



2011/ED/EFA/MRT/PI/29

Background paper prepared for the
Education for All Global Monitoring Report 2011

The hidden crisis: Armed conflict and education

Education and Civil Conflict: A Review of the Quantitative, Empirical Literature

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2010

This paper was commissioned by the Education for All Global Monitoring Report as background information to assist in drafting the 2011 report. It has not been edited by the team. The views and opinions expressed in this paper are those of the author(s) and should not be attributed to the EFA Global Monitoring Report or to UNESCO. The papers can be cited with the following reference: "Paper commissioned for the EFA Global Monitoring Report 2011, The hidden crisis: Armed conflict and education" For further information, please contact efareport@unesco.org

Education and Civil Conflict: A Review of the Quantitative, Empirical Literature

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Word count: 13,223 (10,195 excluding literature list & appendix)

Version: 26.04.2010

1. Introduction

This paper provides a systematic review of the quantitative literature on education and political violence. It does not offer new theories or new empirical evidence on the effects of education on conflict, but it offers a perspective on the current state of the debate in the literature. We present the main theoretical propositions that feature in the existing education-conflict studies and examine more closely the empirical tests of these propositions, drawing mainly on thirty statistical studies, but also a few qualitative case studies. The empirical evidence presented herein should be highly relevant for policy-makers. As opposed to many other factors that are known to affect political violence, such as e.g. GDP per capita and mountainous terrain, education is indeed something that almost all governments can alter through national policy (Thyne, 2006).

The relationship between education and conflict has attracted increasing interest from both educational and conflict researchers over the last decade. However, to date, most of this research has been qualitative, which reflects the fact that the research agenda has been driven primarily by the concerns of practitioners and researchers ‘in the field’, and a lack of comparable international data, and the complexity of the interaction between education and conflict (Barakat & Urdal, 2009: 3).

Based on the existing quantitative evidence, there seems to be an emerging consensus in the literature that education has a general pacifying effect on conflict. However, this poses an interesting puzzle when contrasted with some recent studies claiming that perpetrators of terrorist acts are more highly educated than the average person in their country. As the articles discussed in this review reveal, the relationship between education and conflict can

be complex and multidimensional, depending on different mediating factors, and the level of analysis. We examine how education may affect various forms of political violence, based on different theoretical arguments relating to the level, expansion, inequality, and content of education.¹ If not stated otherwise, political violence refers in this report to civil conflict, although we also briefly consider other forms of political violence, such as genocide, terrorism, unrest and urban violence. In addition to the more traditional cross-national studies, this review also evaluates sub-national studies of particular countries, and micro-level studies of the links between an individual's education and his/her involvement in political violence. We argue that the latter is particularly important in order to make sense of the mixed evidence on the relationship between education and participation in militant activities.

The remainder of the paper is structured as follows: We first provide a theoretical framework which presents the main theoretical propositions in the education-conflict literature. The third section offers an overview of existing data on education and political violence. This is followed by a section that summarizes the available empirical evidence for the various theoretical propositions. The last section discusses challenges with existing studies, identifies some avenues for future research in the field, and offers some policy recommendations.

2. Theoretical Framework

Many questions can be asked with regard to the impact of education on civil conflict: Does more education among young males reduce the supply of potential rebels? Does a rapid expansion in higher education lead to unmet expectations of employment opportunities and hence a greater conflict risk? Does unequal access to education among individuals and groups produce a threat to peace and stability? Are highly educated individuals more likely to join terrorist organizations, and if so, for what reasons? Various theoretical responses to these and other questions are the focus of the discussion that follows. Scholars have focused on the relationship between education and civil war dating as far back as to early political theorists like Aristotle. As a way of systematizing the different theoretical propositions

¹ In this review we exclusively consider the impact of education on conflict. For an overview of the reverse causal relationship, i.e. the effects of conflict on education, see e.g. Blattman & Miguel (2010) and Lai & Thyne (2007).

presented in the literature we find it useful to distinguish between arguments relating to *levels, expansion, inequality, and content* of education.

2.1. Education levels and conflict

Most of the arguments presented in the literature on education and conflict pertain to levels of education, or government investment in education. What these propositions have in common (with few exceptions) is that more education fosters peace. However, the reasoning behind this expectation differs, and can be grouped into three main categories: grievance explanations, opportunity cost explanations, and stability explanations.

The so-called relative deprivation theories posit that grievances arise when the gap between people's expectations and their actual situations worsens (Gurr, 1970). Education can have both a direct and indirect effect on the grievances that may foment political violence. First, according to a World Bank report (Akoki et al., 2002), government investment in education is a means by which governments can make a direct and lasting positive impact on people's lives, which may directly reduce the level of grievances in society. Second, Thyne (2006) suggests that educational spending can reduce grievances and conflict by spurring economic development and social equality.²

In the strand of the civil war literature focusing on the economic causes of war, education is seen as an opportunity factor. Opportunity factors relate to structural conditions that may facilitate a rebel group's war against a state, of which an important aspect is the cost of rebel recruitment. Soldiers must be paid, and the cost of recruiting is related to their income forgone by enlisting as rebels. Greater levels of educational attainment increase the opportunity cost of young people³ and hence, according to Collier & Hoeffler (2004), rebel recruitment is more costly and rebellion less likely the higher the level of education in a society. In particular, Collier & Hoeffler argue that one should focus on secondary school

² Critics of the government investment argument have argued that educational expenditures may often be distributed unequally to the university level, which disproportionately is favorable to the wealthy in society. Furthermore, spending measures may show false responsiveness if funds get trapped in bureaucratic inefficiency or corruption. For this reason, Thyne (2006) warns that increased educational expenditures could actually lead to more social unrest if they intensify existing inequalities, particularly in very poor societies. As an alternative indicator of reduced grievances, thus, he suggests that one focuses on primary education enrollment, which arguable better captures how government investment in education actually reaches those who need it most.

³ Barakat & Urdal (2009: 4) note that for the relatively small number of 'conflict entrepreneurs', a higher level of education may actually lead to higher rewards due to more efficient management of illicit trade or similar activities.

enrollment of young males—the group from which most rebels are recruited. Following this logic, Barakat and Urdal (2009) assume that in countries with large potential pools of rebel recruits due to large young male cohorts, increasing education at any level will help reduce this pool considerably.

A third explanation for the pacifying effect of education is the creation of social and political stability. Aristotle argued that education promotes a culture of peace (Sargent, 1996). Lipset (1959: 79) noted that ‘education presumably broadens men’s outlook, enables them to understand the needs for norms of tolerance, restraining them from adhering to extremist and monistic doctrines’. In line with this, several scholars hold that higher educational attainment reduces the risk of political violence by encouraging political participation and channeling conflicts of interest through institutional pathways rather than through the use of violence (e.g. Alesina & Perotti, 1996; Hegre, 2003; Hibbs, 1973; Huntington, 1968).⁴ More recently, education has also been argued to promote social cohesion, such as learning how to work together peacefully, which in turn enables socioeconomic stability. For example, Thyne (2006) points out that indicators of adult education, such as secondary and tertiary enrollment, as well as adult literacy should be of special relevance, indicating whether a government is able to provide an arena for the fostering of social cohesion among the ones most likely to rebel against the state.

2.2. Educational expansion and conflict

As outlined above, the opportunity literature suggests that education is generally expected to increase the opportunity cost of rebel recruitment, which in turn reduces the likelihood of rebellion. This is not incompatible with the motive-oriented literature which focuses on the potential for violent conflict arising from grievances caused by lacking education. As argued above, high rates of enrollments at all levels of education could be expected to be associated with lower risks of conflict. However, Huntington (1968: 47) has argued that rapid expansion of education could increase the risk of political instability. When countries respond to large youth cohorts by expanding access to higher education, this may produce a much larger group of highly educated young people than the labor market is able to absorb (Urdal, 2006). Prevailing unemployment among highly educated youth segments may cause

⁴ Hanf & Bauerle (2009) find in a study of survey data in 10 countries (Chad, Zimbabwe, Georgia, Indonesia, Kosovo, Lebanon, Malaysia, Sri Lanka, Namibia and South-Africa) that there is a robust, positive relationship between high education and democratic attitudes on the individual level.

frustration and grievances that could motivate political violence. According to Choucri (1974: 74), high unemployment among educated youth is one of the most destabilizing and potentially violent sociopolitical phenomena in any regime. Concurring with this, Goldstone (2001: 95) notes that rapid increase in the amount of educated youths has preceded historical episodes of political upheaval. Lia (2005) has argued that the expansion of higher education in many countries in the Middle East has produced large masses of unemployed and easily mobilizable youths, which has had a radicalizing effect and provided new recruits to militant organizations. An important policy question arising from this discussion is how countries are best advised to expand educational opportunities in order to avoid instability.

