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Child Soldiering:
*Impact on Childhood Development
and Learning Capacity*

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Summary

Former child soldiers have not only missed out on months or years of education but may suffer learning difficulties when attempting to (re-)enter education or vocational training programmes. The paper examines the evidential base for impaired cognitive performance and learning capacity of children exposed to trauma and war. This may be relevant to issues of reparations, as well as education programme design.

Today, among the 87 war-torn countries in which data have been gathered, hundreds of thousands of children are involved with fighting forces as child soldiers. Some, as young as eight, commit unspeakable atrocities: killing parents and siblings, assaulting neighbors, torching the villages they once called home. Some are forced to serve as sex slaves. Many are provided narcotics to curb their inhibitions against committing violence.

Scientific knowledge on the impact of trauma and adversity in childhood indicates that the greatest harm comes from the cumulative burden of multiple risk factors, including fear, abuse, substance abuse, torture, and exposure to violence—the same traumas child soldiers endure. The lasting, neurobiological effect on children who experience multiple traumas leads to a far greater likelihood of anti-social behavior, lower achievement in school and poor physical and mental health – all of which society addresses at great cost. With each additional risk factor, the odds of long-term damage to brain architecture, learning and social functioning, increase.

This paper provides an overview of the damage to childhood development and learning capacity caused by traumatic stress in former child soldiers. The overview is derived from a meta-analysis of literature on former child soldiers and research on other forms of childhood adversity that is most relevant to former child soldiers in developing countries. The prevalence of PTSD in former child soldiers is examined as is the prevalence of PTSD in children and adults exposed to war. A summary of research on cognitive impairments of children, adolescents, and adults affected with PTSD is offered and applied to former child soldiers in developing countries as applicable. Evidence from the child soldier literature documenting impairments to learning, with a focus on cognitive and other competencies needed for study in classroom and related settings, is highlighted, as is related evidence on specific learning difficulties faced by children and adolescents in other insecure and violent environments. The paper concludes with basic recommendations on the kinds of basic and specialized assistance child soldiers require when re-entering civilian life.

Introduction¹

The Paris Principles define a Child Soldier as:

“A child associated with an armed force or armed group below 18 years of age who is, or who has been, recruited or used by an armed force or armed group in any capacity, including but not limited to children, boys and girls, used as fighters, cooks, porters, spies or for sexual purposes. It does not only refer to a child who is taking, or has taken, a direct part in hostilities”. (Paris Principles and guidelines on children associated with armed forces or armed groups, UNICEF, February 2007.)

Within this definition child soldiers can perform a range of tasks including participation in combat, laying mines and explosives; scouting, spying, acting as decoys, couriers or guards; training, drill or other preparations; logistics and support functions, portering, cooking and domestic labour; and sexual slavery or other recruitment for sexual purposes.

In 1996 it was estimated that more than 300,000 children were actively fighting as soldiers with government armed forces or armed opposition groups worldwide (Machel, G., 1996). Although there are no exact recent figures, hundreds of thousands of children under the age of 18 are serving in government forces or armed rebel groups (Human Rights Watch, 2008). Since 2001, the participation of child soldiers has been reported in 21 on-going or recent armed conflicts in almost every region of the world (Human Rights Watch, 2008). Most of these children are between the ages of 14 and 17, but some are as young as seven (Interagency Planning Consultation on Child Protection in Emergencies, 2006).²

Children are often deliberately brutalized in order to harden them into better soldiers. In some conflicts, children have been forced to commit atrocities against their own families. In Sierra Leone the Revolutionary United Front forced captured children to take part in the torture and execution of their own relatives, after which they were led to neighboring villages to repeat the slaughter (Machel, G., 1996). Elsewhere, before battle young soldiers have been given amphetamines, tranquillizers and other drugs to "increase their courage" and to dull their sensitivity to pain.

Most studies and advocacy related to child soldiers focus on children who are abducted and forced to fight with an armed group. Less attention has been paid to groups of children who “choose” to join armed groups. Children are more likely to choose to become child soldiers if they are separated from their families, displaced from their homes, living in combat zones or have limited access to education (UNICEF fact sheet). Children may see joining an armed group as the only way to guarantee access to food and survival. In a study looking at child soldiers in Burundi, Congo-Brazzaville, Democratic Republic of Congo (DRC) and Rwanda,

¹ EAA would like to thank the authors for their contribution to EAA's work on the protection of education in times of conflict and insecurity.

² Accurate estimates of child soldiers are difficult to determine, in part because it is an illegal activity.

Dumas and de Cock (2003) found that two out of three current or former child soldiers took the initiative of joining armed groups themselves. For many children in the sample, joining an armed group represented an escape from marginalization; voluntary participation was found to be based on six major factors, namely material needs, ideology, prestige of the army, feeling of exclusion, desire for vengeance, and fear (Schmidt, A., 2007). In Sierra Leone almost half of child soldiers interviewed described their participation as voluntary, with revenge and community protection as their major motives (Aning and McIntyre 2005). Specific reasons given for joining a armed group were revenge, family protection, to get food for themselves and others as well as political motives, such as “to liberate our people” or to “fight for my country” (Human Rights Watch, 2004). In Northern Uganda, in contrast, recruitment into the Lord’s Resistance Army was almost always involuntary (UNICEF, 2007). There motivation to join an armed group can vary from the need to survive to reasons of religious beliefs. Unfortunately, research addressing religious motivation in child soldiers is lacking and thus not addressed here.

