

Working Paper No. 175

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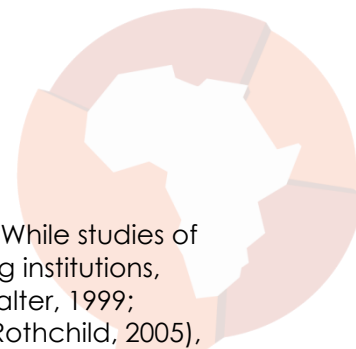
**Shelley Liu** is a PhD student in the Department of Government at Harvard University. Email: [shelleyxliu@g.harvard.edu](mailto:shelleyxliu@g.harvard.edu).

## Abstract

How does civil war affect society and citizen interaction with politics? Civilians who live through warfare face numerous challenges that can have permanent effects on society even after peace is achieved. This project uses the Liberian civil wars as a case study to examine the impact of war through one channel – disruptions in education for an entire generation of children. The paper shows that negative effects of war on education and economic outcomes clash with citizen expectations for post-war democracy, leading to negative consequences for the democratization process. Specifically, educational deficiencies in this particular generation of young adults decrease job prospects, breeding resentment against the promises of democracy. This extends to the political sphere, such that those who lost out on educational opportunities due to war exhibit lower engagement, less desire to engage with democratic processes, and a greater rejection of democracy altogether.

## Acknowledgements

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## 1. Introduction

How does civil war affect society and citizen interaction with politics? While studies of political violence and post-war reconstruction focus largely on building institutions, reconciliation between warring groups, and societal rehabilitation (Walter, 1999; Wantchekon & Neeman, 2002; Joshi, 2010; Manning, 2002; Roeder & Rothchild, 2005), civilians who live through warfare face numerous other challenges to everyday life that can have permanent effects on society even after peace is achieved. This paper uses the Liberian civil wars as a case study to examine one adverse consequence of civil war – disruption in schooling – and its downstream consequences on political attitudes and participation. The conflict, which took place over a span of 14 years from the end of 1989 until mid-1996 and then again from 1999 to mid-2003, remains one of the world's most destructive and predatory civil wars. The long-lasting legacy of war continues to take its toll on citizens today, emphasizing the importance of identifying such effects.

Recent literature has presented increasingly positive aspects of war on state-building and democratization. A particular strand of this literature focuses on the ways in which shared victimization by civil war or crime has led to pro-social outcomes with respect to political participation, civic engagement, and community support. Bellows and Miguel (2009) and De Luca and Verpoorten (2015), for example, find in Sierra Leone and Uganda that victimization during war led to an increase in participatory behaviours such as voting, attending community meetings, and joining local committees and groups. Gilligan, Pasquale, and Samii (2014) confirm these findings in Nepal and further identify two causal mechanisms for these results: selection effects that arise when war disproportionately causes previously-isolated individuals to flee, as well as collective coping by those who remain in conflict zones. Studies in other localities, focusing more specifically on ex-combatants and conscripted child soldiers, find similar positive results arising from wartime trauma (Annan, Blattman, Mazurana, & Carlson, 2011; Blattman, 2009; Bauer et al., 2016). In a cross-national study using survey data from Latin America, Europe, Asia, Africa, and North America, Bateson (2012) and Rojo-Mendoza (2014) observe the same effect from crime victimization as well, suggesting that such empowering behaviour arises not just from war trauma, but from general forms of victimization.

However, while fighting undeniably forges social capital from shared experiences and creates new support networks by which citizens can navigate the political system, conflict's numerous adverse consequences for the lives of victims can outweigh pro-social behaviour that arises from conflict. Recent studies find that conflict has enduring negative effects for different groups of citizens: Grossman, Manekin, and Miodownik (2015), for example, show that soldiers in the Israeli Defense Force who have seen combat have significantly more negative attitudes toward negotiation with the opposing side – suggesting that conflict further intensifies divisive attitudes and decreases likelihood of post-war reconciliation. This effect of war is extended not only beyond ex-combatants, but also to subsequent generations: Lupu and Peisakhin (2017) show that among Crimean Tatar families who were deported in 1944, in-group attachment persists across several generations as a result of information and attitude transmission to subsequent generations. Similarly, Cassar, Grosjean, and Whitt (2011) show lowered social cooperation and trust within communities after the civil war in Tajikistan, while Rohner, Thoening, and Zilibotti (2013) show that war decreases trust and trade (and vice versa). Finally, García-Ponce (2016) shows divergent effects of conflict on female participation depending on whether sexual violence was committed during war, emphasizing the importance of considering the ways in which perpetration of violence can differentially affect post-war outcomes.

In this paper, I build a theory of wartime education loss using qualitative interviews with ex-combatants, civilians, and political figures in Liberia. The speed at which the main rebel group, the National Patriotic Front of Liberia (NPFL), took over the entire country and the

profound effect the war had on the entire population make Liberia an important case with which to study the downstream effects of war. Further, the poor state of Liberia's education system prior to war, as well as its neo-patrimonial legacy, allow me to examine the impact of educational loss as a result of war, rather than simply poor education in general, on social, political, and economic outcomes. The subject remains of contemporary significance as the country grapples with both the reintegration of the "lost generation" – young adults who were child soldiers during the civil war (Global Times, 2014; Al Jazeera, 2017; Blattman, Jamison, & Sheridan, 2017) – as well as the issue of rebuilding education, human capital, and jobs provision for a youth population that is turning to petty crime to make ends meet.

I argue that the economic consequences of war as identified by previous scholarship clash with the expectations that citizens have for post-war democracy, leading to strong direct consequences for the democratization process. Specifically, the loss of educational opportunities as a result of war leads to poor economic outcomes during the post-war period due to a lack of skills among those who were of primary-school age at war onset. This differentially affects those from more affluent families – people whose families may have received education and who expected to attend school but were denied this opportunity as a result of conflict and instability. Yet the post-war democratization process is often accompanied by promises and expectations of development, jobs, and improved living standards – promises that are especially difficult to deliver for the unskilled labor force. Particularly in cases where a civilian might have already been attending school or was expected to attend school after reaching school age, the inability to achieve economic security given wartime sacrifices breeds discontent and resentment against the democratically elected government. Thus, a drop in education due to civil war leads to disengagement from the political system and a loss of faith in democracy due to cynicism.

The paper makes two substantive contributions to existing literature. First, I show that war's negative consequences, through the destruction of human capital, can lead to political outcomes that complicate the democratization process. While a growing body of work on civil war has looked at the negative impacts of war on human capital, these studies often stop at establishing this relationship (Angrist, 1990; Chamarbagwala & Morán, 2011; Leon, 2012; Eder, 2014). A subset of these has further traced the economic or health impacts of decreased human capital (Verwimp & Van Bavel, 2014; Justino, 2011); however, none to my knowledge has examined the downstream political impacts and the reasons for why lowered educational attainment as a result of conflict might lead to negative political outcomes.

Second, the paper contextualizes the effects of education on political participation by arguing that a drop in educational attainment due to war has adverse consequences for political participation after the war, but that these consequences do not necessarily follow conventional wisdom about the positive effects of increased education on political participation (Lipset, 1960; Deutsch, 1961; Skocpol, 1997; Almond & Verba, 2015). Instead, I add to current education research (Croke, Grossman, Larreguy, & Marshall, 2016; Larreguy & Marshall, forthcoming) and argue that the manner by which education levels are changed, along with the population affected by educational changes, matter: Because civil war most affects the educated populace by taking away previously-available opportunities for education, decreased educational attainment more closely follows theories of relative deprivation and unrealized potential. This paper thus aims to show that there is a difference between a loss of education as a result of war onset and a lack of education in an underdeveloped region.

Combining the 2008 Liberian census and three rounds of Afrobarometer data, I employ a difference-in-differences design to compare the effects of war on education in areas that previously had high primary-school enrollment to areas that already received little formal schooling prior to war. Results show that children who were born between 1979 and 1989, and were therefore of primary-school age during the Liberian civil wars, are differentially less likely to have any formal schooling by the end of war. This effect is compounded by civil-war

intensity, rebel recruitment, and displacement during war. I further show that education deficiencies in this particular generation of young adults extends to the political sphere, such that those who lost out on educational opportunities due to war exhibit lower political engagement, less desire to engage with democratic institutions, and a greater rejection of democracy altogether. Placebo checks using society-wide outcomes previously identified in the literature, such as positive effects on community engagement and trust in fellow citizens, provide additional assurance that the effects identified by the difference-in-differences strategy are indeed cohort effects induced by loss of education.

The paper proceeds as follows: First, I provide a brief background about the Liberian civil war with respect to education in addition to qualitative accounts of civilian experiences with schooling. Next, I use interviews with ex-combatants, civilians, and political officials in Liberia to expand on the theory of wartime educational loss, and lay out two hypotheses that arise from the theory. The third section details the data and identification strategy I use to identify the effects of war on political attitudes through the channel of education loss. The fourth section provides results and an interpretation of these results in relation to the theory. The fifth section concludes.

## 2. Background

The Liberian conflict, which took place in 1989-1996 and again in 1999-2003, remains one of the most destructive and predatory wars in sub-Saharan Africa. The country was submerged in war quickly, as the Samuel Doe government collapsed and the main rebel group, the National Patriotic Front of Liberia (NPFL) led by Charles Taylor, was able to take control of almost the entire country by the end of 1990. New rebel groups (altogether seven major factions) entered the war, and inter-group fighting and casualties reached their peak in 1992 and 1994. Peace in mid-1996 and Taylor's presidency in 1997 were short-lived as rival factions resumed cross-border attacks in 1998. The conflict reached civil-war levels in 1999 and continued until August 2003, when all sides signed the Comprehensive Peace Agreement at Accra.