2.3. Educational inequality and conflict

Socioeconomic inequality is among the factors frequently used to measure grievances, and is often seen as giving rise to conflict. General theories of relative deprivation posit that whereas absolute poverty may lead to apathy and inactivity, comparisons with those in the same society who do better may inspire radical action and even violence (Gurr, 1970). In line with such theory one should expect that uneven distribution of education could breed grievances that could potentially cause conflict. Ferranti et al. (2004) argue that education is in fact the main driver of socioeconomic inequality in a society.

In the inequality-conflict literature there has been much discussion about the significance of two types of inequality. The first pertains to inequality between individuals (or so-called *vertical inequality*), and the other type pertains to systematic inequalities between ethnic, linguistic, religious, or regional groups (so-called *horizontal inequality*). It has been argued that the latter type of inequality matters more, given that civil conflicts are inter-group conflicts, and not isolated cases of random violence between individuals (see Østby, 2008). In short, the argument is that socioeconomic or political inequalities that coincide with identity cleavages in society may enhance group grievances and thus facilitate mobilization for conflict. Schooling policies are often used as a discriminatory policy by governments against minority groups (de Soysa & Wagner, 2003). For example, in South Africa under apartheid, state expenditure on education per white student was 14 times the expenditure per black student (Stewart, 2002: 24).

A different form of uneven distribution of educational opportunities relates to gender inequality. Most explanations for the relative peacefulness of societies with greater gender equality refer to the general pacifism of women as a result either of nature or of socialization

(Bussmann, 2007). Second, such societies may be more peaceful due to the norms of respect and inviolability that characterize close relations between individuals, which are also expected to carry over to more distant relations, thereby strengthening societal norms that reject abuse and violence (Melander, 2005). Bussmann (2007) argues that gender equality in education indirectly leads to peace through the promotion of development and good governance.

2.4. Content of education and conflict

Finally, some of the education-conflict literature is concerned with the quality and content of education. Expanding access to education of relatively low quality may raise expectations that do not match employment opportunities (especially in the private sector). This has particularly been noted with reference to the Middle East (e.g. Salehi-Isfahani 2008). Education can also be used as a means of indoctrination, fueling militarism, and violent religious extremism, which may increase the probability of civil conflict (Thyne, 2006: 738). Further, Berrebi (2007: 7) warns that educational content that advocates particular political or religious messages may increase an individual's propensity to join militant organizations. Such extremist education might on the one hand encourage radical thought while only on the margin increase productive opportunities in the labor market.

2.5. Education and different forms of political violence

Although the main focus of this review is the link between education and civil conflict, it also refers to studies that consider the educational effect on other forms of political violence, such as genocide, inter-communal violence, riots, protests, urban violence, and terrorism. For example, there has been some discussion that expansions in higher levels of education may be particularly relevant for low-intensity violence such as riots (e.g. Urdal, 2006). Another important distinction is that between civil conflict and terrorism.⁵ As described above, the theoretical contributions concerning the effects of education on civil conflict assume an overall negative influence of education. The literature on the economics of crime also suggests that a lack of education is connected to illegal activities. Although terrorism seems akin to crime, however, this literature does not yield a clear answer to the question of whether more education would reduce the participation in terrorism (Krueger & Malečková,

⁵ See e.g. Sambanis (2005: 169–172) for an overview of the differences between terrorism and civil conflict.

2003). Berrebi (2007: 7–9) provides a number of theoretical considerations and speculations as to why increasing education could actually lead to a *greater* risk of terrorism. Inter alia, he points to the potential importance of educational content (e.g. extremist religious teachings), reasoning skills (which e.g. make individuals more aware of social injustice), contextual factors (such as limited economic opportunities), and finally the selection of terrorists by terrorist organizations. The latter argument was originally formulated by Bueno de Mesquita (2005), who developed a theoretical model which posits that terrorist organizations themselves are likely to screen the pool of potential members and select the better educated individuals.

3. Data and Measurement Issues

‘Civil conflict’ as used in this report generally refers to internal armed conflict as defined by the Uppsala/PRIO dataset (Gleditsch et al., 2002). This is one of the most authoritative conflict datasets, and is used in the majority of the studies of education and conflict reviewed here. A civil or internal conflict is defined as an armed conflict between two organized parties, of which one is the government of a state, resulting in at least 25 battle-related deaths in a calendar year.⁶ The number of civil conflicts in the world was increasing steadily from the beginning of the dataset in 1946 and until 1993, and has declined significantly thereafter. Although there has been a recent slight increase in conflicts globally, the number is considerably lower than it was throughout the 1980s and 1990s.

Several different measures capturing quite different aspects of ‘education’ are used in the studies referred to in this review. The most basic measure is the relative number of literates in the adult population, or in some specific age group (typically young adults). This rather crude measure is sometimes used to proxy variation in development level (e.g. Urdal, 2008). Further, several conflict studies use measures of the level of education in a society, either by educational *enrollment* (primary, secondary tertiary), or actual *attainment*, i.e. the number of years in school or level of completion. While enrollment rates have been widely

⁶ The complete definition of a UCDP conflict is (1) *Use of armed force*: use of arms in order to exert violent force, resulting in death (1.1) Arms: any material means, e.g. manufactured weapons but also sticks, stones, fire, water, etc. (2) *25 deaths*: a minimum of 25 civilian deaths per year and per actor (3) *Government*: the party controlling the capital of the state (4) *Formally organized group*: any non-governmental group of people having announced a name for their group and using armed force (5) *State*: a state is (5.1) an internationally recognized sovereign government controlling a specified territory, or (5.2) an internationally unrecognized government controlling a specified territory whose sovereignty is not disputed by another internationally recognized sovereign government previously controlling the same territory.

used, a new dataset compiled by researchers at IIASA (Lutz et al. 2007) provides educational attainment data for 120 countries for the period 1970-2000. The dataset is based on individual-level educational attainment data from Demographic and Health Surveys (DHS) and national censuses that have been back-projected using multi-state demographic modeling. This detailed kind of data also allows for the calculation of educational progression rates from one level to the next, of measures of expansion in access to education between succeeding cohorts (Barakat & Urdal, 2009), and DHS data can further be used to construct measures of educational inequalities between ethnic, religious or regional groups (e.g. Østby, 2008). Several studies referred to in this report further separate between education among men and women.

There is also data available on educational quality, although such data often do not exist for the most conflict-affected areas. We are also not aware of any studies that have attempted to systematically look at the relationship between quality or content of education, and conflict. Finally, some studies use a measure of education spending relative to income levels to capture government responsiveness (e.g. Thyne, 2006).

Education is sometimes treated as a proxy for development, meaning that it is used as an indicator of the general level of development in society (e.g. Urdal, 2008). However, both Thyne (2006) and Barakat & Urdal (2009) demonstrate that education indeed has a pacifying effect even after controlling for income level, with direct measures such as GDP per capita.

Different levels of analysis

As noted by Humphreys & Weinstein (2008), a range of seemingly rival theories attempt to explain why some individuals choose to participate in armed conflict and others do not. In particular, there are two rival explanations for why people in countries with low average education levels may be more likely to join insurgencies than people in countries with higher education levels: Either because they are aggrieved due to poor education and fight against the source of grievance, *or* that they seek loot and alternative income opportunities by joining a rebel movement. These two explanations are observationally equivalent given cross-national data. In order to be able to discriminate between these explanations, and to distinguish those who rebel from those who defend the status quo, there is a need for micro-level data on individuals (Arjona & Kalyvas, 2007). In the following section, we first discuss the existing macro-level (cross-national) and meso-level (sub-national) evidence on the education-conflict nexus, before we move on to discuss the findings of works that rely on micro-level (individual-based) evidence based on the perceptions and actions of individuals.

