Perpetual perpetration: How violence shapes the offender

The interplay between organized and family violence, appetitive aggression and mental health

Dissertation zur Erlangung des Grades des Doktors der Naturwissenschaften (Dr. rer. nat)

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Mathematisch-Naturwissenschaftliche Sektion Fachbereich Psychologie

Tag der mündlichen Prüfung: 15.11.2013

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Konstanzer Online-Publikations-System (KOPS)
URL: http://nbn-resolving.de/urn:nbn:de:bsz:352-251864
Acknowledgments

Many thanks to:

Thomas Elbert
Katharin Hermenau
Neema Hermenau
Anna Maedl
Maggie Schauer
Heike Riedke
Dorothea Isele
Susanne Schaal
Charlotte Salmen
Astrid Pabst
Roos Haer
James Moran
Danie Meyer-Parlapanis
Justin Preston
Roland Weierstall
Martina Ruf-Leuschner
Anselm Crombach
Anna Radkovsky
Norbert Hecker
Roger Buhendwa Zashurwa
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Désiré Muhire Biyonga
Flory Barhimanya Kahisa
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The present thesis explored how violence shapes the violent offender by investigating the interplay between exposure to and perpetration of organized and family violence and its impact on mental health and aggression. Violence and cruelty seem to be omnipresent in men. Nell (2006) suggested that an affectively positive, dopamine mediated and, therefore, rewarding perception of violence fosters violence among humans. Findings concerning the impact of perpetrating violence on mental health are, however, contradictory, ranging from increasing to buffering the risk for mental disorders. Elbert, Weierstall and Schauer (2010) suggested that an appetitive perception of violence may explain the contradictory findings and thus introduced the term ‘appetitive aggression’. Previous studies have shown that appetitive aggression buffers the risk of developing trauma-related suffering (Weierstall, Schaal, Schalinski, Dusingizemungu, & Elbert, 2011; Weierstall, Schalinski, Crombach, Hecker, & Elbert, 2012). Furthermore, the literature suggests a strong association between exposure to violence and mental health problems (Elbert & Schauer, 2002) as well as aggressive behavior (Weaver, Borkowski, & Thomas, 2008). The present thesis examined the phenomenon of appetitive aggression more closely in former combatants and child soldiers in the eastern provinces of the Democratic Republic of the Congo (DRC). Additionally, the interplay between organized and family violence, mental health, and aggression was investigated.

The ‘cycle of violence’ hypothesis (Curtis, 1963; Elbert, Rockstroh, Kolassa, Schauer, & Neuner, 2006), which holds that violence breeds further violence, forms the underlying premise of the first article. This examined the association between exposure to family violence and aggressive behavior in primary school students in Tanzania. Results revealed that in line with the ‘cycle of violence’ hypothesis exposure to family violence, i.e. corporal punishment, was positively related to children’s aggressive behavior.

The second article focused on appetitive forms of aggression in a sample of former combatants and child soldiers in the DRC. Results showed that combatants reporting high levels of appetitive aggression are characterized by the perpetration of a high number of violent acts, joining armed groups on their own accord and as children. Joining an armed group voluntarily may indicate an innate appetite for aggression. However, joining young and perpetrating violence on a regular basis seem to intensify the appetite for aggression.

The third article examined the same sample, this time investigating whether the perpetration of violence damaged the perpetrator’s mental health. Results revealed that voluntary combatants differed significantly from forcibly recruited combatants, as they reported more...
perpetrated violence and higher levels of appetitive aggression. Furthermore, we found that perpetrating violence was positively related to posttraumatic stress disorder (PTSD) symptom severity in forcibly recruited combatants, but not in voluntary combatants. Thus, perpetrating violence does not necessarily damage mental health. The combatant’s perception of violence may determine whether perpetrating violence affects their mental health.

Previous research suggests that appetitive aggression might buffer the risk of developing trauma related illnesses (Weierstall et al., 2011, 2012). In the fourth article, we investigated the relation between exposure to traumatic stressors, appetitive aggression, and PTSD symptom severity in voluntary combatants in the eastern DRC. The results showed that traumatic events were positively related to PTSD symptom severity and that appetitive aggression correlated negatively with PTSD symptom severity for participants with low to medium PTSD symptom severity. Thus, these findings provide further support for earlier findings that repeated exposure to traumatic stressors cumulatively heightens the risk of PTSD and revealed that appetitive aggression buffers the risk of developing PTSD symptoms under certain circumstances.

The fifth article explored the relation between alcohol or drug consumption and the perpetration of violence in former combatants in the eastern DRC from a political science perspective. Prior research revealed a link between substance use and violent behavior. Substance consumption seems to decrease the threshold for using violence, i.e. it removes the learned constraints and thus facilitates aggressive behavior (Moore & Stuart, 2005; Reiss & Roth, 1993). At the same time, specific substances, particularly alcohol, seem to incite violence directly via aggression and rage (Hoaken & Stewart, 2003). Our analyses showed, after controlling for armed group-level and individual-level variables, that drug intake and alcohol consumption boost the amount of perpetrated violent actions by combatants.

Earlier findings showed that former child soldiers or ex-combatants often form small groups of outlaws in civil life, performing violent and criminal acts (Elbert et al., 2010; Wessells & Monteiro, 2004). Based on these findings and the prior findings of the present thesis, the last article tested the efficacy of Narrative Exposure Therapy for Forensic Offender Rehabilitation (FORNET) in a randomized controlled clinical trial. FORNET is a psychological intervention focusing on trauma-related suffering and appetitive forms of aggression to foster the integration of former combatants into civil society and break the cycle of violence. The treatment group reported reduced PTSD symptoms and less contact with combatants. Thus, the study presented for the first time evidence for the feasibility and efficacy of FORNET. We could show that addressing traumatic events and perpetrated violence foster the rehabilitation of violent offenders and thus may help to break the cycle of violence in violent environments.
The present thesis has attained further knowledge about the appetitive perception of violence, the interrelation between the exposure to and the perpetration of organized and family violence as well as its impact on mental health and aggression. Clinical implications and directions for future research are discussed. The findings regarding appetitive aggression may provide one explanation at the level of the individual offender for why it is extremely difficult to pacify crisis regions or restrict the risk of violent recidivism in former offenders. However, the successful integration of violent offenders into civil society can help to break the cycle of violence. The findings of the present thesis increase the understanding of the needs and difficulties of violent offenders and can thus improve the rehabilitation process.
Zusammenfassung


Vorherige Studien zeigten, dass ehemalige Kindersoldaten und Kämpfer im zivilen Leben oft kleine Banditengruppen bilden, die gewalttätige und kriminelle Handlungen ausüben (Elbert et al., 2010; Wessells & Monteiro, 2004). Basierend auf diesen Befunden und den bereits erwähnten Ergebnissen dieser Arbeit, überprüft der letzte Artikel in einer randomisierten Kontrollgruppen-Studie die Effektivität der Narrative Exposure Therapy for Forensic Offender
Rehabilitation (FORNET), einer psychologischen Intervention, die den Fokus auf traumabezogene Störungen und appetitive Ausprägungen der Aggression legt, um die Integration von ehemaligen Kämpfern in die zivile Gesellschaft zu fördern und so den Kreislauf der Gewalt zu durchbrechen. Die PTBS-Symptomatik verringerte sich in der Behandlungsgruppe und sie berichtete weniger Kontakt mit aktiven Kämpfern als die Kontrollgruppe. Die Studie lieferte erste Hinweise für die Durchführbarkeit und Effektivität der FORNET. So konnten wir zeigen, dass die Bearbeitung von traumatischen Erlebnissen und selbst ausgeübter Gewalt den Rehabilitationsprozess von Gewalttätern fördert und so dazu beitragen kann den Kreislauf der Gewalt in gewalttätigen Umwelten zu durchbrechen.

Record of achievement

The articles in this thesis were realized with the support of a number of colleagues. In the following, I list the submitted articles and my independent research contributions.

**Article 1:** The relationship between corporal punishment and children's aggressive behavior: A cross-sectional study of Tanzanian primary school students (unpublished manuscript)
Tobias Hecker, Katharin Hermenau, Dorothea Isele, Thomas Elbert

**My contributions:**
- designed the study
- carried out clinical interviews
- supervised clinical interviews
- conducted the statistical analysis
- drafted the manuscript.

Tobias Hecker, Katharin Hermenau, Anna Maedl, Thomas Elbert, Maggie Schauer

**My contributions:**
- participated in the design of the study
- carried out a large number of clinical interviews
- conducted the statistical analysis
- drafted the manuscript.

**Article 3:** Does perpetrating violence damage mental health? Differences between forcibly recruited and voluntary combatants in DR Congo (published in *Journal of Traumatic Stress, 2013, 26 (1),* 142 – 148. doi: 10.1002/jts.21770)
Tobias Hecker, Katharin Hermenau, Anna Maedl, Harald Hinkel, Maggie Schauer, Thomas Elbert

**My contributions:**
- participated in the design of the study
- carried out a large number of clinical interviews
- conducted the statistical analysis
- drafted the manuscript.
Article 4: Aggression inoculates against PTSD symptom severity – insights from armed groups in the eastern DR Congo (published in European Journal of Psychotraumatology, 2013, 4, 20010. doi: 10.3402/ejpt.v4i0.20070)
Tobias Hecker, Katharin Hermenau, Anna Maedl, Maggie Schauer, Thomas Elbert
My contributions:
- participated in the design of the study
- carried out a large number of clinical interviews
- conducted the statistical analysis
- drafted the manuscript.

Article 5: Drugs boosting conflict? A micro-level test of the linkage between substance use and violence (accepted in Terrorism and Political Violence. doi: 10.1080/09546553.2013.796935)
Tobias Hecker, Roos Haer
My contributions:
- participated in the design of the study
- carried out a large number of clinical interviews
- supported the statistical analysis
- supported the drafting of the manuscript

Article 6: Addressing post-traumatic stress and aggression by means of narrative exposure – a randomized controlled trial with ex-combatants in the eastern DRC (accepted in Journal of Maltreatment, Aggression, and Trauma, 22 (8))
Katharin Hermenau, Tobias Hecker, Susanne Schaal, Anna Maedl, Thomas Elbert
My contributions:
- designed the study
- carried out a large number of clinical interviews
- conducted a large number of FORNET therapies
- supported the statistical analysis
- supported the drafting of the manuscript


1 Introduction

Why is cruelty and violence so omnipresent in men? Violence occurs in a countless number of armed conflicts throughout the world but it is also present within civil communities and families. Any sort of conflict, be it ordinary fights, criminal assault, murder, war or genocide, has a way of escalating and creating a seemingly self-perpetuating dynamic. Many crisis regions are characterized by repeated waves of violence. One example is the Great-Lakes-Region in Central Africa. Rwanda has experienced one of the bloodiest genocides in human history, in which 800,000 people were killed within a period of only three months (Hatzfeld, 2004; Zimbardo, 2008). Northern Uganda has suffered a bloody war for years and the fragile peace is only slowly reaching all parts of the society (Amoné-P’Olak, 2004; Vinck, Pham, Stover, & Weinstein, 2007). Also the recent history of the Democratic Republic of the Congo (DRC) has been one of civil war and violence. After independence in 1960, unrest and rebellion plagued the country, until 1965, when Mobutu Sese Seko seized control of the country and declared himself president. Under his rule, the country, then called Zaire, became a dictatorship that came to an end when Laurent-Désiré Kabila, backed by Rwanda and Uganda, captured the capital and removed Mobutu from office in 1996. Nonetheless, Congo’s troubles continued. A rift between Kabila and his former allies sparked a new rebellion. Angola, Namibia and Zimbabwe took Kabila’s side against Rwanda and Uganda’s influence in the DRC, turning the country into a vast battleground for many years. In 2003, an official peace agreement was signed. In spite of this, the eastern provinces of the DRC are still the site of one of the world’s worst on-going humanitarian crises and many warring factions are still roaming through large areas of the country, raiding villages and committing severe human rights abuses (International Crisis Group, 2009).

To illustrate what kind of violence and atrocities combatants from different armed groups forcibly or voluntarily perpetrate in the still ongoing conflict in the eastern DRC, I present the following quotes of ex-combatants retrieved from interviews for the present thesis:

“I was making others really suffer. We went to steal at night and destroyed every person we met. If we came across a woman we raped her, if we came across a boy we beat him. […] After combat we killed everybody who was left except the beautiful women. We took them with us. We were raping and stealing a lot […]. Then we went into the rooms and chopped everybody’s head off with machetes. Blood was everywhere.” (Participant 2088)
“Mai-Mai cut the genitals of captured soldiers to use them for witchcraft.” (Participant 2077)

“When I was with the rebels we killed many civilians. I took part in these killings, and I mutilated many people.” (Participant 1036)

These grotesque acts of cruelty, like cutting off prominent parts of the body (ears, nose, genitals, fingers and so on) can be observed in completely different crisis regions and scenarios with varying cultural and historical backgrounds (Elbert, Weierstall, & Schauer, 2010; Guy, 2009; Maclure & Denov, 2006; Schauer & Elbert, 2010).

Prior research has focused particularly on victims of war and violence (Karunakara et al., 2004; Neuner, Schauer, Karunakara, et al., 2004; Schalinski, Elbert, & Schauer, 2011). However, little is known about how extreme forms of violence shape people. This is particularly the case for those who have not only been exposed to violence but also repeatedly perpetrated severe forms of violence, either forcibly or voluntarily. The detrimental mental effects of exposure to violence are not only common for civilian victims, but also for soldiers and combatants. Prior research has consistently shown that exposure to violence, including organized violence, enhances the risk of mental ill-health such as trauma-related illnesses, depression, or substance abuse (Bayer, Klasen, & Adam, 2007; Odenwald, Hinkel, et al., 2007; Pham, Vinck, & Stover, 2009; Vinck et al., 2007). Following the so-called "cycle of violence" hypothesis, one would predict that high levels of war violence lead to higher levels of violence within the family and community (Catani, Jacob, Schauer, Kohila, & Neuner, 2008; Elbert et al., 2006; Widom, 1989). Additionally, we can also hypothesize that high levels of family violence can lead to higher levels of aggression in children, which in turn might increase the likelihood of enlisting in armed groups and perpetrating violence in wartime. In northern Uganda, Elbert and colleagues (2010) investigated how children can be turned into violent killers and described these “cruel people” as boys and men who became used to or even “addicted” to killing. Former child soldiers stated that “cruel people” usually take up a higher military rank in the group of rebels. Elbert and colleagues (2010) presented statements from former child soldiers describing these “cruel people”:

“[…] cruel people are warriors; […] always follow orders; […] have a contaminated mind; […] they say everyday I will kill you” (Elbert et al., 2010, p. 101).

For “cruel people” their atrocities seem to be emotionally thrilling and fascinating. Elbert and colleagues document former child soldiers’ estimates of the percentage of “cruel people” in
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the armed groups as making up a large part of the combatants, rather than a tiny psychopathological minority. Additionally, they reported that the children themselves presented somewhat astonishing insights on how this cruelty has developed:

“Cruelty will turn you cruel [...]. They take revenge for things that happened to them and become cruel [...]. Children are made to punish each other [...]. The process takes about 2–3 months [...]. Boys from 8 years on can be turned into terrible killers [...]. The age from 8–17 is the window of opportunity [...]” (Elbert et al., 2010, pp. 101-103).

Concurrently, the literature suggests anecdotally that under certain circumstances normal people could become extremely violent and seem to perceive perpetrating violence as fascinating and highly arousing. For example some veterans from the United States of America who served in Vietnam described combat as being fascinating and thrilling; the thirst for combat even resembled an addiction:

„Combat addiction [...] is caused when [...] the body releases a large amount of adrenaline into your system and you get what is referred to as a “combat high”. This combat high is like getting an injection of morphine – you float around, laughing, joking, having a great time, totally oblivious to the dangers around you. [...] Problems arise when you begin to want another fix of combat, and another, and another, and, before you know it you are hooked. As with heroine or cocaine addiction combat addiction surely will get you killed. And like any addict you will get desperate and will do anything to get your fix” (Grossman, 1995, p. 243).

In the Rwandan genocide a number of perpetrator reports illustrate that, at least for some, killing and mutilating their victims was pleasurable, exciting and thrilling to them:

“The more we killed, the more we acquired a taste for it. If you are allowed to act out this lust, it will never let you go again. You could see the lust in our greedy popping eyes. [...] It was an unprecedented pleasure for everyone” (Hatzfeld, 2004, p. 53; translated into English by: Crombach, Weierstall, Hecker, Schalinski, & Elbert, 2013).

Concordantly, former child soldiers and ex-combatants often report that their experience of war and violence brought about a gradual transformation in their perception of violence: At first it was frightening, but with repeated experience it became not only normal and acceptable, but even exciting and arousing (Maclure & Denov, 2006). How can we explain this change in people’s response to violence?

In a peaceful society, moral standards, social customs and laws inhibit extreme forms of violence including killing of humans (Elbert et al., 2010). Life in an extremely violent
environment often breaks these socially learned inhibitions and moral standards (Engen, 2008). This can for example be achieved through dehumanization of the enemy (Staub, 2006) and initiation rites in armed groups, including killing of relatives (Amone-P’Olak, 2004). Elbert et al. (2010) have developed this idea further by introducing the term ‘appetitive aggression’ into the literature. They argue that hunting behavior is fascinating and attractive. It can be described as a desire that makes temporary deprivation from physical needs, pain, sweat, blood and, ultimately, the willingness to kill tolerable and even appetitive. The evolutionary advantages of personal or social power and dominance have transferred some appetitive elements from hunting prey to hunting humans. While a breakdown of the inhibition towards intra-specific killing would endanger any animal species, controlled inhibition was enabled in humans in that higher regulatory systems, such as frontal lobe-based executive functions, prevent the involuntary derailment of hunting behavior. Normally, children learn which conditions legitimate aggressive behavior and which do not. Bonding and social rites (e.g. initiation) set up the constraints for both hunting and violent disputes. However, if this control is not learnt or if it breaks down, for example in child soldiers, then brutality towards humans remains fascinating and appealing (Elbert et al., 2010).

