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Child soldiers as time bombs? Adolescents' participation in rebel groups and the recurrence of armed conflict

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Abstract

The existent work on child soldiering began only recently to systematically study its consequences, both theoretically and empirically. The following article seeks to contribute to this by examining the impact of rebels' child soldier recruitment practices during war on the risk of armed conflict recurrence in post-conflict societies. We argue that child soldiering in a previous dispute may increase both the willingness and opportunity to resume fighting in the post-conflict period, while disarmament, demobilization and reintegration programmes could decrease these aspects of conflict recurrence. Empirically, we analyse time-series cross-section data on post-conflict country-years between 1989 and 2005. The findings highlight that the risk of conflict recurrence does, indeed, increase with child soldiers who fought in an earlier dispute, but — counter-intuitively — is unlikely to be affected by the presence of disarmament, demobilization and reintegration programmes in post-conflict societies. This research has important implications for the study of armed conflicts, child soldiering and research on post-conflict stability.

Keywords

Child soldiers, conflict recurrence, disarmament, demobilization and reintegration programmes, post-conflict stability

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Introduction

Not only have millions of young people been first-hand witnesses of war and atrocities that invariably accompany aggression, but — despite a near-universal condemnation from the international community (UNICEF, 2003) — an increasing number of adolescents have also been recruited by governmental military organizations, militias and primarily rebel groups over the last few decades, performing diverse and multiple roles, including fighting (e.g. Betancourt et al., 2010; Maclure and Denov, 2006: 119; Wessells, 2006).

The existing scholarly work on child soldiers[1] (e.g. Achvarina and Reich, 2010; Beber and Blattman, 2013; Blattman and Annan, 2010; Brett and Specht, 2004; Lasley and Thyne, forthcoming; Reich and Achvarina, 2005; Singer, 2006, 2010; Tynes, 2011; Tynes and Early, forthcoming) mainly focuses on the *determinants* of child soldiering, that is, those factors leading to child recruitment in the first place. Lasley and Thyne (forthcoming: 3–4), most recently, provide a comprehensive overview and highlight the importance of supply- and demand-side factors. For instance, socio-economic factors such as low income levels and an abundance of children, conflict characteristics such as longer conflict durations or higher levels of violence, and the fact that children are more easily coerced and indoctrinated may make it more likely that child soldiering occurs during conflict (e.g. Achvarina and Reich, 2010; Andvig and Gates, 2010; Beber and Blattman, 2013; Becker, 2010; Blattman and Annan, 2008, 2010; Brett and Specht, 2004; Cohn and Goodwin-Gill, 1994; Honwana, 2006; Lasley and Thyne, forthcoming; Machel, 1996; Rakisits, 2008; Singer, 2006, 2010; Tynes and Early, forthcoming; Wessells, 2006).

Few studies, however, focus on the *consequences* of child recruitment during war for post-conflict stability (for an exception, see Blattman and Annan, 2010). This seems surprising since international organizations, policymakers, the media and other public sources frequently emphasize the potentially highly negative impact that child soldiering might have on societies once a conflict is over. The United Nations Children's Fund (UNICEF, 2013), for example, fears that former child soldiers may become a 'lost generation', which is likely to be too disturbed to function in a post-conflict environment (see also Wessells, 2006). Similarly, the former French Foreign Minister Philippe Douste-Blazy warned in 2007 that young ex-combatants are 'a time bomb that threatens stability and growth … lost for peace and lost for the development of their countries' (BBC, 2007; see also Lasley and Thyne, forthcoming; Singer, 2006: 110), while the *New York Times* (2006) expressed the concern that such youths (i.e. child soldiers) return after war as 'damaged, uneducated pariahs'. Ultimately, if subscribing to these statements, child soldiering may be thought to contribute to the well-known 'conflict trap'. According to Neil Boothby (1998):

> I think it is safe to say unless we are able to break the cycle of violence, unless we are able to focus on this teenage population specifically … it will be the teenager who picks up the gun and starts the next cycle.

Nonetheless, a systematic analysis of these claims is missing and, in fact, scholars studying the causal mechanisms underlying the recurrence of armed conflict have thus far not paid much attention to the role of former child soldiers. Evidence on the impact of former

child soldiers destabilizing peace in post-war societies is scarce, and little has been empirically quantified or theoretically identified (Steenkamp, 2005). We seek to contribute to this debate by combining the dominant theoretical 'willingness-and-opportunity' framework for explaining the recurrence of armed conflict (e.g. Kreutz, 2010; Mason et al., 2011; Quinn et al., 2007; Rustad and Binningsbø, 2012; Toft, 2010; Walter, 2004, 2014) with the literatures on youth bulges (e.g. Leahy et al., 2007; Mesquida and Wiener, 1996; Schwartz, 2010; Urdal, 2006, 2008; Urdal and Hoeschler, 2009) and the consequences of child soldiering (e.g. Blattman and Annan, 2010) to assess how rebel groups' child soldiering practices in a preceding conflict affect post-conflict stability.

In the words of Walter (2004), 'conflict begets conflict' and it has been estimated that a large share (about 38%) of civil wars between 1945 and 1996 recurred. Mason et al. (2011), Kreutz (2010) and Quinn et al. (2007) identify similar patterns, highlighting the importance of conflict recurrence: many outbreaks of armed conflicts are recurrences of a past conflict rather than 'new' disputes. We argue that child soldiering in conflicts may increase both the willingness and opportunity to resume fighting in post-conflict societies.[2] However, the willingness and opportunity of rebels to take up arms again can potentially be decreased by disarmament, demobilization and reintegration (DDR) programmes, especially in the case of former child soldiers. To empirically test the derived hypotheses, we analyse time-series cross-sectional data on post-conflict country-years between 1989 and 2005 (Kreutz, 2010). The empirical findings highlight that the risk of conflict recurrence does increase with child soldiers who were recruited by rebel groups in an earlier dispute, but — counter-intuitively — that the presence of DDR programmes is unlikely to influence conflict recurrence at all. To this end, we not only contribute to the previous work by extending the study of child soldiering consequences, but also identify a new channel within the 'willingness-and-opportunity' framework that affects the risk of a new conflict breaking out. We conclude this article with a comprehensive discussion of the implications for policymakers and the scholarly literature.

An overview of the conflict recurrence literature

Conflicts are likely to recur if at least one side of the former belligerents perceives that a new dispute is more beneficial than sustained peace (e.g. Annan et al., 2011; Fortna, 2003; Kreutz, 2010; Mason et al., 2011; Quinn et al., 2007; Rustad and Binningsbø, 2012; Toft, 2010; Walter, 2004, 2014). When trying to assess the likelihood of resumed conflict, we therefore deal with the issues of *willingness* and *opportunity* (Most and Starr, 1989; Quinn et al., 2007; Starr, 1978; Urdal, 2006; Walter, 2004, 2014).

First, willingness is about 'the processes and activities that lead men to avail themselves of the opportunities to go to war' (Starr, 1978: 364). In the literature on the recurrence of armed conflict, one can find this willingness aspect when scholars discuss existing (or new) grievances. Civil war outcomes might, for instance, foster old grievances or induce new ones, which, in turn, increase the willingness of belligerents to take up their arms again (Collier, 2000). Quinn et al. (2007: 176) point out that former combatants may be dissatisfied with, for example, the peace agreement set in place or with the institutions of dispute resolution (see also Fortna, 2003; Toft, 2010; Walter, 2004, 2014). Similarly, dissatisfaction over the distribution of resources increases the

willingness of belligerents to discard post-conflict peace (Rustad and Binningsbø, 2012), while poor or stigmatized ex-combatants could also have a higher willingness to fight again (e.g. Walter, 2004, 2014). For instance, Spear (2006) argues that former fighters may feel compelled to resort to arms if they cannot find livelihoods to support themselves, either due to unemployment or a lack of reintegration assistance. Other scholars (e.g. Berdal, 1996; Call and Stanley, 2003) suggest that if former fighters are harassed or threatened, they may rearm in order to protect themselves. This is also confirmed by Themnér's (2011) case studies.

Second, 'opportunity' describes those factors that increase the likelihood that belligerents *can* attack each other again as it refers to the set of possibilities and constraints of conflict recurrence (Starr, 1978: 368). Most scholars emphasize the importance of 'greed' factors in this context (Urdal, 2006). For example, rebellions require material resources to pursue their goals (e.g. Collier and Hoeffler, 2004). Rustad and Binningsbø (2012) focus on the role of natural resources in funding renewed rebellion. Others highlight the outcome of an armed conflict. Quinn et al. (2007: 173), for instance, suggest that if one side wins an armed conflict decisively, it is likely that this will lead to the disarmament of the other side. In turn, the opportunity to fight and, hence, the recurrence of armed conflict is not given (see also Toft, 2010). Finally, Themnér (2011, 2013) argues for the influence of networks of former combatants in the re-mobilization of fighters: ex-combatants who fought on the same side often constitute a distinct social group. It is, then, not uncommon for ex-fighters of the same faction to continue to fraternize long after leaving their armed units, and that these social networks mirror pre-existing command structures. This positively affects the opportunity to resume fighting.

Adolescents, former child soldiers and post-conflict (in)stability

Although there are several pioneering studies dealing with questions of how willingness and opportunity influence conflict recurrence, and how former combatants influence post-conflict instability, none of them takes the potential role of former child soldiers explicitly into account (Collier, 2000; Fortna, 2003; Kreutz, 2010; Mason et al., 2011; Quinn et al., 2007; Rustad and Binningsbø, 2012; Toft, 2010; Walter, 2004, 2014). There is, however, one approach that specifically links youth to the (re)occurrence of conflict: the 'youth-bulge' literature.

The youth-bulge work follows the more general debate on security implications of population pressure and resource scarcity (Urdal, 2011). It is founded on the rationale that large cohorts of young (especially male) people, the so-called 'youth bulges', make countries more susceptible to civil wars (Leahy et al., 2007; Mesquida and Wiener, 1996; Schwartz, 2010; Urdal, 2006, 2008; Urdal and Hoeschler, 2009). Youth bulges potentially increase both the opportunity and willingness of rebel groups to (re-)engage in political violence. Considering the opportunity side, Collier (2000: 94) suggests that relatively large youth cohorts facilitate recruitment through the abundant supply of 'rebel' labour with low opportunity costs (e.g. Urdal, 2006; see also Yair and Miodownik, forthcoming). Scholars also argue that the opportunity for rebellion among adolescents

is boosted by a weak government with limited capability to inflict losses on the rebels (Collier and Hoeffler, 2004; Fearon and Laitin, 2003; Urdal, 2006: 609).