4. Empirical Evidence on the Education-Conflict Nexus

The studies examined in this review were selected on basis of the following criteria:⁷

- that they were quantitative in nature
- that they examine some kind of political violence as the dependent variable, and
- that some kind of education measure was included in the empirical analysis

Based on these criteria we were able to identify thirty quantitative studies that somehow treat the relationship between education and political violence through several literature searches (See Appendix A for a systematic overview of these studies). What became clear from this exercise was first of all that the quantitative literature on education and conflict is quite a new field. In a review article assessing the early quantitative civil war literature, Sambanis (2002) only mentioned education briefly under the heading ‘poverty and slow economic growth’, making reference to only one study, an early working paper version of Collier & Hoeffler (2004). In another review article on poverty and political violence as late as five years ago, Sambanis (2005) concluded that ‘there is not a wealth of quantitative results on education to discuss’. In fact, in the present review, only five out of the thirty studies predate Sambanis’ article, whereas the bulk of the studies reviewed here were conducted after 2005, as shown in Table 1.⁸

Table 1. Number of studies per 5-year period

Period	1996-2000	2001-2005	2006-2010	Total
# Studies	1	10	19	30
%	(0.03)	(33.3)	(63.3)	(100)

One of the more influential of the early studies has been the work by Paul Collier and Anke Hoeffler (Collier & Hoeffler, 2004), which has inspired a very fruitful discussion about individual motivations for joining a rebel movement. While the initial separation between ‘greed’ and ‘grievance’ may have been problematic, distinguishing between different forms of motivations and opportunities determining rebel recruitment has contributed to also shape the discussion on the relationships between education and conflict. In particular, low

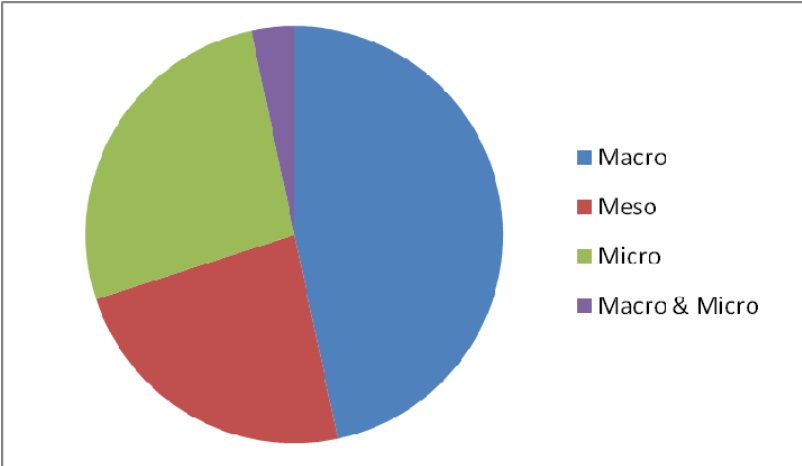
⁷ A few exceptions were made to these criteria: We include a study by Pugel (2007), who looks at the link between education and enrollment in reintegration programs by ex-combatants in Sierra Leone, and a study by Collier, Hoeffler, and Söderbom (2004) which focuses on the *duration* of civil war.

⁸ Furthermore, 14 of these works are yet to be published.

education can arguably be understood both as a factor that generally reduces economic opportunities and hence increases the attractiveness of joining a rebellion as a source of income, or alternatively as a factor that spurs feelings of injustice among excluded groups of young people who engage in political violence to redress grievances.

Most of the studies presented here typically include one education measure among a large number of explanatory variables. To date, only a few systematic quantitative conflict studies have had education as the primary focus, notably the works by Barakat & Urdal (2009), Krueger & Malečkova (2003), and Thyne (2006). Only seven out of the thirty studies presented in this review have the word ‘education’ as a part of the title (Barakat & Urdal; 2009; Berrebi, 2007; Fair, 2008; Krueger & Malečkova, 2003; Oyefusi, 2008; Shayo, 2007; Thyne, 2006), and among these the vast majority are micro-level studies, which will be further discussed towards the end of this section. Figure 2 displays the distribution of the different levels of analysis among the thirty reviewed studies. Among these there are fourteen macro-level (cross-country) studies; seven meso-level (sub-national) studies (of which most are single country studies), and one study which presents both macro-and micro-level evidence (Shayo, 2007).

Figure 2. Level of analysis (N=30)

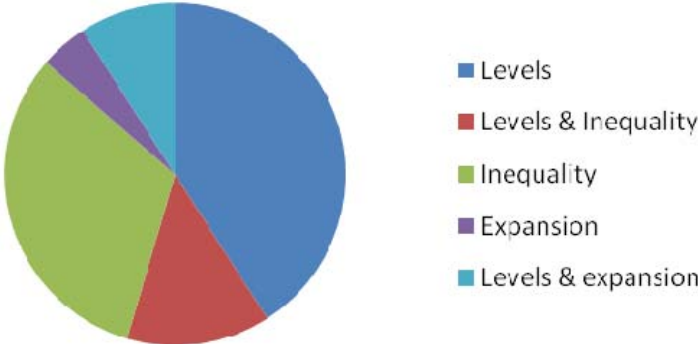


Twenty-two articles in our sample are either cross-country (macro-level) or sub-national (meso-level) studies.⁹ The latter category includes works that analyze the link between

⁹ A large majority of these studies focus on the influence of education on civil conflict, but there are also examples of studies that examine terrorism (Urdal, 2006); riots (Urdal, 2006; 2008); urban social disorder (Urdal &

education and conflict at the sub-national (e.g. regional, or inter-city) level. Below, we evaluate the theoretical propositions presented earlier in light of the existing empirical evidence from these studies. As visualized by Figure 3, the majority of the macro- and meso-level studies focus on the conflict potential of various levels of education, but there are also quite a few studies which examine the impact of some kind of educational inequality. Only three studies consider the impact of educational expansion, and none of the studies examine the effect of educational content. The remainder of this section discusses the accumulated quantitative evidence on the education-conflict nexus.

Figure 3. Educational focus of macro- and meso-level studies (N=22)



4.1. Higher levels of education are linked to peace

Table 2 summarizes the main evidence on the link between education levels and conflict, distinguishing between the individual impacts of six different indicators of educational level. The findings from sub-national studies are marked in grey. The signs indicate whether education has a negative, zero, or positive impact on conflict risk

Hoelscher, 2009); ethno-communal violence (Mancini, 2008); and other forms of political violence (Barron, Kaiser & Pradhan, 2004; Tadjoeeddin & Murshed, 2007).

Table 2. Conflict potential of education levels: Macro- and meso-level evidence

Study \ Educ. variable	Primary	Secondary	Tertiary	Years of schooling	Literacy	Government spending
Alesina & Perotti (1996)	–					
Barakat & Urdal (2009)		– ¹				
Besançon (2005)			+/- ⁴			
Bussmann (2007)	–	0	–		–	
Collier & Hoeffler (2004)		– ²				
Collier, Hoeffler & Söderbom (2004)		– ³				
Hegre (2003)		–			–	
Hegre et al. (2009)	–	–				
Østby, Nordås & Rød (2009)				–		
Shayo (2007)				–		
Thyne (2006)	–	–	0		–	–
Urdal & Hoelscher (2009)	–	–				–
Barron, Kaiser & Pradhan (2004)		–				
Tadjoeddin & Murshed (2007)				Inv.U ⁵		
Urdal (2008)					0/ +/ – ⁶	

NOTE: ‘–’ indicates a negative effect of higher education levels on conflict; ‘+’ a positive effect; and ‘0’ denotes no effect. ¹Result pertains to both genders and to males only. ²Males only. ³Males only; dependent variable is conflict duration. ⁴Positive effect on ethnic wars and genocides, negative effect on revolutions. ⁵Violence increases as education rises, but declines as education continues to increase; dependent variable: everyday ‘routine’ violence in Indonesia. ⁶Literacy levels have no effect on armed conflict; a positive effect on political violent events, and a negative effect on riots. Grey shade refers to single country meso-level studies.

