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## TRUSTING FORMER REBELS: AN EXPERIMENTAL APPROACH TO UNDERSTANDING REINTEGRATION AFTER CIVIL WAR\*

*Michal Bauer, Nathan Fiala and Ian Levely*

The stability of many post-conflict societies rests on the successful reintegration of former soldiers. We use a set of behavioural experiments to study the effects of forced military service for a rebel group (the Lord's Resistance Army) on trust and trustworthiness in Northern Uganda. We present evidence that soldiers did not self-select nor were systematically screened by rebels. We find that the experience of soldiering increases individual trustworthiness and community engagement, especially among those who soldiered during early age. These results suggest that the impact of child soldiering on social behaviour is not necessarily detrimental.

In conflicts around the world, the forcible recruitment of soldiers, often children, is a widespread practice among many militaries and insurgent groups (Blattman and Miguel, 2010; Beber and Blattman, 2013). After conflicts end, policy makers and researchers warn that societies risk falling into the conflict trap, in part because former combatants may become economically worse off or socially isolated. Feelings of frustration and low opportunity costs may increase the chances that they join armed groups in the future (Collier *et al.*, 2003; Collier and Hoeffler, 2004; Knight and Özerdem, 2004). This makes it essential to understand the effects of combat on former soldiers' economic outcomes, attitudes and behaviour, especially in developing country contexts where most violent conflicts take place. Studies from the US and the Netherlands have shown that military service and exposure to combat lowers earnings and employment (Angrist, 1990; Angrist and Krueger, 1994; Imbens and van der Klaauw, 1995). In Northern Uganda, Blattman and Annan (2010) document that combat for a rebel group lowered schooling and earnings, suggesting that economic gaps may generalise to developing countries. Thus, while progress has been made towards understanding impacts on labour market outcomes, little is known about the legacy of soldiering on social behaviour and on community acceptance.<sup>1</sup>

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<sup>1</sup> More recently, researchers have started to explore legacies of soldiering on political behaviour. They have found that exposure to combat increases voting in Uganda (Blattman, 2009), hardens attitudes towards the rival group in Israel (Grossman *et al.*, 2015) and increases political collective action in India (Jha and Wilkinson, 2012).

In this article, we explore two questions in particular:

- (i) How does the experience of being abducted to fight for a rebel group affect individual trustworthiness and civic engagement? and
- (ii) Do members of the receiving communities mistrust and discriminate against former combatants?

We do so by employing behavioural experiments and surveys in Northern Uganda to study trust and trustworthiness in economic interactions between former rebels and people from receiving communities.

Besides having implications for post-conflict re-integration and development, understanding the adaptation of social behaviour among soldiers who fight during warfare is interesting theoretically. Several streams of literature have highlighted the importance of adhering to social norms and trustworthiness during warfare, recognising that soldiers are more likely to survive if they form cohesive groups and overcome collective action problems inherent in war. Scholars studying the effectiveness of military units have argued that trustworthiness, as well as other elements of social capital, are crucial for military groups to work effectively (Costa and Kahn, 2001; Kenny, 2011). More broadly, evolutionary theorists have proposed that the environment of lethal conflict between groups, or other external threats, should favour the development of parochial altruism (Boyd and Richerson, 2005; Choi and Bowles, 2007; Bowles, 2008), greater norm adherence or more altruistic preferences towards individuals that people identify with.<sup>2</sup>

So far, researchers have tested the question of whether conflict can be the source of altruism and trustworthiness among civilians who have been differentially exposed to war. The evidence suggests that greater exposure reduces selfishness and increases pro-social behaviour towards in-group members (Bellows and Miguel, 2009; Voors *et al.*, 2012; Gilligan *et al.*, 2014; Bauer *et al.*, 2014a, 2016). We contribute to this literature by studying this question among former child soldiers who were forced to take an active part in a brutal insurgent group and who thus happened to grow up, in part, in an environment which arguably shares many features with fighting bands that characterised much of our evolutionary history (Bowles, 2009).

Further, little is known about whether people in receiving communities are aware of behavioural changes in trustworthiness among former combatants and whether resentment represents a barrier to trusting this group. Trust and trustworthiness are vital for mutually beneficial interactions to take place when complete contracts are not feasible or available. This is not only true within families or among friends but also in market settings – Kenneth Arrow (1972, p. 357) famously noted that ‘Virtually every commercial transaction has within itself an element of trust’. In rural economies, essentially all economic interactions are governed by informal arrangements. Therefore, a lack of trust and trustworthiness may hamper access to jobs, credit or informal insurance and saving schemes.<sup>3</sup> To the best of our knowledge, ours is the first study

<sup>2</sup> Note that these models postulate that the development of parochial altruism due to inter-group conflict operates at the evolutionary level, i.e. due to selection. Here, we consider a within-individual behavioural reaction of being exposed to conflict in the spirit of these models.

<sup>3</sup> Empirically, societal trust has been found to be linked with the quality of self-governance of communities (Cox *et al.*, 2011; Gächter and Herrmann, 2011), financial development and trade (Guiso *et al.*, 2004) and the rate of economic growth (Knack and Keefer, 1997).

that uses an experimental approach to identify potential discrimination against former soldiers and measures trust towards this group in an incentive compatible way.

The setting we study is Northern Uganda, where the Lord's Resistance Army (LRA), an unpopular local rebel group, forcibly and indiscriminately recruited tens of thousands of youths during a war that lasted for 20 years. A noteworthy aspect of this setting is that, at the point of recruitment, soldiers in Northern Uganda were not a select group compared to their peers. This is in contrast to conscription practices in other conflicts. In particular, we build on the previous detailed evidence of Blattman and Annan (2010) and argue that the LRA recruitment methods created exogenous variation in conscription which was not affected by self-selection and screening by the armed group. Thus, comparing the behaviour of former LRA soldiers with their non-abducted peers is, we believe, more informative about the legacies of soldiering than in other post-conflict settings.

Five years post-conflict, we collected large-scale experimental data ( $N = 688$ ) and implemented a variant of the trust (investment) game (Berg *et al.*, 1995). In this sequential, two-player game, Senders are first given the option to transfer money to Receivers. The amount sent is tripled by the experimenter, and then the Receiver decides how much to transfer back to the Sender. Two groups of individuals took part in the task. A random sample of middle-aged villagers from conflict-affected area, who were too old to have been targeted for forced conscription by the LRA, made choices as Senders. The amount which they choose to invest tells us how much they trust the Receiver. A second group, consisting of younger males (18–34) from similar communities as Senders, some of whom had been forcibly recruited by the LRA, were recruited as Receivers. The amount that they returned indicates their trustworthiness.

Before making their decisions, Senders received some information about Receivers. We varied whether they were told that Receivers had been with the LRA for around one month, for around one year, or given no information on abduction history. By comparing the amount sent by Senders across treatments, we can measure whether trust depends on individual LRA history of the Receiver. In order to separate whether observed differences in received trust transfers are driven by perceived differences in trustworthiness of former soldiers or different levels of altruism felt towards this group, Senders were also asked about expected back transfers and to make choices in a non-strategic Dictator game.<sup>4</sup> Last, we compare actual back transfers of the former LRA soldiers and their peers, in order to shed light on the effect of LRA soldiering on trustworthiness and to assess whether villagers hold accurate beliefs about trustworthiness of former soldiers.

The trust game has several features which make it a suitable tool to study behavioural differences in this setting. First, this incentivised task is very simple to explain (Sutter and Kocher, 2007), yet it captures the key elements of many principal–agent interactions in labour and credit markets, since it requires both trust and

<sup>4</sup> In terms of experimental design, we build on Fershtman and Gneezy (2001) who study ethnic discrimination using the trust, dictator and ultimatum games among university students in Israel. Our design differs from their study in that we elicit beliefs about partners' behaviour and use a within subject design instead of an across subject design.

trustworthiness for mutually beneficial transactions to take place. Second, previous research suggests that trust game is a powerful tool for detecting discrimination against individuals with certain group attributes, including race (Fershtman and Gneezy, 2001) and low socio-economic status (Falk and Zehnder, 2013). Also, the trust game and related experimental games have been used to demonstrate the influence of community characteristics and early life experiences on pro-social behaviour (Barr, 2003; Henrich *et al.*, 2006; Cameron *et al.*, 2013).<sup>5</sup> Finally, observing behaviour and eliciting beliefs in comparable trust and dictator games allows us to link patterns of choices to competing economic theories of discrimination in a straightforward way (Fershtman and Gneezy, 2001; Ashraf *et al.*, 2006) and distinguish whether discrimination, if it exists, originates in preferences (taste-based discrimination) or beliefs (statistical discrimination) and whether beliefs about other groups are accurate. Such distinctions are crucial for designing effective policies that target discrimination by, for example, regulating certain behaviours or spreading information to combat stereotypes (Gneezy *et al.*, 2012).

Our main findings can be summarised as follows. First, we find that former soldiers transfer a higher share back to Senders in the Trust game compared to their peers. The effect of soldiering on trustworthiness is particularly strong among those who soldiered during early age (were abducted below 14 years of age) and muted for participants who were abducted during late adolescence or adulthood. The observed increase in trustworthiness is economically important, robust to controlling for a range of characteristics and it is not driven by differences in the economic well-being or understanding of the task. We find a similar pattern when we replace experimental measures of trustworthiness with out-of-laboratory proxies of pro-social behaviour, constructed based on responses to questions on participation in local community groups. While the observed patterns are most consistent with the impact of soldiering on social behaviour, we also explicitly analyse whether the effect could be attributed to selection caused by higher mortality among less trustworthy soldiers. We also note that we are not able to nail down the precise mechanism linking soldiering and change in trustworthiness and this remains an important question to explore for future research.

As a second step, we investigate trust towards former soldiers. On average, we find a positive but statistically insignificant effect of Receivers' history with the LRA on investments in the trust game. Interestingly, Senders who have had a son abducted by the LRA invested significantly more in the LRA treatments. The difference in investments seems to be statistical in nature and not due to greater altruism: parents of former soldiers expect to receive more back from ex-soldiers but do not give them more in the Dictator game, indicating that Senders with an abducted son are aware of the actual differences in trustworthiness of ex-soldiers relative to their non-abducted peers, and they act based on this belief. Investments in the trust game, their beliefs about Receiver's trustworthiness, or giving in the Dictator game do not differ significantly among Senders with no sons abducted. Thus, we conclude that former

<sup>5</sup> For other creative uses of the trust game to understand issues in developing countries, see, for example, Castilla (2015) and Karlan (2005).

soldiers do not face mistrust or preference-based discrimination from members of receiving communities.