In terms of the willingness perspective, it is frequently emphasized that institutional crowding on the labour market or the educational system, lack of political openness, and crowding in urban centres causally link youth bulges and conflict onset or recurrence (e.g. Braungart, 1984; Choucri, 1974; Goldstone, 2001; Urdal, 2011). For example, Moser and Rodgers (2005) argue that violence is strongly associated with unequal access to employment, education, health and basic physical infrastructure. Situations of widespread, severe inequality, then, heighten the potential for alienated, frustrated and excluded populations and, particularly, younger men to engage in violence (see also Goldstone, 2001). This is also confirmed by Brett and Specht (2004), who found strong micro-level support for the expectation that poverty, a lack of schooling and low alternative income opportunities are important reasons for joining a rebel group (see also Collier, 2000).

The (implicit) assumption of the youth-bulge literature is that young people suffer more from marginalization and relative deprivation than other groups, and that they are more likely to resort to violence once they are aggrieved (Hilker and Fraser, 2009: 17). This assumption is made more explicit in the so-called 'blocked transition to adulthood' approach. Its underlying argument is that the structural exclusion and lack of opportunities faced by young people in many countries effectively blocks or prolongs their transition to adulthood (i.e. leaving the parental home and setting up new living arrangements, finishing full-time education, or settling into a stable source of livelihood) and can lead to frustration, disillusionment and, ultimately, engagement in violence (Barker and Ricardo, 2005; Curtain, 2001; Hilker and Fraser, 2009: 19). In light of this, some scholars argue that the social and economic status required for adulthood is increasingly unattainable for young people (Hilker and Fraser, 2009: 18; see also Richards, 1996; Utas, 2005, 2008; Uvin, 1998). For example, Utas (2005: 150) describes that many male Liberian adolescents are unable to become socially accepted as men because they have been unable to achieve the cultural mandates of building their own house and getting married. This corresponding frustration and discontentment among young people can result in taking up arms and (re-)engaging in political violence.

Against this background, even if youth is considered to be of special importance for conflict (re-)emergence, existing approaches do not focus per se on the role that former child soldiers play and how this particular group differs from those youngsters that were not recruited by rebel groups. As we argue in the following, former child soldiers could be an additional mechanism within the willingness and opportunity framework, leading to a higher risk of conflict recurrence. To the best of our knowledge, we offer the first systematic account of the impact of former rebel child soldiers on post-conflict stability in a country. In light of those works that discussed the consequences of child soldiering before (e.g. Blattman and Annan, 2010), we argue that there are at least two avenues that especially link (the experiences of) former child soldiers to the willingness and opportunity for the recurrence of conflict in post-conflict societies: educational/economic drawbacks; and psychological harms (see also Singer, 2006: 185). These two factors ultimately lead to lower recruitment costs for rebel organizations in a

post-conflict environment, which induces the risk of conflict recurrence (see also Urdal, 2006: 609; Yair and Miodownik, forthcoming).

First, compared to children who have not been recruited by rebel groups, former child soldiers are more likely to experience economic disadvantages due to a lack of education after a conflict has ceased. The resulting economic weakness in post-conflict states may then motivate the recurrence of fighting. This argument belongs to the willingness cluster of the theoretical framework on conflict recurrence, but also includes elements of opportunity as former child soldiers already have the skills for and are 'acquainted with' violent conflict. Brett and McCallin (1998: 134), for instance, suggest that former child soldiers often find themselves alienated from the traditional means of livelihood as they never had the opportunity to obtain the skills that underpin the economic bases of their communities once they lay down weapons. Consequently, economic issues due to a lack of education weigh especially heavily on former child soldiers (Wessells, 2006: 202).[3] Similarly, Blattman and Annan (2010) show that rebels' child soldier recruitment in Uganda had a negative impact on former child soldiers' (post-conflict) education and earnings due to the lack of civilian schooling.[4] According to these scholars, this education deficit impedes labour-market success: while former child soldiers are just as likely to be employed, they are half as likely to be engaged in skilled work, and they earn wages that are lower by a third. The fact that former child soldiers in particular suffer economically is also confirmed by research on the challenges that former child soldiers faced in Mozambique and El Salvador (e.g. Boothby et al., 2006; Santacruz and Arana, 2002).

In other words, former child soldiers may have no skills other than killing and being able to fieldstrip weapons (Singer, 2006: 111), and future life prospects are dimmed for them in the wider region. This may significantly raise the willingness of former child soldiers to start fighting again since recruitment costs are reduced (from the perspective of the rebel group) and rejoining a rebel group might ensure at least access to basic necessities and supplies, such as food, shelter and so on, and perhaps even a higher income (see also Barnitz, 1997; Honwana, 2006; Wessells, 2010). A Liberian child soldier, for example, told Human Rights Watch (2004, quoted in Wessells, 2006: 168):

> [f]or a while, I did some small jobs around Monrovia, but there was not much to do and I could not afford to go back to school. So two years ago, I decided to join the Liberians United for Reconciliation and Democracy (LURD). I figured I was better to fight and try to get something, than hang around town doing nothing.

As such, rejoining rebel groups might be the only viable outside option that former child soldiers have in post-conflict societies.

Second, and reinforced, in fact, by the preceding argumentation on economic and educational disadvantages, child soldiering might cause psychological harm in a way that can have severely negative consequences for post-conflict stability (Freud and Burlingham, 1943; Masten and Nyaran, 2012). Typically, former child combatants have undergone and/or carried out shocking and disturbing violent actions (Barnitz, 1997; Machel, 1996). Due to the fact that they are young, the effect of these events on children's psyches is magnified as they occur during a period when personalities are being formed and in which the brain and its functions are still in development. Traumatic experiences in these sensitive periods might have an especially negative impact on

development, either because the child is particularly responsive at that time or because the brain is becoming 'programmed', that is, it adapts to the new information and will subsequently filter all new information on the basis of these changes (Masten and Narayan, 2012; Perry, 1997). Perry et al. (1995: 290) formulate it even more strongly: 'experiences can change the nature of the brain, but experiences during critical periods of early childhood organize brain systems'.

Due to children's vulnerabilities or lack of coping mechanisms, these traumatic events might result, for instance, in affective blindness or in Post-Traumatic Stress Disorder (PTSD) (Perry, 1997).[5] PTSD is a psychiatric disorder that was first associated with battle fatigue among soldiers during the First and Second World Wars. It may lead to both physical (i.e. severe headaches, stomach pain, sleep disorders) and mental symptoms (depression, anxiety, high levels of aggression, extreme pessimism or a limited capacity to accept frustration), which particularly impair former child soldiers' ability to function in day-to-day living, as compared with adults and children who have not been recruited by armed groups (see also Singer, 2006: 194).[6] In other words, traumatic experiences during childhood increase the risk of developing a variety of neuropsychiatric symptoms in adolescence and adulthood (see Perry et al., 1995). Perry (1997) and Masten and Narayan (2012) provide good overviews of how traumatic events influence neurological development and how these experiences influence the subsequent emotional, behavioural, cognitive and social functioning of children.

One of the most worrying symptoms connected to children's war participation is a supposed increase in their level of aggression, as compared with adults and children who have not fought for an armed group, once a conflict has ceased (see Cohn and Goodwin-Gill, 1994). Within armed groups, child soldiers are especially susceptible to learning aggressive behaviour by observing and imitating others (Berkowitz, 1993; Schauer and Elbert, 2010; Singer, 2006: 193f). As Dickson-Gómez (2002: 350) states: 'these children are constantly surrounded by extreme levels of violence, that violence therefore becomes normalized'. As a result of this normalization of violence, former child soldiers often resolve conflicts violently in a post-conflict environment (Schauer and Elbert, 2010: 335). Magambo and Lett (2004), for instance, report that former child soldiers in Northern Uganda applied physical violence to resolve conflicts and that they were not able to think of any non-violent alternatives, reflecting an absence of adequate social skills. These necessary skills are also not always acquired after a conflict ends since these children often encounter broken family networks that could have provided a better regulation of the use of violence and would have helped them to settle in a more peaceful, institutionalized civil life (Steenkamp, 2005).

In sum, based on the youth-bulge literature, it is especially the youth that is more inclined to re-engage in conflict. However, given the fact that former child soldiers are more aggrieved economically and psychologically, we expect that this cohort is especially more willing and has more opportunities to take up weapons again. Hence, 'the phenomenon of child soldiers feeds upon itself' (Singer, 2006: 109): conflict creates a new cohort of potentially traumatized former child soldiers that lack any economic or education skills, which 'then becomes a potential pool and catalyst for the next spate of violence' (Singer, 2006: 109; see also Wessells, 1997). Put differently, due to economic and educational disadvantages and psychological harm, *if children were involved in a*

previous conflict, we expect to observe a higher willingness and opportunity to resort again to violence, perhaps even if only when eventually grown up,[7] *which, in turn, is likely to increase the risk of conflict recurrence*.

DDR programmes and post-conflict (in)stability

Governments and international organizations are, however, not helpless in overcoming the willingness and opportunity of former child soldiers to take up arms again. They can increase the opportunity costs for rebellion and decrease former child soldiers' willingness in order to avoid the outbreak of another conflict. An important way of influencing the opportunity (but also the willingness) of former child soldiers may be the establishment of DDR programmes (see Banholzer, 2014; Muggah, 2009; Themnér, 2013).

Between 1989 and 2008, no less than 60 such programmes existed around the world (Muggah, 2009; Themnér, 2013: 296). The ultimate objective of these initiatives is to remove arms from ex-combatants and to ensure former fighters' socio-economic and political assimilation into society, thereby enabling a safe and peaceful transition from military to civilian life (Themnér, 2013: 296; UN, 2014). As Vargas-Barón (2010: 219) states:

> if these programs are successful, then recidivism will be low. If they are not effective, then child soldiers tend to return to their former group or enter other rebel groups, bandit groups, mercenary bands, youth gangs, or networks running illicit trades.