A quick look at Table 2 yields some immediate observations. First of all, there seems to be broad empirical evidence of a general negative relationship between the level of education and conflict. In other words, there is good reason to believe that countries with higher average levels of education do indeed have a lower risk of experiencing armed conflict. This appears to be in correspondence with the qualitative case study literature, which generally seems to suggest that low access to education explains participation in civil conflict. One example is Brett & Specht (2004) who have been conducting interviews with young soldiers, and have found strong micro-level support for the expectation that lack of schooling in addition to poverty, and low alternative income opportunities are important reasons for joining a rebel group

Second, education level has been measured in several ways in quantitative conflict studies, but the most common indicator seems to be some variant of secondary education enrollment (either for males or for both genders). This is in line with Barakat & Urdal (2009: 12), who found secondary education attainment to provide the most suitable discriminator in

assessing the role of education in conflict. Also for this separate indicator, the results seem to point in the same direction, with only one exception.¹⁰

Third, judging from the results summarized in Table 2 it is still unclear whether (and *if*) tertiary education is related to conflict risk. In what is perhaps the most comprehensive accounts of education and conflict to date, Thyne (2006) does not report any significant effect on conflict of higher education. Disaggregating civil conflict into three sub-types, Besançon (2005) finds that higher tertiary education levels increase the risk of ethnic wars and genocides, whereas they lower the risk of revolutions. Bussmann (2007) finds that tertiary education has an overall pacifying effect.

Fourth, the effects of education become less clear when we move from cross-national evidence to sub-national evidence from single countries (Barron, Kaiser & Pradhan, 2004 and Tadjoeeddin & Murshed, 2007 on Indonesia; and Urdal, 2008 on India). Tadjoeeddin & Murshed (2007), looking at the link between average years of schooling and the risk of what they refer to as everyday ‘routine’ violence in Indonesian districts 1994-2003, do not find a linear relationship, but rather conclude that violence increases as education rises, but, later on, the level of violence falls as education continues to increase.

Fifth, the two studies that examine the effect of education level on multiple types of conflict (Besancon, 2005 on ethnic wars, genocides, and revolutions; and Urdal, 2008 on armed conflict, political violence and Hindu-Muslim riots in India) also indicate that education does not necessarily seem to have the same calming effect on all kinds of conflict.

What Table 2 does *not* reveal is the impact of various contextual factors on the link between education and conflict. For example, Barakat & Urdal (2009) found that low rates of male secondary education are more likely to cause conflict in societies with large young male population bulges, particularly in poor countries, and particularly in Sub-Saharan Africa. Furthermore, Barakat & Urdal (2009) found some evidence indicating that the presence of large youth cohorts with low education increases the risk of conflict more the higher the country’s dependence on rich natural resources. Finally, Hegre (2003) found that the impact of education level (measured as literacy) may be mediated by regime type. More

¹⁰Surprisingly, Bussman (2008) is not able to replicate the negative relationship between secondary education enrollment and conflict risk, although her conflict data stem from the PRIO/Uppsala Armed Conflict Dataset which is also used by e.g. Barakat & Urdal (2009) and Hegre (2003). Secondary enrollment does at least have a negative coefficient in her model, but the effect is not statistically significant.

specifically, he found that the risk of armed conflict is decreasing with increasing literacy for democracies, but not for other (non-democratic) regimes.

Taken together, the empirical evidence presented above brings some support to all the theoretical propositions presented in Section 2 regarding education's effect on conflict via grievances, opportunity-costs and social cohesion and stability. However, it is hard to validate the different explanations of the negative impact of education on conflict in the absence of micro-level data. For example, the general finding that countries with higher levels of secondary educational enrollment have smaller risks of conflict could be explained both in terms of reduced opportunity costs of rebel recruits, or in terms of reduced grievances among young people (and males in particular). However, as we will see below, individual-level studies have so far not been able to settle this issue.

4.2. Expansion in higher education – not a threat?

Three studies in our sample have tested the violence potential of rapid expansions in higher education, of which two are cross-national studies and the third is conducted at the city-level. Barakat & Urdal (2009) focus on the effect of expansions in tertiary education on civil conflict; Urdal (2006) analyzes the impact on both armed conflict, terrorism, and riots; whereas Urdal & Hoelscher (2009) study the impact of expansions in higher education on the levels of lethal and non-lethal urban social disturbances in 55 large cities in Asia and Africa. According to their joint findings, expansions in higher education seems to have no bearing on the risk of civil conflict, riots, or urban violence – not even in the context of large youth bulges. Urdal (2006) did find some evidence that the interaction of youth bulges with expansion in higher education was associated with an increased risk of terrorism, but the education data used are inferior to the IIASA data, and the terrorism data are of a somewhat uncertain quality. While this finding could be compatible with individual-level studies reporting higher education as being a factor in recruitment to terrorist organizations (see below), the claim has to be tested on more comprehensive and reliable data in order to assess its validity.

Furthermore, the argument relating social unrest to large numbers of university students without a prospect for adequate employment has been made with a particular reference to the Middle East (e.g. Lia, 2005: 145–146). However, Barakat & Urdal (2009) still found no effect on civil conflict when they tested the tertiary expansion measure on a subsample of MENA countries only.

4.3. Inter-group schooling inequality matters

In studies that look at the impact of uneven education on conflict, there is less concern with the amount or level of education and more attention paid to how educational opportunities are distributed. Education is most often treated as just one out of several indicators that capture the broader phenomenon of systematic socioeconomic disparities between individuals or groups. Hence, although it has been argued that education can be a particular relevant indicator of inequality with regard to conflict, it can sometimes be hard, if not impossible, to single out any separate effects of educational disparities independent from other forms of inequality.

Table 3 summarizes the evidence on the link between educational inequality and conflict, distinguishing between inequality between individuals and four types of inter-group inequality. Single country sub-national studies are marked in grey. The signs indicate whether educational inequality has a negative, zero, or positive impact on conflict risk.

Table 3. Conflict potential of educational inequality: Macro- and meso-level evidence

Study	Basis of inequality	Individuals	Ethnic groups	Religious Groups	Regions	Gender
Besançon (2005)		+ / 0 ¹				
Bussmann (2007)						+
de Soysa & Wagner (2003)		0				
Melander (2005)						+
Østby (2008)		0	+			
Østby, Nordås & Rød (2009)		(+) ²			0	
Østby & Strand (2010)			+	+	+	
Barron, Kaiser & Pradhan (2004)		0 ³	-			
Mancini (2008)			+			
Murshed & Gates (2005)					+	

NIOTE: ‘-’ denotes negative effect of education on conflict; ‘+’ denotes positive effect; ‘0’ denotes no effect. ¹DV: Positive effect on ethnic wars & genocides; no effect on revolutions. ²Intra-regional inequality ³Intra-district inequality in Indonesia. Grey shade refers to single country meso-level studies.

With a few exceptions, Table 3 reveals that the overall conflict potential of disparities in educational opportunities seems to be consistent with a key finding in the broader inequality-conflict literature: Inequality between individuals does not matter for conflict, but inter-group inequality does.

With regard to the effect of individual educational inequality, two studies (Besançon, 2005; Soysa & Wagner 2003) use a cross-national dataset provided by Castelló & Doménech

(2002) who computed a Gini coefficient¹¹ for schooling inequality on the basis of Barro & Lee's (2001) data on education attainment. de Soysa & Wagner (2003) do not find any significant effect of individual-based educational conflict on the risk of civil conflict, but Besançon finds some evidence that schooling inequality is positively related to ethnic wars and genocides, but not to revolutions. In a cross-national study of 36 developing countries Østby (2008) calculates Gini coefficients for years of education based on individual survey data from national Demographic and Health Surveys. She finds no effect of such inequality on the likelihood of civil conflict onset. However, Østby, Nordås & Rød (2009) conduct a similar test, but at a lower level of analysis: In their sub-national study of 22 countries in Sub-Saharan Africa, they find that regions with high levels of intra-regional inequality do have a higher risk of experiencing a civil conflict onset. Drawing on census- and survey data from Indonesia, Barron, Kaiser & Pradhan's (2004) do not find any relationship between schooling inequality and conflict at the community level. Overall, the quantitative evidence on the conflict potential of educational inequality between *individuals*, usually measured as the Gini coefficient of education years, is mixed.