The article contributes to the empirical work on the legacy of soldiering and warfare on social behaviour. Policy makers and the media commonly assume that former soldiers from violent armed groups are ‘social pariahs’ (*New York Times*, 2006) who remain alienated from the members of their original communities and ‘at war’ in their minds (Richards *et al.*, 2003). While soldiering undoubtedly can have many negative psychological impacts, our findings support a more optimistic view with respect to social reintegration which is consistent with emerging micro-level evidence suggesting that exposure to warfare, despite many negative legacies for individuals and societies, elevates local cooperation and civic engagement (Bauer *et al.*, 2016). The most closely related study to ours is (Blattman, 2009) who shows, shortly after conflict in the same setting we study, that forced soldiering for the LRA leads to greater likelihood of voting.<sup>6</sup> We build on this evidence by documenting positive effects of soldiering on individual trustworthiness in incentivised experiments and by showing that change in social behaviour is enduring and may last for at least five years post-conflict. The pattern is also in line with other evidence which suggests that early stages of the life cycle are critical for formation of trust, social preferences and other non-cognitive skills (Cunha *et al.*, 2006; Heckman, 2006; Sutter and Kocher, 2007; Fehr *et al.*, 2008; Bauer *et al.*, 2014b).

Our article also contributes to the scarce empirical literature on attitudes and behaviour towards the ex-combatants. In Sierra Leone, a survey of ex-combatants documents that increased exposure to violence is associated with reports of a lower community acceptance (Humphreys and Weinstein, 2007). Cilliers *et al.* (2016) show, also in Sierra Leone, that reconciliation increases self-reported measures of forgiveness and trust towards ex-combatants among villagers. In the Ugandan context, we do not find evidence of mistrust or preference-based discrimination in behavioural experiments, suggesting that these factors are unlikely to drive the employment gap observed among former soldiers. Also, following the logic of the attribution theory (Heider, 1958; Weiner, 1995; Gneezy *et al.*, 2012) which proposes that the controllability of an action or stigma affects the likelihood that one is subject to helping or punishing behaviour, we speculate that the concerns about former rebels bearing enduring stigma are less warranted in contexts where the receiving population perceives participation in combat as involuntary, as was the case in the LRA conflict.

The remainder of the article is organised as follows. Section 1 provides the background about the conflict in Northern Uganda and the Lord’s Resistance Army. Section 2 describes the sample selection and the experimental design. In Section 3 we present the empirical results about behavioural differences between former soldiers and their peers. Section 4 presents results about differential treatment of former soldiers by their communities. Section 5 concludes.

<sup>6</sup> See also Cassar *et al.* (2013) who find a negative link between reporting involvement in fighting and social preferences and trust ten years after the civil war in Tajikistan. As the authors readily acknowledge, however, their sample of ex-combatants is very small (10 individuals) due to challenges with identifying former soldiers in this context.

## 1. A Background on Soldiering in Northern Uganda

The leader of the Lord's Resistance Army (LRA), Joseph Kony, led a group of Acholi fighters from the North of the country against the government from 1987 to 2006. While Kony claims to seek a spiritual cleansing of Uganda and overthrow of the government, Branch (2010) describes the roots of the conflict as originating both from divisions between Acholis in the North and the national government, as well as an internal political crisis within the Acholi society. Thus, in contrast to many civil conflicts in Africa and elsewhere, the majority of perpetrators and victims of violence shared the same ethnicity. Perhaps because of its brutality and lack of realistic goals, the LRA has never – with the possible exception of an initial period from 1986 to 1989 – enjoyed support from the local Acholi population (Allen, 2010). With this lack of civilian support, the LRA obtained supplies and new recruits by conducting raids on rural homesteads, carting off food and forcibly conscripting both children and adults to join the group.

The LRA attacks and abductions escalated dramatically after 1996, when Sudan started to supply Kony with weapons and provided territory to build bases. Exposure to violence in Kitgum and Gulu districts (which we study) was widespread, affecting virtually the entire population.<sup>7</sup> In 2005, around 90% of the adult population in Gulu and Kitgum districts had been displaced, 67% had witnessed a child abduction and 48% had witnessed a family member killed (Vinck *et al.*, 2007). The violence with the LRA abated after a peace agreement was signed in 2006 and the LRA has since withdrawn into South Sudan, the Central African Republic and the Democratic Republic of Congo. At the time of this study, in 2011, the camps for displaced people had been closed and the majority of the population had returned to their home villages.

An estimated 24,000–38,000 child soldiers and 28,000–37,000 adults were forcibly recruited by the LRA (Vinck *et al.*, 2007). In the districts, we study the large scale and seemingly indiscriminate abduction concerned around one quarter of youth aged 18–35. Youth were taken by groups of ten to twenty rebels during night raids on rural homes (Beber and Blattman, 2013). The LRA has demonstrated a preference for adolescent conscripts and youths under age 11 and over 24 were rarely taken, with the highest abduction rate at around 14 years of age. Using a representative sample of youths who were born between 1975 and 1991, (Blattman and Annan, 2010) show that, except age, no individual or household characteristic predicted the likelihood of conscription.

Blattman and Annan (2009) argue that the LRA targeted younger adolescents for strategic reasons: individuals from this age range are more effective soldiers than younger children, yet are easier to manipulate psychologically than older adolescents or adults. Amone-P'Olak (2007) links this to the emphasis that Acholi culture places on complete obedience to parents and other adults, which was exploited by the LRA as a means of maintaining discipline.

While with the LRA, abductees went through a period of training and indoctrination. Former soldiers report that socialisation within the LRA included an emphasis on

<sup>7</sup> For more details about the conflict and the impact of displacement see, e.g. Allen and Vlassenroot (2010) and Fiala (2013).

maintaining group cohesion, avoiding tension with other group members (Vermij, 2011) and obeying rules and orders within one's unit (Mergelsberg, 2010). Two thirds were forced to commit a crime or violence and a fifth were forced to murder soldiers, civilians and sometimes family members in order to dissuade them from escaping.

Throughout their time with the LRA, abductees were under constant threat of punishment, while financial or in-kind rewards were extremely rare (Blattman and Annan, 2009). Given the results of our study, it is interesting that former abductees have reported they were rewarded by commanders with more relaxed discipline if they earned their trust (Amone-P'Olak, 2007). To supplement corporal punishment, abductees were threatened with supernatural consequences, rooted in spiritual powers attributed to Joseph Kony and other LRA leaders. For example, soldiers were often told that spirits protected them from harm on the battlefield but only as long as they followed certain rules. This placed abductees in a constant state of perceived observation, which discouraged escape – even when abductees were alone and unsupervised (Titteca, 2009).<sup>8</sup>

Despite this, 84% of abductees eventually left the LRA by escaping and a smaller percentage was rescued or released (Blattman and Annan, 2010). Around 1% of abductees were thought to be still with LRA in 2010. The remainder perished. To deal with the influx of returning former soldiers, reception centres were set up by government agencies and NGOs. Annan *et al.* (2006) estimate that 95% of former abductees returned to their home communities.

## 2. Experimental Design

### 2.1. Sample Selection

The experiment was conducted from July to September 2011 in rural areas of Gulu and Kitgum districts in Northern Uganda. We started with a list of communities known to be affected by LRA abduction from Pham *et al.* (2007) and then identified villages in which at least 20 ex-abductees were living, based on reports of village leaders, and randomly selected 33 out of 52 such villages (Figure A1 in online Appendix A). In each village, we randomly selected 40 households from a village roster of all households and a member of each household was invited to participate in a pre-survey for which he or she was compensated with 1,000 UGX (around \$0.50 at the time). At this point, the prospect of participating in an experiment was not mentioned. Using this information from the pre-survey, we compiled a list of individuals and their characteristics and identified those who fitted the criteria for Senders and Receivers.

Since our experimental design models an economic interaction between older members of the community (who are more likely to control productive assets and who were extremely unlikely to be soldiers in the LRA) and younger men, who may or may not have been abducted by the LRA, selection criteria were different for Senders and Receivers. In each village, we randomly selected on average 15 individuals from the

<sup>8</sup> While the LRA may be extreme in its pervasive spiritual rules, Titteca (2009) notes that other rebel groups have also enforced unit cohesion through unique spiritual beliefs. For instance, Richards (2006) describes how the Revolutionary United Front used spirituality as a means of increasing unit cohesion and creating distance between child soldiers and their communities in Sierra Leone.



population of those between 35 and 55 years old to participate in the role of Senders. Receivers were randomly sampled from the pool of young men between 18 and 34 years old, the age range with highest proportion of former soldiers.

We oversampled ex-soldiers in order to have a large enough sample for the position of Receivers. Those invited to participate in the experiment were promised a show-up fee of 2,000 UGX, with the opportunity to earn more. Overall, the response rate was high for both Senders (96%) and Receivers (91% for former soldiers and 87% for non-soldiers). In all, we have valid experimental data from 378 Senders and 337 Receivers. However, due to incomplete survey data, most of our analysis includes only 360 and 328 individuals, respectively. Subjects were not made aware that they had been selected based on their conflict history and at no point during interviews with local leaders, household pre-survey or subject invitations did we mention that the focus of the study was reintegration of former soldiers.

## 2.2. *Experimental Tasks*

### 2.2.1. *Senders*

The individuals recruited as Senders were told that the task would be conducted in pairs and that they would be matched with another person from a different but nearby village. The first task consisted of the trust game. Senders were endowed with 2,000 UGX, which was equal to around \$1 US at the time of the experiment, and is slightly less than the average cash weekly income in our sample. Senders were told that Receivers would not be given any initial endowment and were asked to decide between three options, by choosing an amount,  $S \in \{0; 1,000; 2,000\}$ , to transfer to their partner. The amount transferred was automatically tripled by the experimenter and the Receivers were given the option of sending back a portion of the received amount,  $R \in \{0; 1,000, 2,000, \dots 3S\}$ . Thus, Senders earned  $2,000 - S + R$ , while Receivers earned  $3S - R$ .

In addition to choosing how much to transfer, we also elicited beliefs about how much Senders expected to receive back. We used the strategy method, asking Senders two questions about the expected back-transfer from their partner, contingent on initially sending 1,000 UGX and 2,000 UGX, respectively. Accurate expectations – i.e., responses that exactly matched the actual behaviour of the Receiver – were rewarded with 500 UGX.

