

Could rebel child soldiers prolong civil wars?

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Abstract

While we know why rebels may recruit children for their cause, our understanding of the *consequences* of child soldiering by non-state armed groups remains limited. The following research contributes to addressing this by examining how rebels' child recruitment practice affects the duration of internal armed conflicts. We advance the argument that child soldiering increases the strength of rebel organizations vis-à-vis the government. This, in turn, lowers the capability asymmetry between these non-state actors and the incumbent, allowing the former to sustain in dispute. Ultimately, the duration of armed conflicts is likely to be prolonged. We analyze this relationship with quantitative data on child soldier recruitment by rebel groups in the post-1989 period. The results confirm our main hypothesis: disputes are substantially longer when rebels recruit children. This work has important implications for the study of armed conflicts, conflict duration, and our understanding of child soldiering.

Keywords

child soldiers; civil war; conflict duration; event history models

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Introduction

Child soldiering is not a new phenomenon (Wessells, 2006), but its practice has altered dramatically over the last few decades (Brett and McCallin, 1998). The number of children involved in conflict is growing and their contribution has changed as they are often used as active belligerents in war, instead of being only recruited for supportive functions such as cooking or carrying loads (Gates, 2011: 31; Maclure and Denov, 2006: 119; Singer, 2006: Machel, 1996; Gates and Reich, 2010).¹ Clearly, child soldiering is a severe case of the deprivation of children's human rights and it is important to advance our understanding of its determinants and consequences in order to provide politicians and public institutions with a more systematic foundation for decision-making that can effectively address this problem.

Although state military organizations also make use of children, this study focuses on the *consequences of rebel group's* child soldiering, as rebels usually have fewer constraints in and more to gain from using child soldiers (Tynes and Early, 2015).² To this end, we focus on child recruitment by rebel groups and how this affects the duration of civil war.³ We argue in this study that rebel groups' use of children additionally helps to explain the duration of civil wars. If civil war durations are indeed influenced by rebels' child soldiering practices, our understanding of conflict dynamics will benefit from insights from the literature on child soldiers (see Brett and McCallin, 1998; Gates, 2011: 31; Maclure and Denov, 2006: 119; Singer, 2006: Machel, 1996; Gates and Reich, 2010; Wessells, 1997; 2005). Conversely, our understanding of child soldiering, also why it occurs in the first place, will benefit by recognizing its role for civil war durations.

There is anecdotal evidence, which suggests that child soldiering might indeed affect conflict duration. Brett and McCallin (1998) argued as one of the first that "the continuous involvement of child soldiers in war can be a cause of further deterioration in the security situation in future. [...] The extensive involvements of children as combatants may in itself

be a significant factor in prolonging the conflict.” However, Achvarina and Reich (2006: 143) conclude that there is “little relationship between duration and the use of child soldiers in cases where we were definitive about their use.”

While these works provide some initial insights and a starting point for our study, a more systematic analysis, which goes beyond single case studies (Singer, 2006) or research on constrained samples of only child soldier cases (Achvarina and Reich, 2006), is necessary to thoroughly understand the relationship between child soldiering and conflict duration. To this end, the next section discusses the previous literature on child soldiering and conflict duration. We then develop a theoretical framework in four steps arguing for a conflict-prolonging effect of rebel groups’ child soldiers on the duration of armed conflict. The net effect of these arguments is studied empirically using data on rebels’ child soldier usage in conflict years between 1989 and 2003.⁴

The conclusion of this study is that civil wars have a significantly and substantially longer duration if rebels recruit and use child soldiers. This conclusion has important implications for our understanding of civil war dynamics as well as for our understanding of child soldiering. First, this result contributes to the vast literature on the determinants of civil war durations that, thus far, was only focused on a number of more aggregated factors pertaining to rebel organizations’ strength (see Cunningham et al. 2009) and did not yet acknowledged the additional influence of child soldiering practices. Focusing on civil war duration and shedding more light on its underlying causes is important for at least two reasons. First, conflict duration is a key factor of conflict intractability influencing the economic and human costs of war (e.g., Bennett and Stam, 1996). Cunningham (2006; 2010), for example, estimates that for each extra month of civil war, an additional 189 casualties (on average) is observed. Knowing which variables increase or decrease the duration of a conflict may help policymakers and scholars alike to gain a better assessment of the possible

risks and costs involved. Moreover, insights on the duration of armed conflicts could help scholars and policymakers alike to anticipate the likelihood of military interventions or whether neighboring countries will be destabilized (Pilster and Böhmelt, 2014). The current conflict case of Syria illustrates this well (Pilster and Böhmelt, 2014). Eventually, our work could change how policymakers, scholars, and public institutions perceive current efforts to prevent, manage, or resolve armed conflicts as we highlight a previously neglected influencing factor.

Second, it is unclear, however, what role, if any, child soldiers have in this and related contexts. To this end, our research makes two central contributions with regard to the specific influence of child soldiers. First, our study is the first to provide systematic evidence. Second, by showing that the associated effects are statistically and substantively significant, we might also inform the existing literature on the *determinants* of child soldiering (e.g., Lasley and Thyne, 2015). Put differently, this article, despite its focus on the *consequences* of child soldiering, might also have implications for those studies that focus on what drives child soldiering in the first place. The following section reviews the relevant literature, which additionally helps us to position our contribution to the field.

Child soldiers, civil war, and conflict duration

Child soldiering

Following UNICEF (2007), child soldiers are defined as “any person below 18 years of age who has been recruited or used by an armed force or armed group.”⁵ This 18-years threshold 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 (UN 2000), but also as international law in 2000.⁶

Existing studies on child soldiers (e.g., Tynes and Early 2015; Lasley and Thyne, 2014;

Blattman and Annan, 2008; 2010; Brett and Specht, 2004; Singer, 2006; Honwana, 2006) can be divided into three broad literature strands. First, some scholars focus primarily on the *determinants* of child soldiering, i.e., those factors that increase or decrease of children joining armed groups during conflict in the first place. Honwana (2006), for example, argues that economic problems associated with globalization affect the children's decision to join armed groups during civil wars. Due to globalization and civil wars, social structures are disrupted that would have otherwise protected children from recruitment efforts. Rosen (2005), on the other hand, emphasize the influence of security on the children's decision to join armed groups. He shows with the help of three in-depth qualitative cases that children are not always passive victims of (civil) war, but often make the rational decision that "not fighting" is worse than "fighting". There is also some in-depth qualitative and quantitative work examining the impact of food scarcity and lack of education resulting from the outbreak of war as factors that make children more likely to join armed groups (e.g., Brett and Specht, 2004; Cohn and Goodwin-Gill, 1994).

