS survey is available, there is an alternative World Bank data

[27] The precise question for the majority of countries followed the format "What about the way President X has performed his job over the past twelve months. Do you (1) strongly disapprove (2) disapprove (3) approve (4) strongly approve." In Uganda the question wording was "In particular, how satisfied are you with the performance of President Museveni: (1) very unsatisfied (2) somewhat unsatisfied (3) somewhat satisfied (4) very satisfied." In Tanzania and Mali the same four options were offered as in Uganda.

[28] On this subject see also the more recent paper by Erikson (2004).

source involving changes in the "primary completion rate" during the 1990s (World Bank, 2003).[29] For reasons described in Section 1, this World Bank data may be less reliable than that derived from the DHS household surveys, and it is also only available at the country level. When we consider country level data, however, the two sources are nonetheless very highly correlated. The pair-wise correlation coefficient between the most recent primary completion rate reported by the World Bank and the 6-10 year old (adjusted) attendance rate reported by the DHS is 0.78.

In order to make the most efficient use of information available about primary school attendance, while also attempting to avoid potential biases introduced by missing data, in the regressions that follow I imputed missing values for the DHS data. The multiple imputation model followed the procedure suggested by Honaker, *et al.* (2003), and King, *et al.* (2001). It included all regression variables, in addition to the World Bank variable for the primary completion rate. The fact that the World Bank completion rate and the DHS primary attendance rate are so highly correlated increases confidence in the results of the imputation model. I used an imputation model that was multivariate normal, and the "EMis" algorithm was used to generate ten imputed datasets.[30]

$$\Pr(performance_{ijk} = n) = \Pr(\alpha_{n-1} < \beta_1 \Delta attend_{jk} + \sum \gamma_x controls_{ijk} \leq \alpha_n) \qquad (3)$$

Table 3 presents multiple imputation estimates of equation (3) for the determinants of presidential approval. The estimation method is ordered logit and the dependent variable is the four-category presidential approval variable described above (with $n \in \{1,2,3,4\}$), with higher values indicating higher levels of satisfaction. In this equation α is used to denote the cut points, i indexes individuals, j indexes regions, and k indexes countries. All regressions use population weights that equalize disparities in the number of observations between countries and between regions within countries. Regression (1) estimates presidential approval as a function of the change during the 1990s in the percentage of 6-10 year olds in a given region that are attending primary school. It also includes a number of individual controls including the education level attained by the respondent, gender, age, urban-rural location, whether the respondent has frequent access to radio or newspapers, and finally, a poverty indicator. The three education variables here are dummy variables where *primary education* is equal to 1 if the respondent has attended primary school, and 0 for any other level of education (including no education, secondary, or tertiary). The *secondary education* and *tertiary education* variables are coded similarly. The poverty indicator is a continuous variable that was constructed by taking the principal factor of the responses to four Afrobarometer survey questions regarding poverty.[31]

[29] The primary completion rate is defined as the total number of students who complete primary school in a given year, divided by the total number of children of graduation age in the population.

[30] While King, *et al.* (2001) suggest that in many cases it will be sufficient to impute only 5 datasets, I have used a larger number here because of the relatively high fraction of missing observations.

[31] I adopted this approach because of the high correlation in the responses to these questions, implying that introducing them individually into the regression would pose problems of multi-colinearity. The questions are "In the last twelve months how often have you or your family: (1) gone without food; (2) gone without enough clean water to drink; and (3) gone without medicine or medicinal treatment that you needed."