The theoretical proposition that educational inter-group inequalities are particularly conflict-prone receives, on the other hand, quite strong empirical support in the reviewed works (Østby, 2008; Østby & Strand, 2010; Mancini, 2008; Murshed & Gates, 2005). One exception is the study by Barron, Kaiser & Pradhan (2004), which, contrary to their expectation, found a negative effect of ethnic disparities in education and conflict within Indonesian districts. The other exception is the sub-national study of African regions by Østby, Nordås & Rød (2009), which failed to find a significant effect of regional relative deprivation of education, although the coefficient had the expected sign. Østby & Strand (2010) in a study of 67 developing countries compare the impact of various group identifiers, and conclude that educational inequalities along ethnic lines (more so than religious or regional) are particularly conflict-provoking, and especially in Sub-Saharan Africa. There is also some preliminary evidence that inter-group inequalities in terms of education has a stronger effect on conflict risk than sheer economic inter-group inequalities (measured e.g. in terms of household assets) (see Østby, 2008; Strand & Østby, 2010), although, as mentioned earlier, various dimensions of inter-group inequalities tend to co-vary quite strongly.

¹¹ The most common measure of inequality is the Gini coefficient – an index between 0 and 1 (or 0 and 100) where 0 implies an egalitarian distribution (perfect equality) and 1 (or 100) indicates total concentration (perfect inequality). Castelló & Doménech (2002) calculates this measure for education years instead of income.

Furthermore, the effect of inter-group inequalities may be influenced by contextual factors. For example, Østby and Strand found that inter-group educational inequality is particularly likely to fuel conflict in democratic regimes. Their main explanation for this is that in a democratic regime with sharp inter-group inequalities, the motives and opportunities to mobilize against the state are both present.

Finally, the two studies which explicitly test the impact of gender inequality in terms of education and conflict risk, both find robust support that gender inequality is indeed conflict-provoking (Bussmann, 2007; Melander, 2005). Both the studies focus on the direct stabilizing effect of gender equality, and Bussmann (2007) also stresses that education indirectly leads to peace through the promotion of development and good governance.

4.4. Disturbing effects of educational content?

The curriculum is likely to be the primary mechanism introducing children to nationalist ideology, which may later feed into support for political violence (Sambanis, 2005). However, systematic cross-national data on what is actually taught in schools is lacking. The only study among the 30 articles reviewed here which – at least to some extent – analyzes political violence in the light of educational content is a micro-level study of participation in militant organizations in Pakistan by Fair (2008). Contrary to common assumptions, she found that Islamist militants are relatively well educated compared to the rest of the population and that they are *not* predominantly emerging from Pakistan's religious seminaries, as often suggested. Further, there appears to be no systematic studies addressing the suggested relationship between educational *quality* or *relevance* and conflict participation.

4.5. Micro-level evidence on education and involvement in conflict

There is an increasing awareness in the quantitative civil war literature of the need to supplement the cross-national macro studies with micro-level research. This trend towards disaggregating conflict studies has gathered speed in the most recent period, and is highly pertinent to the study of education and conflict as many of the claims of causal relationships made in the macro studies build on assumptions about individual-level motivations and actions. While this challenge is widely acknowledged, the number of quantitative micro-level studies is still limited. A major reason for this is that data on individual motivations of conflict actors are difficult to obtain (Arjona & Kalyvas, 2007: 2) and data collection is

costly. However, pioneering studies like Arjona & Kalyvas (2007) and Weinstein & Humphreys (2008) appear to be inspiring more individual-level research, and it is very likely that we will see a considerable increase in such studies in the coming years based in particular on survey work.

The micro-level studies of education and conflict reviewed here all have in common that they explore if and how individual education level affects support of, or participation in, various activities related to political violence. The majority of the studies focus on armed conflict (Arjona & Kalyvas, 2007; Fair, 2008; Humphreys & Weinstein, 2008; Oyefusi, 2008, Shayo, 2007) two studies focus particularly on terrorist activities (Berrebi, 2007; Krueger & Malečkova, 2003), and one study looks at the link between education level and the likelihood of becoming a perpetrator of genocide (Verwimp, 2005). The general findings of these studies are presented in Table 4, with the signs indicating the direction of the relationship. Obviously, one of the limitations of country-specific micro-level analyses of conflict actors is that the results are not generalizable beyond the actual country. Hence, with the limited number of such studies available, we should be careful not to draw too broad conclusions.

Table 4. Education level and conflict recruitment: Micro-level evidence

Study	Dependent variable	Armed conflict	Terrorist activity	Genocide (perpetrator)
Arjona & Kalyvas (2007)		0 ¹		
Berrebi (2007)			+ ⁶	
Fair (2008)		+ ²		
Humphreys & Weinstein (2008)		- ³		
Krueger & Malečkova (2003)			+(weak)	
Oyefusi (2008)		- ⁴		
Shayo (2007)		- ⁵		
Verwimp (2005)				+

NOTE: ‘-’ denotes negative effect of education on conflict; ‘+’ denotes positive effect; ‘0’ denotes no effect. ¹The dependent variable pertains to the difference in average education level between individuals in rebel groups and counter-insurgency groups. The education results are not included in the final empirical model, but reported in passing as insignificant findings on p. 22. ²The dependent variable pertains to martyrdom during participation in Islamist militant groups in Pakistan. These were originally state-sponsored actors, but recently many have turned against the state. ³The negative effect of education pertains to both recruitment to rebel groups (both voluntarily and forced) and to counter-insurgencies. ⁴The dependent variable pertains to both disposition to armed struggle and the willingness to participate in violent protests. ⁵Dependent variable pertains to ‘support for armed forces’. ⁶The positive effect of education holds for both recruitment to terrorist organization and to participating in e.g. suicide bombing.

Overall, the evidence summarized in Table 4 indicates that people with low education levels are more likely to be recruited to armed conflict, whereas the effect is the opposite for terrorism and genocide, which tend to attract the more highly educated individuals.¹²

In a systematic review of arguments pertaining to recruitment of fighters in armed conflicts, Arjona & Kalyvas (2007) point out the fact that existing macro-level studies are based on assumptions of individual-level motivations that can hardly be tested empirically in macro-level designs. In particular, macro-level studies using aggregate measures to test individual-level assumptions are vulnerable ecological fallacy by drawing conclusions about individuals based on group characteristics. Arjona & Kalyvas (2007) further argue that one of the important shortcomings of existing macro-level as well as much micro-level work has been the exclusive focus on recruitment of insurgents, while recruitment to counter-insurgency organizations has been largely ignored.

Arjona & Kalyvas' (2007) study of Colombia and Humphreys & Weinstein's (2008) study of Sierra Leone provide very useful tests of rival recruitment explanations by exploring what it is that distinguish the people who rebel from those who fight to defend the status quo. We will discuss these two studies at some length here since they offer valuable insights into the micro-level evidence for some of the general claims in the literature.

Arjona & Kalyvas (2007: 4) argue that there are three main individual-level arguments for why individuals engage in political violence. First, joining could be understood as a reaction meant to rectify grievances ('grievance'); second, individuals may join based on the expectation of monetary or other material personal gain ('greed'); third, a person may be attracted to political violence by the promise of non-material rewards such as security. Among the indicators used to measure grievances, Arjona & Kalyvas (2007: 22) include low education and illiteracy.

Grievances are assumed to contribute to the recruitment to armed groups through two distinct mechanisms. Recruits may either be driven by *consequentialist* motivations, i.e. a desire to end the source of their grievances. Or motivations may be *expressive*, in the sense that people are driven by moral outrage or strong moral values (Arjona & Kalyvas, 2007: 5). In order to separate grievance explanations and test them against other individual-level as well as structural variables, the authors assume that 'grievances' should be found disproportionately among those who join organizations committed to challenge status quo.

¹² In Table 4 we have not included a study by Pugel (2007) on ex-combatants in Liberia. He reports that those who had completed a reintegration training program appeared to be the most educated among the ex-combatants.

