Educating Demonstrators: Education and Mass Protest in Africa

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Abstract

Does a more educated population spur regime-challenging mass protest? It is commonly argued that educated individuals are more likely to collectively challenge governments through protests, and that this may explain why education is associated with democratization. While many studies have investigated education’s effect on conventional political participation (voting, petitioning etc.), we do not know whether education levels affect contentious mass protest. This paper argues that education increases the frequency of mass protest, by alleviating collective-action problems and motivating mass opposition, particularly in autocracies. These links are investigated at the sub-national level in Africa, by mapping over 650,000 survey respondents to spatialized protest event data. We present evidence that areas with more educated populations have higher levels of protest activity, and we find mixed evidence consistent with both opportunity- and grievance-related mechanisms driving this relationship. We proceed to identify the causal effect of education by using the location of colonial-era christian missions to instrument for local education levels.
1 Introduction

The notion that education increases a population’s tendency to initiate mass uprisings against existing institutions is popular. University campuses have often served as locus points for protests and riots, and students and graduates spearheaded revolts against the crumbling Soviet empire in 1989, the Tiananmen Square uprisings in the same year, and the Arab Spring of 2011, to mention some notable examples. Meanwhile, there is evidence that educated individuals are more politically aware, more critical of government and more politically active (see, e.g., Dec, 2004; Hillygus, 2005; Solis, 2013). Based on this, a growing number of studies point to mass mobilization as the most plausible causal mechanism linking education to democratization (Glaeser, Ponzetto and Shleifer, 2007; Murtin and Wacziarg, 2010; Sanborn and Thyne, 2014). Yet, this education-protest link is rarely investigated systematically. While a comprehensive literature indicates a strong relationship between education and “conventional” political activities within democracies – such as voting and party membership – few studies probe how education affects collective action aimed at transforming existing patterns of political authority. Such studies are essential to answer the question of whether education leads to more social instability, and, consequently, whether education is a force for regime change, as suggested by proponents of modernization theory (e.g., Lipset, 1959; Glaeser, Ponzetto and Shleifer, 2007).

This paper provides fresh evidence that education increases the frequency of protests. It offers the first systematic analysis linking education to protest, drawing on local-level evidence from 42 countries in Africa in the period 1991-2012. We present a simple framework for relating education to protest, assuming that protest emerges when people have both sufficient motivation to protest and opportunities to do so. Education should affect protest motivation in two ways. First, educated citizens will arguably be more politically active and more likely to demand civil liberties, individual autonomy and democracy. Second, educated individuals are more critical of government and should be strongly motivated to protest when their education is not converted into jobs. Hence, they should overall be more motivated to raise their voice and protest, and especially against non-democratic, corrupt and malfunctioning governments. Education may also enhance protest opportunities, by serving as a resource that eases collective-action problems of potential protesters, by enhancing skills, stimulating social networks and creating common understandings. For these reasons, we expect education to raise the likelihood of protest.

To investigate this expectation, we create a dataset capturing fine-grained variation in education and protest, by mapping local education levels to protest event data. We rely on georeferenced household data from the Demographic and Health Survey (DHS) project combined with georeferenced information on the location of regime-challenging protest events in Africa from the Social Conflict in Africa Dataset (SCAD) (Salehyan et al. 2012). This maps over 650 000 survey respondents to protest events, allowing us to investigate whether areas within countries with high education levels
are more likely to experience protest.

Studying Africa has several advantages - in addition to the availability of fine-grained, georeferenced data that this study draws upon. A majority of the countries included in our sample are authoritarian or semi-democracies (according to the Polity index), and all have in the relevant period suffered from problems such as unemployment, inflation, corruption or poor governance. Hence, the countries in our sample represent particularly fertile ground for testing the proposed mechanisms tying education to protest, such as anti-government grievances. At the same time, the region exhibits enough variation in both democracy, governance and economic conditions to assess empirically whether the effect of education is conditioned on economic and political context. Moving beyond the country-year setup also has several benefits: First, dis-aggregating this information plausibly brings us closer to the actual events and processes through which education affects collective action, reducing the danger of ecological fallacies. Second, it allows us to exploit variation in the sub-national spread of education that is plausibly exogenous to modern protest dynamics.\(^1\)

Empirically, we find that education generally does increase protest. This holds across a wide range of specification choices, and also obtains when we endogenize education by using patterns in the settlements of Christian missionaries in colonial Africa to instrument for contemporary education levels, following (Nunn, 2010). In fact, the result is strengthened in models that account for endogeneity. To evaluate the motivation mechanism, we first test whether education is particularly conducive to anti-regime protest when combined with more unfavorable economic opportunities, in line with Campante and Chor (2012a,b). Second, we look at whether education is more strongly linked to anti-government protest in more authoritarian regimes. These tests are intended to distinguish between economic and ideological aspects of education-induced motivations for protest. We find no support for the first expectation, but strong and consistent support for the second, leading us to conclude that education is particularly protest-inducing in dictatorships. This suggests that education could affect protest through enhancing preferences for democracy and more accountable governance.

To assess the opportunity-mechanism, we investigate whether education also affects protest events that should not be motivated by education-induced preferences, captured by looking at protests that are not aimed at the government. Here, we also find a link between education and protest, suggesting that education also impacts on capacities to stage protests not directed against the government, holding preferences constant. Since this latter test is somewhat less direct than our tests for the motivational mechanisms, we supplement it with numerous detailed case-based examples showing how this mechanism links education to protest in historical African cases.

We contribute to the literature by being the first study to demonstrate that education is linked to a higher likelihood of actual protest events, and that this effect is particularly strong in more authoritarian settings, suggesting that education spurs protest through anti-authoritarian grievances.

\(^1\)It allows us to control for omitted variables at the country-level.
The research design furthermore offers new insights on the causal nature of the education-protest link, by leveraging (plausibly) exogenous spatial variation. Finally, it adds to a growing literature on the determinants of sub-national political instability (e.g., Hendrix and Salehyan, 2012; Pierskalla and Hollenbach, 2013) by introducing an important new predictor of local protest.

2 Education, participation and protest

It is commonly held that educated citizens are more politically active. For instance, Dahl (1971) conjectured that socioeconomic development creates an educated populace likely to nurture the kind of participatory culture and political awareness necessary to sustain democracy. The claim that education increases political participation in democracies is supported by several studies, and has been referred to as “one of the most thoroughly-explored and best-established facts in the social sciences” (Campante and Chor, 2012b), and “one of the major contributions of political science to the general body of knowledge” (Solis, 2013). In particular, numerous studies report that educated individuals are more likely to vote (e.g., Wolfinger, 1980; Dee, 2004; Freeman, 2003). Relatedly, there is a strong association between education and individual political knowledge and democratic awareness (e.g., Almond and Verba, 1963; Verba and Norman, 1972; Hanushek, 2002; Bratton, Mattes and Gyimah-Boadi, 2005), interest in obtaining political information (Dee, 2004), party membership (see e.g., El-Said and Rauch, 2012), and greater dissatisfaction with existing institutions (Weakliem, 2002).