In addition, in a statement of March 2000, the President of the UN Security Council announced that the Security Council:

> underlines in particular the importance of disarming, demobilizing, and reintegrating child soldiers, as well as taking into account the problems faced by war-affected children in mission areas. It is therefore imperative that child soldiers be fully included in disarmament, demobilization and reintegration programs. (UN, 2000b)

Most DDR programmes consist of three elements. First, the disarmament phase is the period in which small arms and light weapons are collected, controlled and disposed of (Özerdem, 2002: 962–963). Second, the demobilization phase concerns the process by which the armed forces (of the state or the non-state actors) either downsize or completely disband. It also entails the idea that former combatants receive some essential help and goods (such as food, medication, counselling and shelter). Third, reintegration is the process whereby former combatants are assimilated into the social and economic life of (civilian) communities (Awodola, 2009; Banholzer, 2014; Humphreys and Weinstein, 2007; Kingma, 1997; Özerdem, 2002: 962–963).

These three aspects are interrelated, rather than sequential, but they can be thought of as requirements for a society to recover from conflict (Muggah, 2009; Özerdem, 2002: 962–963). The DDR process for child soldiers is, however, slightly different than those for adult combatants (UN, 2014). The main differences between the adult and child reintegration packages are that adults often receive a cash allowance on site (in return for their weapon), receive a shorter period of psychological support and do not always automatically receive family-tracing support (e.g. Gislesen, 2006).

The ultimate goal of DDR programmes is, then: to decrease the opportunity and willingness of former (child) combatants to take up arms again by taking away their weapons; to break the network with other former (child) soldiers in order to make re-recruitment more difficult; and to provide education or vocational training to undermine the economic reasons for rejoining. Although these programmes are widely applied, only a few studies examine the theoretical expectation that these programmes lessen the likelihood of conflict recurrence by successfully reintegrating former combatants into civilian life. Most of the existing work, such as Humphreys and Weinstein (2007) and Denov (2010) on Sierra Leone, Blattman (2009) on Uganda, and Gilligan et al. (2013) on Burundi, identifies various correlates of the successful (or unsuccessful) economic, political and social reintegration of ex-combatants. However, these and other studies rely on perceptual assessments of potential risk factors for recidivism rather than on actual recidivism itself (Kaplan and Nussio, 2014: 3). One important exception is Kaplan and Nussio (2014), who find that reintegration programmes are effective in reducing the probability of direct recidivism, the proclivity to recidivism and the vulnerability to recruitment in Colombia. Notwithstanding, Kaplan and Nussio (2014) do not make any distinction between former adult combatants and child soldiers.

In line with the theoretical expectations and the few empirical studies, we hypothesize that *the establishment of DDR programmes enables the government and the international community to counter recidivism and, in turn, the recurrence of conflict*. This is of especial importance for former child soldiers, who, as we argued earlier, are likely to be characterized by a high opportunity and willingness to resume fighting in a post-conflict society.

Research design

Data and dependent variable

Given our theoretical arguments, we expect that (a) child soldiering in a previous conflict negatively affects post-conflict peace and (b) DDR programmes positively influence post-conflict stability and may even intervene in the child soldiering–conflict recurrence relationship. Our empirical analysis of this relies on the Uppsala Conflict Data Program/Peace Research Institute Oslo (UCDP/PRIO) Armed Conflict Dataset (Gleditsch et al., 2002), which Kreutz (2010) converted into a conflict-recurrence data set. Specifically, based on the UCDP/PRIO's conflict start and end dates, Kreutz (2010) coded post-conflict country-years, which also constitute our unit of analysis.[8] Since conflicts may relate to one rebel group only or more than one rebel group, we aggregate the variable on child soldiers over conflicts, as described later.

Our dependent variable, conflict recurrence, is coded as 1 in a post-conflict country-year in which a conflict resumed, and 0 otherwise. After accounting for missing values on our core explanatory variable on child soldiers (as described in detail later), but before considering missing values on our control variables, we ultimately obtain a data set that captures 1,040 post-conflict years and 61 peace failures in 65 countries between 1989 and 2005.[9]

Due to the dichotomous nature of our dependent variable, we use logistic regression models with standard errors clustered on the specific country to correct for possible bias

due to non-constant variances, which are, for example, caused by a differing number of rebel groups across conflicts in countries.[10] To account for any temporal dependencies, we follow Kreutz (2010) and, depending on model specifications,[11] include a time trend, a peace-years variable (time elapsed since conflict termination) and different sets of cubic splines (Beck et al., 1998).[12]

Core explanatory variables

As indicated earlier, rebel groups are not the only military organizations that may have recruited child soldiers in preceding conflicts (Gates and Reich, 2010), but we focus on these groups. Accurate data on the child soldier usage of rebel groups are difficult to obtain (see Brett and McCallin, 1998; Høiskar, 2001; Lasley and Thyne, forthcoming; Tynes, 2011: 2). It is, therefore, not surprising that few studies have systematically and empirically examined the consequences of child soldiering. There are, however, a few notable exceptions. First, Beber and Blattman (2013) collected information on the child soldier usage of 40 randomly selected sub-Saharan African armed groups. On the basis of (news) reports, academic articles and experts, they categorize the percentage share of child soldiers in these organizations. Second, Tynes (2011) recorded a binary variable on the use of child soldiers covering 198 armed groups between 1987 and 2007 (see also Tynes and Early, forthcoming).[13] However, for this study, we rely on the data by Haer and Böhmelt (forthcoming), who compiled a data set on the use of child soldiers, defined as any person below 18 years of age who has been recruited or used by an armed force or armed group as a soldier (UNICEF, 2007), for each rebel group identified by version 3.4 of the Non-State Actor Dataset (NSA) (Cunningham et al., 2009, 2013).[14] As such, their data set covers more rebel groups over a longer period of time.

These data are based on information provided by various independent news and academic sources in different languages (for more information, see Haer and Böhmelt, forthcoming). Although Haer and Böhmelt (forthcoming) took great care in ensuring the data's accuracy, it is important to discuss some potential sources of bias. For example, advocacy groups might have the incentive to exaggerate the proportion of child soldiers to get attention for their mission. In addition, rebel groups could downplay their recruitment of child soldiers in order to avoid punishment by the international community. Furthermore, it is likely that advocacy groups and news reports only report child soldier usage by rebel groups that are well known. Consequently, it does not necessarily mean that those groups that are coded as having no child soldiers have never recruited children. Notwithstanding, when comparing Haer and Böhmelt's (forthcoming) data with the existing data collected by Beber and Blattman (2013) and Tynes (2011), the former data do not identify any group to have child soldiers that was not already identified by the two latter sources.[15]

We employ Haer and Böhmelt's (forthcoming) ordinal child soldier variable, which is coded as 0 if a rebel group did not use child soldiers at all, coded as 1 if a rebel group used a few child soldiers, that is, less than 50% of the overall group size, and coded as 2 if a rebel group used many child soldiers, that is, more than 50% of the group size.[16] We aggregated this variable by calculating the mean value of rebel groups' child soldiering across conflicts. Not only is this aggregation necessary in order to be able to merge it

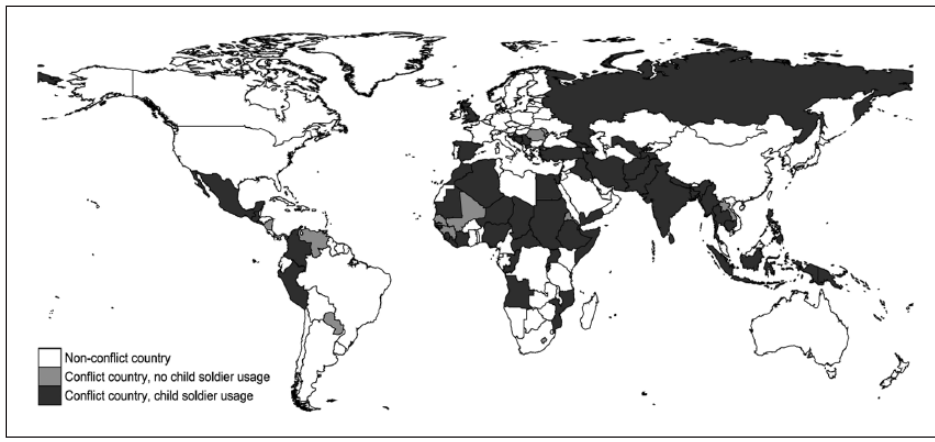

Figure 1. Child soldiering in conflict countries worldwide, 1989–2010.

with our unit of analysis, but, at the same time, it also allows us to deal with multiple rebel groups per conflict and the fact that rebel groups usually cease to exist after a conflict is over. In fact, our approach seems more suitable since a more disaggregated set-up would artificially increase the number of observations of the conflict-recurrence data. Figure 1 gives an overview of the countries in our sample in which at least one rebel group relied on child soldiering during conflict between 1989 and 2010.

Our second core variable is based on Banholzer (2014), who coded for all armed conflicts since 1989 whether the post-conflict period has seen the establishment of a DDR programme and, if applicable, how long this programme was in place. We use this information to code whether a specific post-conflict year has seen such a programme (1) or not (0). It is important to note that this variable only captures those programmes that are characterized by all three components: disarmaments, demobilization and reintegration. Consequently, some initiatives, such as those implemented in Indonesia and Rwanda, were disregarded since they solely focused on the reintegration component. The data by Banholzer (2014) are virtually identical to the information in the UCDP Peace Agreement data (Harbom et al., 2006), and using the latter data instead does not affect the results presented in the following. Table 1 gives an overview of those post-conflict countries with DDR programmes.

Control variables

Table 2 summarizes the descriptive statistics and variation inflation factors (VIFs) of the variables we have discussed so far and, additionally, the control covariates that will be included in some of the following models. Note that none of the explanatory variables has a VIF above 5, indicating that they hardly suffer from multicollinearity problems.

