Horizontal Inequality in Education and Violent Conflict

LITERATURE REVIEW

Washington, DC

February 2015

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United Nations Children's Fund

Peacebuilding Education and Advocacy programme

Education Section, Programme Division

Three United Nations Plaza

New York, New York 10017

February 2015

Contents

Acronyms

ACD	Armed Conflict Dataset
ACLED	Armed Conflict Location and Event Data Project
CDC	Categorically Disaggregated Conflict dataset
CRISE Network	Center for Research on Inequality, Human Security and Ethnicity Network
DEIW	Data Set of Educational Inequality in the World
DHS	Demographic and Health Surveys
EFA	Education for All
EPDC	Education Policy and Data Center
ERIC	Education Resources Information Center
GIS	Geographic Information Systems
HCB	Heidelberg Conflict Barometer
INEE	International Network for Education in Emergencies
MAR	Minorities at Risk project
MEPV	Major Episodes of Political Violence database
MICS	Multiple Indicator Cluster Survey
PRIO	Peace Research Institute Oslo
SIP	Scalar Index of Polities
UACD	Uppsala Armed Conflict Dataset
UCDP	Uppsala Conflict Data Program
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UIS	UNESCO Institute for Statistics
UNICEF	United Nations Children's Fund
UNICEF PBEA Programme	UNICEF Peacebuilding, Education and Advocacy Programme
USAID	United States Agency for International Development
WIDE	World Inequality Database on Education

Executive Summary

This literature review is the first step in a comprehensive research project, funded by UNICEF and implemented by the FHI 360 Education Policy and Data Center (EPDC), to examine the relationship between inequality in education and the likelihood of violent intergroup conflict. The purpose of this document is to summarize existing evidence in order to inform and situate the quantitative analysis of cross-national time series data and two in-depth qualitative case studies to be carried out as part of this research project. This review examines existing literature on inequality and intrastate conflict, the role of educational inequality in conflict settings, and the linkages between theories of conflict and the role of schools in society. The focus of the review is on inequalities between identity groups and subsequent intergroup violence, with a particular emphasis on research on social horizontal inequality.

There is evidence that societies with low overall access to education are more likely to experience conflict, and that schooling can both create inequalities as well as mitigate them. However, evidence that speaks to the effects of educational inequality on conflict or to the effects of the magnitude of educational inequality in a historical and cross-national perspective has been limited to date. We devoted particular attention to literature that builds on the conceptual framework developed by Stewart (2000) and reiterated by Brinkman, Attree and Hezir (2013) that distinguishes horizontal inequality from vertical inequality as a key driver of violent conflict and to studies exploring how education could fit into this framework.

The literature on inequality generally falls within relative deprivation theory, which posits that it is one's relative access to resources that generates grievances that could later escalate into conflict. In this framework, education can be seen as both a vehicle for deepening future economic and political inequality and a reflection of existing social inequality, in each case contributing to the formation of grievances. Schooling also plays a crucial role in shaping group identity, and a sense of the "other" with respect to individuals from other ethnic or religious groups, thereby fostering the potential for group mobilization in conflict situations.

Despite the intuitive appeal of relative deprivation theory, empirical evidence – particularly evidence originating in large-N quantitative studies – has found mixed support for the causal link between inequality, initially measured simply through the Gini coefficient of income distribution, and violent conflict. The emergence of horizontal inequality literature, where the subject of inquiry is inequality between groups rather than individuals, is in part a response to the mixed findings of previous studies. More often than not, the horizontal inequality literature has focused on measures of economic and political inequality. Studies focusing on horizontal educational inequality measuring disparities between identity groups have been limited, and, as this literature review shows, the findings so far have been modest and on the whole inconclusive. Metrics of educational inequality have been limited by data availability challenges, resulting in shorter time series and restricted geographic scope. This emerging evidence is in need of further corroboration and development, particularly through cross-national, historical perspectives.

Evidence on the peacebuilding role of education is even scarcer. This literature review presents some of the key contributions to the literature on education in post-conflict contexts and the important conceptual frameworks that position schooling as a key element of relief and reconstruction. However, this literature is primarily composed of advocacy and policy materials, and empirical research on the role of education in shaping positive peace (Galtung 1979) is confined mainly to ethnographic studies. After the seminal work of Bush and Saltarelli (2000), research on peacebuilding has been relatively limited. In the Smith, McCandless, Paulson, and Wheaton (2011) review completed for UNICEF, evidence on education policies

explicitly addressing inequality as a way of strengthening peace has been captured mostly in policy publications, rather than empirical research.

In sum, there is a clear need for continued research on the role of educational inequality as a driver of conflict, as well as the role of education in mitigating group divisions and providing a foundation for peace and stability after violence. In the next phase of this research project, EPDC will expand the scope of quantitative research on horizontal educational inequality and violent conflict between identity groups (i.e., ethnic and religious), examining nearly 100 countries over a period of 50 years. In addition, in collaboration with the University of Nairobi, EPDC will perform in-depth country-level studies of policies aimed at reducing inequality in the aftermath of violent conflict and contribute to the literature on the role of education in peacebuilding.

This literature review begins with a brief introduction that articulates the rationale for examining education as a contributing factor in conflict. We offer a brief overview of the general approach and methodology for selecting the studies for review. We then set the framework with theories of conflict, followed by a review of literature on group identity and its measurement in conflict literature, with a particular focus on horizontal inequality. Finally, we move into the discussion of the literature specifically on educational inequality, which is rather sparse, and discuss the studies and evidence to date. The literature review is supported by appendices that provide discussion on the methods used in quantitative studies of educational inequality and conflict, a list of inequality measures used in the literature, and reviews of the advantages and disadvantages of existing conflict and education databases.

Introduction

Ever since the first schools opened their doors, run by churches, mosques, synagogues, or village elders, education has formed the cornerstone of group identity and has defined a sense of belonging to a wider community than one's immediate family. Schools teach children who they are (and are not), their place in the world, and what actions are or aren't socially acceptable and defensible. Through curriculum choices, such as the promotion of certain historical narratives, and language of instruction policies, schooling both reflects and shapes identity politics. Education may instill a shared national identity, respect for diversity, or a sense of global citizenship (Reimers 2006). It can also be used to indoctrinate hatred or marginalize particular groups (Bush & Saltarelli 2000). Education is hence an inherently political process, molding the dynamics of inclusion and exclusion (Brown 2011). During the colonial era, education was often used to segregate elites from the masses, and education was a tool for creating groups with vastly different access to political power. Unequal access to quality education – or to schooling more broadly – is in most societies a path to disenfranchisement and marginalization, and even subservience.

Education is also an economic process, a way for nations to harness the creative and productive potential of their populations. In modern societies, education therefore exerts structural influence on access to opportunities. Theodore W. Shultz (1961) famously linked schooling to economic growth through his theory of human capital, forming an unshakable argument of education as a public good. More recently, Hanushek and Woessmann (2007) argued that higher average quality of learning outcomes was linked to subsequent economic growth. This ties education to labor opportunities and means that inequality in education leads to unequal opportunities in life, both for individuals and for groups, with profound consequences for the developmental paths of nations (Reimers 2000). Where unequal access to education means groups are denied skills relevant to the labor market and important to economic advancement, educational inequality may be grounds for social discontent.

It follows that *equity in education is the cornerstone of equality at large,* and one can form the hypothesis that societies with unequal access to education are more likely to witness grievances and social tension, which can spur violent conflict. Further, exclusion along group lines from educational opportunities could fuel *collective* discontent, leading to intergroup conflict. *To what extent are these hypotheses true?* Can a causal link be drawn from educational inequality and violence? Or is it purely economic and political reasons, regardless of schooling opportunity, that push individuals and groups to take to violence and turn against their compatriots? Finally, *if* there is a causal link, is there a direct relationship between the extent of inequality and the extent of violence?

These questions lie at the heart of this research project, funded by the UNICEF PBEA Programme, which seeks to establish the relationship between inequality in educational opportunity and the likelihood of violent conflict. This literature review is the first element in this research project and seeks to synthesize what is and is not known about the effects of unequal education on subsequent violent civil conflict, and identify the appropriate lenses, metrics, data sources, and enabling conditions to address in the quantitative analysis of cross-country time series data on educational inequality and conflict.

This literature review is structured as follows. We begin with a brief overview of the general approach and methodology for selecting the studies for review. We then set the framework with theories of conflict, followed by a review of literature on group identity and its measurement in conflict literature, with a particular focus on horizontal inequality. Finally, we move into the discussion of the literature specifically on education inequality, which is rather sparse, and discuss the studies and evidence to date. The literature review is supported by appendices that provide summaries of the methods of quantitative studies of

educational inequality and conflict and their strengths and weaknesses, a list of inequality measures used in the literature, and reviews of the advantages and disadvantages of existing databases.

Methodology

This review concentrates on literature that addresses the relationship of inequality to intrastate conflict; the role of educational inequality in conflict settings, and the linkages between theories of conflict and the role of schools in society. We devoted particular attention to literature that builds on the conceptual framework developed by Stewart (2000) and reiterated by Brinkman, Attree and Hezir (2013) that distinguishes horizontal inequality from vertical inequality as a key driver of violent conflict, and how education could fit into that framework.

In order to identify central debates and critical scholarship, we examined published literature reviews on themes of inequality, conflict, and education, including Brinkman, Attree and Hezir (2013), Brown (2011), Østby and Urdal (2010), and Østby (2013). Key titles from those reviews were supplemented with publications of key authors, organizations, and research networks examining the intersection between inequality and conflict (especially The CRISE Network and PRIO). We retrieved additional suggested texts from area experts, from INEE resources, and through searches conducted in ERIC and Google Scholar on key terms.

All titles and abstracts were compiled in a database and categorized according to their relevance to the following issues: debates about a) the centrality of inequality to conflict; b) the relationship of group diversity to education and conflict; c) education, group inequality, and conflict/peacebuilding; d) and measurement of conflict and inequality. While there is a rich qualitative literature on many of these topics, this review focuses specifically on dominant theoretical pieces and cross-national comparisons of conflicts occurring within countries. With exceptions for seminal research studies, quantitative pieces are from 2000 forward. We also exclude terrorism from our examination of intrastate conflict given that terrorism relies more heavily on ideology and individual commitment and is therefore top-heavy, requiring a different framework for analysis beyond the theories explored here.