While most of the above studies indicate a positive association between education and participation, they mainly draw on purely correlational evidence that does not support causal interpretations. Against this background, several authors have utilized inference techniques such as quasi-experiments and instrumental variable regression in order to more properly assess whether education causes political participation, yielding mixed evidence (see e.g. Solis, 2013; Tenn, 2007; Kam and Palmer, 2008; Persson, 2012). While a number of studies – chiefly drawing on evidence from the US – identify causal effects (Sondheimer and Green, 2010; Milligan, Moretti and Oreopoulos, 2004), others do not (e.g., Solis, 2013; Friedman, Kremer, Miguel and Thornton, 2011). Moreover, probing this question in a non-democratic setting, Croke et al. (2015) find no effects of education on political participation in Zimbabwe.

While one might surmise from this literature that there is suggestive – yet mixed – evidence for a positive effect of education on participation, all the studies mentioned above deal with “normal” political participation, aiming to channel demands and preferences within the framework of established political institutions, mainly in western democracies. The literature is much less comprehensive when it comes to the question of how education affects regime-challenging political action, or “contentious politics”; defined by Tarrow (1994, 7) as “used by people who lack regular access to representative institutions, who act in the name of new or unaccepted claims, and who behave in ways that
fundamentally challenge others or authorities”.

A prominent literature, associated with modernization theory, suggests that an educated population is more likely to induce political change, especially change towards more democracy and political liberalization (Lipset, 1959; Glaeser, Ponzetto and Shleifer, 2007). One of the key mechanisms proposed to explain the education-democracy relationship in influential studies on democratization is a suggested effect of education on mass protest (e.g., Glaeser, Ponzetto and Shleifer, 2007); a quintessentially unconventional form of participation. While an individual who is likely to oppose a dictatorship would perhaps also be likely to vote and participate in a functioning democracy, this does not mean that participation in democracies generalizes to dictatorships: Taking part in anti-government protest is much more costly than political participation in conventional democratic channels. While casting a vote in a democracy comes with the mere cost of traveling to the polling station, protests against a dictator may lead to prison or even death. While this is especially the case in repressive regimes, even protesting in (semi-)democracies can be fraught with peril, as many protesters face tear gas, jail and police brutality.

There are few investigations of the link between education and “contentious” protest. A couple of studies look at education and various forms of protest within single countries. For example, Miller (1977) finds that schooling predicts participation in the U.S. urban unrest in the 1960s and 70s, and explains this by appeal to Davies (1962) “J-curve theory”, positing that “rapid expansions in opportunities build up expectations which, if unmet, can lead to frustration and violence”. Studying Kenya, Friedman et al. (2011) finds that education does not make individuals more likely to challenge authority. Some cross-country studies exist, looking at education and self-reported individual participation in protest. Campante and Chor (2012b,a) find that education combined with economic grievances is likely to spur protest. They show that individuals whose income falls below the predicted value based on achieved education are more likely to report protest participation, and that education coupled with unemployment is associated with higher levels of reported protest, in line with the “J-curve” tested in Miller (1977).

While studies of self-reported protest activities yield valuable insights; they do not tell us whether education increases levels of protest as such. It could for example be that education raises individual inclinations to join already existing protests and demonstrations, while not affecting the coordination-processes that are necessary for protests to get underway in the first place. Hence, using individual-level findings to draw expectations about overall protest incidence is perilous. In light of this, the lack of studies investigating the link between education and actual protest events represents a considerable gap. Furthermore, with the exception of Friedman et al. (2011), the above-mentioned studies pay little attention to causal inference, which means that we can not rule out that the correlations between education and reported protest activities are driven by endogeneity. Our study sets out to address these issues, through investigating the effects of education on protests at the sub-national level in Africa, with a research design to identify causal effects.
In addition to informing the debate relating to the general relationship between education and regime-challenging contentious collective action, our study also illuminates ongoing work on the impacts of education on democracy, collective action, and political participation in Africa specifically (e.g., Albaugh, 2014; Mattes and Mughogho, 2009; Bleck, 2015).

3 Linking education to popular protests

We here outline the mechanisms linking education and protest, drawing on a well known distinction between two determinants of collective action: opportunity and motivation (e.g., Kuran, 1991; Tarrow, 1994). For protest activities to materialize, potential dissenters must first be motivated to oppose a regime, for instance due to frustrations with governments. But, as Kuran (1991, p.21) notes: “Anti-government feelings can certainly bring a revolution within the realm of possibility, but other conditions must come together to set it off”. Prospective dissidents must gain the opportunity to organize actions such as demonstrations or strikes. Hence, a minimum of both motivation and opportunity are necessary conditions for collective action, but the two can to a certain extent compensate for each other. Collective action can materialize despite slender opportunities as long as motivations are sufficiently strong, and people may choose to protest even based on moderate grievances if conditions are sufficiently favorable. In the following we relate education to both motivations and opportunities for contentious collective action.

3.1 Motivations

Education should make people more motivated to engage in regime-challenging protest – at least when the political regime and its policy performance are considered sub-optimal. We here specify two branches of the causal channel tying education to protest through motivations; an ideological branch that involves citizens becoming more challenging of existing institutions due to preferences for accountable and better governance and an economic branch where educated citizens protest when education is unmet by economic opportunities.

First, education should alter preferences for political institutions. Schooling increases knowledge of politics and a more critical view on government performance. More education should increase demands for influence over government decision-making, and lower thresholds for criticism if governments do not satisfy expectations. Relatedly, it has been argued that education makes people more endorsing of democracy, civil liberties and citizen empowerment (Welzel, 2013). This builds on a proposed psychological mechanism according to which citizens who become used to exercising critical thinking in schools, universities and in the work-place, start demanding influence on political affairs (Inglehart and Welzel, 2005).

This is pertinent in the context of Africa, where education is often found to make citizens more
critical of political institutions. This is documented in cross-national surveys (Mattes and Mughogho, 2009) and case-based work, such as Bleck (2015)’s study of education and political engagement in Mali. In the Malian context, Bleck (2015, 3) notes that “in environments of fragile or imperfect institutions, educated, empowered citizens might be more critical of regimes than their uneducated peers are”.

In line with this, we expect education to be particularly protest-conducive in political regimes that fail to live up to standards of democracy and good governance, given that education induces sympathies with such ideals. This implies that more educated citizens in more autocratic states should be especially likely to express grievances through mass protest.

Second, education should affect economic grievances. For example, increased political awareness and a more critical approach to politics may be especially protest-inducing if combined with economic hardship and unemployment. Conversely, if combined with a healthy economy, education is likely to get converted into better jobs and better material conditions for the educated. Schooling is, after all, also a public good yielding tangible benefits for its recipients. Even if education generally makes people more critical of the government, it may create incentives in favor of the status quo that trumps such dissenting views. Hence, the protest-enhancing effect (of education) may be less pronounced for educated people who have converted their acquired human capital into employment and material benefits.

3.2 Opportunities

The window of opportunity to form regime-challenging movements is a function of two factors: The capacity of potential protesters to organize, and the capacity of regimes to prevent protest (see e.g Gurr, 1970). There are some reasons to suppose that education could strengthen the regime, since educated labor may boost economic productivity and government revenue, increasing state capacity. However, most arguments point in favor of education strengthening the capacity of protesters, tipping the balance in favor of the protesters’ side of the equation. Crucially, successful mobilization requires human capital and overcoming collective action problems.