Furthermore, when ex-combatants return to their civil homes, they may restore inhibition and control the desire for aggression and the lust to kill, but there are as yet no insights into how good or for how long this will work in any given individual. The potential to switch back to the "aggressor mode" might explain why it is extremely difficult to pacify crisis regions or restrict the risk of violent recidivism in former offenders. Elbert and colleagues’ (2010) research in northern Uganda and in the eastern the DRC revealed that former child soldiers form small groups of outlaws in civil life, performing violent and criminal acts to a varying degree. This corresponds well with the findings in Angola suggesting that a high percentage of former adolescent combatants commit offences or become bandits (Wessells & Monteiro, 2004).

To break the cycle of violence, we need to understand how violence shapes not only those who are exposed to violence but also those who frequently perpetrate severe forms of violence. Therefore, the present thesis analyzed the interplay between exposure to and perpetration of violence, mental health (i.e. trauma-related disorders) and appetitive aggression empirically.
1.1 The concept of appetitive aggression

Post-conflict and war-affected regions as well as collective violence worldwide are characterized by escalating violence (Buvinic & Morrison, 2000; Mattaini, 2003). In addition to the specific initiating conditions that lead to an outbreak of mass violence in terrorism, gang warfare, war, and genocide, extreme forms of violence, including inconceivable cruelty and inhuman punitive methods, shape the perpetrators’ behavior throughout cultures and regions (Weierstall & Elbert, 2011). How can we explain these extreme forms of violence?

Human aggression is commonly defined as any behavior towards another individual that includes the intention to harm (Berkowitz, 1993; Geen, 2001; Smith & Mackie, 2000). In addition, the perpetrator must willingly want to harm the victim and the victim must want to avoid this behavior (Bushman & Anderson, 2001). Violence, however, is an extreme form of aggression, including for example physical assault or killing (Anderson & Bushman, 2002). The literature distinguishes consistently between two major forms of aggression: reactive and instrumental aggression (Fontaine, 2007; Kempes, Matthys, de Vries, & van Engeland, 2005; Vitiello & Stoff, 1997). Reactive aggression is also known as affective, impulsive, or hostile aggression. It can be conceived as being impulsive, driven by anger, and occurring as a reaction to some perceived provocation or threat (Anderson & Bushman, 2002; Hubbard et al., 2002). The reactive–impulsive form of aggression is experienced by women and men alike: If an acute threat is posed, either to oneself, one’s own children, members of one’s own community or to one’s own resources, the disposition to harm others increases spontaneously (Elbert et al., 2010).

Instrumental aggression, however, is planned, purposeful and target- or goal-oriented. The literature also refers to it as proactive, goal-oriented or predatory aggression (Geen, 2001; Meloy, 1997; Nelson & Trainor, 2007). Instrumental aggression has often been linked to secondary rewards, like the gain of social status (Daly & Wilson, 1996; Shackelford, 2005), wealth (Anderson & Bushman, 2002), or reproductive success (Bernhardt, 1997). Following Elbert et al. (2010), we hold that the controlled-instrumental aggression can be an end in itself. That is to say, this form of aggression, where others are hunted or predated upon, and the associated feelings of power over other beings are intrinsically rewarding. Nell (2006) outlined an innate and strongly male-gendered human blood lust that may culminate in the purposeful mutilation of victims in war-affected regions. The rewarding effects of the perpetration of violence, for example the killing or mutilation of victims, have received scant attention in aggression research (Berkowitz, 1993; Geen, 2001). Nevertheless, we see evidence of this in the testimony of soldiers and combatants, who often report that committing violence can be appealing, fascinating, and exciting (Konner, 2006; MacNair,
2006; Silva, Derecho, Leong, Weinstock, & Ferrari, 2001). Furthermore, killing has sometimes been associated with positive feelings like joy or happiness (Konner, 2006; MacNair, 2006; Silva et al., 2001). Normally, control mechanisms in the frontal lobe inhibit intraspecific violence (Kelly, 2005; Nelson & Trainor, 2007). However, dehumanization of the enemy (Staub, 2001, 2006) and initiation rites in armed groups could break learned moral standards and increase intraspecific violence (Engen, 2008; Gibson, 1991). The origins of this desire for aggression, characterized by a fascination with and sometimes even an enjoyment of cruelty may lie in the development of hunting behavior (Weierstall et al., 2011). Human hunting behavior has evolved as a profitable strategy, and perpetrating violence against one’s own species has brought manifold evolutionary advantages, especially for males (Jones, 2008). Nell (2006) suggested an affectively positive, dopamine mediated and, therefore, rewarding perception of violence, which would be responsible for the enjoyment of violent behaviors. For example, this would be active when soldiers are hunting down their enemies, but could also be behind the enjoyment of violent movies or video games in peaceful societies. The logical consequence of this view would be that violence itself, violent cues and violent acts may have appetitive components for the perpetrator (Nell, 2006; Weierstall et al., 2011). Consistently, researchers following evolutionary perspectives predicted that men would have an innate appetite for aggression and violence (Elbert et al., 2010; Jones, 2008; Nell, 2006). Thus, higher profile confrontations, for example mass killings, genocides or assassinations, seem to be rooted in the more appetitive forms of aggression. The understanding of these appetitive forms of aggression is therefore essential for social and political scientists as well as for clinical and forensic psychology and psychiatry (Elbert et al., 2010).

But how do we define these appetitive forms of aggression? Elbert et al. (2010) introduced appetitive aggression as a subtype of instrumental aggression into the literature. Appetitive aggression was defined as the perpetration of violence or the infliction of harm upon a victim, with the aim of experiencing violence-related enjoyment through exposure to violent cues, such as the struggling of the victim. In other words, appetitive aggression can be defined as perceiving aggressive behavior towards others as fascinating, arousing and thrilling even without gaining any external benefit.
Introduction

1.2 Appetitive aggression in war and crisis regions

Recently, a few studies have focused on appetitive aggression in war and crisis regions. In a study with genocide perpetrators in Rwanda, Weierstall and colleagues (2011) found that violent cues themselves can indeed be rewarding and that the struggling of a victim can reinforce aggressive behavior. These results supported the hypothesis of Nell (2006) that when moral restrictions are removed, or when authority sanctions violence, that humans can enjoy cruelty. Moreover, Weierstall et al. (2011) discovered that men rated violent acts more positively than women, an observation that has also been predicted by Nell's evolutionary perspective that in humans, other than animal predators, males have a stronger genetically prepared hunting disposition and hence are prone to aggression and violence. Concordantly, participants who had reported that they perpetrated more violence demonstrated higher appetitive aggression (Weierstall et al., 2011). The study thus provided first empirical support that the victim's struggling could be an essential rewarding cue for perpetrators. These results were replicated by a study with former combatants in Colombia (Weierstall, Bueno Castellanos, Neuner, & Elbert, 2013), which revealed that appetitive aggression was very common among Colombian former combatants. Furthermore, two studies with former child soldiers in northern Uganda showed that appetitive aggression was present at least to some degree in both former child soldiers and war-affected youth, with the caveat that this was more pronounced in the child soldiers. Perpetrated violence could be identified as the best and only significant predictor of appetitive aggression (Crombach et al., 2013; Weierstall et al., 2012). Weierstall and Elbert (2011) replicated this finding in a large sample of more 1600 former combatants and child soldiers from different conflict zones in the world. Furthermore, Crombach et al. (2013) showed that individually perpetrated violence was closely associated with appetitive aggression, but this correlation was stronger within those child soldiers holding a military rank. They concluded that perceiving the perpetration of violence as fascinating and arousing is rewarded with higher social status in war-affected communities, particularly in armed groups. Concordantly, a study with former child soldiers in the DRC concluded that appetitive aggression seems to be advantageous for survival in a violent environment such as an armed group (Weierstall, Banholzer, Haer, & Elbert, in press). Furthermore, the study revealed that those former child soldiers who joined the armed group voluntarily and were not forcibly recruited, were more likely to report high levels of appetitive aggression. This supports the idea that humans, particularly men, have an innate appetite for aggression and violence (Elbert et al., 2010; Jones, 2008; Nell, 2006). In a violent environment of war and conflict this appetite may facilitate the voluntary enlistment to an armed group.
In summary, prior research on appetitive aggression in war and crisis regions has consistently shown that appetitive aggression was an important factor in all samples. Appetitive aggression is strongly associated with perpetrated violence (Weierstall et al., 2011), however, the study designs of the previous studies do not allow any causal interpretation of this association. On the one hand innate appetitive aggression may facilitate the perpetration of violence. This hypothesis is supported by the findings that appetitive aggression is correlated with voluntary enlistment (Weierstall et al., in press). On the other hand frequent perpetration of violence may reinforce appetitive aggression. In regard to the cycle of violence hypothesis (Elbert et al., 2006; Widom, 1989), the correlation between appetitive aggression and higher social status (Crombach et al., 2013) and reports of former child soldiers about the gradual transformation of the perception of violence (Elbert et al., 2010; Maclure & Denov, 2006) support this idea. Further research is needed to clarify the causal relation between perpetration of violence and appetitive aggression.

1.3 Exposure to violence and mental health

Prior research has consistently shown that the greater the cumulative exposure to traumatic experiences, including organized violence, the greater the risk of trauma-related disorders, including PTSD, depression, or substance abuse (Amone-P’Olak, Garnefski, & Kraaij, 2007; Catani et al., 2008; Chapman et al., 2004; Edwards, Holden, Anda, & Felitti, 2003; Hermenau et al., 2011). In war and crisis regions, soldiers and combatants are exposed to severe forms of violence on a daily basis. The brain adapts to frequent stressors and danger, such as those posed by war and armed conflict, by prioritizing a stress-responsive pathway. This pathway helps the individual to react to danger with aggression or flight, but it is also related to a higher risk of mental illness (Elbert et al., 2006). Exposure to severe and traumatic stress may lead to the development of PTSD and other trauma related mental disorders. As exposure to different types of traumatic stressors increases, the prevalence of PTSD and other manifestations of mental illness increase. This “building-block-effect” of cumulative trauma has been found throughout many crisis regions (Elbert et al., 2009; Kolassa & Elbert, 2007; Neuner, Schauer, Karunakara, et al., 2004). Previous research indicates that life-threatening situations create a fear network that activates and reinforces all highly arousing emotional-sensory and somatic memories of the traumatic experience, as the connections between intense aspects of the memories are strengthened, the influence of contextual information is weakened (see also Figure 1.2 a): The “when and where” of each experience is not integrated into the network, its elements are no longer perceived as memories from a different time and place, the horror becomes omnipresent. This network of trauma-related sensations, emotions and thoughts is held to explain the development of most of the
sympotms from the spectrum of trauma related disorders. Thus, one of the main consequences of untreated traumatic experiences is that the emotional-sensory (“hot”) past continuously pushes into the present. The memories remain largely implicit, making it impossible for the traumatized to talk about them, a phenomenon, that has been called “speechless terror” (Elbert et al., 2006, 2010; Elbert & Schauer, 2002; Schauer & Elbert, 2010).

1.4 Perpetration of violence and mental health

Perpetrating violence may also have a direct impact on the mental health of perpetrators. In a number of studies, researchers rated perpetrating violent acts (e.g., killing or raping) as traumatic experiences (Bayer et al., 2007; Vinck et al., 2007). Following DSM-IV (American Psychiatric Association, 2000), a life event is classified as traumatic if it produces feelings of helplessness, horror, or massive fear. Perpetrating violence (e.g., torturing or raping), however, might not necessarily result in a fearful or horrified response and is not always linked to forms of helplessness.

In a number of studies with veterans and in historical cases, MacNair (2001, 2002, 2006) explored the impact of perpetrating violence, particularly killing, on the mental health of perpetrators. In a study with Vietnam veterans, she found that those veterans who reported that they have killed someone showed higher posttraumatic stress disorder (PTSD) scores than those who did not. The effect size of the group difference was large and remained significant after controlling for battle intensity (MacNair, 2002). She concluded that perpetrating violence, particularly killing, leads to enhanced risk for PTSD. Hence, MacNair suggested the term perpetration-induced traumatic stress. The idea of perpetration-induced traumatic stress also hints that the human mind is not well set up for killing (MacNair, 2001). This idea is supported by Grossman (1995) who showed in historical studies of war that only small portions of soldiers have actually shot in combat, despite doing other brave and supportive actions. He concluded that there seems to be a great resistance in the human being to the act of killing. Accordingly, studies on Vietnam veterans have reported a high degree of PTSD in former soldiers (Kulka et al., 1990). Even professional torturers reported trauma-associated symptoms and Milgram reported that participants in his study on obedience reported distress when they applied electroshocks (Gibson & Haritos-Fatouros, 1986; Milgram, 1963).
In contrast to MacNair, Pfeiffer and Elbert (2011) found in a study with former child soldiers in northern Uganda that the duration spent within a rebel group is correlated negatively with the PTSD symptom severity (Figure 1.1). The longer a child soldier was abducted, the lower the sum score of the PTSD symptoms, but still within a clinically significant range.

One possible explanation may be that those who have a greater symptom score are more likely to be killed in the bush, or more likely to escape. While this possibility cannot be completely ruled out, it would require that fatalities were even higher than the worst estimates. Thus Pfeiffer and Elbert (2011) concluded that child soldiers seem to have adapted to the violent environment of an armed group with some resilience against PTSD. They argue that this adaptation can be seen as a protective coping mechanism, enabling the denial of ongoing horrifying events. In line with this finding, Bayer et al. (2007) found in a study with child soldiers from Uganda and the DRC that only 35% of the former child soldiers suffered from PTSD, despite having experienced a high number of traumatic events. Furthermore, Elbert et al. (2010) reported that many soldiers and combatants described perpetrating violent acts as fascinating, appealing, and exciting. Concordantly, a number of studies with former child soldiers in Uganda (Weierstall et al., 2012), former combatants in Colombia (Weierstall et al., 2013) and genocide perpetrators in Rwanda (Weierstall et al., 2011) provide first evidence that appetitive aggression may prevent trauma-related illnesses.
Thus, the findings concerning the impact of perpetrating violence on the mental health remain contradictory and need further clarification. As a number of studies have provided first evidence that appetitive aggression may moderate the impact of perpetrated violence on the mental health of the perpetrator, I will outline the theoretical considerations and first findings concerning the interplay between appetitive aggression and mental health in the next section.

1.5 Appetitive aggression and mental health

In war and crisis, the cumulative exposure to traumatic stressors constitutes a predictor of endemic mental illness. This would also make combatants and soldiers highly vulnerable for mental disorders, as they are exposed to a great number and variety of traumatic stressors. Baumeister and Campbell (1999), however, emphasized that to understand the psychology of perpetrators, it may be necessary to distance oneself from the victim’s view as the perception of violence differs remarkably between the perpetrator’s and victim’s perspective. Correspondingly, studies with former child soldiers reported only low rates of trauma-related suffering (Bayer et al., 2007; Pfeiffer & Elbert, 2011). For example Elbert et al. (2010) found a correlation between the PTSD symptom severity and traumatic experiences that child soldiers experience during their civil life, yet they did not find this frequently observed building-block-effect for their lives as rebels. Concurrently, the literature from several wars and conflicts provides anecdotal evidence that under certain circumstances normal people could become extremely violent and seem not to suffer under their atrocities but rather enjoy their cruelty (see Introduction). Thus in male combatants, exposure to and exertion of violence may not necessarily increase the likelihood of PTSD. In line with these findings, the testimony of former child soldiers describes the reaction of “cruel people” to killing as precisely the opposite of “speechless terror” (Elbert et al., 2010):

“[...] after they have killed someone, they sit together and talk about their killing stories like an adventure and re-enact the victim’s suffering with scoff and laughter [...]” (Elbert et al., 2010, p. 103).

Why does exposure to and perpetration of violence not produce widespread mental suffering in perpetrators of severe atrocities?

These findings strongly suggest that there is a protective mechanism that counters the extension of the fear network that would be expected to occur with each additional life-threatening experience or exposure to violent cues (Weierstall et al., 2011). Elbert and colleagues (2010) suggested that in analogy to the fear network (Elbert et al., 2006; Elbert &
Schauer, 2002), perpetrators form a hunting network, marked by approach rather than avoidance of violent cues. Whereas exposure to violent acts leads to an extension of the fear network, arousing or appetitive elements that arise during the perpetration of violence are integrated into the hunting network (Figure 1.2). The massive exposure to violence as a victim leads to an extension of a fear network, which can be triggered by re-exposure to a violent cue. This in turn then evokes a massive alarm response. In contrast, exposure to the same violent cues from the perpetrator’s perspective would form connections that are integrated with the appetitive elements of the hunting network. Thus perpetrators may perceive violent cues as appetitive instead of aversive. This “hunting network” seems to stimulate appetitive arousal when a sufficient number of its memory elements have been activated by respective exteroceptive and interoceptive stimuli.

However, as violence cues share many sensations, cognitions and physiological responses with those that may also form part of the fear network, the exposure to violence can cause severe distress even to very active perpetrators, if the integration into the hunting network fails and memories are integrated into the fear network (see Figure 1.2).
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Figure 1.2: Competition between the (a) fear network and (b) the hunting network: (a) Repeated experience of traumatic stress forms a fear network of related sensory, cognitive and physiological memories that are detached from contextual cues such as time and location of the danger and serve as explanation for most of the PTSD symptoms. (b) Hunting experiences also form a network of related sensory, cognitive and physiological memories, which may be very similar to the contents of the fear network. However, the affective valence of much of the emotional experiences and memories is exactly opposite: The fear network links the memories of the event only to negative affect, while the valence of the disposition to hunt is intrinsically positive (from Elbert et al., 2010).