In the trust game, gains are obtainable through cooperation. The amount transferred by the Sender serves as an indication of his trust towards the Receiver or of the two players' ability to cooperate. The efficient outcome, which maximises total welfare, requires the Sender to transfer the whole endowment to Receiver, since this amount is tripled. When Receivers decide to return an amount larger than that initially transferred by the Sender, both the Sender and Receiver are left better off than they were at the outset of the experiment. However, a purely self-interested Receiver would not be expected to return anything and a similarly self-interested Sender, anticipating this, would not be expected to send anything, leading to an inefficient outcome which fails to exploit potential gains from sending a positive amount.

The same subjects also participated in a triple dictator game. This task is designed to mirror the trust game closely and differs only in that Receivers do not have the option

of sending anything back. Senders were endowed with 2,000 UGX and decided how much to transfer to the (passive) Receiver. Upon deciding how much to allocate, the task is over. The Sender's earnings were  $2,000 - S$ , while the Receiver's earnings were  $3S$ . Thus, the triple dictator game is equivalent to a standard dictator game, except that the amount transferred by Sender to Receiver is tripled. Since the interaction is anonymous and the Receiver is passive in this task, purely selfish individuals would be expected to not transfer any money to the Receiver. However, if Senders care about the welfare of Receivers or adhere to sharing norms,<sup>9</sup> they may transfer positive amounts.

In order to study differential treatment of former soldiers relative to their peers, we implemented three treatment conditions in which we varied information on the length of time one's partner spent with LRA and communicated this to Senders. Prior to making choices, the experimenter verbally provided each Sender with a profile including several pieces of information about the Receiver. We varied information on the Receiver's experiences during the conflict, implemented across subjects. In the LRA long treatment, the Sender was told that the Receiver had been with the LRA for around a year, in the LRA short treatment he or she was told that the Receiver had been with LRA for around one month. There was no reference to LRA abduction in the control treatment.<sup>10</sup>

There are several noteworthy features of the information we provided subjects. First, in addition to information related to the Receiver's abduction status, we included several pieces of information in the Receiver profile, in order to make relevant information about LRA experience appear more natural and to mask the fact that this information was of primary interest. Specifically, Senders were told that the Receiver was between 18 and 34 years old, male, that he lived in a different village but in the same sub-county, whether he was married or single and also that he had spent time in a camp for internally displaced persons (IDPs) during the conflict. Since 90% of people in the area we study spent time in IDP camps, this information should not convey anything meaningful about the anonymous partner. However, we included former IDP status in all treatments to avoid a potential confound that could arise if subjects in the LRA treatments were reminded of the conflict and those in the control treatment were not. Second, we matched Senders with Receivers so that the information reported in these profiles reflected true characteristics of the Receivers. Third, Senders were informed that Receivers would also receive a short profile of their characteristics (their gender, that they were between 35 and 55 years old and that they lived in the same sub-county but in a different village).

Since we used a within subject design in eliciting choices in the trust and dictator games, we varied the order in which Senders completed the two tasks and control for the order effects in estimation. Since the decision to trust is a risky one, we also elicited Senders' attitudes towards risk and use it as a control variable, as in, for example, Ashraf *et al.* (2006). Specifically, Senders were given the choice between a lottery that paid 1,000 UGX with a 50% probability and nothing with a 50% probability, or to

<sup>9</sup> See List (2007) or Lazear *et al.* (2012) for thoughtful experiments on whether dictator game allocations are motivated by social preferences or social pressure.

<sup>10</sup> Subsequently, Senders were told that they were matched with an ex-abductee and were in fact matched with ex-abductees; length of abduction was matched as closely as possible given the sample.

accept a fixed amount with certainty, which was variously 300, 400 and 500 UGX. The more an individual prefers the lotteries to the fixed amounts with certainty, the less risk averse he is.

### 2.2.2. *Receivers*

In the trust game, Receivers chose how much to return to the Sender. We used the strategy method, in which Receivers made two decisions, contingent on the two positive amounts they might receive: 3,000 UGX and 6,000 UGX.<sup>11</sup> The existing literature considers three distinct types of social preferences, which can motivate Receivers in a one-shot trust game to return positive amounts: unconditional altruism (Andreoni and Miller, 2002), inequality aversion (Fehr and Schmidt, 1999) and reciprocity, defined as rewarding kind acts with kind acts and retaliating against hostile acts with hostile acts. In the dictator game, Receivers were passive and did not make any choice. We also elicited beliefs about how much they actually expected to receive from Senders in both the trust and the dictator games. Accurate responses were incentivised with 500 UGX.

Prior to making choices, Receivers were informed about a set of characteristics of the Sender with whom they were matched, as described above. We did not manipulate the Senders' profile. Receivers were also informed about which of their characteristics were reported to Senders. Thus, ex-soldiers knew that Senders knew that they had been with the LRA in the LRA treatments.<sup>12</sup>

### 2.3. *Procedure and Payments*

To ensure understanding of tasks, we adapted the explanation of the games from written experimental protocols developed by Barr (2003) and Henrich *et al.* (2006) for the specific purpose of conducting experiments in small scale societies, delivered all instructions in the local language (Acholi) and extensively used visual aids to illustrate options and payoffs (see Figure A2 in online Appendix A). The script was translated into Acholi from the original English, then back-translated to English by a separate translator to check for consistency. After a group explanation stage, subjects were called individually and were read the profile of the player with whom they were matched. Before making choices, participants were asked a series of comprehension questions about payoff consequences of their actions as well as those of the other player. Comprehension was generally high, and only 2% of Senders and 0.3% of Receivers answered one or more of these questions incorrectly. (See online Appendix B for full instructions.)

In each village, we ran two experimental sessions – first with Senders and later during the same day with Receivers, with sessions overlapping in order to minimise the chance of communication between participants.

<sup>11</sup> A recent review of experiments studying the effect of the strategy method finds no cases in which its use led to different treatment effects (Brandts and Charness, 2011). The advantage of strategy method is the increased number of observations.

<sup>12</sup> Former soldiers were not, however, informed that the Sender had any information regarding the length of their soldiering, simply that they had been abducted.

We took several steps to increase the level of anonymity when making choices. Senders knew they were not matched with Receivers from the same village (and *vice versa*). This was to minimise the role of strategic considerations due to a potential impact of future (outside the laboratory) interactions, including potential fear of reprisals from former soldiers. Next, subjects made decisions behind cardboard dividers to keep their choices private from the experimenter who provided the one-on-one explanation.<sup>13</sup>

Subjects were paid for either the trust or dictator game, based on a coin flip. The payment was made in private, one on one, at the same location as the experimental sessions, two days after the experiments. When collecting payments, subjects were informed which task was chosen for payment and given money in closed envelopes. On average, Senders' total earnings were 4,012 UGX and Receivers' earnings were 5,832, including the show up fee.

#### 2.4. Survey Data and Sample Characteristics

A large part of the survey instrument was the same for Senders and Receivers, and included questions about individual characteristics and exposure to violence during the conflict. For Senders, we included a specific module on the abduction experiences of their family members, in particular children. Surveys for Receivers included additional questions on exposure to violence, soldiering for the LRA, individual community involvement and experience of hostilities. The wording of many questions in the survey instrument was modelled after questions included in the Survey of War Affected Youth, in which economists and psychologists specifically tested how to ask sensitive questions about abduction-related experiences in a non-intrusive way (Annan *et al.*, 2006). Summary statistics of the main variables are in Table 1.

Our sample mostly consists of subsistence farmers, with 97% of respondents engaged in agriculture. The subjects are very poor. Receivers report cash income of around 2,722 UGX (\$1.35) on average over the past seven days, with Senders earning just over 2,000 UGX. More than 60% of subjects report no cash income at all over the previous week, reflecting, in part, the high reliance on subsistence farming. The older subsample selected for the role of Sender, participants have an average of 3.3 years of schooling and less than quarter reported basic literacy. Receivers are relatively more educated (around seven years of schooling).

Exposure to violence during the LRA conflict was extremely high in the area we study. Overall, 68% of Senders and 78% of Receivers had a family member or friend who died as a result of the conflict. Even among non-abducted participants, virtually all individuals were affected by the conflict in some way: less than 2% (4%) of Receivers (Senders) report no conflict exposure. Over half of Senders were attacked and 48% received a physical injury. As expected, former abductees have even higher levels of

<sup>13</sup> Further, decisions were tallied by a second person who did not know whose ID number corresponded to whom. Payouts were made in private, by a third person who distributed sealed envelopes with rewards from the experiment based on ID numbers. This procedure, explained to subjects prior to their choices, was effective in keeping decisions and payoffs anonymous, although subjects' perceptions of anonymity required them to trust the experimenters to keep decisions and identification information separate.

Table 1  
*Summary Statistics: Means (SD)*

Sample	Receivers	Senders
	(1)	(2)
Panel (a): experimental outcomes		
Trustworthiness: average % returned*	34.89 (23.39)	
Expected trust: belief of Sender's transfer in trust game (1,000 UGX)	1.38 (0.61)	
Expected altruism: belief of Sender's transfer in dictator game (1,000 UGX)	1.23 (0.72)	
Trust: transfer in trust game (1,000 UGX)		1.12 (0.64)
Altruism: transfer in dictator game (1,000 UGX)		0.86 (0.75)
Expected trustworthiness: belief of average % returned		0.60 (0.30)
Panel (b): personal characteristics		
Ever abducted by LRA (d)	0.55 (0.50)	
Abduction length (years)	0.68 (1.72)	
Abduction length (years) <sup>†</sup>	1.25 (2.18)	
Son abducted (d)		0.22 (0.42)
Age	24.45 (4.89)	43.08 (6.10)
Birth order	3.55 (2.33)	4.18 (2.98)
No. of siblings	5.01 (2.74)	
Mother no school (d)	0.65 (0.48)	0.85 (0.36)
Father no school (d)	0.27 (0.45)	0.35 (0.48)
Father alive in 1996 (d)	0.80 (0.40)	
Mother alive in 1996 (d)	0.92 (0.27)	
Married (d)	0.53 (0.50)	0.80 (0.40)
No. of current HH members	6.92 (4.83)	8.11 (3.56)
Cash earned in past seven days (1,000 UGX)	2.69 (10.23)	2.02 (5.42)
Wealth	-0.04 (2.22)	-0.01 (2.19)
Literate (d)	0.75 (0.43)	0.28 (0.45)
Schooling (years)	7.07 (2.74)	3.27 (3.11)
Risk preference scale <sup>‡</sup>		1.56 (1.09)
Observations	337	378

*Notes.* (d) indicates dummy variable. Means. Standard deviations in parentheses. \*Average percentage returned from two separate decisions made by Receivers, conditional on Senders' actions (strategy method). Senders could send 1,000 or 2,000 UGX, Receivers could return 0–3,000 and 0–6,000 UGX, in each decision respectively. <sup>†</sup>Results shown for sub-sample of ex-abductees. <sup>‡</sup>Index of violence-related dummy variables, elements of index listed below in italics. <sup>§</sup>1st principal component constructed from count of household assets, including: jerry cans, wash basins, bicycles, mattresses radios, plates, livestock, chairs, mobile phones and plows. <sup>¶</sup>Risk scale is sum of instances when participant chose the safe option in lottery experiments (max. 3): 0 indicates low risk aversion, 3 indicates high risk aversion.