The inherent difficulty of organizing collective action has been described in depth (see e.g Olson, 1965). Collective action problems plague prospective protest movements for two reasons: Protest participation is quite costly, particularly in non-democratic regimes where protestors face severe punishments. Second, even if an individual will benefit greatly from a successful protest outcome such as regime change, she might still refrain from protest participation, due to doubts that the movement will succeed - a source of even higher costs. Such doubts are enhanced by free-rider problems, since popular protest can be seen as a “public good” that individuals benefit from without contributing themselves.

According to this logic, protest success hinges on the number of protestors: the more people, the
more likely a successful outcome. In such settings, people usually lack information regarding other people's intentions or preferences raising doubts that others will participate (e.g. Kuran, 1995). Hence, individuals may end up choosing to refrain from protest based on fear that others will also do so.

Education can mediate such collective action problems. First, education improves communication skills, which are essential for collective action. For instance, well-developed reading and writing skills are crucial for circulating critical information about the government, to spread calls for protest, and to utilize internet and social media to mobilize. More generally, enhanced literacy should improve abilities to effectively communicate and articulate opinions on policy issues.

Second, schooling enhances cooperation skills. Through making students participate in collective learning tasks and activities such as games, plays, research projects, and in socializing, pupils learn how to successfully interact with others (Newton, 1997). An important side product of such activities is a greater understanding and appreciation of other points of view. Hence, class environments foster toleration of diverging opinions, as well as effective communication of one's own. These are qualities that are vital to overcoming collective action problems.

Third, education stimulates social networks. The role of such networks in overcoming collective-action problems has been extensively discussed (e.g Goldstone, 1994). Networks strengthen group-mentality and make people more likely to trust that others will also participate in collective action. Indeed, the size of one's network affects the probability of engaging in political activity (McClurg, 2003). Interestingly, since schools bring people together that might not otherwise have interacted, education should be expected to enhance the kinds of “weak ties” that are particularly conducive to collective action. As argued by (Granovetter, 1973), weak ties connect previously unconnected parts of a network and create relationships between “friends of friends”. Such ties create network integration – more connected members – rather than fragmentation. In large and integrated networks information flows faster from one end of a network to another since there are more nodes in the network. This reduction in information costs eases collective action.

Relatedly, education should increase work differentiation and specialization, furthering network integration and specialization. In line with this, tight-knit networks with few weak ties, such as the family have been identified as an obstacle to political participation and civic engagement (Alesina and Giuliano, 2011). In sum, education should create a more networked population, which in turn can stimulate collective action.

Fourth, education should enhance inter-group solidarity. People who have attended the same schooling or university system will share at least a minimal common framework of reference, easing communication and coordination. According to Tarrow (1994, p.11): “Education provides us with a common knowledge of a set of dates, places, names, events, concepts, references and quotations that help the social interaction of otherwise disparate individuals”. He shows how collective action problems can be solved when leaders or key agents are able to “tap into and expand deep-rooted
feelings of solidarity or identity” (Tarrow, 1994, p.11), arguing that the crucial ingredients for a successful mass movement are mobilization around a common purpose.2

3.3 Examples from Africa

We here discuss a number of protest cases in Africa that are consistent with our two mechanisms. First, in line with the argument that education induces motivations for protest, we find many instances of protest by students or educated people that seems to be driven by demands for democracy or civil liberties in (semi-)authoritarian regimes.

A prominent illustration is the series of mass protests in Kenya in 1990 against the Moi government, in which public sector employees, students, bishops and lawyers played a prominent part (Haugerud, 1997). The movement initiated a series of democratic reforms throughout the 1990s, and originated in grievances over corruption and human rights violations. In July 1990, public sector officials, students and professionals carried out rallies in Nairobi and elsewhere, demanding democracy. The democratic nature of their demands is illustrated by Bratton and van de Walle (1992, p.425), who describes how the crowds “flashed a two-finger sign indicating support for political pluralism and called for the release of political detainees”.

Similar grievances fueled the student unrest in Zimbabwe in 1989-90. Through letters, boycotts and campus demonstrations, students in the country’s main universities expressed discontent with corruption, lack of academic freedom and sham elections. For instance, leaders of the national student union wrote to the government: “This university is the last island of democracy in this country and we will fight to the bitter end and hilt to sustain these democratic rights and extend them to the generality of the masses of Zimbabwe” (Swarthmore, 2015)

Examples also support the claim that education leads to protest through enhancing mobilization capacities. For instance, several cases suggest that the media skills and tech-savviness of students and professionals are important tools for contentious collective action across Africa. Consider the anti-regime protests that took place in major cities in Zimbabwe in 2016, organized by groups of students, teachers, civil servants, journalists and lawyers. The (educated) protesters relied on the kind of communication skills described above. They were started by a social media campaign launched on Twitter and Youtube with hashtags #ThisFlag and #ZimShutdown2016, which encouraged civil servants, teachers and health professionals to “shut down Zimbabwe” by staying at home (Bearak, 2016). Moreover, the social media application “WhatsApp” served as a key device to coordinate and circulate information about the shut-down (Bearak, 2016). The campaign culminated in a nationwide strike targeting schools and hospitals.

Communication skills (plausibly) induced by education were instrumental in African protests also before the age of social media. For example, the pro-democracy campaign in the Central African

2The opportunity-related factors discussed above, such as skills and networks, will often reinforce each other in conducing collective action. For example, increased access to communication technology will reinforce social networks and vice versa.
Republic (CAR) between 1990 and 1993 expressed discontent through a series of letters to the government demanding multi-party elections. The letters were drafted by student organizations, who also distributed pamphlets with key demands and calls for national strikes (Swarthmore, 2015).

The protests in CAR also illustrate the importance of networks and coordination skills for enabling joint resistance. Collective action was facilitated by the fact that professionals such as teachers, lawyers and health workers in the public sector were already organized in powerful professional associations that were used as launch pads. Moreover, these different groups drew on their organizational skills to set up the umbrella association “Coordinating Committee for a National Congress (CCCN)”, which was crucial to coordinating the large-scale resistance campaign (Swarthmore, 2015). In line with this, Gyimah-Boadi (1996, p.123) argues that professional organizations such as bar, medical and university faculty associations were important sources of contentious mobilization in the democratic transitions in countries such as Ghana, Kenya and Togo – partly due to their “complex and cohesive organization”.

Finally, the series of student protests taking place at the University of Dakar in Senegal in 1968-69 illustrate the role of social networks in mass protest. Just like other instances of student protest across Africa, these originated at the university campus, when students occupied university buildings and boycotted classes (Boren, 2013). The protests clearly grew out of university networks: The actual teaching activities and campus life in general created an integrated student body with a common goal, identity and social infrastructure that facilitated anti-regime protests (Zeilig and Ansell, 2008). The protests continued to spread across the country as students reached out to family and friends in their respective hometowns (Zeilig and Ansell, 2008), illustrating the advantages of the educational system bringing together people from different areas and societal strata.

In sum, these examples illustrate how the motivations and capacities for collective action that (according to theory) should link education and protest are clearly evident in powerful examples of mass protest in African cases.