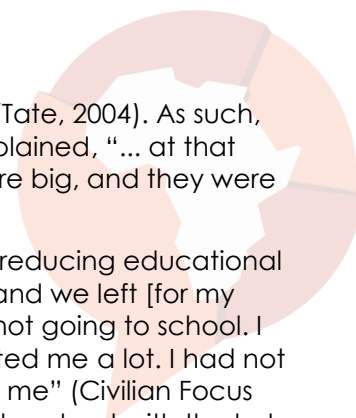
Even before the onset of civil war, the education system in Liberia had been severely lacking. In the formal education system (unchanged to this day), children entered primary school at age 6 to complete grades 1-6 before moving on to secondary school for grades 7-12 and then to higher-education programs or specialized training. Despite a longstanding law mandating education for all children, however, school enrollment levels were low while attrition rates were high in comparison to neighbouring countries. According to 1984 census figures cited in the 1986 Demographic and Health Survey Final Report, primary-school enrollment was about 46% overall (57% among boys, 34% among girls). Literacy rates for all citizens over 10 years old were around 34% for males and 17% of females (Chieh-Johnson, Cross, Way, & Sullivan, 1988). Moreover, formal school attendance was skewed in favour of urban areas, whereas many children in rural areas were either prevented from going to school for traditional reasons or were educated in informal school settings.

While the education system was poor, it was slowly expanding under President William Tubman's administration following World War II (Streissguth, 2006). When the war began, however, the violence and destruction led to a great setback in educational attainment in the country. Especially among civilians who had been living in the capital, Monrovia, during their childhood, school attendance was frequently identified during qualitative interviews as having been disrupted by warfare and displacement.<sup>1</sup> Amidst the fighting, many schools were bombed while others were seized by rebels to use as barracks or as shields against attacks. Some students and teachers were shot and killed at school (Dahn, 2008), while

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<sup>1</sup> Qualitative work was done between June and August 2016 as part of a broader project on post-war state governance. Altogether, I conducted six civilian focus groups totaling 32 people, as well as interviews with 43 ex-combatants and five government or party officials.





others were taken off as child soldiers during school recruitment raids (Tate, 2004). As such, schools were often closed when fighting intensified; as one civilian explained, "... at that time, there was no school. School was not in session. Boys and girls were big, and they were not in school because of war..." (Civilian Focus Group 3).

Beyond fighting and destruction, displacement played a large role in reducing educational attainment. One civilian recalled, "From when the war came in 1990 and we left [for my mother's hometown] until 1992 when we returned to Monrovia, I was not going to school. I was in the third grade, to be promoted to the fourth grade. ... It affected me a lot. I had not seen myself writing ... for many months and years, so it highly affected me" (Civilian Focus Group 2). Another recounted the number of times they tried to return to school with the help of nongovernmental organizations, which would provide school supplies, only to leave school once again when conflict intensity increased (Civilian Focus Group 2). When the first war ended in 1996, children who tried to return to school had difficulties doing so. As one civilian explained, prior to the war, his parents had jobs and were able to provide pencils, copybooks, school uniforms, and other supplies for school. After the war, this was no longer the case: His family suffered hardship due to a lack of employment and could no longer afford schooling. While some students were able to get donated supplies from UNICEF, others were forced to drop out to sell items along the streets in order to help their families (Civilian Focus Group 5). As violence returned, the situation became worse. Human Rights Watch reported, "Many children who fought with [Taylor's forces] from 2000 to 2003 were picked up in round-ups on the streets, traveling to and from schools and at their homes. ..." This depressed school attendance even further, as parents took their children out of school "in part due to lack of money to pay school fees," but also out of fear that "children would be picked up on their way to and from school" (Tate, 2004, p. 14).

Even after the second war ended in 2003 and the country started transitioning toward democratic governance in 2005, progress toward education was slow. For child soldiers, a small but significant portion of the population, the demobilization process was ill-equipped to cope with educational needs. Official statistics from the Disarmament, Demobilization, Rehabilitation, and Reintegration (DDRR) program show that 37% of adult ex-combatants – including those who were child soldiers during the first war but were now over age 18 – chose to return to school, while 75% of the children chose formal education. However, services fell short of promises as programs were underfunded and ex-combatants experienced a "long wait between disarmament and entrance into a job training or education program" (Human Rights Watch, 2005). Educational needs were similarly urgent for children who had not taken part in war: Despite international aid and schooling initiatives, 65% of primary-school-aged children in Liberia were not in school in 2007, while 58% of those between the ages of 15 and 24 had not completed primary school. The primary-school net enrollment rate in 2010 – accounting only for those who were of primary-school age – was only 41%, and only 65% of those who entered primary school completed their primary education. Yet the gross enrollment rate was 102%, reflecting the high percentage of over-age children who were still trying to attain a primary education (Education Policy Data Center, 2014).

Today, Liberia's education system remains feeble, its infrastructure broken and curriculum lacking. As noted in a 2011 UNICEF report, "... ask any Liberian what they need most and the answer is the same – education" (UNICEF, 2011). While the country has made strides toward mandating primary-school education and providing free public education for primary and secondary school children, the quality of education and instructor training at public schools is low. Overall enrollment rates still mask the ongoing education crisis. For example, literacy is not built into education goals (Ministry of Education, Liberia, 2015), and poor literacy rates underscore the low standards of education in the country. The Minister of Education reported that "among adult women who reached fifth grade in Liberia, less than 20% can read a single sentence" (Werner, 2017), while teachers, who go unpaid for months, do not go to work and are often involved in strikes, bribery, and child sexual assault (AllAfrica, 2014; Global Nonviolent Action Database, 2012-2014; New Dawn Liberia, 2015). More recently, in 2016, the



Liberian government announced the privatization of schooling to eight companies as a way to combat these problems and to give children “an education that gives them real chances and choices in life” (Werner, 2017).

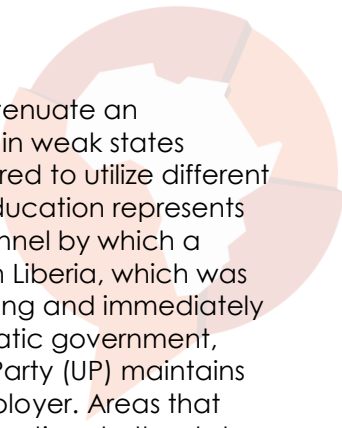
### 3. Theory and hypotheses

According to the classic theories on relative deprivation (Davies, 1962), those who are most likely to participate in protest or rebellion are not necessarily the repressed population, because people who know only repression, and thus do not expect improvements to life quality, are unlikely to demand political change. Instead, protests for change require acute awareness of repression and frustration over curtailed prospects through comparisons with their peers. Thus, those who live among, or work closely with, people who are better off are more likely to realize political inequalities and grow to resent repression and develop grievances against the political system. In the case of Davies' classical argument, deprivation is felt through the J-curve – an increase and then a sudden and steep decline in quality of living through an economic downturn (Davies, 1962). Subsequent research on political grievances has provided strong evidence for the relative deprivation theory when a repressed population becomes more educated (Bates, 1983; Kelly & Breinlinger, 1995) or if they live in ethnically or economically heterogeneous areas (Canache, 1996). Recent work on civil wars and political violence has similarly emphasized grievances arising from relative rather than absolute deprivation (Agbiboa, 2013; Samii & West, 2015).

In the case of Liberia and other conflict zones, effects of conflict-related education loss on political participation and beliefs in democratic institutions should closely follow theories of relative deprivation. While research on the links between democracy and education tend to focus on positive increases in education and emphasize causal pathways through civic-mindedness or socialization (Glaeser, Ponzetto, & Shleifer, 2007), education loss as a result of conflict and violence presents challenges for civilians that undoubtedly lead to a different set of political outcomes. In particular, when a state is taken over by war, adverse effects to education are primarily clustered around areas that previously had relatively higher access to education; areas that had little to no education prior to war – agricultural or rural areas – face fewer educational consequences from war onset. Instead, it is in places where children are expected to attend school and have older siblings, friends, or parents who attended school that the effects of war on educational attainment are most greatly felt.

Children who expected to attend school or were attending school when the war began found themselves navigating tense security situations in which even basic primary education became an unaffordable luxury rather than a normal civilian activity. During focus group conversations with civilians who lived through the war, frustrations over schooling opportunities was an unprompted but frequently discussed topic. The situation was acutely felt by those who were already of school age and were forced to drop out of school to avoid the security risks of attending school or due to forced displacement during periods of intensified conflict. When asked to recount their experiences during the conflict, several civilians recalled schools closing due to risks of conflict, or being taken out of school for months or years at a time to avoid the security risks of leaving their homes. Schooling, which had once been a “liberty” for those who lived in well-educated areas, became an uncertainty. As one interviewee noted, “... the means of going to school – those liberties were all ceased” (Civilian Focus Group 3).

Lack of schooling for primary-school-aged children has two direct economic consequences in the post-war period, both of which decrease their expected quality of life in comparison to older siblings or parents who received the expected amount of education. First, education loss as a child results in a decrease in marketable skills, which similarly decreases job prospects and earning potential as an adult. This is certainly not limited to conflict-related losses in education: Educational attainment is strongly linked with economic performance and standard of living in any context (Croke et al., 2016; Deutsch, 1961; Larreguy & Marshall, forthcoming; Lipset, 1960), and the post-war context should also show differential outcomes



for economic performance. Second, missed schooling opportunities attenuate an individual's social network. It is common to find neopatrimonial systems in weak states characterized by conflictual social divisions, where individuals are required to utilize different networks to navigate the political landscape. In such cases, a loss of education represents not just a decrease in skills, but also a loss of one potential network channel by which a citizen can access resources from the state. This is especially the case in Liberia, which was governed by neopatrimonialism even before the war and certainly during and immediately after the first civil war. Though the country today is run under a democratic government, evidence of patronage politics is widely observable as the ruling Unity Party (UP) maintains tight control over state resources and remains the country's largest employer. Areas that were highly educated prior to the war were likely to have greater connections to the state, and a disruption in school attendance could have severed such network ties.