The choice of control variables is based on earlier work on post-conflict peace and conflict recurrence (Fortna, 2003; Kreutz, 2010; Mason et al., 2011; Quinn et al., 2007; Rustad and Binningsbø, 2012; Toft, 2010; Walter, 2004, 2014), that is, we principally

Table 1. Conflict countries with DDR programmes.

Country with DDR programme	Begin DDR	End DDR
Afghanistan	2003	2005
Angola	1994	1996
Angola	2002	2009
Bosnia and Herzegovina	1995	2007
Burundi	2004	2008
Cambodia	1992	1993
Central African Republic	2004	2007
Chad	2005	2010
Colombia	2003	2006
Congo Brazzaville	2008	2009
Democratic Republic of the Congo	2004	2012
El Salvador	1992	1993
Eritrea	2002	2008
Eritrea	1993	1997
Ethiopia	1991	1994
Ethiopia	2000	2007
Guatemala	1996	1998
Guinea Bissau	2001	2005
Haiti	1994	1996
Indonesia	2005	2009
Indonesia	1999	2001
Ivory Coast	2005	2008
Liberia	2003	2008
Mali	1996	1997
Mozambique	1992	1994
Namibia	1989	1989
Nepal	2007	2012
Nicaragua	1989	1992
Niger	2006	2007
Philippines	1997	2006
Rwanda	1997	2001
Rwanda	2001	2008
Serbia	1999	2001
Sierra Leone	1998	2004
Somalia	2003	2007
Sudan	2005	2012
Tajikistan	1999	2003
UK	1998	2005
Uganda	2000	2008

Source: Banholzer (2014).

consider other variables next to our core factors that may influence actors' willingness, opportunity or both to resume conflict. Specifically, for the control variables and the model specifications, we pursue Kreutz's (2010) strategy and consider those control

Table 2. Descriptive statistics and VIFs.

Variable	Obs.	Mean	Std. dev.	Min.	Max.	VIF (Walter, 2004)	VIF (Quinn et al., 2007)
Conflict recurrence	1040	0.06	0.24	0.00	1.00		
Child soldiers	1040	0.67	0.61	0.00	2.00	1.43	1.66
DDR programme	1040	0.23	0.42	0.00	1.00	1.47	1.63
Population below 15 (% of population)	1038	3.52	0.31	2.67	3.93	2.23	3.97
Victory	1040	0.27	0.44	0.00	1.00	2.45	
Government victory	1040	0.20	0.40	0.00	1.00		2.27
Rebel victory	1040	0.06	0.25	0.00	1.00		1.80
Peace agreement	1040	0.18	0.38	0.00	1.00	1.54	2.07
Ceasefire	1040	0.18	0.39	0.00	1.00		1.74
Partition	1040	0.04	0.19	0.00	1.00	1.66	
Peacekeepers	1040	0.30	0.46	0.00	1.00		1.93
Ethnic mobilization	1040	0.56	0.50	0.00	1.00	2.12	
Ethnic revolution	1040	0.13	0.33	0.00	1.00		1.79
Total goals	1040	0.45	0.50	0.00	1.00	1.88	
Secessionist	1040	0.53	0.50	0.00	1.00		2.46
Battle deaths (ln)	1040	−0.18	2.61	−3.51	6.32	2.82	2.64
Duration (ln)	1040	0.34	1.74	−2.53	3.78	3.42	3.15
Army size (% of population)	970	0.01	0.00	0.00	0.02		2.10
Infant mortality (lag)	732	64.21	42.25	5.00	206.00	2.55	2.79
GDP per capita (lag)	587	3579.08	3676.05	460.70	24252.44		3.11
Democracy (lag)	856	1.45	6.45	−9.00	10.00	1.30	2.28
ELF	928	0.53	0.24	0.01	0.84	1.31	
Population (ln)	1000	2.97	1.57	−0.34	6.89		2.48

Notes: Variables for temporal correction are not shown due to space limitations. Given the focus on two different models of conflict recurrence, some variables are included in some models but not others. The VIFs (columns 7–8) highlight those items that are taken into account by Walter (2004) and Quinn et al. (2007), respectively. ELF – Ethnic fractionalization; GDP – gross domestic product.

items that have been included in the analyses of Walter (2004) and Quinn et al. (2007), respectively. These controls pertain to the four broad clusters underlying the willingness and opportunity framework (Kreutz, 2010: 247): (a) conflict termination (victory, victory for the government, victory for the rebels, peace agreement, ceasefire, partition and peacekeepers); (b) conflict issues (ethnic mobilization, ethnic revolution, total goals and secession); (c) the costs of conflict (battle deaths, conflict duration and army size); (d) the post-conflict environment (gross domestic product (GDP) per capita and democracy); and (e) other influences (ethnic fractionalization (ELF), population and the temporal controls). These clusters and the corresponding variables are considered by Walter (2004), Quinn et al. (2007) or both, and columns 7–8 in Table 2 indicate what variables are considered by which study. The exact operationalization of these items is described in Kreutz (2010) and we summarize their measurement again in Appendix 1.

Finally, we also control for the population less than 15 years of age as a percentage of the total population. If our argument works by 'simply witnessing' violence in a country, the impact on the risk of conflict recurrence may be actually attributed to the number of children in a conflict state and not child soldiering itself. We control for this possibility by using data from the World Bank Development Indicators.[17] Note that this also controls for the arguments and mechanisms presented in the youth-bulges literature, that is, that large youth cohorts 'make countries more susceptible to political violence' (Urdal, 2006: 607; see also Yair and Miodownik, forthcoming).

Empirical results

Table 3 summarizes our findings from the logistic regression models. We estimate four different models to show that our results are robust across several specifications.[18] The first model is based on Walter (2004), but only includes the core explanatory variables and her items for temporal correction (not displayed). The second model also considers the core covariates only next to the temporal corrections, but is based on Quinn et al.'s (2007) specification for the latter. The third model comprises all variables that have been considered by Walter (2004) and our core explanatory variables. Finally, the fourth model is entirely based on Quinn et al. (2007), while we incorporate our main explanatory items as well. As coefficients in non-linear models cannot be interpreted directly, we present simulated first-difference estimates of our core variables in Figure 2. These estimates show the change in the probability of conflict recurrence (*Conflict recurrence = 1*) when moving a specific explanatory variable from the minimum to the maximum while holding all other variables at their median.

The main explanatory variable, *Child soldiers*, achieves conventional levels of statistical significance and is associated with first differences that mirror our theoretical expectations: child soldiering is positively related to conflict recurrence. This finding is robust across model specifications — adding or dropping controls affects neither this variable's direction of influence nor substance. Specifically, the coefficient is positively signed and significant at least at the 5% level across Models 1–4. The first-difference estimate shows that the risk of conflict recurrence in any given post-conflict country-year is on average 20 percentage points higher when lots of children (maximum value) were used as compared to using no children (minimum value) in a previous conflict. This result provides support for our theoretical expectation that former child soldiers might, indeed, be 'spoilers' of post-conflict stability.

Second, contrary to our expectations, the DDR variable is statistically insignificant and, in fact, positively signed, meaning that the presence of DDR programmes is unlikely to affect post-conflict peace at all. Both the coefficients in Table 3 and the first differences in Figure 2 stress this. However, one should be careful with the interpretation of this particular finding. Our proxy for the presence of DDR programmes in post-conflict societies does not, for example, distinguish between certain types of programmes: there is no information on whether the implemented programmes focused on child soldiers or the general combatant population. This information is simply not publically available.

Other scholars, however, also confirm our null finding. Humphreys and Weinstein (2007), for instance, obtain little micro-level evidence that DDR programmes facilitate the

Table 3. The determinants of conflict recurrence: logistic regression models.

	Model 1 (Walter)	Model 2 (Quinn et al.)	Model 3 (Walter)	Model 4 (Quinn et al.)
Core variables				
Child soldiers	0.52	0.66	0.67	1.31
	(0.23)**	(0.26)***	(0.25)***	(0.27)***
DDR programme	−0.36	−0.20	−0.15	0.09
	(0.30)	(0.30)	(0.46)	(0.56)
Population below 15 (% of population)	1.57	1.83	2.56	2.08
	(0.58)***	(0.63)***	(0.96)***	(1.39)
Termination				
Victory			−0.17	
			(0.63)	
Government victory				−2.42
				(1.13)**
Rebel victory				0.76
				(1.00)
Peace agreement			−0.46	−0.23
			(0.54)	(0.69)
Ceasefire				−0.23
				(0.41)
Partition			(omitted)	
Peacekeepers				−1.26
				(0.59)**
Conflict issues				
Ethnic mobilization			0.55	
			(0.45)	
Ethnic revolution				0.61
				(0.70)
Total goals			−0.24	
			(0.45)	
Secessionist				0.80
				(0.79)
Cost of conflict				
Battle deaths (ln)			0.10	0.12
			(0.09)	(0.11)
Duration (ln)			−0.18	−0.31
			(0.12)	(0.15)**
Army size (% of population)				−135.49
				(50.94)***
Post-conflict				
Infant mortality (lag)			−0.01	−0.01
			(0.00)	(0.00)

(Continued)

Table 3. (Continued)

	Model 1 (Walter)	Model 2 (Quinn et al.)	Model 3 (Walter)	Model 4 (Quinn et al.)
GDP per capita (lag)				−0.00
				(0.00)
Democracy (lag)			−0.01	−0.03
			(0.02)	(0.02)
Controls				
ELF			3.24	
			(1.10)*	
Population (ln)				−0.07
				(0.14)
Observations	1038	1038	589	512
Log pseudo-likelihood	−207.66	−217.09	−127.61	−114.65
Wald χ^2	54.07***	44.96***	120.85***	151.89***

Notes: Table entries are logit coefficients. Standard errors clustered on country in parentheses. Constant and variables for temporal correction included in all models, but omitted from presentation. Partition drops out in Model 3 due to perfectly predicted cases. * $p < .10$; ** $p < .05$; *** $p < .01$. Two-tailed significance tests. ELF – Ethnic fractionalization; GDP – gross domestic product.