Table 3: Primary Education Provision and African Presidential Approval
(multiple imputation estimates using ordered logit)

	(1)	(2)	(3)	(4)
Change primary attendance	.026	.013	.022	.011
(in district)	(.006)	(.006)	(.005)	(.005)
	.000	.025	.000	.053
Respondent has primary education	.035	.013	.194	.063
	(.094)	(.062)	(.084)	(.063)
	.706	.827	.021	.319
Respondent has secondary education	-.370	-.161	-.198	-.090
	(.114)	(.073)	(.093)	(.072)
	.001	.029	.033	.214
Respondent has tertiary education	-.449	-.337	-.220	-.199
	(.132)	(.104)	(.109)	(.097)
	.001	.001	.044	.041
Gender	-.090	-.088	-.103	-.090
	(.036)	(.036)	(.036)	(.038)
	.014	.014	.005	.018
Age	-.003	.0001	.001	.003
	(.002)	(.0016)	(.002)	(.002)
	.163	.949	.443	.072
Rural	.406	.167	.280	.106
	(.095)	(.059)	(.085)	(.057)
	.000	.005	.001	.066
Media radio	.040	.038	.023	.028
	(.015)	(.013)	(.016)	(.014)
	.053	.004	.150	.053
Media newspaper	-.017	-.023	-.027	-.029
	(.018)	(.015)	(.017)	(.015)
	.340	.130	.117	.047
Poverty	-.358	-.277	-.139	-.126
	(.056)	(.042)	(.053)	(.044)
	.000	.000	.009	.004
Performance health			.569	.554
			(.036)	(.032)
			.000	.000
Performance economy			.396	.334
			(.032)	(.023)
			.000	.000
Cut point 1	-1.36	-1.75	.739	0.52
	(.223)	(.018)	(.233)	(0.20)
	.000	.000	.002	.008
Cut point 2	-.375	-.651	1.85	1.72
	(.220)	(.163)	(0.23)	(0.19)
	.088	.000	.000	.000
Cut point 3	1.19	1.11	3.63	3.65
	(0.23)	(0.18)	(0.25)	(0.20)
	.000	.000	.000	.000
N=	15,924	15,924	15,924	15,924
Country Fixed Effects?	No	Yes	No	Yes

Heteroskedastic-consistent standard errors in parentheses, with clustering at the regional level.

In regression (1) of Table 3, the estimated coefficient on the *change primary attendance* variable is positive and statistically significant. Regression (2) repeats the exercise while including a set of country dummies. As a result, this second regression asks whether we continue to observe a positive correlation

between presidential approval and *change primary attendance* when we consider only variation between different regions within countries. As can be seen, the estimated coefficient on *change primary attendance* is now smaller, which is not surprising, but it remains positive and statistically significant. With regard to the other variables in the regression, there is a consistent pattern whereby more educated individuals and those in urban areas are less likely to indicate approval of their chief executive. Those experiencing poverty are also less likely to approve of presidential performance, and finally there is also a gender gap, with women being less likely to approve of presidential performance. The heteroskedastic-consistent standard errors that are reported in Table 3 are estimated using clustering at the regional level in order to allow for the possibility that observations are not independently distributed within individual regions.[32]

While regressions (1) and (2) in Table 3 suggest that changes in primary education provision are correlated with levels of presidential approval, they do not control for the possibility that performance in other policy areas, such as health or the economy, may be correlated with performance in the area of education. Regressions (3) and (4) add two variables to the specification. The variable *performance health* is a subjective response based on a question regarding government performance in the area of basic health provision (higher values indicate greater satisfaction). The variable *performance economy* is a subjective indicator of how well the government has handled the economy. As noted above, the work by Kramer (1983) suggests that regressing an overall approval variable on subjective responses like this may produce biased estimates, since prior opinions about a president may condition a respondent's statement about how the president has handled the economy. However, while this should lead to an upward bias on the coefficient estimates for *performance health* and *performance economy*, it should if anything produce a downward bias on the *change primary attendance* coefficient. As a result, if we conclude that the coefficient on *change primary attendance* remains similar after including the two subjective performance variables, this still provides useful information about the robustness of the result with regard to primary education performance. When we include both of these subjective performance variables, we observe that the coefficient on *change primary attendance* remains very similar to those observed in regressions (1) and (2).[33]

Further consideration shows that based on the regressions in Table 3, the estimated effect of a change in primary attendance ratios on presidential approval levels is also substantively significant. If we take regression (1) as an example, the probability that a respondent in a region where the primary attendance ratio has been unchanged will be "strongly approve" is 0.38, setting other variables at their mean values.[34] In contrast, in a region where *change primary attendance* is equal to +10 percent (approximately one cross-country standard deviation), the estimated probability of responding "strongly approve" increases to 0.44. Expressed in terms of the cross-country standard deviations, this implies that a one standard deviation increase in *change primary attendance* would be associated with approximately one-third of a