Despite not being able to unveil the exact mechanism at work, we should expect to see that if grievance factors are indeed important, individuals joining insurgent groups should be poorer and less educated, consider themselves to be poorer, come from poorer households and communities, and feel more excluded compared to those who join *counterinsurgent* groups (ibid.: 6). Interestingly, the empirical analysis finds that the grievance arguments pertaining to poverty and low education ‘cannot differentiate between people joining the FARC or the paramilitaries’ (ibid.: 22). Despite having very different political goals, both sides appear to be attracting people from the poorest and less educated sides of society. Furthermore, greed explanations are also questioned given that many rebels gave up good sources of income to join FARC, and also that paramilitary fighters appear to be no more motivated by material rewards than FARC members, even though paramilitaries actually receive compensation.

One of the main conclusions arising from the study by Arjona & Kalyvas (2007) is that civil wars are dynamic processes and that much theorizing and empirical studies tend to focus too much on the conditions existing prior to the outbreak of war and largely overlook the endogenous processes. While ‘greed’ factors would suggest that individuals may be ‘shopping around’ for groups to join, their analysis suggests that individuals are actually strongly constrained in their ‘choices’. Generally, Arjona & Kalyvas (2007) conclude that none of the theories that have been advanced in the literature seem to be able to explain recruitment by themselves. Given the challenges associated with testing causal mechanisms that are derived from over-aggregate and observationally equivalent theories, they find that additional theorizing as well as empirical testing is strongly needed.

In a similar study of both former insurgents and counterinsurgents in Sierra Leone, Humphreys & Weinstein (2008) test three rival explanations; grievances, personal incentives, and social sanctions associated with strong community ties. Like Arjona & Kalyvas (2007) they find that ‘grievance factors’ like poverty, lack of access to education, and political alienation all explain participation in both insurgent and counterinsurgent groups (Humphreys & Weinstein, 2008: 452). They also report a positive effect between lacking education and participation in rebellion among abductees, questioning the very idea of agency among potential rebel recruits. This could be explained by the fact that areas with poor, uneducated people typically have less means of protection and that army leaders therefore might prefer to target such destinations for recruitment (Achvarina et al., 2009).

Like Arjona & Kalyvas (2007), Humphreys & Weinstein (2008) conclude that this calls into question a simple grievance model that predicts insurgents to be the most

aggrieved. Instead of proxying grievances, Humphreys & Weinstein speculate that poverty and education rather capture a more general vulnerability to political manipulation, less patience with more peaceful forms of protest, or just fewer options (ibid.). They further argue that all three main theories receive some support, and that posing them as rivals and mutually exclusive is artificial. Rather than continuing to impose different and competing theoretical frameworks on empirical materials, Humphreys & Weinstein argue that analysis should focus on ‘the conditions under which distinct strategies of recruitment are pursued by different groups at different times’ (2008: 453).

Several other individual-level studies add to our understanding of individual-level motivations. Oyefusi (2008) examines the factors that determine youth’s willingness to participate in different forms of civil unrest in the Niger Delta, and finds that all three levels of education individually reduce the willingness to participate in violent protest, whereas only secondary and tertiary education constrain disposition to armed struggle.¹³ This is consistent with Shayo (2007: 28), who concludes from his investigation of individual-level surveys from 32 countries that ‘low education promotes militaristic attitudes’. In contrast to this, Fair (2008) in a study of militant martyr households in Pakistan found that the militants were more highly educated than the average Pakistani.¹⁴ However, she points out that this finding could reflect the outcome of group selection effects because most of the *mujahideen* in her sample served and died in Kashmir, where the operational environment is very challenging. Fair’s (2008) findings are thus largely consistent with the terrorism literature.

After the events of September 11th 2001, the debate about whether poverty and education influence terrorism has gained considerable momentum. One of the most well-known contributions is a study by Krueger & Malečková (2003). Drawing on public opinion polls in the West Bank and Gaza Strip, they investigate the link between respondents’ educational attainment and their support of and participation in militant and terrorist activities. They found that support for armed attacks on Israeli civilians does not decrease among those with more education. Further, they found that (Hezbollah) terrorists had slightly better than average education than the population in general, but their overall conclusion is that ‘any connection between poverty, education, and terrorism is indirect, complicated, and

¹³ He also finds that while higher education constrains participation in violence, it increases the probability for participating in peaceful protests.

¹⁴ Fair (2008) further found that the militants in her sample are not predominantly emerging from Pakistan’s *madaris* (religious schools) religious seminaries, as often assumed.

probably quite weak' (Krueger & Malečková, 2003: 119).¹⁵ Berrebi (2007) reports more robust results linking education and terrorism. Analyzing the biographies of 335 Palestinian terrorists he found that higher education is positively associated with participation in both Hamas and the Palestinian Islamic Jihad (PIJ). If we take these results at face value, they imply that increasing schooling could actually increase the supply of terrorists. However, Berrebi (2007) stresses that the importance of using education to fight terror is not invalidated in spite of his findings. He suggests that the most likely explanation of the results may be educational content, pointing to anecdotal evidence on how education can be directly used to breed terrorism (Berrebi, 2007: 28 – 29).

Finally, the last category of studies in Table 4 is represented by Verwimp (2005), who presents evidence on the profiles of perpetrators of the Rwandan genocide. He found that perpetrators were more highly educated than others, and suggests that what he terms the 'something to defend thesis' is one way to account for this.

A general lack of education is found to be associated with popular support and over-confidence in armed forces – which in turn increases the risk of conflict (Shayo, 2007). Ignorance and lacking education can help generate and sustain popular support for military campaigns, even if the least educated supporters of war are not necessarily the most likely to actually fight. This can help reconcile the mixed evidence presented above on the link between individual education and participation in militant activities with the strong macro-level evidence on the relationship between overall education levels and conflict.

4.6. Is low and unequal education causing conflict, or vice versa?

As demonstrated by Lai & Thyne (2007), armed conflict may also impact education. To what extent can we be certain that the relationship between low and unequal education and conflict is not simply reflecting the other causal direction, namely that conflict can lead to disruption and discrimination in the provision of education?

Similar concerns about *endogeneity* or reverse causality exist for many other relationships in the civil war literature, including between development and conflict, economic growth and conflict, regime type and conflict, and ethnic fractionalization and conflict. These concerns are real and have to be addressed properly. Studies of conflict onset typically address this problem by lagging the explanatory variables so that conflict onsets in

¹⁵ Paxton (2002) argues that Krueger & Malečková's results might apply only to the Middle East.

a given year are explained by the values on the explanatory variables in the previous year. The purpose of this procedure is to avoid any influence of conflict on the explanatory variables.¹⁶ An additional point is that educational measures capturing the level of education, such as educational attainment, whether on individual or group level, are not likely to be strongly affected by conflict in a short to medium time frame. Significant declines or inequalities in access are likely to primarily result from long-lasting and high-intensity conflict. Measures of enrollment or of education change are likely to be more susceptible to conflict influence.

In the most systematic study of education and conflict to date, Thyne (2006) specifically tests for endogeneity by running a two-stage model where the first stage involves predicting education and other possible endogenous variables. Then, the residuals from the first stage are run in a basic civil war model. Thyne (2006) finds strong support for the exogeneity of his education variables, indicating that the statistical relationship between education and conflict is not driven by the reverse causal influence of conflict on education.

5. Conclusion

According to the Universal Declaration of Human Rights, adopted by the General Assembly of the United Nations following World War II, education shall ‘promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace’ (UN, 1948: Article 26)

The empirical evidence presented above suggests that such a hope is not entirely unrealistic. Overall, the evidence from quantitative studies very strongly suggest that increasing education at all levels reduces most forms of political violence, although some micro-level evidence suggest that the more highly educated individuals tend to be overrepresented among terrorists. Recent studies have provided important insights into more subtle aspects of the education and conflict nexus by employing a multitude of measures sensitive to education level and changes as well as gender and group distribution of

¹⁶ However, this is complicated by the handling of recurring conflicts. In most studies, a period of conflict inactivity, typically two to five years, is required before a new onset of the same conflict is coded. Hence, ‘conflict legacy’ may have some influence on the explanatory variables for recurring conflicts. As Thyne (2006) points out, an added endogeneity problem is that people may act upon the anticipation of fighting, for instance fleeing before a conflict breaks out. This would not necessarily be captured by a lagged data structure.

education. However, secondary male education seems to be perhaps the single most suitable discriminator given the theoretical attraction – young men in their high teens or low twenties are the main protagonists of violence – as well as empirical variation between countries. Micro-level studies of motivations suggest that multiple theoretical frameworks have to be employed to understand how recruitment to political violence is happening. They seem to refute simple claims that the poorest and least educated rebel against the status quo. In fact, poverty and low schooling is associated with recruitment to both insurgent and counterinsurgent organizations.