Second, others focus more on identifying the factors that drives rebel groups to recruit children (also called the supply-side of child soldiering). Beber and Blattman (2013), for instance, argue that it is easier to indoctrinate and mislead children, and that they are cheaper to retain and more responsive to coercive methods. Similarly, Wessells (2006) and Schauer and Elbert (2010) report that child soldiers demonstrate more aggressive behavior than adult combatants, as they perceive violence more often as something positive.⁷ However, some scholars also emphasize that child recruitment is not without any costs (e.g., Gates, 2011). Rebel groups still have to invest resources for the socialization and training of children either in relation to their combat role (military tactics) or their logistical support function (Gates and Reich, 2010).

Lastly, there is a literature strand on the *consequences* of child soldiering. Veale and Stavrou (2007) for instance, have explored the issue of changing identities of child soldiers due to abduction and its effect on reintegration. Other scholars like, Dickson-Gómez (2002), Berkowitz (1993), and Bandura (1973) have examined how social learning processes influence the mental and behavior changes that a child undergoes in the context of war. Punamäki (1987), for instance, examines the level of aggression among Palestinian and Israeli children and conclude that Palestinian children, who had been exposed to a greater amount of war stressors than Israeli children, frequently display more aggressive behavior (see also Hecker et al. 2013). Others, such as Blattman and Annan (2008; 2010) focus more on the economic consequences. They find that rebels' child soldier recruitment in Uganda has a negative impact on their post-conflict earnings, which is also confirmed by qualitative research on the recruitment practices in Mozambique and El Salvador (Boothby et al., 2006; Santacruz and Arana, 2002). Additionally, there is a growing body of research that focus on the effective reintegration of child soldiers after war, especially in the context of Disarmament, Demobilization, and Reintegration (DDR) programs. Utas (2011) describes how former child soldiers in Liberia use the victim label as an aid in accessing reintegration support. Others, such as Halton (2011), have looked from a practitioner perspective to the reintegration process. He concludes from his own experience in the Sudan reintegration process that it is of importance to have a strong enforcement of the reintegration process on the local level. Somewhat surprisingly, however, we know relatively little about the consequences of child soldiering on *conflict dynamics and the society in general*. There are only few notable exceptions that explicitly focus on their impact. Bakaki and Hinkkainen (2016) empirically demonstrate that child soldiering in civil war increases the likelihood UN peacekeeping interventions. Haer and Böhmelt (2016a; 2016b) find that child soldiers might improve the military effectiveness of rebel organizations, but ultimately have a very

detrimental impact on post-conflict peace as dispute recurrence becomes more likely with them. However, none of these qualitative and quantitative studies addresses the underlying phenomenon that may influence all these outcomes, i.e., on the impact of rebel groups' child soldiering on the duration of conflicts.⁸

Armed conflict duration

The UCDP/PRIO Armed Conflict Dataset (Gleditsch et al., 2002) defines an armed conflict as a contested incompatibility between two parties (of which one is the government of a state in question) involving the use of armed force that leads to at least 25 battle-related deaths. This definition does not specify the type of conflict and consequently include ethnic, territorial, governmental conflicts and conflicts over other non-ethnic issues. Moreover, conflicts between two states are excluded from the analysis and, hence, we only examine domestic-level disputes. These civil wars, insurgencies, and, more generally, domestic armed conflicts remarkably vary in how long they last (e.g., Fearon, 2004; Lyall, 2010; Cunningham, 2006; 2010; Wucherpfennig et al., 2012).

Studies attempting to explain this variation primarily rely on the idea that conflicts continue if at least one of the belligerents believes that the dispute is more beneficial than peace (e.g., Hegre and Sambanis, 2006; Fearon, 2004; Regan, 2002; Hegre, 2004; Cunningham, 2006; 2010; Collier and Hoeffler, 2004; Wucherpfennig et al., 2012). This cost-and-benefit calculation depends in large parts on available information concerning the actors' private capabilities. The information about belligerents' capabilities is then (partly) revealed over the course of fighting. Hence, conflict termination and, in turn, conflict duration depends on how fast the actors are *able* and *willing* to reveal information (Starr, 1978; Most and Starr, 1989). Within this willingness and opportunity framework, most studies have focused on four clusters, each of them generating different predictions about which factor is likely to make

conflicts shorter or longer: (1) physical terrain and geography, (2) cultural and ethnic influences, (3) rebel power, and (4) state power (e.g., Collier et al., 2004; Fearon, 2004; Lyall, 2010; Hegre and Sambanis, 2006; Pilster and Böhmelt, 2014).

For example, Balch-Lindsay and Enterline (2000: 623) argue that the duration of conflicts is driven by the distribution of resources across parties (see also Mason and Fett, 1996; Collier and Hoeffler, 2004). When resources are equally distributed, conflicts last longer as each side is unable to achieve its preferred goal. Hence, these studies address the influence of physical terrain and geography, rebel power, and state power as they focus on (natural) resources that empower the rebels or the government and, thus, affect war duration.

Fearon (2004) contends that it is easier for parties to commit to peace in some types of civil wars than others, and that conflicts in which commitment problems are lessened will be shorter. These types are largely based on rebel-group motivations: wars emerging from coups, revolutions, and anticolonial struggles are relatively brief, while “sons of the soil” conflicts – “land or natural resource conflicts between a peripheral ethnic minority and state-supported migrants of a dominant ethnic group” – take longer (Fearon, 2004: 277).

Walter (2002) claims that conflict actors will have difficulties to credibly commit to any peace agreement if third-party enforcement is not given. Hence, third-party involvement and intervention influence conflict duration. However, whether this factor belongs to the third (i.e., rebel power) or fourth cluster (i.e., state power) of explanatory factors influencing variation in conflict duration depends on the side an intervener is biased toward (Hegre, 2004; Regan, 2002). For example, Balch-Lindsay and Enterline (2002) find that interventions biased toward the government increase conflict duration. DeRouen and Sobek (2004) show that UN interventions are not associated with shorter wars, while Cunningham (2006; 2010) examines whether conflicts become longer if more parties are involved.

However, none of the existing studies on conflict duration has touched upon the influence of child soldiers and how they could affect the conflict duration. To address this, we develop our theoretical idea in the following section, linking rebels' child recruitment to the duration of intrastate-armed conflict.

Could rebel child soldiers affect civil war durations? Theoretical arguments

The dominant framework for examining the duration of armed conflicts relies on actors' willingness and opportunity. While willingness pertains to the resolve and intention of the actors to continue fighting, opportunity stands for the available possibilities, resources, and abilities to actually do so. We argue that rebels' child-soldier recruitment is likely to be a crucial part of the opportunity as well as the willingness to continue fighting and, thus, an important determinant of conflict duration that has been neglected so far.