Hence Elbert et al. (2010) suggested that becoming a perpetrator can result in appetitive behavior disconnecting many of the cues, like for instance “blood” from the neural fear network as they become associated with the fascination for violence. This pruning of the fear network may result in a decreased vulnerability for PTSD. Due to the fact that the appetitive, fascinating element of violence seems to prevent the incorporation of the cruel, genuinely traumatizing experiences into the fear network “cruel people” may have a higher chance of survival in the bush (Elbert et al., 2010). This may also explain the initially surprising findings that many former child soldiers and ex-combatants did not fall ill within the trauma spectrum (PTSD, depression, substance abuse) although they went through tremendously distressing experiences and ongoing threats of torture and death. Thus the possibility that appetitive aggression, including planning, perception and experience of violent acts, may promote resilience for PTSD can be explained on the basis of the competition between the networks representing the generalized fear and hunting experiences.
In accord with this, a number of studies have found a negative relation between PTSD symptom severity and appetitive aggression. In a study with genocide perpetrators in Rwanda, Weierstall et al. (2011) found a dose-response effect between the exposure to traumatic events and the PTSD symptom severity. Moreover, participants who had reported that they perpetrated more violence demonstrated higher appetitive aggression. In turn, higher appetitive aggression was negatively related to PTSD symptom severity. Thus, the results indicated that appetitive aggression might inhibit PTSD and trauma-related symptoms in perpetrators and prevent perpetrators from getting traumatized by their own atrocities. These findings could be replicated in two further studies, one with Ugandan child soldiers (Weierstall et al., 2012) and one with Colombian ex-combatants (Weierstall et al., 2013). Concordantly, Elbert et al. (2010) stated that appetitive aggression buffers the risk of PTSD, as the integration of violent cues into the hunting network (and not into the fear network) may reduce the likelihood of a trigger-related activation of the fear network. On the other hand, they argue that this protective effect may wane if the combatant exceeds a certain level of traumatization due to an overlap of the hunting and the fear networks. With a greater number of items linked to the fear network, comes a higher likelihood of the fear network being triggered. Consequently, the combatant may experience trauma related symptoms. Although perceiving the perpetration of violence as fascinating and arousing can lead to a substantial risk-reduction, cumulative trauma exposure will eventually trigger a trauma-related disorder (Weierstall et al., 2012).

In summary, previous studies have presented first evidence that perpetrators perceive committing violence as fascinating, arousing and thrilling. The appetitive perception of aggression and violence is accompanied by increased cruelty and brutality but lower rates of mental suffering (Weierstall et al., 2011, 2012). Hence, Elbert et al. (2010) suggested that in analogy to the fear network, perpetrators form a hunting network integrating the arousing or appetitive elements that arise during the perpetration of violence. Thus, the appetitive and fascinating element of violence prevents the incorporation of the cruel, genuinely traumatizing experiences into the fear network. Concordantly, they conclude that the competition between hunting and fear network may explain a partial defense against trauma-related disorders in perpetrators. A few studies in war and crisis regions have supported this idea, however, further research is needed to understand the altered perception of violence when it is committed from the perpetrator’s perspective and its impact on the perpetrator’s mental health.
1.6 Substance consumption and violence

Most scholars in political science examining the link between drugs and conflict have focused on the revenue dynamic linking these two concepts (Cornell, 2007; Fjelde & Nilsson, 2012; Piazza, 2012). Selling drugs gives armed groups the means to prolong the conflict by allowing them to buy, for example, weapons and to attract recruits. However, few researchers have focused on another possible ongoing dynamic, i.e. how drugs intake is related to the combatant’s behavior on the battlefield.

Prior research in psychology has repeatedly shown that exposure to violence enhances the risk of substance abuse and addiction (Odenwald, Hinkel, et al., 2007). On the other hand, some other studies give additional insights into the link between substance use and violent behavior. Alcohol consumption is often connected to violence and aggression (Hoaken & Stewart, 2003). Previous research indicates that the most commonly accepted mechanism for alcohol-induced aggression is through the disinhibition of fear via anxiolytic action (Lavine, 1997). For example, alcohol can affect cognitive functions in such a way as to decrease the capacity to plan actions in response to threatening situations. Alcohol may also increase the perception of pain as a cause of greater defensive aggression (Boles & Miotto, 2003).

Although alcohol is clearly the drug with the most evidence to support an intoxication–violence relationship, a number of studies have also found a relationship between physical aggression and use of other drugs, although the results are less robust (Hoaken & Stewart, 2003). The association between cocaine use and physical aggression is one of the relations that is well established (Inciardi & Pottieger, 1994; Macdonald et al., 2003; Miller, Gold, & Mahler, 1991). Less is known, however, about the association between violence and marijuana use (Moore & Stuart, 2005). Cannabis in most recreational settings decreases aggressive feelings in humans and increases sociability (Ashton, 1999). However, research has shown that predisposed individuals, especially if under stress, become aggressive after taking cannabis (Grenyer, Solowij, & Barlow, 1999). There is also some evidence that chronic use of marijuana can eventually alter the nervous system in a way that disrupts social communications; an effect that may increase one’s involvement in altercations that escalate to violence (Reiss & Roth, 1993). Furthermore, its abuse is also connected to crimes of violence (Boles & Miotto, 2003). For example, Spunt, Goldstein, Brownstein and Fendrich (1994) showed that marijuana was often used in the 24-hour period before homicide. In summary, the studies investigating the link between marijuana consumption and aggressive or violent behavior revealed either mixed or contradictory findings concerning the intoxication–violence relationship, but we can conclude that under certain circumstances
marijuana consumption seems to lower the threshold for aggressive and violent behavior (Moore & Stuart, 2005; Reiss & Roth, 1993).

Overall, these studies suggest a link between substance use and violent behavior. Substance consumption seems to decrease the threshold for using violence, i.e. it removes the learned constraints and thus facilitates aggressive behavior. At the same time, specific substances, particularly alcohol, seem to incite violence directly via aggression and rage. Thus, the consumption or abuse of alcohol or drugs may play an important role in violent environment and may influence the interplay between both exposure to and perpetration of violence as well as its impact on mental health and aggressive behavior.

1.7 Exposure to violence and aggressive behavior

Curtis (1963) coined the saying “violence breeds violence” 50 years ago. He expressed the concern that abused or neglected children may become perpetrators of violence in adolescence or adulthood. For obvious ethical reasons, the validity of this idea cannot be assessed by direct experimental manipulations. However, converging evidence suggests that experiencing violence is related to expressing violence: For instance, parents who were abused as children are more likely to abuse their own children. Rates of abuse double for parents who themselves grew up in violent environments compared to parents who did not (Elbert et al., 2006). Prospective and retrospective studies on children who were abused or neglected disclosed a high incidence of later delinquency. For example, children clinically referred to residential treatment with a history of abuse scored significantly higher on measures of aggression than non-abused control children (Connor, Doerfler, Volungis, Steingard, & Melloni, 2003). Violence exposure occurring specifically in the home, school, or community has been associated with the development of conduct problems in children. Likewise, violence victimization was found to be the single best predictor of juvenile violent behaviors for children in a sample of adolescents (Blum, Ireland, & Blum, 2003; Weaver et al., 2008). Finally, a large proportion of homicide offenders come from unfavorable home environments and up to 80% of subjects within delinquent samples reported witnessing violence in their childhood or adolescence (Elbert et al., 2006).

It is important to note that effects are exerted from early childhood on, when plasticity for brain and mind is the greatest. Developmental studies indicate that abuse and neglect are related to aggressive behavior in children from infancy onwards (Widom, 1989). Although relatively short-term, these developmental studies provided serious ground for concern, given the literature that suggested that aggressiveness is a fairly stable personality trait and that early aggressiveness was predictive of later antisocial behavior (Widom, 1989). Thus,
violent childhood experiences may leave their mark on the brain and mind of the affected individuals, a vulnerability that interacts with future stressful experiences. Extreme or continuous stress may drive the individual into an increasingly maladaptive state with the potential for mental disorders (Elbert et al., 2006). Concordantly, Van der Kolk and Fisler (1994) emphasized that abused children often fail to develop the capacity to express specific and differentiated emotions, which seems to promote aggressive behavior. Similarly, high rates of traumatic and violent experiences were found in a sample of juvenile delinquents (Abram et al., 1994). Thus, traumatic experiences or exposure to violence appears to play an important role in individuals showing violent or antisocial behavior.

Furthermore, studies in war and crisis regions addressing consequences of traumatic experiences found increased impulsive aggression towards intimate partners (Byrne & Riggs, 1996). Accordingly, exposure to violence during civil war was highly correlated with the amount of violent behavior inflicted on children in their families in a study conducted in post-war Sri Lanka (Catani et al., 2008). The authors concluded that children in post-war societies might not only be affected by violence occurring within the framework of organized violence, but also by family violence. Moreover, research with former child soldiers revealed that child soldiers who have been frequently and severely exposed to violence perpetrated more types of violence (Weierstall et al., 2012). This relationship is well explained by the hypothesis of a cycle of violence. The authors concluded that their findings provide further evidence that violence breeds violence. However, their conclusions were not limited simply to reactively aggressive acts grown from trauma-related suffering or difficulties in regulating emotions. Instead, Weierstall and colleagues (2012) proposed that exposure to violence may also foster appetitive aggression, which in turn increases the likelihood of violent offenses. The study implied that in an environment dominated by organized violence, exposure to violence and other traumatic stressors seems to increase appetitive aggression and further violent behavior, thus driving a cycle of violence (Elbert et al., 2010).

Following the ‘cycle of violence’ hypothesis, one would predict that high levels of war violence lead to higher levels of violence within the family and community (Catani et al., 2008; Elbert et al., 2006; Widom, 1989). Community and family violence includes all types of interpersonal violence, for example physical, emotional or sexual violence, within the community or the family. Corporal punishment forms a typical and very common subtype of physical violence in families and schools. Commonly corporal punishment is defined as ‘the use of physical force with the intention of causing (bodily) pain, but not necessarily injury, for purposes of correction or control of the child’s behavior’ (Straus, 2010). The prevalence and effects of corporal punishment have been a controversial topic of discussion in the literature
for several decades (Gámez-Guadix, Straus, Carrobles, Muñoz-Rivas, & Almendros, 2010; Gershoff, 2002; Straus, 2001). Research in multiple countries indicates that corporal punishment by parents is more prevalent and more severe than is generally realized (Straus, 2010). The rates of corporal punishment in a study of 32 countries on six continents ranged from less than 20% in Sweden and the Netherlands to almost 75% in China. Most available research indicates that there are few, if any, positive developmental outcomes associated with corporal punishment. In fact, the detrimental effects of corporal punishment have been demonstrated repeatedly (Gershoff, 2002). In addition to physical injury, corporal punishment and family violence are associated with a number of emotional and behavioral problems in childhood, adolescence and adulthood (Catani et al., 2008; Felitti et al., 1998; Hermenau et al., 2011; Repetti, Taylor, & Seeman, 2002). Of these links, the strongest has been shown to exist between corporal punishment and externalizing behavior problems, such as aggressive and delinquent behavior (Strassberg, Dodge, Pettit, & Bates, 1994). In line with the ‘cycle of violence’ hypothesis, Strassberg et al. (1994) found that children who had been spanked reported higher levels of aggressiveness. Consequently, the researchers concluded that in spite of parents’ goals, corporal punishment fails to promote prosocial development and is instead associated with higher rates of aggression toward peers. Other studies were able to replicate and thus confirm the relation between family violence or corporal punishment and both reactive and proactive aggression as well as delinquent and antisocial behavior in children and adolescents (Connor, Steingard, Cunningham, & Anderson, 2004; Fantuzo & Mohr, 1999; Schilling, Aseltine, & Gore, 2007). A longitudinal study conducted by Mulvaney and Mebert (2007) revealed that early corporal punishment was associated with increased externalizing behavior problems both in toddlerhood (36 months) and in the first grade. Concordantly, experiencing corporal punishment at age 10 predicted violent behavior and delinquency in adolescence (Weaver et al., 2008). A meta-analysis provided further evidence of the association between corporal punishment and numerous undesirable behaviors and experiences; corporal punishment was associated, among others, with an increase in child aggression, child delinquent and antisocial behavior, as well as an increase of aggression, criminal and antisocial behavior in adulthood (Gershoff, 2002). Despite controlling for children’s temperament and earlier levels of aggression, parents’ use of corporal punishment continued to significantly predict children’s later aggression (Weiss, Dodge, Bates, & Pettit, 1992).
Thus, previous research provides some evidence of a cycle of violence perpetuating itself through families, schools, and communities in interactive and complex patterns (Weaver et al., 2008). Likewise, a violent environment seems to facilitate the development of further violent behavior. However, little is known about the occurrence of corporal punishment in Sub-Saharan Africa and its link to aggressive behavior. A few studies have revealed the extensive use of corporal punishment in schools in developing countries (Anderson & Payne, 1994). In a UNICEF report about the use of corporal punishment against children in 35 middle- and low-income countries, of the 10 countries in which corporal punishment was found to be very common, six are in Sub-Saharan-Africa (UNICEF, 2010). In these countries more than 80% of the children reported frequent corporal punishment at home. In a study from Nigeria, Ani and Grantham-McGregor (1998) described high levels of corporal punishment both at home and in school and linked it to children’s aggressive behavior.

In both relatively peaceful and war-torn countries and regions in Sub-Saharan Africa, corporal punishment at home or at school seems to be very common. Further research is needed to examine how early and frequent exposure to violence shapes behavior of the affected children.

### 1.8 Breaking the cycle of violence

When ex-combatants or former child soldiers return to their civil homes, they may be able to control their emotions and the desire for aggression, but there are so far no insights into how well or for how long this will work. Elbert et al. (2010) argue that the potential to switch back to the ‘aggressor mode’ might explain why it is extremely difficult to pacify crisis regions or restrict the risk of violent recidivism in former offenders. This corresponds well with findings in Angola showing a high percentage of former adolescent combatants commit offences or become bandits (Wessells & Monteiro, 2004). On the other hand, ex-combatants and former child soldiers can be easily re-recruited by the army or other armed groups. The reasons for former combatants to rejoin armed forces are not necessarily financial; perceiving violence as fascinating and appetitive may suffice to reenlist in armed forces or armed bandit gangs in war-torn regions like southern Sudan, northern Uganda, eastern DRC, Somalia or Afghanistan. As long as these considerations are not taken into account, lasting peace and law-and-order may be impossible to establish in these conflict regions. The successful integration of violent offenders such as former combatants into civil society may help to prevent further violence. In line with this idea, organized violence was linked to higher levels of family violence in post-conflict countries (Catani et al., 2008). Therefore, we need to understand the interplay between organized and family violence, mental health and aggression in order to break the cycle of violence and prevent further violence in the conflict
regions, communities and families. However, up to now, little is known about how to prevent violence in post-conflict societies and how to repair failed states that house irregular forces (Elbert et al., 2010).

Following disarmament and demobilization, integration of ex-combatants and child soldiers into civil society is implemented to stabilize countries after armed conflicts (Annan, Brier, & Aryemo, 2009; Kingma, 1997; McMullin, 2004). The success of reintegration programs can be blocked by mental health problems and aggression (Annan et al., 2009). PTSD symptoms like concentration problems, flashbacks, sleeping problems and hyperarousal can lead to impaired functionality and a greater risk of dropping out of the program (Betancourt, Simmons, Borisova, & Brewer, 2008; Mogapi, 2004). Likewise, aggressive behavior that leads to interpersonal problems can cause discontinuation of reintegration programs (Boyden, 2003). If ex-combatants drop out of the reintegration programs they are at high risk for violent and delinquent behavior (Stott, 2009).

Previous research has consistently revealed appetitive aggression as a common phenomenon among male perpetrators, however, there is no adequate therapeutic intervention available yet addressing appetitive aggression (Weierstall & Elbert, 2011). Nevertheless such a therapeutic intervention would be essential for the reintegration of former combatants into society. Thus reintegration programs need to address mental health and aggression so that ex-combatants can fully profit from integration efforts (Hill & Langholtz, 2003). Furthermore, they need to find closure with their past as well as change their self-image from “combatant” to “civilian” (Boyden, 2003; Williamson, 2006). Even though some reintegration programs include a counseling or psychosocial component, they are often not evaluated and adjusted to the individual combatant’s needs (Hoge, 2011; Maedl, Schauer, Odenwald, & Elbert, 2010; Malan, 2000; Mogapi, 2004; Stott, 2009). Stott (2009) states that reintegration programs shifted their focus from individual psychological help to a community level, neglecting that social reintegration can only be successful if individual psychological suffering is addressed as well. A combination of the essential components of reintegration, like community approaches and economic support, with psychological support may be most effective in targeting successful reintegration (Betancourt et al., 2008; Mogapi, 2004; Stott, 2009).