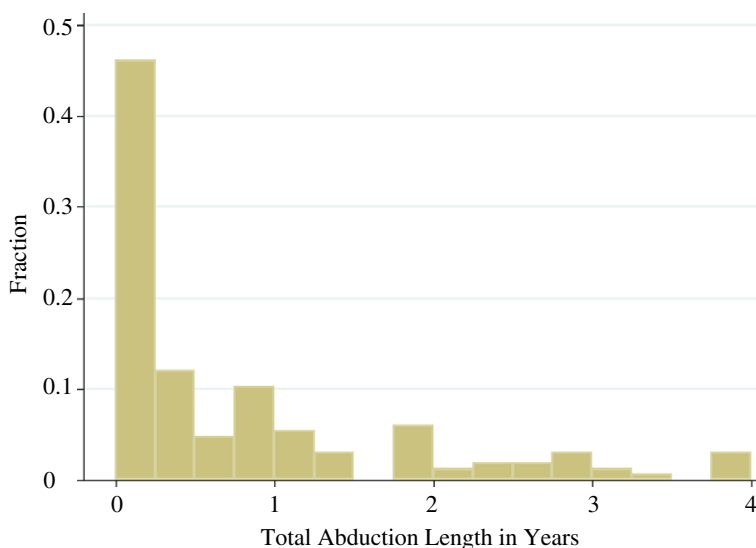


Fig. 1. *Distribution of the Length of Abduction among Former Abductees*

*Notes.* Histogram.  $N = 167$ , sample excludes former abductees who spent more than five years with the LRA (10 individuals). Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com).

conflict exposure. Over 85% of former abductees were attacked or received a beating and 78% received physical injuries as a result of the conflict. The vast majority of former abductees also witnessed violent acts: 83% witnessed a killing and 33% witnessed a rape or sexual assault related to the conflict. (For more details about exposure to violence and abduction experience, see Table A1.)

While the average combined length of time that abductees spent with the LRA is 1.24 years, there is a great deal of variation: around 20% spent under one month with the LRA, half were abducted for less than six months, with around a quarter being abducted for more than two years. Figure 1 shows the distribution of time spent with the LRA among former abductees. The individual abduction experiences support the preferred recruitment practices of the LRA described in the previous Section: the majority of former abductees were child soldiers: the median age of abduction is 14 years and more than 70% were first abducted when younger than 18 years of age (see Figure 2). Those who were abducted younger (13 or below) spent somewhat longer time (around seven months on average) with the LRA than those who were abducted at age 14 or above.

### 3. Behaviour and Beliefs of Former Soldiers

#### 3.1. *Predictors of Abduction*

In this Section, we discuss whether it is plausible to consider selection into the armed group as exogenous – without self-selection and the screening of recruits by rebels, arguably the two most common concerns in this type of study. In particular, a legitimate concern is that current differences in trustworthiness are results of pre-war traits that lead to selection into the rebel group. First, since the LRA's killings in 1991

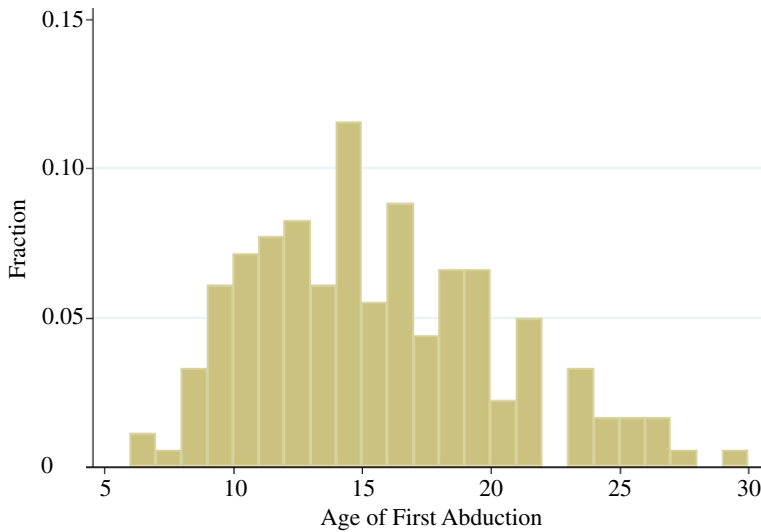


Fig. 2. *Distribution of Age of first Abduction among Former Abductees*

Notes. Histogram.  $N = 175$ . Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com).

destroyed the little remaining support which the group had and since after this recruitment was only in the form of forced abduction (Allen and Vlassenroot, 2010; Blattman and Annan, 2010), self-selection is unlikely. The median year of abduction in our sample is 2001 and there are only two ex-soldiers who were abducted prior to 1991 (excluding these subjects does not affect our findings). Furthermore, in the analysis we distinguish between those who were abducted at later age (14 and above) and those abducted earlier. In fact, the main result is driven by those abducted at an early age, arguably the group for which self-selection is extremely unlikely.

Second, our motivation for choosing to study the Ugandan conflict is the existence of uniquely detailed evidence on LRA recruitment practices which suggests the LRA has not abducted, either deliberately or by chance, a select group. Most importantly, using a large and representative sample of youth who were born prior to the conflict (1975–91), Blattman and Annan (2010) show that pre-war household characteristics do not predict the likelihood of abduction, in contrast to other civil wars in Africa (Humphreys and Weinstein, 2007). We arrive at similar conclusions in Table 2 using our data, where we study predictors of abduction by the LRA, age of abduction as well as abduction length. As in Blattman and Annan (2010), the only strong predictor is year of birth, which is intuitive, given that abduction rates varied between different phases of the conflict. The only other variable which is a marginally significant predictor of being abducted is having a mother who had some schooling ( $p$ -value = 0.08).

The lack of systematic correlations between observable pre-existing family characteristics (family size, education of father and mother, parental death) and abduction status also accords with qualitative descriptions. As described in greater detail in Blattman and Annan (2010), rebels typically invaded villages and homesteads at night, abducting all civilians who could carry loot. Officers were instructed to release young children and older adults but to keep all adolescent and young adult males.

Table 2  
*Family Characteristics and Abduction*

Dependent variable	Abducted by the LRA				
	Ever (d)	Before the age of 14 (d)	After the age of 14 (d)	Abduction length (years)	Age of first abduction
Sample	Receivers				
	All				
	(1)	(2)	(3)	(4)	(5)
Year of birth	-0.02*** (0.01)	0.02*** (0.01)	-0.05*** (0.01)	-0.03 (0.02)	-0.76*** (0.06)
No. of siblings	0.00 (0.01)	0.01 (0.01)	-0.01 (0.01)	-0.02 (0.03)	0.03 (0.10)
Father no school (d)	0.10 (0.08)	0.05 (0.05)	0.05 (0.09)	0.09 (0.20)	0.52 (0.42)
Mother no school (d)	-0.12* (0.06)	-0.05 (0.06)	-0.07 (0.07)	0.03 (0.22)	-0.26 (0.53)
Mother alive in 1996 (d)	-0.05 (0.12)	-0.14 (0.12)	0.07 (0.10)	0.36 (0.25)	1.65* (0.96)
Father alive in 1996 (d)	0.12 (0.07)	0.02 (0.06)	0.08 (0.08)	0.27 (0.30)	0.57 (0.78)
Observations	328	328	328	328	175
(Pseudo) R <sup>2</sup>	0.06	0.09	0.21	0.05	0.55

*Notes.* Marginal effects reported for probit regressions (columns (1)–(3)). Columns (4)–(5), OLS. Robust, standard errors in parentheses, clustered at village level. \* significant at 0.10%; \*\* significant at 5%; \*\*\* significant at 1%. (d) indicates dummy variable. All regressions include dummies for missing information on mother's/father's level of schooling.



Accordingly, the most common age of abduction is around 14 years. Given the short interval between the attack and abduction, LRA soldiers had little chance to assess the character of potential recruits and therefore it is unlikely that ex-soldiers were selected for their level of trustworthiness at the outset. There is also reason to believe that the length of abduction is exogenous, to a degree. As reported in column (4) of Table 2, we fail to find any pre-abduction characteristics that predict length of abduction. It should be noted, however, that this does not imply that other forms of selection, after abduction, did not play a role and we return to the issue in the empirical analysis and discussion.<sup>14</sup>

### 3.2. *Trustworthiness*

In the following subsections, we present results for Receivers and analyse the link between soldiering for the LRA and trustworthy behaviour in the trust game. We use the following regression model:

$$D_i = \alpha + \beta A_i + \gamma \mathbf{X}_i + \varepsilon_i, \quad (1)$$

where  $D_i$  is individual  $i$ 's action in the experiments,  $A_i$  is a variable capturing a soldiering experience,  $\mathbf{X}_i$  is a vector of individual characteristics, and  $\varepsilon_i$  is the error term, with standard errors are clustered at the village level.<sup>15</sup>

We measure trustworthiness as the percentage returned in the trust game. Participants made two conditional choices (using strategy method), deciding how much to return both in case a Sender transferred 1,000 UGX (and the Receiver would get 3,000 UGX) and when a Sender would transfer 2,000 UGX (and the Receiver would get 6,000 UGX). The percentage sent back by Receivers is very similar in both cases: 34% and 35% on average, respectively. We begin by analysing the average of these two amounts. These responses are broadly in line with previous studies using the trust game: a meta-study of trust games by Johnson and Mislin (2011) finds that the average percentage returned in experiments conducted in Africa is 31.9%. At the same time, there is a great deal of variation in trustworthiness in our sample: the standard deviation is 23.5% (see Figure 3).

Does the level of trustworthiness of former soldiers differ from their peers? In column (1) of Table 3, panel (a) we regress a dummy variable that equals 1 if an individual had ever been abducted by the LRA on trustworthiness. The results indicate that former soldiers returned more in the trust game than their peers: abduction is associated with an increase of roughly 5 percentage points in trust-game back-transfers (p-value = 0.14). While this positive effect is (marginally) insignificant, we do not find that ex-soldiers are *less* trustworthy than peers, as is suggested by some portrayals of

<sup>14</sup> The vast majority of abductions in our sample ended when the individual escaped (84%); while unobservable, personal characteristics may have determined the likelihood of such escapes, Pham *et al.* (2007) report that the most common conditions for escape was during fighting or ambushes, and appropriate opportunities may have arisen exogenously.