Our argument is based on the assumption that there usually is a power asymmetry between rebel groups and the governments, i.e., rebels are typically weaker (Cunningham et al., 2009; 2013). This assumption is justified in light of Cunningham et al.'s (2009; 2013) Non-State Actor Dataset (NSA), which codes information about rebel groups since 1944. According to these data, rebels were much stronger, stronger, or equally strong as the government in only about 13 percent of the cases ($N=75$ out of 575 conflict episodes that are paired with the government of a country and a rebel group). In the vast majority of coded rebel organizations (about 87 percent), they were weaker or much weaker than the government ($N=500$ out of 575 cases).⁹

Note, however, that Cunningham et al. (2009: 575) distinguish between two separate dimensions of rebel strength and, therefore, power asymmetries between rebels and the government: "offensive strength, or the ability to inflict costs on a government in the center, and the ability to resist or evade government repression in the insurgent's 'home' territory in

the periphery and the underground.” While rebels that are stronger on the first dimension are associated with shorter conflicts, rebels that address their power asymmetry on the second dimension fight longer wars.¹⁰ Due to the fact that rebel groups generally have an *ex-ante* lower probability of winning a conflict militarily, they seek to address this capability asymmetry quickly. One way of doing so can be via the recruitment of minors (Tynes and Early, 2015: 87)

We argue that child soldiering primarily affects the power asymmetry on Cunningham et al.’s (2009: 575) second dimension, i.e., child soldiers improve rebels’ ability to resist government repression in the periphery and the underground. The opportunity and willingness to continue fighting via child soldiering and, thus, to lengthen an armed conflict with a more powerful governmental adversary is then given by at least four interrelated mechanisms. First, even if recruited children only provide non-combat related services,¹¹ children are more adaptable and obedient than adults (Schauer and Elbert, 2010: 316), and are more easily influenceable, which makes them easier to control and retain (e.g., Beber and Blattman, 2013). Moreover, child soldiers are said to be more loyal, committed, and less likely to desert than adults (Gates and Reich, 2010). Finally, children are more likely to take risks due to an underdeveloped death sense (Singer, 2006; Brett and Specht, 2004). In other words, children possess certain characteristics that make them more likely to sustain in their fight against the government, which in turn might increase the duration of a conflict.¹²

Second, by recruiting children, rebels can address personnel shortages.¹³ The recruitment of children is usually seen as a way of conserving military capabilities when suffering from personnel shortages and to deny the government access to human resources (e.g., Singer, 2006; Tynes and Early, 2015; Brett, McCallin, and O’Shea, 1996; Gates, 2011; Wessells, 2006; Podder, 2011). For instance, Syrian rebels defended their use of adolescent fighters as inevitable after several years of conflict (Washington Post, 2013). Moreover, after the

Ugandan government launched a large military offensive (Operation Iron Fist) in 2002, the Lord's Resistance Army (LRA) recruited children on a massive scale to compensate their losses in manpower (Human Rights Watch, 2013). By drafting new, adolescent recruits (who are often said to be cheaper than adult recruits), even if they are not able to fulfill fighting functions, rebel groups are more able to absorb a high level of damage before being forced to give up (e.g. Gates and Reich, 2010; Mason and Fett, 1996; Bennett and Stam, 1996).

Third, in line with the core idea of the second strength dimension of Cunningham et al. (2009: 575), child soldiering can also be used as a stalling tactic or stopgap measure. By accessing a new source of recruits, rebel groups can address personnel shortages that allows for the regrouping and rebuilding of own forces, which again leads to a longer conflict (see also Singer, 2006; Tynes and Early, 2015). For example, mercenaries from the private military company "Executive Outcomes" and the Economic Community of West African States Monitoring Group (ECOMOG) coalition forced the Revolutionary United Front (RUF) in Sierra Leone into retreat in at least two instances (1995 and 1997). Each time, however, the rebels used children to regroup and rebuild their manpower, allowing them to continue fighting. Based on this illustration, decisive and complete victory over groups that use children might be more difficult to achieve. These groups will often find a way to persist, sometimes for decades. As long as these rebels are able to maintain at least some kind of organizational foundation, and child soldiers facilitate this, it will be more difficult to suppress them by force although they may not be strong enough to win (Singer, 2006: 97). Consequently, with the help of child soldiers, rebels are able to continue to fight over an extended period of time.

While the previous paragraphs dealt with the relationship between child soldiers and conflict duration from an opportunity perspective, we also contend that there is at least one mechanism pertaining to the willingness side of the theoretical framework. Specifically, the

use of children during a conflict may make it more difficult to reach a peace agreement or negotiated settlement as child soldiering harms the post-conflict commitment to peace (Haer and Böhmelt, 2016b; see also Cunningham et al., 2009: 575). Children are frequently not included in DDR programs, which could make re-mobilization easier (Banholzer, 2014). Moreover, when child-centered DDR programs exist, they often suffer from a variety of problems, which makes former child soldiers vulnerable for re-recruitment (e.g., Singer, 2006; Shepler, 2005; Lee, 2009; Peters and Richards, 1998; Haer and Böhmelt, 2016b). For instance, peace broke down in Sri Lanka because rebels mobilized children and returned to the battlefield quickly after a couple of settlements (Singer, 2006: 98). Also, the Coalition to Stop the Use of Child Soldiers (2004) argues that the Burundian “Forces Nationales de Libération” (FNL) and the “Conseil National Pour la Défense de la Démocratie-Forces pour la Défense de la Démocratie” (CNDD-FDD) undertook massive child recruitment to increase their numbers for gaining recognition and bargaining power just before peace negotiations took place. This bargaining power made it then more difficult to reach any kind of agreement and the conflict went on. As Singer emphasizes, “children make wars easier to start and harder to end” (Singer, 2006: 98).

To recap, we developed several different, but interrelated arguments suggesting that rebel child soldiering will increase the duration of armed conflicts. While the lack of micro-level, disaggregated data does not allow us to test each of these mechanisms directly, we examine the observable net effect that *child soldiering by rebel groups is likely to increase the duration of civil wars*.¹⁴ In the next section, we use quantitative data and methods to shed empirical light on this general expectation.

Research design

Dependent variable and methodology

We compiled a quantitative data set that comprises information on civil wars, rebel groups, and their child soldiering practices. While the child soldier data stem from a relatively new data source (Haer and Böhmelt, 2016a; 2016b), all other data sets are virtually standard in the literature and commonly used. The data structure and our information on conflict-termination dates are based on the UCDP/PRIO Armed Conflict Data (Gleditsch et al., 2002), for which Kreutz (2010) coded start and end dates of the included conflicts. With this information, we created a monadic data set combining conflicts, rebel organizations, and years, i.e., the armed (intrastate) conflict-rebel-year constitutes our unit of analysis. One conflict may have more than one rebel organization fighting against governmental forces and, hence, each conflict (and, hence, the conflict's government side) is paired with each rebel group that actively participates in that conflict in a given year. The attributes of either the state or the rebel group in a dyad may change over time (the years of that dyad), and our research design allows for capturing these changes. Specifically, as soon as there is a change in any of the dyad's (government-rebel pair) parameters, a new observation is given in the data. The child soldier data (introduced below) follow this practice.