Based on previous work in Uganda (Pfeiffer & Elbert, 2011; Weierstall et al., 2012), Rwanda (Weierstall et al., 2011) and the DRC (Weierstall et al., in press), we developed an intervention to bridge this gap in reintegration programs and to break the cycle of violence. It broadly follows the logic of the evidence-based trauma-focused Narrative Exposure Therapy (NET; Ertl et al., 2011; Hoge, 2011; Schauer et al., 2011). However, we adapted it to address
both traumatic experience and perpetrated violence. As Medeiros (2007) stated, it is crucial to overcome the dichotomy of victim and perpetrator to address the complexity of the former combatants' feelings and experiences. The Narrative Exposure Therapy for Forensic Offender Rehabilitation (FORNET) aims to reduce both PTSD symptoms and appetitive aggression by recalling the experiences through narrative exposure. It helps the former combatant to anchor not only fearful and traumatic experiences but also positive feelings that might have been linked to various forms of aggressive behavior in the past. The role change from a combatant to a civilian is specifically addressed and reinforced. Additionally, visions for the future are developed in order to foster successful integration into society. Besides disarmament, demobilization and social and economical integration into civil society, many former combatants also need psychological support to demobilize their mind. In a pilot study we tested the efficacy of the FORNET using a randomized controlled trial with former combatants and child soldiers participating in a reintegration program offering vocational training and education in the eastern DRC.

1.9 The rationale of the present thesis

The phenomenon of appetitive aggression has only recently begun to receive attention. Likewise, Elbert et al. (2010) stated that appetitive aggression has until now received too little scientific attention. With the present thesis I focused on this appetitive form of aggression in former combatants and child soldiers. Furthermore, the present thesis investigated the interplay between exposure to and perpetration of organized and family violence and its impact on mental health and aggression in children and adults alike. With the different studies and articles I try to answer the following research questions:

1) What are the predictors or correlates of appetitive aggression?
2) How are exposure to and perpetration of violence related to (appetitive) aggression?
3) How are exposure to and perpetration of violence associated with mental health problems?
4) Does appetitive aggression buffer the risk of developing posttraumatic stress disorder symptoms?
5) How are alcohol consumption and drug intake linked to the perpetration of violence?
6) Can psychological interventions focusing on trauma-related suffering and appetitive forms of aggression help to break the cycle of violence and improve the rehabilitation of violent offenders?
In the six articles that constitute this thesis I will provide preliminary answers to the research questions. The first article investigated the association between exposure to family violence, particularly corporal punishment, and aggressive behavior in primary school students in Tanzania. The second article focuses on the phenomenon of appetitive aggression and its predictors and correlates in ex-combatants and former child soldiers in the eastern DRC. The third article examines the impact of perpetrated violence on the mental health of ex-combatants and former child soldiers in the eastern DRC. The fourth article concentrates on the research question, whether appetitive aggression buffers the risk of developing posttraumatic stress disorder symptoms in ex-combatants and former child soldiers in the eastern DRC. The fifth article focuses on the linkage between alcohol consumption and drug intake and the perpetration of violence from a political science perspective. In the last article a longitudinal randomized controlled trial was described testing the efficacy of FORNET, a psychological intervention addressing traumatic experiences and perpetrated violence in former combatants and child soldiers from the eastern DRC. In the last section of this thesis I will discuss all findings of the six articles and present conclusions and implications for further research and clinical practice.
2 The relationship between corporal punishment and children’s aggressive behavior: A cross-sectional study of Tanzanian primary school students

2.1 Abstract

Background: An association between corporal punishment and impaired mental health and functioning in children has been demonstrated repeatedly in industrialized countries. Nevertheless, corporal punishment has remained common practice not only in many homes, but is also regularly practiced in schools, particularly in low-income countries, as a measure to maintain discipline. Proponents of corporal punishment have argued that the differences in culture and industrial development in low-income countries might also be reflected in a positive relationship between the use of corporal punishment and improving behavioral problems in low-income nations.

Methods: In the present study we assessed the occurrence of corporal punishment at home and in school in Tanzanian primary school students. We also examined the association between corporal punishment and aggressive behavior. The 409 children (52% boys) from grade 2 to 7 had a mean age of 10.49 (SD = 1.89) years.

Results: Half of the respondents reported having experienced corporal punishment within the last year in the family. Nearly all of them had experienced it at some point during their lifetime both in the family and school contexts. A multiple sequential regression analysis revealed that corporal punishment by parents or by caregivers was positively related to children’s aggressive behavior.

Conclusions: The present study provides evidence that Tanzanian children of primary school age are frequently exposed to extreme levels of corporal punishment, with detrimental consequences for externalizing behavior. Our findings emphasize the need to inform people and governmental organizations, especially in low-income countries, about the adverse consequences of using corporal punishment both at home and at school.

Keywords: corporal punishment, aggressive behavior, children, Sub-Saharan Africa, Tanzania
2.2 Background

The prevalence and effects of corporal punishment have been a controversial topic for decades (Gámez-Guadix et al., 2010; Gershoff, 2002; Straus, 2001). Corporal punishment is commonly defined as ‘the use of physical force with the intention of causing (bodily) pain, but not necessarily injury, for purposes of correction or control of the child’s behavior’ (Straus, 2010). Most available research indicated that there are few, if any, positive developmental outcomes associated with corporal punishment. In fact, the detrimental effects of corporal punishment have been demonstrated repeatedly (Gershoff, 2002). In addition to physical injury, corporal punishment and family violence are associated with a number of emotional and behavioral problems that begin in childhood but may last through adolescence and adulthood. Adverse effects include aggressive or delinquent behavior, conduct disorder, substance abuse, post-traumatic stress disorder, anxiety, depression, reduced self-esteem, and suicidal behavior (Catani et al., 2008; Felitti et al., 1998; Hermenau et al., 2011; Repetti et al., 2002). Of these links, the strongest has been shown to exist between corporal punishment and externalizing behavior problems, especially aggressive behavior (Strassberg et al., 1994; Straus & Kantor, 1994). For example, Strassberg et al. (1994) found that children who had been spanked reported higher levels of aggressiveness. Consequently, the researchers concluded that, in spite of parents’ goals, corporal punishment fails to promote prosocial development and is instead associated with higher rates of aggression toward peers. Other studies were able to replicate these findings, confirming the relationship between family violence or corporal punishment and both reactive and proactive aggression as well as delinquent and antisocial behavior in children and adolescents (Connor et al., 2004; Fantuzo & Mohr, 1999; Schilling et al., 2007). A longitudinal study conducted by Mulvaney and Mebert (2007) revealed that early corporal punishment was associated with increased externalizing behavior problems both in toddlerhood (36 months) and in first grade. Concordantly, experiencing corporal punishment at age 10 predicted violent behavior and delinquency in adolescence (Weaver et al., 2008). A meta-analysis provided further evidence of the association between corporal punishment and numerous forms of undesirable behavior: Corporal punishment was associated with, among others, an increase in child aggression, child delinquent and antisocial behavior, and an increase of aggression, criminal and antisocial behavior in adulthood (Gershoff, 2002). Despite controlling for children’s temperament and earlier levels of aggression, parental use of corporal punishment continued to significantly predict children’s later aggression (Weiss et al., 1992).
Different approaches to conceptualize the association between corporal punishment and children’s aggression have been discussed in the literature (Gershoff, 2002; Lee & Hoaken, 2007). For example, learning theory posits that corporal punishment models aggression, attribution theory holds that corporal punishment is unable to facilitate children’s internalization of morals and values, and social control theory postulates that corporal punishment erodes the parent–child relationship. Of the theories addressing this issue, social information processing theory has received some of the strongest empirical support. Applied to parental use of corporal punishment, social information processing theory suggests that the experience of corporal punishment affects how children process information about the behavior and intention of others. For example, harshly treated children may be hypervigilant to hostile cues, attribute hostile intent to others, access more aggressive potential responses, and may be more likely to consider aggression a viable route to achieving social benefits (Dodge, 1986; Gershoff, 2002). This idea is supported by findings demonstrating that deficits in children’s social information processing mediated the association between parental corporal punishment and increased aggression in childhood, adolescence, and adulthood (Dodge, Bates, & Pettit, 1990; Dodge, Pettit, Bates, & Valente, 1995; Weiss et al., 1992).

Research conducted in multiple countries has indicated that corporal punishment by parents is both more prevalent and more severe than is generally realized (Straus, 2010). In a study encompassing 32 countries on six continents, the rates of corporal punishment ranged from less than 20% in Sweden and the Netherlands to almost 75% in China. Studies in high-income countries have consistently linked corporal punishment with current and future aggressive behavior. However, little is known about the occurrence of corporal punishment and its link to aggressive behavior in low-income countries, especially in Africa. Research has shown the extensive use of corporal punishment in schools in resource-poor countries (Anderson & Payne, 1994). In a UNICEF report on the use of corporal punishment against children in 35 middle- and low-income countries, six of the 10 countries in which corporal punishment was found to be very common are in Sub-Saharan Africa (UNICEF, 2010). In these countries more than 80% of the children reported frequent use of corporal punishment at home. In a study conducted in Nigeria, Ani and Grantham-McGregor (1998) described high levels of corporal punishment both at home and in school and also linked it to aggressive behavior in the children in their study.

In Tanzania, only 28% of secondary school students strongly disagreed that they were spanked or hit often before the age of 12 (Straus, 2010). In a study conducted at secondary schools in Tanzania, 40% of the teachers reported the frequent use of corporal punishment, defined as more than ten times a week. Interviews with teachers and students confirmed that caning was the most frequently used method of corporal punishment in schools (Feinstein &
Corporal punishment and children’s aggressive behavior

Mwahombela, 2010). In 2009, a national survey concerning violence against children with a representative sample of more than 3,700 youths between the ages of 13 and 24 found that almost three-quarters of both females and males had experienced physical violence by a relative or authority figure prior to the age of 18 (UNICEF, 2011). The vast majority of this corporal punishment consisted of being punched, whipped, or kicked. More than half of girls and boys aged 13 to 17 years reported that they had experienced physical violence at the hands of either a relative or authority figure during the past year. Moreover, in a study with orphans and vulnerable children in Tanzania, Hermenau et al. (2011) reported a positive relation between exposure to violence and aggressive behavior displayed by the child. However, while much of the research has focused on the adolescent years little is known about the occurrence of corporal punishment at home for children of primary school age. Furthermore, the link between exposure to corporal punishment and children’s aggressive behavior has not been systematically examined in Sub-Saharan Africa, where caregivers and teachers have argued that corporal punishment may have different effects than in the industrialized world due to its role as part of “African culture”.

In the present study, we investigated the occurrence of corporal punishment in the home using a sample of Tanzanian primary school students, as well as the relationship between corporal punishment in the home and children’s aggressive behavior. Based on previous reports from Tanzania (Feinstein & Mwahombela, 2010; UNICEF, 2011), we hypothesized that a) primary school students in Tanzania experienced frequent and severe corporal punishment at home both throughout their lifetime and also within the previous 12 months. Furthermore, in concordance with prior research (e.g. Gershoff, 2002; Weaver et al., 2008) we predicted that exposure to corporal punishment is positively related to children’s aggressive behavior after controlling for possible confounding influences, such as sex and age.
2.3 Methods

2.3.1 Participants

The children participating in this study were enrolled at a private primary school in a town of approximately 100,000 inhabitants in southern Tanzania. We interviewed 409 children (52% boys) from class 2 to class 7 with a mean age of 10.49 (SD = 1.89, range: 6 - 15) years. The majority of the children lived together with their families. In total, 67% \((n = 273)\) of the children reported living together in a single household with their mother and 59% \((n = 242)\) with their father. Sixty-five children (16%) lived in institutional care and 10 children (2.4%) in foster families. In total, 89 (22%) children reported that at least one parent had died.

2.3.2 Procedure

A team of five Tanzanian psychologists, five German psychologists, and two Tanzanian psychology students conducted structured interviews with the children. All interviews were conducted in Swahili. The project leaders (TH and KH) were present throughout the training and data collection phases. The interviewers were qualified in the use of interview skills, conducting interviews with children, and the concepts of mental disorders and aggression, including role-plays and interview observation. The interviewers received instruction for these skills during a two-week training session. They were also trained in the translation of the instruments from English to Swahili and the translation of the participants' responses from Swahili to English for the German psychologists. All instruments were translated in written form to Swahili by committee and were intensely discussed to guarantee a precise translation. A written, blind back-translation into English ensured valid and accurate translation. One of the authors speaks Swahili fluently (TH) and thus could ensure valid translation as well as supervise the work of the Tanzanian staff. In addition, the project leaders supervised the research team throughout all stages of the study. Interview teams either consisted of one German and one Tanzanian or one or two Tanzanian staff members. The interview teams rotated their pairings continuously. The interviewers had standardized the form of assessment by conducting joint and double-rated interviews to achieve a high level of inter-rater reliability. In the total sample, 33 interviews were double-rated to assess and ensure high inter-rater reliability.

Our study was conducted in close cooperation with the school. Before data collection we sent a letter and a written informed consent form to all parents or caregivers of the children from class 2 to 7 explaining the purpose of the study. The letter clarified that the participation of the children would be entirely voluntary, no monetary compensation would be offered, and
invited them to call or meet the project leaders in case of additional questions. Approximately 80% of the parents and caregivers signed the informed consent and sent it back. Only children with an informed consent signed by their caregivers were included in the study. Every child was interviewed individually in a calm setting. Girls were interviewed by a female interviewer. The children were assured that the interview was confidential and that they were free to end the interview at any time. The interview took 1.5 hours on average. The Tanzanian Commission for Science and Technology and the Ethical Review Board of the University of Konstanz approved the study.

2.3.3 Measures

All instruments were applied as a structured interview. In this way, even young children could be interviewed using all instruments. The first part of the interview consisted of socio-demographic information, including age, grade and sex.

Corporal punishment was assessed with a checklist of four questions covering possible forms of corporal punishment by parents and caregivers (see Table 2.2). In the present sample the score for corporal punishment types ranges from 0 – 4 (see Table 2.1 for descriptive statistics and inter-correlations). Cronbach’s Alpha coefficient was .40 and the Cohen’s Kappa coefficient measuring the inter-rater reliability was > .99 (.98 – 1). Additionally, we asked two questions regarding exposure to and observation of corporal punishment by teachers at school.

Current aggressive behavior was assessed with the Reactive-Proactive Questionnaire (RPQ; Raine et al., 2006). The questionnaire assesses how often the child has shown a specific aggressive behavior in the last four weeks. Possible answer categories are never (0), sometimes (1) and often (2). Following Hermenau et al. (2011) one of the original 23 items was removed, as it was not appropriate for the conditions in Tanzania (Item 18: Made obscene phone calls for fun) and one item was slightly rephrased for a better understanding (Item 9: gang fight replaced with fight). This study used the current aggression score, which ranges from 0 to 44 (see Table 2.1 for descriptive statistic and inter-correlations). In the present sample the Cronbach’s Alpha coefficient was .85 and the Cohen’s Kappa coefficient was .99 (.94 – 1).

We assessed lifetime aggression and delinquent behavior with a checklist of 14 questions covering possible aggressive and delinquent actions during the child’s life. Sample items include “Have you ever taken things from others against their will?”; “Have you ever physically attacked another person (e.g. punched, beaten up, kicked or hit with an object)?” or “Have you ever injured another person dangerously?” In a manner similar to a trauma checklist we assessed the presence of different categories of aggression and delinquent
behavior but not the number of occurrences. Therefore, the interviewer rated the child’s report as never happened in life (0) or happened at least one time (1). This checklist has been successfully used in a sample of Burundian street children (Crombach & Elbert, 2013). We calculated a sum score by totaling up all of the question responses. The score of lifetime aggression types ranged from 0 to 14 (see Table 2.1 for descriptive statistic and inter-correlations). In the present sample the Cronbach’s Alpha coefficient was .77 and the Cohen’s Kappa coefficient was >.99 (.94 – 1).

The self-evaluation of internalizing and externalizing problems was assessed with the Strengths and Difficulties Questionnaire (SDQ; Goodman, Meltzer, & Bailey, 1998). The SDQ comes with good psychometric properties and is utilized internationally (Goodman, Ford, Simmons, Gatward, & Meltzer, 2000). We used the self-report version for children. It consists of 25 statements with corresponding response categories of *not true* (0), *somewhat true* (1) or *certainly true* (2). Each of the five subscales (conduct problems, hyperactivity, emotional symptoms, peer problems and prosocial behavior) consists of five items. The total difficulties score is generated by summing the scores of all items, except the items for prosocial behavior, and ranges from 0 to 40. On average, the participants reported a SDQ total score of $M = 10.08$ ($SD = 5.58$, range: 0 - 31). In the present sample the Cronbach’s Alpha coefficient was .67 and the Cohen’s Kappa coefficient was .99 (.94 – 1). In the present study we focused on the conduct problems scale (possible range: 0 – 10) as this scale also describes aggressive behavior of children (see Table 2.1 for descriptive statistic and inter-correlations). A score of 4 indicates an enhanced level of conduct problems and a score higher than 4 indicates an abnormal level. In total, 323 (79%) showed a normal level of conduct problems, 36 (9%) showed an enhanced level and 50 (12%) showed an abnormal level of conduct problems.
Table 2.1
Descriptive statistics and inter-correlations of all relevant variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Corporal punishment types</td>
<td>409</td>
<td>2.29</td>
<td>1.07</td>
<td>0 – 4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Current aggressive behavior</td>
<td>408</td>
<td>8.53</td>
<td>5.74</td>
<td>0 – 31</td>
<td>.33***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Lifetime aggression types score</td>
<td>396</td>
<td>3.62</td>
<td>2.75</td>
<td>0 – 12</td>
<td>.35***</td>
<td>.56***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Conduct problems (SDQ)</td>
<td>409</td>
<td>2.18</td>
<td>1.84</td>
<td>0 – 8</td>
<td>.28**</td>
<td>.40***</td>
<td>.34***</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Aggression total score</td>
<td>396</td>
<td>-0.03</td>
<td>2.35</td>
<td>-4.0 – 7.3</td>
<td>.40***</td>
<td>.83***</td>
<td>.81***</td>
<td>.73***</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6. Age</td>
<td>409</td>
<td>10.49</td>
<td>1.89</td>
<td>6 – 15</td>
<td>-.10*</td>
<td>-.14**</td>
<td>-.08</td>
<td>.07</td>
<td>-.07</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. M = mean, SD = standard deviation, *p ≤ .05, **p ≤ .01, ***p ≤ .001
2.3.4 Data analysis

For logistical reasons, thirteen interviews could not be completed. This resulted in all thirteen cases missing data concerning lifetime aggression and, in one case, missing data concerning current aggressive behavior. These data sets were excluded from all analyses that included these measures.