While it is not possible to disentangle these two channels by which education affects job prospects, they both manifest themselves in decreased economic outcomes. I thus test the following:

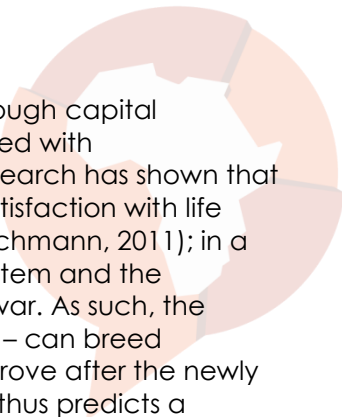
**Hypothesis 1:** *Poor educational attainment among those who were of school age at war onset decreases economic outcomes, such as employment and access to basic goods and necessary services.*

Alongside depressed earning potential, the post-war context often hastens democratization efforts through elections, which tout democracy and voting as a panacea for societal problems. Immediately following the end of war, democratic governance and power sharing are often considered by the international community as being the best ways to prevent the resumption of war. Capital and manpower are spent to hold elections and establish democracy, an expensive endeavor. Post-war democratization brings promises of a better life for citizens, but the newly elected government is likely to under-deliver, especially with respect to unskilled citizens who are seeking employment. Post-war elections in non-consolidated democratic states often feature a large number of candidates (including former rebel elites) who make empty campaign promises about job provision and development, which cannot be fulfilled once the winning candidate takes office. As one political party official noted about campaign promises, "The campaign process is different. When you campaign, you have to say things. ... The campaign environment is politically charged. The post-campaign environment is not" (party official interview).

This is not lost on the civilian population and breeds cynicism as the least skilled members of society lose faith in the political system: "Under this regime, we see, yes, that we are in peace. But in the sense that the peace is here, but we are going through crisis in our various areas of life. No jobs. A lot of youths are out of jobs, a lot of youths are out of school because of the economic constraints" (Civilian Focus Group 2). Yet reform for unskilled workers is difficult to achieve, even with joint efforts between the government and the international community: "Do you know how challenging it is? ... There are thousands of Liberians here saying, 'There's no jobs!' And I say, 'Well, what can you do?' And then his response is, 'Anything.' Hm. Have you ever read a vacancy for 'anything'?" (party official interview).

Thus the democratic process and the newly elected government bring disappointment to a populace that has suffered and sacrificed during war. Resource constraints prevent the establishment of welfare systems for the poor, while jobs for unskilled workers tend to be only temporary if they are available at all, rather than salaried positions. In comparison to older peers who acquired at least a basic education, those who were of primary-school age when the war began were unable to attain such skills. Returning to school after the war is unlikely for an individual who is already an adult. Instead, citizens choose to enter vocational training – if they have the means of paying for the materials and courses – or become unskilled members of Liberia's unemployed or temporary workforce. While the government has begun to enact laws mandating minimum wages for unskilled laborers (AllAfrica, 2015), and many





workers choose to start their own businesses when they have saved enough capital (Andrews et al., 2011; Richiardi, 2015), the economic insecurity associated with underemployment or informal employment is a perpetual problem. Research has shown that unemployment, and even past unemployment, can contribute to dissatisfaction with life (Clark, Georgellis, & Sanfey, 2001; Knabe & Rätzl, 2011; Reichert & Tauchmann, 2011); in a post-conflict setting, this discontent may be targeted at the political system and the politicians in power who are unable to fix the problems brought on by war. As such, the negative consequences of war for civilians – education loss in this case – can breed bitterness against the political system when living conditions do not improve after the newly elected government has taken over and peace is restored. This theory thus predicts a second hypothesis:

**Hypothesis 2:** *A drop in education levels leads to dissatisfaction with democracy due to poor quality of life, which further results in disengagement from the democratic process.*

This argument thus diverges from traditional relative deprivation theory in predicting that citizens in a post-war democratic environment are more likely to disengage from the political process but are not necessarily more likely to turn again to violence. Unlike in clear cases of repressive regimes, or in the case of civil wars that end while warring groups are still active and participating in government and politics, citizens in nascent post-war democracies do not face obvious repression from a specific group in power. Rather, they view their current plight as stemming from government incompetence and lack of accountability: In Liberia, many citizens lament the futility of electing government officials who have promised to rebuild the country's infrastructure and economy but instead let down their constituents after coming to power. The post-war context also brings a reluctance to return to conflict, as citizens blame their current misfortunes on wartime destruction. This viewpoint is pervasive in Liberia, where interviewed ex-combatants and civilians alike overwhelmingly emphasized the need to sustain peace even as they expressed frustration with the current government. Qualitative work suggests that these two factors – lack of targeted repression and a war-weary attitude – go far in explaining a lack of desire to rebel again.

Thus, rather than fomenting rebellion against a repressive regime, people instead disengage from a political process that does little to help them rebuild their lives after war. As noted in the underlying logic put forth by Glaeser, Ponzetto, and Shleifer (2007), democracy and political participation can only be sustained if there is a broad enough base of citizens who benefit from democracy and are willing to defend it against anti-democratic elements. In the case of war-torn countries pushed into democratization, such as Liberia, there is little incentive for citizens to do so, because their problems are unlikely to be solved through elections alone; on the other hand, there is little faith that alternative political regimes, such as military or authoritarian rule, would bring prosperity to the country either.

#### 4. Data and identification strategy

Analyses focus on two substantive findings. First, the paper causally identifies the effects of civil-war onset, as well as the intensity of war and displacement, on educational attainment among those who were children during the war. Specifically, analyses focus on primary-school attendance and completion, since primary-school education was the median level of schooling in the country prior to the war. Having shown strong effects of war on education, in the second section I use the estimation strategy from the first step as a proxy for lower education, which I then use to show a correlation with economic and political outcomes.

Liberia's 2008 census identifies 15 counties, 136 administrative districts,<sup>2</sup> and 12,833 unique localities. The first set of analyses primarily takes advantage of the full census data at the locality level,<sup>3</sup> while the second set of analyses uses Afrobarometer survey data from rounds 4-6 at the district level. For all main regressions, the sample is trimmed to those born between 1975 and 1989 to minimize confounding effects. Those born from 1975 onward are less likely to have suffered educational consequences from the 1980 coup by Samuel Doe and would have all been educated under Doe's regime from 1981 (6 years old) onward. Similarly, those born after 1989 might arguably have been affected by confounding factors related to being born during the civil war, and thus are omitted from the sample. Descriptive statistics for all variables used from census data and from Afrobarometer rounds 4-6 are available in Appendix tables A.1 and A.2.

## 4.1 Main effects

### 4.1.1 Effects of war on education

In the first set of analyses, the paper utilizes a difference-in-differences (DiD) identification strategy to demonstrate the negative effects of war onset on education. Since I argue that education loss from war primarily affects the educated areas of the country, the DiD design is particularly useful at differentiating between the control group – in this case, those who would have received little to no education regardless of war – and those who were relatively well-educated prior to the war and thus had more to lose from war onset.

Children attend primary school in Liberia between the ages of 6 and 11, so the post-treatment variable *post* is defined as those who were 11 years old or younger by the start of the war.<sup>4</sup> *Post* is allowed to vary according to incrementally increasing partial treatment, such that those who were 11 years old receive a lower treatment value of 1/6, while those who were ages 6 or younger receive a full treatment value of 1. Since students who were in the middle of attending primary school during war onset would presumably have had more education than those who were just starting or would have soon started primary school, this method of coding *post* allows more detailed identification.<sup>5</sup>

I construct the exogenous treatment variable for the first-stage DiD regression using the average education level of those who were of primary-school age in the five cohorts just before the start of the war in 1990 (ages 12-17) within each Liberian locality, and thus should have completed primary school before the war. Their primary schooling was therefore theoretically not affected by war onset. This allows me to isolate the war's effects on educational attainment of affected age cohorts, net of other confounding factors. Treatment is defined as a continuous treatment intensity, where intensity is higher for those who are highly educated. Data for this variable are taken from the full 2008 Liberian census, which provides the age and education level of each individual living within each of the more than 12,000 Liberian localities. Since the civil war resulted in population displacement, which might disproportionately affect areas with differing levels of fighting intensity, I create the treatment intensity variable using only the information of those who reported on the census that they lived in the particular locality prior to war onset. Thus, treatment is:

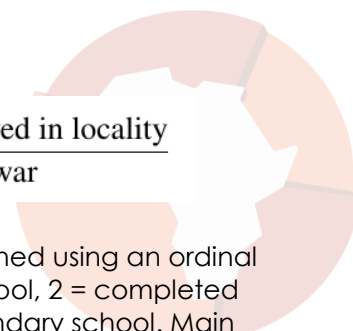
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<sup>2</sup> This is different from the 90 electoral districts.

<sup>3</sup> It is important to note that, as the country's first census in 24 years, the 2008 census likely suffers from data-quality issues related to training and funding. However, it remains the most comprehensive available data set on the Liberian population.

<sup>4</sup> The war began on December 24, 1989; I consider war onset to be 1990 since the initial attack took place at the very end of 1989 and the violence did not spread to other areas of the country until 1990.

<sup>5</sup> Results for the first set of analyses remain robust to alternative codings of *post*, where 1) partially treated individuals are dropped from the sample and 2) *post*= 1 for all those who were 6 or younger and *post*=0 for all those who were 7 or older by 1990.



$$intensity = \frac{\text{12-17 age who attended some primary school, lived in locality}}{\text{All 12-17 age, lived in locality during war}}$$

The outcome of the first set of analyses is education level, *school*, defined using an ordinal scale from 0 to 4 where 0 = no formal schooling, 1 = some primary school, 2 = completed primary school, 3 = some secondary school, and 4 = completed secondary school. Main results as well as heterogeneous effects for DiD analyses use the full census sample, collapsed to a locality-age unit of analysis: For each locality, the mean education level for each age within the locality is taken as the outcome variable. The main DiD equation is then:

$$\text{mean school}_{b,l} = \tau (\text{post}_b \times \text{intensity}_l) + \beta \text{intensity}_l + \kappa_b + \eta_l + \epsilon_{b,l}$$

where *b* is the birth cohort and *l* is the locality. The regression is further weighted by the population count in each birth cohort within the locality, and standard errors are clustered at the locality level.