We define the dependent variable as the time between the outbreak of a conflict and its termination. Thereby, we focus on conflict duration, which can also be seen as a parsimonious operationalization for conflict intractability. After accounting for missing values in our explanatory variables described below, our sample covers 133 conflicts with 199 different rebel groups in 72 countries between 1989 and 2003. Conflicts are included in the data set when they were ongoing on January 1, 1989 or as soon as they break out afterwards during the period 1989-2003. Each state-rebel pair leaves the data in the year the respective conflict is over as identified by Kreutz's (2010) termination variable.

In total, we obtain 783 conflict-rebel-years. Out of these observations, 45 cases are left censored (i.e., the actual conflict start date is before January 1, 1989) and 36 cases are right censored (i.e., termination did not take place before the last day of observation in the data, December 31, 2003). The problem due to left censoring is addressed by taking into account the actual start date of a conflict (which may go back until January 1, 1944) when calculating durations. The issue of right-censored cases is taken into account by our estimator, for which we directly specify that all cases that did not terminate by December 31, 2003 are indeed right-censored.¹⁵ The average conflict duration of a government-rebel dyad in our sample is about seven years.

Since we do not impose a particular functional form on the baseline hazard of conflict termination, we use Cox proportional hazards models. This leaves the duration dependency unspecified and focuses the empirical analysis on how the covariates shift the baseline hazard. We examined the Schoenfeld residuals for a violation of the proportionality assumption, but this assumption is met for each model. We cluster the standard errors on the conflict, taking into account potential intra-group correlations. Finally, next to our regular models, we fit stratified Cox models, which allow the form of the underlying hazard function to vary across levels of stratification variables. Following the specifications in Cunningham et al. (2009), we use a conflict's underlying issue areas (in our case, only ethnic conflict or coups d'état vary are available) as strata, which then controls for the fact that the salience of conflicts is likely to vary over issue area (see also Wucherpfennig et al., 2012).

Explanatory variable: Rebel groups' child soldiering practice

While rebel groups are not the only organizations that recruit child soldiers (Gates and Reich, 2010; Tynes and Early, 2015), we focus on these non-state actors and rely on the arguably most comprehensive data on child soldiering compiled by Haer and Böhmelt (2016a; 2016b).

Following, UNICEF's (2007) definition, this data set defines child soldiers as any person below 18 years of age who has been recruited by a rebel group, while a rebel group is identified by Cunningham et al.'s (2009; 2013) Non-State Actor Dataset (NSA).¹⁶

We employ two different, yet interrelated variables from Haer and Böhmelt (2016a; 2016b) that measure the use of children by the rebels. First, there is an *ordinal child soldier variable*, which is coded as 0 if a rebel group did not use child soldiers at all in a specific conflict-rebel dyad, coded as 1 if a rebel group used a few child soldiers in a specific conflict-rebel dyad (i.e., less than 50 percent of the overall group size), and coded as 2 if a rebel group used many child soldiers in a specific conflict-rebel dyad (i.e., more than 50 percent of the group size). Second, we also consider a *binary variable for child soldiering*. This item captures whether the rebel group had child soldiers (1) or not (0) in a conflict-rebel year. Both variables do not distinguish between children that are forced recruited or voluntarily enlisted.

Most of the armed groups in the data used some child soldiers (coded as 1 with the ordinal variable). However, several rebel organizations did not use any children at all. For instance, the data indicate that there is no evidence that either the "Ethiopian People's Revolutionary Democratic Front," the Algerian group "Exile and Redemption," or the Turkish "Maoist Communist Party" used adolescent soldiers. Others like the RUF in Sierra Leone or the "Communist Party of Nepal-(Maoist)" recruited children on a large scale (coded as 2 with the ordinal variable).

We introduce these two variables separately into our models. Relying on these two different items and, hence, model specifications ensures the robustness of our findings. Using the dichotomous child soldier variable, although it discards information, also avoids the risk of making wrong assumptions about the actual size of child soldiering, since some coding might be affected by coding errors. In the appendix, we provide more information about the

original data set's coding process, procedures, sources, and the potential bias in the collected data (based on Haer and Böhmelt, 2016a).

Control variables

We control for a broad set of alternative determinants of our dependent variable, i.e., conflict duration. These controls are based on Cunningham et al.'s (2009: 579ff) work, and mirrors those items used by Wucherpfennig et al. (2012). Most of these controls can also be seen as correlates with child soldier recruitment, i.e., we control for observable determinants of child soldiering as well. The latter is particularly important for our empirical models in light of controlling for possible selection problems, i.e., the first stage of rebels' decision to recruit children.¹⁷ These control variables can be categorized under three different clusters: country characteristics, conflict features, and rebel-group items. These clusters mirror those identified in the literature review above (e.g., Collier et al., 2004; Cunningham et al. 2009; Fearon, 2004; Lyall, 2010; Hegre and Sambanis, 2006; Pilster and Böhmelt, 2014; Wucherpfennig et al., 2012).

First, in line with Cunningham et al. (2009: 582ff), we consider the form of government, the economic situation, ethnic and linguistic fractionalization, and population for the cluster of country characteristics. The level of *democracy* is frequently used in duration studies (Hegre and Sambanis, 2006; Pilster and Böhmelt, 2014; Fearon, 2004) as being the form of government that is likely to be most open to a negotiated settlement. The level of democracy may also affect child soldiering practices as it could decrease any actor's, including rebels', incentives to recruit adolescent soldiers due to reputational concerns (Tynes and Early 2015: 90f). We employ a binary version of the *polity2* item from the Polity IV data set (Marshall and Jaggers, 2004), which receives the value of 1 (full democracy) for a *polity2* value of +6 or higher (0 otherwise). We also re-estimated all our models with different specifications, i.e.,

the actual 20-point polity2 variable and when adding the square term of the polity2 item to model a curvilinear relationship (Cunningham et al., 2009). Our substantive results are not affected by either change in the research design.

The economic condition of a country is captured with the natural logarithm of a state's *GDP per capita* in a given year. The data for this item are taken from Gleditsch (2002), while its theoretical rationale is twofold: the economic development of a country is not only one of the most robust predictors in the civil conflict literature (Ward et al., 2010), but may also affect the likelihood of child recruitment (Tynes, 2011: 93): child soldiering might be more prevalent in weaker states (Collier et al., 2004). In the words of Tynes and Early (2015: 95), “[t]his variable tests the contention that poverty motivates children to become soldiers, as soldiering can translate into a job, money and/or a food source for them.” We also include the natural logarithm of a country's *population* that pertains to both conflict dynamics (Ward et al., 2010) (i.e., a larger population signifies a larger pool of potential recruits for either the government or the rebels, which prolongs civil conflict) and Dallaire's (2011) claim that overpopulation made children “cheap” recruits. The data stem from Gleditsch (2002) as well.