<sup>15</sup> Due to the relatively low number of villages in our sample (33), we also explore the effect of utilising bootstrap clustering. Specifically, we use the 'wild' bootstrap method for clustering standard errors proposed (Cameron *et al.*, 2008). The results are robust to clustering method for all results on trustworthiness in Table 3: all coefficients that are significant at the 10% and 95% levels in the original specification remain significant at the respective levels. For group membership, the results are robust in panel (a) only.

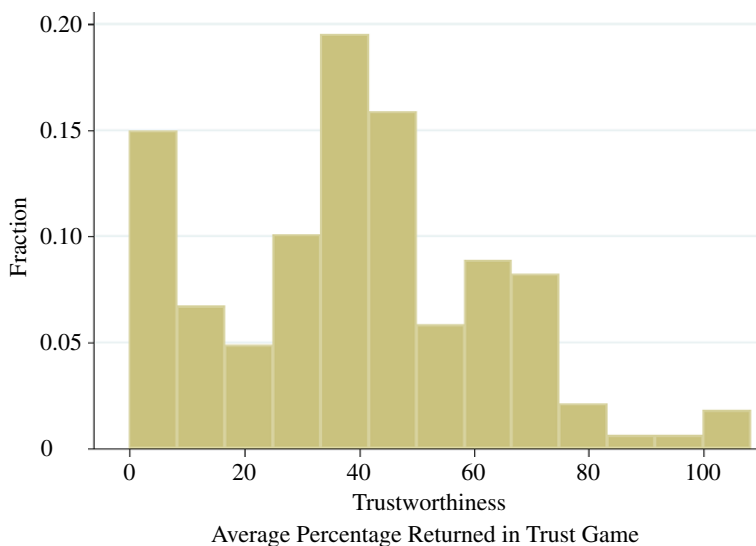


Fig. 3. *Distribution in Average Trustworthiness (Average Percentage Returned in Trust Game)*  
*Notes.* Histogram.  $N = 328$ . Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com).

ex-abductees. Furthermore, we examine the relationship between abduction length and trustworthiness, since the simple binary measure includes individuals who were abducted for very short periods of time (as little as one day) as well as those abducted for long periods of time. In column (1) of panel (b) we find a strong positive relationship between length of soldiering and the amount returned in the trust game ( $p$ -value  $< 0.001$ ).

Next, we test whether the link between soldiering and trustworthiness is more pronounced or more enduring when soldiering is experienced during an early age, compared to soldiering during adolescence and adulthood. Previous experimental evidence among young children consistently shows that social preferences develop during the age range from 3 to around 13 years (Fehr *et al.*, 2008, 2013; Almås *et al.*, 2010; Bauer *et al.*, 2014b), suggesting this a sensitive period in the development of social preferences. The evidence is scarce and less conclusive for the period after 13 years – two studies that include both young children as well as adolescents suggest that development of fairness motivations plateaus after the age of 13–14 years (Almås *et al.*, 2010; Fehr *et al.*, 2013). We exploit the fact that the age of abduction ranges in our sample from 6 to 30 and the median age of first abduction is 14, and test whether the effect of soldiering on trustworthiness depends on whether it was experienced during an early age, rather than during adolescence and adulthood.

We find that age of abduction matters. In Column (2) of Table 3, panel (a) we compare three groups of subjects: those who were abducted at an early age (less than 14), those who were abducted at later age and those who had never been abducted (omitted). We find that those who were abducted young transfer back 8.2 percentage points more compared to the non-abducted group. Compared to the median percentage returned by non-abductees, 33.3%, this represents an economically important increase – in case 2,000 UGX is sent, an increase in this size represents

Table 3  
*Abduction by the LRA and Trustworthiness*

Dependent variable	Trustworthiness									
	Average percentage returned in trust game				Percentage returned					
	Returned > 0		Returned < 0		1,000 UGX sent		2,000 UGX sent			
Sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Controls	x	x	x	x	x	x	x	x	x	x
Village – fixed effects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(9)
Receivers										
Panel (a)	4.99 (3.26)									
Abducted (d)										
Abducted young (<14 years) (d)		8.82** (3.91)	7.32* (3.99)	7.45** (3.52)	7.82** (3.45)	8.04* (4.28)	9.61** (3.98)	0.47** (0.17)	0.69*** (0.22)	0.16 (0.27)
Abducted as adolescent/adult (≥14) (d)		1.42 (3.89)	-1.80 (2.78)	1.78 (3.51)	-0.22 (3.48)	3.14 (4.73)	-0.30 (3.95)			
Constant		30.31** (11.92)	34.00*** (1.62)	25.84* (15.43)	34.80*** (10.96)	31.26*** (10.87)	29.36** (14.12)	1.16** (0.43)	0.80* (0.41)	0.80* (0.41)
Observations	333	333	333	333	283	333	333	333	333	333
R <sup>2</sup>	0.07	0.08	0.02	0.22	0.09	0.07	0.07	0.15	0.16	0.16
Panel (b)	1.17*** (0.32)	2.18*** (0.69)	2.11*** (0.65)	1.80* (1.06)	1.12** (0.51)	1.10 (1.05)	3.26*** (1.01)	0.12** (0.05)	0.15* (0.08)	0.15* (0.08)
Abduction length (years)		0.37 (4.05)	-2.65 (3.07)	1.47 (3.71)	-1.66 (3.29)	0.90 (4.73)	-0.16 (4.12)			
Abducted young (<14 years) (d)		-2.41* (1.19)	-2.49** (1.16)	-2.19 (1.66)	-1.31 (0.78)	-0.70 (1.64)	-4.13*** (1.40)			
Abduction length × abduction adolescence/adult (≥14)		35.39*** (12.47)	33.92** (12.50)	35.26*** (1.88)	41.49*** (11.88)	34.92*** (11.74)	32.93** (14.50)	1.07** (0.47)	1.08** (0.48)	1.08** (0.48)
Observations	328	328	328	328	279	328	328	328	328	328
R <sup>2</sup>	0.07	0.07	0.02	0.22	0.08	0.06	0.08	0.15	0.15	0.15

Notes. OLS. Robust, standard errors in parentheses, clustered at village level in all columns except (4). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. (d) indicates dummy variable. The dependent variable in columns (1)–(5) is the average percentage returned from two decisions made by Receivers. Additional controls in all regressions: Age, Number of siblings, Father no school (d), Mother no school (d), and dummies for missing information on mother's/father's level of schooling. Mother alive in 1996 (d), Father alive in 1996 (d), and Partner in experiment male (d). Log of weekly income, Current household size, carried (d), Literate (d), Schooling (years), Wealth (principal component). Table A2 reports coefficients for all control variables. Column (4) contains the sub-sample of Receivers that returned a positive amount in the trust game.

around 492 UGX, which is more than the average daily cash income in our sample. At the same time, we find virtually no difference in behaviour between those who soldiered during later age and the non-abducted group (p-value = 0.72). Table A3 supports these findings by providing more detailed classification. We divide the ex-soldiers into seven groups, based on age of abduction (<10, 10–11, 12–13, 14–15, 16–17, 18–19, >20). Although the results are less statistically significant given the low number of observations for each of these groups, we find that, when compared with the non-abducted group, there are large positive coefficients for each of the three groups with the lowest age of abduction (<10, 11–12, 12–13), while the coefficients for all the groups with the higher age of abduction are small.

As with the binary measures of abduction, we observe that the effect of the length of time spent soldiering is stronger for those who were abducted when younger than 14 years of age and mute for those abducted at a later age. Column (2) of Table 3, panel (b) demonstrates this by including an interaction between an indicator of first abduction at 14 years age or older and the total length of abduction. The coefficient for years of abduction, which shows the link with trustworthiness for those who were abducted at early age (<14 years), is positive and larger than in the baseline regression. At the same time, we find a negative interaction effect between length of abduction and being abducted later than at 14 years of age. The two coefficients are roughly the same size, indicating that the effect of time spent with the LRA on trustworthiness is specific for former soldiers who were abducted younger than 14 and that there is no such link for those abducted during late adolescence and adulthood.

In the main regression specification, we control for measures of wealth, education as well current family characteristics, indicating that differences in current socio-economic characteristics are unlikely to explain the differences in choices. The estimated effect of soldiering during early age on trustworthiness is robust to using different specifications: with no controls for any background variables (column (3) of Table 3), and when we add controls for village fixed effects (Column (4)).<sup>16</sup>

In the previous Section, we argued that abduction was, to a large extent, exogenous, conditional on observable characteristics such as age. We can gauge the degree to which unobservable variables might bias our estimates of abduction's effect on trustworthiness by computing the ratio of the coefficient from the model with controls over the difference in coefficients between models with and without controls, after Altonji *et al.* (2005).<sup>17</sup> When the difference between coefficients in models with and without controls is smaller, the ratio goes up – the larger the ratio, the greater the influence of omitted variables would need to be

<sup>16</sup> Note that age of first abduction and length of abduction are negatively correlated ( $r = -0.23$ ,  $p = 0.00$ ) and those abducted before the age of 14 spent nearly eight months longer with the LRA than those who were abducted older (t-test,  $p = 0.05$ ). This relationship raises a concern that both variables may capture a similar effect. In Table A4, we conduct a sensitivity analysis and regress trustworthiness on both binary measures of abduction before 14 years of age and abducted older and add length of abduction. When compared to the baseline model (i.e. excluding length of abduction), the coefficient for 'abducted young' decreases only slightly. Also, the observation that length and age of abduction interact (Table 3), i.e. that length of abduction only predicts greater trustworthiness among younger ex-abductees – somewhat alleviates the concern.

<sup>17</sup> The ratio is obtained by comparing the coefficient from the regression with no controls,  $\hat{\beta}_{NC}$ , with estimate from the model with the full set of controls included,  $\hat{\beta}_C$ , and computing  $\hat{\beta}_C / (\hat{\beta}_{NC} - \hat{\beta}_C)$ . Also see Bellows and Miguel (2009) and Cassar *et al.* (2011) who use a similar approach.

in order to change the outcome of the estimation. The ratio is 5.88 for the ‘abducted young’ dummy (columns (2)–(3) of Table 3, panel (a)) and 31.14 for abduction length on the sub-sample of former abductees who were first abducted when younger than 14. These values are large enough that selection on unobservable factors is unlikely to bias our results to such an extent that the effects we measure would no longer be present.