Further, since the second set of analyses uses individual respondent-level Afrobarometer data to estimate the effects of education on political outcomes, I also show that the DiD treatment effect is robust when limited to the Afrobarometer sample. Here, the treatment intensity is defined using the census data at the district level to reduce missingness – rather than locality level – since matching at the locality level would have resulted in unmatchable observations; however, the variable is allowed to vary according to gender such that women have a different intensity level than men. Given the disparate education levels of males and females, this allows a more precise identification of the effects of war on education. The Afrobarometer DiD equation is:

$$\text{school}_{i,b,d,y} = \tau (\text{post}_b \times \text{intensity}_d) + \beta \text{intensity}_d + X_i \gamma + \kappa_b + \eta_d + \zeta_y + \epsilon_{i,b,d,y}$$

where *i* denotes the individual respondent, *b* denotes birth cohort fixed effects, *d* is district fixed effects, and *y* is survey year fixed effects. The Afrobarometer equation also includes individual-level controls (*X<sub>i</sub>*) for gender and urbanity, and standard errors are clustered at the district level.

In order for the DiD estimation to be causally valid, the requirement of parallel pre-treatment trends must be satisfied in order to ascertain that there are no alternative confounding variables that are affecting the results. I test this in two ways. First, I plot the mean education level for those who live in areas that have above 50th, 75th, and 90th percentile treatment values in comparison to those who live in areas below the corresponding percentile treatment values across birth cohorts. The plots for both the census sample and the Afrobarometer sample are available in Appendix Figure A.1. The requirement of parallel trends in the census data is clearly satisfied, especially when looking only at the 1975-1989 birth cohorts that are used for analysis in this paper. The plots further provide visual evidence that wartime educational loss is primarily affecting children in areas that previously had especially high education, as the drop in education becomes steeper with an increase in percentile. While the Afrobarometer sample shows greater noise in the data due to a small number of observations for each birth cohort, the trend lines follow similar patterns.

Second, I check for confounding factors by choosing two placebo cutoff dates – 1965 and 1970 – which are then coded as the post-treatment period with the same method (continuous post) as is done for the actual estimation. All other aspects, including bandwidth size, are kept the same. Results in Appendix Table A.3 show that treatment induces a positive effect using the sample and no effect using the Afrobarometer sample. The census results



might be explained by the possibility that areas with higher education by 1975 (when treatment intensity was defined) may have had higher levels of educational development earlier on, which led to the high levels of education by 1970.

#### 4.1.2 Heterogeneous effects

Next I include four heterogeneous effects variables, which are used to estimate the effects of war intensity. I consider three ways in which localized variation in conflict can affect educational outcomes. First, high war intensity should compound war's toll on education because security concerns lead schools to close and citizens to remain home. Second, high rebel recruitment – especially in Liberia, where child soldiers were common – prevents children from entering or continuing school when they are recruited into rebel ranks. Third, displacement is particularly disruptive, as found in Eder (2014) and Duenas (2013): Since internally displaced persons (IDPs) are forced to leave their homes and often travel for long periods of time to seek safety and refuge, this leads to long gaps in schooling for young children (Internal Displacement Monitoring Centre, 2010).

Variables are coded and operationalized in the following manner. First, I use the Uppsala Conflict Data Program's Geo-referenced Events Dataset (GED) of wartime violence, which provides the geocoded locations of violent events, coded using media articles and reports (Sundberg & Melander, 2013). In conjunction with the geocoded census data, the GED allows me to code two war-intensity variables: I create *share conflict count*, which is the total number of conflicts divided by the total population, and *share civilian targeting*, which is the number of conflicts that are targeted at civilians (as opposed to inter-rebel group battles) divided by the total number of conflicts. Both variables are constructed using data from within a 5km radius of each locality, and thus they vary at the locality level.

Next, I use data from the Liberian Disarmament, Demobilization, Rehabilitation, and Reintegration (DDRR) program, which began immediately after the war, to estimate the ex-combatant population. While, to my knowledge, no data on ex-combatant birthplaces exist, past survey results have shown that ex-combatants in Liberia often returned home after the war, especially if they were from outside of Monrovia (Pugel, 2007). Further, DDRR participation was high in Liberia (Pugel, 2007). Finally, the DDRR data are entered at the county level, so those who may not have returned to rural areas but to nearby cities would still be accurately portrayed using these DDRR data.<sup>6</sup> The heterogeneous effects variable *share DDRR participants* is calculated as the total number of DDRR participants divided by the total population in the county.

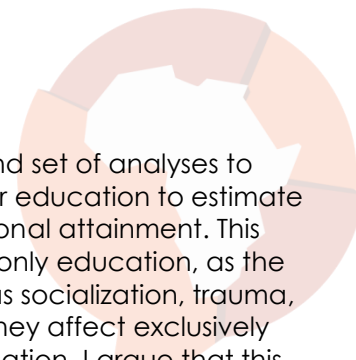
Finally, I estimate the compounding effect of displacement in the variable *share displaced population*, which is created using the census data and is entered at the locality-age level. For each individual living in Liberia, the 2008 census records whether the person was ever displaced during the war. The displacement variable is thus calculated as the share of each birth cohort within each locality that experienced displacement.

The heterogeneous effects equation is:

$$\begin{aligned} \text{mean school}_{b,l} = & \tau_1 (\text{post}_b \times \text{intensity}_l) + \tau_2 (\text{post}_b \times \text{intensity}_l \times \text{HE}_{b/l/c}) \\ & + \beta_1 \text{intensity}_l + \beta_2 (\text{HE}_{b/l/c} \times \text{intensity}_l) + \beta_3 (\text{post}_b \times \text{HE}_{b/l/c}) + \kappa_b + \eta_l + \epsilon_{b,l} \end{aligned}$$

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<sup>6</sup> DDRR data are recorded at the district level; however, these districts are different from administrative districts, which are the only unit for which information is available in the census data. Therefore, DDRR data are aggregated up to the county level.



## 4.2 Effects of war on politics through education

Having established the effects of war on education, I turn in the second set of analyses to estimating the reduced-form DiD identification equation as a proxy for education to estimate the effects of war on politics through the channel of lowered educational attainment. This identification strategy allows me to isolate the cohort effects through only education, as the estimates would be unaffected by other consequences of war such as socialization, trauma, or social capital. These latter channels would be confounders only if they affect exclusively those who were ages 11 or younger and living in areas of higher education. I argue that this is unlikely: Individual mechanisms such as socialization or trauma should arguably be more likely in less educated areas, since conflict intensity as well as isolation from NGOs were higher in rural areas. Similarly, community-wide mechanisms such as coping or social capital should have no differential effects for those who just turned 11 as opposed to those who were a year or two older.

While a causal mediation or instrumental variable (IV) identification method would allow a more causal interpretation of the results, the number of respondents in the Afrobarometer surveys born between 1975 and 1989 – the sample used in this paper – is small, resulting in a weak first stage in a subset of the results. Thus, I present only reduced-form estimates, and argue that the correlations using post intensity as a proxy for education are strongly suggestive of longer-term economic and political effects for those whose schooling was affected by war. I include IV estimates as additional evidence of a causal relationship in Appendix tables A.4-A.6. I also include IV estimates using a wider bandwidth of respondents, which have appropriately high F-statistics using the larger sample size, in Appendix tables A.7-A.9. Results from both sets of IV estimates match the interpretations from the proxy approach, although there is some loss in levels of significance in cases when the F-statistic decreases due to a reduction in sample size.

### 4.2.1 Economic effects

Economic effects of war through education are estimated in two ways. First, I use the census data to create *share employed*, which is the share of each birth cohort within each locality that has full-time employment. Because of the way in which the census categorizes employment, there is no clear-cut distinction to identify part-time employment separately from full employment; further, census data do not identify individual ownership of assets (this is done at the household level) or other economic indicators. Thus, I further use the Afrobarometer data for a wider range of individual-level economic outcomes. Specifically, I replicate the full employment variable within the Afrobarometer sample. I also create a variable called *some employment*, which denotes whether the individual is employed in some capacity. Next, I create a covariance index of whether the individual lacks access to basic necessities (food, water, medicine, fuel, and cash income) as well as an index of whether the individual owns basic assets (radio, TV, vehicle).

### 4.2.2 Political effects

First, I use the 2014 voter register, which provides names, ages, and polling locations, to estimate voter registration behaviour. Since the voter register does not record the locality in which each individual lives, I follow Bowles, Larreguy, and Liu (2016) and assign each census locality to each polling location based on closest distance. I then aggregate the population count for each birth year at the precinct level using the census data, and calculate the population share of each birth cohort within the precinct. Using the voter register, I similarly calculate the population share of each birth cohort who registered to vote within the precinct. For each birth cohort, I take the difference between the two population shares to calculate *voter representation*:



$$\text{voter representation} = \frac{\text{registered population of birth cohort}}{\text{total registered population in precinct}} - \frac{\text{population of birth cohort}}{\text{total population in precinct}}$$

This variable aims to capture how likely each birth cohort is to register to vote in relation to other birth cohorts: If the *voter representation* value is negative, this means that the birth cohort registers less than their population share, and is thus interpreted as being less likely to register to vote; if the *voter representation* value is positive, then the birth cohort registers to vote in greater proportion than other years, and is correspondingly interpreted as being more likely to register to vote. Since voter registration varies at the precinct-age level, the treatment intensity variable is redefined at the precinct level for this analysis, and regressions include precinct fixed effects with precinct-level clustered standard errors.