Finally, Fearon and Laitin (2003), among others, highlight the importance of ethnic and linguistic fractionalization for civil war onset, which may also affect conflict duration. This factor could fuel grievances toward the state and depending on their strength, might influence the duration. In addition, enlistment of children might also be influenced by social pressure exercised by family and friends due to ethnic identification (Achvarina and Reich, 2006; Goodwin-Gill, 1994; Becker, 2010; Brett and Specht, 2004). Following Cunningham et al. (2009: 584), we include Fearon and Laitin's (2003) measures for ethnic and linguistic fractionalization (*ELF Index*), which captures possible cultural and ethnic influences by measuring the probability that two randomly selected individuals belong to different ethnic groups.¹⁸

Coming to the characteristics of a conflict, we control for conflict type and the number of rebel groups active in a dispute. Cunningham et al. (2009) distinguish between *coups d'état* and *ethnic conflicts*. Coups are by default shorter conflicts (Fearon, 2004), while the literature shows that ethnic disputes are more difficult to settle and therefore usually takes longer (e.g., Rothman and Olson, 2001; Walter, 2002). In addition, it may be easier to recruit from one's own ethnic group or moral or social constraints against recruiting children may be more relaxed if rebels abduct and coerce members of other ethnic groups to fight for them. We control for these possibilities by including two dichotomous indicators that capture whether an armed conflict pertains to a coup or whether a conflict has an ethnic component, respectively. Furthermore, Cunningham (2006; 2010) demonstrates that the more actors are participating in a conflict, the longer a conflict lasts, since more players could block the implementation of an agreement. The effect on child soldiering may be given by two or more rebel groups' competing over recruiting children for their organizations. Controlling for this seems even more important in light of the data structure, which divides conflicts along rebel group-years. We include Cunningham et al.'s (2009) measure *Two or More Dyads*, i.e., whether other government-rebel dyads (and, hence, rebel groups) are active in the same conflict.

The last cluster controls for the influences of rebel groups' characteristics. Given our theoretical discussion, specific power characteristics (that vary of the course of a conflict) give us a metric of when a group is more likely to be in need of child soldiers. We follow again Cunningham et al. (2009; 2013) and consider measures, which control for the possibility that rebels might recruit child soldiers because they would lose otherwise. Finally, as Cunningham et al. (2009; 2013) note, all these group-related variables are likely to affect conflict durations, although their effect varies depending on whether they pertain to the "offensive strength" dimension or the dimension on "the ability to resist or evade government

repression.” At the most aggregated level, we include variables based on expert assessments measuring the *strength of a rebel group* vis-à-vis the government: we distinguish between weaker, equally strong, and stronger rebel groups, using “weaker rebels” as the baseline category. These aggregated variables can be disaggregated along four different items, however.

First, there is *Strong Central Command* that measures the extent to which a central command exercises control over the constituent groups of an insurgent movement. According to Cunningham et al. (2009: 580), “a strong central command provides the organizational structure necessary to mount an effective rebel strategy against the state [...]” We employ a binary variable that receives the value of 1 for stronger command structures of rebel forces in comparison to the government. Second, we consider a dichotomous variable for a rebel group’s *mobilization capacity*. When subscribing to the claim that child and adult soldiers are complements rather than substitutes, rebel groups that have the ability to recruit a larger number of fighters are not only more likely to draft child soldiers, but also “present a clear threat to governments and engage in direct attacks” (Cunningham et al., 2009: 580). Therefore, the higher the mobilization capacity, the more likely it is that rebels are militarily effective. Third, Cunningham et al. (2009: 580) suggest that “insurgents that have high capacity to procure arms should be better able to effectively target governments.” We, therefore, also incorporate their *High Arms-Procurement Capacity* variable, which is a binary item receiving the value of 1 if a rebel group has the ability to procure arms relative to the government and 0 otherwise. Fourth, we use the *High Fighting Capacity* variable in order to operationalize a rebel group’s fighting capacity relative to the government (Cunningham et al., 2009: 580). This variable measures the fighting capacity of a rebel group relative to the government on a dichotomous scale: low (0) or high (1).

We also control for two final rebel characteristics that do not belong to their strength or military capabilities relative to the government, but may be equally important. First, there is a dichotomous variable measuring whether a rebel group controls any *territory* (1) or not (0). Territory provides rebels with a variety of resources and shelter from the government's authorities, which may influence conflict duration. Territorial control also facilitates to accommodate training complexes, arms depots, etc., and may make it easier to draft adolescent fighters. Finally, conflicts are likely to be shorter when rebels have greater opportunities to substitute non-violent activities for violent ones (Cunningham et al., 2009: 580). The NSA data provide information on whether rebels have an acknowledged *political wing*, and whether the political wing is legal (i.e., accepted by the government). Against this background, we consider a binary variable on whether a legal political wing does exist or not as it "provides rebels the opportunity to pursue their demands through legal political means" (Cunningham et al., 2009: 581). The appendix provides the descriptive statistics of the used variables.

Empirical findings

The empirical analysis begins with the Kaplan-Meier Estimator, which provides a non-parametric estimate of the survivor function indicating the probability of an observation to survive past some point in time. Figure 1 shows that the survival probability of a conflict-rebel dyad lasting beyond 2,000 days since January 1, 1989 is about 3 percent when rebels have not recruited child soldiers. However, the survival probability and, hence, the chances of continued conflict are substantially higher when rebel groups comprise child soldiers (by about 40 percentage points).

Figure 1 here

While this offers some initial support for our theoretical expectation, a more systematic analysis is required, as the Kaplan-Meier Estimator cannot take into account the influence of the control covariates. Table 1 reports the results of our aggregated empirical analysis, i.e., the models where we use the abstract measures of rebel strength. Table 2 summarizes our findings when taking the more disaggregated perspective, i.e., we replace the abstract rebel-strength items by *Strong Central Command*, *High Mobilization Capacity*, *High Arms-Procurement Capacity*, and *High Fighting Capacity*. Within Tables 1 and 2, we further distinguish between those models that use the binary child soldier variable and those that rely on the ordinal measure. Finally, the last two models in either Table 1 or 2 make use of stratified Cox models, i.e., we take the controls *Coup d'état* and *Ethnic Conflict* out of the models, but use them as strata for the estimations. We report non-exponentiated coefficients, where higher values for an explanatory variable signify shorter conflicts. Hence, positive coefficients indicate an increasing hazard (shorter conflicts) and negative coefficients specify a decreasing hazard (longer conflicts).