The observed differences in trustworthiness are not simply due to a higher propensity to send a positive amount rather than nothing. If this were the case, it might indicate more idiosyncratic behaviour, such as a willingness to meet minimum social expectations, rather than increased trustworthiness, *per se*. In column (5) of Table 3, we analyse the sub-sample of subjects that returned a positive amount in the trust game and find similar patterns as in the entire sample. In other words, the link between child soldiering and greater back transfers is driven by differences at both the intensive and extensive margins (Table A5). Further, we consider which type of social preference is likely to motivate more trustworthy behaviour among former soldiers. The observed patterns suggest that it is driven neither by greater inequality aversion, since former soldiers are not more likely to choose an equal split of payoffs (Table A5), nor by a greater preference for reciprocity, since we do not see a greater difference in the proportion sent back when a Sender sends 2,000 UGX (arguably a kind act) compared to when he or she sends 1,000 UGX. In fact, in columns (6)–(7) of Table 3 we find that the link between child soldiering and the proportion sent back is similar for both potential amounts that could have been sent by Sender. Thus, we conclude that the greater trustworthiness of former soldiers is likely to be motivated by elevated unconditional altruism or by a greater adherence to sharing norms.

To supplement the results from the experiment, we examine whether soldiering is systematically related to behaviour in the naturally occurring world by replacing the experimental measure with a survey-based proxy of pro-social behaviour. We find strikingly similar pattern. Soldiering is associated with membership in 0.47 more groups ( $p = 0.01$ ), and as with trustworthiness, this is primarily due to those abducted at a young age (columns (8)–(9) of Table 3). We also see that group membership increases with abduction length. When looking at other post-reintegration outcomes, we find that younger abductees also attend church more often and are less likely to report quarrels with family and community members (Table A6).

LRA soldiering captures a host of experiences. As expected, soldiering is positively related to survey-based indices of violence received, committed or witnessed by an individual. Interestingly in light of previous findings, LRA experiences also seem to be related to age of abduction. We find that those who were abducted at an earlier age report more exposure to LRA prayer ceremonies, receiving more violence and were also more likely to be forced to beat and kill others while with the LRA, compared to those who were abducted at a later age (panel (b) of Table A7). They were also more likely to participate in informal reintegration ceremonies after returning<sup>18</sup> and to

<sup>18</sup> The index of participation in informal reintegration ceremonies is the sum of two indicator variables: whether the subject took part in a traditional welcoming ceremony and a cleansing ceremony. The welcoming ceremony involves stepping on an egg as a way of welcoming back people who have been gone for a long period of time. The cleansing ceremony, Mato Oput, is a ceremony for creating peace among people who aggrieved another party, which has been adapted as means of forgiving and accepting abductees after their return from the LRA (for more details see Allen, 2010).

attend church (Table A6). Cilliers *et al.* (2016) document that community reconciliation increased forgiveness to former soldiers in Sierra Leone. Yet, we show that the violence exposure, reintegration measures or church attendance post-LRA are not strongly related to trustworthy behaviour in the experiment. This suggests that none of these specific abduction-related experiences can be singled out as driving the observed effect of abduction on trustworthiness in the setting we study (Table A8).

A series of further robustness checks is discussed in online Appendix A, in order to assess concerns about truthfulness of reporting abduction status, comprehension of the tasks, the role of guilt, robustness with respect to excluding long-term abductees and those who were abducted outside of the LRA's preferred age range, and thus may have been selected more carefully. Results are robust in all of these cases.

### 3.3. *Expectation of Trust and Altruism*

To measure expectations of trust and altruism of older community members towards participants, we elicited beliefs from each Receiver about the amount they expect to receive from the Sender in both the trust game and dictator game. On average, out of a possible 2,000 UGX, Receivers expect to receive 1,377 UGX in the trust game and 1,233 in the dictator game.

Do former soldiers expect to be less trusted than their peers? Note that Receivers were informed that their profile, which included whether they had been with LRA, had been provided to Senders prior to Senders' decisions, and thus a difference in expectations of trust could arise if ex-soldiers expect others to differentiate between ex-soldiers and their peers, or if abductees have different beliefs about the behaviour of others in general.

In columns (1)–(2) of Table 4, we find virtually no link between soldiering and the amount that was expected to be received in the trust game. In column (4) of panel (b), we do find a small negative relationship between length of abduction and expected allocation in the dictator game: for individuals who were abducted younger than 14 years old, each additional year of abduction is associated with expecting 4 percentage points less in the dictator game ( $p = 0.03$ ). However, in panel (a), column (4) of Table 5 the correlation between being abducted below 14 and expected kindness is small and statistically insignificant ( $p = 0.66$ ). Thus, we conclude that if ex-abductees do expect discrimination in either the trust or dictator games, the magnitude of any effect is very small and likely driven by long-term abductees. As we discuss in the next Section in more detail, former soldiers do not, in fact, face any discrimination from community members, and the lack of any robust finding with regards to abduction and expected trust and altruism indicates that former soldiers have qualitatively accurate beliefs.

### 3.4. *Alternative Explanations*

Here, we discuss alternative mechanisms which could explain the observed heightened trustworthiness of former soldiers compared to their peers. The first possibility is a behavioural change caused by soldiering experience. The evidence documented in this Section is consistent with the idea that social preferences are malleable, especially during childhood, and that soldiering during this sensitive period affects preferences.

Table 4  
*Abduction by the LRA and Expected Trust and Altruism*

Dependent variable	Expected trust: Belief of Sender's transfer in trust game		Expected altruism: Belief of Sender's transfer in dictator game	
	Receivers			
Sample	(1)	(2)	(3)	(4)
Panel (a)				
Abducted (d)	0.06 (0.07)		0.00 (0.08)	
Abducted young (<14 years) (d)		0.05 (0.10)		-0.05 (0.11)
Abducted as adolescent/adult (≥14) (d)		0.07 (0.09)		0.05 (0.12)
Constant	1.65*** (0.33)	1.66*** (0.32)	1.19*** (0.43)	1.28*** (0.46)
Observations	333	333	333	333
R <sup>2</sup>	0.04	0.04	0.03	0.04
Panel (b)				
Abduction length (years)	0.00 (0.01)	0.00 (0.02)	-0.03 (0.02)	-0.04** (0.02)
Abducted as adolescent/adult (≥14) (d)		0.05 (0.11)		0.03 (0.13)
Abduction length × abduction adolescence/adult (≥14)		0.00 (0.03)		0.03 (0.04)
Constant	1.64*** (0.33)	1.68*** (0.32)	1.26*** (0.44)	1.31*** (0.44)
Observations	328	328	328	328
R <sup>2</sup>	0.04	0.04	0.04	0.04

*Notes.* OLS. Robust, standard errors in parentheses, clustered at village level. \* significant at 0.10%; \*\* significant at 5%; \*\*\* significant at 1%. (d) indicates dummy variable. In columns (1)–(3) the dep. var. is the amount Receivers expected to be transferred by Senders in trust game. In columns (4)–(6) the dependent variable is the amount Receivers expected to be transferred by Senders in the dictator game. In all columns, we control for the same set of variables as in Table 3.

While the conflict in Northern Uganda represents a unique opportunity to study the effects of soldiering without the conscious self-selection and systematic screening in the recruitment stage that is at work in many other civil wars, as discussed in subsection 3.1, there are still several ways in which personal characteristics could have influenced surviving the conflict, and returning and staying home. We now consider whether these mechanisms could explain the full set of findings.

Personal characteristics – including trustworthiness – might have affected how LRA soldiers were treated by commanders after forcible recruitment. In particular, untrustworthy individuals may have been more severely punished or given more dangerous assignments, which could have resulted in higher mortality and thus underrepresentation in our sample. Annan *et al.* (2006) estimate that 15% of ex-abductees did not return and can be presumed dead. We use the sensitivity analysis proposed by Lee (2009) and calculate bounds of the effect of soldiering, taking into account selective survival. We trim the distribution of the outcome variable in the group with less attrition (the non-abducted) and we drop 15% of the most selfish

Table 5  
*Behaviour Towards Former Soldiers: Trust and Altruism*

Sample	Senders					
	All		Sons abducted	All		Sons abducted
	(1)	(2)	(3)	(4)	(5)	(6)
Panel (a)						
Dependent variable	Trust: transfer in trust game			Altruism: transfer in Dictator Game		
LRA-long treatment (d)	0.07 (0.08)	-0.04 (0.10)	0.53** (0.22)	-0.00 (0.11)	0.02 (0.12)	-0.22 (0.28)
LRA-short treatment (d)	0.07 (0.10)	0.01 (0.13)	0.36 (0.27)	0.01 (0.10)	0.02 (0.12)	-0.00 (0.21)
LRA-long t. × son abducted		0.50** (0.21)			-0.08 (0.29)	
LRA-short t. × son abducted		0.29 (0.24)			-0.04 (0.23)	
Son abducted (d)	0.12 (0.08)	-0.14 (0.12)		0.13 (0.10)	0.17 (0.17)	
Constant	0.49* (0.28)	0.44 (0.27)	-0.70 (0.64)	0.87** (0.41)	0.87** (0.41)	0.11 (0.81)
Observations	360	360	82	360	360	82
R <sup>2</sup>	0.09	0.11	0.28	0.08	0.08	0.18
Panel (b)						
Dependent variable	Investment: difference between trust and dictator allocations (1000 UGX)			Expected back-transfer in trust game: directly elicited 1st order beliefs (percent, pooled)		
LRA-long treatment (d)	0.08 (0.10)	-0.05 (0.10)	0.75*** (0.27)	0.03 (0.04)	0.01 (0.04)	0.16* (0.09)
LRA-short treatment (d)	0.07 (0.08)	-0.00 (0.10)	0.36* (0.21)	0.05 (0.04)	0.04 (0.04)	0.11 (0.11)
LRA-long t. × son abducted		0.59** (0.24)			0.13 (0.09)	
LRA-short t. × son abducted		0.33 (0.21)			0.05 (0.09)	
Son abducted (d)	-0.02 (0.10)	-0.32* (0.16)		0.00 (0.05)	-0.05 (0.07)	
Constant	-0.46 (0.41)	-0.53 (0.41)	-0.81 (0.82)	0.65*** (0.14)	0.64*** (0.15)	0.58* (0.30)
Observations	359	359	82	360	360	82
R <sup>2</sup>	0.05	0.07	0.20	0.06	0.06	0.17

*Notes.* OLS. Standard errors, clustered at village level in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. (d) indicates dummy variable. Dependent variables in 1,000 UGX. LRA-long treatment and LRA-short treatments are indicator variables equal to one if Sender was informed that Receiver was with the LRA for around one year and around one month, respectively, and zero otherwise. The omitted group is the control condition, in which no reference to LRA abduction was made. In all regressions we control for order of the tasks, marital status of partner, indices of violence received and witnessed, index of violence against family, age, gender, marital status, results of risk experiment, wealth, log of income and current household size.

individuals. The results imply that under such implausible dramatic selection, LRA soldiering during childhood still increases trustworthiness, but the effect is small and not statistically significant (Table A10 in online Appendix A). Thus, we cannot rule out that the effect of LRA abduction on higher trustworthiness in the population is caused by higher mortality of less trustworthy recruits.