Finally, I use the Afrobarometer surveys to estimate how war – through education – affects political behaviour. I consider three categories of political effects. First, I look at election outcomes, which include both views on electoral processes and actual engagement and participation in the election process. Next, I look at civic engagement variables, which record each individual's attitudes toward taxation and politics, as well as whether they discuss politics with others and whether they contact various types of government officials. The last set of political variables pertains to attitudes toward democracy and democratic processes. This includes variables on whether the individual approves of various processes that promote checks and balances, as well as variables on regime-type preferences.

## 5. Results

### 5.1 Effects of war on education

#### 5.1.1 Main effects

Table 1 presents estimates for the first-stage results – the main DiD regression results for the effects of war on educational attainment. In both the census sample and the Afrobarometer sample, children who were of primary-school age (6-11 years old) by war onset in 1990 are more likely to have less schooling than those born just before that cutoff, and this effect is statistically significant at the  $p < 0.001$  and  $p < 0.01$  levels, respectively. Further, effects are substantive in size: When estimated using the full census data, being fully treated by war onset – i.e. being 6 years old or younger in a highly educated locality – is associated with a -0.589 decrease in education where education is measured on a 0-4 scale. Effects are larger in the Afrobarometer sample, where treatment is defined at the district rather than locality level: Students lose almost an entire level of education when fully treated with war onset.

**Table 1: Effect of war on education**

	(1) Census sample	(2) AB sample
Post × Intensity	-0.589*** (0.042)	-0.926** (0.280)
Observations	98763	2162
$R^2$	0.802	0.272
Treatment level	Locality	District

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

### 5.1.2 Heterogeneous effects

To bolster these findings, I show the heterogeneous effects of several war-related variables, which are estimated using the full census sample. In Table 2, columns 1 and 2 tell a complementary story: Column 1 results show that the effect of war onset on education levels is intensified if the locality experiences more violent conflict episodes per capita during the civil war. Violent localities – often battleground areas that were affected by war from the very beginning – see an additional -1.224 decrease in education. However, the mean *share conflict* count is only 0.01, so conflict intensity measured through *share conflict* count leads to only an additional -0.012 decrease in education. In Column 2, in areas where rebel groups attacked civilians in greater proportion than fighting against each other, the negative effect on educational attainment is higher for the mean *share civilian* targeting level (0.74). This effect is barely significant at the  $p < 0.1$  level; given the large number of observations used to estimate this equation, heterogeneous effects results for civilian targeting is suggestive but tenuous. Taken together, columns 1 and 2 intuitively suggest that war intensity – which indicates greater fighting and arguably more attacks targeted at civilians rather than between rebel groups – depress school attendance among citizens living within a locality. These findings are corroborated by secondary sources, where qualitative accounts of the war report that rebels frequently attacked schools, held children and teachers as hostages, and used public buildings as shields during fighting (Dahn, 2008; Tate, 2004).

**Table 2: Heterogeneous effects of war intensity on education**

	(1) Share conflict count	(2) Share civilian targeting	(3) Share DDDR participants	(4) Share displaced population
<i>Heterogeneous effect:</i>				
Post × Intensity	-0.588*** (0.043)	-0.588*** (0.043)	-0.361*** (0.043)	-0.602*** (0.060)
Post × Intensity × HE	-1.224* (0.492)	-1.389+ (0.728)	-2.171** (0.760)	-0.444*** (0.115)
Observations	98763	98763	98763	98763
$R^2$	0.802	0.802	0.802	0.802
Treatment level	Locality	Locality	Locality	Locality
Treatment × HE level	Locality	Locality	County	Locality

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Column 3 investigates the effects of civilian participation in war, while Column 4 looks at whether education is affected by civilians fleeing from war. Qualitative interviews with ex-combatants and civilians have suggested that education was halted when they dropped out of school to join a rebel group or when they were forced to flee their homes during periods of intensified fighting. Results show substantive effects: In counties that have a greater share of DDDR participants, and thus are likely to have been large recruitment sites for rebels, those who were of primary-school age during war have an additional -0.21 units lower education by 2008 (mean *share DDDR participants* = 0.097). Similarly, areas with a high displacement population have a correspondingly negative heterogeneous effect, suggesting that those who are displaced tend to have lower education than those who are not; the effect size is about an additional -0.12 educational decrease.



## 5.2 Effects of war on politics through education

### 5.2.1 Economic outcomes

Having shown the negative effects of war on the educated sector of the Liberian population, I find evidence to support Hypothesis 1 – that the loss in education has led to economic insecurity in the long term. Table 3 presents the reduced-form outcomes for employment and other economic indicators using the census sample and the Afrobarometer sample, respectively. In the census sample, the share of each birth year that is employed in some capacity – including own-account workers, family cooperative workers, etc. – decreases by about 18% among the sample that is affected by the civil war, suggesting substantive negative economic consequences for those who were of primary-school age during the war. The Afrobarometer sample tells a similar story: Those who were born after 1979 are less likely to be fully employed, and this 20% effect is statistically significant at the  $p < 0.01$  level. Unlike census results, the treated population does not seem less likely to be employed in at least a part-time position in the Afrobarometer sample; however, the effect becomes significant if the bandwidth is increased, so data might be too noisy to find an effect for this variable.

**Table 3: Effect of war on economic outcomes through education**

	<i>Census Sample</i>	<i>Afrobarometer Sample</i>			
	Share Employed	Full employment	Some employment	Lack necessities	Assets
Post × Intensity	-0.188*** (0.009)	-0.198** (0.075)	-0.055 (0.069)	-0.199 (0.275)	0.018 (0.057)
Observations	98763	1768	1768	1768	1765
$R^2$	0.779	0.107	0.130	0.161	0.264
Treatment level	Locality	District	District	District	District

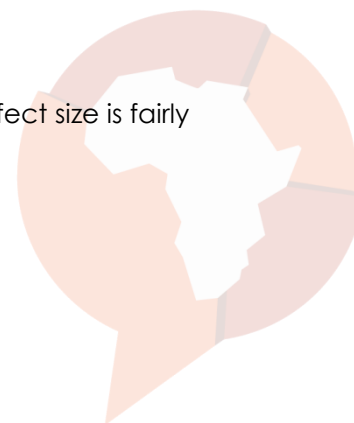
Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

In the last two columns of Table 3, I check for whether the treated population is less likely to have access to basic necessities such as water, food, cash, and health care, or whether they are less likely to own a television, radio, or vehicle. Both effects are statistically insignificant and remain so even when the bandwidth is increased; further, *lack necessities* is defined on a scale of 0-4, so the coefficient is small. Thus, these two columns suggest no substantive effects of education on access to necessities or ownership of assets. Yet, taken in conjunction with the employment outcomes, and given the Liberian job market's temporariness and uncertainty (Andrews et al., 2011), I argue that the ability to reach mean levels of necessities and assets does not mitigate economic anxiety stemming from under-employment (Hypothesis 2). Instead, lower employment levels at the time of the surveys despite ownership of assets suggest that jobs – and income – tend to fluctuate so that individuals can afford items when they are employed, but are unlikely to have permanent or long-term employment.

### 5.2.2 Political outcomes

Hypothesis 2 argues that a loss of education will negatively affect a variety of political outcomes. I first show this in Table 4, which displays the effect of being treated on voter registration. As noted in the data section, the variable *vote representation* is calculated as the share of registered voters in birth cohort b minus the share of people in birth cohort b. This variable captures whether people in birth cohort b are registering to vote at a higher or lower level than their population share within each precinct level. Results show a negative effect of being treated on *vote representation*; in comparison to the outcome standard



deviation, which is 0.015 for the 1975-1989 birth cohorts sample, this effect size is fairly substantive.

**Table 4: Effect of war on voter registration through education**

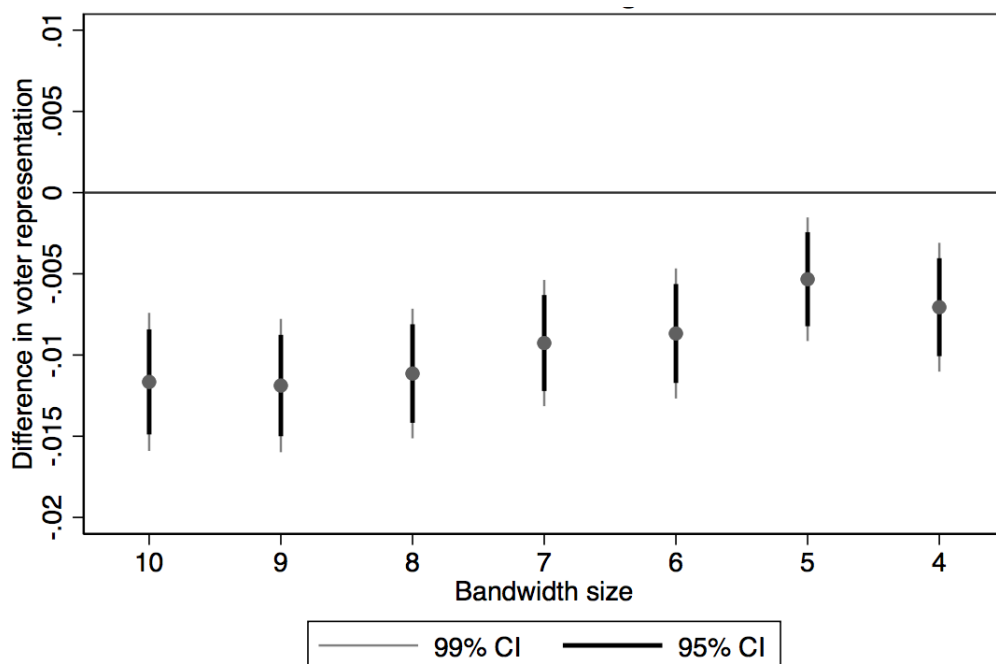
	(1)
	Voter representation
Post × Intensity	-0.009*** (0.002)
Observations	18510
$R^2$	0.357

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

I further show that this result is robust to larger bandwidths (Figure 1) and that the estimated effect size in Table 4 is on the conservative side. Placebo cutoffs, shown in Appendix Figure A.2, confirm that these effects are unlikely to be due to confounding factors. These results thus suggest that wartime exposure among the young populace living in educated areas is correlated with a decrease in the likelihood of registering to vote.