Rapid expansion in tertiary education has been voiced as a concern in relation to recruitment to terrorist organizations, and also as a source of low-level protest. However, such expansion does not generally seem to pose a serious threat to peace, although only a handful of studies have addressed this concern. An important shortcoming of existing studies of educational expansion is that they do not simultaneously address opportunity factors that matter for educated youth. While there is little evidence that schooling inequality between individuals seems to matter for conflict, when such inequality overlaps with other cleavages in society, such as ethnicity, religion, region or gender, the risk of conflict seems to increase significantly. We have not been able to identify any quantitative study analyzing the effect on conflict of educational quality or content. Although evidence from case studies suggest that low relevance and quality of education can seriously hamper young peoples' economic opportunities, the link to violent conflict is not clear. There is further little evidence available on the link between curricula and violence. While training in religious schools is often cited in relation to recruitment to extremist religious organizations, at least one study on Pakistan seems to suggest that Pakistani militants in Kashmir were not primarily educated in religious schools (Fair, 2008).

One of the greatest challenges for previous, comparative analysis has been the lack of reliable and complete education data. The recent development of a new country-level sex and age specific dataset on educational attainment on all levels (Lutz et al., 2007) provides great prospects of further empirical investigation of the education-conflict relationship. The dataset currently covers 120 countries for the period from 1970-2000, but will be expanded to include several more conflict countries at a later stage. An already released extension dataset providing education projections has proven useful for forecasting future conflict risks (Hegre et al., 2009). Generally, education data on the sub-national level are scarce for many conflict countries, and also do not always allow for comparison across countries. Recent

approaches using individual-level survey data to construct regional education data (e. g. Østby, Nordås & Rød, 2009) are promising, but limited by the lack of survey data for certain countries and periods.

As illustrated in this review, more meso- and micro-level analysis of education and conflict is necessary to appropriately address some of the most central assumptions of the relationship. In particular, the theoretical frameworks of many macro-level cross-national studies build on assumptions of rebel recruitment that cannot be tested in the absence of appropriate micro-level data that can provide information about the actual motivations of conflict actors. While there is a recent and very promising move towards the disaggregation of education and conflict studies, data on individual motivations are difficult and expensive to collect. An additional challenge pertains to drawing conclusions beyond the sample, which is typically restricted to one country. Additional micro-level analyses of more conflict contexts are necessary in order to validate some of the early studies of single countries.

Other important priorities for future systematic research on education and conflict include assessing the importance of education for a greater variety of violence and for conflict dynamics; collecting data to study how conflict risk is affected by educational content and quality; and emphasizing context-specific and interaction effects such as the role of education in rural and urban settings separately, the interaction of education and labor market, the role of migration, and of systematic exclusion of groups.

Policy recommendations

In a study that sets out to predict future conflict for the years 2010–2050, Hegre et al (2009) demonstrate that the implementation of policies that e.g. help increase education levels have an impact on future global conflict levels. Compared to most other factors that are known to affect political violence, education is something that almost all governments can alter through national policy (Thyne, 2006). However, Mack (2002) warns that policy-makers may not take a great interest in general recommendations of policies that are already widely pursued as a broader development agenda, even though invoking security arguments is often helpful for generating support behind a specific policy (Barakat & Urdal, 2009). Rather, as pointed out by Barakat & Urdal (2009), the focus should be to identify what forms and levels of education and under what conditions educational reform may contribute to reduce the risk of conflict. A major objective of this review is to single out from existing empirical evidence some explanations for political violence that are particularly relevant to policy makers.

Overall, this review summarizes evidence that very clearly points to a pacifying effect of education, at all levels. There is little support for concerns that governments should be cautious about expanding access to education rapidly, although little empirical work has been done on the consequences for conflict of educational expansion and labor market dynamics. While policymakers should monitor the situation for educated youths generally, and particularly so following broad expansions in educational access, there is every reason to keep up the pressure for education expansion as a development strategy that will provide opportunities for young people. Lack of education has been identified as a particularly potent predictor in low-income countries and in countries with large youth bulges, and recent efforts to increase education levels in the poorest countries may thus have a significant long-term pacifying effect. It is further important to note that democracies seem to experience a greater stabilizing effect of education than non-democracies do.

Policymakers should further be particularly committed to reduce educational inequality. Systematic differences in access to education between religious and ethnic groups appear to fuel conflict, whether they are caused by ‘grievances’ or simply by few opportunities among young people in the disadvantaged groups. The conflict potential of regional disparities in education seems to be stronger for democracies than for other regime types (Østby & Strand, 2010). This implies that inter-group inequalities can be particularly explosive with regard to regime change, and that a reduction of such inequalities could contribute to peaceful democratic transitions. The positive effect of educational equality also extends to gender as equal access to education between boys and girls also appears to reduce conflict risk.

Finally, much academic as well as popular attention has been devoted to the connection between education and terrorism following the observation that terrorists often are well educated and rarely marginalized. Does this mean that raising education in for instance countries in the Middle East and North Africa will lead to more terrorist violence? This is an implausible conclusion. Rather, the higher-than-average education levels among recruits to terrorist organizations is likely to be a *selection effect*, whereby more educated and thus qualified recruits are chosen over less qualified (see e.g. Berrebi, 2007; Bueno de Mesquita, 2005). Future studies on education and terrorism should focus particularly on the mismatch of education and jobs, on group inequalities in access to education, and on educational content.

6. Literature

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Appendix A. Quantitative Evidence of the Links between Education and Political Violence

<i>International cross-country/region/city studies</i>				
Study	Spatio-temporal coverage; unit of analysis	Dependent variable(s) (Conflict/Violence)	Main independent variable(s) (Education terms and other central variables)	Main finding(s) regarding the effect of education on conflict
Alesina & Perotti (1996)	71 countries, 1960–1985; country-year	Political instability (authors)	Primary and secondary school enrollment; (Barro & Lee, 1993)	Countries with higher levels of education tend to be more stable.
Barakat & Urdal (2009)	120 countries, 1970–2000; country-year	Internal armed conflict (PRIO/Uppsala)	Secondary attainment (all, males); primary to secondary progression ratio; expansion in education (secondary, tertiary) (IIASA); interactions with youth bulges	Large, young male population bulges are more likely to increase the risk of conflict in societies where male secondary education is low, particularly in low and middle-income countries, and particularly in Sub-Saharan Africa. Rapid expansion in higher education does not seem to affect conflict risk.
Besançon (2005)	108 countries, 1960–2001; country-year	Ethnic wars; revolutions; genocide (Marshall, Gurr & Harff, 2002)	Schooling inequality (Castelló & Doménech, 2002); tertiary education (World Bank, 2000).	Schooling inequality leads to a greater likelihood of higher levels of violence for ethnic wars and genocides, but not revolutions. Tertiary education has a negative impact on ethnic wars and genocides, but is associated with a higher risk of revolutions.
Bussmann (2007)	100 countries, 1985–2000; country-year	Internal armed conflict (PRIO/Uppsala)	Literacy (female, male, ratio between the genders); primary, secondary and tertiary enrollment (all, ratio between the genders) (WDI, 2004)	Educational gender equality is associated with lower conflict risk for literacy and all levels of school enrollment. Primary and tertiary enrollment associated with lower risks but secondary enrollment has no impact.