What is PTSD?

The essential feature of Posttraumatic Stress Disorder (PTSD) as identified in the fourth edition of the American Psychological Association’s Diagnostics and Statistical Manual (DSM-IV-TR, 2000) is:

“The development of characteristic symptoms following exposure to an extreme traumatic stressor involving direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one’s physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate. The person’s response to the event must involve intense fear, helplessness, or horror (or in children, the response must involve disorganized or agitated behavior).” (DSM-IV-TR, 2000)

Traumatic events that are experienced directly and related to child soldiers include, but are not limited to: military combat; violent personal assault (sexual assault, physical attack, robbery, mugging); being kidnapped; being taken hostage; terrorist attack; torture; incarceration as a prisoner of war or in a concentration camp; or natural or manmade disasters (DSM-IV-TR, 2000). For children, sexually traumatic events may include developmentally inappropriate sexual experiences without threatened or actual violence or injury (DSM-IV-TR, 2000). Witnessed events that may be experienced by child soldiers include, but are not limited to: observing the serious injury or unnatural death of another person due to violent assault, accident, war, or disaster or unexpectedly witnessing a dead body or body parts (DSM-IV-TR, 2000). Events experienced by others that may be learned about by child soldiers include, but are not limited to, violent personal assault, serious accident, or serious injury experienced by a family member or a close friend; or learning about the sudden, unexpected death of a family member or a close friend (DSM-IV-TR, 2000). PTSD may be especially severe or long lasting when the stressor is of human design (such as torture, rape). The likelihood of developing this disorder may increase as the intensity of and physical proximity to the stressor increase (DSM-IV-TR, 2000). PTSD can be classified as acute or as chronic. To have acute PTSD the

duration of symptoms must be less than 3 months, for chronic PTSD the duration of symptoms must be 3 months or more.

PTSD Prevalence

There have been multiple studies looking at the prevalence of PTSD in former child soldiers. In Northern Uganda 55.9% of a sample of former child soldiers suffered from symptoms of post-traumatic stress disorder, and 88.2%, symptoms of depressed mood (Ovuga, E., Oyok, T. O., & Moro, E.B., 2008), while another sample found that 97% had a clinically significant PTSD score (Derluyn, I., Broekaert, E., Schuyten, G., & De Temmerman, E., 2004). Phan, Vinck and Stover (2009) found that 56% of former child soldiers in Northern Uganda and over two thirds of those who experienced abduction met the criteria for symptoms of PTSD, while female child soldiers were more likely than males to report symptoms of PTSD. In Nepal, after adjusting for traumatic exposures and other covariates, former child soldier status was significantly associated with PTSD among girls (OR=6.80), and boys (OR=3.81) (Kohrt, B.A., Jordans, M.J.D., Tol, W.A., Speckman, R.A., Maharjan, S.M., Worthman, C.M., & Komproe, I.H., 2008).

There is more research regarding the prevalence of PTSD in children exposed to war. In Palestine, rates of PTSD were found to be associated with residential patterns, with noticeably higher rates of PTSD observed in children from refugee camps; the prevalence of PTSD among children who had economic hardship was higher than children who had a better financial status (Khamis, V., 2005). Children in Palestine who witnessed high levels of military violence expressed higher level of aggressive and antisocial behavior than children exposed to lower levels (Qouta, S., Punamaki, R., Miller, T., & El-Sarraj, E., 2008). Children exposed to high degrees of witnessing military violence reported higher levels of proactive aggression, reactive aggression, and enjoyment of aggression (Qouta, S., Punamaki, R., Miller, T., & El-Sarraj, E., 2008). With regards to adolescents, 68.9% of a Palestinian sample was classified as having developed PTSD (Elbedour, S., Onwuegbuzie, A.J., Ghannam, J., Whitcome, J.A., & Abu Hein, F., 2007).

There has also been research into PTSD prevalence in adults exposed to war, mostly in refugee and internally displaced populations (IDPs). In the Balkans, 22.8% of adults were diagnosed with PTSD. The highest relative risks for PTSD were found for witnessing murder or death (39.1% vs. 15.9%), being tortured (48.7% vs. 20.0%) and non-sexual or sexual assault by a stranger (44.2% vs. 19.4%) (Priebe, S., et al., 2010). In Bosnia the strongest predictor of PTSD symptom severity in women was found to be the level of education, with women having no or very little education reporting higher levels of traumatic symptoms (Schmidt, M., Kravic, N., & Ehlert, U., 2008). Lopes Cardozo, Talley, Burton, and Crawford (2004) identified insufficient food, higher number of trauma events, previous mental illness, and landmine injuries as psychosocial risk factors for poorer mental health and social functioning outcomes in adult refugees along the Thai-Burma Border.

Impacts on Childhood Development and Learning Capacity

There is a remarkable convergence of new scientific knowledge about the developing brain, the human genome, and the effects of early experiences on later learning, behavior, and health. This body of research clearly indicates that exceptionally stressful experiences early in life predictably have long-term consequences for a child's learning, behavior, and both physical and mental health. Some types of “positive stress” in a child's life—overcoming the challenges and frustrations of learning a new, difficult task, for instance—can be beneficial. However, severe, uncontrollable and chronic trauma can produce detrimental effects on developing brain architecture as well as on the chemical and physiological systems that help an individual adapt to stressful events.