Theories of Conflict

What causes violent conflict? Why is it that seemingly peaceful societies sometimes break into bloody and prolonged violence, while others grow and develop for decades without major outbreaks of tension? Political scientists have long grappled with this question, examining and parsing out wars and interethnic conflict, focusing on the needs, wants, grievances, and opportunities of the sides in each conflict, as well as the conditions that make violence more likely. Over the past several decades, the vast literature on the causes of civil war and intergroup violence generally fell along two major strands:

1) *Relative deprivation* theory, which posits that perceived relative welfare matters more than absolute welfare, and consequently, that social conflict may be motivated by the belief that one has received less than they are due (for theory origins see Gurr 1970 and Sambanis 2000).
2) *Economic opportunity cost* theories, which argue that the onset of violence depends on opportunities related to the economic, structural, and environmental conditions that make the success of violent uprising more likely and more remunerative than nonviolence (Hirschleifer 1995; Grossman 1991; Grossman 1999; Fearon and Laitin 2003; Collier and Hoeffler 2004). Economic

opportunity cost theories argue that inequality is pervasive, common in both peaceful and violent contexts, and therefore inadequate to explain intrastate warfare.

More recently, the relative deprivation versus opportunity cost debate has subsided, and scholars have begun to reconcile the theories, arguing that relative deprivation, group differences, and economic and political factors all influence the outbreak of violence (Stewart 2010). Indeed, even in their important foundational piece establishing opportunity cost as the root of conflict, Collier and Hoeffler (2004) acknowledge that grievance could explain some of the factors they attributed to opportunity cost explanations, as the two causes are difficult to disentangle. Other scholars have explicitly acknowledged the *complementarity* of the two theories, arguing that it is both relative deprivation, which provides impetus for violent change and strengthens group cohesion, as well as contextual factors (such as a weak state) that lower the opportunity cost of participating in an insurgency that lead to violence (Humphreys & ag Mohamed 2005; Ross 2005; Sambanis 2003).

Inequality is a central concept in relative deprivation theory, a source of grievance that motivates violence. However, despite the intuitive appeal of the relative deprivation argument, major quantitative studies *have failed to find strong support for inequality as a cause of conflict* (Fearon and Laitin 2003; Collier and Hoeffler 2004; Sambanis 2004). The rare exceptions include Alesina & Perotti (1996) who, in a cross sectional study of 71 developing countries from 1960-85, were able to show that income inequality fuels social discontent and increases political and social instability, in the worst cases resulting in rebellion. Very recently, a study by Bartusevicius (2014) also found support for social inequality as a predictor of broad popular rebellion (as distinguished from ethnic war). These studies used traditional inequality metrics, such as the Gini coefficient, and focused on income distribution across societies as a whole.

Concerns about correctly capturing the extent of inequality have led scholars to challenge the prevailing framework and search for stronger and more precise metrics of relative deprivation. A rich literature has developed that argues that previous studies found only a limited role for inequality in conflict because they measure inequality across all individuals in a country, while it must be examined between groups instead. As a result, the conflict literature in recent years has begun to distinguish *vertical inequality,* or the disparity in the distribution of resources *across individuals* "from 'top' to 'bottom'", and *horizontal inequality*, or inequality *between groups* drawn along social identity lines, such as religious, regional, ethnic, and gender (Stewart 2000). The argument advanced by the proponents of horizontal inequality is that it is the collective experience of inequality in access to resources, including education, that provides individuals with the agency to mobilize for violent action.

Role of Education in Conflict

Education plays a deeply complex role in igniting conflict and preserving peace, and conflict in turn impacts the educational opportunities available in a country. Research has established that low levels of education leave societies vulnerable to conflict, as demonstrated in Thyne (2006) who shows that more education in a society as a whole is associated with greater stability using UNESCO Institute for Statistics data on school enrollment rates and national spending on education. Research on subnational regions in Sub-Saharan Africa confirms this finding, reinforcing evidence that low absolute levels of education predict greater susceptibility to violence (Østby, Nordas, & Rød 2009). Moreover, research that recognizes males as more likely aggressors in conflict has examined the relationship of male education specifically to conflict. National-level analyses using attainment data from household surveys have concluded that population bulges of young males in conjunction with low secondary education increase conflict risk (Barakat and Urdal 2009). Using rates of secondary educational attainment among males as a proxy of opportunity cost

of violence, Collier and Hoeffler (2004) find support for their idea that where there are few options available in education and the job market, the risk of civil war is significantly greater.

Education is further implicated in conflict when school grounds become sites for rebel recruitment, when schools become targets of violence (as in the Srebrenica massacre in the Bosnian War and the Khmer Rouge violence in Cambodia), and when cultural opposition to dominant education practices precipitates violent retaliation (as with rebel opposition to girls' education in the recent abductions of schoolgirls in Nigeria and the attacks against girls' education committed by the Taliban) (Novelli & Smith). Yet the intersection of inequality, education, and conflict remains under-researched. Theory and qualitative evidence speak mainly to indirect roles for education in conflict: Educational inequality creates and maintains the broader socio-economic and political inequalities that may govern conflict dynamics (Brown 2011). Importantly, education systems are not only aggravators of inequality and conflict, they have equal potential to alleviate inequalities and provide a foundation for stability though policies that seek to reduce disparities (Bush & Saltarelli 2000).

Educational inequalities may occur through political mechanisms, in which education systematically discriminates against ethnic, religious, gender, and other groups (Smith 2010). Interrelated with these political factors are structural ones through which education helps determine economic opportunities (Heyneman 1991; Reimers 2006; Jacob & Holsinger 2008) and hence impacts economic inequalities along group lines. Indeed, education policies have profound political and economic implications for inequality. These policies range from inequitable financing of education across a nation to patterns in the quality of the teaching force, and from choices in the curriculum that privilege the historical narratives of some over others to amplified obstacles to school safety and access for girls.

One example of a policy with direct consequences on life opportunities is affirmative action in education, which may serve to decrease inequality where a group has been historically marginalized and improve human capital through access to education for a particular group. Yet these same policies may themselves be incendiary where they appear to benefit certain groups over others (Brown 2011), demonstrating that education has an important but complicated place in conflict dynamics, one that often intersects with other social domains.

Another fraught policy choice concerns decisions about language of instruction, which are implicitly value-laden in multilingual societies. In some contexts, schools promote a shared national language, while in others, they prioritize mother tongue instruction, at least in primary grades. Where mother tongue instruction improves minority access to and quality of schooling, it helps to reduce inequality. On the other hand, instruction in multiple languages reinforces group identity over a shared national identity (Tilly 1975; Anderson 1983), may deepen ethnic cleavages, and may be particularly inflammatory where students of different ethno-linguistic backgrounds attend the same school. Further, shared languages, economists argue, improve the economic efficiency of nations (Brown 2011) and the economic potential of individuals, who without strong knowledge of a national language may be disadvantaged later in life.[1] While bilingual programming that promotes a shared national language along with a local language may bridge these political and structural divides (Garcia 2009), such programs require investments in resources beyond the capabilities of many education systems.

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[1] These claims are supported by Montalvo & Reynal-Querol (2005b) and Alesina et al. (2003), who find that ethnic and linguistic fractionalization dampens economic growth.

These inequalities serve to enhance both grievance and opportunities for rebellion through the enhancement of group cohesion. This idea is explored in the next section, where we further discuss the concept of *group identity* and its connection to conflict, given its importance in the horizontal inequality literature at large, as well as in literature on the role of education in conflict.

Group Identity and Conflict

One does not need to be a political scientist to recognize the significance of ethnicity and religion to many of the world's conflicts throughout human history. By definition, civil war presumes the presence of identity groups below the level of the nation-state capable of mobilizing for violent action in order to achieve their goals. Ethnic and religious groups, in particular, are a frequent subject of research on civil war, because social markers – such as a shared religion, language, or a narrative of common ancestry – create a foundation for in-group/out-group juxtaposition. The presence of strong social identification, largely formed through formal or informal schooling, is the first step to the perception of collective deprivation in access to economic and political opportunities, where, as discussed earlier, education also plays a crucial role. Resulting grievances stemming from relative deprivation can both provide a motive for conflict and enhance social cohesion, facilitating collective action against the state or other actors (Fearon & Laitin 1996). Given the importance of group identification to conflict dynamics, it is imperative to further examine the concept of group identity and the role of education in identity formation.

A growing number of scholars acknowledge that while ethnic identity starts from a certain innate core, its social importance varies across contexts and may not be relevant if individuals identify strongly with the nation at large (Sambanis & Shayo 2013). Today, the *primordialist* view of ethnicity as a fixed concept has largely given way to *constructivist* theories, which see group identity as complex, multidimensional, and fluid. Constructivist theories argue that identities shift over time and evolve with changes in social contexts (Laitin 1998; Wodak, de Cillia, Reisigl & Liebhart 1999; Pavlenko & Blackledge 2004). The role of schooling in molding identities is particularly central during the process of nation-building: Darden (2011) finds that schooling was the main mechanism through which modern European national identities were formed within remote mountainous settlements of the Alps in 19th century, while Darden and Grzymala-Busse (2006) describe a similar process in the Soviet Union, starting from the mass literacy campaign of the early 1930's.

Despite constructivist emphasis on the malleability of identity, the durable nature of ethnic identity (Caselli & Coleman 2006) continues to attract political sociologists and conflict theorists, who use fixed and mutually exclusive measures of group belonging (e.g., ethnicity) alongside constructivist notions of group formation (Brown & Langer 2010). Scholars have begun to quantify group-level differences and to position group-level dynamics in access to economic, political, and social resources as the central focus in the study of intrastate violence. This literature generally employs two lenses in looking at group dynamics: *group diversity*, or the breadth of the number of groups, and *group inequality*, or the extent to which groups differ in their level of access to a particular type of resources. Both of these sets of measures would be well placed in studies of the effect of ethnic cleavages on conflict, and measures of educational inequality must be complemented by measures of group diversity as an enabling or mitigating condition. We examine the key contributions to the literature on each dimension below.