Nevertheless, the existing evidence suggests that children were less likely to be allocated dangerous tasks and participate in battles. Annan and Blattman (2009) note that:

Rebel officers questioned a young child's ability to handle a firearm, or be an effective fighter . . . In general, the survey evidence suggests young children below the age of 11 or 12 were entrusted with military tasks less frequently than older youth, while adolescents seem to have been at least as dependable and effective as young adults (and in some cases more so).

Another concern is that less trustworthy returning soldiers were less likely to be accepted by the home communities and thus may have been forced to migrate to cities or villages outside of the regions we study. However, Annan *et al.* (2006) estimate that around 95% of ex-abductees stayed after returning to their home communities, which suggests that migration was quite rare. Also, it is not clear why such selection would be specific only for youth who were abducted at an early age.

#### 4. Behaviour of Receiving Communities Towards Former Soldiers

In this Section, we explore whether Senders behave differently towards former soldiers and, if so, whether this is due to social preferences or beliefs about trust-worthiness. The average age of the Senders is 43 years and 56% are female. The randomisation was successful; we find no statistically significant differences in observable characteristics across the experimental manipulation of information about LRA history of the Receiver (Table A11 in online Appendix A).

##### 4.1. Trust and Altruism

On average, Senders transfer 55.7% of their 2,000 UGX endowment to the Receivers in the trust game, which is close to average proportion found in other studies (around 50% of the endowment, Johnson and Mislin, 2011). We do not find any statistically significant difference across the three LRA treatments. In the *LRA long* treatment, in which Senders were told that their partner had been with the LRA for 'around one year,' subjects sent 57.5% of their endowment, on average, compared to 55.2% in the control treatment, in which no information on abduction history was provided. The difference is not statistically significant, according to a two-sided t-test ( $p = 0.46$ ). In the *LRA short* treatment, in which it was communicated that Receivers had been with the LRA for 'around one month,' the average trust-game allocation was 54.5%, which also does not differ significantly from the control treatment ( $p = 0.89$ ). We confirm this lack of a treatment difference through regression analysis in columns (1)–(2) of Table 5, panel (a) in which our exogenous explanatory variables of interest are dummies for the *LRA short* and *LRA long* treatments and the control treatment is the omitted category. We control for Sender's observable characteristics (age, gender, attitude to risk, wealth, income, household size and an index of conflict exposure). On average, we find a positive but statistically insignificant effect of the LRA treatments. Nor is there a statistically significant difference between the distribution of choices between either of the LRA treatments and the control group (Table A12 in online Appendix A).

In theory, the amount sent in the trust game reflects both expectations of trustworthiness as well as social preferences towards the Receiver (Ashraf *et al.*, 2006; Fehr 2009, Sapienza *et al.* 2013). Understanding these motivations is necessary for determining whether any discrimination towards ex-abductees is indeed absent, since they might influence trust-game allocations in opposite directions and thus produce a non-result in the trust game, when in fact Senders do have different beliefs and preferences towards former abductees. For example, community members might harbour anger towards former child-soldiers but at the same time be aware of ex-abductees' greater trustworthiness.

Choices in the dictator game allow us to measure taste for discrimination against or favouritism towards former soldiers. In the dictator game, Senders transferred 43% out of their 2000 UGX endowment on average. We find no effect of LRA treatments on the mean amount sent in the dictator game (column (4) of Table 6, panel (a)). The coefficients for LRA treatments on dictator game allocations is both very small in magnitude and statistically insignificant. It is unlikely that this is due to a low sample size. Given our sample size and the variation in dictator allocations, we have the statistical power to detect a treatment effect of 183 UGX at (9.2 percentage points) at the 5% level. This is equivalent to 0.25 standard deviations in our sample.<sup>19</sup> We thus conclude that there is no evidence of differences in kindness towards ex-soldiers and non-soldiers. We also find little difference in terms of distribution of the amount sent (Table A12 in online Appendix A). In line with the intuition, we find that the amount sent in the trust game is positively related to the amount sent in the dictator game (p-value = 0.00), which measures altruism, as well as to the amount that Sender's believed would be returned by Receivers (p-value = 0.02).

In order to understand possible differences in expectations of trustworthiness, we use two different measures. First, we directly examine beliefs about how much Senders expect Receivers to transfer back. The variable of interest is the mean of the percentage expected by the Sender for both possible amounts he or she could have sent: 1,000 UGX and 2,000 UGX.<sup>20</sup> Second, we exploit the within subject design of our experiments and identify pure behavioural trust (i.e. the part of the transferred amount motivated by expected return) by taking the difference between what the Sender transferred in the trust game and what was voluntarily given in the triple dictator game, using an approach proposed in Cox (2004).<sup>21</sup> This difference can be thought of as the 'investment portion' of the trust game allocation, or the strategic element of trusting behaviour Fehr (2009).

<sup>19</sup> Calculated using a power of 0.80 and a significance level of 0.05. The intra-class correlation within villages for dictator allocations is 0.00871.

<sup>20</sup> The mean expected return on investment is 82% and the Senders expect a slightly higher return on investment when sending 2,000 UGX compared to sending 1,000 UGX. Thus, the Senders have inaccurately optimistic expectations, since the actual return on investment, based on the actual behaviour of Receivers, is only 5.6%. Such overly optimistic expectations of trustworthiness seem to be a common finding for high levels of trust (Ashraf *et al.*, 2006).

<sup>21</sup> This approach implies that 77% of the amount sent in the trust game is due to altruistic preferences and 23% is motivated by pure trust, i.e. expected return from Receivers. However, these numbers should be interpreted cautiously; see, for example, Fehr (2009) for why taking the difference in the amount sent in the trust game and dictator game may understate the magnitude of behavioural trust.

On average, we find positive but small effects of the LRA treatments on the expectation of trustworthiness. We obtain similar results both when analysing the ‘investment portion’ of the amount sent in the trust game – the amount transferred in the trust game minus the amount sent in the dictator game – (Table 5, panel (b), column (1)) as well as the percent expected to be transferred back (column (4)). Thus, we conclude that former soldiers do not face systematic mistrust or preference-based discrimination in the communities we study.

4.2. Social Distance and Behaviour Towards Former Abductees: Subjects with Former-abductee Sons

Assuming that Senders are aware of behavioural differences between ex-abductees and their peers and are, at least in part, motivated by self-interest, one would expect to see more trusting behaviour in the LRA 1-year treatment to reflect the higher proportion returned by ex-soldiers. Although we study relatively small villages, in which people generally know who was with the LRA and who was not, some Senders may not interact with former soldiers on a regular basis. We examine one personal characteristic that is likely to increase accuracy of beliefs: whether Senders have at least one son who was abducted by the LRA during the conflict ( $N = 82$ ).

Figure 4 and columns (2)–(3) of Table 5, panel (a) reveal a sharp difference in the effects of the LRA treatments on trust-game allocations for the sub-sample of those who have a formerly abducted son and those who do not. For the sub-sample of participants with no abductee sons, there is no significant difference between trust allocations in the three LRA treatments. In contrast, those who do have sons that were abducted send more when playing with an ex-soldier in both the LRA 1-month and LRA 1-year

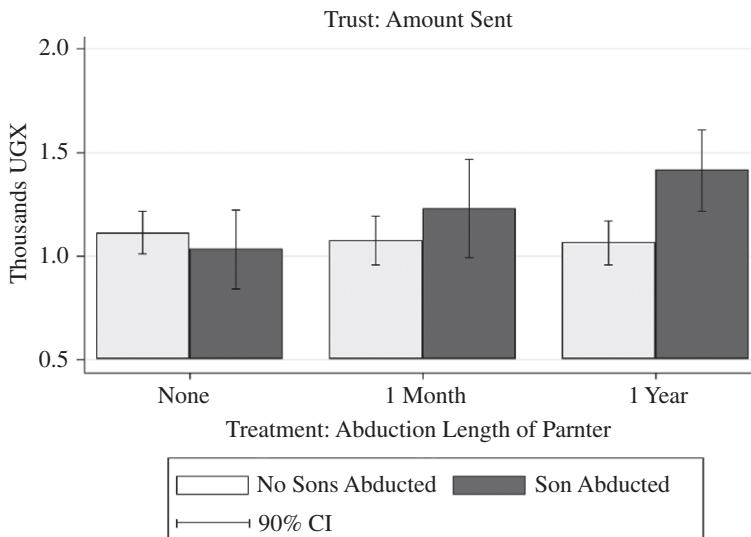


Fig. 4. Amount Sent in Trust Game: Disaggregated by Treatment and the Abduction History of Subjects' Sons

treatments. Compared to the control group, they sent 360 UGX (p-value = 0.20) more to the LRA 1-month group and 530 UGX more to the LRA one year group (p-value = 0.02). Put differently, while we find no difference in trust towards the non-abducted (control) group between those who had a son abducted and those who did not, we find a positive interaction effects between having an abducted son and the LRA treatments on trust.<sup>22</sup>

This differential treatment towards ex-abductees from parents of former LRA soldiers seems to be motivated by beliefs of higher expected return, rather than greater empathy, as indicated by dictator-game results. Figure 5 compares the mean amount sent in the dictator game across LRA treatments, separately for the participants with and without an abducted son. We observe virtually no effect of LRA treatments in either of these two groups. This is confirmed by the regression analysis in Table 5, panel (a), where we find no interaction effect between having an abducted son and LRA treatments (column (5)) and no statistically significant treatment effect on the sub-sample with former-abductee sons (column (6)).