Tables 1 and 2 show that the two child soldier variables have a negative and significant coefficient, suggesting that the estimated risk of conflict termination decreases, while the duration of a conflict increases when rebel groups have recruited children. Across Models 1-8, when moving from no child soldiering to child soldiering (*Child Soldiers Dummy*=1), there is a decrease in the estimated risk of conflict termination as conflicts with child soldiers are about 76 percent less likely to stop. When considering *Child Soldiers Ordinal*, a rise by one unit reduces the estimated risk of conflict end by about 65 percent. Adding or dropping control variables does not change the substance of these findings.¹⁹

Table 1 here

Figure 2 illustrates our key finding in a more nuanced way. We estimated different survival functions that are based on the estimates in Models 5 and 6. This figure, which is based on control variables being set to their mean values, mirrors the results shown in Figure 1 and Tables 1 and 2. The figure shows that child soldiers delay conflict termination. Specifically, the survival probability of a conflict-rebel dyad without child soldiers is about 10 percent (left or right panel) after 2,000 dispute days (about 5.5 years). In contrast, the probability that a conflict continues after 5.5 years of fighting is more than 60 percent when considering the aggregated child soldiering value (left panel) and about 50 percent when rebel groups recruited a few child soldiers (right panel); in case child soldiers constitute more than 50 percent of a rebel organization, the probability of conflict continuation is even higher with about 80 percent (right panel). Interestingly as well, conflict-rebel dyads with child soldiers even have a positive likelihood of continued dispute duration when approximating the end of our sample period, i.e., 2003. For instance, the right panel in Figure 2 shows that the survival probability is at around 40 percent after 6,000 days of fighting (16.4 years) if many child soldiers have been recruited.

Table 2 here

Coming to our control variables, the results are in line with earlier studies both in terms of substance and significance (see also Cunningham et al., 2009). We focus our discussion on the statistically significant findings due to space limitations. First, rebels that are at least as strong as the government in terms of the “offensive strength” dimension substantially shorten conflicts. For example, the estimated risk of conflict termination increases by about 180 percent when rebels are stronger than the government (as compared to when they are weaker than the government). Even when rebels are equally strong as the government, the likelihood

of a conflict to end is raised by about 120 percent (hazard ratio of 2.20 on average in Table 1). Interestingly, however, Table 2 demonstrates that *High Mobilization Capacity* largely drives these findings: this variable is the only rebel-strength characteristic that consistently has a positive and significant sign across the disaggregated models. In other words, when rebel groups have a high mobilization capacity, the risk of conflict termination increases by about 135 percent (hazard ratio of 2.35 on average in Table 2).

Figure 2 here

In terms of the conflict-types cluster, *Coup d'état* has the expected positive sign and is both substantially large and statistically significant throughout the models in Tables 1-2. That is, if an armed conflict is about a coup (and that has not yet terminated by a certain time), it has more than 10 (10.02) times the chance to end at the next point in time compared to a non-coup related dispute. Somewhat surprisingly, *Ethnic Conflict* does not influence the length of a civil war, which mirrors the findings in Cunningham et al. (2009: 585). Note that taking out these variables and using them as strata (Models 3-4 and 7-8) does not affect the substance of our results.

Finally, most of our country-characteristic controls fail to achieve conventional levels of statistical significance. Democracy is the only exception: on average, we obtain a coefficient estimate of -1.51 across our models, suggesting that increasing the polity variable by one unit decreases the estimated risk of conflict end by about 78 percent. Hence, more democratic states actually see longer armed conflicts. In line with Cunningham et al.'s (2009) argument, this result is likely to be driven by democratic states such as India or Israel that are involved in particularly long disputes during our study period.

Conclusion

The existing approaches to conflict duration do not consider the influence of child soldiers. With this study, we sought to fill this gap by examining theoretically and empirically how adolescent fighters might increase the length of intrastate-armed conflicts. Theoretically, we argued that child soldiers affect both the willingness and opportunity of rebel groups to continue fighting, which increases the probability that a conflict lasts longer. The empirical findings are based on a data set of rebel groups and civil wars between 1989 and 2003. Our survival analysis highlighted that child soldiers are, in fact, associated with conflict duration. Specifically, the probability of conflict continuation is *ceteris paribus* around 80 percent after 2,000 days when many children are recruited, but only 10 percent when rebel groups did not use adolescent soldiers.

We believe that several important avenues for further research exist in light of this finding. First, although we found a statistically significant link between child soldier usage and conflict duration, we treated child soldiers as a homogenous group. Due to the lack of data, we did not account for the gender of recruited children or how they were recruited. Additionally, as discussed above, we are unable to test which of the four mechanisms we developed is the main driver of our results. While we do know the net effect of child soldiers on conflict duration, it remains ambiguous whether children are mostly used as stopgap measures or as leverage in negotiation processes. Future research, qualitative cases studies in particular, might then focus on testing each of these direct mechanisms separately to gain more insights on the exact ways children influence conflict length. Finally, it remains to be seen which impact child soldiers have on other, perhaps related factors such as the outcomes of civil wars or violence against civilians in conflict. We hope, however, that this research constitutes the starting point for a series of fruitful projects in this area, which further help shedding light on the consequences of child soldiering.

With regard to the policy implications of our work, we believe that this research could influence how decision makers and public institutions engage with armed conflicts, their duration, and child soldiering in important ways. First, we have shown that there is a critical and frequently overlooked linkage between the recruitment of children and conflict duration. Child soldiers prolong conflicts, which raises the material and human costs not only for the belligerents, but potentially also for third parties due to the negative externalities associated with conflict. It is then of vital importance for the policy community to establish measures against child recruitment in the first place rather than primarily focusing on how to reintegrate children back into society once a conflict is over. Following recent research on the determinants of child soldiering (Tynes and Early 2015: 108), policymakers and the international community may have to address more thoroughly those factors that are conducive to child soldiering, but which can nonetheless be directly influenced. For example, weakened social norms and value systems must be strengthened again to protect children from recruitment (Honwana, 2006). Also, the lack of education and future perspectives as well as poverty and starvation are prominent “supply-side” determinants of child soldiering (e.g., Tynes, 2011: 93). Battling poverty and improving education are therefore key factors in fighting the abuse of children in conflicts. Finally, Tynes and Early (2015) highlight other structural factors such as democracy, which are likely to decrease the risk of child soldiering. At the same time, however, the link between child soldiers and conflict duration might lead to additional justifications for external interventions: the rationale behind this is that a third-party intervention could not only address the conflict as such, but also the use of child soldiers (Bakaki and Hinkkainen, 2016; Tynes and Early, 2015).

Second, in line with previous work (e.g., Haer and Böhmelt, 2016a), our work implies that the international community must realize that recruiting and using children in conflict is, although being an immoral strategy, conducive to prolonging fighting. While this does not

make the aim of abolishing child soldiering easier, activists gain a better understanding of rebels' motives behind child soldiering, which can then be fought more effectively. To this end, however, we do require more enforcing ways that can change rebels' cost-benefit analysis, e.g., economic sanctions or counter-propaganda strategies (Haer and Böhmelt, 2016: 16).