**Figure 1: Voter registration effects across bandwidths**



I next examine electoral outcome variables from the Afrobarometer sample. Table 5 provides estimates for variables that measure political participation in elections (Panel A) and beliefs in electoral processes (Panel B). Results on political participation are in accordance with the theory presented in this paper: While the effect of voting in the last election is statistically insignificant in Panel A, these individuals are less likely to register to vote (as shown in Table 4 above). Panel A also shows negative effects on their likelihood of attending political rallies in the 2011 election (28% reduction), canvassing for a candidate in

2011 (29.3% reduction), and volunteering and/or working for a political candidate in 2011 (28.6% reduction).

**Table 5: Effect of war on election outcomes through education**

<i>Participation in Elections</i>				
<b>Panel A</b>	Voted last election	Attended rally	Canvassed for cand.	Worked for cand.
Post × Intensity	-0.109 (0.084)	-0.280* (0.127)	-0.293** (0.102)	-0.286** (0.102)
Observations	1739	1201	1199	1195
$R^2$	0.115	0.099	0.121	0.085
Treatment level	District	District	District	District

<i>Electoral Processes</i>				
<b>Panel B</b>	Ballot not secret	Fears intimidation	Careful about politics	Rejects elections
Post × Intensity	-0.456* (0.221)	-0.290 (0.247)	-0.309+ (0.169)	0.345*** (0.098)
Observations	1000	1721	1714	1761
$R^2$	0.121	0.095	0.127	0.121
Treatment level	District	District	District	District

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

It may be the case, however, that this result is not due to frustration and disengagement with politics, as predicted by the theory of educational loss, but may in fact be because poorly educated citizens are more likely to distrust the democratic process. I test this in Panel B and find that those who are treated by wartime education loss are in fact less likely to believe that the ballot is not secret, less likely to fear intimidation (although this variable is statistically insignificant), and less likely to believe that it is necessary to be careful about what one says in public regarding politics. These attitudes suggest that treated individuals are not more fearful or mistrustful of their government. Instead, the last column of Panel B shows that this particular population is probably less likely to participate because more likely to reject the idea of holding elections: The variable *rejects elections*, measured from 0 to 2, shows that people who are of primary-school age in highly educated areas are 0.345 – or a little more than 17% – more likely to believe that “since elections sometimes produce bad results, we should adopt other methods for choosing this country’s leaders” (Afrobarometer, 2015). These estimates suggest that those who were of primary-school age during war, and thus experienced education loss as a result of war onset, are less likely to participate in the country’s democratic processes despite statistically significant responses that the government does not intimidate or violate ballot secrecy.

Civic engagement outcomes, presented in Table 6, suggest a similar disengagement from politics. Individual responses to questions about political engagement generally indicate a lack of interest in participating in politics. All variables in Table 6 are coded from 0 to 2, where a coding of 2 indicates a stronger opinion than 1. The treated population is less likely to believe that good citizens should pay taxes, to discuss politics, and to be interested in public affairs. Effects for all three variables hover around a 15% to 18% reduction. The final variable used to measure political engagement – *contact gov index* – is a correlation index of whether the individual contacted local or national government for political problems. Unlike the other variables, the results are statistically insignificant and the coefficient is close to 0, indicating no cohort effect of educational loss on contacting the government.



**Table 6: Effect of war on political engagement through education**

	Must pay taxes	Discuss politics	Interest pub affairs	Contact gov index
Post × Intensity	-0.295 <sup>+</sup> (0.154)	-0.331* (0.138)	-0.362* (0.173)	-0.011 (0.100)
Observations	1726	1707	1726	1759
R <sup>2</sup>	0.092	0.161	0.077	0.104
Treatment level	District	District	District	District

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

Finally, I examine attitudes toward democratic institutions and other political regime types. As previously theorized, people whose education was affected by war onset should not have a lesser understanding of democratic institutions in the post-war context given the overwhelming international presence, the strong push for elections after peace is restored, and the thorough civic education and voter training programs conducted by NGOs and governmental organisations – such as the National Election Commission in Liberia – tasked with ensuring a successful first election. Panel A of Table 7 substantiates this part of the theory. In all four variables presented, individuals are asked about a variety of checks and balances, largely centered on limits to presidential powers. In all four variables, the outcomes are statistically insignificant, and with the exception of *pres. obey courts*, coefficients are close to 0.

**Table 7: Effect of war on democracy outcomes through education**

<i>Checks and Balances</i>				
<b>Panel A</b>	Pres. obey courts	Want term limits	MP checks pres.	Parl. makes laws
Post × Intensity	-0.143 (0.199)	0.069 (0.179)	0.068 (0.167)	0.027 (0.215)
Observations	1757	1752	1755	1748
R <sup>2</sup>	0.106	0.124	0.114	0.113
Treatment level	District	District	District	District

<i>Regime Preferences</i>				
<b>Panel B</b>	Quality of dem	Non-dem preferable	Military rule	Authoritarian regimes
Post × Intensity	-0.003 (0.176)	0.171* (0.086)	-0.031 (0.117)	-0.038 (0.081)
Observations	1656	1601	1733	1754
R <sup>2</sup>	0.150	0.107	0.163	0.152

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

Along the same lines of having no differential opinions about the importance of checking presidential powers, those who experienced education loss from war do not have differing beliefs about the quality of democracy in Liberia. Column 1 of Panel B measures beliefs about democratic quality from 0 to 3, and finds no differential cohort effects stemming from educational loss. Yet, those who are 11 years old or younger are 17% more likely to say that a non-democracy might be preferable to a democratic government. The Afrobarometer question, which asks whether the individual believes that 1) democracy is preferable, 2) a

non-democratic regime type can sometimes be preferable, or 3) the regime type doesn't matter "for someone like me" (Afrobarometer, 2015), shows negative results for the treated population. While I report only the most extreme of these preferences – an indicator for non-democratic regimes sometimes being preferable – the coefficients for not affirmatively preferring democracy (i.e. non-democracy is preferred or it doesn't matter) is also statistically significant at the  $p < 0.05$  level. When faced with actual choices for other regime types, however, treated individuals show no affinity for military rule or other types of authoritarian regimes. I interpret the results as a cynicism about politics and the concept of democracy as being able to provide for its citizens, but with no clear interest in learning about any particular alternatives.

### 5.3 Alternative channels

The identification design allows me to isolate cohort effects through education rather than other channels as identified by the literature, such as coping, socialization, or displacement. In all these channels, it is unlikely that such effects would be seen only in the population of Liberians who were younger than 11 years old in better-educated areas. However, as a placebo test, I consider outcomes that would be affected by other channels but not by education loss as identified in this paper. Trust in other citizens and engagement in local-level associations, for example, should not be affected by the theory of educational loss as argued in this paper. They should, however, increase based on theories of community coping but decrease according to theories of war trauma.

**Table 8: Alternative channels as placebo tests**

<i>Community Engagement</i>			
<b>Panel A</b>	Civic trust (close)	Civic trust (far)	Association member
Post × Intensity	0.167 (0.334)	0.000 (0.300)	-0.037 (0.100)
Observations	1102	1097	1760
$R^2$	0.173	0.127	0.101
Treatment level	District	District	District
<i>Violent Socialization</i>			
<b>Panel B</b>	Used force	Violence justified	Against amnesty
Post × Intensity	0.100 (0.173)	-0.148 (0.307)	-0.702 (0.428)
Observations	1076	1070	556
$R^2$	0.108	0.122	0.148
Treatment level	District	District	District
<i>Displacement</i>			
<b>Panel C</b>	Displaced	Schooling	Full employment
Post × Intensity	-0.242 (0.150)		
Displaced		0.149 (0.148)	0.055+ (0.030)
Observations	560	558	560
$R^2$	0.134	0.374	0.193
Treatment level	District	District	District

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 8 Panel A presents results of correlational indices based on Afrobarometer responses to 1) whether individuals trust their relatives and neighbours; 2) whether individuals trust acquaintances and other Liberians; and 3) whether individuals are members of religious or voluntary associations. All variables are coded on a scale from 0 to 3, and across the board, results are insignificant and coefficients are close to 0. There is thus no evidence suggesting differential effects of war on community-oriented civic engagement through the channel of educational loss, providing additional assurance that the identification strategy is indeed isolating the effects of wartime educational loss on political behaviour in the post-war period.

Theories of socialization would predict that people who lived through war, and perhaps younger children in particular, are socialized into a culture of violence and retaliation. These individuals would be more likely to resort to violence in political affairs, and could arguably be less interested in participating in peaceful elections. I test the socialization hypothesis using three variables. The first variable measures whether the individual has taken part in political violence in the past year, or would ever do so. The variable is coded from 0 to 4, where 0 indicates that the individual “would never do this” and 4 indicates that the individual has often done so. The second variable asks whether the individual believes violence is ever justified in Liberian politics. This is coded from 0 to 3, with 3 indicating strong agreement that violence is justified. Finally, Afrobarometer asks whether the individual believes that those who took part in the civil war should be granted amnesty. The variable ranges from 0 to 3, where 3 records the belief that those involved should not be granted amnesty. Panel B in Table 8 shows that, across the board, there is no statistically significant effect on violent behaviour or forgiveness toward ex-combatants.