Group Diversity

In measuring group diversity, one seeks to know whether greater diversity is associated with greater likelihood of conflict – or if, in fact, high diversity predicts peace. Taking the diversity metric to the study

of education inequality as a predictor of conflict, one might ask, is education inequality more likely to result in conflict in contexts with relatively few groups or in highly diverse societies?

Initially, a series of seminal studies examining measures of ethnic fractionalization did not show strong findings linking high diversity with the likelihood of civil conflict (Collier & Hoeffler 2004; Fearon & Laitin 2003).[2] More recently, however, other scholars have been able to find some support for the idea that patterns of group diversity are related to incidences of conflict. In an influential empirical study, Montalvo and Reynal-Querol (2005a) operationalize Horowitz's (1985) theory that conflict is more likely in nations with large ethnic majorities *and* large ethnic minorities (i.e., higher *polarization*) and less likely in both nearly homogenous populations (ethnic *dominance*) and highly diverse populations (ethnic *fractionalization*) (Table 1). With an extensive cross national and historical dataset, Montalvo and Reynal-Querol (2005a) find robust support that greater polarization increases susceptibility to civil war but find no role for fractionalization in conflict.

Table 1. Measures of group diversity used in conflict research

Type of Group Diversity Measure	Description of Type of Measure	Evidence in Support of Measure
Fractionalization	Fractionalization is often measured as the probability that any two individuals from a country belong to the same group. Fractionalization is high in diverse societies and low in homogenous societies. The theory behind the use of fractionalization indices in conflict research is that homogenous societies will be less conflict prone than more diverse societies.	Sambanis (2001) finds that ethnic diversity matters in the context of ethnic wars. Esteban, Mayoral, and Ray (2012) note that higher fractionalization is linked to conflict in their study of 138 countries from 1960-2008. Collier and Hoeffler (2004) and Fearon and Laitin (2003) do not observe a significant role for fractionalization in civil wars. Collier (2001) shows that higher ethnic fractionalization is associated with more peace.
Ethnic dominance	Ethnic dominance implies the presence of a large majority group in a country. Horowitz (1985) suggests that the presence of a large ethnic majority makes societies more conflict prone. A large group is generally conceived of as one with between 45 and 90 percent of the population.	Collier (2001) finds that ethnic dominance increases the risk of civil war.

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[2] Sambanis (2001) did find that ethnic diversity matters specifically for wars that could be considered ethnic wars.

Type of Group Diversity Measure	Description of Type of Measure	Evidence in Support of Measure
Polarization	Theories on polarization, like ethnic dominance, recognize that large majorities are important but add that the presence of a large minority makes a country more conflict prone (Montalvo & Reynal-Querol 2005a). Polarization is highest when a country is composed of two groups of equal size. Esteban and Ray (2005) move beyond this purely demographic measure of polarization and construct a measure of social polarization, operationalized as linguistic similarity/difference in Esteban, Mayoral, & Ray (2012).	Montalvo & Reynal-Querol (2005a) find that greater polarization is associated with conflict. Esteban and Ray (2012) show that polarization is linked to greater conflict risk. Østby (2008a) does not find ethnic polarization significant in her model of ethnic conflict.

Some scholars contend that the degree of *social distance* between groups determines the relevance of diversity to conflict. Where cultural or linguistic differences are more pronounced, it is easier to define group belonging, thus enhancing cohesion *within* groups and distance *between* groups, ultimately facilitating greater opportunity for conflict. Esteban, Mayoral, and Ray (2012) find that varied measures of ethnic diversity predict conflict, and their findings are particularly strong for a measure of polarization that captures both the relative size of groups and differences in group preferences (measured as linguistic difference between groups).[3] Additional support comes from Neuberg et al. (2014), who conceptualized religious *infusion* as a predictor of violence, focusing on the visibility of religious markers. However, the measure of infusion in the study is based on an expert survey and hence its reliability is difficult to ascertain.

Education systems must manage diversity, and how they do so has ramifications for inequality as well as for peace and conflict dynamics. Schools not only teach students who they are and are not but how to value those differences. Curricula, particularly curricula with explicit peacebuilding emphasis, may instill tolerance for differences (Bush & Saltarelli 2000; Smith 2010). Education is likely to be more controversial, and potentially more incendiary, in highly polarized societies since educational policies can be more easily perceived as advantageous to one group over another (Brown 2011).

In sum, group identity and group diversity matter to the study of conflict as well as to the study of inequality as a cause of violence. This has implications for the study of education inequality, as schooling contributes to the shaping of group identity, and is one of the social domains where group diversity can be particularly visible. Therefore, studies of intergroup inequality must take into account both high polarization and high fractionalization, and examine the intersection between the depth of inequality and the pattern of diversity.

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[3] Brown & Langer (2010) usefully distinguish between the *demographic* polarization measure in Montalvo & Reynal-Querol (2005a) and measures of *economic* polarization from Esteban & Ray (1994), which are effectively measures of group inequality and demographic polarization. However, we reference the Esteban, Mayoral, and Ray (2012), even though it draws on some of their earlier conceptualizations of diversity measures, because the authors deliberately focus only on demographic measures, population and linguistic differences.

Group Inequality and Conflict

Research on horizontal inequality posits that people are more aware of their relative welfare than their absolute welfare, and where a group of individuals is unsatisfied by its collective relative welfare, their group grievances can translate into conflict. Inequality, especially when groups recognize it as the product of unequal and unfair systems, breeds sufficient resentment for groups to resort to violence, whether they are relatively disadvantaged and seek to correct their position, or relatively advantaged and seek to preserve their status and access to resources. Indeed, Stewart (2010) argues that even relatively well-off groups may be motivated to take to violence in situations where states redistribute resources to which those groups feel entitled (e.g., school integration provoking backlash among whites in the Southern United States in the 1960's).

While there is no single way to measure horizontal inequality, several approaches are briefly summarized in Table 2, with additional information in the Measurement section. As Table 2 shows, measures of inequality are linked with measures of diversity, with the focus on disparity in access to resources captured across all groups, between the two largest or most different groups, and between the group and the nation as a whole.

Table 2. Measures of group inequality and supporting evidence

Type of Group Inequality	Definition of Inequality Measure	Research Evidence
Horizontal (between group) inequality	Studies of horizontal inequality aim to capture a sense of how unequal a society is and therefore measure the level of inequality among *all groups* in a country (Stewart, Brown, & Mancini 2010).	• Huber and Mayoral (2013) examine economic horizontal inequality, but do not find it significantly related to conflict in their study of 89 countries from 1992-1998. • In the context of Indonesia, Østby (2014) finds a measure of horizontal inequality between religious groups predicts violence *only* where provinces have experienced dramatic population growth.
	Other studies measure horizontal inequalities between *two groups* only, based on criteria such as size or linguistic difference. Studies using these measures assume that some groups are more conflict prone than others.	• Østby (2007) finds that horizontal social (educational) and economic inequality between religious, ethnic, and subnational groups predicts conflict, and that horizontal inequalities make violence particularly likely in 55 developing countries. • Østby (2008a) examines horizontal inequalities between ethnic groups and finds that elevated social and economic horizontal inequalities make societies more vulnerable to conflict in 36 developing countries.
	A third category of measure examines relative deprivation *between a group and the nation* and is often adopted by disaggregated studies of conflict.	• In their global study of ethnonationalist civil war, Cederman, Weidmann, and Gleditsch (2011) find that relatively rich and poor ethnic groups are more likely to be involved in conflict. • Østby et al. (2009) observe that relative economic deprivation increases the likelihood of civil war in

Type of Group Inequality	Definition of Inequality Measure	Research Evidence
		regions of Sub-Saharan Africa, especially in regions with natural resources wealth (oil or diamonds). • In a study of mostly developed nations, Brown (2010) finds that secessionist conflict is more likely where there are greater economic horizontal inequalities between primary administrative units and the national average. Both relatively disadvantaged and advantaged regions are more conflict prone. • Buhaug, Cederman, and Gleditsch (2014) find that countries with relatively poor ethnic groups are more likely to engage in civil wars in general, and ethnic territorial wars in particular. • Fjelde and Østby (2012) find modest support that horizontal inequalities – both economic and educational – increase the likelihood of non-state conflict in Sub-Saharan Africa.
Intragroup inequality	Recognizing that group dynamics are key to understanding conflict, some studies look at inequality *within groups*. According to Esteban and Ray (2005), strong in-group inequality is essential to conflict, which requires the capital of the relatively advantaged and the labor potential of the relatively disadvantaged.	• Huber and Mayoral (2013) conduct country and group-level analyses of economic inequalities and find that within-group measures of inequality had stronger effects than between-group inequality in their study of 89 countries • Østby et al. (2009) find that greater social and economic inequality within subnational units is linked to greater prevalence of civil war in Sub-Saharan Africa. • Fjelde and Østby (2012) find that socio-economic inequality within Sub-Saharan African regions increases the risk of non-state conflict.

Of the different dimensions of horizontal inequalities articulated by Stewart (2000), empirical research has devoted the greatest attention to economic and political inequality. Cross-national studies have found some – albeit usually modest and not always robust – evidence that horizontal inequalities in wealth and politics are related to civil war, as documented in Table 2. Nevertheless, the limited existing support suggests that horizontal inequality measures generally outperform vertical measures (Cederman, Weidmann, & Gleditsch 2011, Østby 2008a; Buhaug, Cederman, & Gleditsch 2014), though recent studies have found some support for vertical inequalities in the context of non-ethnic conflicts (Bartusevicius 2014) and in disaggregated studies (Østby et al. 2009; Østby & Fjelde 2012; Østby et al. 2009).

Relative deprivation theories contend that disadvantage motivates conflict, but horizontal inequality theory adds that relatively advantaged groups may turn to violence to preserve their advantage, bolstered by their greater resources for rebellion. Some evidence has emerged supporting the notion that both relatively well-off and relatively disadvantaged groups are associated with violence in ethnic civil war (Kuhn & Weidmann 2013), in secessionist warfare (Brown 2010), and in ethnonationalist civil war (Cederman, Weidmann, & Gleditsch 2011).