At this point, we should note that education in Africa - the empirical context we investigate - exhibits great variety. For example, the continent hosts a wide variety of religious schools (such as Madrassas), schools run by development actors, as well as the more standard public and privately run schools adhering to baseline curricular standards. Education systems also vary greatly, as illustrated by the differences between Francophone and Anglophone countries when it comes to supporting multilingual versus unilingual language policies in education (see e.g., Albaugh, 2014). Despite this heterogeneity in schooling in Africa, we still think investigating the impact of education as such on protest in Africa is warranted. While school types in Africa will undoubtedly differ slightly in content, there is no strong theoretical reason to suspect that the theoretical mechanisms outlined above should apply strongly to some but not to others. Furthermore, while our data does not allow us to distinguish empirically between forms of education (such as public vs. private) it does allow us to investigate heterogeneity across country-level education systems such as is found between
Francophone and Anglophone countries (discussed in Albaugh (2014)). We will therefore return to the question of heterogeneity in education systems in our empirical analysis.

3.4 Expectations

Several expectations flow from our discussion. Most importantly, most of the arguments point to education being on net conducive to mass protest. Education should enhance critical sentiments that should motivate protest overall, at least in the African context where there are many sources of grievances such as poor governance and lack of democracy. Since education is also expected to boost protest-capacities, we get the following unconditional expectation: Increases in education should increase the risk of protest overall.

We also formulate some conditional expectations bearing on the two mechanisms. First, the motivational channel, which can be broken down into an ideology-component and an economic-component, implies that education motivates protest against the government. Hence, this mechanism yields expectations regarding anti-government protest. The ideological component (of the motivational channel) implies that education generates preferences that motivate protest against dictatorships. For this reason, we expect an interaction effect, whereby education should have a stronger positive effect on anti-regime protests in more autocratic regimes. Additionally, we discussed the economic component of the motivational channel, whereby education should interact with economic opportunities, such that individuals with high education but poor economic conditions should be more likely to protest. This yields the second conditional expectation, that education should be more conducive to anti-government protest when combined with high unemployment.

Finally, we discussed the opportunity channel stipulating that education should increase capacities for protest, holding preferences constant. To test whether this operates, we circumscribe our sample to look at protests that are not directed at governments. If the opportunity mechanism operates, we would expect education to increase all forms of protest – also those not motivated by education-related grievances. Hence, we expect that: education should increase protests not aimed at the government.

4 Data

To investigate our expectations, we need data on both sides of the education-protest equation. To this end, we combine georeferenced survey data from the Demographic and Health Surveys (DHS) with georeferenced data on protests in Africa taken from the Social Conflict in Africa Dataset (SCAD) (Salehyan et al., 2012). Africa is particularly ideal for our purposes. The continent has experienced a surge in education over the past three decades, and protests and riots are quite frequent, occurring in different regime contexts.

3The DHS data are available at http://www.dhsprogram.com/Data/
Our education data comes from the DHS survey, and is at a high level of spatial resolution. DHS provides GPS coordinates for each survey “cluster” where a given respondent was surveyed, and by aggregating survey responses in these areas we get a local picture of education levels in the areas where clusters are located. The DHS covers 42 African countries. These are mostly either semi-democracies or authoritarian, and most of them are poorly governed and suffer from (relatively) weak economic performance. The average democracy score in the sample (measured using the Polity index) is 1.78, making the average country in our sample a semi-democracy. This suggests that there are many potential sources of grievances, that may interact with education-induced resources and greater political awareness to induce mass protest. Hence, Africa is a particularly vital context for investigating how education impacts on political protests.

Our data on protest events, from SCAD, is based on news reports, and covers all countries in Africa in the 1991-2012 period. A highly beneficial property of the SCAD dataset is that it contains geocodes for each protest event, allowing us to map protest events to the mentioned survey clusters. To do this, we need a common spatial frame of reference that can give us units of analysis comprising information on protest events, and the education levels in the areas where these events took place. For such a template, we use the PRIO-GRID spatial template (Tollefsen, Strand and Buhaug, 2012), version 2.0, which partitions our map of Africa into 50X50KM grid-cells. The PRIO-GRID is now a standard template for sub-national analyses of spatial data in conflict research, commonly used by scholars doing disaggregated conflict analysis (e.g., Pierskalla and Hollenbach, 2013; Wischnath and Buhaug, 2014). The grid-cell units are completely independent of country-borders and other administrative units.

To construct our dataset, we proceed as follows. First, we aggregate respondent information (from households) to the level of the survey-clusters, and remove all clusters with no GPS coordinates, leaving us with over 650000 respondents situated in roughly 26000 clusters in the period 1990-2012. These clusters are then merged into the grid cells that encompass them, leaving us with just above 6800 grid cells containing survey clusters with education data and respondents. The DHS contains data for every year in the 1990-2012 period covered by the SCAD data, but only some grid-cells are surveyed in more than one year. The result is an unbalanced panel of grid-cells with survey and conflict data for the 1990-2012 period. Figure 1 shows a map of Africa with all the grid cells in our dataset and SCAD events overlaid.

In our interpretations we treat grid-cell values as roughly representative for local populations. One could argue that this is compromised by the aggregation of survey-respondents to grid-cells. There are about 98 survey respondents on average in each grid-cell, with a minimum of 1 and a maximum of 2972. Most cells have acceptable numbers of respondents. The median number of survey respondents is 47 and more than 80% of cells have more than 29 respondents. Nevertheless,

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4The DHS surveys are household surveys, often covering more than one respondent in a household. In these cases we aggregate values for all respondents in a household to survey clusters.
some of our units-of-analysis will contain too few respondents, and will thus not be representative.\textsuperscript{5} We believe this should generate attenuation bias, pulling our estimates towards zero. This makes our tests slightly more conservative and should bias against finding a relationship between education and protest. However, to further probe this, we conduct robustness checks dropping all cells with less than 30 respondents, with no qualitative change in results.

To measure education we take the grid-cell level mean of the main education item in the DHS surveys. At the respondent level, the item takes the values: 0 = no education, 1 = incomplete primary education, 2 = completed primary education, 3 = incomplete secondary education, 4 = completed secondary education, 5 = higher education. Taking the grid-cell mean of this survey item we get a measure that is normally distributed, with an empirical mean of 1.1, and an empirical minimum and maximum of 0 and 4.41. The countries with the lowest scores on this education variable are Algeria (0.07), Somalia (0.15) and Niger (0.24), while the countries with the highest scores are Swaziland (2.46), South Africa (2.45) and Botswana (2.37).

As our measure of protest events, we create a measure based on the Social conflict in Africa (SCAD) data (Salehyan et al., 2012). This counts the number of ‘organized’ and “unorganized” demonstrations and riots, defined as: “distinct, continuous”, and “directed toward members of a distinct “other” group or government authorities.” These include peaceful anti-regime demonstrations, as well as violent riots. It also includes general or limited strikes. In the SCAD data, each such event includes a brief description of the event. Typical examples of events that we focus on are pro-democracy rallies, student demonstrations, strikes among public employees and so on. Our protest measure counts the absolute number of protest events in a grid-cell in a 3-year time-window after each grid-cell has a survey.\textsuperscript{6} Our baseline models include all protest events. However, we also present results from models distinguishing between the anti-government and non-government grievances, allowing us to assess the mechanisms.

In our sample (where we have DHS clusters), 11\% of grid-cells experience at least one protest event, while the average frequency of protest events for all grid-cells (where we have DHS data) is .07. Of the countries in our dataset, in the 1991-2012 period, Nigeria has the highest number of events (327), followed by South Africa (168) and Kenya (106), while the least protest-prone countries in the period are Eritrea (8 events), Lesotho (5) and Gambia (4).