[32] Clustering variables at the regional level, rather than at the country level, is logical given that my *change primary attendance* variable is a regional level variable, and that I do not have any country level variables in the estimates. Another reason to opt for clustering at the regional level (there are 177 regions in the sample), rather than at the country level, is that the statistical results involving the consistency of clustered standard errors have been derived only for cases where the number of independent clusters is "large." See Wooldridge (2002: 274-6) and Wooldridge (2003) for a discussion. Given that there are only 12 countries in the sample, it is uncertain whether these results regarding clustered standard errors would apply to such a small number of clusters. When I did estimate regressions (1) and (2) with standard errors clustered at the country level, the results for regression (1) were very similar to those reported here. In regression (2) using this method, the coefficient on *change primary attendance* was less statistically significant (p=0.208)

[33] When regressions (3) and (4) were estimated using standard errors clustered at the country level (rather than the regional level) the results for regression (3) were very similar, while in regression (4) the coefficient on *change primary attendance* was less statistically significant (p=0.268).

[34] For the binary variables I considered the case of a female living in a rural area.

standard deviation increase in the percenta ge of people responding that they "strongly approve" of presidential performance. In other words, variation in primary school attendance can account for a significant share of the variation in executive approval ratings between African countries.

I also repeated all Table 3 regressions while excluding the imputed data. The results were similar, with the exception that in the regressions including country fixed effects, the coefficient on the *change primary attendance* variable was less statistically significant (it remained highly significant in regressions 1 and 3).

Primary Education and Support for Democracy

In addition to providing information useful for assessing determinants of African presidential approval, the Afrobarometer surveys also included questions regarding support for democracy. As discussed by Bratton (2002), Bratton and Mattes (2001), and Bratton, Mattes, and Gyimah-Boadi (2005), the question asking whether "democracy is preferable to any other form of government" was designed to be comparable with a similar question asked in surveys for other regions. Respondents were given the option of either agreeing with the statement, of indicating that the form of government "does not matter," or of indicating that in some situations a non-democratic form of government may be preferable. As Bratton notes, a very sizeable majority of interviewees for the Afrobarometer survey (74 percent of those who responded) suggested that democracy was "preferable to any other form of government," but there are significant disparities between countries. So, for example, in Botswana 87 percent of individuals responded that democracy was preferable, but this was true of only 60 percent of respondents in Mali and only 53 percent of respondents in Lesotho. The appendix lists the percentage of respondents in each country that found democracy preferable to any other form of government. There also appears to have been significant variation in responses between different groups within African countries. So, for example, only 66 percent of individuals without any formal education responded that democracy was always preferable, but this was true of 75 percent of individuals who had at least a primary education, and 81 percent of individuals who had a university education. There also appears to be a small but significant gender difference in support for democracy, with 77 percent of men declaring democracy to always be preferable, but only 72 percent of women offering the same response.

The underlying hypothesis motivating my examination in this section is that education, by shaping individual attitudes, may ultimately determine the survival of a democratic system. One possible concern when investigating this in a cross-section is that democratic attitudes may be caused by democracy, rather than the reverse.[35] However, apart from the case of Botswana, there is little indication in the Afrobarometer data that preference for democracy is higher in countries with longer democratic histories. In addition, this effect of different democratic histories is controlled for in my regressions by the inclusion of country fixed effects.

In order to perform a more systematic test of the determinants of support for democracy, I examine whether education levels are correlated with support for democracy when controlling for other potential determinants. The dependent variable in the Table 4 regressions, *support for democracy*, takes a value of 3 if the respondent agrees that democracy is "preferable to any other form of government," 2 if the respondent agrees that, "To people like me it doesn't matter what form of government we have," and 1 if the respondent agrees that, "In certain situations a non-democratic government can be preferable."[36]

[35] Scholars have extensively debated whether the correlation observed between democracy and a "civic culture" implies that attitudes drive regime outcomes, or the reverse. See the study by Muller and Seligson (1994), as well as Inglehart (2003) on this point.