Finally, one might argue that displacement might be an alternative channel for political disengagement, and that education levels are likely to co-vary with degree of displacement. For example, it is possible that those who were most educated before war are more likely to be wealthy, and thus more likely to permanently leave Liberia. Unfortunately, it is not possible to test this channel: Since this population no longer lives in Liberia, it does not appear in the Afrobarometer surveys. However, it is unlikely that this channel would affect only those between ages 1 and 11 years at the start of war. Wealthier families escaping conflict are likely to leave as a family, so the “brain drain” hypothesis should not differentially affect only younger groups. Further, as noted in Section 4.1.1, the intensity variable is created only with people who lived in their locality at the start of war, and thus would not capture the education levels of those who fled during war and are no longer living in Liberia.

Alternatively, rural residents were more likely to have been displaced, and if civilians from rural areas with lower education permanently relocated to urban areas, this could artificially depress education levels. While this is similarly unlikely to have targeted those who were 11 or younger at the start of war, I run the same reduced-form regression using an indicator for displacement as an outcome. The result (in the first column of Table 8, Panel C) shows no statistically significant relationship for the population in question – primary-school-aged Liberians in highly educated areas – and the negative coefficient suggests in fact that older individuals living in rural areas today are more likely to have experienced displacement during the war. A t-test of displaced individuals shows that those living in urban areas are 12.3% less likely to have been displaced during the war than rural citizens ( $p < 0.00$ ), providing suggestive evidence that displaced individuals were likely repatriated to their rural homes prior to the first Afrobarometer survey in 2008. I further run an OLS regression in columns 2 and 3 to show that displacement status across the entire population (as opposed to only those who were of primary-school age) has no effect on schooling. They are in fact somewhat more likely to have full employment, although the employment coefficient is very close to zero.

## 6. Conclusion

This paper argues that the negative consequences of war on human-capital accumulation has substantial effects on society because it affects a large proportion of the country's

population: an entire generation of children who were of school age or younger when the war began. Because of the violence, insecurity, and poverty associated with warfare, educational attainment – which was previously a liberty that was expected by populations living in well-educated areas – became secondary, during times of conflict, to pressing issues such as food and safety. As such, continuous schooling was virtually impossible, and students were often forced to go through periods of months or years without education, resulting in educational setbacks or even a stop to education altogether. Even after the war, poor economic prospects and the individual's age close the windows of remedial education for many who were affected by the war.

This paper shows that education loss in such a context leads to different predictions than previous theories about the effects of education on political participation and democratization. Because individuals are not advancing from no education to higher education, but are instead living in a situation where their educational opportunities were taken away in comparison to their slightly older peers, the war's costs and effects on their quality of life breed resentment against politics. Economic prospects are lowered due to a lack of skills and an inability to afford more training, while jobs for unskilled workers are temporary and provide little security. In Liberia and other post-war countries, a democratically elected government under peace is an unsatisfactory fix, since it is constrained by inadequate resources, ambitious professional politicians, and the neopatrimonial legacy that has existed since before the war. As such, the generation of children who grew up during the war and are now adults without skills direct their anger at the democratic government that cannot improve their living conditions. While these problems may have little to do with democracy or the democratic process itself, the resentment against politics during a time of transition can complicate democratic consolidation.

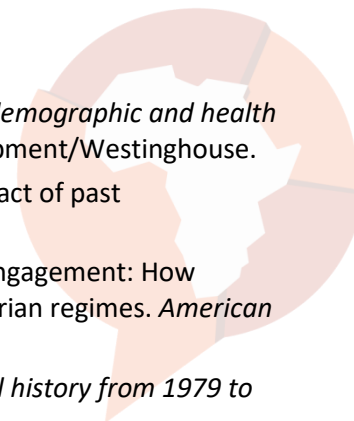
These outcomes make the case that democratic transition after civil war hinges on myriad factors beyond maintaining the peace and ensuring reconciliation. With regard to education loss, providing adult education and ensuring that young adults have resources and opportunities for remedial schooling seem particularly important, alongside reconstructing the country's education program for new generations of children and seeking new types of formal and permanent employment for unskilled workers. In doing so, the post-war government may minimize attitudinal shifts among the population affected by education loss, and thus aid post-war democratic transition.



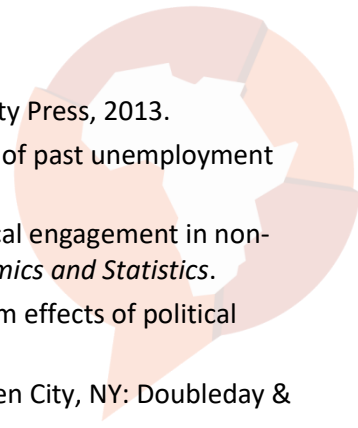
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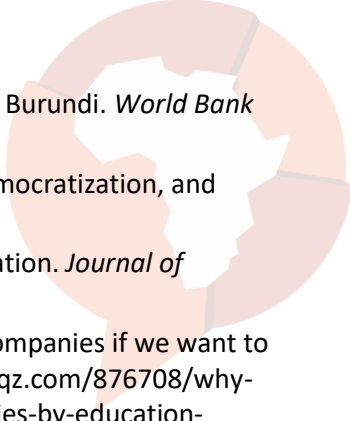
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## Appendix

### Descriptive statistics

**Table A.1: Census and voter registration data**

	count	mean	sd	min	max
<b>First stage</b>					
Intensity	98763	0.512	0.234	0	1
Schooling	106259	1.586	0.851	0	4
<b>Outcomes</b>					
Employment	106259	0.419	0.291	0	1
Voter representation (precinct level)	18635	-0.000	0.015	-0.303	0.093
<b>Heterogeneous effects</b>					
Share conflict count (5km radius)	106001	0.075	0.578	0	24
Share civilian targeting (5km radius)	106001	0.053	0.399	0	15
Share DDDR participants (district level)	106259	0.104	0.040	.008	.218
Share displaced population	104139	0.060	0.170	0	1
<b>Controls</b>					
Share ethnicity 1	106259	0.129	0.233	0	1
Share ethnicity 2	106259	0.008	0.057	0	1
Share ethnicity 3	106259	0.003	0.025	0	1
Share ethnicity 4	106259	0.031	0.120	0	1
Share ethnicity 5	106259	0.074	0.209	0	1
Share ethnicity 6	106259	0.043	0.145	0	1
Share ethnicity 7	106259	0.098	0.220	0	1
Share ethnicity 8	106259	0.201	0.296	0	1
Share ethnicity 9	106259	0.049	0.145	0	1
Share ethnicity 10	106259	0.044	0.173	0	1
Share ethnicity 11	106259	0.061	0.141	0	1
Share ethnicity 12	106259	0.054	0.129	0	1
Share ethnicity 13	106259	0.036	0.079	0	1
Share ethnicity 14	106259	0.077	0.213	0	1
Share ethnicity 15	106259	0.014	0.064	0	1
Share ethnicity 16	106259	0.013	0.084	0	1
Share ethnicity 17	106259	0.041	0.120	0	1
Share ethnicity 18	106259	0.006	0.037	0	1
Share ethnicity 19	106259	0.016	0.026	0	1
Share ethnicity 20	106259	0.002	0.005	0	1
Share religion 1	106259	0.855	0.214	0	1
Share religion 2	106259	0.125	0.208	0	1
Share religion 3	106259	0.005	0.038	0	1
Share religion 4	106259	0.002	0.015	0	1
Share religion 5	106259	0.014	0.064	0	1

**Table A.2: Afrobarometer rounds 4-6 data**

	count	mean	sd	min	max
<b>First stage</b>					
Intensity	1768	0.495	0.228	.054	.838
School	1756	2.335	1.529	0	4
<b>Economic</b>					
Full employment	1768	0.137	0.344	0	1
Some employment	1768	0.245	0.430	0	1
Lack necessities	1768	1.524	0.982	0	4
Assets	1765	0.353	0.296	0	1
<b>Participation in Elections</b>					
Voted last election	1739	0.787	0.409	0	1
Attended rally	1201	0.465	0.499	0	1
Canvassed for cand.	1199	0.506	0.500	0	1
Worked for cand.	1195	0.315	0.465	0	1
<b>Electoral Processes</b>					
Ballot not secret	1000	0.369	0.675	0	2
Fears intimidation	1721	1.023	1.024	0	3
Careful about politics	1714	1.065	0.874	0	2
Rejects elections	1761	0.187	0.524	0	2
<b>Political Engagement</b>					
Must pay taxes	1726	1.151	0.681	0	2
Discuss politics	1707	0.762	0.733	0	2
Interest pub affairs	1726	0.799	0.863	0	2
Contact gov index	1759	0.225	0.411	0	2
<b>Checks and Balances</b>					
Pres. obey courts	1757	1.127	0.785	0	2
Want term limits	1752	1.389	0.747	0	2
MP checks pres.	1755	1.187	0.841	0	2
Parl. makes laws	1748	1.197	0.800	0	2
<b>Regime Preferences</b>					
Quality of dem	1656	1.836	0.878	0	3
Non-dem preferable	1601	0.088	0.283	0	1
Military rule	1733	0.328	0.612	0	2
Authoritarian regimes	1754	0.161	0.394	0	2
<b>Community Engagement</b>					
Civic trust (close)	1102	2.011	0.977	0	3
Civic trust (far)	1097	1.052	0.887	0	3
Association member	1760	0.591	0.540	0	2
<b>Violent Socialization</b>					
Used force	1076	0.199	0.662	0	4
Violence justified	1070	0.711	0.906	0	3
Reject amnesty	556	1.694	1.205	0	3
<b>Displacement</b>					
Displaced	560	0.841	0.366	0	1
<b>Controls</b>					
Urban	1768	0.519	0.500	0	1
Gender	1768	0.531	0.499	0	1