To regress the corporal punishment scores on aggression, we z-standardized the current aggression score (RPQ), the lifetime aggression score and the conduct problem score and calculated an aggression total score by summing up these three z-scores (see Table 2.1 for descriptive statistic and inter-correlations). To test the relationship between corporal punishment and aggressive behavior we conducted a multiple sequential regression analysis. First, we included only the potentially confounding variables of sex (female: 0; male: 1) and age as predictors. After controlling for these influences, we added ‘corporal punishment types’ to the model. The regression model fulfilled all necessary quality criteria for linear regression analyses. The residuals did not deviate significantly from normality (Kolmogorow-Smirnov-Z = 0.84, p = .479), linearity, or homoscedasticity. Following Stevens (2002), we defined values that deviate more than 3 standard deviations from the mean as outliers. That way we identified two univariate and nine multivariate (Cook’s Distance) outliers. Consequently, all outliers were excluded resulting in a sample size of n = 385. The maximum Variance Inflation Factor did not exceed 1.05. Therefore, we did not need to take multicollinearity into account. All analyses used a two-tailed α = .05. Our metric for a small effect size was \( f^2 \geq .02 \), for a medium effect, \( f^2 \geq .15 \); and for a large effect; \( f^2 \geq .35 \) (Cohen, 1992). Data was analyzed with IBM SPSS Statistics Version 21 for Mac.
Corporal punishment and children’s aggressive behavior

Table 2.2
Occurrence of corporal punishment during the children’s lifetime and within the last 12 months for boys (n = 214) and girls (n = 195)

<table>
<thead>
<tr>
<th>Question</th>
<th>Last year</th>
<th></th>
<th>Lifetime</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td></td>
<td>% (n)</td>
<td>% (n)</td>
<td>Chi²</td>
<td>% (n)</td>
</tr>
<tr>
<td>1) Has your parent/caregiver intentionally pinched, slapped, punched or kicked you?</td>
<td>27 (58)</td>
<td>27 (53)</td>
<td>&lt;0.01</td>
<td>69 (148)</td>
</tr>
<tr>
<td>2) Has your parent/caregiver spanked you with the palm of his/her hand on your buttocks, arms or legs?</td>
<td>23 (49)</td>
<td>24 (48)</td>
<td>0.08</td>
<td>55 (117)</td>
</tr>
<tr>
<td>3) Has your parent/caregiver spanked you with an object such as a strap,</td>
<td>36 (76)</td>
<td>37 (72)</td>
<td>0.09</td>
<td>83 (178)</td>
</tr>
<tr>
<td>belt, stick, tube, broom, wooden spoon, etc?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Has any parent/caregiver hit you so hard that you were injured?</td>
<td>7 (14)</td>
<td>3 (6)</td>
<td>2.63</td>
<td>26 (56)</td>
</tr>
<tr>
<td>5) Has your teacher intentionally pinched, slapped, punched or spanked (including with an object, e.g. a</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>98 (210)</td>
</tr>
<tr>
<td>stick) you?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) Have you witnessed that your teacher intentionally pinched, slapped, punched or spanked (including with</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>98 (209)</td>
</tr>
<tr>
<td>an object, e.g. a stick) another student?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note. Chi²: Persons Chi-Square statistics. **p ≤ .01.**
2.4 Results

2.4.1 Occurrence of corporal punishment

In total, 95% of the children reported that they have experienced at least one type of corporal punishment by their parents or caregivers during their lifetime (51% within the previous 12 months). The majority of the children have been punished with objects like sticks or belts (82%) or by being slapped, hit or pinched (66%). Almost one quarter (24%) has been hit so hard that he/she was injured. Additionally, about 95% reported having experienced corporal punishment at school and 98% having witnessed corporal punishment used against other children at school. Boys reported that they have experienced corporal punishment by teachers at school significantly more often (98%) than girls (91%; Chi$^2 = 9.83$, p = .003). Table 2.2 displays the frequencies of all different types of corporal punishment during the children's lifetime and within the last 12 months separately for boys and girls.

2.4.2 Corporal punishment and aggressive behavior

The first regression model with sex and age as predictors explained 2% of the variability of the aggression total score ($R^2 = .02$, $F(2, 382) = 4.54$, $p = .011$, $f^2 = .02$). Adding the corporal punishment score as additional predictor improved the model significantly ($\Delta R^2 = .15$, $F(1, 381) = 70.81$, $p < .001$, $f^2 = .20$). As shown in Table 2.3, ‘corporal punishment types’ were positively related to the aggression total score. The total regression model explained 17% of the variability of the total aggression score.
Corporal punishment and children’s aggressive behavior

Table 2.3
Results of regression analysis predicting the aggression total score

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>B</th>
<th>SE of B</th>
<th>β</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>0.60</td>
<td>0.22</td>
<td>.14</td>
<td>2.67**</td>
</tr>
<tr>
<td>Age</td>
<td>-0.11</td>
<td>0.06</td>
<td>-.09</td>
<td>-1.84</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>0.45</td>
<td>0.21</td>
<td>.10</td>
<td>2.16*</td>
</tr>
<tr>
<td>Age</td>
<td>-0.06</td>
<td>0.06</td>
<td>-.05</td>
<td>-1.02</td>
</tr>
<tr>
<td>Corporal punishment types</td>
<td>0.82</td>
<td>0.10</td>
<td>.40</td>
<td>8.42***</td>
</tr>
</tbody>
</table>

Note. adjR² = .17, f² = 0.21, n = 385, B: unstandardized regression weight, SE: standard error, β = standardized regression weight, T: t-test statistics. *p ≤ .05. **p ≤ .01. ***p ≤ .001.

2.5 Discussion

In accordance with our hypothesis we found very high rates of exposure to corporal punishment in our sample. Almost all children reported having experienced at least one type of corporal punishment at home. In addition, more than half of the children indicated that they had experienced at least one type of corporal punishment by a parent or a caregiver in the past 12 months. The majority of the children (82%) stated that they have been punished with sticks, belts or other objects, and almost one quarter of the entire sample has been punished so severely that they have been injured as a result. In addition to the in-home findings, we also found high rates of corporal punishment by teachers in school. Our findings are in concordance with prior research concerning corporal punishment in Tanzania (Feinstein & Mwahombela, 2010; UNICEF, 2011) and other countries (Straus, 2010; UNICEF, 2010). Using a systematic approach to completely assess grades 2 through 7 in one primary school, for the first time we provide evidence that high rates of corporal punishment at home seem to be not only common for adolescents but also for primary school-aged children in Tanzania.

Even controlling for the possible influences of sex and age, corporal punishment by parents or caregivers predicted the children’s aggressive behavior. Thus, children reporting more corporal punishment present with higher rates of aggressive behavior. Our findings were in
Corporal punishment and children's aggressive behavior

concordance with prior reports from Sub-Saharan Africa (Ani & Grantham-McGregor, 1998; Hermenau et al., 2011). Similar relations between corporal punishment or family violence and aggressive behavior have been reported in other countries worldwide (Connor et al., 2004; Fantuzo & Mohr, 1999; Gershoff, 2002; Schilling et al., 2007). Our results stand in contrast to the common assumptions made by many parents and caregivers that corporal punishment promotes prosocial behavior. Instead, our findings suggest a robust association between corporal punishment and children's aggressive behavior, which is in line with prior research (Strassberg et al., 1994). In the present study the effect size of this association implies a significant influence. Considering that 95% of the children in our sample have experienced at least one type of corporal punishment, the effects on the aggression levels of so many children may manifest into a considerable cause for concern at the societal level (Straus, 2001). That is even more troubling when one considers the cumulative effect of corporal punishment on a child's overall well-being, including increased aggression, and decreased mental health (Catani et al., 2008; Felitti et al., 1998; Gershoff, 2002; Straus, 2001). Longitudinal research suggests that exposure to corporal punishment during childhood predicts aggression and antisocial or delinquent behavior in adolescence and adulthood (Dodge et al., 1995; Mulvaney & Mebert, 2007; Weaver et al., 2008). High rates of corporal punishment hold the risk that victimized children may grow into adolescents or adults with increased aggressive behavior, conduct problems, and other mental health issues. Thus, further longitudinal studies are needed to investigate the causal relation between corporal punishment and aggressive behavior, particularly in countries and societies with high levels of corporal punishment. Given the extremely high rates of corporal punishment in countries such as Tanzania, corporal punishment has the potential to pose serious challenges to the societies in which it is widely practiced.

This indicates that effective prevention of corporal punishment may be required to help prevent children from developing externalizing problems. Preventative measures could focus on positive parenting and non-violent caregiving strategies. The reasons for using corporal punishment provided to researchers seem to be the lack of non-violent caregiving skills, excessive demands, and helplessness (Hermenau et al., 2011). Therefore parents and teachers may profit from learning non-violent parenting and disciplinary skills. With this aim in mind, future research should focus on developing and testing culturally appropriate prevention programs for corporal punishment addressing both families and schools.
There are several limitations of the study that should be noted when interpreting the findings of this work. First, the cross-sectional study design does not allow for the establishment of causality. For instance, it may be argued that those who display more aggressive behavior would have deserved and received greater punishment. This, however, seems unlikely since we assessed corporal punishment that had occurred during the entire lifespan of the children and it correlates with the current aggressive behavior (see Table 2.1). If children’s aggressive behavior would have been penalized in their past and if the use of corporal punishment had been successful, children reporting having experienced high levels of corporal punishment during the course of their entire lifetime should not report current aggressive behavior. Additionally, we studied only one primary school in Tanzania and although it included children from various social backgrounds, general prevalence rates cannot be derived from the present data alone. However, results are consistent with previous findings and in line with observations the authors have made during the course of visits to a number of schools in Tanzania. This study also did not focus on corporal punishment carried out by teachers in detail. While this study provides some insight, further research, particularly in public schools, is needed to investigate the association between corporal punishment by teachers and aggressive behavior. Generally, the children talked very openly about their experiences and feelings. However, potential bias, like social desirability, can never be completely ruled out for subjective reports.

2.6 Conclusion

The present study provides evidence for the first time that Tanzanian children of primary school age experience high rates of corporal punishment. Furthermore, the results revealed that corporal punishment is closely linked to children’s aggressive behavior.

The findings of the present study emphasize the need to inform people and governmental organizations, especially in low-income countries, about the adverse consequences using corporal punishment both at home and at school. Further, our findings underscore the need to implement preventative measures against the frequent and widespread use of corporal punishment both at home and at school, in resource-poor countries as well as industrialized nations. Therefore, we advocate for developing and testing culturally appropriate prevention programs focused on ameliorating the issue of corporal punishment. Through these efforts, reducing corporal punishment in their home and school environments combined with the fostering of positive parenting skills would enable more children to grow up in a respectful and supportive atmosphere, thereby strengthening their development.
2.7 Key points

- An association between corporal punishment and children’s behavioral problems has been demonstrated repeatedly for industrialized countries. However, little is known about the occurrence of corporal punishment and its link to aggressive behavior in low-income countries.
- The current study indicates that Tanzanian children in primary school age experience high rates of corporal punishment at home and at school.
- In the present sample corporal punishment was closely associated with children’s aggressive behavior.
- Longitudinal studies are needed to understand the causal relation between corporal punishment and children’s aggressive behavior.
- Our findings emphasize the need to increase awareness of the adverse consequences of using corporal punishment and underscore the need for preventative measures against the frequent and widespread use of corporal punishment.

2.8 Acknowledgements

This research was supported by the Deutsche Forschungsgemeinschaft (DFG) and by the NGO vivo international. We are grateful to all the children who participated in this study for their readiness to participate and willingness to discuss often intimate and painful subjects. We also wish to thank all of the teachers, the head teacher and the director of the school for their support while conducting this study. We are very grateful to our very motivated and reliable German and Tanzanian research team, including: Manswab Geho, Huruma Kipagile, Getrude Mkinga, Andrew Mtitu, Zephania Ngowi, Lulu Nziku, Astrid Pabst, Charlotte Salmen, and Leila Samson. Without their support this study would not have been possible. We also thank Justin Preston who critically reviewed the manuscript.
3 Appetitive aggression in former combatants – derived from the ongoing conflict in DR Congo

3.1 Abstract
Soldiers and combatants often report that committing violence can be appealing, fascinating and exciting (Elbert et al., 2010). This appetite for aggression was investigated in a sample of 224 former combatants from different armed groups and forces in the eastern DRC. In a semi-structured interview they were questioned about their military history, exposure to violence and perpetrated violence. Appetitive aggression was assessed with a 15-item-scale (Weierstall & Elbert, 2011), which was successfully implemented in comparable samples (Weierstall et al., 2012). A sequential multiple regression was conducted to determine possible predictors of appetitive aggression. Perpetrated violence types, recruitment type, and joining as a child were significant predictors and explained 26% of the variability in appetitive aggression. Duration or military rank within the armed group and exposure to violence did not play a significant role.

Thus, combatants reporting high levels of appetitive aggression are characterized by perpetrating a high number of violent acts, joining armed groups on their own accord and as children. Joining an armed group on one’s own accord indicates pre-existing appetitive aggression. However, joining young and perpetrating violence on a regular basis seems to intensify the appetite for aggression.

Keywords: appetitive aggression, violence, combatants, DR Congo

3.2 Introduction
Soldiers and combatants often report that committing violence can be appealing, fascinating, and exciting (Konner, 2006; MacNair, 2006; Silva et al., 2001). This phenomenon has only recently gained attention in aggression research (Elbert et al., 2010). Commonly, human aggression is defined as any behavior towards another individual that includes the intention to harm (Berkowitz, 1993; Geen, 2001; Smith & Mackie, 2000). In addition, the perpetrator must willingly want to harm the victim and the victim must want to avoid this behavior (Bushman & Anderson, 2001). Violence, however, is an extreme form of aggression including for example raping or killing (Anderson & Bushman, 2002). The literature distinguishes consistently between two major forms of aggression: reactive and instrumental
Appetitive aggression in former combatants

Aggression (Fontaine, 2007; Kempes et al., 2005; Vitiello & Stoff, 1997). Reactive aggression is also known as affective, impulsive, or hostile aggression. It can be conceived as being impulsive, driven by anger, and occurring as a reaction to some perceived provocation or threat (Anderson & Bushman, 2002; Hubbard et al., 2002). Instrumental aggression, however, is planned, purposeful and target- or goal-oriented. The literature also refers to it as proactive, goal-oriented or predatory aggression (Elbert et al., 2010; Geen, 2001; Meloy, 1997; Nelson & Trainor, 2007). Anderson and Bushman (2002) emphasize that obtaining a goal other than harming the victim motivates the use of this form of aggression. Humans adopt instrumental aggression in order to achieve positive outcome and avoid negative consequences (Crick & Dodge, 1996; Fontaine, 2006; Schwartz et al., 1998). However, the pure dichotomy of these two types of aggression is questionable (Bushman & Anderson, 2001) as they are highly correlated (Card & Little, 2006) and often occur simultaneously in the real world (Kempes et al., 2005). Therefore, Anderson and Bushman (2002) distinguish between proximate and ultimate goals. All forms of aggression include the intention to harm others as a proximate goal. However, the ultimate goal might be different (Anderson & Bushman, 2002). For example while looting a village, a perpetrator might ultimately be more focused on external benefits than harming a victim, whereas another perpetrator, while physically assaulting someone, might be ultimately more focused on inflicting physical harm per se. Elbert et al. (2010) reported that child soldiers in Uganda perceived perpetrating violence as fascinating, appealing and even addiction-like. They assumed that harming or killing others might be rewarding in itself. Also Nell (2006) described that perpetrating violence and being cruel is perceived as rewarding in humans. The evolutionary development of men as hunters might explain these rewarding effects (Elbert et al., 2010; Jones, 2008). Normally, control mechanisms in the frontal lobe inhibit intraspecific violence (Kelly, 2005; Nelson & Trainor, 2007). However, dehumanization of the enemy (Staub, 2001, 2006) and initiation rites in armed groups can break learned moral standards and increase intraspecific violence (Engen, 2008; Gibson, 1991). Furthermore, killing is sometimes associated with positive feelings like joy or happiness (Konner, 2006; MacNair, 2006; Silva et al., 2001). Consequently, Elbert et al. (2010) introduced appetitive aggression, which has by definition the ultimate and intrinsic rewarding goal of harming others, as a subtype of instrumental aggression. Hence, appetitive aggression can be defined as perceiving aggressive behavior towards others as positive, fascinating even without gaining any external benefit.

A few studies focused on appetitive aggression recently. In samples with genocide perpetrators from Rwanda (Weierstall et al., 2011) and child soldiers from Uganda (Weierstall et al., 2012) appetitive aggression was related positively to perpetrating violent acts and negatively to posttraumatic stress disorder (PTSD). Social status or military rank
within the armed group correlated positively with appetitive aggression in Ugandan child soldiers (Crombach et al., 2013). From an evolutionary perspective researchers expect a pre-existing appetite for aggression in all male humans (Elbert et al., 2010; Jones, 2008; Nell, 2006). Hence, it can be assumed that enlisting on one’s own accord is positively related to appetitive aggression (Weierstall et al., in press).