[36] I focused on support for democracy, in the sense of support for regime principles (following the terminology of Norris (1999)), rather than questions regarding definitions of democracy or satisfaction with democracy, because the support question seems most directly related to the theoretical proposition that more educated individuals are more

While the number of missing observations of the *support for democracy* variable is quite small, there are somewhat larger numbers of missing observations for several of the independent variables used in the Table 4 regressions, including the poverty indicator. In order to deal with this issue, I once again used a multiple imputation model to impute missing values for all variables. All regression variables were used in the imputation model.

$$\Pr(support_{ijk} = n) = \Pr(\alpha_{n-1} < \beta_1 primary_{ijk} + \beta_2 second_{ijk} + \beta_3 tert_{ijk} + \sum \gamma_x controls_{ijk} \leq \alpha_n) \quad (4)$$

Table 4 presents the results of multiple imputation estimates, using ordered logit, of the *support for democracy* variable on three education variables, gender, age, an urban-rural dummy variable, as well as the same media and poverty variables used in the Table 3 regressions.[37] Once again, in order to interpret the coefficients on the education variables here it should be remembered that *Respondent has primary education* is a dummy variable which takes a value of 1 for individuals who have attended primary school, but who have not had any further schooling. The results in Table 4 show that individuals who have attended primary school are more likely than those with no schooling to support democracy to the exclusion of other systems of government. In turn, individuals who have attended primary school are less likely to be supportive of democracy than are those who have continued their formal education to the secondary or university level. In terms of other variables, we observe that individuals experiencing poverty are less likely to support democracy, and women are also less likely to support democracy to the exclusion of other forms of government (though the substantive effect of this variable is not large).

However, the substantive magnitude of the effect of primary education does not appear to account for a sizeable fraction of the observed cross-country variation in support for democracy. Setting other variables at their means, based on regression (2) an individual with no formal education would have a 65 percent chance of preferring democracy to any other form of government. In contrast, an individual who has attended primary school would have a 72 percent chance of unambiguously preferring democracy.[38] This effect may seem large at the individual level, but when we use this information to consider the effect of a sudden increase in primary education provision on overall democratic attitudes, we realize that at the country level the effect is quite small. Even if a country experienced a one standard deviation increase in the share of its population that had a primary education, from 32 percent to 50 percent (holding the percentage of people with higher levels of education constant), then this would only translate into an increase of 0.012 in the mean level of support for democracy. This would represent an increase of about $1/8^{th}$ of the cross-country standard deviation in support for democracy. Finally, it should also be reiterated that in order to achieve even this small change in average support for democracy, one would need to increase the percentage of the adult population who has a primary education by 18 percent. As observed in previous sections, significantly changing the stock of education in the adult population in this manner takes a considerable lag time.

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likely to believe that political conflicts should be resolved through democratic procedures. Classic arguments about education and democratic attitudes do not stress that educated individuals will necessarily be more satisfied with the actual performance of a specific democracy. See Linde and Ekman (2003) on the distinction in survey data between support for democratic principles and satisfaction with democracy.

[37] Given the question wording of the *support for democracy* variable, one might ask whether it is justified to consider the responses to this question to be ordered, particular for values of 1 and 2. I also estimated the Table 4 regressions using a multinomial logit model and obtained similar results.

[38] It is worth adding here that when setting other regression variables at their means, the substantive effect of both secondary and tertiary education on democratic attitudes is actually smaller than the effect of primary education. When compared with someone who has a primary education, an individual who has a secondary education will be only 1 percent more likely to favor a democratic system under all circumstances.