Collier & Hoeffler (2004)	125 countries, 1960–1999; 5-year intervals per country	Civil war onset (COW)	Male secondary school enrollment (WDI, WB, 1998)	Increasing secondary male enrollment reduces conflict risk.
Collier, Hoeffler & Söderbom (2004)	55 conflicts, 1960–2000; conflict-time	Duration of civil war (COW)	Male secondary school enrollment (WB, 1998)	Increasing secondary male enrollment is associated with shorter wars.
de Soysa & Wagner (2003)	92 countries, 1989–2000; country-year	Internal armed conflict (PRIO/Uppsala)	Schooling inequality (Castelló & Doménech, 2002)	Zero effect of schooling inequality.
Hegre (2003)	126 countries, 1960–2000; country-year	Internal armed conflict (minor & major) (PRIO/Uppsala)	Literacy; secondary school enrollment (WB, 2002); interaction between literacy and regime type	Education has a negative impact on the risk of armed conflict. The conflict risk is increasing in literacy for democracies, but not for non-democratic regimes.
Hegre et al. (2009)	Macro-level: global and regional level (169 countries), 2008–2050	Incidences of armed conflict (predictions)	Projection of male secondary educational attainment (International Institute for Applied Systems Analysis)	Increased education levels do have an impact on future global conflict levels. This risk reduction also transmits into neighboring countries.
Melander (2005)	107 countries, 1960–1945; Country-year	Internal armed conflict (minor & major) (PRIO/Uppsala)	Female-to-male ratio of higher education	Lower levels of the ratio of female-to-male higher education attainment are associated with lower levels of intrastate armed conflict.
Østby (2008)	36 developing countries, 1986–2003 country-year	Internal armed conflict (PRIO/Uppsala)	Inter-ethnic educational inequality; inter-individual educational inequality (author's calculations based on DHS)	Higher levels of inter-ethnic educational inequality have a positive impact on conflict risk, but inter-individual educational inequality has no impact.
Østby et al. (2009)	Meso-level: sub-national regions in 22 countries in South Saharan Africa, 1986–2004; region-year	Region involvement in internal armed conflict (PRIO/Uppsala)	Regional measures of average education, relative deprivation; and intra-regional inequality in terms of education years (authors)	Conflict onset is less likely in regions with lower average education levels and regions with sharp intra-regional education inequality.

Østby & Strand (2010)	67 developing countries, 1986–2008; Country-year	Internal armed conflict (PRIO/Uppsala)	Inter-ethnic, inter-religious, and inter-regional educational inequality (author's calculations based on DHS)	All types of inter-group education inequality are positively associated with conflict risk. This impact is particularly strong in democratic regimes and in countries with regularly installed leaders.
Shayo (2007)	33 countries, 1960–2000; country-year; including micro-level study (see below)	Civil war (Fearon & Laitin, 2003)	Educational attainment (Barro & Lee, 2000)	Increase in average schooling of population reduces the risk of civil war.
Thyne (2006)	160 countries, 1980–1999; country-year	Civil war (Fearon & Laitin, 2003)	Educational expenditure; primary, secondary (both male and universal), post-secondary enrollment rates, adult literacy rates (WDI, 2004; UNESCO, 2004)	Education has a general pacifying effect on civil war, but not postsecondary enrollment (which has no effect).
Urdal (2006)	All sovereign states in the international system, 1950–2000 (1984–1995 for terrorism and riot models); country-year	Internal armed conflict (PRIO/Uppsala); terrorism, riots (King & Zeng, 2001)	Tertiary education growth (UNESCO/USAID, 2003)	The interaction of youth bulges with expansion in higher education increases the risk of terrorism, but not of civil conflict and rioting.
Urdal & Hoelscher (2009)	Meso-level: 55 cities in Asia and SSA, 1960–2006; city-year	Urban social disorder (lethal and non-lethal) (Urdal, 2008)	Male secondary educational attainment; expansion in tertiary education for males (Barakat & Urdal, 2008)	Low levels of secondary educational attainment are associated with increasing levels of (lethal) urban social disturbance. No interaction effect with youth bulges or effect of expansion of tertiary education .

<i>Single country meso-level studies</i>				
Study	Spatio-temporal coverage	Dependent Variable(s) (Conflict/Violence)	Main Independent Variable(s) (Education terms and other central variables)	Main Finding(s)
Barron, Kaiser & Pradhan (2004)	69,000 villages and neighborhoods in Indonesia, 2002–2003; cross-sectional	Conflict at community level (Indonesia's Village Potential Statistics survey (PODES), 2003)	Inter-individual and inter-ethnic group inequality of years of schooling (2002 Indonesian Village Census)	Inter-individual educational inequality has no effect on conflict. Higher educational inequality between large ethnic groups is associated with lower levels of conflict.
Mancini (2008)	164 districts across 19 provinces in Indonesia, 1995–2004; cross-sectional	Ethno-communal violence (UNSFIR / Varshney et al., 2004).	Inter-ethnic group inequality of years of education (1995 Intercensal Population Survey (SUPAS))	On average, inter-ethnic educational inequality is generally lower in peaceful districts.
Murshed & Gates (2005)	75 districts in Nepal, 1996; cross-sectional	Conflict intensity: Number of people killed by district (Gautam, 2001)	Schooling gap between each district and Kathmandu (UNDP, 1998)	The schooling gap between a district and Kathmandu is negatively associated with deaths due to armed civil conflict.
Tadjoeddin & Murshed (2007)	Javanese districts, Indonesia, 1994–2003; district-year	Everyday 'routine' violence (UNSFIR / Varshney et al., 2004).	Mean education years (BPS-Statistic Indonesia)	The relationship between violence and education takes inverted-U shape: Initially, violence increases as education rises, but, later on, the level of violence falls as education continues to increase.
Urdal (2008)	27 Indian states, 1956–2002; state-year	Internal armed conflict (PRIO/Uppsala); political violent events (IPS/Marshall, 2001), Hindu-Muslim riots (Varshney & Wilkinson, 2004)	Literacy (Central Statistical Organization (CSO), annual)	Literacy has no impact on armed conflict risk, slightly positive effect on political violence, and negative impact on Hindu-Muslim riots.

<i>Micro-level studies</i>				
Study	Spatio-temporal coverage	Dependent Variable(s) (Conflict/Violence)	Main Independent Variable(s) (Education terms and other central variables)	Main Finding(s)
Arjona & Kalyvas (2007)	Survey of 829 demobilized combatants and 545 civilians in Colombia, June–October, 2005	Armed actor recruitment (rebel and counter-insurgent factions) (authors)	Literacy, education level (authors)	No education difference between paramilitary and guerilla fighters.
Berrebi (2007)	Biographies of 335 Palestinian terrorists, 1987 to 2002.	Participation in terrorist activities by members of the Hamas and PIJ (author)	Schooling years (authors)	Higher education is positively associated with participation in Hamas or PIJ and with becoming a suicide bomber.
Fair (2008)	Survey of 141 militant (martyr) households in Pakistan, August 2004–April 2005	Participation in militant group (author)	Education level (author)	The militants in the sample are well educated and are not predominantly emerging from Pakistan’s religious seminaries, as is often suggested.
Humphreys & Weinstein (2008)	Survey of 1,043 ex-combatants + 184 noncombatants in Sierra Leone, June–August 2003	Membership in the RUF, CDF (authors)	Lack of education (authors)	Lack of education predicts participation in both rebellion and counter-rebellion.
Krueger &	1357 Palestinian	Support of and	Educational attainment	Terrorists have slightly better than

Malečkova (2003)	Respondents in West Bank & Gaza, December 19–24, 2001	participation in terrorist or militant activities (authors)	(authors)	average education than the population in general.
Oyefusi (2008)	1300 survey respondents in Niger Delta, February–August, 2005	Different forms of civil unrest (author)	Educational attainment and studentship (author)	Primary, secondary and tertiary education reduce the willingness to participate in violent protests. Secondary and tertiary education reduce the probability of having a disposition to armed struggle.
Pugel (2007)	590 former ex-combatants, Monrovia, Liberia, February–March 2006	Registration/enrollment in a reintegration training program (author)	Education level (author)	Those ex-combatants who had completed a reintegration training program appear to be the most educated.
Shayo (2007)	38 WVS surveys from 32 countries, with average of 1250 respondents per survey	‘Confidence in armed forces’ (World Values Surveys)	Schooling years (World Values Surveys)	Low education promotes militaristic attitudes.
Verwimp (2005)	1838 respondents from 350 Rwandan households at two points in time: (1989–1992) and 2000	Perpetrator of genocide (author)	Educational attainment (author)	Perpetrators are over-represented among the educated.