\textbf{4.1 Covariates}

Our baseline models include a sparse set of confounders, while adding additional controls in robustness tests. One baseline covariate is the log distance to the capital, since the capital expectedly

\textsuperscript{5}DHS clusters are randomly sampled within regions of a country, and respondents are randomly sampled within clusters.

\textsuperscript{6}While our results are robust to using a 1-year window, we use the 3-year time-window to get more information on conflict events in our dataset. Since most grid-cells are measured in the DHS only once, or with more than 3-year intervals, and since education levels are expected to be relatively static from year to year, using a 3-year window is a sensible solution.
Figure 1: Grid cells with DHS education data and protest events overlaid, 1990-2012
has higher education levels and probably also more protests because of the location of government buildings and similar focal points. We also include the average travel time to the nearest city in the grid cell, using data from the PRIO-GRID database, capturing the development of infrastructure and urbanization in the grid-cell. Furthermore, we include some items from the DHS surveys; the mean age among respondents in the grid-cell, the mean number of respondents living in an urban area (as defined by DHS), and the average unemployment level. It should be noted that the latter covariate potentially induces post-treatment bias (since it is potentially intermediary between education and protest). We therefore display models both with and without this variable. Since protest events cluster in space, a spatial lag could be a candidate for the baseline model, but we have opted to include it only in additional tests; both because it is potentially post-treatment, and because it is insignificant when conditioning on observables (its inclusion does not alter our results). A number of additional candidates for confounders are considered in the robustness section.

5 Empirical strategy

Our main analysis estimates a set of probit models capturing the probability of a grid-cell experiencing at least one protest event, along with OLS linear models capturing the log of the count of protest events in a grid cell. These models are estimated with and without controls, and country- and year dummies.

We subsequently probe whether our results support a causal interpretation, by comparing the OLS and the probit models to Two Stage Least Squares (2SLS) and Instrumental Variable probit (IVprobit) models for the same outcomes. This is done to address the (quite plausible) eventuality that education is endogenous; either due to reverse causality or unobserved confounders. Reverse causality occurs if observed or latent protests affects education levels. This will be the case if conflict or political instability drives out educated people indirectly, through affecting the economy, or directly; if educated are more resourceful and thus more able to migrate in the face of conflict. Unobserved confounding would occur if, for example, certain areas are not serviced with public goods such as education precisely because they are anti-government. If this is the case, we would see downwardly biased correlations between education and protests. One could also imagine the opposite pattern; that places with high levels of protest received higher levels of education as a concession to stave off unrest.

In short, we have good reasons to suspect endogeneity, and need a strategy for addressing this. We therefore endogenize education by using the historical presence of Christian missions as an instrument for contemporary education levels. The logic behind using this historical mission-station instrument is that Christian missionaries provided education to the localities they settled in, and, given the

\footnote{An arguably appropriate choice of models would be negative binomial models, which would be more fitting for our count outcome. However, these are infeasible since they are too computationally intensive and do not converge when estimated on our data (with the full set of controls). There is also no acceptable two-stage estimator for count models.}
persistence of education levels through e.g. social reproduction, increased contemporary education levels. This builds on recent contributions showing that Christian missionaries at the local level in Africa substantially increased education levels in their communities (Nunn, 2010). Missionaries e.g. established schools that boosted education in localities close to missions. Building on a historical literature documenting this, Nunn (2010) finds that mission stations increase local levels of civic participation, and persuasively demonstrates that this is due to education.

To create this mission-station instrument, we use the map created by Roome (1925), digitized in Nunn (2010), containing coordinates of all missions and bible depots in Africa in 1924. We combine this with the DHS clusters that are georeferenced in Grid-cells, and count the number of historical mission stations in a grid-cell, taking the log of the number of historical missions as our instrument for contemporary grid-cell level education. Around 20% of the cells we have survey-clusters for has at least one Christian mission in 1924. Figure 2 shows the digitized map of mission stations in colonial Africa. The map shows that there is substantial spatial variation in mission station locations. The exclusion restriction assumed in models using this instrument is that the presence of missions is unrelated to protests when conditioning on observables, and the IV-strategy requires that missions strongly predict higher education levels in our grid-cells (the expectation yielded by the argument linking missionaries to the spread of education). We return to these considerations in our discussion of the IV models.
In our baseline estimates and in the instrumental variable models, we use a protest measure including both anti-government protest and protest aimed at other targets, but in section 5.2 we also distinguish between these two forms of protest, in order to evaluate the proposed grievance and opportunity- mechanisms.

5.1 Baseline estimates

First, we estimate probit and OLS models assuming that education levels are exogenous conditional on observables. Table 1 presents results from the probit models (models 1.1-1.4) and OLS estimates (models 1.5-1.8).

Model 1.1 is most parsimonious, including lagged protest and education levels. As expected, the coefficient is positive (.252) and precisely estimated (Z-value= 10.12). This result strengthens when country- and year-fixed effects are added (model 1.2), and remains positive and strong in models with additional grid-cell level controls (1.3 and 1.4), also when the unemployment control is included. Based on a simulation of model 1.4, depicted in figure 3 below, we find that when increasing average education from no education to completed secondary education, protest probability in a given year rises from roughly 2% to 8%. This is a substantial increase, suggesting that education is a powerful driver of unrest. Education is a potent predictor also when compared to other variables tapping crucial aspects of socioeconomic development. Indeed, as we discuss in the appendix, it compares favorably to variables such as unemployment, literacy, and urbanization. This indicates that education is an important driver of mass protest in Africa.

To illustrate the role of education in our model, we consider the example of mass protests in Lagos, Nigeria, in the 2008-2011 period. When introducing education to the baseline model, the predicted protest probability for the grid-cell encompassing Lagos increases from roughly 14% to 25%. Lagos has, compared to surrounding areas (and conditional on the other variables), a high level of education, and leveraging information about education significantly improves the prediction of protest. That these protests exhibited heavy involvement by educated participants is strongly supported by qualitative sources. For example, using the qualitative information contained in the SCAD data, we find protests organized by teachers unions (over higher wages), doctors (in a hospital strike over higher wages), and youth protest holding a rally demanding clean elections. In fact, student protests are a frequently occurring phenomenon in Lagos, often emerging in higher-education institutions such as the University of Lagos (Adesina, 2011) and Lagos State University (Edukhugo, Ejuwa and Igbaruma, 2011).