Third, despite the importance of preventing the use of child soldiers in the first place, attention should also be given to countering recidivism of former child soldiers during DDR processes (Haer and Böhmelt, 2016b). This is also important from the perspective of conflict duration. For instance, these programs should be focus more on the protection of children once they are no longer in an armed group. This should make it more difficult for rebel groups to get access to them. In addition, policymakers and public institutions must further increase and improve the “skills” of former child soldiers. Only when these children are capable of performing other jobs than soldiering, they are less likely to enlist (again), which in turn is associated with conflict durations and, hence, material and human costs. We conclude that child soldiers influence the duration of civil wars significantly.

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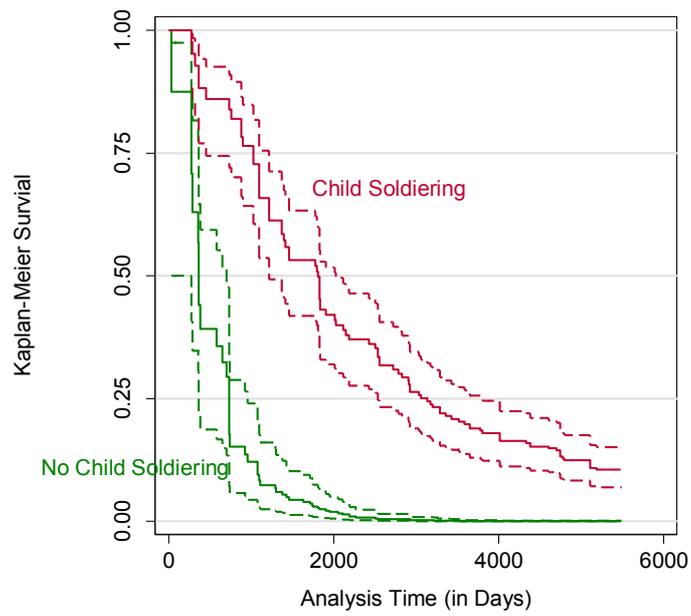
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Figure 1. Estimates of Kaplan-Meier survival functions according to *Child Soldier Dummy*



Note: Dashed lines constitute 90 percent confidence intervals; green lines pertain to “no child soldiers” (*Child Soldier Dummy*=0), while red lines pertain to “child soldiers” (*Child Soldier Dummy*=1)

Table 1. The determinants of the duration until conflict termination

	Model 1	Model 2	Model 3	Model 4
Child Soldier Dummy	-1.48 (0.24)***		-1.46 (0.25)***	
Child Soldiers Ordinal		-1.10 (0.19)***		-1.07 (0.19)***
Territorial Control	-0.55 (0.27)**	-0.43 (0.28)	-0.49 (0.26)*	-0.39 (0.27)
Legal Political Wing	0.14 (0.29)	0.28 (0.28)	0.18 (0.28)	0.30 (0.27)
Rebels Stronger than Government	1.06 (0.33)***	1.07 (0.36)***	1.02 (0.34)***	0.97 (0.37)***
Rebels in Parity with Government	0.86 (0.27)***	0.87 (0.30)***	0.70 (0.28)**	0.71 (0.30)**
Coup d'état	2.26 (0.58)***	2.55 (0.56)***		
ELF Index	0.15 (0.50)	0.39 (0.45)	0.07 (0.50)	0.36 (0.47)
Ethnic Conflict	0.03 (0.26)	0.14 (0.25)		
GDP per capita (ln)	0.12 (0.17)	0.13 (0.16)	0.10 (0.17)	0.11 (0.17)
Democracy	-1.56 (0.41)***	-1.55 (0.38)***	-1.55 (0.40)***	-1.54 (0.38)***
Two or More Dyads	-0.23 (0.19)	-0.27 (0.20)	-0.21 (0.19)	-0.29 (0.20)
Population (ln)	-0.01 (0.09)	-0.06 (0.09)	0.01 (0.09)	-0.03 (0.09)
Observations	783	783	783	783
Proportional Hazards Assumption χ^2	13.71	18.15	13.56	18.61
Strata	No	No	Yes	Yes
Pseudo Likelihood (ln)	-476.98	-473.28	-378.05	-374.90
Wald χ^2	153.79***	151.16***	88.34***	85.68***

Note: All models are based on Cox Proportional Hazards Models; robust standard errors clustered on conflict in parentheses; Efron method used for ties; Models 3 and 4 use conflict types (*coups d'état* and *ethnic*) as strata.

* significant at 10%; ** significant at 5%; *** significant at 1% (two-tailed)

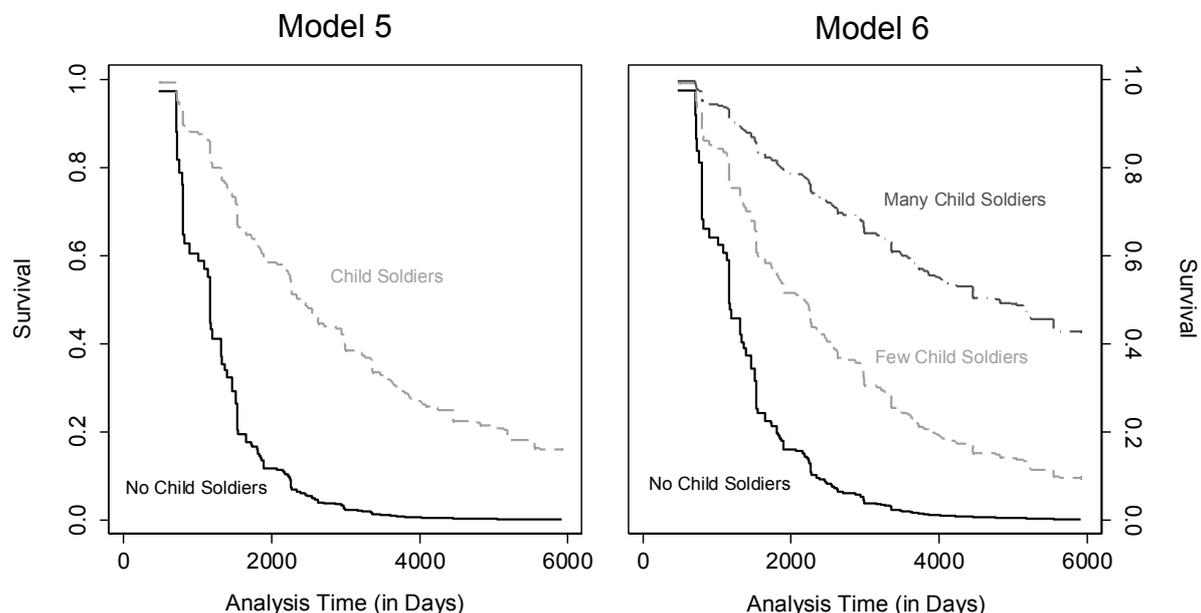
Table 2. Disaggregated analysis for the time until conflict termination