The following section reviews existing scientific knowledge on the effects of chronic trauma in childhood as it pertains to a child's capacity to learn, adapt and take hold of life. It includes research on children exposed to maltreatment, abuse and violence, as well as war and child soldiering.

There have been many studies examining the effects of PTSD on the cognitive abilities of children, adolescents and adults affected by PTSD. There is consistent evidence of higher rates of trauma-related psychological problems in children affected by war, with the majority of these reports from Occupied Palestinian Territories (oPT). Of the different age groups, the most vulnerable are adolescents and the greater the exposure to trauma – both physical and psychological – the more pronounced symptoms (Murthy, R. S., 2007).

Biological and Neurological Effects

Most of the empirical research regarding the biological and neurological effects of PTSD comes from animal studies and studies of children with abuse or maltreatment related PTSD. Animal research has shown that serious, fear-triggering experiences elicit physiological responses that affect the architecture of the brain as it is developing; these experiences cause changes in brain activity and have been shown to have long-term, adverse consequences for learning, behavior, and health (National Scientific Council on the Developing Child, 2010). The stress of child maltreatment has been associated with alterations in neurobiological systems that are involved in brain maturation, cognitive development, and emotional/behavioral regulation (De Bellis, 2005). Heightened stress has also been shown in animals to impair the development of the prefrontal cortex, the brain region which, in humans, is critical for the emergence of executive functions—a group of abilities which includes making, following, and altering plans; controlling and focusing attention; inhibiting impulsive behaviors; and developing the ability to hold and incorporate new information in decision-making (National Scientific Council on the Developing Child, 2010). When someone is confronted with a threat, stress systems are activated and elevate the levels of several different stress chemicals that are circulating throughout the body. An increase in one of these chemicals, cortisol, can have a dramatic impact on how memories are processed and stored, and too much cortisol can impair memory and learning in non-threatening contexts (National Scientific Council on the Developing Child, 2010). Chronic stress has also been associated with negative impacts on learning, memory, and executive functioning

(Smith, Makino, Kvetnansky, & Post, 1995). These studies suggest that the stress of childhood maltreatment is associated with alterations of biological stress systems, which in turn, leads to adverse effects on brain development and delays in cognitive, language, and academic skills (Watts-English, T., et al., 2006). Brain imaging studies in adults have confirmed that PTSD disrupts the dorsolateral prefrontal cortex, which is responsible for working memory and attention (Morey, Dolcos et al., 2009).

When compared with controls, maltreated children and adolescents had smaller intracranial volumes than did non-abused controls (De Bellis, Keshavan, Clark, Casey, Giedd, Boring, Frustaci, & Ryan, 1999). Results also showed that males may be more vulnerable to the effects of severe stress on brain development than females (De Bellis, Keshavan, Clark, et al., 1999). The fact that there was a strong positive correlation of intracranial volume with age of onset of PTSD trauma and a negative correlation of intracranial volume with duration of abuse, suggests that traumatic childhood experiences may adversely influence brain development. (De Bellis, Keshavan, Clark, et al., 1999)

Bremner's 1999 study looked at Vietnam combat veterans with PTSD and children with abuse related PTSD and found that both groups had deficits on neuropsychological measures that have been validated as probes of hippocampal function. Magnetic resonance imaging (MRI) showed a reduction in the volume of the hippocampus in both combat veterans and victims of childhood abuse (Bremner, 1999). An 8% decrease in MRI-based measurement of right hippocampal volume in Vietnam combat veterans with PTSD was observed in comparison to matched control subjects, while children with abuse related PTSD showed a 12% reduction in left hippocampal volume in relation to comparison subjects (Bremner, 1999). PTSD patients with early life trauma had a greater reduction in left hippocampal volume, while those with PTSD from later life (Vietnam combat) had bilateral or right hippocampal atrophy, showing that offenses to the hippocampus at different stages of development may have different effects on the hippocampus (Bremner, 1999). Stein et al. (1997) found a statistically significant 5% reduction in left hippocampal volume in sexually abused women compared to non-abused female controls. This suggests that experiences in the form of traumatic stressors can have long-term effects on the structure and function of the brain.

Right before puberty, adolescent brains experience a growth spurt that occurs mainly in the frontal lobe, which is the area that governs planning, impulse control, and reasoning. Another change that happens during adolescence is the growth and transformation of the limbic system, which is responsible for emotions. Children who experience the stress of abuse will focus their brains' resources on survival and responding to threats in their environment. This chronic stimulation of the brain's fear response means that the regions of the brain involved in this response are frequently activated (Perry, 2001a). Other regions of the brain, such as those involved in complex thought and abstract cognition, are less frequently activated, and the child becomes less competent at processing this type of information.

While there are no studies of the biological and neurological effect of PTSD on former child soldiers we can take what has been learned from animal studies and research relating to maltreated children who are affected by PTSD and apply to this to former child soldiers with

PTSD. As the children with PTSD related to child maltreatment and abuse have been shown to have an increased risk of delays in cognitive, language, and academic skills as a result of adverse effects on brain development caused by the alteration of biological stress systems (De Bellis, 2005; Smith, Makino, Kvetnansky, & Post, 1995; Sapolsky, Uno, Rebert, & Finch, 1990; Watts-English et al., 2006) it would make sense that former child soldiers with PTSD would be affected by the same delays in cognitive, language, and academic skills. Both populations of children are affected by PTSD and the alteration of their biological stress systems brought about by the stress of their experiences. MRI studies have shown reductions in volume of the hippocampus in both combat veterans and victims of childhood abuse (Bremner, J.D., 1999), suggesting that traumatic stressors can have long-term effects on the structure and function of the brain.