Children commonly serve as combatants throughout many different armed conflicts worldwide (Wessells, 2006) and particularly in the eastern Congo (Coalition to Stop the Use of Child Soldiers, 2010; Guy, 2009b). Growing up in a violent environment (Waller, 2006) put child soldiers at high risk to be forced to perpetrate violence but also to adapt to perpetrating violence (Schauer & Elbert, 2010; Wessells, 2006). Considering the plasticity of the brain (Elbert et al., 2006), child soldiers are more likely to report appetitive aggression as they adapt best to the violent circumstances in armed groups (Hermenau, Hecker, Maedl, Schauer, & Elbert, 2013).

Being a victim of violence in war or armed conflict, on the other hand, is closely related to mental illness (Amone-P’Olak et al., 2007; Bayer et al., 2007; Vinck et al., 2007). Therefore, it is rather unlikely that experiencing violence as a victim is positively related to appetitive aggression.

The present study investigated appetitive aggression more closely in a sample of former combatants from different armed groups and forces in eastern Congo. The ongoing conflict in the provinces of North- and South- Kivu includes foreign armed groups, several local militias and the Congolese Government Army (Romkema, 2007). We postulated that perpetrating violent acts correlates positively with appetitive aggression. Furthermore, we expected that joining an armed group on one’s own accord and joining an armed group as a child (i.e. below the age of 18), as well as the duration within armed groups and holding a military rank have a positive link to appetitive aggression. Reasons for enlisting by one’s own accord vary from seeking a better life to defending the family or ethnic group (Coalition to Stop the Use of Child Soldiers, 2010; Romkema, 2007). In this study the desire to become a fighter was also assessed in order to link the reason to enlist to appetitive aggression. On the other hand, we predicted that exposure to violence has no linear relation with appetitive aggression.

Combatants reporting high levels of appetitive aggression were expected to report more perpetrated violence in comparison to combatants reporting only low levels of appetitive aggression. Furthermore, they should have joined armed groups more often on their own accord and as children. Additionally, we expected that combatants reporting high levels of appetitive aggression held military ranks more often and stayed longer in an armed group. Again, no differences were expected in exposure to violent acts, but combatants reporting high levels of appetitive aggression were expected to show less PTSD symptom severity.
3.3 Method

3.3.1 Procedure
Four clinical psychologists and one western-trained nurse interviewed all participants with the help of three interpreters, who have all been trained in the concepts of mental disorders and aggression. Semi-structured interviews were carried out in Kiswahili, Kinyarwanda or Lingala. The interviewers standardized the form of assessment by practicing in joint interviews to achieve a high inter-rater reliability. The translation was intensely discussed to guarantee a precise translation.

All interviews were conducted in Goma, in the province of North Kivu in eastern DRC. In total, 72% ($n = 152$) of the interviews took place at the demobilization camp of the United Nations, 27% ($n = 56$) were conducted at a training center for former combatants and child soldiers and 1% at the military detention facility. The demobilization camp is a transition camp. Participants normally stayed only between 20 and 72 hours in the demobilization camp before being sent to other places. In rare cases, this led to the termination of the interview. In the training center a Congolese non-governmental nonprofit organization offers skills training to former child soldiers. One interviewer and one translator interviewed each interviewee individually in a calm setting. The interview took, on average, one and a half hours.

The Ethical Review board of the University of Constance approved the study and all participants gave their informed consent verbally. In addition, the facilities gave their informed consent for the interviews of underage participants. Participants received financial compensation of about two U.S. Dollars.

3.3.2 Participants
In total 224 interviews were conducted. Out of these 213 were completed. The 11 interviews that could not be completed were all held at the demobilization camp. The analyses included only former combatants who reported combat experience ($n = 200$). All participants were male. They were between 15 and 50 years old with a mean age 24.6 years ($SD = 7$ years). Participants belonged to a variety of armed groups and forces. In total 5% ($n = 9$) were member of the Congolese Government Army (FARDC), 42% ($n = 84$) of rebel forces from Rwanda, i.e. Forces Démocratiques pour la Libération du Rwanda (FDLR), and 53% ($n = 107$) of rebel forces from Congo, i.e. different Mai-Mai groups ($n = 73$), Congrès National pour la défense du people (CNDP, $n = 21$), or Patriotes résistants congolais (Pareco, $n = 13$). In total, 45% of the combatants who joined on their own accord reported the desire to become a fighter as one reason for enlisting.
3.3.3 Material

All instruments were applied as an interview and the same interview-set was used in all interview settings. The first part of the interview consisted of socio-demographic information, e.g. place and year of birth as well as educational background. The former combatants were interviewed about their military career, e.g. its duration, their highest rank in the armed group and the manner in which they joined the armed group.

Exposure to violence was assessed with a checklist of 30 war- and non-war-related potentially traumatic events, e.g. assault with a weapon, rape, life-threatening accidents. This check-list included events from the checklist of the Posttraumatic Stress Diagnostic Scale (Foa, Cashman, Jaycox, & Perry, 1997) and was closely oriented on a checklist (Neuner, Schauer, Karunakara, et al., 2004), which had previously shown a high test-retest reliability ($r = 0.73$, $p < .001$) and significant accordance with the event list of the Composite International Diagnostic Interview in a study in Uganda (Ertl et al., 2010). The number of times a specific event had been experienced was not assessed, as distorted memory in PTSD renders this measure unreliable (Elbert & Schauer, 2002; Kolassa & Elbert, 2007; McNally, 2006). For the analysis we further distinguished between the sum score of self-experienced violence types (range: 0 to 7), i.e. being physically or sexually assaulted, and the sum score of witnessed violence types (range: 0 to 9), i.e. witnessing others being physically or sexually assaulted, as well as the sum score of perpetrated violence types (range: 0 to 9), like assaulting someone else physically or sexually.

Appetitive aggression was assessed with the 15-item Appetitive Aggression Scale (AAS; Weierstall & Elbert, 2011), which was successfully implemented in comparable samples in Uganda, Rwanda and DRC (Weierstall et al., in press, 2011, 2012). A statement regarding the perception of violence or appetitive aggression was given to the participant in each item (e.g. *Is it exciting for you if you make an opponent really suffer?, Once fighting has started do you get carried away by the violence? or Is fighting the only thing you want to do in life?*). Participants had to rate on a five-point Likert scale ranging from disagree (0) to agree (4) on how much they personally agreed with a given statement. The items were based on the definition of the instrumental aggression subtype according to Vitiello and Stoff (1997) and the ICD–10 addiction criteria. Further items were compiled on basis of interviews with perpetrators about the appetitive experience of violence (Elbert et al., 2010). For the analyses a sum score of all 15 items was computed. It ranges from 0 to 60.
The symptom severity of post-traumatic stress disorder (PTSD) was determined using the PTSD Symptom Scale-Interview (PSS-I; Foa, Riggs, Dancu, & Rothbaum, 1993). The PSS-I assesses the 17 DSM-IV symptom criteria for PTSD and refers to symptoms experienced in the previous month. Each of the items was answered on a 4-point scale ranging from not at all/only one time (0) to five or more times per week/almost always (3). Additionally, general functionality was assessed. The PSS-I comes with good psychometric properties and is widely used to diagnose PTSD (Foa et al., 1993; Foa & Tolin, 2000). A PTSD symptom severity score (possible scores range from 0 to 51) was computed by adding all symptom scores.

### 3.3.4 Data analysis

First, a multiple sequential regression analysis was conducted to find possible predictors of appetitive aggression (AAS sum score). In the first step, only perpetrated violence types were included as a predictor in the analysis. In the second step, recruitment type (abducted: 0; non-abducted: 1) was added and joining as child (≥18: 0; <18: 1) was then added in the third step. Neither the duration of staying in the armed group nor having a rank in the armed group could explain significant more variance, which means that these two factors could not improve the prediction of the AAS score. This was also true for witnessed violence types and self-experienced violence types.

Furthermore, two groups were computed by using only the fourth (n = 51) and the first (n = 52) quartile of the AAS score. A MANOVA was conducted to compare combatants reporting a high level of appetitive aggression (HLAA) and reporting only a low level (LLAA) in reported perpetrated, witnessed, and self-experienced violence types, as well as the PSS-I score. They were also compared in recruitment type, joining as children (i.e. below the age of 18), holding a military rank in the armed group and the duration within the armed group. All variables were normally distributed. Neither univariate nor multivariate outliers could be identified and variance-covariance matrices showed homogeneity. Subsequently, a Roy-Bargmann Stepdown Analysis was performed to investigate the contribution of each dependent variable. All analyses were computed two-tailed on an alpha-level of $\alpha = .05$. Concerning the effect size, $\eta^2 = .01$ indicates a small effect, $\eta^2 = .06$ a medium effect, and $\eta^2 = .14$ a large effect.
3.4 Results

3.4.1 Predictors of appetitive aggression

The first regression model with the score of perpetrated violence types as the only predictor explained 22% of the variability in the AAS score ($R = .47, F(1, 198) = 55.92, p < .001$). After the recruitment type was added as another predictor, the second model could explain 25% of the variance. The change in $R^2$ was significant ($\Delta R^2 = .04, F(1, 197) = 9.69, p < .01$). The third model, which additionally included joining as a child, explained 26% of the variability in the AAS score. Again the change in $R^2$ was significant ($\Delta R^2 = .02, F(1, 196) = 4.48, p = .04$). No other predictor could significantly improve the prediction of the AAS score. The third model fulfilled all necessary quality criteria for linear regression analyses. The residuals showed normality, linearity and homoscedasticity. Neither univariate nor multivariate outliers could be identified and the maximum Variance Inflammation Factor did not exceed 1.1. Hence, multicollinearity could be neglected. As shown in Figure 3.1, the sum score of perpetrated violence types was the strongest predictor of the AAS score ($\beta = .40, t = 6.27, p < .001$). Both, recruitment type ($\beta = .20, t = 3.25, p = .001$) and joining as a child ($\beta = .14, t = 2.12, p = .04$) were positively related to the AAS score. Figure 3.2 shows the partial relation between the sum score of perpetrated violence types to the AAS score in a partial scatter plot.

Figure 3.1: Significant correlations of appetitive aggression
**3.4.2 Differences between combatants reporting high (HLAA) or low (LLAA) levels of appetitive aggression**

Table 3.1 shows all descriptive data concerning HLAA and LLAA. Wilks’ criterion showed a significant multivariate group difference between HLAA and LLAA ($F(8, 94) = 7.64; p < .001; \eta^2 = .39$). Perpetrated violence types ($stepdown F(1, 101) = 46.16; p < .001, \eta^2 = .31$), recruitment type ($stepdown F(1, 100) = 7.27; p < .01, \eta^2 = .07$) and joining as a child ($stepdown F(1, 99) = 3.87; p = .05, \eta^2 = .04$) made unique contributions to the composite dependent variable that distinguished between the two groups. HLAA reported more perpetrated violence types than LLAA (see Table 3.1). HLAA were also more likely to join on their own accord and as a child (see Table 3.1). Neither the duration ($stepdown F(1, 98) = 0.22; p = .64, \eta^2 < .01$) nor the rank in armed groups ($stepdown F(1, 97) = 0.67; p = .42, \eta^2 < .01$) made any unique contributions or differed significantly between HLAA and LLAA (see Table 3.1). As expected, both witnessed ($stepdown F(1, 96) < 0.01; p = .98, \eta^2 < .01$) and experienced violence types ($stepdown F(1, 95) = 0.66; p = .42, \eta^2 < .01$) made no further unique contribution to the composite DV that distinguished between the two groups. This was also true for the PSS-I score ($stepdown F(1, 94) = 0.01; p = .93, \eta^2 < .01$).
Appetitive aggression in former combatants

Table 3.1
Differences between combatants reporting high (HLAA) and low (LLAA) levels of appetitive aggression

<table>
<thead>
<tr>
<th></th>
<th>HLAA (N = 51)</th>
<th>LLAA (N = 52)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding military rank</td>
<td>45% (n = 23)</td>
<td>35% (n = 18)</td>
</tr>
<tr>
<td>Joined as child</td>
<td>78% (n = 40)</td>
<td>42% (n = 22)</td>
</tr>
<tr>
<td>Recruitment type:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>non-abducted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration within armed group (in years)</td>
<td>$M = 6.9$ (SD = 5.8)</td>
<td>$M = 7.0$ (SD = 5.6)</td>
</tr>
<tr>
<td>Experienced violence types</td>
<td>$M = 4.59$ (SD = 1.02)</td>
<td>$M = 3.90$ (SD = 1.19)</td>
</tr>
<tr>
<td>Witnessed violence types</td>
<td>$M = 7.16$ (SD = 1.30)</td>
<td>$M = 5.65$ (SD = 1.70)</td>
</tr>
<tr>
<td>Perpetrated violence types</td>
<td>$M = 6.12$ (SD = 1.62)</td>
<td>$M = 3.63$ (SD = 2.06)</td>
</tr>
<tr>
<td>PSS-I Score</td>
<td>$M = 11.67$ (SD = 10.17)</td>
<td>$M = 7.88$ (SD = 8.03)</td>
</tr>
</tbody>
</table>

3.5 Discussion

Results showed that only perpetrating violent acts, recruitment type and joining as a child correlated positively with appetitive aggression. Consistent with our assumptions and prior findings (Weierstall et al., 2011, 2012), perpetrating violent acts had a strong relationship with appetitive aggression. HLAA reported significantly more perpetrated violence types.

Furthermore, the recruitment type correlated positively with appetitive aggression. Combatants, who joined on their own accord and were not abducted, were more likely to report high levels of appetitive aggression. In a study with child soldiers in DRC, Weierstall et al. (in press) found similar results. These results indicate that pre-existing appetitive aggression might lead to the decision to join an armed group. Evolutionary perspective supports the assumption that especially men show an innate disposition of appetitive aggression (Elbert et al., 2010; Jones, 2008; Nell, 2006). Yet, this correlation should be interpreted with caution, as reasons to enlist might vary. Common reasons in the present sample did not differ from prior findings (Coalition to Stop the Use of Child Soldiers, 2010; Romkema, 2007) and included, among others, seeking a better life, defending the family or ethnic group or avoiding forced recruitment from another armed group. However, even if the decision to join resulted in some cases from the circumstances in a region of instability, these combatants might feel more in control of their lives than abducted combatants. If armed groups are seen as hope for security and a better life (Coalition to Stop the Use of Child Soldiers, 2010), they are not perceived as threatening as when being abducted.
Furthermore, 45% of the combatants who joined on their own accord reported the desire to become a fighter as one reason for enlisting. Hence, we assume that combatants reporting joining on their own accord may be more fascinated by violence and by being member of an armed group before joining than combatants reporting forced recruitment.

The duration within the armed group was not linked to appetitive aggression and did not differ between HLAA and LLAA. These findings support the assumption that some combatants exhibit pre-existing appetitive aggression as some combatants reported high and others low levels of appetitive aggression independent from their duration within the armed group.

Joining as a child correlated positively with appetitive aggression and the rate of child soldiers was higher among HLAA. Many child soldiers seem to adapt well to the violent environment of armed groups (Waller, 2006). The plasticity of the brain and the ongoing development of a moral mindset probably enhance the development or increase of appetitive aggression under the circumstances of armed conflict (Elbert et al., 2006; Maedl et al., 2010). Hermenau et al. (2013) concluded that child soldiers reporting high levels of appetitive aggression adapted best to the circumstances in armed groups.

As HLAA adapted well to circumstances in armed groups, they may face difficulties in reintegration to civil life after leaving the armed group. To date, reintegration programs effectively addressing mental ill-health are rare (Maedl et al., 2010; Schauer & Elbert, 2010). However, as HLAA seem to be most likely to return to an armed group on their own accord, programs for former combatants focusing on reintegration should include aspects of mental health and in particular focus on appetitive aggression.

Holding a military rank was neither related to appetitive aggression nor differed between HLAA and LLAA. In contradiction to our results, Crombach et al. (2013) found a positive relation between military rank and appetitive aggression. However, a positive relation might be true only for combatants who joined as children, as Hermenau et al. (2013) showed for the present sample. Adult combatants are more likely to start with higher ranks depending on educational background or age, whereas child soldiers commonly begin their military career from the bottom. Consequently, joining as a child might lead more likely to the development or the increase of appetitive aggression. Dehumanization of the victims (Staub, 2001, 2006) and initiation rites (Engen, 2008; Gibson, 1991) probably promote the development or increase of appetitive aggression particularly in child soldiers.
Exposure to violence and PTSD symptom severity were also not related to appetitive aggression. Moreover, HLAA and LLAA did not differ in exposure to violence and PTSD symptom severity. Although prior findings suggest a negative relation between PTSD symptom severity and appetitive aggression (Weierstall et al., 2011, 2012), the present study could not replicate this negative relation. Elbert et al. (2010) highlighted that appetitive aggression might only be negatively related to PTSD symptom severity, if combatants do not exceed a certain threshold of self-experienced traumatic events. Yet, this might be the case in this study.

The degree to which the results of this study can be generalized is limited. First, the cross-sectional study design does not allow any conclusion about causality. Combatants from different armed groups and forces were interviewed. Although the armed groups did not differ obviously, e.g. concerning reported levels of aggression or perpetrated violence, minor differences might influence the results. The same might be true for the varying interview settings. Moreover, the sample consists mainly of deserters, who may not be comparable to active combatants. Furthermore, the instruments were not validated for combatants in DRC. Nonetheless, they were implemented as structured interviews by psychologists with extensive experience in aggression and mental health research in low-income countries and have been successfully tested before in other Sub-Saharan African conflict settings. Future research should investigate the causal relations of appetitive aggression; for example, whether pre-existing appetitive aggression leads to join on one’s own accord or whether violent environment in armed groups and perpetrating violence on a regular basis enhance the development of appetitive aggression. Results of this study indicate that both may be the case.