	Model 5	Model 6	Model 7	Model 8
Child Soldier Dummy	-1.38 (0.24)***		-1.37 (0.24)***	
Child Soldiers Ordinal		-1.02 (0.18)***		-1.02 (0.18)***
Territorial Control	-0.49 (0.28)*	-0.45 (0.29)	-0.48 (0.28)*	-0.47 (0.29)
Strong Central Command	0.15 (0.31)	0.32 (0.31)	0.27 (0.31)	0.49 (0.30)
High Mobilization Capacity	0.94 (0.36)***	0.72 (0.35)**	0.96 (0.36)***	0.78 (0.36)**
High Arms-Procurement Capacity	1.05 (0.62)*	0.97 (0.64)	1.18 (0.63)*	1.05 (0.65)
High Fighting Capacity	0.06 (0.46)	-0.16 (0.48)	-0.23 (0.48)	-0.53 (0.52)
Legal Political Wing	0.04 (0.29)	0.17 (0.28)	0.10 (0.29)	0.23 (0.27)
Coup d'état	2.28 (0.57)***	2.48 (0.54)***		
ELF Index	0.29 (0.51)	0.47 (0.45)	0.19 (0.51)	0.42 (0.45)
Ethnic Conflict	0.02 (0.27)	0.14 (0.25)		
GDP per capita (ln)	0.05 (0.18)	0.04 (0.17)	0.03 (0.18)	0.02 (0.17)
Democracy	-1.49 (0.39)***	-1.45 (0.37)***	-1.46 (0.37)***	-1.44 (0.36)***
Two or More Dyads	-0.23 (0.20)	-0.28 (0.21)	-0.22 (0.20)	-0.29 (0.20)
Population (ln)	-0.06 (0.10)	-0.11 (0.10)	-0.03 (0.09)	-0.08 (0.09)
Observations	783	783	783	738
Proportional Hazards Assumption χ^2	6.70	12.33	5.83	11.48
Strata	No	No	Yes	Yes
Pseudo Likelihood (ln)	-477.33	-474.89	-376.98	-373.96
Wald χ^2	162.34***	139.74***	120.65***	100.71***

Note: All models are based on Cox Proportional Hazards Models; robust standard errors clustered on conflict in parentheses; Efron method used for ties; Models 7 and 8 use conflict types (*coups d'état* and *ethnic*) as strata.

* significant at 10%; ** significant at 5%; *** significant at 1% (two-tailed)

Figure 2. Survival Function Estimates according to Child Soldier Variables



Note: Panels show survival functions based on semi-parametric Cox Model estimations, while all other variables are held at their mean values.

¹ It is important to note that there is an on-going discussion about the exact number of children involved in armed conflict. Sometimes, the figure of 300,000 is mentioned, although the evidence for this is somewhat ambiguous. The Human Security Report (2005) provides a detailed overview of this discussion and a critique.

² In doing so, we also do not focus on the potential use of children by paramilitary organizations. However, when additionally controlling for governments' use of child soldiers using data from Tynes and Early (2015), our core findings remain qualitatively identical.

³ The terms "civil war," "civil conflict," "intrastate conflict," and "(armed) domestic dispute" are used interchangeably in this article.

⁴ The time period is clearly limited, but we face the same problem as Chiba et al. (2015): while the UCDP/PRIOD data we use for our empirical analysis now provide information up to 2014, we opted for December 31, 2003 as the censoring point. The reason for this is that reliable information on many covariates is available only until that point in time. That said, comparing our number of observations with the latest version of the UCDP data reveals that we only miss 220 observations, which is unlikely to bias our estimates.

⁵ As indicated above, we focus on rebel groups. Also note that this definition entails that children can serve in different ways, e.g., as spies, scouts, cooks, messengers, etc.; they do not have to actively fight (see also Gates, 2011).

⁶ Even before, one of the most influential reports on children in conflict – the UN Machel Report (1996) – and the UN 1989 Convention on the Rights of the Child used the definition of 18 years of age. We recognize, however, that this threshold is not without controversy (see also Tynes, 2011; Tynes and Early, 2015). For instance, there is the problem of defining child soldiers in long-term conflicts where fighters might have been children when they were recruited, but are adults by the time the conflict ceases. For more information on the potential problems related to the definition, see McCullin (2011).

⁷ Lasley and Thyne (2015) offer a more comprehensive discussion of these determinants of child soldiering.

⁸ Besides these strands in the literature, there is an excellent critical literature on child soldiering, vulnerability, agency, or the shortcomings and potentials of the Convention on the Rights of the Child (see, e.g., Lee, 2009).

⁹ This information is based on the variable we describe in the research design as “*strength of a rebel group vis-à-vis the government.*”

¹⁰ We control for the first dimension of rebel strength in the empirical analysis.

¹¹ It is important to note that the term child soldier applies to a wide range of children associated with armed groups with enormously varying experiences and roles. A child soldier, according to the official UN definition, can be anything from a sex slave, a cook, a carrier to a combatant (Wessells, 2006).

¹² This does, of course, not mean that all rebel groups recruit children, since (costly) investments have to be made to effectively use children in combat and non-combat functions. We return to this selection issue in the research design and the robustness section.

¹³ However, recruiting children is not the only way for rebel groups to fill their ranks, as they could also recruit women and the elderly. Comparatively, though, children’s enhanced vulnerability to coercion can make them easier to recruit and retain (Tynes and Early, 2015: 83; Beber and Blattman, 2013; Singer, 2006: 95).

¹⁴ We are aware that there is a possibility of reverse causation. That is, it may be precisely prolonged conflict that requires the use of children on the front lines, because of the duration, loss of adults, problems with recruitment, etc. We return to this issue in the appendix.

¹⁵ The Cox model ensures that the estimation of the partial likelihood function with random right-censoring of observations remains efficient (see Efron, 1977).

¹⁶ The original unit of analysis in these data is a conflict-dyad-period, i.e., a government is combined with a rebel group in one period of time (of any length) in which the attributes of this conflict dyad do not change. As soon as there is a change in any of the dyad’s parameters, however, a new observation is given. Hence, even after merging this information into our data, all our variables are time varying.

¹⁷ This, however, only addresses a “selection on observables”. We thus estimated bivariate probit models that may account for unobserved factors leading to the non-random selection of child soldiers. We return to this in the appendix.

¹⁸ Note that our core results remain virtually unchanged when using Wucherpfennig et al.’s (2012) item on ethnic linkage with excluded groups. This item also mirrors what Wucherpfennig et al. (2012) report in terms of substance and significance.

¹⁹ See the appendix for additional robustness checks.