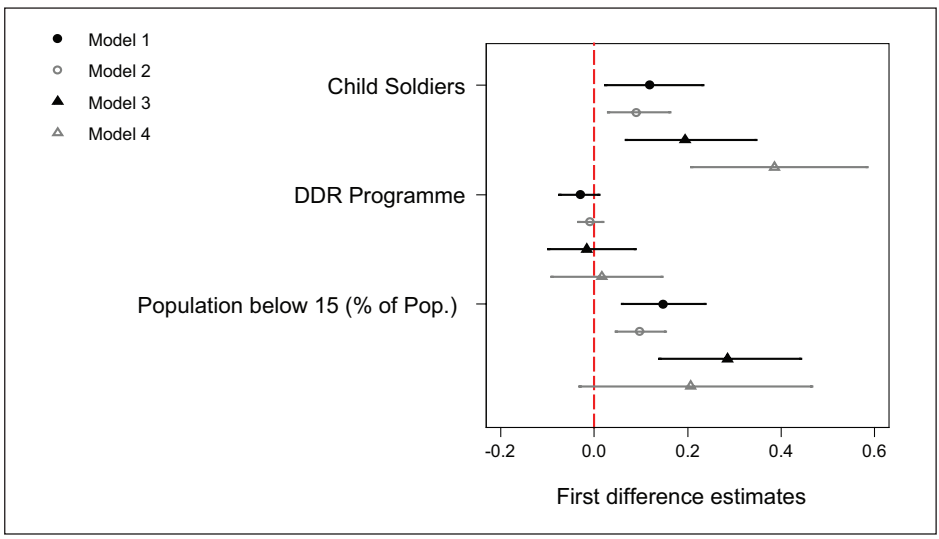

Figure 2. First-difference estimates.
Notes: Simulated estimates are based on 1000 draws from a multivariate normal distribution. Horizontal bars pertain to 90% confidence intervals. First-difference estimate of 0 marked with vertical dashed line.

demobilization and reintegration of former combatants. Although their study does not explicitly focus on former child soldiers, they show that participation in a DDR programme does not increase: (a) the degree to which the community accepts former combatants; (b)

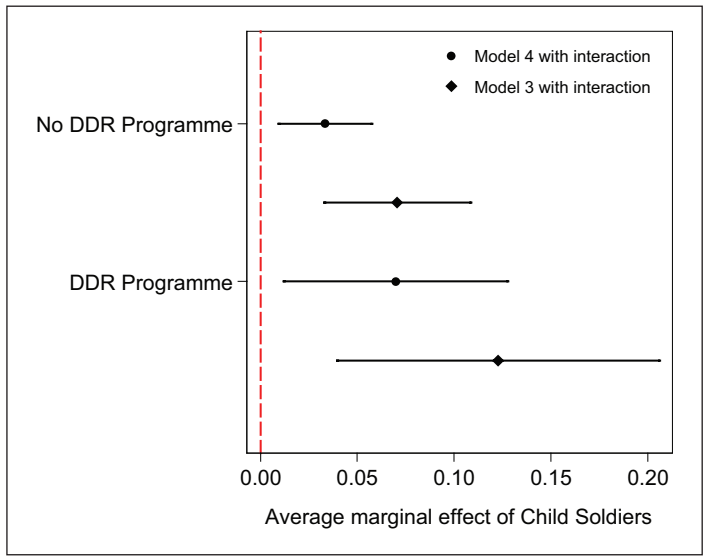

Figure 3. The interaction of Child soldiers and DDR programme.
Notes: Plots show average marginal effects. Solid vertical lines signify the 90% confidence interval. The dashed horizontal line signifies an average marginal effect of 0. The graph is based on the specifications of Model 3 and 4 to which we additionally included a multiplicative term of *Child soldiers* and *DDR programme*. The results of all control variables in these unreported models are identical to the previous findings.Plots show average marginal effects. Solid horizontal lines signify the 90% confidence interval. The dashed vertical line signifies an average marginal effect of 0.

democratic attitudes among former combatants; (c) the likelihood that they would break ties with their factions; or (d) the chances that they return home. This mirrors the results in Pugel (2009) or Themnér (2013: 326–327). In their studies on how and when ex-combatants resort to violence, both authors conclude that DDR programmes appear to be inefficient at disarming ex-combatants and addressing their economic and security concerns.

We also examined whether the impact of child soldiers on the risk of conflict recurrence varies conditionally on DDR programmes. To test this, we revised Models 3–4 by including an interaction term between *Child soldiers* and *DDR programmes* (i.e. a multiplicative term of these two variables). We omit the table here, but present the calculated average marginal effects of *Child soldiers* according to *DDR programmes* in Figure 3 to allow for a substantive interpretation. According to the displayed marginal effects, the impact of *Child soldiers* remains unchanged as we still obtain a positive and statistically significant estimate for the average marginal effect — independent of whether a DDR programme has been implemented or not.

Concerning the control covariates in Table 3, we find evidence that a large pool of potential child soldier recruits or, more generally, a large cohort of youths leads to a higher risk of conflict recurrence. The item *Population below 15 (% of population)* is statistically significant in three out of four models and positively signed. On average, the risk of armed conflict recurrence increases by about 18 percentage points when this variable is raised from its minimum to its maximum, holding other items constant.

Second, while the aggregated victory variable (*Victory*) is unlikely to affect conflict recurrence, the more disaggregated perspective in Model 4 (based on Quinn et al., 2007) reveals that governmental victories lead to a lower recurrence risk. The first-difference estimate of *Government victory* suggests a decrease of about 12 percentage points in the likelihood of resumed fighting. In addition, *Peacekeepers* exerts a negative and significant impact in Model 4, emphasizing that the presence of peacekeeping forces does, indeed, lower the risk of renewed fighting (decrease of nine percentage points). Negative effects are also given for the duration of a conflict and the size of the army, which mirrors the findings in Quinn et al. (2007). Finally, the *ELF* item on ethnic fractionalization is the only control in the model based on Walter (2004) that achieves a conventional level of statistical significance. Other variables do not display consistent or significant findings. While this goes against the usual expectations in the literature (e.g. Mason et al., 2011; Quinn et al., 2007; Walter, 2004), it is in line with previous results. Rustad and Binningsbø (2012), for example, also do not obtain a peace-prolonging and significant effect of these variables. Kreutz (2010: 248), which our data rely on, finds the same and explains the difference between his (and our) insignificant findings and significant results in earlier studies (e.g. Mason et al., 2011; Quinn et al., 2007; Walter, 2004) by the lower death threshold per conflict-year (25 versus 1000 in other studies). As described in depth by Kreutz (2010: 247), however, our data seem more accurate than data used in previous studies, which did find more results that were significant at conventional levels.

To illustrate what our findings imply with regard to 'actual cases', we calculated predicted probabilities for all post-conflict profiles in our sample, using the models in Table 3 and then averaged across outputs. This approach gives us the probabilities of conflict recurrence for all post-conflict country-years. All country- and conflict-specific variables were set to their actual values of a specific year for the respective post-conflict country. For example, the probability that Liberia would experience conflict recurrence in 1989, based on its covariate values in the year 1989 (including a value of 1.75 for *Child soldiers*), is 54.33% according to our models — and, in fact, Liberia did see the outbreak of another conflict in 1989. Russia in 2001, on the other hand, receives the lowest predicted probability of conflict recurrence in our data set. Based on its covariate values, including a value of 0 for *Child soldiers*, the risk of conflict recurrence was only 0.37% in 2001. Not surprisingly, Russia did not see the outbreak of a recurred conflict in 2001.

Conclusion

The existing literature on child soldiering primarily focuses on the reasons why children join armed groups and why they are recruited. Few studies, however, examine the *consequences* of child soldiering (e.g. Annan et al., 2011; Blattman and Annan, 2010; Singer, 2006; Wessells, 2010). Despite important insights provided by this literature, there has been no systematic research directed towards studying the effect of child soldiers on the recurrence of armed conflict, both theoretically and empirically.

We tried to fill this niche by explaining why and how adolescent fighters might increase the risk of resumed armed conflict. The empirical findings based on post-conflict peace

durations since 1989 confirm our theoretical expectation: child soldiers influence the probability of conflict recurrence. Or, put differently, when rebel groups recruited children as soldiers during a previous conflict, it is more likely that armed conflict recurs in a post-conflict society.

The literature on child soldiering still has a lot to uncover and several avenues for future research do exist. First, there is a strong demand for additional high-quality data compilations. New data should focus not only on a wider and broader coverage of child soldiering, but also on related aspects such as DDR programmes. For instance, it would be valuable to collect systematic information on whether some DDR initiatives focused on the specific needs of former child soldiers. This would allow researchers to assess the impact of DDR programmes more thoroughly and comprehensively than we could have possibly done in this study.

Second, we only examined child soldier usage by rebel groups. Yet, an expansion of the data to also include information on child soldier usage by governments might be an effort worth making. Moreover, we only used an ordinal variable on whether a particular rebel group has used children. While this treatment seems appropriate and justifiable for a first study, it would be desirable to have information on the exact number of children used by these groups. For instance, it seems plausible that there must be a critical mass of child soldiers in a previous conflict in order to see an effect on conflict recurrence at the macro-level. Our approach treated any number of child soldiers as sufficient to undo peace. Currently, due to the lack of more precise data on the number of children used (in rebel and government forces), we might have actually underestimated the impact of adolescent fighters on post-conflict stability.

Third, our argument on willingness and opportunity suggests that child soldiering in conflicts increases the risk of not only conflict recurrence in a post-conflict society, but also other forms of violence at a lower scale. For instance, one could think of criminal violence or violence to settle economic disputes. While it goes beyond the scope of this study, future studies might want to examine whether our theory applies to these low-intensity forms of conflict as well.

Fourth, throughout this article, we referred to and highlighted several underlying mechanisms associating child soldiers with the recurrence of conflict. Due to reasons stated earlier, we focused on the macro-level in our analysis and, consequently, were only able to evaluate these mechanisms indirectly. The exact linkage between economic incentives and rejoining a rebel group, or the mechanism of previously endured psychological harm and the decision to take up arms again, are not directly tested as such. Therefore, we also call for in-depth case studies (or field research) that might be better able to shed more light on the existence of these underlying causal mechanisms.