3.6 Conclusions

Combatants reporting high levels of appetitive aggression (HLAA) are characterized by having joined the armed group more often on their own accord and as children. They perpetrated more acts of violence than combatants reporting low levels of appetitive aggression (LLAA). Whether or not this is the cause or the consequence of appetitive aggression cannot be conclusively answered with the design of the present study. However, the fact that combatants joined the armed group on their own accord and that the duration in the armed group had no influence, suggests that combatants with high levels of appetitive aggression at the time of the study had already appetite for aggression before joining the armed group. Yet, joining young and perpetrating violence on a regular basis seem to intensify appetitive aggression.
3.7 Acknowledgements

This research was supported by the NGO vivo international and by the Deutsche Forschungsgemeinschaft (DFG). We are grateful to all the former combatants with their eagerness to participate and willingness to reveal even intimate information. We thank our local staff Roger Buhendwa Zashurwa, Ben Ombeni Cigolo, and Flory Barhimanya Kahisa for translating the interviews, their commitment to our work, and their empathy with participants. Moreover, we thank the staff of the training center Equipe d’ Education et d’ Encadrement des Traumatisés de Nyiragongo in Goma and the staff of the demobilization camp of the United Nations in Goma for all their help. Last but not least we thank Harald Hinkel and Heike Riedke for their great knowledge of the Great Lakes region and all their support.
4 Does perpetrating violence damage mental health? 
Differences between forcibly recruited and voluntary combatants in DR Congo

4.1 Abstract
As a consequence of the ongoing conflict in the Democratic Republic of the Congo (DRC), combatants are constantly involved in various forms of violence. Findings concerning the impact of perpetrating violence on mental health are contradictory, ranging from increasing to buffering the risk for mental ill-health. The present study investigated the impact of perpetrating violence on mental health. In total, 204 forcibly recruited and voluntary male combatants (mean age = 24.61) from different armed groups in the eastern DRC took part in the study. In a semi-structured interview, respondents were questioned about appetitive aggression and posttraumatic stress disorder (PTSD) as well as self-experienced violence and self-perpetrated violent offending. A MANOVA ($\eta^2 = .23$) revealed that voluntary combatants perpetrated more violent acts ($\eta^2 = .06$) and showed higher appetitive aggression ($\eta^2 = .03$). A moderated multiple regression analysis ($R^2 = .20$) showed that perpetrating violence was positively related to PTSD in forcibly recruited combatants, but not in voluntary combatants. Thus, perpetrating violence may not necessarily qualify as a traumatic stressor. Further studies might consider assessing the combatant's perception of committing violent acts.

*Keywords: violence, PTSD, aggression, combatants, DR Congo*

4.2 Introduction
The eastern Congo has been trapped in an ongoing cycle of war and violence for more than 2 decades. Civilians suffer on a large scale from the consequences of violence (Guy, 2009b; Maedl, 2011). The detrimental mental effects of exposure to violence are, however, not only common for civilian victims, but also for soldiers and combatants. Prior research has consistently shown that exposure to violence, including organized violence, enhances the risk of mental ill-health such as trauma-related illnesses, depression, or substance abuse (Amone-P’Olak et al., 2007; Catani et al., 2008; Hermenau et al., 2011; Neuner, Schauer, Karunakara, et al., 2004; Odenwald, Lingenfelder, et al., 2007). Additionally, combatants
perpetrate violent acts, which may also have an impact on their mental health. In a number of studies, researchers rated perpetrating violent acts (e.g., killing or raping) as traumatic events (Bayer et al., 2007; Vinck et al., 2007). Following DSM-IV (American Psychiatric Association, 2000), a life event is classified as traumatic if it produces feelings of helplessness, horror, or massive fear. Perpetrating violence (e.g., torturing or raping), however, might not necessarily result in a fearful or horrified response and is not always linked to forms of helplessness.

MacNair (2001, 2002) concluded from studies with veterans that perpetrating violence (e.g., killing) leads to enhanced risk for posttraumatic stress disorder (PTSD). Hence, she suggested the term perpetrator-induced traumatic stress. In contrast, Pfeiffer and Elbert (2011) showed a negative relation between the number of years as a member of rebel forces and PTSD symptoms. Elbert et al. (2010) reported that many soldiers and combatants described perpetrating violent acts as fascinating, appealing, and exciting. This phenomenon of appetitive aggression has only recently begun to receive attention. A number of studies with former child soldiers in Uganda (Weierstall et al., 2012) and genocide perpetrators in Rwanda (Weierstall et al., 2011) have suggested that appetitive aggression could prevent trauma-related illnesses. According to Elbert et al. (2010), however, the effects of traumatic experiences are cumulative and once the number of traumatic experiences exceeds a certain threshold, then the buffering effect of higher appetitive aggression is no longer effective, though the range of the threshold is not yet precisely known. Two studies from DRC found that combatants who report high levels of appetitive aggression are characterized by having perpetrated high numbers of violent acts as well as having joined on their own account and as children (Hecker, Hermenau, Maedl, Elbert, & Schauer, 2012; Weierstall et al., in press).

These contradictory findings concerning the impact of perpetrating violent acts on the mental health of combatants in the eastern Congo were tested in the present study. We hypothesized that the impact of perpetrating violent acts on mental health varies between voluntarily and forcibly recruited combatants. We predicted that forcibly recruited combatants are more often forced to perpetrate violence against their will. Consequently, we hypothesized a more negative impact on their mental health.

The ongoing conflict in eastern DRC includes foreign armed groups, several local militias, and the Congolese Government Army (Romkema, 2007). Most armed groups in the province of North Kivu recruit a high number of combatants by force. Others, however, volunteer for duty. Reasons for joining vary from seeking a better life to defending the family and ethnic group (Coalition to Stop the Use of Child Soldiers, 2010; Romkema, 2007). Although the decision to join is in some cases the result of limited and equally harsh choices in a resource-
poor region of instability (Guy, 2009b; Schauer & Elbert, 2010), voluntary combatants might feel more in control of their lives and might perceive the armed group as less threatening than forcibly recruited combatants would (Hecker et al., 2012; Hermenau et al., 2013).

The present study investigated the impact of perpetrating violent acts on the perpetrator’s mental health more closely. The sample consisted of former forcibly recruited and voluntary combatants from different armed groups in eastern Congo. As the Congolese Government Army (FARDC) is also accused of atrocities against civilians, including forcibly recruiting child soldiers (Davis & Hayner, 2009), the present study treated the FARDC in its analysis as a local armed group.

Forcibly recruited and voluntary combatants were compared concerning exposure to and perpetration of violent acts, as well as concerning PTSD symptom severity and appetitive aggression. Furthermore, the relationship between PTSD symptom severity and exposure to violence and perpetrated violent acts in both groups was investigated. Possible confounding factors (e.g., age, country of origin, or length of time with armed group) were examined. Furthermore, we examined whether combatants joined foreign armed groups or local militia groups, because foreign armed groups were more likely to forcibly recruit combatants, whereas many combatants from local militia groups volunteered for duty. As children growing up in a violent environment often suffer from mental health problems (Hermenau et al., 2013; Schauer & Elbert, 2010; Waller, 2006), the present study also examined the influence of being recruited before the age of 15.

We hypothesized that voluntary combatants perpetrated more violence and perceived violence per se as more fascinating and appealing than forcibly recruited combatants. Hence, they would show higher levels of appetitive aggression. Furthermore, we predicted that self-experienced violence is closely related to PTSD symptom severity. The correlation between perpetrated violent acts and PTSD symptom severity might depend on whether the combatants were recruited voluntarily or forcibly. Therefore, we predicted that the number of perpetrated violent acts would correlate positively with PTSD symptom severity only in forcibly recruited combatants. In voluntary combatants, we predicted that only self-experienced violence would correlate positively with PTSD symptom severity.
4.3 Method

4.3.1 Participants and Procedure

In total, 224 interviews were conducted. Only combatants who reported combat experience were included in the analyses. Additionally, eight interviews could not be completed due to the short stay in the demobilization camp. All eight interviews were excluded from the analyses involving the Appetitive Aggression Scale resulting in a sample of \( n = 202 \). For all other analyses only six incomplete interviews had to be excluded resulting in a sample of \( n = 204 \). All participants \( (n = 204) \) were male reporting a mean age of 24.61 years. Participants belonged to a variety of armed groups and forces. In total, 43\% \( (n = 91) \) were former members of the foreign armed group Forces Démocratiques pour la Libération du Rwanda (FDLR) and 57\% \( (n = 119) \) of local armed groups including different Mai-Mai groups, Congrès National pour la Défense du Peuple (CNDP), or the Congolese Government Army (FARDC).

In order to compare forcibly recruited and voluntary combatants, we divided the sample into two subgroups. In total, 97 combatants reported that they were physically forced to join an armed group. 107 combatants reported that they volunteered to join. In this armed conflict, which has been a part of the people’s everyday lives in the eastern Congo for more than 2 decades, the boundaries between forcible and voluntary recruitment, however, were sometimes blurred. For example, a child may “voluntarily” join the army because his village is always under attack and he just wants to defend himself or his village. In such cases we counted the individual combatant’s subjective perception of his recruitment. Table 4.1 shows demographic characteristics of forcibly recruited and voluntary combatants.

Four clinical psychologists and one western-trained nurse interviewed all participants with the help of three interpreters, who had all been trained in the concepts of mental disorders and aggression. Semi-structured interviews were carried out in Kiswahili, Kinyarwanda, or Lingala. The interviewers had standardized the form of assessment by practicing in joint interviews to achieve high interrater-reliability. The translation was discussed in great detail to guarantee a precise translation.
### Table 4.1
Demographic characteristics of forcibly recruited and voluntary combatants

<table>
<thead>
<tr>
<th></th>
<th>Forcibly recruited</th>
<th>Voluntary</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 97)</td>
<td>(n = 105)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M or n</td>
<td>SD or %</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>23.18</td>
<td>6.37</td>
<td>25.72</td>
</tr>
<tr>
<td>Years with armed group</td>
<td>5.53</td>
<td>4.20</td>
<td>8.02</td>
</tr>
<tr>
<td>Country of origin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRC</td>
<td>80</td>
<td>82</td>
<td>73</td>
</tr>
<tr>
<td>Rwanda</td>
<td>18</td>
<td>18</td>
<td>35</td>
</tr>
<tr>
<td>Joined as child</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;15</td>
<td>37</td>
<td>38</td>
<td>43</td>
</tr>
<tr>
<td>&gt;15</td>
<td>61</td>
<td>62</td>
<td>65</td>
</tr>
<tr>
<td>Group membership</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>48</td>
<td>49</td>
<td>69</td>
</tr>
<tr>
<td>Foreign</td>
<td>50</td>
<td>51</td>
<td>39</td>
</tr>
<tr>
<td>Experienced violence types</td>
<td>4.37</td>
<td>1.18</td>
<td>4.19</td>
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<tr>
<td>Perpetrated violence types</td>
<td>4.70</td>
<td>2.06</td>
<td>5.17</td>
</tr>
<tr>
<td>AAS Score</td>
<td>20.87</td>
<td>13.59</td>
<td>27.69</td>
</tr>
<tr>
<td>PSS-I Score</td>
<td>11.18</td>
<td>9.14</td>
<td>9.30</td>
</tr>
</tbody>
</table>

*Note. M: Mean, SD: standard deviation, F: test statistics based on Roy-Bargmann Stepdown Analysis: *p < .05. **p < .01. ***p < .001.

All interviews were conducted between March and May 2011 in Goma, in the province of North Kivu in the eastern Congo. In total, 72% (n = 152) of the interviews took place at the demobilization camp of the United Nations, 27% (n = 56) were conducted at a training center for war-affected youth, and 1% at the military detention facility. The demobilization camp is a transition camp for all combatants who leave any armed groups in the province of North Kivu and report to the United Nations. We were able to interview all combatants who passed through this demobilization camp during the time of assessment. No ex-combatant refused
participation. Participants, however, stayed only between 20 and 72 hours in the demobilization camp before being sent to other places. In 8 cases, this led to the termination of the interview. In the training center, a Congolese non-governmental non-profit organization offered a one-year vocational training in different manual trades to former child soldiers and ex-combatants. We interviewed all former child soldiers and ex-combatants who were enrolled in the program. Not a single case refused participation. One interviewer and one translator interviewed all interviewees individually in a calm setting. The interview took, on average, 1.5 hours.

The Ethical Review Board of the University of Konstanz approved the study and the United Nations and the respective Congolese non-governmental non-profit organization allowed us to interview all participants enrolled in their program. All participants gave their informed consent orally. In addition to the oral consent of the participants, we asked the respective institutions for permission to interview underaged child soldiers, as their caregivers were not available. Participants received financial compensation of about 2 U.S. dollars.

4.3.2 Measures
All instruments were administered as an interview. The first part of the interview consisted of socio-demographic information (e.g., place and year of birth as well as educational background). The former combatants were interviewed about their military career (e.g., how they were recruited, length of service, and their highest rank).

Exposure to different types of violence over the combatant’s entire lifetime was assessed using a checklist of 30 war- and non-war-related potentially traumatic events (e.g., assault by weapon, rape, life-threatening accidents), which also included events from the checklist of the Posttraumatic Stress Diagnostic Scale (Foa et al., 1997). The checklist that we used was a version of a previously published checklist (Neuner, Schauer, Karunakara, et al., 2004) that we adapted to fit the Congolese cultural context. This checklist showed a high test–retest reliability ($r = 0.73, p < .001$) and significant accordance with the CIDI Event List (Ertl et al., 2010) in a study with former child soldiers in Uganda. The number of times a specific event had been experienced was not assessed, as distorted memory in PTSD renders this measure unreliable (Elbert & Schauer, 2002; Kolassa & Elbert, 2007; McNally, 2006). For the analyses we further distinguished between the number of self-experienced violence types (range: 0 to 7; e.g., being physically or sexually assaulted) and the number of perpetrated violence types (range: 0 to 9), for example, assaulting someone else physically or sexually.
The PTSD symptom severity was determined by using the PTSD Symptom Scale-Interview (PSS-I; Foa et al., 1993). The PSS-I assesses the 17 DSM-IV symptom criteria for PTSD and refers to symptoms experienced in the previous month. Each of the items was answered on a 4-point scale ranging from 0 = *not at all/only one time* to 3 = *five or more times per week/almost always*. The PSS-I showed good psychometric properties and is widely used to diagnose PTSD (Foa et al., 1993; Foa & Tolin, 2000). A PTSD severity score (range 0 to 51) was computed by adding all symptom scores. In the present study Cronbach’s $\alpha$ coefficient was .90.

Appetitive aggression was assessed with the Appetitive Aggression Scale (AAS; Weierstall & Elbert, 2011), which has been validated with over 1600 ex-combatants and proven its good psychometric properties in comparable samples in Uganda (Weierstall et al., 2012), Rwanda (Weierstall et al., 2011), and the DRC (Hecker et al., 2012). The AAS consists of 15 items regarding the perception of violence or appetitive aggression (e.g., “Is it exciting for you if you make an opponent really suffer?” “Once fighting has started do you get carried away by the violence?” or “Is fighting the only thing you want to do in life?”). Participants rated how much they personally agreed with a given statement on a 5-point Likert scale ranging from disagree = 0 to agree = 4. The items were based on the definition of the instrumental aggression subtype according to Vitiello and Stoff (1997) and the ICD-10 addiction criteria (World Health Organization, 1992). Further items were compiled on the basis of interviews with child soldiers about the appetitive experience of aggression and violence (Elbert et al., 2010). In the validation study (Weierstall & Elbert, 2011) the AAS showed good psychometric properties. Cronbach’s $\alpha$ coefficient of the sum score was .85 and in a principal-axis factoring analysis all items loaded statistically significant onto a single factor accounting for 32% of the total variance. Moreover, further analyses revealed that the scale measures a distinct construct of human aggression (for further details see Weierstall & Elbert, 2011). For the analysis a sum score of all 15 items was computed. It ranged from 0 to 60. In the present study Cronbach’s $\alpha$ coefficient was .89.

### 4.3.3 Data Analysis

A MANOVA was conducted to compare forcibly recruited and voluntary combatants in their reported number of self-experienced violence types, number of perpetrated violence types, and their PSS-I score, as well as their AAS score. The confounding variables age, years with armed group, group membership (foreign: 0; local: 1), country of origin (Rwanda: 0; DRC: 1), and joining as a child ($\geq 15$: 0; $< 15$: 1) were entered into the model. No variable deviated significantly from normal distribution. Neither univariate nor multivariate outliers could be identified, and variance–covariance matrices showed homogeneity. Subsequently, a Roy-
Bargmann stepdown analysis (Tabachnick & Fidell, 2006) was performed to investigate the contribution of each dependent variable.

A moderated sequential multiple regression analysis was conducted to investigate the prediction of the PSS-I score by the number of experienced and perpetrated violence types. Type of recruitment was included in the analysis. It was dummy-coded with 0 for forcibly recruited and 1 for voluntary combatants. To mitigate multicollinearity, the predictor variables were mean-centered for calculations of interaction terms (Kleinbaum, Kupper, Nizam, & Muller, 2008). The regression analysis included the same confounding variables mentioned above. In the first step, the regression model only included the control variables. In the second step, the main effects of type of recruitment, number of self-experienced violence types, and the number of perpetrated violence types were added to the model. The third step consisted of two-way interactions between type of recruitment and both number of self-experienced and perpetrated violence types. In the last step, the three-way interaction was added to the regression model. All regression models fulfilled the necessary quality criteria for linear regression analyses. The residuals did not deviate significantly from normality, linearity, and homoscedasticity. Neither univariate nor multivariate outliers could be identified. The maximum Variance Inflation Factor did not exceed 3.4. Hence, we do not need to take multicollinearity into account. All analyses used a two-tailed $\alpha = .05$. Our metric for a small effect size was $\eta^2 = .01$, for a medium effect $\eta^2 = .06$, and for a large effect $\eta^2 = .14$.