Intellectual Capacity and Concentration

With regards to the effects of PTSD on intellectual capacity and concentration, most of the research comes from studies of maltreated children, as well as from studies of children growing up in violent neighbourhoods in the United States. Animal experiments and correlational human studies indicate that extreme stress can harm brain development and lead to lower IQ (Cicchetti & Walker, 2001; De Bellis, 2001; Perry, 1994; Sanchez, Ladd, & Plotsky, 2001; Sapolsky, Uno, Rebert, & Finch, 1990). Children with histories of physical abuse have been found to have deficits in verbal and memory skills (Friedrich, Einbender, & Luecke, 1983).

Koenen et al. (2003) found that children exposed to high levels of domestic violence had IQs that were, on average, 8 points lower than unexposed children (Koenen, Moffitt, Caspi, Taylor, & Purcell, 2003). Low levels of domestic violence were associated with an average suppression of less than 1 IQ point, medium with almost 5 points, and high with greater than 8 points; overall, maltreated children had significantly lower IQs (IQ=89.51) than the non-maltreated children (IQ=97.92) (Koenen, Moffitt, Caspi, Taylor, & Purcell, 2003). Koenen et al. (2003) hypothesized that if elevated levels of catecholamines and cortisol resulting from chronic exposure to extreme stress cause neuronal death or interfere with neuronal growth in the developing brain, then children exposed to chronic stress would be expected to exhibit lower IQs (Koenen, Moffitt, Caspi, Taylor, & Purcell, 2003). In an examination of the long-term outcomes of physical abuse and neglect, Perez and Widom (1994) found that among young adults, those with a history of maltreatment demonstrated IQ and reading ability scores that were well below average when compared to established norms and members of the comparison group. When controlling for sociodemographic variables, physical abuse and neglect were found to be significant predictors of cognitive ability, while neglect was found to be a significant predictor of academic achievement (Perez & Widom (1994).

Carrey, Butter, Persinger, and Bialik (1995) found that children between 7 and 13 years of age who had been physically and/or sexually abused had lower verbal and full scale IQ scores than children without a history of abuse. Navalta, Polcari, Webster, Boghossian, and Teicher, (2006) found a strong association between duration of childhood sexual abuse in women and memory impairments; for each year of abuse, there was a 2.4, 2.0, 1.9, and 2.3 reduction in short-term, verbal, visual and global memory scores, respectively. The abused group did not differ from the

healthy group on the verbal SAT test (636 vs. 628) but scored on average 74 points lower on the math section (585 vs. 659); within group analyses indicated that the verbal-math difference was significant for abused subjects but not for comparison subjects (Navalta, Polcari, Webster, Boghossian, & Teicher, 2006).

After controlling for confounders (child's gender, caregiver's IQ, home environment, socioeconomic status, and prenatal exposure to substance abuse) a child experiencing both violence exposure and trauma-related distress at or above the 90th percentile would be expected to have a 7.5-point decrement in IQ and a 9.8-point decrement in reading achievement³ (Delaney-Black et al., 2002). De Bellis (2001) found that cognitive processes associated with violence exposure in children included lower intellectual ability and difficulties with memory and concentration, which have clear consequences for school performance.

As with neurological effects, there are no studies regarding the effects that PTSD in former child soldiers has on IQ. Once again we can draw conclusions from maltreated, abused, and sexually abused children with PTSD. Child soldiers with PTSD are likely to encounter many of the same traumas and adversities as maltreated, abused, and sexually abused children with PTSD. Children in both groups are likely to be maltreated by those who are in charge of their care (the withholding of food, acceptance, praise, love, and sometimes medical treatment); both are likely to be injured/harmed by those in charge of their wellbeing (either physically or emotionally); and both groups are likely to be sexually assaulted by those above them. Therefore it would be expected that the extreme stress faced by both groups could harm brain development and lead to lower IQs. Even after controlling for sociodemographic variables, physical abuse and neglect were found to be significant predictors of cognitive ability, while neglect was found to be a significant predictor of academic achievement in children with abuse and maltreatment related PTSD (Watts-English, Fortson, Gibler, Hooper, & De Bellis, 2006) it would make sense that former child soldiers with PTSD would be affected in much the same way.

School Performance

In term of the effects of PTSD on school performance, most of the empirical research comes from studies of children with abuse or maltreatment related PTSD as well as from children living in the Occupied Palestine Territories. There is large and growing scientific evidence that prolonged and/or excessive exposure to fear and states of anxiety can lead to levels of stress that can impair early learning and adversely affect later performance in school, the workplace, and the community (National Scientific Council on the Developing Child, 2010). The brain region in animals that appears highly vulnerable to adversity in this regard is the prefrontal cortex, which is the critical area for regulating thought, emotions, and actions as well as for keeping information readily accessible during the process of active learning; humans experiencing chronic stress have been shown to perform poorly on tasks related to prefrontal

³ The 'Test of Early Reading Ability (2nd edition)' was employed to determine this outcome. Like IQ it has a normal distribution with a mean of 100 and SD of 15.

cortex functioning (such as working memory or shifting attention), and their ability to control their emotions is typically impaired (National Scientific Council on the Developing Child, 2010).