With regard to the policy implications of our work, we believe that this research could influence the study of armed conflicts, child soldiering and post-conflict behaviour in important ways. We have shown that there is a critical and frequently overlooked linkage between the recruitment of children in previous conflicts and the recurrence of conflict. For the policy community, then, it is also important to consider how we can adequately deal with the very detrimental consequences of child soldiering. Although our results show that DDR programmes are unlikely to prolong post-conflict peace on their own, DDR programmes should perhaps be much more focused on the specific needs of former child soldiers in order to be effective.

This can, of course, only be done once rebel groups and government armies admit to the usage of children during the conflict. Once admitted, fully funded special programmes solely focused on the needs of former child soldiers have to be implemented. Until now, this has been far from sufficient; UNICEF's child soldier demobilization programmes in the Democratic Republic of the Congo, for instance, needed US$15 million in 2001, but only received US$4 million (Singer, 2006: 186). Additionally, and perhaps even more importantly, there should be special programmes set up that teach former child combatants to acquire the necessary skills to live in harmony with oneself, with others and within a non-violent environment. It is, then, also crucial that the international community is not only aware of the problem of former child soldiers as 'time bombs' (BBC, 2007), but also willing to invest (more) resources for the development of such much-needed programmes.

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Notes

1. Following UNICEF (2007), we define child soldiers as 'any person below 18 years of age who has been recruited or used by an armed force or armed group'. This 18-years threshold has been adopted not only in the Optional Protocol to the Convention on the Rights of the Child on the Involvement of Children in Armed Conflict (United Nations, 2000a: Art. 1), but also as international law in 2000. Even before that, one of the most influential reports on children in conflict — the United Nations (UN) Machel Report (Machel, 1996) — and the UN Convention on the Rights of the Child in 1989 used the definition of 18 years of age. In addition, while rebel groups are not the only military organizations that recruit children (Gates and Reich, 2010), we focus on these groups as Tynes and Early (forthcoming) argue that rebel groups have 'fewer constraints' in and 'more to gain' by using child soldiers than governments.
2. As emphasized by Urdal (2006: 609): '[b]oth the opportunity and the motive perspectives are macro-level theoretical frameworks that attempt to explain events essentially consisting of a series of individual decisions — whether to join a rebel or terrorist organization or not — by focusing on economic, political, and social structural features. Existing literature has not yet successfully linked macro-level theories to micro-level assessments of individual motives and preferences.' While we do not seek to 'attempt to bridge this gap' (Urdal, 2006: 609), we seek to study the macro-level implications of a micro-level phenomenon by linking child soldiering in previous conflicts to the risk of conflict recurrence in a post-conflict environment.
3. Although many children are denied access to education even in peacetime, child soldiering prevents educational opportunities (almost) entirely (Cohn and Goodwin-Gill, 1994: 112–113).

4. However, Annan et al. (2011) show that there is hardly any link between the length of time of abduction and bad economical outcomes for *female* abductees. They suggest that this result is due to the fact that even in the absence of abduction, women and girls may not have been educated in the first place — they have fewer opportunities to start with.
5. Note that actively participating in conflicts as child soldiers constitutes a 'higher dosage' of exposure to violence and, thus, is qualitatively different than 'simply' witnessing violence.
6. However, Blattman and Annan (2008) suggest that the correlation between children's abduction into the Lord's Resistance Army in Uganda and their aggression after reintegration is rather weak. Boyden (2003) and Straker (1992) also question the idea that former child soldiers have developed morally twisted values. For an excellent discussion of the debate on the psychological consequences of child soldiering, see Wessells (2006). Notwithstanding, it is generally accepted that children represent a highly vulnerable population and that they have the least capacity to recover (Barenbaum et al., 2004; Singer, 2006: 115).
7. In the words of Singer (2006: 185): '[m]any conflicts last so long that children brought into fighting before the age of eighteen are adults at the end'.
8. A conflict is defined as a 'contested incompatibility that concerns government or territory or both, where the use of armed force between two parties results in at least 25 battle-related deaths in a year' (Gleditsch et al., 2002). A new conflict is coded whenever a conflict restarts after one or more years of inactivity. Note that conflicts in Kreutz (2010) are coded along conflict episodes, which enables researchers to distinguish between different phases of a conflict.
9. Some countries experienced more than one conflict, perhaps simultaneously. These are coded separately.
10. As a robustness check, we also estimated a model including a variable counting the number of rebel groups present in the conflict preceding peace durations. This change in our research design, however, does not affect the substance of our findings.
11. Specifications for our models vary as we follow Kreutz (2010), who estimated different models based on somewhat different theoretical rationales of Walter (2004) and Quinn et al. (2007), respectively. The variables for these different models are described later.
12. We also re-estimated all of the models with several duration estimators. Our results are virtually identical to the findings based on the logistic regressions reported.
13. Another noteworthy data set is provided by Lasley and Thyne (forthcoming). However, the time period covered by these authors is only 1998–2008. Furthermore, their data lack a temporal identity variable, which makes the comparison with other data sets rather difficult.
14. The 18-years-old threshold in the definition may be controversial. However, it has not only been adopted in the Optional Protocol to the Convention on the Rights of the Child on the Involvement of Children in Armed Conflict (United Nations, 2000a: Art 1), but also as international law in 2000. Lasley and Thyne (forthcoming), among others, also rely on this threshold for coding their data.
15. For a more extensive case description file, which specifies all coding decisions and references, see Haer and Böhmelt (forthcoming).
16. Our results remain virtually unchanged when using the binary variable for child soldiering. Specifically, using the ordinal variable could make averaging across conflicts problematic. For instance, two rebel groups might be active in a conflict with an ordinal child soldiering value of 1 and 2, respectively. In another conflict, there might be only one rebel group active, which received the child soldier value of 2. When averaging these values across rebel groups in a conflict, one would assume that there are more child soldiers in the latter scenario than in the former, although the former scenario may, in fact, comprise more adolescent soldiers. Hence, using the dichotomous child soldier variable avoids the risk of making wrong assumptions about the actual size of child soldiering, although it discards available information.

17. Given our definition of child soldiers, a variable capturing the percentage of the population that is 18 years of age or younger would have been more appropriate. However, the World Bank does not code such a variable. Also, the literature on youth bulges largely refers to cohorts aged 15–24. Given our focus on child soldiers, though, our treatment seems more appropriate for this article.
18. According to Andvig and Gates (2010), among others, child soldiers are used as a resource in the most desperate of circumstances, which should, prima facie, also lead to a greater possibility of recurrence once peace is restored. To control for a possible non-random selection of child soldiers into conflicts, we re-estimated the core model using a bivariate probit model. This set-up essentially mirrors the specification for Models 3–4, but differs in two important aspects. First, due to the two-stage nature of this estimator, we must define a purely binary dependent variable for the first stage, that is, the selection equation. We created a variable that receives the value of 1 if at least one rebel group recruited children in a conflict and 0 otherwise. Second, we use *Duration (ln), % Population below 15* and *Battle deaths (ln)* only in the first stage of this estimator to model the dependent variable in this first stage's equation. In other words, these variables influence child soldiering directly, and influence conflict recurrence indirectly through child soldiering. This treatment seems justifiable as all these variables are essentially degree, scope and conflict intensity characteristics (except for the population item). Our results remain robust to this change of estimator, though. Specifically, our findings for the control variables hardly differ from Table 3, with a longer conflict duration facilitating child soldier recruitment. More importantly, the item *Child soldiers* remains statistically significant at the 10% level in the model based on Quinn et al. (2007), but fails to achieve statistical significance in the model based on Walter (2004). The rho parameter capturing the correlation of the estimator's two stages is insignificant in either model, though. This suggests that a regular logit model is more efficient.

References

Abouharb MR and Kimball A (2005) A new dataset on infant mortality rates, 1816–2002. *Journal of Peace Research* 44(6): 743–754.

Achvarina V and Reich S (2010) No place to hide: Refugees, displaced persons, and child soldier recruits. In: Gates S and Reich S (eds) *Child Soldiers in the Age of Fractured States*. Pittsburgh, PA: University of Pittsburgh Press, pp. 55–76.

Andvig J and Gates S (2010) Recruiting children for armed conflict. In: Gates S and Reich S (eds) *Child Soldiers in the Age of Fractured States*. Pittsburgh, PA: University of Pittsburgh Press, pp. 77–92.

Annan J, Blattman C, Mazurana D et al. (2011) Civil war, reintegration, and gender in Northern Uganda. *Journal of Conflict Resolution* 55(6): 877–908.

Awodola B (2009) Comparative international experience with reintegration programme for child soldiers: The Liberian experience. *Peace & Conflict Review* 4(1): 1–10.

Banholzer L (2014) When do disarmament, demobilization and reintegration programmes succeed? *DIE Discussion Paper 8/2014*: 1–43.

Barenbaum J, Ruchkin V and Schwab-Stone M (2004) The psychological aspects of children exposed to war: Practice and policy initiatives. *Journal of Child Psychology* 45(1): 41–62.

Barker G and Ricardo C (2005) *Young Men and the Construction of Masculinity in Sub-Saharan Africa: Implications for HIV/AIDS, Conflict, and Violence*. Social Development Papers, Conflict Prevention & Reconstruction 26. Washington, DC: World Bank

Barnitz L (1997) *Child Soldiers: Youth Who Participate in Armed Conflict*. Washington, DC: Youth Advocate Program International.

BBC (British Broadcasting Corporation) (2007) Child soldiers 'are a time bomb'. BBC News. Available at: http://news.bbc.co.uk/1/hi/6330503.stm (accessed 12 January 2015).

Beber B and Blattman C (2013) The logic of child soldiering and coercion. *International Organization* 67(1): 65–104.

Beck N, Katz J and Tucker R (1998) Taking time seriously: Time-series cross-section analysis with a binary dependent variable. *American Journal of Political Science* 42(4): 1260–1288.

Becker J (2010) Child recruitment in Burma, Sri Lanka, and Nepal. In: Gates S and Reich S (eds) *Child Soldiers in the Age of Fractured States*. Pittsburgh, PA: University of Pittsburgh Press, pp. 108–120.

Berdal M (1996) *Disarmament and Demobilisation after Civil Wars*. London: International Institute for Strategic Studies.