Horizontal inequality is sometimes juxtaposed with *intragroup inequality*, an alternative way of conceptualizing the role of group identity in conflict via what is essentially a vertical inequality measure, but disaggregated to a lower level. While horizontal inequality theory focuses on between-group inequality, its main proponents acknowledge that intragroup inequality may also play a role in conflict (Stewart 2000). According to Esteban and Ray (2005), the presence of relatively well-off individuals within the group who have the necessary capital for group mobilization and relatively disadvantaged individuals in the same group who provide labor predicts group engagement in violence. Alternatively, Stewart (2000) suggests that grievance stemming from inequality in situations of high intragroup disparity can be re-directed by group elites towards external targets. In another example of a comparison of between- and within-group inequality, Huber and Mayoral (2014) find that within-group economic inequality has somewhat higher effect on conflict likelihood.

The evidence on intragroup inequality lends support to opportunity cost theories of conflict: vertical inequality within groups facilitates mobilization. Yet opportunity alone is increasingly considered an important but insufficient condition for rebellion (Cederman, Gleditsch & Buhaug 2013), as the deterioration of the greed/grievance dichotomy over the past decade underscores. While intragroup inequality may provide the *means* for conflict, group grievance contributes critical *motivation* for violence (Østby 2013), validating a focus on horizontal inequalities despite comparatively modest findings thus far.

Horizontal Inequality in Education

Research on horizontal inequality in education as a predictor of conflict is relatively limited, due largely to data availability challenges. We discuss the findings of these studies below, and Appendix A provides technical commentary on the methodologies and magnitude of findings from these studies. *Using a vertical measure,* Bartusevicius (2014) finds that greater inequality in educational attainment is associated with higher risk of popular rebellion. Yet Bartusevicius argues that *inequality between groups* (social classes in the case of rebellion) is fundamental to understanding conflict and that his vertical measure is intended as a "*proxy* of the inequality between conflicting parties" (p. 38). While horizontal inequality theory emphasizes cleavages between identity-based groups (that is, cultural groups rather than social classes), Bartusevicius's reasoning on the salience of social class echoes the logic of horizontal inequality theory, and he conceives of social class as an identity-based group with characteristics similar to other social groups, specifically ethnic groups.

Expanding on the relationship of different inequality measures, Stewart notes that the concepts of vertical and horizontal inequality overlap, since "any overall measure of societal inequality of income distribution (like the Gini or the Theil coefficients as vertical measures) can be decomposed into the weighted sum of two elements—inter-group inequality and intra-group inequality" (2000, p. 253). Like Bartusevicius (2014), the concept of vertical inequality as a proxy for horizontal inequality appears in Besançon (2005), who uses inequality in education as a measure of human capital, and finds that greater educational inequality increases the magnitude of conflict in ethnic wars and genocides but not revolutions. Following Castello and Domenech (2002), Besançon proposes that the human capital index approximates horizontal inequality and provisionally suggests that social inequalities between ethnic groups increase the likelihood of ethnic wars.

Education inequality between ethnic and religious groups

Of the few cross-national studies examining education as an element of horizontal inequalities, modest evidence has emerged that inequality between ethnic and religious groups in educational attainment, as a

measure of socioeconomic well-being, is associated with greater conflict risk, mostly from Østby (2007, 2008a, 2008b) and Fjelde and Østby (2012). However, these studies have been limited in geographical and temporal scope with few data points before 1986 and outside the developing world; they have drawn mainly on household survey data, and have suffered from low statistical power due to reliance on small-n micro-datasets. In one of the foundational studies of social (educational) horizontal inequalities, Østby (2007; 2008b) used DHS surveys from 55 developing countries during the period of 1986-2003, and found statistically significant positive relationships between horizontal inequalities in household wealth and education between both religious and ethnic groups and conflict, using the two largest groups in each country. However, the effect of horizontal inequality did not hold when inequality between groups was considered through an alternative horizontal inequality measure (the group-based coefficient of variance).

In these studies, Østby (2007, 2008a, 2008b) focuses on the role of horizontal inequality in civil wars, i.e., political violence against the state, whereas Fjelde and Østby (2012) examine non-state conflict, i.e., violence in which the government is not a direct actor. Although measures of horizontal educational inequality perform modestly for both types of conflict, the theoretical role of education varies. In the studies of civil war, education is a gauge of social welfare with the assumption that inequality between groups in education or other public services may indicate systematic discrimination by the government. In this conceptualization, social inequalities "perpetuate material disadvantages of certain groups" and therefore reinforce economic disenfranchisement (Østby 2008a, p. 148). Besançon (2005) also recognizes interconnections between social and economic inequality, but argues that greater *social (educational) inequality* (providing stronger grievance) in conjunction with greater *economic equality* (affording similar resources to finance rebellion) increases the likelihood of ethnic civil war. In the Fjelde and Østby (2012) study of non-state conflict, education proxies economic welfare directly, and the rationale for focusing on non-state conflict is anchored in economic arguments and immediacy of payoffs: "In the face of wealth disparities, groups can use violence to capture assets controlled by other groups in a direct attempt to shift the distribution of resources in their own favor" (p. 7). While measurement of economic well-being through education as a proxy is a well-established practice (e.g., Østby 2007, 2008a, 2008b; Fjelde and Østby 2012), research interested in the role of education *per se* as a public or quasi-public good and a driver of inequality (or greater equality) also has a strong theoretical foundation in literature examining political conflict (Brown 2010; Østby and Urdal 2010; Bush and Saltarelli 2000).

Gender inequality in education

Studies looking at educational inequality between males and females conclude that greater equality reduces conflict risk and promotes peace (Bussman 2007; Melander 2005). Bussman (2007), who examines civil war onset, is interested in gender equality in society generally, and sees greater equality in education as a means to greater participation of women in public and economic domains. Greater equality, in turn, is linked to peace through direct mechanisms (men are more prone to aggression than women and greater participation of women in all social domains is associated with peace) and indirect mechanisms (gender equality indicates greater democracy and economic and social welfare). Melander (2005) is more concerned with how gender equality impacts the *magnitude of violence* in civil conflict, but, like Bussman (2007), is also interested in what educational equality (in higher education) says about the relative status of women in a society. Melander (2005) finds evidence for the idea that women manifest more peaceful behavior than men, and, therefore, that allotting them a greater political role enhances peace. However, the author acknowledges that greater gender equality may also indicate greater social tolerance across other social borders, like ethnicity or political orientation.

Studies using non-educational measures have argued that greater gender equality is associated with lower likelihood of violent conflict, as in Caprioli (2005), who used fertility rates and female workforce participation as two proxies of gender discrimination. However, while high fertility is indeed damaging to women's health and their ability to be active in political life, it may also serve as a proxy for factors beyond gender discrimination, such as population density, youth bulge, and overall economic opportunity. Carpenter (2006) calls attention to the idea that gender norms in conflict settings that have an outsize effect on boys, highlighting that boys are more likely to be forced to serve in militias, may experience sexual violence, and may be more heavily targeted in massacres. These pieces speak to the importance of having direct metrics of gender inequality in education, and expanding research on the relationships between gender discrimination and violence against girls and women in education and violence in society at large. The role of education in reflecting and producing unequal gender norms and condoning gender-based violence within schools warrants attention in the context of conflict and civil violence studies (Brinkman, Attree & Hezir 2013).

Subnational inequality in education

While much group-level conflict research has defined groups based on their *social* identification (e.g., ethnic, religious), a number of studies have examined intergroup inequality at the *subnational* level (Brown 2009; Brown 2010; Bakke & Wibbels 2006). Some of these studies have examined horizontal educational inequalities along subnational lines (e.g., Østby 2007; Østby et al. 2009; Murshed & Gates 2005). While Østby (2007) finds horizontal inequalities between regions increase the likelihood of civil war and do so somewhat more than inequalities between ethnic and religious groups, the findings from Østby et al. (2009) are inconclusive, possibly as a result of being geographically confined to 22 Sub-Saharan African countries. In the context of Nepal, Mushed and Gates (2005) find that lower gaps in schooling between districts and Kathmandu (in other words, raising district levels of education) predicts lower *severity* of violent conflict, measured by the number of fatalities.

Regional identification differs to some extent from the culturally-driven categories of social identification. Regional identification *can* be a source of group cohesion, especially in federations. Even where regional affiliation is not central to social identity, administrative units are key to the flow of governmental resources and policy from the center to the periphery, potentially involving redistribution of natural resource wealth or the promotion of certain cultural ideas (Østby et al. 2009), including educational resources and policies, such as language of instruction policies or decisions about the content of curriculum, that may exacerbate (or reduce) regional or group inequality. Decentralized education systems allow greater local determinations about what is important in education and therefore may play a role in reducing inequality, except where lack of central oversight and funding leads to increasing inequality between administrative units (Smith 2010).

Research must carefully consider the relationship of subnational borders to patterns of diversity, especially where borders are fixed in relation to ethnic groups. Langer and Stewart (2013) contend that where ethnic and regional borders coincide, violence is particularly likely. Another consideration is in many postcolonial settings, where borders were often deliberately drawn *through* groups during colonial rule (Brown & Langer 2010).

Effects of conflict on education

While this literature review focuses on the relationship between education inequality and conflict, it is important to recognize the potential reciprocal effect of intrastate violence on subsequent educational

inequality. There is abundant evidence showing that conflict damages educational infrastructure, the capacity of the state to deliver services, and inhibits educational attainment (Justino 2011; Smith 2010; UNESCO 2011). So far, few studies have considered its effect on educational inequality, and the findings have been unclear on whether conflict exacerbates or mitigates educational disparities, (e.g., Østby & Urdal 2014, which looks at Sub-Saharan Africa, and Gates et al. (2010) which focuses on the effect of conflict on the Millennium Development Goals). To some extent, the lack of findings may be explained by the weaknesses of the underlying data, as is the case with Østby and Urdal (2014), where information on conflict occurring in a given region in the mid-1990's is used as a predictor of inequality in that region in 2007-2008, using only women's data disaggregated by religion. In sum, insights into the effects of conflict on educational inequality at the international level are murky at best, yet there seems to be consensus that conflict is disruptive and, consequently, that violence may cause important changes in an educational landscape. Therefore, controls for prior violence are crucial in the study of group inequality as a cause of conflict.

Enabling Conditions for Violent Conflict

It has long been established that it is not one single condition but rather a combination of factors that result in outbreaks of violence. While the root causes of violence may lie in horizontal inequalities in access to resources, such as education, the presence of inequality per se is not itself a sufficient condition for conflict. Indeed, some level of inequality is common to any society, and yet it is at particular points in history or in a given geographic locality that it translates into violence.