Education increases protest also in the OLS models of the log number of protest events (models 1.5-1.8). All education coefficients are positively signed, and precisely estimated, with T-values ranging from 7.68 (model 1.6) to 3.02 (model 1.8). These OLS and Probit results indicate that protests are more common in highly educated areas, even when potential measured confounders, and
Table 1: Baseline probit and OLS models of protest events

<table>
<thead>
<tr>
<th></th>
<th>Probit (1.1)</th>
<th>Probit (1.2)</th>
<th>Probit (1.3)</th>
<th>Probit (1.4)</th>
<th>OLS (1.5)</th>
<th>OLS (1.6)</th>
<th>OLS (1.7)</th>
<th>OLS (1.8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td>0.252***</td>
<td>0.409***</td>
<td>0.296***</td>
<td>0.225***</td>
<td>0.142***</td>
<td>0.236***</td>
<td>0.121***</td>
<td>0.078***</td>
</tr>
<tr>
<td></td>
<td>(10.12)</td>
<td>(8.24)</td>
<td>(3.50)</td>
<td>(3.76)</td>
<td>(6.27)</td>
<td>(7.68)</td>
<td>(3.86)</td>
<td>(3.02)</td>
</tr>
<tr>
<td><strong>Protest_{t-1}</strong></td>
<td>0.628***</td>
<td>0.720***</td>
<td>0.648***</td>
<td>0.643***</td>
<td>1.160***</td>
<td>1.001***</td>
<td>0.952***</td>
<td>1.065***</td>
</tr>
<tr>
<td></td>
<td>(7.44)</td>
<td>(7.19)</td>
<td>(6.33)</td>
<td>(6.05)</td>
<td>(8.03)</td>
<td>(6.69)</td>
<td>(6.43)</td>
<td>(7.19)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>0.034</td>
<td>0.176</td>
<td>-0.004</td>
<td>0.001</td>
<td>0.000</td>
<td>0.000</td>
<td>(0.11)</td>
<td>(0.45)</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.45)</td>
<td>(-0.52)</td>
<td>(0.41)</td>
<td>(0.21)</td>
<td></td>
<td>(-0.23)</td>
<td>(-0.57)</td>
</tr>
<tr>
<td><strong>Age^2</strong></td>
<td>0.591***</td>
<td>0.562***</td>
<td>-0.004</td>
<td>0.001</td>
<td>0.000</td>
<td>0.000</td>
<td>(5.87)</td>
<td>(5.40)</td>
</tr>
<tr>
<td></td>
<td>(5.40)</td>
<td>(5.40)</td>
<td>(5.12)</td>
<td>(6.01)</td>
<td></td>
<td></td>
<td>(0.50)</td>
<td>(0.80)</td>
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<tr>
<td>L(Capital distance)</td>
<td>-0.169***</td>
<td>-0.175***</td>
<td>-0.109***</td>
<td>-0.111***</td>
<td></td>
<td></td>
<td>(-3.62)</td>
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<tr>
<td></td>
<td>(-3.76)</td>
<td>(-3.85)</td>
<td>(-3.52)</td>
<td>(-3.81)</td>
<td>(2.13)</td>
<td></td>
<td>(-3.02)</td>
<td>(-3.54)</td>
</tr>
<tr>
<td><strong>Time to city</strong></td>
<td>-0.001*</td>
<td>-0.001***</td>
<td>0.000*</td>
<td>-0.000***</td>
<td></td>
<td></td>
<td>(-2.42)</td>
<td>(-4.56)</td>
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<tr>
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<td>(-3.02)</td>
<td>(-3.54)</td>
<td>(-2.42)</td>
<td>(-4.56)</td>
<td></td>
<td></td>
<td>(-3.02)</td>
<td>(-3.54)</td>
</tr>
<tr>
<td><strong>Unemployment</strong></td>
<td>0.150</td>
<td>0.150</td>
<td>-0.004</td>
<td>-0.004</td>
<td></td>
<td></td>
<td>0.150</td>
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<td>(-0.23)</td>
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<td></td>
<td>(1.50)</td>
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</tr>
<tr>
<td>β</td>
<td>-1.553***</td>
<td>-2.405***</td>
<td>-1.134</td>
<td>-4.003</td>
<td>-4.544***</td>
<td>-4.369***</td>
<td>-3.023*</td>
<td>-2.812</td>
</tr>
<tr>
<td><strong>Country-FE</strong></td>
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<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Year-FE</strong></td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Log likelihood</strong></td>
<td>-2247.764</td>
<td>-1031.161</td>
<td>-980.606</td>
<td>-896.914</td>
<td>6272.000</td>
<td>6272.000</td>
<td>6272.000</td>
<td>5905.000</td>
</tr>
<tr>
<td><strong>R^2</strong></td>
<td>0.067</td>
<td>0.112</td>
<td>0.126</td>
<td>0.111</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: *p<0.05; **p<0.01; ***p<0.001, standard errors are clustered at the level of the grid-cell. Z-scores (probit) and T-values (OLS) in parentheses.

To investigate whether the patterns identified in table 1 warrant a causal interpretation, we estimate a series of IV-probit (of the binary outcome) and 2SLS models (for the log-linear outcome) endogenizing education levels in grid-cells using the mission instrument. This comparison takes us some way towards a causal interpretation of the estimated associations.

Table 2 conducts this exercise, instrumenting for education using mission stations. In this set of models we control for the presence of (current day) christians in each specification, since this is the most obvious threat to the exclusion restriction (we report several additional tests in the appendix, where we further probe the exclusion restriction). This is because the historical presence of Christian missionaries should affect religiosity in these areas today, through the missionaries’ spread of their faith. Furthermore, since Christian areas might see more protests (especially where Christians are national minorities, such as in Sierra Leone, Burkina Faso, and Mauritius), potentially threatening the exclusion restriction.

Columns 2.1-2.4 in table 2 display IV-probit models, showing substantively similar results to those reported in table 1. The coefficients are positive and substantive, ranging from 1.103 (model 2.2) to .251 (model 2.3). With the exception of model 2.3, all coefficients are precisely estimated, with large Z-values. The pattern is stronger for the 2SLS models in columns 2.5-2.8, showing precise coefficients across specifications. For most IVprobit and 2SLS models, the education coefficients are...
Table 2: IV-probit and 2SLS models of protest events