Berkowitz L (1993) Pain and aggression: Some findings and implications. *Motivation and Emotion* 17(3): 277–293.

Betancourt TS, Borisova II, Williams TP et al. (2010) Sierra Leone's former child soldiers: A follow up study of psychosocial adjustment and community reintegration. *Child Development* 81(4): 1077–1095.

Blattman C (2009) From violence to voting: War and political participation in Uganda. *American Political Science Review* 103(2): 231–247.

Blattman C and Annan J (2008) Child combatants in Northern Uganda: Reintegration myths and realities. In: Muggah R (ed.) *Security and Post-Conflict Reconstruction: Dealing with Fighters in the Aftermath of War*. New York, NY: Routledge, pp. 103–126.

Blattman C and Annan J (2010) The consequences of child soldiering. *Review of Economics and Statistics* 92(4): 882–898.

Boothby N (1998) Child combatants: The road to recovery. *Weekly Defense Monitor* 2. Available at: https://www.essex.ac.uk/armedcon/story_id/000961.html (accessed 12 January 2015).

Boothby N, Crawford J and Halperin J (2006) Mozambique child soldier life outcome study: Lessons learned in rehabilitation and reintegration efforts. *Global Public Health* 1(1): 87–101.

Boyden J (2003) The moral development of child soldiers. What do adults have to fear? *Peace and Conflict: Journal of Peace Psychology* 9(4): 343–362.

Braungart RG (1984) Historical and generational patterns of youth movements: A global perspective. *Comparative Social Research* 7(1): 3–62.

Brett R and McCallin M (1998) *Children: The Invisible Soldiers*. Stockholm: Rädda Barnen (Save the Children).

Brett R and Specht I (2004) *Young Soldiers: Why They Choose to Fight*. Boulder, CO: Lynne Rienner.

Call C and Stanley W (2003) Military and police reforms after civil wars. In: Darby J and Ginty RM (eds) *Contemporary Peacemaking: Conflict, Violence and Peace Processes*. New York, NY: Palgrave, pp. 300–312.

Choucri N (1974) *Population Dynamics and International Violence: Propositions, Insights and Evidence*. Lexington, MA: Lexington Press.

Cohn I and Goodwin-Gill G (1994) *Child Soldiers. The Role of Children in Armed Conflict*. Oxford: Clarendon Press.

Collier P (2000) Policy for post-conflict societies: Reducing the risks of renewed conflict. Unpublished manuscript, Oxford University.

Collier P and Hoeffler A (2004) Greed and grievances in civil war. *Oxford Economic Papers* 56: 563–595.

Cunningham D, Gleditsch KS and Salehyan I (2009) It takes two: A dyadic analysis of civil war duration and outcome. *Journal of Conflict Resolution* 53(4): 570–597.

Cunningham D, Gleditsch KS and Salehyan I (2013) Non-state actors in civil wars: A new dataset. *Conflict Management and Peace Science* 30(5): 516–531.
Curtain R (2001) Youth and employment: A public policy perspective. *Development Bulletin* 55: 7–11.
Denov M (2010) *Child Soldiers: Sierra Leone's Revolutionary United Front*. Cambridge: Cambridge University Press.
Dickson-Gómez J (2002) Growing up in guerrilla camps: The long-term impact of being a child soldier in El Salvador's civil war. *Ethos* 30(4): 327–356.
Fearon J and Laitin D (2003) Ethnicity, insurgency, and civil war. *American Political Science Review* 97(1): 75–90.
Fortna P (2003) Scraps of paper? Agreements and the durability of peace. *International Organization* 57(2): 337–372.
Freud A and Burlingham DT (1943) *War and Children*. New York, NY: Medical War Books.
Gates S and Reich S (2010) Introduction. In: Gates S and Reich S (eds) *Child Soldiers in the Age of Fractured States*. Pittsburgh, PA: University of Pittsburgh Press, pp. 3–13.
Gilligan MJ, Mvukiyehe EN and Samii C (2013) Reintegrating rebels into civilian life: Quasi-experimental evidence from Burundi. *Journal of Conflict Resolution* 57(4): 598–626.
Gislesen K (2006) *A Childhood Lost? The Challenges of Successful Disarmament, Demobilization and Reintegration of Child Soldiers: The Case of West Africa*. Oslo: Norwegian Institute of International Affairs.
Gleditsch KS (2002) Expanded trade and GDP data. *Journal of Conflict Resolution* 46(5): 712–724.
Gleditsch NP, Wallensteen P, Eriksson M et al. (2002) Armed conflict 1946–2001: A new dataset. *Journal of Peace Research* 39(5): 615–637.
Goldstone JA (2001) Demography, environment, and security. In: Diehl PF and Gleditsch NP (eds) *Environmental Conflict*. Boulder, CO: Westview Press, pp. 84–108.
Haer R and Böhmelt T (forthcoming) The impact of child soldiers on rebel groups' fighting capacities. *Conflict Management and Peace Science*.
Harbom L, Högbladh S and Wallensteen P (2006) Armed conflict and peace agreements. *Journal of Peace Research* 43(5): 617–631.
Heldt B and Wallensteen P (2005) *Peacekeeping Operations: Global Patterns of Intervention and Success, 1948–2004*. Sandö: Folke Bernadotte Academy.
Hilker LM and Fraser E (2009) Youth exclusion, violence, conflict and fragile states. Available at: http://www.gsdrc.org/docs/open/CON66.pdf (accessed 12 January 2015).
Høiskar AH (2001) Underage and under fire. An enquiry into the use of child soldiers 1994–8. *Childhood* 8(3): 340–360.
Honwana A (2006) *Child Soldiers in Africa*. Philadelphia, PA: University of Pennsylvania Press.
Human Rights Watch (2004) *How to Fight, How to Kill*. New York, NY: Human Rights Watch.
Humphreys M and Weinstein JM (2007) Demobilization and reintegration. *Journal of Conflict Resolution* 51(4): 531–567.
IISS (International Institute for Strategic Studies) (1998) *The Military Balance 1998/99*. London: Oxford University Press.
Kaplan O and Nussio E (2014) Explaining recidivism of ex-combatants in Colombia. Unpublished manuscript, University of Denver, CO.
Kingma K (1997) Demobilization of combatants after civil wars in Africa and their reintegration into civilian life. *Policy Studies* 30(3): 151–165.
Krain M (2005) International intervention and the severity of genocides and politicides. *International Studies Quarterly* 49(3): 363–387.

Kreutz J (2010) How and when armed conflicts end: Introducing the UCDP conflict termination dataset. *Journal of Peace Research* 47(2): 243–250.

Lacina B and Gleditsch NP (2005) Monitoring trends in global combat: A new dataset on battle deaths. *European Journal of Population* 21(2/3): 145–166.

Lasley T and Thyne C (forthcoming) Secession, legitimacy, and the use of child soldiers. *Conflict Management and Peace Science*.

Leahy E, Engelman R, Vogel CG et al. (2007) *The Shape of Things to Come: Why Age Structure Matters to a Safe, More Equitable World*. Washington, DC: Population Action International.

Machel G (1996) *Impact of Armed Conflict on Children*. New York, NY: UNICEF.

Maclure R, Denov M (2006) 'I didn't want to die so I joined them': Structuration and the process of becoming boy soldiers in Sierra Leone. *Terrorism and Political Violence* 18(1): 119–135.

Magambo C and Lett R (2004) Post-traumatic stress in former Ugandan child soldiers. *Lancet* 363(9412): 1647–1648.

Marshall MG and Jaggers K (2002) Polity IV dataset. Available at: http://www.systemicpeace.org/polity/polity4.htm

Mason TD, Gurses M, Brandt PT et al. (2011) When civil wars recur: Conditions for durable peace after civil wars. *International Studies Perspectives* 12(2): 171–189.

Masten AS and Narayan AJ (2012) Child development in the context of disaster, war, and terrorism: Pathways of risk and resilience. *Annual Review of Psychology* 63(1): 227–257.

Mesquida CG and Wiener NI (1996) Human collective aggression: A behavioral ecology perspective. *Ethnology and Sociobiology* 17(4): 247–262.

Moser CO and Rodgers D (2005) *Change, Violence and Insecurity in Non-Conflict Situations*. Working Paper 245. London: Overseas Development Institute.

Most BA and Starr H (1989) *Inquiry, Logic and International Politics*. Columbia, SC: University of South Carolina Press.

Muggah R (2009) Introduction: The emperor's clothes? In: Muggah R (ed.) *Security and Post-Conflict Reconstruction: Dealing with Fighters in the Aftermath of War*. New York, NY: Routledge, pp. 1–29.

New York Times (2006) Armies of children. *New York Times*, 12 October.

Özerdem A (2002) Disarmament, demobilisation and reintegration of former combatants in Afghanistan: Lessons learned from a cross-cultural perspective. *Third World Quarterly* 23(5): 961–975.

Perry BD (1997) Incubated in terror: Neurodevelopmental factors in the 'cycle of violence'. In: Osofsky JD (ed.) *Children in a Violent Society*. New York, NY: Guilford Publications, pp. 124–148.

Perry BD, Poland RA, Blakley TL et al. (1995) Childhood trauma, the neurobiology of adaption, and 'use-dependent' development of the brain: How 'states' become 'traits'. *Infant Mental Health* 16(4): 271–291.

Pugel J (2009) Measuring reintegration in Liberia: Assessing the gap between outputs and outcomes. In: Muggah R (ed.) *Security and Post-Conflict Reconstruction: Dealing with Fighters in the Aftermath of War*. New York, NY: Routledge, pp. 70–102.

Quinn JM, Mason TD and Gurses M (2007) Sustaining the peace: Determinants of civil war recurrence. *International Interactions* 33(2): 167–193.

Rakisits C (2008) Child soldiers in the east of the Democratic Republic of Congo. *Refugee Survey Quarterly* 37(4): 108–122.

Reich SF and Achvarina V (2005) Why do children fight? Explaining child soldier rations in African intra-state conflicts. Unpublished manuscript, Ford Institute of Human Security.

Richards P (1996) *Fighting for the Rain Forest: War, Youth and Resources in Sierra Leone*. Oxford: James Currey.