Research has examined specific conditions that increase the likelihood of horizontal inequality to escalate into deep grievances and slide into violence. A number of contextual factors, shown to contribute to likelihood of violence in prior studies, are routinely accounted for by social scientists exploring the effects of their hypotheses. Such common controls include overall country wealth, measured by GDP per capita and/or proportion of natural resource wealth, demographic factors such as population size and density (Montalvo & Reynal-Querol 2005a, Østby 2008a, Bartusevicius 2014), and youth bulges (Barakat & Urdal 2009), and prior occurrence of conflict. Additional measures, established by such seminal titles as Fearon & Laitin (2003), include mountainous terrain, shown to predict higher levels of insurgency, as well as weak or unstable government, proxied through a variety of measures, and a political regime that is neither democratic nor autocratic (*anocracy*).

The inclusion of many of the control factors, or enabling conditions, in the analyses of inequality as a cause of conflict underscore the intersection between a) relative deprivation theory, which supports the argument that individuals and groups are more likely to engage in violent uprising when they realize their relative social or economic position and develop grievances against those with greater access to resources, and b) economic opportunity cost theory, which posits that violence is more likely when the costs of engaging in violence are lower than the costs of remaining peaceful. Weak economic development, proxied through GDP per capita, combined with weak political regimes where law is poorly enforced, lower the opportunity costs of joining armed groups and thereby facilitate the translation of group-level grievances into violent action (Collier & Hoeffler 2004). Mountainous terrain makes insurgency less costly and therefore also contributes to the likelihood that relative deprivation results in the growth of militarized groups. Similarly, low access to primary and secondary education in society as a whole reduces the potential for economic productivity and hence may broaden recruitment opportunities for insurgency.

The influence of a natural resource wealth is also often controlled for in studies of conflict, albeit with mixed conclusions. Collier and Hoeffler (2004) find that while natural resources are associated with higher conflict incidence, the relationship is complex: Natural resources also increase the economic well-being of the state, and hence, serve to strengthen state power to crack down on insurgency. By contrast, Fearon and Laitin (2003) contend that oil-dependent economies have weaker state apparatuses as well present a higher potential "prize" in civil conflict, thus contributing to the likelihood of civil war. Ndikumana and Emizet (2005), examining the case of the Democratic Republic of the Congo, conclude that is it is not dependency on natural resources per se, but unequal distribution of these resources across groups that fuels discontent and subsequent intergroup violence. Hence, the presence of abundant natural resources may exacerbate social inequality and an important condition to account for in analyses of educational inequality as a cause of violence.

Østby (2007, 2008b) finds a significant interaction effect between (de facto) political exclusion and horizontal (asset) inequalities in regions (between the capital region and other regions). The study also finds some support for a possible interaction between regional educational horizontal inequalities and regime type and electoral system, observing more conflict in democratic regimes and where there are inclusive electoral systems). Brown (2010) finds support for an interaction between ethnic diversity and fiscal decentralization, but only in situations of very dramatic ethnoreligious inequality does fiscal decentralization dampen the likelihood of secession. Additionally, Cederman, Gleditsch, and Buhaug (2013) find that groups with greater political horizontal inequalities are more likely to turn to conflict if they have recently lost power or are discriminated against.

In studies of education inequality as a predictor of conflict, patterns of group diversity may also act as enabling or mitigating conditions. If it is indeed true that highly *polarized* societies make group differences easier to observe, this would act as a powerful enabler, magnifying the effects of inequality across all dimensions. By contrast, in highly fractionalized societies, the likelihood of intergroup conflict may be dampened if the variability in access to resources is spread out across all groups.

In sum, in examining the effects of horizontal inequality in education on violent conflict, it is important to account for the variability in context and history, and account for factors that are likely to contribute to intergroup conflict. Furthermore, the interplay between inequality and diversity, as well as between inequality and economic opportunity cost, makes a strong case for explicitly controlling for interactions between horizontal inequality in education measures and measures of enabling conditions. The studies that will be part of this research project will control for the key enabling conditions that emerged from the literature disussed above and will explore interactions between these conditions and educational inequality.

Peacebuilding

The literature on peacebuilding, in general, and on the peacebuilding role of education is largely one of theory and advocacy rather than research. In an important theoretical piece that attempts to expand conceptualizations of peace and peacebuilding, Galtung proposed a focus on *positive peace*, which involves addressing differentials in power and systematic disadvantage involved with the causes of conflict (1979). The notion of positive peace resonates with theories that see inequality, and structural inequality along group lines in particular, as a driver of conflict. In a seminal UNICEF publication, Bush and Saltarelli (2000) present a theoretical framework that describes the dual role that schooling can play in exacerbating or alleviating the tensions that lead to conflict, outlining some of the structural means through which education promotes peace. Many of the roles that the authors identify for education in peacebuilding mirror

the ways that education increases inequality in conflict, including through language of instruction policies and the influence of schools play on the formation of identity.

Educational policies with peacebuilding potential often aim to improve school *access*, especially for disadvantaged groups. Examples include the elimination of school fees, rebuilding and/or improving the educational infrastructure, or ensuring that schools support the linguistic diversity of their students (as discussed in a review of literature by Smith et al. 2011). In contexts with few female teachers, recruiting women into the teaching force may make schools safer spaces and attract stronger enrollment for girls (Nicolai 2009).

Many peacebuilding initiatives also seek to transform the *quality* of schooling and, in doing so, acknowledge that post-conflict educational environments must address unique issues that result from violence, including students and teachers traumatized by conflict, devastation of resources – possibly including schools, population shifts caused by forced migration, and reduction of the teaching force (Nicolai 2009). Kirk (2008) indicates that the situation for girls may be particularly impacted by conflict due to increased risk from sexual and gender based violence, while Carpenter (2006) urges attention to gendered effects from violence on boys as well as girls, noting that boys may be impacted by sexual violence, are more likely to be recruited against their will, and may be more likely targets in massacres. To address these changed environments, the peacebuilding literature advocates development of conflict-sensitive curricula that, at a minimum, 'do no harm' and do not increase inequality or discrimination, and, ideally, help reduce inequality and group tensions (UNESCO 2011). Davies and Bentrovato suggest that curricula should promote a shared national identity while simultaneously valuing diversity, and that alone either may be inflammatory (2011). As presented in the Smith et al. review, teacher quality and investment in teachers is an important theme in peacebuilding literature, including sensitizing teachers to their own social and political values, improving teacher pay in order to attract more qualified and motivated teachers, and providing incentives and support for qualified teachers to teach in underserved and disadvantaged areas (2011).

Davies and Bentrovato (2011) observe a tension between investments in educational access and quality in fragile contexts. In countries with limited resources and low overall school access, priority is often given to increasing enrollments. Yet much peacebuilding literature goes beyond access to suggest that quality of education, curricula, and teachers matters in reducing inequality and improving group relations. Such resource-related issues make improved financing of education an important factor in peacebuilding. In the context of Liberia, Blattman, Hartman, and Blair (2011) similarly note that peacebuilding education programs may be too expensive in contexts with limited budgets and note that peacebuilding programs sometimes carry risk: Programs that invite discussion of underlying tensions must do so cautiously as such issues are sensitive and can re-inflame grievances.

In sum, the role of education in peacebuilding resonates with the themes articulated in the literature on conflict. At the same time, the massive disruptions caused by conflict create additional dimensions to issues of inequality and group relations that peacebuilding initiatives must consider. While disruption may make space for positive change, creating an opening to redress inequalities and group tensions, it also means education must operate in contexts where individuals and society are deeply vulnerable (Nicolai 2009).

Measurement

The modest findings from the literature on educational inequality and conflict must be understood in conjunction with the measurement challenges that these studies face. Measurement involves many

complexities that require review, including a lack of consensus on the measurement of key concepts – group identity, education, inequality, and conflict – and data availability challenges that result in shorter time series and restricted geographic scope. Below, we briefly address measures that have been used in the literature while Appendix C offers a list of education and conflict databases and their advantages and disadvantages.

Measures of group identity

Despite their dominance in the study of ethnicity, constructivist notions of identity are at odds with the treatment of ethnicity in much of the conflict literature (Brown & Langer 2010; Kalyvas 2008; Sambanis & Shayo 2013). As Brown and Langer explain, "…quantitative studies of ethnic diversity are inherently problematic because they require the reduction of ethnicity into exhaustive and mutually exclusive groups (something sophisticated theories of ethnicity militate against)" (2010, p. 415). The authors argue that ethnicity can still be a useful empirical measure, but that researchers must acknowledge the primordialist assumptions implicit in variables based on fixed group categories and that ethnicity should be conceptualized as a measure of social distance or diversity, like gender, religion, or caste.

In time series analyses, groups are seen as invariant. However the breadth of data on ethnic and religious groups is inherently dependent on the researcher's notion of what is and is not a group worthy of inclusion in a demographic data collection instrument. Furthermore, much of the ethnicity and religion information originates in surveys and census data, and hence may carry a degree of noise, given that both religion and ethnicity are self-reported. Nonetheless, the lack of data that captures overlapping group membership (as opposed to mutually exclusive group membership) at this time leaves little space for testing constructivist notions of group identity in large-N studies. Research can, however, account for the presence of ethnic diversity, and – using a limited number of data sources – capture the extent of ethnic intermingling, such as mixed ethnicity and mixed religion households and/ or communities.

Measures of education

While the availability of education data has grown dramatically over the past two decades, finding strong measures of education for research into educational inequality continues to pose a challenge, particularly in studies taking a longer historical view. Measures of educational access are most available, with gross and net enrollment rates stretching as far back as the 1970's in official sources (such as the UIS Data Centre). However, while gender disaggregation is often available from national-level data, participation levels by ethnicity, religion, or subnational levels are generally not published. Further, the coverage of school participation data is scarce for lower income countries, and reliability of official data has sometimes been called into question (Heyneman 2001, EPDC 2013).

In historical time series, studies mostly rely on school attainment as a measure of educational disparity, often translating the metric into years of schooling completed (Barro & Lee 2010; Bartusevicius 2014) or using the proportions of populations or groups that have attained a certain schooling level (Collier & Hoeffler 2004, Barakat & Urdal 2009). While the first metric carries the benefit of simplicity and comparability, the second metric captures the more meaningful dynamic – the presence of a given school credential in the population as a whole, which has direct relevance for policy makers, educators and society at large, regardless of cross-country differences in how long it takes to accomplish each level.