Table 4: Education and Support for Democracy in Africa
(multiple imputation estimates using ordered logit)

	(1)	(2)
Respondent has primary education	.296	.272
	(.087)	(.067)
	.001	.000
Respondent has secondary education	.421	.390
	(.098)	(.075)
	.000	.000
Respondent has tertiary education	.427	.320
	(.130)	(.109)
	.001	.003
Gender	-.196	-.203
	(.041)	(.039)
	.000	.000
Age	.003	.005
	(.002)	(.002)
	.161	.003
Rural	.047	.014
	(.072)	(.057)
	.516	.802
Media radio	.030	.043
	(.015)	(.014)
	.041	.002
Media newspaper	.018	.001
	(.021)	(.018)
	.400	.940
Poverty	-.212	-.166
	(.046)	(.037)
	.000	.000
Cut point 1	-1.68	-2.41
	(0.22)	(0.22)
	.001	.000
Cut point 2	-.690	-1.39
	(.214)	(0.22)
	.000	.000
N=	21,530	21,530
Country Fixed Effects?	No	Yes

Heteroskedastic-consistent standard errors in parentheses, with clustering at the regional level, and p-values reported for each coefficient (below the standard errors). All regressions are estimated with population weights that equalize disparities in the number of observations between countries and between regions within countries.

Conclusion

There is evidence at both the aggregate and the individual level that democratically elected African governments have greater incentives than their authoritarian counterparts to provide primary education for their citizens. This argument is supported both by a strong correlation between regime type and primary attendance rates, as well as by individual-level data which show that Africans in regions where primary attendance rates have risen in recent years are more likely to approve of presidential performance. Growth in primary school attendance can account for a substantial part of the variance observed in approval ratings for presidents in different African countries. In this paper I have also found statistically significant evidence that the causal link between democracy and education can run in the opposite

direction. Aggregate data show that the presence of a democratic regime has been positively correlated with education levels in African countries, and individual-level data from the Afrobarometer survey also show that the higher an individual's level of education, the more likely they are to support democracy to the exclusion of alternative forms of government. However, the substantive size of the effect of education on democracy appears to be small. Variations in education levels account for only a small part of the large variation in support for democracy observed across the 12 countries in the Afrobarometer survey. Overall, my findings suggest that while electoral competition has given African governments an incentive to improve primary education provision, there is less support for the idea of a self-reinforcing relationship between democracy and education in Africa.

Appendix A: Regime Type and Country Means for Attendance of 6-10 Year Olds

Country	Year DHS survey	Attend	Regime2	Regime	President popularity	Support democracy
Benin	1996	41.8	0	0		
Botswana	na		0	1	2.82	87.1
Burkina Faso	2003	26.3	0	1		
Cameroon	1998	70.1	0	1		
CAR	1995	54.8	0	0		
Chad	1997	28.4	0	1		
Comoros	1996	43.2	1	1		
Cote d'Ivoire	1999	49.7	1	1		
Eritrea	2002	50.3	1	1		
Ethiopia	2000	20.8	1	1		
Gabon	2000	93.2	0	1		
Ghana	2003	56.7	0	0		76.9
Guinea	1999	21.6	0	1		
Kenya	2003	89.3	0	0		
Lesotho	na		0	0	2.80	53.5
Madagascar	2003	75.8	0	0		
Malawi	2000	72.2	0	0	2.77	66.9
Mali	2001	32.9	0	0	2.99	60.7
Mauritania	2001	59.5	0	1		
Mozambique	2003	53.3	0	1		
Namibia	2000	81.3	0	1	3.29	71.2
Niger	1998	20.5	1	1		
Nigeria	2003	63.6	0	0		81.2
Rwanda	2000	36.7	1	1		
South Africa	1998	88.6	0	0	2.51	63.6
Tanzania	1999	35	0	1	3.44	84.1
Togo	1998	68.2	0	1		
Uganda	2001	79.1	1	1	3.53	83.3
Zambia	2002	52	0	0	2.69	77.8
Zimbabwe	1999	82.8	1	1	1.85	74.8

Sources: DHS and Afrobarometer surveys. Regime and Regime2 are drawn from Przeworski, et al. (2001) and the update by Cheibub and Gandhi (2004). These two variables were coded based on the year the DHS survey was conducted. Attend is the country mean drawn from the DHS surveys. President Popularity and Support Democracy are country means drawn from the Afrobarometer survey and are explained in the text.