Beers and De Bellis (2002) found that children with maltreatment-related PTSD performed more poorly than a matched comparison group in the areas of attention, problem solving, abstract reasoning/executive functioning, learning and memory, and visual-spatial functioning. In a study comparing the effects of trauma and PTSD on IQ in African American adolescents and on Iraqi refugee adolescents in the United States, personal identity traumas generally had negative effects on working memory (Kira, Lewandowski, Somers, Yoon, & Chiodo, 2011). Sexual abuse, which has been found to be one of the most emotionally damaging traumas in children, had negative effects on perceptual reasoning and working memory (Kira, Lewandowski, Somers, Yoon, & Chiodo, 2011). Survival traumas seemed to negatively affect processing speed, while abandonment traumas seemed to have the most negative effects on IQ, compared to other trauma types, as they negatively affected perceptual reasoning, working memory and processing speed (Kira, Lewandowski, Somers, Yoon, & Chiodo, 2011).

In Gaza children living in direct military confrontation areas had lower Health Related Quality Of Life scores, psychosocial health, emotional, social, and school functioning (Massad, Nieto, Palta, Smith, Clark, & Thabet, 2011). The most common symptoms rated as occurring most of the time by children in oPT were: difficulty concentrating (41.9%), avoidance of reminders (37.5%), upset when thinking about the event (37.5%) and thoughts of event interfering with learning (35.2%) (Massad, Nieto, Palta, Smith, Clark, & Thabet, 2011). The more traumatic experiences Palestinian children had and the more they participated in the Intifada, the more concentration, attention and memory problems they had (Qouta, Punamaki, & El Sarraj, 2005).

These results can easily be applied to former child soldiers as they face most of the adversities met by children living in war zones, as well as children with PTSD related to maltreatment and exposure to violence. If the memory and concentration functions of children with PTSD related to maltreatment, exposure to violence or living in a war zone, are negatively affected by their experiences then it would make sense that child soldiers with PTSD would be affected in the same way. A study looking at former child soldiers in Nepal suggests that being a soldier exposed children to more traumatic events, which was associated with higher rates of symptoms of PTSD, generalized psychological difficulties, and function impairment. (Kohrt, Jordans, Tol, Speckman, Maharjan, Worthman, & Komproe, 2008).

Emotional and Behavioral Impacts

Chronic stress or repeated traumas can result in a number of biological reactions: neurochemical systems are affected which cause changes in attention, impulse control, sleep, and fine motor control (Perry, 2000a; 2000b). Chronic activation of certain parts of the brain involved in the fear response (such as the hypothalamic-pituitary-adrenal [HPA] axis) can “wear out” other parts of the brain such as the hippocampus, which is involved in cognition and memory (Perry, 2000b). When children are exposed to chronic traumatic stress, their brains sensitize the pathways for the fear response and create memories that automatically trigger that response without conscious thought; this is called hyperarousal (Child Welfare Information

Gateway, 2009). Children with hyperarousal have an altered baseline for arousal, and tend to overreact to triggers that other children find non-threatening, they may be highly sensitive to non-verbal cues, such as eye contact or a touch on the arm, and they may read these actions as threats (Child Welfare Information Gateway, 2009). As their brains are constantly monitoring non-verbal cues for threats, they are less able to interpret and respond to verbal cues, even when they are in a non-threatening environment, such as a classroom (Child Welfare Information Gateway, 2009). While these children are often labeled as learning disabled, the reality is that their brains have developed so that they are constantly alert and are unable to achieve the relative calm necessary for learning (Child Welfare Information Gateway, 2009).

With regards to the effects of PTSD on interpersonal and emotional and behavioural impacts, research comes from studies of children living in war zones. Preschoolers in the Gaza Strip had Health Related Quality Of Life, including psychosocial health and emotional functioning, that was often severely impaired (Massad, Nieto, Palta, Smith, Clark, & Thabet, 2011). Children living in oPT who had witnessed high levels of military violence expressed higher level of aggressive and antisocial behavior than children exposed to lower levels of witnessing violence (Qouta, Punamaki, Miller, & El-Sarraj, 2008). These children also reported higher levels of proactive aggression, reactive aggression, and enjoyment of aggression (Qouta, Punamaki, Miller, & El-Sarraj, 2008).

Among adolescents impulsive behavior, poor decisions, and increased risk-taking are all part of the normal teenage experience but for adolescents who have been traumatized, this impulsive behavior may be even more evident (Child Welfare Information Gateway, 2009) as their brains have developed to focus on survival, at the expense of the more advanced thinking that happens in the brain's cortex (Chamberlain, 2009). An underdeveloped cortex can lead to increased impulsive behavior, as well as difficulties with tasks that require higher-level thinking and feeling; these adolescents may show delays in school and in social skills as well (Chamberlain, 2009). They may be more drawn to taking risks, and they may have more opportunity to experiment with drugs and crime if they live in environments that put them at increased risk for these behaviors. Those who lack stable relationships with adults who can provide guidance and model appropriate behavior may never have the opportunity to develop the relationship skills necessary for healthy adult relationships (Child Welfare Information Gateway, 2009).