Unfortunately, data on quality of education (quality of inputs or quality of learning outcomes), although potentially consequential for educational inequality and inequality later in life, are particularly scarce,

especially in historical and cross-national perspective. While education economists have attempted to construct time series measures of learning outcomes (Hanushek & Woessmann 2007), the reliability of the metrics and their geographic scope are limited, and they are generally unavailable at the group-level. Similarly, reliable data on education resources is generally limited to the past decade, making it difficult to examine the role of education funding in creating and exacerbating inequality in historical and cross-national perspective. However, the role of education resource allocation across subnational units can and should be examined at the country level, as a way of gauging educational inequality and predicting future group-level grievances with the potential of sliding into conflict.

Measures of inequality

While in traditional vertical inequality research, the Gini coefficient is by far the prevailing metric, horizontal inequality studies have struggled to come up with a single measure consistently used across all research. Choices have been made regarding disparity across *two major groups* or disparity across *all groups* captured in society. Measures that capture disparity between *two major groups* include *ratio-based* measures, where the group with the highest access to resources is compared with the group using the lowest amount of resources. An alternative use of ratios is the ratio between a given group value of resources *and the national population average*, in essence measuring the level of marginalization of that particular group. Measures that account for *variability across all groups* include simple measures of variance, such as standard deviation, coefficient of variability (standard deviation divided by the mean), and range (distance between the highest and lowest value), as well as the Gini coefficient initially used in economic literature.

In a growing number of analyses, measures of inequality account for both *the extent of variability* across groups in access to resources *as well as the weight of the population subgroups*. This means that one is no longer simply interested in how unequal groups are on a given parameter, but whether smaller groups are more disadvantaged than larger groups, and vice versa. In these examples, the essential measures of inequality described above are weighted by a population weight. Appendix B presents a comprehensive list of measures found in studies of inequality. In their original contexts, many of these measures were used to consider inequality in wealth or political power but they can be applied to different dimensions of inequality, including educational inequality.

The choice of inequality measure has proven consequential for the results of different studies, which underscores the complexity of research into horizontal inequality and conflict. It is evident that inequality is multifaceted and the relative disadvantage captured in one measure may not show up in another measure. While no clear metric for inequality has emerged from the literature, in their analyses of horizontal inequality measures, Mancini, Stewart, and Brown (2008) and Stewart, Brown, and Mancini (2010, 2005) favor the group Gini, the group-based coefficient of variance, and the GTHEIL, all of which can be population-weighted. The cross-national quantitative PBEA study that will be carried out will employ multiple measures of horizontal inequality, documenting the merits of each and discussing the subtle differences in interpretation of the relationship between educational inequality and conflict implied by different measures.

Level of disaggregation

Most studies of education inequality focus on the country-year level, examining the presence of inequality in the country as a whole on its experience of violent conflict, though a number of studies take a disaggregated approach, focusing at the level of primary administrative units (e.g., Østby et al. 2009; Brown 2009) or spatially concentrated groups (Huber & Mayoral 2013; Kuhn & Weidman 2013) under the

assumption that conflict is usually confined to specific regions and rarely engulfs an entire country (Rustard, Buhaug, Falch & Gates 2011; Østby et al. 2009). In other examples, ethnic and religious groups are the unit of analysis, with each group's disadvantage examined as a predictor of its engagement in – or experience of – violence (Cederman, Weidman & Gleditsch 2011; the Minorities at Risk project 1999-2009). Each of these levels presents an angle for examining the relationship between education inequality and conflict, with data availability as the main limitation. While these two dimensions intersect, inter-ethnic and inter-religious differences often manifest differently across geographic sub-units, the small statistical power found at overlaid levels of disaggregation has so far largely prevented scholars from exploring inequality at that level of granularity.

Measures of conflict

Conflict is usually conceptualized as a binary variable (there either is conflict, or there is not), which simplifies the complex and often fuzzy boundaries between tension and violence, which in turn ranges from a small number of street fatalities to civil war with thousands of victims. By far the most dominant source of conflict data is the UCDP Armed Conflict Database, which registers conflicts starting at a threshold of 25 deaths. While it may seem that occurrence of a conflict event is an objective metric, discrepancies between UCDP and other conflict databases and datasets compiled by scholars, such as ACLED (Raleigh, Linke, Hegre & Karlsen 2010), Ethnic Power Relations (Wimmer, Cederman & Min 2009), as well as MEPV (Marshall 2014) underscore the inherent subjectivity present in the compilation and coding of conflict events. For example, Eck (2012) compares the UCDP Georeferenced Events Dataset (UCDP GED), which will be used in the quantitative analysis for the cross-national PBEA study, to ACLED. She observes that the conflict definition used by ACLED is more flexible and subject to interpretation than the definition used by UCDP. In the case of Burundi, Eck describes discrepencies between the UCDP GED and ACLED, including an example of an attack on cattle that appears in ACLED and is categorized as violence against civilians. Appendix C presents a fuller discussion of conflict databases reviewed for this project, as well education databases from which measures of education inequality will be drawn.

Rather than conflict incidence, some studies examine the onset of new conflict as the dependent variable in their analysis. "New conflict" refers to violence that breaks out after a given period of peace, which may range from one to eight years (the UCDP Conflict Onset database includes onset versions cutoff at two, five, and eight years). Fearon & Laitin (2003) coded all years in which new conflict occurred as "new onset," with no thresholds for the duration of peace. Increasingly however, scholars converge around the two-year rule to determine "new" conflict (Buhaug & Gates 2002; Østby 2008a).

Which metrics to use?

This overview of metrics used in the study of education inequality as a cause of conflict demonstrates the challenges across many dimensions. Conceptually, the definition of "which groups" to compare in horizontal inequality studies has implications for the understanding of the extent of disparity in a given context. Data availability limitations generally narrow down the measures of educational opportunity to those of school participation and attainment, while the distribution of educational resources can be examined in country-level cases. The absence of consensus on a metric for inequality (at large, and for educational inequality in particular) leaves the field open for subsequent research, which should continue to explore and juxtapose different measures of inequality to validate findings and examine differences in aspects of inequality captured within each. Finally, while variability (and criticisms) exist across conflict data sources, there appears to be convergence around the use of the UCDP Armed Conflict dataset as well as the UCDP Conflict Onset database.

Looking ahead: Implications for Peacebuilding and Education

The review of the literature on horizontal inequality, education and conflict offers several key takeaways that have implications for this project, as well as for peacebuilding programs as a whole. First, the evidence base on the effects of inequality and conflict is small but growing, with recent studies focusing on horizontal inequality and exploring subnational divisions in levels of economic and social well-being. This means that peacebuilding programs must pay attention to group-level inequality, particularly in contexts with high group polarization and in the presence of strong group identities (ethnic, religious, or subnational). Substantially more research should look into the relationship between horizontal inequality in education as a stand-alone social domain and violent intergroup conflict, both in a large-N cross-national perspective and at the country level. One of the main challenges in this literature is finding the right metric to capture the depth and breadth of inequality, as well as the enabling conditions under which inequality-based grievances shift into inter-group violence. This is the subject of the quantitative analysis to be carried out by FHI 360/ EPDC following this literature review, which will consist of a cross-national time series analysis and two country case studies. So far, the presence of multiple metrics indicates that peacebuilding programs may explore several measures of inequality across groups, and compare results across countries and historical time periods.

Secondly, the role education plays in forming group identity and the value placed by students on belonging to the nation, as opposed to an ethnic or religious group, is crucial for the understanding of its role in future peacebuilding. It is through schooling that most modern developed nation-states were able to cultivate a unified national identity, shape a common narrative story of origin, and spread the use of a common language and cultural values. Available evidence on the importance of group identity makes it critical that peacebuilding education programs are sensitive to the issue of identity and group belonging, and seek to contribute to the shaping of a common narrative and the development of national identity that at the same time acknowledges the presence of diversity. However, in order to fully inform this aspect of peacebuilding in education, additional research is needed to explore the impact of education on social cohesion in recent history, particularly in countries that have a history of intergroup violence.

Finally, while the importance of education to post-conflict stability has been largely established, more research is needed into the peacebuilding effects of education in the aftermath of prolonged violence. In particular, research is lacking on the ways in which policies addressing equity in education affect inequality, real or perceived, and how they affect the likelihood of prolonged peace. Furthermore, rigorous evidence is needed on the effects of peacebuilding education programs. Notwithstanding the challenges in conducting such research in using large-N approaches (using transnational, country-year panel data, for example), longitudinal designs may offer opportunities for in-depth examination of existing peacebuilding education programs for different youth groups.

In sum, the most important conclusion from the literature review is that more evidence is needed on the relationship between education inequality and violent intrastate conflict, as well as the role of educational reduced education inequality in building peaceful societies. The next phase of this research project is intended to make a contribution to the literature on both of these dimensions, using a quantitative methodology in cross-national historical perspective, and qualitative case study approach with two country cases with recent history of intergroup violence. The quantitative study will draw on this literature review to select appropriate controls and interaction effects (such as levels of economic development, prior conflict incidence, population denstity and composition, proxies of state strength, and other relevant covariates), and disaggregate by gender and age in developing measures of education inequality. Methods explicitly

accounting for the time series panel structure of the data, where there is no clear independent variables and years are clustered within countries will be applied. Finally, while the quantitative study will follow the broader practice in the literature in using the education group-weighted Gini coefficient as a predictor of violent conflict, alternative measures of inequality will be tested to examine whether the choice of inequality metric affects the inferences about the relationship between inequality and conflict.

This literature review must also serve as a cautionary tale for our upcoming study, as so far the literature has not been conclusive on the relationship between inequality and conflict. This may mean that the relationship itself is not clear or evident across the board, and hence a pattern may not be found in the data collected for our study. Alternatively, this may also indicate that other factors, and not educational inequality per se, are the cause of violent conflict. With a larger geographic and historical scope, as well as the breadth of disaggregation, this project provides a unique opportunity to "dig deeper" in the data, and enhances the likelihood of finding the causal relationship between inequality in education in conflict, IF it exists.