<table>
<thead>
<tr>
<th></th>
<th>IV-Probit (2.1)</th>
<th>IV-Probit (2.2)</th>
<th>IV-Probit (2.3)</th>
<th>IV-Probit (2.4)</th>
<th>2SLS (2.5)</th>
<th>2SLS (2.6)</th>
<th>2SLS (2.7)</th>
<th>2SLS (2.8)</th>
</tr>
</thead>
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<tr>
<td>Education</td>
<td>0.430***</td>
<td>1.103***</td>
<td>0.251</td>
<td>0.900***</td>
<td>0.695***</td>
<td>0.703***</td>
<td>0.653**</td>
<td>0.788**</td>
</tr>
<tr>
<td></td>
<td>(3.73)</td>
<td>(6.81)</td>
<td>(1.19)</td>
<td>(2.69)</td>
<td>(5.38)</td>
<td>(4.92)</td>
<td>(3.18)</td>
<td>(2.86)</td>
</tr>
<tr>
<td>Christians</td>
<td>-0.139</td>
<td>-1.103***</td>
<td>0.109</td>
<td>-0.805*</td>
<td>-0.904***</td>
<td>-0.664***</td>
<td>-0.862**</td>
<td>-0.715*</td>
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<tr>
<td></td>
<td>(-0.81)</td>
<td>(-4.46)</td>
<td>(0.37)</td>
<td>(-2.01)</td>
<td>(-5.22)</td>
<td>(-3.66)</td>
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<tr>
<td>Protest_{t-1}</td>
<td>0.487***</td>
<td>0.444***</td>
<td>0.491***</td>
<td>0.477***</td>
<td>0.949***</td>
<td>0.842***</td>
<td>0.945***</td>
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<tr>
<td></td>
<td>(4.97)</td>
<td>(3.69)</td>
<td>(5.12)</td>
<td>(3.73)</td>
<td>(6.26)</td>
<td>(5.62)</td>
<td>(6.30)</td>
<td>(5.66)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.339*</td>
<td>0.006</td>
<td>-0.000</td>
<td>-0.25</td>
<td>-0.012</td>
<td>-0.025</td>
<td>-0.10</td>
<td>-0.22</td>
</tr>
<tr>
<td></td>
<td>(-2.40)</td>
<td>(0.02)</td>
<td>(-0.10)</td>
<td>(-0.22)</td>
<td>(-0.91)</td>
<td>(-0.92)</td>
<td>(-0.22)</td>
<td>(-0.22)</td>
</tr>
<tr>
<td>Age^{2}</td>
<td>0.005*</td>
<td>-0.000</td>
<td>0.000</td>
<td>0.000</td>
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<td>0.000</td>
<td>0.000</td>
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<tr>
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<td>(2.10)</td>
<td>(-0.05)</td>
<td>(0.09)</td>
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<td>(0.09)</td>
<td>(0.27)</td>
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<tr>
<td>Urban</td>
<td>0.095</td>
<td>-0.021</td>
<td>-0.004</td>
<td>-0.162</td>
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<td>-0.000</td>
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<tr>
<td></td>
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<td>(-0.53)</td>
<td>(-0.77)</td>
<td>(-0.34)</td>
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<td>(-0.63)</td>
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<tr>
<td>L(Capital distance)</td>
<td>-0.086**</td>
<td>-0.076</td>
<td>-0.097**</td>
<td>-0.038</td>
<td>-0.36</td>
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<td>-0.000</td>
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<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(-1.48)</td>
<td>(-1.91)</td>
<td>(-1.34)</td>
<td>(-0.63)</td>
<td>(-1.34)</td>
<td>(-0.63)</td>
<td>(-1.34)</td>
<td>(-0.63)</td>
</tr>
<tr>
<td>β</td>
<td>-1.592***</td>
<td>-2.336***</td>
<td>4.515*</td>
<td>-1.782</td>
<td>-4.639***</td>
<td>-5.189***</td>
<td>-3.862*</td>
<td>-4.619*</td>
</tr>
<tr>
<td></td>
<td>(-32.43)</td>
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<td>(2.16)</td>
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<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
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<tr>
<td>N</td>
<td>5747.000</td>
<td>5157.000</td>
<td>5747.000</td>
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<td>ll</td>
<td>-7968.774</td>
<td>-4973.652</td>
<td>-7355.571</td>
<td>-4167.407</td>
<td>-5200.000</td>
<td>-5200.000</td>
<td>-5200.000</td>
<td>-5200.000</td>
</tr>
<tr>
<td>R²</td>
<td>0.008</td>
<td>0.003</td>
<td>0.063</td>
<td>0.063</td>
<td>0.063</td>
<td>0.063</td>
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<td>0.063</td>
</tr>
</tbody>
</table>

Notes: *p<0.05; **p<0.01; ***p<0.001, standard errors are clustered at the level of the grid-cell. Z (probit) and T (OLS) values in parentheses.

Stronger than their counterparts in Table 1, with no first-stage. This is the expected pattern if there was a negative endogeneity bias, which happens if governments provide less education to protest-prone areas. IV-diagnostics show that each model needs a first stage, since education shows signs of endogeneity (all Wu-Hausmann p-values are below .05). Furthermore, the instrument is clearly relevant, with F-values well above scores usually considered critical (never dropping below $F = 50$) (see e.g., Stock and Yogo, 2005).

While the IV models buy us some added internal validity, this comes at the price of a loss in generalizability. This is because the treatment effects estimated are local average treatment effects (LATEs) that are less generalizable than the associations estimated in the OLS models. Crucially, the LATEs we estimate describe the effect of education on protest in areas where education levels are predicted by the presence of mission stations. In spite of this caveat, these results warrant greater confidence in claiming that education has a causal effect on increasing protest incidence.

5.2 Exploring mechanisms and robustness

We go on to probe the specific mechanisms proposed above, starting with the two branches of the motivational mechanism; ideological and economic grievances. First, we test whether education has a stronger effect in dictatorships and especially on protests that are anti-government. To do this, we first circumscribe our dependent variable to anti-government protests. Then we introduce an
interaction term to our baseline models, between education and (country-level) democracy, using the POLITY IV index (Marshall, Gurr and Jaggers, 2013). Second, we investigate whether the effect of education is particularly salient where the educated have fewer economic opportunities, to capture the economic branch of the motivation mechanism. To model this, we create an individual-level multiplicative term between education (0-3) and unemployment (1=unemployed, 0 otherwise). We then aggregate this to the grid-cell and enter it into our baseline, along with each constitutive term. If the economic-grievances aspect of the motivational mechanism is operating, we would expect to see more protest in areas with high scores on this variable.

Investigating the opportunity channel in a straightforward way is much harder than assessing the motivational mechanism. Rather than identifying some clear-cut quantitative test, we find the most persuasive evidence for this mechanism in the wealth of examples of this mechanism discussed in section 3.3. Nevertheless, we propose what is arguably an indicative test that opportunities matter, holding motivations constant. We do this by circumscribing our dependent variable to exclude all protests that are aimed at (any) level of government. We believe this partly probes the opportunity-channel by showing that education increases all kinds of protest holding the level of anti-government grievances constant. If this is the case, then education increases protest through affecting more than just anti-government grievances, and plausibly the opportunities for mass protest. While this is a less direct test than the ones for motivations, it provides at least suggestive evidence consistent with opportunities. To separate anti- from non-government protests, we use the SCAD variables
registering whether the government (central or regional) was the target of the given protest event.