A study of preschoolers in the Gaza Strip found that psychosocial health and emotional functioning is often severely impaired in children living in war zones that meet the criteria for PTSD diagnosis (Massad, Nieto, Palta, Smith, Clark, & Thabet, 2011). As noted above, children in oPT that witnessed high amounts of military violence expressed higher level of aggressive and antisocial behavior than children exposed to lower levels; children exposed to high degrees of witnessing military violence reported higher levels of proactive aggression, reactive aggression, and enjoyment of aggression (Qouta, Punamaki, Miller, & El-Sarraj, 2008). Once again, these results can easily be applied to former child soldiers as they face most of the same adversities met by children living in war zones. If the psychosocial and emotional functions of children with PTSD related to living in a war zone are negatively affected by their experiences then it would follow that child soldiers with PTSD would be affected in much the

same way. A look at child soldiers in Nepal suggests that being a soldier exposed children to more traumatic events, which was associated with function impairments (Kohrt, Jordans, Tol, Speckman, Maharjan, Worthman, & Komproe, 2008).

Moral Development Impacts

As noted above, child soldiering is likely to have significant psychological and biological impacts which affect a child's ability to learn and engage socially. Research on the impact of communal violence and war also suggest that children's social and moral development may be greatly affected by the kinds of trauma and deprivations associated with child soldiering (Garbarino & Kostelny, 1996). Trauma arises, in part, when the child cannot give meaning to dangerous experiences in the presence of overwhelming arousal. This orientation is contained in the American Psychiatric association's definition of post-traumatic stress disorder, which refers to threatening experiences outside the realm of 'normal experience'. Experiences that are cognitively overwhelming and that produce overwhelming arousal may evoke a process in which understanding these experiences has pathogenic side effects. That is, in coping with traumatic events, the child is forced into patterns of behavior, thought, and feelings that are themselves 'abnormal' when contrasted with those of the "untraumatized child."

Children and youth exposed to acute danger may require months to recover pre-trauma cognitive and emotional processing abilities (Pynoos and Nader, 1988). If the traumatic stress is intense enough, it may leave permanent psychic scars (Terr, 1990). Chronic danger, on the other hand, imposes a requirement for developmental adjustment or accommodation (in Piagetian terms). These are likely to include, not only persistent PTSD, but also alterations of ideological interpretations of the world as a safe place to be. This is particularly true when the danger comes from the violent overthrow of day-to-day social reality as is the case in war and child soldiering. At the heart of this philosophical trauma is declining trust in adults amongst child soldiers who exist within fighting forces.

There is some research to suggest that childhood victims of violence (including former child soldiers) who are protected from this philosophical trauma through counselling and other mediation efforts may be better able to manage their psychological symptoms (Garbarino, J. 1995; Boothby, N., Halprin, J., and Crawford, J., 2006; Betancourt, T.S., 2010). These children may be suffering from PTSD, but they are still able to organize their behavior effectively in pro-social patterns as students, co-workers, citizens, and family members. In short they function, albeit with emotional pain. However, those who suffer from PTSD and the philosophical wounds of distrust, terminal thinking, and antisocial hostility are likely to become dysfunctional, unable to learn in school or develop social relationships.

Child Soldier Specific Research

There is a lack of published research comparing the severity of mental health problems and functional status among child soldiers with children living through war who were not conscripted to armed groups. In Northern Uganda, a common feature among former child soldiers is that of abduction by the Lord's Resistance Army (LRA), with the majority being abducted into a fighting

force. In a Northern Uganda study, 94.1% of former child soldiers had been abducted (Ovuga, Oyok, & Moro, 2008). Among respondents who reported being abducted, in another Northern Uganda study of former child soldiers, 67% met the criteria for symptoms of PTSD, compared to 51% among those who were not abducted (Pham, Vinck, & Stover, 2009).

Many child soldiers are exposed to violence, and the effects of this exposure vary by type and duration of exposure. A study of former child soldiers in Nepal showed that exposure to bombing was associated with depression and general psychological difficulties, and exposure to torture was associated with symptoms of PTSD and general psychological difficulties (Kohrt, Jordans, Tol, Speckman, Maharjan, Worthman, & Komproe, 2008). The mental health burden among former child soldiers ranged from 39% to 62% of participants depending on type of distress versus 18% to 45% for children not conscripted by armed groups - child soldiers had worse mental health outcomes (symptoms of depression, PTSD, general psychological difficulties, and function impairments) than the comparison groups (Kohrt, Jordans, Tol, Speckman, Maharjan, Worthman, & Komproe, 2008). A study of children in Darfur found that abduction, hiding to protect oneself, being raped, and being forced to kill or hurt family members were most predictive of traumatic reactions (Morgos, Worden, & Gupta, 2007). Among IDP children in Darfur, there was a sub set of children who were forced to kill their parents. Older children in this subset reported more somatic responses, more reliving of trauma events, more fear of the event recurring, and feeling isolated from other people than IDP children at large. Amongst the forced-to-kill subset, younger children reported more sleep disturbance than older children (Morgos, Worden, & Gupta, 2007).

Participation in violence and types of violence experienced also vary.. In Ovuga, Oyok and Moro's (2008) study of child soldiers in Northern Uganda 52.9% reported having been forced to kill someone (including their own colleagues in the bush), and 16.7% reported having been forced to kill a close family member. In Northern Uganda 77% of former child soldiers saw someone being killed during their abduction; 6% saw their own father, mother, brother, or sister being killed, 39% had to kill another person themselves; 2% killed their own father, brother, or another relative, and 64% were forced to participate in fights (Derluyn, Broekaert, Schuyten, & De Temmerman, 2004).