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Appendix

Appendix A: Review of Methodologies Used in Studies of Educational Inequality and Conflict

Study	Methodology	Magnitude of relationship (* p < 10%; ** p < 5%;*** p < 0.01%)	Commentary
Barron, Kaiser, and Pradhan (2009)	*Model:* logit regression *Unit of analysis*: urban areas of sub-districts; rural areas of sub-districts *Dependent variable*: violent conflict *Scope*: Indonesia, 2003 *Main data sources*: 2003 Village Potential Statistics for conflict data; census for education data *Inequality is considered between* ethnic groups in a sub-district *and within* the population of males in a sub-district.	In rural areas of sub-districts, the logit coefficient for educational inequality between males ranges from 0.40*** 0.57***. Horizontal educational inequality between ethnic groups in rural areas of sub-districts is -0.01*** in both models it is included in, suggesting that has a negligible effect on the likelihood of conflict. Inequalities (both intra-group and inter-group) in urban areas of sub-districts are insignificant in all models.	Analysis done using a cross sectional design, with violent conflict in a community in the past year being the dependent variable. Horizontal inequality enters at the same time as vertical inequality, which is proxied through a standard deviation. Study offers limited support for education inequality as a cause of conflict.
Bartusevicius (2014)	*Model:* logit regression *Unit of analysis*: country years *Dependent variable*: onset of non-ethnic governmental conflict *Scope*: 1961-2009 *Main data sources*: Categorically Disaggregated Conflict dataset (CDC) (conflict); Data Set of Educational Inequality in the World, 1950-2010 (DEIW) (inequality) *Inequality is considered within* countries.	In the main models, logit coefficients for education inequality range from 1.833*** to 2.341**. For a model with a squared education term, the base education term is 11.7** and the squared term is (-9.19)**. In two models, the education term is insignificant. In models using imputed values, the coefficient for education inequality ranges from 1.19* to 1.81***.	Study finds strong effects for vertical education inequality on conflict onset. Magnitude is highest in models not controlling for wealth inequality. Evidence of a potential curvilinear effect may warrant further study.
Besançon (2005)	*Model:* ordinal probit *Unit of analysis*: country years *Dependent variable*: deaths caused by insurgent activity in ethnic wars, revolutions, and genocide *Scope*: 1960-1999; 108 countries *Main data sources*: State Failures Task Force (conflict); Castello and Domenech (2002) human	In ethnic wars, the probit coefficients are 0.01*** in both models considered. Besançon explains that "a ten-fold increase in human capital inequality in ethnic wars parallels a greater than ten-fold increase in the predicted probability of violence" (p. 405).	Large cross national, time series dataset, resulting in nearly 3.5 thousand observations. Study finds a relationship between educational attainment and conflict that is statistically significant but negligible in magnitude effects.

Study	Methodology	Magnitude of relationship (* p < 10%; ** p < 5%;*** p < 0.01%)	Commentary
	capital measure based on Barro and Lee (2001) for education data *Inequality between individuals* at the national level.	In situations of genocide, the probit coefficients are 0.01** in both models considered. The educational inequality measure is insignificant in revolutions.	
Bussmann (2007)†	*Model:* pooled time-series cross-section logit model for analysis of conflict onset; panel fixed-effects regression models for analysis of good governance *Unit of analysis*: country years *Dependent variable*: civil war onset, good governance *Scope*: *1985-2000, 100+ countries* *Main data sources*: PRIO/Uppsala (conflict); World Development Indicators 2004 (education data) *Inequality is considered between* males and females.	For the ratio of female to male literacy rates, the logit coefficient is -2.69***.	The model testing the effect of gender equality on civil war onset does not control for GDP, choosing instead an index of good governance (ICRG). Without an explicit control it is difficult to verify that the effect of gender equality in education does not suffer from omitted variable bias.
Fjelde and Østby (2012)†	*Model:* logit regression *Unit of analysis*: region years *Dependent variable*: instance of internal, non-state conflicts *Scope*: 1990-2008, 34 countries in Sub-Saharan Africa *Main data sources*: UCDP GED (conflict); DHS (inequality) *Inequality is considered between* ethnic groups in a region.	For vertical measures of educational inequality within regions, the logit coefficients range from 1.33** to 1.44**. With other variables held at their means, a shift from the 25th to the 75th percentile raises conflict risk from 1% to 2%. The effects of vertical inequality within regions are stronger than the effects of horizontal inequality, where the coefficient for relative disadvantage is 0.15*.	Findings are extremely modest. Geographic and temporal scope is limited, and measures are limited to educational attainment among women.
Melander (2005)	*Model: random effects ordered logistic regression* *Unit of analysis*: country years *Dependent variable*: changes in the level of intra-state armed conflict (both minor and full civil war) *Scope*: 106 countries	For gender inequality in higher education, the logit coefficients range from (-1.23)** to (-1.51)***, suggesting that where females are disadvantaged in higher education, countries experience greater conflict.	This large-N study includes two additional measures of gender equality besides education; however gender inequality in education is by far the highest predictor of conflict among them, second only to lagged GDP per capita.

Study	Methodology	Magnitude of relationship (* p < 10%; ** p < 5%;*** p < 0.01%)	Commentary
	Main data sources: PRIO/Uppsala (conflict); Barro and Lee (2001) for educational attainment data *Inequality between* female and male higher education attainment.		
Murshed and Gates (2005)	*Model:* Poisson regression *Unit of analysis*: districts *Dependent variable*: intensity of conflict *Scope*: Nepal, 1996 *Main data sources*: conflict data based on Gautam; schooling data from UNDP *Inequality between* districts and Kathmandu.	With a 1 year increase in the average years of schooling in a district, casualties drop by 29. The Poisson regression coefficient for schooling gap is -1.51***.	Study is has a small n (74 obs). Dependent variable is number of fatalities, not incidence of conflict, and therefore models may suffer from endogeneity problem: relatively poor districts have fewer resources to protect civilians once conflict does occur.
Østby (2007)ł	*Model:* logistic regression *Unit of analysis*: country years *Dependent variable*: civil war onset *Scope*: 55 developing countries from 1986-2003 *Main data sources*: DHS (inequality), Uppsala/PRIO Armed Conflict Dataset (ACD) (conflict) *Inequality is considered between* ethnic, regional, religious groups.	Logit coefficients for horizontal inequalities in education range from 1.84** for religious groups to 1.96** for ethnic groups to 2.18** for regions. For models with interaction terms, logit coefficients for base education terms range from 2.50*** to 2.98*** with the interaction terms ranging from (-4.56)** in situations of autocracy to 6.70** using a Scalar Index of Polities (SIP) variable. An interaction term using political exclusion is insignificant.	The focus on the two largest groups may overlook the disparity between ethnic majorities and smaller ethnic minorities. However, the use of interaction effects explicitly accounts for autocratic political regime as an enabling condition for conflict.
Østby (2008a)	*Model:* logistic regression for the main analysis and negative binomial regression in robustness check *Unit of analysis*: country years *Dependent variable*: civil war onset *Scope*: 36 developing countries from 1986-2004	In the main logit regression model, the variable for horizontal inequality in education has a coefficient of 2.16*. In the negative binomial regression, the educational horizontal inequalities coefficient is slightly stronger and more significant at 2.39**. The vertical inequality measure at the national level is insignificant.	Economic and social measures of inequality enter as independent predictors in separate models, thus making it difficult to distinguish the effects of social and asset inequality. Study acknowledges limitations presented by the small n.

Study	Methodology	Magnitude of relationship (* p < 10%; ** p < 5%;*** p < 0.01%)	Commentary
	Main data sources: DHS (inequality), Uppsala/PRIO Armed Conflict Dataset (ACD) (conflict) *Inequality is considered between* ethnic groups and *within* the nation.		
Østby et al. (2009)	*Model:* logistic regression *Unit of analysis*: region years *Dependent variable*: civil war onset *Scope*: 22 countries in Sub-Saharan Africa, 1986-2004 *Main data sources*: DHS (inequality), Uppsala/PRIO Armed Conflict Dataset (ACD) (conflict) *Inequality is considered between and within* regions.	The logit coefficient for absolute measure of education years is (-0.40)***. For vertical measure of educational inequality (Gini), the logit coefficient is 3.25***. Relative deprivation measures of inequality are insignificant.	Robust evidence is found for the effect of vertical education inequality *within* subnational regions. Education inequality enters regression models with asset inequality controlled.

† Conference paper

ł Working paper

Appendix B: Inequality Measures

H/I[4]	Research Using Measure	Measure	Description of Measure
H	Huber & Mayoral (2013)	GGINI; also referred to as Between Group Inequality (BGI)	$$GGINI = \frac{1}{2\bar{y}}\sum_{r}^{R}\sum_{s}^{S} p_r \, p_s |\bar{y}_r - \bar{y}_s|$$ where $\bar{y}_r = \frac{1}{n_r}\sum_{i}^{n_r} y_{ir}$ is group r mean value, R is the group r's population size, p_r is group r's population share, y_{tr} is the quantity of the variable of interest (e.g., income or years of education) of the ith member of group r, Y_r is the value of y for group r, and Y is the grand total of variable y in the sample.
H	Østby (2014); discussed in Mancini, Stewart, and Brown (2008)	Group-based Coefficient of Variance	$$GCOV = \frac{1}{\bar{y}}\left(\sum_{g=1}^{G} p_g \left(\overline{y_g} - \bar{y}\right)^2\right)^{\frac{1}{2}}$$ where $\overline{y_g}$ is the mean score on variable y for group g, G is the number of groups, p_g is group g's population share, and $\bar{y}$ is the overall sample mean of variable y (Østby, 2014). Using this measure, Østby (2014) find that horizontal inequality between religious groups predicts violence in Indonesian provinces with large population growth, but is not significant on its own.
H	-	GTHEIL	$$GTHEIL = \sum_{r}^{R} p_r \frac{\overline{y_r}}{\bar{y}} \log\left(\frac{\overline{y_r}}{\bar{y}}\right)$$ where $\bar{y}_r = \frac{1}{n_r}\sum_{i}^{n_r} y_{ir}$ is group r mean value, R is the group r's population size, p_r is group r's population share, y_{tr} is the quantity of the variable of interest (e.g., income or years of education) of the ith member of group r, Y_r is the value of y for group r, and Y is the grand total of variable y in the sample (Langer & Stewart 2013).
H	Brown (2009) and (2010) based on Østby (2008b)	Horizontal Inequality	$$hineq = 1 - e^{|0 - \ln(relgdp)|}$$ where $relgdp$ is the simple ratio of PAD-level GDP per capita (subnationally disaggregated gross regional domestic product [GRDP] data) to national GDP per capita. Brown 2009 finds this horizontal inequality measure to be insignificant in predicting protest. In his 2010 study of secessionism, he finds this measure to be a strong and significant predictor.