Table 3: Models Exploring Mechanisms

<table>
<thead>
<tr>
<th></th>
<th>(3.1)</th>
<th>(3.2)</th>
<th>(3.3)</th>
<th>(3.4)</th>
<th>(3.5)</th>
<th>(3.6)</th>
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<tr>
<td></td>
<td>(Anti-gov.)</td>
<td>(Anti-gov.)</td>
<td>(Anti-gov.)</td>
<td>(Anti-gov.)</td>
<td>(Non-gov.)</td>
<td>(Non-gov.)</td>
</tr>
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<td></td>
<td>(Probit)</td>
<td>(OLS)</td>
<td>(Probit)</td>
<td>(OLS)</td>
<td>(Probit)</td>
<td>(OLS)</td>
</tr>
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<td>(3.81)</td>
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<td>-0.026***</td>
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</tr>
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<td></td>
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<td>Education-Unemployment</td>
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<td>-0.098</td>
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<td></td>
<td>(-2.14)</td>
<td>(-1.44)</td>
<td></td>
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<tr>
<td>Unemployment</td>
<td>-0.248</td>
<td>-0.037</td>
<td>0.403</td>
<td>0.091</td>
<td>0.342</td>
<td>0.040</td>
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<tr>
<td></td>
<td>(-0.95)</td>
<td>(-0.63)</td>
<td>(1.37)</td>
<td>(1.52)</td>
<td>(1.42)</td>
<td>(0.94)</td>
</tr>
<tr>
<td>Protest_{t-1}</td>
<td>0.587****</td>
<td>0.627****</td>
<td>0.589****</td>
<td>0.655****</td>
<td>0.329***</td>
<td>0.330***</td>
</tr>
<tr>
<td></td>
<td>(5.23)</td>
<td>(4.29)</td>
<td>(5.55)</td>
<td>(4.52)</td>
<td>(2.81)</td>
<td>(2.92)</td>
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<tr>
<td>Age</td>
<td>0.746*</td>
<td>0.027</td>
<td>0.698</td>
<td>0.003</td>
<td>-0.042</td>
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<td>(1.74)</td>
<td>(0.58)</td>
<td>(1.59)</td>
<td>(0.07)</td>
<td>(-0.10)</td>
<td>(-0.21)</td>
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<tr>
<td>Age^2</td>
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<td>-0.001</td>
<td>-0.013*</td>
<td>-0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
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<td>(-1.86)</td>
<td>(-0.77)</td>
<td>(-1.72)</td>
<td>(-0.28)</td>
<td>(0.02)</td>
<td>(0.16)</td>
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<tr>
<td>Urban</td>
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<td>0.227****</td>
<td>0.574****</td>
<td>0.249****</td>
<td>0.383***</td>
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<td>(4.42)</td>
<td>(4.48)</td>
<td>(4.43)</td>
<td>(4.82)</td>
<td>(2.92)</td>
<td>(1.85)</td>
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<tr>
<td>L(capital distance)</td>
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<td>-0.062**</td>
<td>-0.126**</td>
<td>-0.071***</td>
<td>-0.236***</td>
<td>-0.056**</td>
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<td>(-2.78)</td>
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<tr>
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<td>-0.000*</td>
<td>-0.001***</td>
<td>-0.001**</td>
<td>-0.001**</td>
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<td>(-2.29)</td>
<td>(-1.80)</td>
<td>(-2.94)</td>
<td>(-2.45)</td>
<td>(-2.30)</td>
<td>(-1.36)</td>
</tr>
<tr>
<td>β</td>
<td>-11.582*</td>
<td>-4.589****</td>
<td>-10.608*</td>
<td>-3.909****</td>
<td>2.783</td>
<td>-4.034***</td>
</tr>
<tr>
<td></td>
<td>(-1.89)</td>
<td>(-6.15)</td>
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<tr>
<td>Year-FE</td>
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<tr>
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<td>5547</td>
<td>5668</td>
<td>5905</td>
<td>5223</td>
<td>5905</td>
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</table>

Notes: *p<0.05; **p<0.01; ***p<0.001, standard errors are clustered at the level of the grid-cell. Z (probit) and T (OLS) values in parentheses.

Table 3 shows the results of this exercise. Models 3.1-3.4 shows our baseline (Probit and OLS) models estimated on anti-government protests rather than all protests. Models 3.1-3.2 investigates whether the education-protest link is stronger in non-democracies, which is implied by the ideological component of the motivational channel. This indeed seems to be the case, as the interaction term is significant and negative in both models (3.1 and 3.2). Models 3.3 and 3.4 consider the education-unemployment interaction. These models indicate patterns that go against the “unmet-expectations” hypothesis. The probit model (3.3) displays a negative interaction term and weakly significant, while the OLS models yield a similar sign but with low T-values. We believe this combination of results provides some, although no more than suggestive, support for education leading to protest through affecting preferences for political institutions rather than economic aspirations.

Finally, models 3.5-3.6 evaluate whether education also affects protest aimed at some other entity than (local or national) government. Here, we find a slightly weaker coefficient for education for this outcome, although it is both positively signed and precisely estimated in both models. This suggests that education induces protest by affecting more than just anti-government grievances, and plausibly that it enhances protest opportunities.
Our key results – both the democracy-interactions and our unconditional result – are retained across a wide variety of specification changes. Most are detailed in the appendix, but we will highlight a few here.

First, we conduct tests introducing a number of additional controls, that plausibly represent both pre-treatment confounders, but also potential threats to the exclusion restriction. For instance, we investigate coefficient stability across a number of controls representing alternative ways to measure economic development, such as infant mortality and local estimated GDP (from PRIO-GRID). We also include a measure of light-emission density at night as measured by satellites, taken from PRIO-GRID, to proxy for local development (Weidmann and Schutte, 2016).

Second, we control for factors that were affected by the presence of Christian missions and could affect protest. This includes a control for media consumption, using a simple additive index registering the share of respondents in a grid cell that consume e.g., TV, radio, and newspapers. This is because missions affected the propagation of early print media (Cagé and Rueda, 2016). We control for literacy in the grid-cell, since missions (and their printing presses) spread literacy, and this could affect societal propensities for social upheaval (Pinker, 2011).

Third, we control for a number of additional proxies for urban development, since urbanization is a particularly salient alternative explanation that could account for our results. We also control for different types of geographic land cover (from PRIO-GRID) – such as mountains, forest and agricultural land, since these could represent omitted variables and potential threats to the exclusion restriction; due to non-random geographic placement of mission. Additionally, we also present tests probing causal heterogeneity, such as seeing if we get similar results when we split the sample into Francophone vs. non-Francophone countries, yielding no qualitative change in the results.

These tests, and several others, show that education is robustly linked to protest incidence.

6 Conclusion

The spread of education is one of the most consequential social developments in the modern era. Yet, the effects of education on regime-challenging protest have been curiously missing from the literatures on the political effects of education and on political instability in more generally. We add to the discussion surrounding this topic by presenting a geographically focused, but still cautiously generalizable, study of this link. In a sample of over 6000 grid-cells spread across 42 African countries in the period 1991-2012, we find that local education levels are positively associated with protest events. This result holds across a wide range of specifications, and also remains when we endoge- nize education using historical missionary settlement locations in colonial Africa to instrument for contemporary local education levels.

We outline two channels that can account for a link between education and protest. A motivational channel, where education induces protest-motivations through changing ideological preferences
for democracy and economic aspirations, and an opportunity channel, where education increases the capacity for collective action. While the empirical analysis mainly focuses on the unconditional education-protest link, results from additional tests and case-examples yield some suggestive evidence on each of these mechanisms. First, we find that education is particularly conducive to anti-government protest in autocracies, and that education combined with high unemployment does not generate protest. This suggests that education increases motivations for protest primarily through making populations increasingly critical of political institutions. In addition to highlighting several case-examples consistent with an opportunity mechanism, we also find that education also impacts on protests not aimed at governments, suggesting that education increases protest incidence through enhancing protest-opportunities.

Our overall interpretation of these results is that education increases both the capacity and motivations for regime-challenging collective action, and that these forces are particularly strong in authoritarian settings. This study thus sheds systematic light on the conventional wisdom that education in dictatorships can generate uprisings among the young, educated and disaffected.

Our study makes several novel contributions to the existing literature. Ours is the first study to use disaggregated event data to look at the link between education and protest. Second, we present a novel way of instrumenting for education in the context of regime-challenging collective action. Finally, ours is the first study to investigate the link put forward in Glaeser, Ponzetto and Shleifer (2007), where education is claimed to lead to democratization through stimulating mass uprisings. We show that in our sample of African localities, education does indeed have this effect.

This corresponds with prominent narratives from African political history. For example, in Zimbabwe, students from higher education institutions have been one of the most vocal groups in opposing the Zanu-PF regime (see, e.g., Zeilig, 2008). In South Africa, students and the educated were vital in the anti-apartheid movement, and similar examples proliferate (Nkinyangi, 1991; Meredith, 2006). These examples, combined with the systematic evidence uncovered above, provide a somewhat cautionary tale for governments wanting to expand education while not improving other governance outcomes and institutions that citizens care about. For example, our results suggest that if African autocrats continue to expand education to their populations, they might find themselves more frequently challenged by riots and protests than they would like.
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