An important health consequence of combat exposure that has been observed in adult soldiers involves the potential for increased risk taking propensity and unsafe behavior among returning soldiers (Killgore, Cotting, Thomas, Cox, McGurk, Vo, Castro, & Hong, 2008). Specific combat experiences, including greater exposure to violent combat, killing another person, and contact with high levels of human trauma, were predictive of greater risk-taking propensity after homecoming (Killgore, Cotting, Thomas, Cox, McGurk, Vo, Castro, & Hong, 2008). Among returned adult soldiers, those with higher scores on Human Trauma Exposure reported greater likelihood of angry verbal outbursts, and were more likely to destroy physical property and threaten someone in their unit with physical violence; having survived a close call was associated with destruction of physical property and threatening others with violence; having killed an enemy was correlated with more yelling and shouting, destruction of physical property, verbal threats of physical assault, and actually physically assaulting someone; similarly, having killed friendly/non-hostiles was associated with more incidents of yelling and shouting, verbal

threats, and actual physical assault (Killgore, Cotting, Thomas, Cox, McGurk, Vo, Castro, & Hong, 2008).

Duration of time spent with an armed group has an effect on former child soldiers. Former LRA abductees in Northern Uganda who spent six or more months with the rebels reported more problems after returning home than those who stayed less time (Pham, Vinck, & Stover, 2009). There is a lack of research on the effects of indoctrination on former child soldiers. Research is also lacking on whether different roles of child soldiers (portering, cooks, soldiers, youth leaders, sex) cause different stress or anxiety reactions and if this relates to cognitive abilities.

Risk Accumulation and Resilience

As the above body of evidence indicates, war and child soldiering experiences have direct effects on child development (such as the biological and neurological impact of trauma and deprivation) as well as indirect effects (such as the loss of key relationships and the erosion of social and moral imperatives). Studies of risk and resilience are particularly important for understanding the impact of war and violence on children and youth around the world—and how humanitarian actors might begin to construct a framework for psychological and social recovery. This research suggests that most children can cope with low levels of risk, but it is the accumulation of risks that jeopardizes development, particularly when no compensatory forces are at work (Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987). Specifically, children can cope with one or two major risk factors in their lives, but when risk accumulates—with the addition of the third, fourth or fifth factor—there is a marked precipitation of developmental damage (Garbarino & Kostelny, 1996).

Risk accumulation research highlights the importance of context in understanding the differences observed among children living in war zones and among child soldiers (Boothby, N., Halprin, J., and Crawford, J., 2006; and Bentancourt, T.S., Myers-Ohki, S.E., Stulac, S.N., Barrera, A.E., Mushashi, C., and Beardslee, W., 2011). It highlights the common observation that children who are already victims of family violence are hurt most by war and community violence (Garbarino & Kostelny, 1996). For most children, the experience of war, and even of child soldiering, takes place within a larger context of risk. Were such children poor? Did they live in disrupted families or were their family members killed or displaced? Were they exposed to domestic violence? Did they have food to eat? Were there other risks? This constellation of risk by itself creates enormous challenges for children and youth. For them, the trauma of child soldiering is often the experience that tilts them towards severe pathology.

On the other side of the equation, some factors promote resilience to stress. (Dunst and Trivette, 1992; Betancourt, T.S., et al. 2010). Convergent findings from studies of life course responses, including later life outcomes of child soldiers, to trauma and adversity in childhood suggest a series of ameliorating factors can be applied to children growing up in war zones (Losel and Bliesener, 1990, Boothby, 2011; Betancourt, T.S., 2010). These include: (1) a child's active efforts to overcome challenges and not just passively succumb to them; (2) cognitive competence (defined by having at least an average level of intelligence); (3) experiences of self-efficacy; (4) a stable emotional relationship with at least one parent or other reference person;

(5) community acceptance and religious or spiritual supports; and, (6) an open, supportive educational climate; and (7) social support from people outside the family.

The task of dealing with the effects of child soldiering falls to the people who care for and educate these children when they return home: their parents and other relatives, teachers and counselors, and grassroots members of the community and religious groups. But these adults tasked with caring for and educating former child soldiers also face enormous challenges of their own. Whether in active combat zones or post conflict environments, community workers and educators are themselves often traumatized by their exposure to violence and other toxic stresses. For these individuals, efforts to create a safe zone in the school and in the community are crucial in order for them to perform their important functions in the lives of former child soldiers and other high risk children (Garbarino, Dubrow, Kostelny, & Pardo, 1992).

Supporting Child Soldiers' Reintegration

Disarmament, Demobilization and Reintegration (DDR) programs offer an initial opportunity to begin to devise a lasting system of care, preferably drawing on the interest of humanitarian actors before they leave. This final section reviews lessons learned in the DDR process with an eye towards identifying those practices and programs that appear likely to enable former child soldiers to re-enter civil life. DDR is a process of removing weapons from combatants, taking combatants out of military structures and helping them integrate socially and economically into society. When DDR programs make the presentation of a weapon for disarmament the criterion for eligibility, children, especially girls, are often excluded (IDDRS, 2006). Because children are associated with armed forces and groups in a variety of ways, not only as combatants, some may not have access to weapons and may therefore be left out of official DDR programs.