Rather, subjects with former abductee sons transfer more in the trust-game to former abductees due to a higher expected return. For participants who have an abducted son, the difference in the amount sent in the trust game and in the dictator game increases by UGX 360 in the LRA 1-month treatment and by UGX 750 in the LRA one year treatment (column (3) of Table 5, panel (b)). The magnitude of this increase is also economically significant (around 37% of Senders' average weekly cash income). In contrast, there is virtually no effect of LRA treatments in the sub-sample that do not

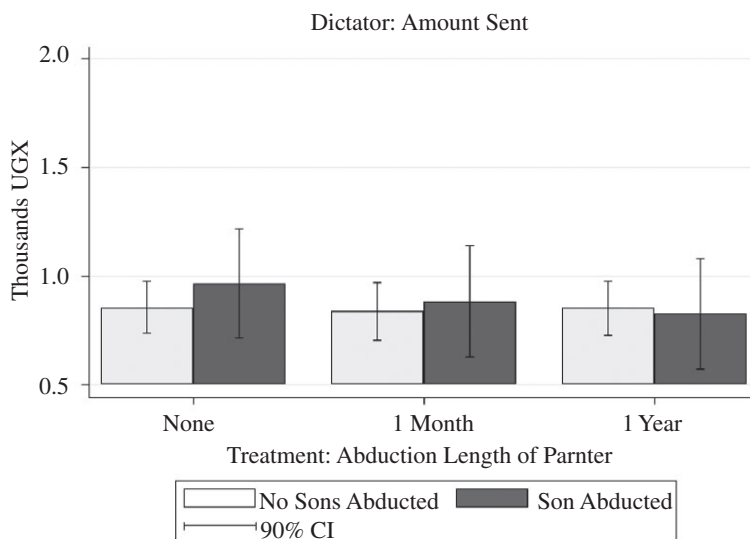


Fig. 5. Amount Sent in Dictator Game, Disaggregated by Treatment and the Abduction History of Subjects' Sons

<sup>22</sup> In the main estimations we use OLS. The results are robust to using alternative estimators, such as ordered probit, which takes into account the discrete nature of the dependent variable (Table A13 in online Appendix A).

have an abducted son (column (2)). The difference in the effects of the LRA treatments across the two sub-samples is statistically significant.

We observe a qualitatively similar pattern when analysing expected return. Among the sub-sample of Senders with a son who was abducted, expectations are higher when Senders are matched with a former soldier,  $p = 0.07$  (column (6) of Table 5, panel (b)). Among those Senders with no ex-abductee sons, there was virtually no difference in expectations of how much Receivers would return across the LRA treatments,  $p = 0.39$  (column (5)).

#### 4.3. Discussion and Further Results

The set of results presented above strongly suggests that having an ex-soldier son improves knowledge about behavioural differences between ex-soldiers and their peers, which in turn affects actions in trust-based interactions. Here, we discuss possible alternative interpretations. First, it could be argued that having an ex-abductee son may correlate with other war-related experiences, and such shared experience of violence may drive differential treatment of ex-soldiers. To test for this possibility, we study the interaction effects between different measures of exposure to violence (violence received, violence against family, violence witnessed or having a daughter abducted by the LRA) and LRA treatments on the amount sent in the trust game. The coefficients are small and statistically insignificant (Table A14 in online Appendix A). Further, the interaction effect of having an abductee son and the LRA treatments is robust to controlling for observable characteristics, measures of violence exposure and the interaction terms of these variables with LRA treatments, indicating that the difference in the impact of LRA treatments among those with abductee sons is not due to differences in other types of war-related experiences or differences in observable characteristics.

Next, since Senders were sampled from the pool of older villagers, who were outside the age range targeted by the LRA, the increased trust among parents of LRA soldiers is unlikely to represent social capital within the LRA, due to a common connection. An alternative interpretation is that people with more familiarity with the LRA are trained to fear ex-soldiers and cooperate more out fear. While this explanation is consistent with greater transfers in the trust game, it struggles to explain why the transfers are not higher in the dictator game as well and why Senders accurately expect increased trustworthiness of ex-soldiers.

Last, we consider the possibility that the salience of Receiver's LRA history during the experiments was greater for individuals with abductee sons, which, potentially, could explain the observed interaction effect on trust. The salience of this information was generally high: in the LRA treatments, 75% of individuals reported that the Receiver with whom they were matched was an abductee in an open-ended question asked approximately 30 minutes after the experiments. We find no relationship between having an abductee son and recall of the Receiver's abduction.

In order to test whether the lack of taste-based discrimination is consistent with attribution theory (Heider, 1958), we elicited the perceptions of the degree to which LRA soldiering was avoidable from members of receiving communities. We sampled a new group of 72 respondents from the same population several months after the main

study. Each person received two fictitious profiles of a formerly abducted person. We randomly manipulated the information about length of abduction ('around one month' or 'around one year'). Respondents were asked two related questions: to what extent do you think this person could have avoided being abducted (completely avoidable, somewhat avoidable and not avoidable)? How likely do you think it is that this person had the chance to escape before they actually left the LRA (very likely; somewhat likely; not very likely)? Overall, 80% of respondents thought that abduction was completely unavoidable and 70% thought that such a person would have no chance to escape from the LRA before they actually left. These results reveal that in the setting we study, soldiering is not seen as an outcome of individual choice, which may help to explain why we do not find taste-based discrimination against former soldiers.

## 5. Conclusions

The common view is that the reintegration of soldiers after civil wars is complicated by the lingering effects of trauma among them, as well as the resentment and ostracism that they face from receiving communities. Using data from economic experiments implemented among a large sample of participants across Northern Uganda, we find that soldiering for the Lord's Resistance Army is positively linked with more trustworthy behaviour. The effect is driven by the behaviour of former soldiers who were abducted at an early age (<14 years). We find neither systematic mistrust nor preference-based discrimination against former soldiers. Moreover, individuals with abductee sons, and thus with better knowledge of their behaviour, trust ex-soldiers more compared to their peers, because they expect ex-soldiers to be more trustworthy. We establish these findings by:

- (i) separately observing the behaviour of former soldiers as well as the treatment of former soldiers by receiving communities;
- (ii) focusing on two important aspects of interpersonal relations, namely, trust and trustworthiness, which are difficult to measure in surveys; and
- (iii) measuring behaviour in incentive-compatible field experiments, in contrast to responses to survey questions.

Our results are broadly consistent with recent theories (Choi and Bowles, 2007) and emerging micro-level evidence (Bauer *et al.*, 2016) linking war and the development of altruism and other forms of local cooperation. Given the need for group cohesion during inter-group fighting, the preferences of former child soldiers may have adapted to the war environment. Such preference adaptation may have evolutionary underpinnings or be due to socialisation – former soldiers may have painfully learned the importance of obeying rules and being trustworthy and they may have internalised such behaviour. Another mechanism linking soldiering and trustworthiness is that armed groups treat unreliable individuals extremely harshly, increasing the prevalence of trustworthy types in the population of former soldiers.

We recognise several caveats with regard to the generalisability of our surprisingly optimistic findings on the legacy of soldiering. First, while we find that child soldiering leads to increased trustworthiness, we do not find similar effects in those who soldiered as older adolescents or adults. The latter group represents the majority of fighters in

most conflicts, and it is an open question whether the impact of soldiering on trustworthiness among adult soldiers is similar. Possibly, there exists an analogous, but less enduring, change in preferences among adults in the short run that we do not capture – our data were gathered roughly nine-years post-conflict. Second, while the indiscriminate forcible recruitment strategy used by the LRA helps us to overcome some identification issues, it might be specific to Northern Uganda. Thus, our finding that former child soldiers are more trustworthy than their peers may not generalise to conflicts in which rebel recruitment strategies or self-selection based on individual characteristics play a relatively larger role in determining average personality traits among former soldiers, as compared to the causal effect of soldiering. Last, the LRA's recruitment strategy may also affect the generalisability of results on the behaviour of receiving communities towards former soldiers. Northern Uganda was highly affected by the conflict and a large fraction of the population witnessed child abduction by the LRA and perceive participation in the insurgency as involuntary. We suspect that our finding that ex-combatants do not face preference-based discrimination might not generalise to post-conflict societies where participation in insurgency is perceived as a voluntary decision.

Although our findings provide some reason for optimism with respect to the prospects of reintegration of child soldiers in their communities after they return from rebel groups, this does not, however, necessarily imply that the elevated trustworthiness among soldiers promotes greater peace in general. To the extent that increased trustworthiness captures a general tendency to obey and behave according to expectations of others, including LRA commanders, such behavioural response may have contributed to stability of the rebel group and ultimately to longer violent conflicts. In fact, recent evidence indicates that while greater social capital may foster favourable social outcomes during peaceful times, it may fuel destruction at times of conflict (Satyanath *et al.*, 2016).

Our results also speak to theories of child soldiering, which offer explanations for why many insurgent groups, including LRA, seem to prefer recruiting children and adolescents over young adults for military tasks (see Wessells, 2006 for a survey). Several million children under the age of 18 are estimated to have served in combat since 2001. In many of the armed groups in Liberia, Sierra Leone, Colombia and Uganda, a large fraction of recruits were 14 years of age and younger (the definition of a child for purposes of a war crime) (Beber and Blattman, 2013). Since children are less able fighters than adults, such a recruitment strategy makes economic sense if child recruits are more obedient and their personality is more malleable and adaptive (Boyden, 2003; Peters *et al.*, 2003; Beber and Blattman, 2013). Our finding that LRA soldiering elevated trustworthiness particularly strongly among those who soldiered as children (fourteen years and younger) but not among those who soldiered at a later age is consistent with this explanation of rebels' preference for recruiting children.

This study contributes to several debates on policy and development in post-conflict societies. The findings suggest that gaps in economic outcomes between ex-soldiers and their peers in Northern Uganda are not driven by lower trustworthiness or discrimination on the part of receiving communities, and thus it may be more efficient for interventions to focus on rebuilding human capital, especially schooling and training that was lost or delayed due to time spent fighting. Next, several studies do

find an increase in mental health problems such as anxiety and post-traumatic stress syndrome in former LRA soldiers (Klasen *et al.*, 2010). Future research should explore the impacts of soldiering on other types of personality traits, besides trustworthiness, that may affect labour market outcomes, including time preference, self-control and resilience. Last, the evidence of limited awareness of the greater trustworthiness of former soldiers among members of receiving communities provides an additional rationale for designing reintegration programmes that provide training and services jointly with non-soldiers, instead of providing services to former soldiers separately.<sup>23</sup> Doing so may provide an additional benefit by facilitating the updating of beliefs and increasing social capital in those communities.

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Additional Supporting Information may be found in the online version of this article:

**Appendix A.** Additional Tables and Figures.

**Appendix B.** Experiment Instructions.

**Data S1.**

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<sup>23</sup> For a debate on this issue see, for example, (Muggah, 2009).



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