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[4] H indicates a horizontal measure of inequality; I indicates a measure of intragroup or vertical inequality.

H/I[4]	Research Using Measure	Measure	Description of Measure
H	Østby (2008a); Østby (2007)	Horizontal Inequality	$$HI = 1 - \exp\left(-\left\|\ln\left(\sum_{i=1}^{M}\frac{a_{i1}/a_{i2}}{M}\right)\right\|\right)$$ where a_{i1} is the share of the largest ethnic group that has asset i, a_{i2} is the share of the second largest group that has asset i, and M is the number of assets (Østby 2008a).
H	Cederman et al. (2011); Deiwiks, Cederman, and Gleditsch (2012); Kuhn and Weidmann (2013)	Horizontal Inequality – Cederman et al. Symmetric Measure	$$lineq2 = \left[\log\left(\overline{d_g}/\overline{D}\right)\right]^2$$ where $\overline{d_g}$ is the GDP per capita of the ethnic group, and $\overline{D}$ is the average GDP per capita of all the groups in the country.
H	Cederman et al. (2011); Deiwiks, Cederman, and Gleditsch (2012); Fjelde and Østby (2012); Brown (2009); Brown (2010)	Horizontal Inequality – Low and High Ratios – Cederman et al. Asymmetric Measure	$$low_{ratio} = \overline{D}/\overline{d_g} \text{ if } \overline{d_g} < \overline{D},$$ $$0 \text{ otherwise;}$$ $$high_{ratio} = \overline{d_g}/\overline{D} \text{ if } \overline{d_g} > \overline{D},$$ $$0 \text{ otherwise;}$$ where $\overline{d_g}$ is the GDP per capita of the ethnic group, and $\overline{D}$ is the average GDP per capita of all the groups in the country. In the Brown 2009 study of protest, this measure is significant, but in the 2010 study of secessionism, it is insignificant. Buhaug, Cederman, and Gleditsch (2014) apply this measure for the most disadvantaged groups (Negative Horizontal Inequality) and the most advantaged group (Positive Horizontal Inequality).
H	Østby et al. (2009)	Relative Regional Deprivation (RRD)	$$RRD = -1\left(\ln\left[\sum_{i=1}^{M}\frac{\overline{y_r}/\overline{y}}{M}\right]\right)$$ where $\overline{y_r}$ is the mean asset score of region r, $\overline{y}$ is the mean asset score of the country as a whole, and M is the maximum number of household assets. Østby et al. (2009) explain that negative values from this measure indicate relative advantage; and that 0 indicates equality. A score of 0.69 indicates that a region is half as well-off as the national average, and a score of (-0.69) indicates that a region is doing twice as well as the national average.
I	Østby et al. (2009); Fjelde and Østby (2012); Kuhn and Weidmann (2013)	Gini Index	Østby et al. (2009) use this to construct absolute measures of intraregional inequality within first administrative levels in DHS for both education and household assets. They find find strong positive and significant relationships between the Gini for education and the Gini for assets at the subregional level.
I	Huber and Mayoral (2013)	Within Group Inequality (WGI)	$$WGI = \sum_{g=1}^{G} GINI_g p_g \pi_g$$

H/I[4]	Research Using Measure	Measure	Description of Measure
			$GINI_g$ is the Gini coefficient for each group, G is the number of groups, p_g is a weight for group g's population share (so unequal small groups have less weight than unequal large groups), and π_g is the proportion of income going to group g (Huber & Mayoral 2013).

Appendix C: Databases of Education and Conflict

Table B1. Table of education databases

Database	Description	Coverage	Advantages	Disadvantages
UNESCO Institute for Statistics	Education indicators collected via school censuses and reported by the Ministries of Education	228 countries and 50 regions or groupings as per multinational agencies, 1999-2013	Broad country-level coverage; gender disaggregation.	No subnational coverage, resource and efficiency indicators not available prior to 1999.
IPUMS	Collection of national census and survey data since the 1960's	70 countries (211 datasets) with information on education, 1960's forward	Good coverage; large-N datasets with demographic information.	Less precision in education indicators pertaining to current school attendance, limited education module; limited number of countries with data on education (42 countries) and ethnicity (22 countries).
Demographic and Health Surveys (DHS)	Household survey administered by Macro International and funded by USAID that provides nationally representative data on related to health and education topics.	59 countries (99 surveys) with information on education, 1985 forward	Good coverage in low-income countries, demographic information on religion and/or ethnicity.	Small n; survey intervals 5 years or more; no coverage in more developed countries. Series starts in 1986 with initial few surveys. Conflict-affected countries are less likely to be surveyed, because of the difficulties of implementing a national survey in violent contexts. Østby (2008a) notes that the bias this creates is likely to skew results downwards. As noted by Kuhn and Weidmann (2013) and Cederman, Weidmann and Gleditsch (2011) in the context of conflict research, most household surveys are not designed to be representative of ethnic and religious groups.
UNICEF Multiple Indicator Cluster Survey (MICS)	Household survey administered and funded by UNICEF. "The MICS has enabled many countries to produce statistically sound and internationally comparable estimates of a range of indicators in the areas of health, education, child	1995 to 2011, 24 countries (31 datasets) with information on education	Good coverage in low-income countries, demographic information on religion and/or ethnicity.	Small n at subnational level. Series starts in 2000; Survey intervals 5 years or more; no coverage in more developed countries.

Database	Description	Coverage	Advantages	Disadvantages
	protection and HIV/AIDS."			
WIDE	UNESCO – EFA Global Monitoring report dataset with categories of educational attainment by age based on DHS and MICS Surveys and broken down by wealth, gender, ethnicity, and other groupings.	Most data from 2000 forward	Disaggregation available by wealth quintile, gender, ethnicity, religion, subnational unit; time series	No ethnicity and region disaggregation at subnational level.
Barro & Lee (2010)	Dataset of education enrollment and attainment, national means	146 countries, 1950-2010	Disaggregated by sex and 5-year age intervals.	National level statistics, disaggregated by gender only.

Table B2. Table of conflict databases

Database	Description	Coverage	Advantages	Disadvantages
Uppsala Conflict Data Program (UCDP)/Uppsala Armed Conflict Dataset (UACD)	A comprehensive database of conflict events since the 1960's; consists of several datasets including Armed Conflict Dataset and Non-State Conflict Dataset (since 1989).	1960's forward; georeferenced from 1989 forward	Information on conflicting sides and territory in dispute, if any. Georeferenced data for African conflicts since 1989.	No subnational disaggregation beyond Africa; no distinction between ethnic/religious conflict, terrorism (Al Qaeda), and gang violence (drug cartels).
Buhaug & Rød (2006)	GIS-generated conflict polygons based on UCDP.	Africa, 1970-2001	Disaggregated, spatially clustered conflict data for Africa. Dataset includes a good selection of variables, including distances between conflict and capital, border distances, population density, level of infrastructure, percentages of mountainous and forested terrain, and commodities.	Like UCDP, no subnational disaggregation outside of Africa.
Major Episodes of Political Violence (MEPV) (Marshall 2014)	Annual, cross-national, time-series data on interstate, societal, and communal warfare magnitude scores for all countries 1946-2012.	331 episodes of armed conflict (32 ongoing) over the contemporary period 1946-2013, global coverage	Full set includes both country data and scores for neighboring countries and regional context for all independent countries (does not include independence wars); conflict intensity coded on a scale of 0-10.	Number of victims not provided directly (factored in 0-10 intensity scale), no subnational disaggregation.

Database	Description	Coverage	Advantages	Disadvantages
Armed Conflict and Event Dataset (ACLED) (Raleigh, Linke, Hegre & Karlsen 2010)	Over 75,000 individual conflict events between 1997-2012.	1997-2012; georeferenced from 1989 forward	Georeferenced data for African conflicts since 1989.	Conflict data is limited to Africa, Haiti, and select Asian and Eastern European countries.
Minorities at Risk (MAR)	Database tracking for over 280 ethnic groups that have faced violence or deprivation since 1945, run by University of Maryland.	280 ethnic groups, 1945 forward	Unique dataset; includes location data for each ethnic group that can be matched with subnational data.	Focuses on marginalized groups only and excludes majorities and dominant groups only. In addition to problems this creates with selection bias, the coding of the data has been criticized as subjective. Brown (2009) suggests this dataset is less problematic when used for independent variables.
Global Peace Index data (Visions of Humanity 2014)	An index developed by Institute of Economics and Peace, based on 22 indicators that ranks 162 nations by their 'absence of violence'.	162 countries, 22 indicators, since 2007	A novel measure, attempting to focus on presence of strong institutions; the index is composed of 22 indicators, ranging from a nation's level of military expenditure to its relations with neighboring countries and the percentage of prison population.	Methodology is unclear and validity of the measures could not be established.
Fearon & Laitin (2003)	National level dataset of conflict onset since 1945.	1945 to 1999, includes 127 civil war starts and a sample of 6,610 country years	Contextual information on economy, political regime and terrain.	No subnational disaggregation, conflict onset only coding.
Asia Foundation Conflict Study (Asia)	Data subnational conflicts based on UACD, HCB, and MAR prepared for an Asia Foundation study of conflict in 26 subnational conflict areas in Asia.	Asia, 26 subnational conflict areas, from 1992-2012	Provides subnationally disaggregated data on conflict in Asia; the conflicts are based on multiple sources and included where they were found in two of three of the following databases: Uppsala Armed Conflict Dataset (UACD), the Heidelberg Conflict Barometer (HCB), and the Minorities at Risk (MAR) project.	Data is presented through online tool but not publically available as a dataset; historical data on conflicts were only collected if a conflict had been active at some point in the past 20 years (1992-2012).