An estimated 30 percent of child combatants never enter formal DDR, either because they are not aware of their rights, choose to go to places that they recognize as providing safety, or because they are deliberately excluded — as is often the case with children who have fled the armed force or group, or girls who are victims of forced marriages (IDDRS, 2006). Girls face great difficulties during the process of being accepted back into their families and communities, with girl mothers and their children experiencing the highest levels of rejection and abuse upon return (IDDRS, 2006). Many girls want to return to their education or receive training to be economically self-sufficient, but are not always afforded this opportunity as they are often left out of the formal DDR process or face economic and other pressures which prevent access to study opportunities.

It has been suggested that women and children should go through a parallel process that is not labeled DDR. Few women have enrolled in DDR in the Democratic Republic of Congo because the program developed a cultural stigma (Hanson, 2007). Though children often do need demobilization, many agree that child soldiers who have been involved in fighting need to be separated from adult combatants to break the psychological links between children and their military commanders (Hanson, 2007). And as most women and girls are noncombatants they do not need this aspect of the demobilization programme. The degree to which child soldiers need special treatment varies, as some have only been fighting for a few months and have

families to which they can return, while others have been fighting for five or six years and may need extensive counseling (Hanson, 2007).

The prevention of recruitment, and the demobilization and reintegration of children is a continuous, ongoing process, and reintegration programmes should offer viable alternatives to military life for all war-affected children. The aim of DDR programmes for children associated with armed forces and groups is to ensure their effective and sustainable reintegration (IDDRS, 2006). Child-specific reintegration aims to allow a child to access education, a livelihood, life skills and a meaningful role in society. The higher a child's level of education, the more their reintegration is likely to succeed. It is therefore important for children to try to reach (or recover) as high a level of education as possible, often starting with basic literacy. However, returning to school is often difficult and even impossible, not only for financial reasons, but also because of the adjustments both teachers and learners have to make (IDDRS, 2006).

Attending school and training programs can help war-affected youth to attain a sense of normalcy and safety (Sommers 2003; Betancourt 2005). The school system provides a number of short- to medium-term benchmarks that children can use to measure their progress in a positive direction: attending classes regularly, adhering to classroom rules, doing homework, studying for and taking exams, and completing grades or cycles of education can all serve as achievable goals providing forward momentum in the reintegration process (Nicolai & Triplehorn 2003). Out of 31 former child soldiers interviewed in Sierra Leone, 28 prioritized school as the most important form of reintegration assistance (Betancourt, T. S., Simmons, S., Borisova, I., Brewer, S. E., Iweala, U., & de la Soudière, M., 2008). An older adolescent female remarked, "The most important aspect that should be given priority is education, because lots of children are not attending school since their return, but have gone back to the street." (Betancourt, T. S., Simmons, S., Borisova, I., Brewer, S. E., Iweala, U., & de la Soudière, M., 2008). Indeed, the UN Inter-agency Standing Committee Guidelines on Mental Health and Psychosocial Support in Emergency Settings underscore the importance of schools as a part of the holistic psychosocial response necessary for assisting war-affected youth (IASC 2007).

Conclusions

The literature review above leads to the conclusion that former child soldiers including those involved in fighting and others associated with fighting forces may experience difficulty in learning due to the impact of their traumatic experiences. The greatest cognitive harm results from the cumulative burden of multiple risk factors, including fear, abuse, substance abuse, torture, and exposure to violence. The lasting, neurobiological effect on children who experience multiple traumas leads to a far greater likelihood of anti-social behavior, lower achievement in school and poor physical and mental health. With each additional risk factor, the odds of long-term damage to brain architecture, learning and social functioning, increase.

It is important to underscore the basic lesson learned from risk and resilience research: **risk accumulates — opportunities ameliorate**. In this sense, reintegration programs catering for former child soldiers offer an initial opportunity to devise a lasting system of care, instead of leaving behind a dust cloud that disappears when the humanitarian actors leave. What is

needed is the promotion of a broad continuum of care—one that extends from everyday citizens and teachers who give former child soldiers encouragement and guidance to frontline community health workers and district based psychologists who can manage cases needing a higher level of services. In an ideal world, grassroots mental health services and schools based programs would offer a place for sufferers to tell their stories, talk about their dreams and ambitions, and develop trusting relationships.

Another important goal is to forge connections to families and communities, and give children the wherewithal to negotiate the adversities they often encounter. Ideally, such approaches are linked to educational and job programs that restore civilian roles—since returning to school or securing a livelihood are prime objectives of former child soldiers. Educational and vocational opportunities are also sources of confidence, motivation and healing.

Concerned actors should take these issues into account:

1. **Actors working in legal settings on victim needs** should be aware that the impact of recruitment on education is not simply that a child is withdrawn from or misses the opportunity for schooling. **The traumatic experiences may also cause cognitive impairment and social-emotional impairment that have a negative impact on learning capacity.**

This impairment is aggravated by other risk factors in the environment, meaning that efforts for (re)insertion into schooling or provision of training need complementary inputs to meet health, psychosocial and basic economic needs including food.

2. **Actors working in the education sector** should be aware that the experience of child soldiering can cause cognitive and social/emotional impairment to learning capacity that can lead to frustration and drop-out. **The teaching/learning environment needs to be structured to assist with concentration and provide additional support (eg tutoring) where needed.** They should also liaise with other sectors to minimize the magnification of harmful effects due to accumulating risk factors, such as concerns over food security, health, psychosocial needs, economic and physical security.

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