Parallel trends

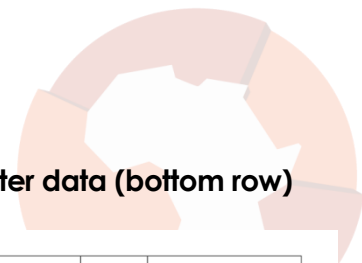
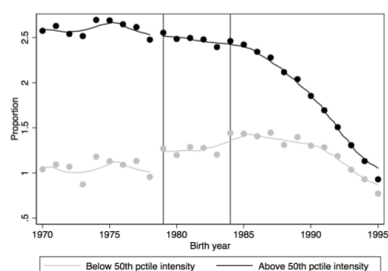
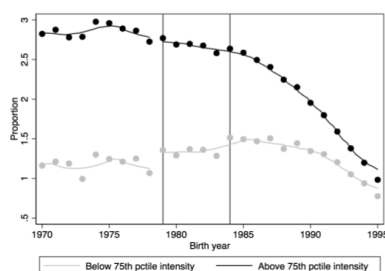


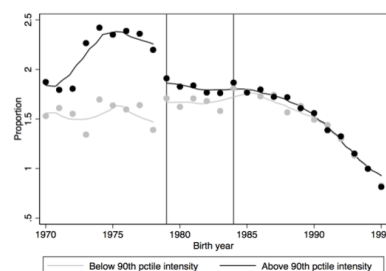
Figure A.1: Parallel trends: Census data (top row) and Afrobarometer data (bottom row)



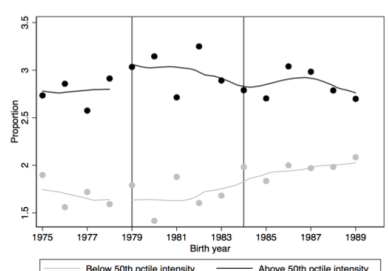
(a) 50th percentile



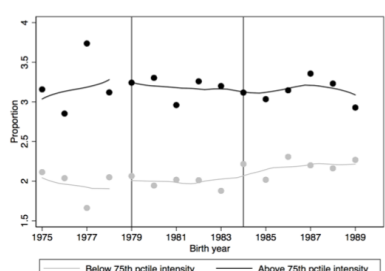
(b) 75th percentile



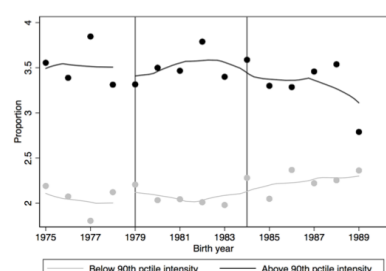
(c) 90th percentile



(a) 50th percentile



(b) 75th percentile



(c) 90th percentile

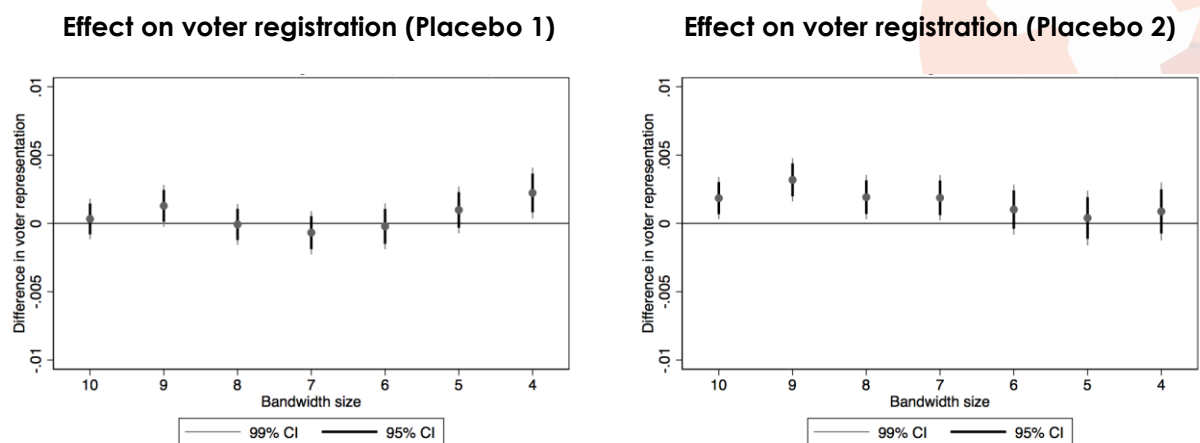
Table A.3: Main effects placebo tests

	Census Sample		Afrobarometer Sample	
	Cutoff = 1965	Cutoff = 1970	Cutoff = 1965	Cutoff = 1970
Placebo × Intensity	0.371*** (0.020)	0.560*** (0.041)	-2.730 (2.397)	-0.890 (1.876)
Observations	86358	86743	780	860
$R^2$	0.688	0.727	0.306	0.250

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Figure A.2: Voter registration placebo tests**



*Estimates using IV (born 1975-1989)*

**Table A.4: Election outcomes**

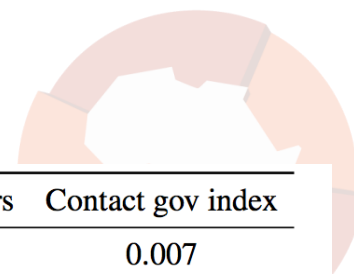
	<i>Participation in Elections</i>			
	Voted last election	Attended rally	Canvassed for cand.	Worked for cand.
School	0.152 (0.103)	0.574 (0.443)	0.591 (0.381)	0.544 (0.332)
Observations	1727	1191	1189	1185
F-statistic	8.256	2.147	2.436	2.706

	<i>Electoral Processes</i>			
	Ballot not secret	Fears intimidation	Careful about politics	Rejects elections
School	0.346 <sup>+</sup> (0.182)	0.348 (0.295)	0.379 (0.233)	-0.396* (0.159)
Observations	996	1709	1702	1749
F-statistic	11.113	8.557	6.524	8.878

Standard errors in parentheses

<sup>+</sup>  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table A.5: Political engagement**

	Must pay taxes	Discuss politics	Interest pub affairs	Contact gov index
School	0.342 <sup>+</sup> (0.178)	0.361* (0.149)	0.444* (0.213)	0.007 (0.109)
Observations	1714	1696	1714	1747
F-statistic	8.777	11.412	8.343	9.363

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ **Table A.6: Democracy outcomes**

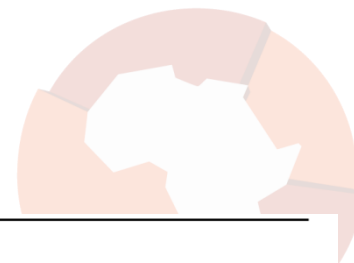
	<i>Checks and Balances</i>			
	Pres. obey courts	Want term limits	MP checks pres.	Parl. makes laws
School	0.188 (0.213)	-0.083 (0.219)	-0.068 (0.192)	-0.042 (0.250)
Observations	1745	1740	1743	1736
F-statistic	9.838	7.855	9.344	8.451

	<i>Regime Preferences</i>			
	Quality of dem	Non-dem preferable	Military rule	Authoritarian regimes
School	0.030 (0.208)	-0.182 <sup>+</sup> (0.099)	0.043 (0.124)	0.036 (0.090)
Observations	1644	1590	1721	1742
$R^2$	-0.004	-0.740	-0.001	-0.037
F-statistic	7.591	11.835	10.004	9.658

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Estimates using IV (born 1970-1995)

**Table A.7: Election outcomes**

	<i>Participation in Elections</i>			
	Voted last election	Attended rally	Canvassed for cand.	Worked for cand.
School	0.092 (0.073)	0.550* (0.281)	0.483* (0.197)	0.469* (0.191)
Observations	2432	1765	1765	1762
$R^2$	-0.067	-1.889	-1.396	-1.651
F-statistic	14.795	5.179	5.781	6.024

	<i>Electoral Processes</i>			
	Ballot not secret	Fears intimidation	Careful about politics	Rejects elections
School	0.215 (0.134)	0.451* (0.226)	0.222 (0.178)	-0.273** (0.100)
Observations	1438	2466	2459	2525
$R^2$	-0.188	-0.334	-0.093	-0.527
F-statistic	10.977	16.497	14.967	17.231

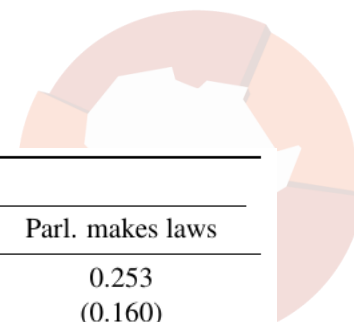
Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ **Table A.8: Political engagement**

	Must pay taxes	Discuss politics	Interest pub affairs	Contact gov index
School	0.284* (0.116)	0.334*** (0.100)	0.284* (0.137)	0.009 (0.080)
Observations	2475	2458	2473	2519
$R^2$	-0.241	-0.107	-0.044	0.004
F-statistic	15.514	19.169	16.649	17.854

Standard errors in parentheses

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table A.9: Democracy outcomes**

<i>Checks and Balances</i>				
	Pres. obey courts	Want term limits	MP checks pres.	Parl. makes laws
School	0.253 <sup>+</sup> (0.132)	-0.152 (0.197)	-0.103 (0.157)	0.253 (0.160)
Observations	2517	2513	2509	2504
$R^2$	-0.185	-0.124	-0.026	-0.171
F-statistic	18.555	16.146	18.962	16.886

<i>Regime Preferences</i>				
	Quality of dem	Non-dem preferable	Military rule	Authoritarian regimes
school1	-0.227 (0.200)	-0.084 (0.059)	-0.023 (0.091)	0.101 (0.075)
Observations	2360	2290	2483	2512
$R^2$	-0.108	-0.128	-0.003	-0.187
F-statistic	11.261	15.821	18.213	18.539

Standard errors in parentheses

<sup>+</sup>  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

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Leslie Social Science Building  
Rondebosch, Cape Town, WC 7701  
South Africa  
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