Rustad SA and Binningsbø HM (2012) A price worth fighting for? Natural resources and conflict recurrence. *Journal of Peace Research* 49(4): 531–546.

Santacruz ML and Arana RE (2002) Experiences and psychosocial impact of the El Salvador civil war on child soldiers [translated]. *Biomédica* 22(2): 283–397.

Schauer E and Elbert T (2010) The psychological impact of child soldiering. In: Martz E (ed.) *Trauma Rehabilitation After War and Conflict: Community and Individual Perspectives*. New York, NY: Springer, pp. 311–360.

Schwartz S (2010) *Youth and Post-Conflict Reconstruction: Agents of Change*. Washington, DC: The Endowment of the United States Institute of Peace.

Singer PW (2006) *Children at War*. Berkeley, CA: University of California Press.

Singer PW (2010) The enablers of war: Causal factors behind the child soldier phenomenon. In: Gates S and Reich S (eds) *Child Soldiers in the Age of Fractured States*. Pittsburgh, PA: University of Pittsburgh Press, pp. 93–107.

Spear J (2006) The disarmament and demobilization of warring factions in the aftermath of civil wars: Key implementation issues. *Civil Wars* 2(2): 1–22.

Starr H (1978) 'Opportunity' and 'willingness' as ordering concepts in the study of war. *International Interactions* 4(4): 47–67.

Steenkamp C (2005) The legacy of war: Conceptualizing a 'culture of violence' to explain violence after peace accords. *Round Table* 94(379): 253–267.

Straker G (1992) *Faces in the Revolution*. Cape Town: David Philip.

Themnér A (2011) *Violence in Post-Conflict Societies. Remarginalization, Remobilizers and Relationships*. London: Routledge.

Themnér A (2013) A leap of faith: When and how ex-combatants resort to violence. *Security Studies* 22(2): 295–329.

Toft MD (2010) Ending civil wars? A case for rebel victory. *International Security* 34(4): 7–36.

Tynes R (2011) Child soldiers, armed conflicts, and tactical innovations. PhD Thesis, University at Albany, State University of New York, USA.

Tynes R and Early BR (forthcoming) Governments, rebels, and the use of child soldiers in internal armed conflicts: A global analysis, 1987–2007. *Peace Economics, Peace Science, and Public Policy*.

UN (United Nations) (2000a) Optional Protocol to the Convention on the Rights of the Child on the Involvement of Children in Armed Conflict. Adopted and opened for signature, ratification and accession by General Assembly Resolution A/RES/54/263 of 25 May 2000.

UN (2000b) Statement by the President of the Security Council. S/PRST/2000/10 of 23 March 2000. Available at: http://www.un.org/en/ga/search/view_doc.asp?symbol=S/PRST/2000/10 (accessed 12 January 2015).

UN (2014) Children. Available at: http://www.unddr.org/key-topics/children/introduction_1.aspx (accessed 12 January 2015).

UNICEF (United Nations Children's Fund) (2003) *Guide to the Optional Protocol on the Involvement of Children in Armed Conflict*. New York, NY: UNICEF.

UNICEF (2007) *The Paris Principles. Principles and Guidelines on Children Associated with Armed Forces or Armed Groups*. New York, NY: UNICEF.

UNICEF (2013) *Syria's Children: A Lost Generation?* Crisis Report March 2011–March 2013. New York, NY: UNICEF.

Urdal H (2006) A clash of generations? Youth bulges and political violence. *International Studies Quarterly* 50(3): 607–629.

Urdal H (2008) Population, resources and violent conflict: A sub-national study of India 1956–2002. *Journal of Conflict Resolution* 52(4): 590–617.

Urdal H (2011) A clash of generations? Youth bulges and political violence. Paper presented at the United Nations Expert Group Meeting on Adolescents, Youth and Development, New York, 21–22 July.

Urdal H and Hoeschler K (2009) Urban youth bulges and social disorder: An empirical study of Asian and sub-Saharan African cities. *World Bank Policy Research Working Paper 5110*.

Utas M (2005) Building a future? The reintegration and re-marginalisation of youth in Liberia. In: Richards P (ed.) *No Peace, No war: An Anthropology of Contemporary Armed Conflicts*. Oxford: James Currey, pp. 137–154.

Utas M (2008) Abject heroes: Marginalised youth, modernity and violent pathways of the Liberian civil war. In: Hart J (ed.) *Years of Conflict: Adolescence, Political Violence and Displacement*. New York, NY, and Oxford: Berghah.

Uvin P (1998) *Aiding Violence: The Development Enterprise in Rwanda*. West Hartford, CT: Kumarian.

Vargas-Barón E (2010) National policies to prevent the recruitment of child soldiers. In: Gates S and Reich S (eds) *Child Soldiers in the Age of Fractured States*. Pittsburgh, PA: University of Pittsburgh Press, pp. 14–23.

Walter B (2004) Does conflict beget conflict? Explaining recurring civil war. *Journal of Peace Research* 41(3): 371–388.

Walter B (2014) Why bad governance leads to repeat civil war. *Journal of Conflict Resolution* 58(2): 1–31.

Wessells M (1997) Child soldiers. *Bulletin of the Atomic Scientists* 53(6): 32–39.

Wessells M (2006) *Child Soldiers: From Violence to Protection*. Cambridge, MA: Harvard University Press.

Wessells M (2010) Girls in armed forces and groups in Angola. Implications for ethical research and reintegration. In: Gates S and Reich S (eds) *Child Soldiers in the Age of Fractured States*. Pittsburgh, PA: University of Pittsburgh Press, pp. 183–199.

Yair O and Miodownik D (forthcoming) Youth bulge and civil war: Why a country's share of young adults explains only non-ethnic wars. *Conflict Management and Peace Science*.

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Appendix 1: Control variables (taken from Kreutz's (2010) online appendix, available at: http://www.pcr.uu.se/digitalAssets/124/124924_1how_and_when_armed_conflicts_end_appendix.pdf)

- **Victory** (based on Kreutz (2010)).
- **Victory for the government** (based on Kreutz (2010)).
- **Victory for the rebel side** (based on Kreutz (2010)).
- **Peace agreement** (based on Kreutz (2010)).
- **Ceasefire agreement** (based on Kreutz (2010)).
- **Partition** (based on Kreutz (2010)). A dichotomous variable indicating whether the conflict ended with the partition of a country into two separate countries: 1 = partition; 0 = no partition. In order to explore the potential recurrence of conflict after partition, the first interstate conflicts between these entities are coded as 'recurrence' of the prior intrastate conflict. That is, even though the conflict over China (government) ended in 1950 and resulted in the partition of the former warring parties into China and Taiwan, the peace is only coded to last until 1954, when the two states resumed fighting. However, subsequent recurrences of fighting are not coded as intrastate conflict.
- **Peacekeepers**. A dummy indicating whether a peacekeeping operation was present in the country, regardless of whether the operation had a mandate with regards to the specific conflict: 1 = peacekeepers; 0 = no peacekeepers. Source: Heldt B and Wallensteen P (2005).
- **Ethnically mobilized conflict**. Walter (2004: 376) suggests that 'if the combatants broke down along ethnic lines, or a faction defined itself as a separate ethnic group, it was coded as [ethnic], all other wars were coded as non-ethnic'. In the cases where it was possible, Walter's coding was used, and additional cases were coded according to the definition just given: 1 = ethnic; 0 = non-ethnic. Source: Walter B (2004).
- **Ethnic revolution** (based on Kreutz (2010)). This variable indicates the 'ethnic' conflicts that were concerned with incompatibility over government (as opposed to incompatibility over territory): 1 = ethnic conflict over government; 0 = other.
- **Total goals**. Walter (2004: 376) suggests that 'if the rebels initiated the war to obtain anything less than total control over the government (i.e. political reform, land reform, territorial autonomy, etc.) the war was coded as involving non-total goals'. In the cases where it was possible, Walter's coding was used, and additional cases were coded according to the definition just given: 1 = total goals; 0 = non-total goals. Source: Walter B (2004).
- **Secessionist conflict**. Quinn et al. (2007: 180) argue that 'in a revolution, the rebels seek to overthrow the incumbent regime and take its place. In a secessionist revolt, the rebels seek not to replace the incumbent regime but to gain independence from it'. The UCDP employs a somewhat broader definition for the category of 'territorial' intra-state conflicts, which include both conflicts where the rebels seek independence and where the rebels are willing to settle for limited goals such as autonomy or a reorganization of the federal entities in a state. However, whether the demands are for independence or autonomy, the conflict issue remains largely

the same, thus the UCDP definition is used: 1 = territorial conflict; 0 = government conflict. Source: Gleditsch NP et al. (2002).

- **Battle-related deaths**. The number of battle-related deaths in the previous conflict, in 1000s (log-transformed). Source: Lacina B and Gleditsch NP (2005).
- **Duration of conflict** (based on Kreutz (2010)). The duration of the previous conflict, originally calculated in days and presented in yearly format (log-transformed).
- **Percent of army of population**. Calculated using information on both military size and population from the same source. Source: IISS (1998).
- **Infant mortality rate** (one-year lag). Source: Abouharb MR and Kimball A (2005).
- **GDP per capita** (one-year lag). Source: Gleditsch KS (2002).
- **Democracy score** (one-year lag). Country democracy score according to the scale from the Polity IV project, ranging from –10 (least democratic) to +10 (most democratic). Source: Marshall MG and Jaggers K (2002).
- **Ethnic heterogeneity** (ELF). This measure is an index to measure ethnic fractionalization. This continuous index is calculated as follows: the proportion of the population of each ethnic group to the total population of the country is squared; the squared proportions for all groups are then summed and that number is subtracted from 1 to come up with the fractionalization measure for that country. A low score indicates asymmetry between groups and/or relative homogeneity. A high score indicates many groups with small or relatively equal percentages of the population. Source: Krain M (2005).
- **Population** (log-transformed). The population of the country, in millions (log-transformed). Source: IISS (1998).
- **Duration of peace** (based on Kreutz (2010); used as temporal control; note that those models based on Walter (2004) also include a yearly, linear time trend and a set of cubic splines). The duration of time since the previous conflict, originally calculated in days and presented in yearly format.