REFERENCES

Acemoglu, Daron and James Robinson (2005) *Economic Origins of Dictatorship and Democracy.* Cambridge University Press.

Acemoglu, Daron, Simon Johnson, James Robinson and Pierre Yared. (2004) "From Education to Democracy?" mimeo, Harvard University.

Acemoglu, Daron, Simon Johnson and James Robinson. (2001) "The Colonial Origins of Comparative Development." *American Economic Review* 91 (4): 1369-1401.

Bannon, Alicia, Edward Miguel and Daniel N. Posner (2004) "Sources of Ethnic Identification in Africa." Afrobarometer Working Paper No.44.

Barro, Robert. (1999) "The Determinants of Democracy." *Journal of Political Economy* 107: S158-S183.

Barro, Robert and Jong-Wha Lee. (2000) "International Data on Educational Attainment: Updates and Implication." Harvard Center for International Development Working Paper No.42.

Bates, Robert. (2005) "Political Reform." Harvard Center for International Development Working Paper No.114.

Bratton, Michael. (2002) "Wide But Shallow: Popular Support for Democracy in Africa." Afrobarometer Working Paper No.19.

Bratton, Michael and Robert Mattes. (2001) "Support for Democracy in Africa: Intrinsic or Instrumental?" *British Journal of Political Science* 31: 447-474.

Bratton, Michael, Robert Mattes and E. Gyimah-Boadi. (2005) *Public Opinion, Democracy, and Market Reform in Africa.* Cambridge University Press.

Bratton, Michael and Nicolas van de Walle. (1997), *Democratic Experiments in Africa: Regime Transitions in Comparative Perspective*. Cambridge University Press.

Brown, David. (1999) "Reading Writing, and Regime Type Democracy's Impact on School Enrollment." *Political Research Quarterly* 52 (4): 681-707.

Brown, David. (2000) "Democracy, Colonization, and Human Capital in Sub-Saharan Africa." *Studies in Comparative International Development* 35 (1): 20-40.

Brown, David and Wendy Hunter. (2004) "Democracy and Human Capital Formation: Education Spending in Latin America, 1980-1997." Forthcoming, *Comparative Political Studies*.

Brown, David and Wendy Hunter. (1999), "Democracy and Social Spending in Latin America." *American Political Science Review* 93 (4): 779-790.

Bueno de Mesquita, Bruce, James D. Morrow, Randolph Siverson and Alastair Smith. (2002) "Political Institutions, Policy Choice and the Survival of Leaders." *British Journal of Political Science* 32 (4): 559-590.

Bueno de Mesquita, Bruce, James D. Morrow, Randolph Siverson and Alastair Smith. (2003) *The Logic of Political Survival.* MIT Press.

Cheibub, Jose-Antonio and Jennifer Gandhi. (2004) "Classifying Political Regimes: A Six-Fold Classification of Democracies and Dictatorships." Yale University.

Denis Cogneau 2002 "Colonisation, école et développement en Afrique: Une analyse empirique, mimeo, French Institute for Development (IRD).

Colclough, Christopher and Samer Al-Samarrai. (2000) "Achieving Schooling for All: Budgetary Expenditures on Education in Sub-Saharan Africa and South Asia." *World Development* 28 (11): 1927-1944.

Coren, Devra. (2003) "Informed Distrusting Democrats: The Effects of Citizen Participation in Ugandan Constitution-Making." Paper presented to the annual meeting of the Midwest Political Science Association.

Englebert, Pierre and Monica Boduszynski. (2005) "Poverty and Democracy in Africa." Mimeo, Pomona College.

Erikson, Robert. (2004) "Macro vs. Micro-Level Perspectives on Economic Voting: Is the Micro-Level Evidence Endogenously Induced?" Mimeo, Columbia University.

Glaeser, Edward, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer. (2004) "Do Institutions Cause Growth?" *Journal of Economic Growth* 9 (3): 271-303.

Hannum, Emily and Claudia Buchanan. (2003) "The Consequences of Global Educational Expansion." American Academy of Arts and Sciences.

Honaker, James, Anne Joseph, Gary King, Kenneth Scheve and Naunihal Singh. (2003) "AMELIA: A Program For Missing Data." Harvard University.

Inglehart, Ronald. (2003) "How Solid is Mass Support for Democracy-And How Can We Measure It?" *PS: Political Science and Politics,* January: 51-57.

Inkeles, Alex and David Smith. (1974) *Becoming Modern.* Harvard University Press.

Keefer, Philip. (2003) "Does Democracy Help?" The World Bank, Washington, D.C.

Keefer, Philip and Stuti Khemani. (2003) "Democracy, Public Expenditures, and the Poor." World Bank Policy Research Working Paper No.3164

King, Gary, James Honaker, Anne Joseph and Kenneth Scheve. (2001) "Analyzing Incomplete Political Science Data: An Alternative Algorithm for Multiple Imputation." *American Political Science Review* 95 (1): 49-69.

King, Gary, Michael Tomz and Jason Wittenberg. (2000) "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* 44 (2): 347-61.

Kramer, Gerald. (1983) "The Ecological Fallacy Revisited: Aggregate vs. Individual-Level Findings on Economics and Elections, and Sociotropic Voting." *American Political Science Review* 77: 92-111.

Lindberg, Staffan. (2003) "The Democratic Qualities of Competitive Elections: Participation, Competition and Legitimacy in Africa." *Commonwealth and Comparative Politics* 41 (3): 61-105.

Linde, Jonas and Joakim Ekman. (2003) "Satisfaction with Democracy: A Note on a Frequently Used Indicator in Comparative Politics." *European Journal of Political Research* .43: 391-408.

Lipset, Seymour Martin. (1959) "Some Social Requisites of Democracy: Economic Development and Political Legitimacy." *American Political Science Review* 53 (1): 69-105.

Lloyd, Cynthia and Paul Hewett 2003, "Primary Scholing in sub-Saharan Africa: Recent Trends and Challenges", Population Council, Working Paper, no.176.

Mattes, Robert and Michael Bratton. (2003) "Learning About Democracy in Africa: Awareness, Performance, and Experience." Afrobarometer Working Paper No.31.

Alain Mingat and Bruno Suchaut 2000 (not 2003) Les systèmes éducatifs africains: Une analyse économique comparative, De Boeck Université, Brussels.

Muller, Edward and Mitchell Seligson. (1994) "Civic Culture and Democracy: The Question of Causal Relationships." *American Political Science Review* 88 (3): 635-652.

Norris, Pippa. (1999) *Critical Citizens: Global Support for Democratic Governance.* Oxford University Press.

Przeworski, Adam, Michael Alvarez, Jose Cheibub and Fernando Limongi. (2000) *Democracy and Development: Political Institutions and Material Well-Being in the World: 1950-1990.* Cambridge University Press.

Stasavage, David. (2005a) "Democracy and Primary Education in Africa." *American Journal of Political Science* 49 (2): 343-358.

Stasavage, David. (2005b) "The Role of Democracy in Uganda's Move to Universal Primary Education." *Journal of Modern African Studies* 43 (1): 53-73.

van de Walle, Nicolas. (2003) "Presidentialism and Clientelism in Africa's Emerging Party Systems." *Journal of Modern African Studies* 41 (2): 297-321.

van de Walle, Nicolas. (2001) *African Economies and the Politics of Permanent Crisis: 1979-1999.* Cambridge University Press.

Wantchekon, Leonard. (2003) "Clientelism and Voting Behavior: Evidence from a Field Experiment in Benin." *World Politics* 55: 399-422.

Wooldridge, Jeffrey. (2003) "Cluster Sample Methods in Applied Econometrics." *American Economic Review*.

Wooldridge, Jeffrey. (2002) *Econometric Analysis of Cross-Section and Panel Data.* MIT Press.

World Bank (2003) *A Chance for Every Child: Achieving Universal Primary Education by 2015*. The World Bank, Washington D.C.