4.4 Results

4.4.1 Differences Between Forcibly Recruited and Voluntary Combatants

Results of the MANOVA indicated that, according to Wilks’ criterion, at least one mean of the dependent variables, including AAS score, number of perpetrated violence types, PSS-I score and number of self-experienced violence types, differed between forcibly recruited and voluntary combatants, $F(9, 192) = 6.47, p < .001, \eta^2 = .23$.

With differences due to control variables already entered, both the mean of the number of perpetrated violence types and of the AAS score differed significantly between the two groups (see Table 4.1). Voluntary combatants reported more perpetrated violence types than forcibly recruited combatants with a medium effect of $\eta^2 = .06$. The same was true for the AAS score but with a small effect of $\eta^2 = .03$. The mean of the number of experienced violence types ($\eta^2 < .01$) and of the PSS-I score ($\eta^2 = .02$) however, did not differ significantly between forcibly recruited and voluntary combatants (see Table 4.1).
4.4.2 Predictors of PTSD Symptom Severity

The first regression model with only the control variables of age, length of time with armed group, group membership, country of origin, and joining as a child accounted for 7% of the variability of the PSS-I score ($R^2 = .09, F(5, 198) = 4.03, p = .002$). After adding number of experienced and perpetrated violence types as well as the recruitment type, the regression model accounted for 14% of the variance. The change in $R^2$ was significant, $\Delta R^2 = .08, F(3, 195) = 6.22, p < .001$. As shown in table 4.2, the main effects of number of perpetrated violence types and of number self-experienced violence types were positively related to the PSS-I score. The main effect of the recruitment type, however, did not predict the PSS-I score significantly.

The third regression model, including also the two-way interactions between the group variable ‘recruitment type’ and both number of self-experienced and perpetrated violence types, explained 16% of the variability of the PSS-I score. The change in $R^2$ was significant, $\Delta R^2 = .03, F(2, 193) = 3.12, p = .046$. Adding the three-way interaction did not improve the model, $\Delta R^2 < .01, F(1, 192) < 0.01, p = .951$. As shown in table 4.2, both two-interaction terms were significant. The interaction between number of self-experienced violence types and recruitment type correlated positively and the interaction between perpetrated violence types and recruitment type negatively with the PSS-I score.

A subsequent regression analysis, which was performed separately for both groups, revealed that experienced violence types were only related positively to the PSS-I score in voluntary combatants ($\beta = .31, t = 2.78, p = .006$). Moreover, perpetrated violence types correlated only positively with the PSS-I score in forcibly recruited combatants ($\beta = .39, t = 3.32, p = .001$).

Table 4.2

Multiple regression analysis for PSS-I score

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>PSS-I score</th>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>$SE$</td>
<td>$\beta$</td>
<td>$T$</td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
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<td>-0.35</td>
<td>-3.07**</td>
</tr>
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<td>-0.41</td>
</tr>
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<td>Country of origin</td>
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<td>0.17</td>
<td>2.06*</td>
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<td>-0.03</td>
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<td>&lt; 0.01</td>
<td>0.06</td>
<td>0.56</td>
</tr>
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</table>

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Impact of perpetrated violence on mental health

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>PSS-I score</th>
<th>B</th>
<th>SE of B</th>
<th>β</th>
<th>T</th>
</tr>
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<tbody>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
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<td>-.19</td>
<td>-1.64</td>
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<td>0.40</td>
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<td>&lt; 0.01</td>
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<td>0.36</td>
<td></td>
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<tr>
<td>Perpetrated violence types</td>
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<td>.16</td>
<td>1.98*</td>
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<tr>
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<td>0.66</td>
<td>.19</td>
<td>2.35*</td>
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</tr>
<tr>
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<tr>
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<tr>
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<td>-2.31*</td>
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</tbody>
</table>

*Note. $R^2 = .20$, $N = 202$,

$B$: unstandardized regression weight, $SE$: standard error, $\beta =$ standardized regression weight, $T$: t-test statistics. *$p < .05$. **$p < .01$. ***$p < .001$.

aForcibly recruited combatants were used as the reference group.
4.5 Discussion

Results showed that voluntary combatants reported more perpetrated violence types and a higher level of appetitive aggression than combatants who were forcibly recruited. These findings are in accordance with prior research concerning child soldiers and combatants in the DRC. As expected, no differences were found between forcibly recruited and voluntary combatants concerning exposure to violence. This was also true, however, for PTSD symptom severity. One might expect lower PTSD symptom severity in voluntary combatants, as they showed higher levels of appetitive aggression. Appetitive aggression is thought to buffer or to prevent PTSD. This seems only to be the case, however, if combatants do not exceed a certain threshold of self-experienced traumatic events (Elbert et al., 2010). Yet this might apply in the present study as all participants experienced a high number of violent acts as well as other traumatic events. Further research is needed to clarify the link between appetitive aggression and PTSD symptom severity.

Furthermore, results indicated that the recruitment type influences the correlation of both self-experienced and perpetrated violence with PTSD symptom severity. Consistent with MacNair, we found a positive relation between PTSD symptom severity and perpetrated violence. This, however, was only true for forcibly recruited combatants. For these combatants, perpetrating violence seems to be more aversive than experiencing violence. Being forced to carry out cruel forms of violence (e.g., against their own village or ethnic group) might explain this. In concordance with prior research we also found a positive relationship between self-experienced violence and PTSD symptom severity. Surprisingly, only voluntary but not forcibly recruited combatants showed this relationship. As all forcibly recruited combatants in the current study experienced extreme forms of violence and survived years in very violent environments, the variability of the number of experienced violence types is limited. The current study, however, cannot determine whether the lack of a relationship between self-experienced violence and PTSD symptom severity in forcibly recruited combatants is a result of a limited variance in this extreme group. Future studies need to investigate and replicate these findings.

Consistent with prior findings, voluntary combatants reported high levels of appetitive aggression. These results are in accord with the notion that they perceived perpetrating violence not necessarily as traumatic but rather as fascinating and appealing. Our study furthermore shows that in contrast to forcibly recruited combatants, voluntary combatants showed no correlation between perpetrated violence and PTSD symptom severity. Although both groups had comparable levels of PTSD symptom severity, in voluntary combatants it
was specifically self-experienced violence and not perpetrated violence that was positively correlated with PTSD symptom severity.

Consequently, it is important not to value perpetrating violence per se as traumatic as is commonly done in a number of studies. In fact, the results of the present study indicate that perpetrating violence is traumatic for many, however, not for all combatants. Whether perpetrating violence is traumatic seems to depend on the perception of violence. In the present study, voluntary combatants perceived violence as fascinating and appealing.

The degree to which the results of the present study can be generalized is limited. First, the cross-sectional study design and the specific sample would not allow establishing causality. Although we interviewed all ex-combatants who were enrolled in the program of the United Nations and this Congolese organization at the time of assessment, the sample was probably not representative for (ex-)combatants in the DRC. Not all ex-combatants are enrolled in a program and the sample consists mainly of deserted combatants, who might not be comparable to active combatants.

Although we tried to rate the combatant’s own perception of his recruitment, in some cases the decision to join was the result of limited choices in a resource-poor region of instability. This sometimes blurred the boundaries between forcible and voluntary recruitment and might have influenced the results of the present study. Nevertheless, we hold that voluntary combatants feel more in control of their lives and perceive the armed group as less threatening than forcibly recruited combatants.

The present study only differentiated between foreign and local armed groups. Combatants from different local armed groups, however, were interviewed. Although the different local armed groups did not differ obviously, for example concerning reported levels of aggression or perpetrated violence, minor differences might influence the results. The same might be true for different interview places. The ex-combatants talked openly about perpetrating violence and appetitive aggression. Generally, the respondents appreciated very much the possibility to detail the situation in the eastern Congo and their own experiences. A potential bias, like an influence of social desirability, however, can never be ruled out for subjective reports.

Future research should investigate the causal relation between perpetrated violence and mental ill-health more closely. The moderating effects of recruitment type and appetitive aggression also need further clarification. Additionally, the role of guilt as an important variable for development and maintenance of PTSD (Henning & Frueh, 1997; Lee, Scragg, & Turner, 2001) should be investigated. This is because guilt might explain the different impact of perpetrating violence on PTSD between forcibly recruited and voluntary combatants.
All in all, the results of the present study indicate that perpetrating violence is positively related to trauma-related mental illness in many, but not all, combatants. As a consequence, we cannot consider perpetrating violence per se as traumatic. In fact, it is very important to consider the combatant’s perception of violence. The same situation might be traumatic for one but appealing for the other.

4.6 Acknowledgements

This research was supported by the NGO vivo international and by the Deutsche Forschungsgemeinschaft. We are grateful to all the former combatants for their readiness to participate and willingness to talk about often intimate and painful subjects. We thank our local staff, Roger Buhendwa Zashurwa, Ben Ombeni Cigolo, and Flory Barhimanya Kahisa for translating the interviews, their commitment to our work, and their empathy with participants. Moreover, we thank the staff of the training center Equipe d’Education et d’Encadrement des Traumatisés de Nyiragongo in Goma and the staff of the demobilization camp of the United Nations in Goma for all their help. We are grateful to James Moran who critically reviewed the manuscript. Last but not least, we thank Heike Riedke for her support with data collection and logistics. We profited a lot from her extensive knowledge of the Great Lakes Region.
5 Aggression inoculates against PTSD symptom severity – insights from armed groups in the eastern DR Congo

5.1 Abstract

Background: In the ongoing conflict in the Democratic Republic of the Congo (DRC) combatants are exposed to massive forms of violence and other traumatic stressors. Nevertheless, many combatants do not suffer from trauma-related disorders, although they have experienced numerous traumatizing events. Perceiving aggressive behavior as fascinating and arousing might be a defense against trauma-related disorders in the violent environment of war and conflict.

Objective: Thus, in the present study we investigated the relation between the exposure to traumatic stressors, appetitive aggression, and posttraumatic stress disorder (PTSD) symptom severity. We hypothesized that cumulative traumatic experiences correlated positively and appetitive aggression negatively with PTSD symptom severity.

Method: In total, 105 voluntary male combatants from different armed groups in the eastern DRC took part in the study. In a semi-structured interview, respondents were questioned about their exposure to traumatic stressors, the extent of appetitive aggression (Appetitive Aggression Scale) and their PTSD symptom severity (PTSD Symptom Scale-Interview).

Results: A multiple sequential regression analysis showed that traumatic events were positively related to PTSD symptom severity. For participants with low to medium PTSD symptom severity, appetitive aggression correlated negatively with PTSD symptom severity.

Conclusions: The results of the present study provide further support for earlier findings that repeated exposure to traumatic stressors cumulatively heightens the risk of PTSD and revealed that appetitive aggression buffers the risk of developing PTSD symptoms under certain circumstances. Thus, the perception of aggressive behavior as fascinating and arousing seem to help combatants to adapt to violent environments but may also be one reason for recurrent failure of re-integration programs for ex-combatants.

Keywords: appetitive aggression, PTSD, defense, building block effect, ex-combatants, DR Congo
5.2 Introduction

The eastern Democratic Republic of the Congo (DRC) has been trapped in ongoing cycles of war and violence for more than two decades, with thousands of soldiers and combatants serving in numerous local militias and armed groups (Davis & Hayner, 2009; Romkema, 2007). Combatants are exposed to war and violence on a daily basis. The brain adapts to frequent stressors and danger, such as those posed by the conditions in the eastern DRC, by prioritizing a stress-responsive pathway. This pathway helps the individual to react to danger with aggression or flight, but it is also related with a higher risk of mental illness (Elbert et al., 2006). Exposure to severe and traumatic stress may lead to the development of post-traumatic stress disorder (PTSD). Prior research has consistently shown that the greater the cumulative exposure to traumatic experiences, including organized violence, the greater the risk of trauma-related disorders, including depression, or substance abuse (Amone-P’Olak et al., 2007; Catani et al., 2008; Chapman et al., 2004; Edwards et al., 2003; Hermenau et al., 2011).

In a study with child soldiers from Uganda and the DRC, however, Bayer et al. (2007) found that only 35% of the former child soldiers suffered from PTSD, despite having experienced a high number of traumatic events. Beyond that, Pfeiffer and Elbert (2011) reported a negative relation between the time spent with the rebels and PTSD symptom severity. They concluded that many combatants had adapted to the violent circumstances of an armed group. Elbert et al. (2010) argued that the combatant's partial defense against trauma-related disorders, in spite of having experienced tremendously distressing events and ongoing threats of war and death, might be best explained in terms of the phenomenon of ‘appetitive aggression’. Aggression is often categorized as either a reactive self-defense response, or alternatively as a behavior carried out for some instrumental gain (Anderson & Bushman, 2002). In contrast, appetitive aggression attempts to capture a rather hedonic form of aggressive behavior that we frequently observe in the field. Appetitive aggression is thus conceptualized as perceiving aggressive behavior towards others as fascinating, arousing and thrilling (Hecker et al., 2012). Former child soldiers and ex-combatants report that their experience of war brought about a gradual transformation in their perception of violence: At first it was frightening, but with repeated experience it became not only normal and acceptable, but even exciting and arousing (Maclure & Denov, 2006). How can we explain this change in people’s response to violence? In a peaceful society, moral standards, social customs and laws inhibit extreme forms of violence including killing of humans (Elbert et al., 2010). Life in an extremely violent environment often breaks these socially learned inhibitions and moral standards (Engen, 2008). This can for example be achieved through dehumanization of the
enemy (Staub, 2006) and initiation rites in armed groups, including killing of relatives (Amone-P’Olak, 2004). Elbert et al. (2010) developed this idea further by arguing that in analogy to the fear network in PTSD, an associative interconnected set of representations (sensory, cognitive, affective) related to the fearful experiences, perpetrators form a hunting network, marked by approach rather than avoidance to violence cues. Whereas exposure to violent acts leads to an extension of the fear network, arousing or appetitive elements that arise during the perpetration of violence are integrated into the hunting network. In contrast to violent behavior of psychopathy or sociopathy, which is seen as emotionally ‘cold’ and driven purely by instrumental motives, combatants report perpetrating violence as highly arousing (Weierstall & Elbert, 2012). Furthermore, we view appetitive aggression not as pathological per se but as an adaptation in a very bloody, cruel and violent environment to overcome the learned inhibition of killing other humans. Seen in terms of the approach/avoidance dichotomy of emotion put forward by Lang, Bradley and Cuthbert (1998), appetitive aggression and its attendant hunting network can be viewed as an approach behavior, whereas fearful responses that generate a fear network can be seen as an avoidance behavior (Weierstall & Elbert, 2012).

In a study in the DRC, former combatants reporting high levels of appetitive aggression were more likely to volunteer for duty and to join as minors. They also reported a higher number of perpetrated violence types (Hecker et al., 2012). For child soldiers, perceiving the perpetration of violence as fascinating and arousing seems to be adaptive for survival in a violent environment. Being more appetitively aggressive is advantageous in this extremely violent environment, with people high in this factor occupying higher positions in armed groups, as well as being both acknowledged and feared by peers (Crombach et al., 2013; Hermenau et al., 2013).

Furthermore, we found that perpetrating violence is perceived as traumatic for some combatants, but not for all. Therefore, it is important to take the combatant's perception of perpetrating violence into account (Hecker et al., 2013). Some combatants consider perpetrating violence to be fascinating and arousing, with voluntary combatants seeming to suffer less from the consequences of perpetrating violence. Elbert et al. (2010) suggested that the appetitive and fascinating element of violence prevents the incorporation of the cruel, genuinely traumatizing experiences into the fear network (Elbert et al., 2006; Elbert & Schauer, 2002). Therefore, we argue that combatants who perceive perpetrating violence to be fascinating and arousing are more likely to integrate sensory input, cognitions and emotions that are linked to the perpetration of violence into the hunting network, whereas perceiving the perpetration of violence as frightening and disgusting leads to an extension of the fear network. In concordance with this, two studies have found a negative relation.
between PTSD symptom severity and appetitive aggression, one in Ugandan child soldiers (Weierstall et al., 2012) and the other in Rwandan genocide perpetrators (Weierstall et al., 2011). Consequently, Elbert et al. (2010) concluded that appetitive aggression buffers the risk of PTSD as the integration of violent cues into the hunting network (and not into the fear network) may reduce the likelihood of a trigger-related activation of the fear network. On the other hand they argue that this protective effect may wane if the combatant exceeds a certain level of traumatization due to an overlap of the hunting and the fear network. As the number of items that are linked to the fear network increases, the higher the likelihood of the fear network being triggered. Consequently, the combatant experiences trauma related symptoms.

5.3 Objective

In the present study we investigated the relation between appetitive aggression, exposure to traumatic experiences, and PTSD symptom severity in former combatants in the eastern DRC. In this conflict, spanning more than two decades, many young men volunteer for duty in one of several armed groups. In some areas of North Kivu up to 70% of the young men have been associated with armed groups (Coalition to Stop the Use of Child Soldiers, 2010; Romkema, 2007). In order to achieve the successful demobilization and integration of former combatants it is necessary to establish and test models that predict how the life in violent environments shapes young men, as well as why some suffer severely from psychological dysfunction and mental disorders while others adapt well to this harsh environment.

In recent reports on data from the same population we found that appetitive aggression is linked to joining an armed group voluntarily (Hecker et al., 2012). Furthermore, perpetrated violence was not correlated with PTSD symptom severity in voluntary combatants and they perceived perpetrating violence as more fascinating and arousing than forcibly recruited combatants (Hecker et al., 2013). Hence, we concluded that forcibly recruited and voluntary combatants process violent cues differently. Whereas forcibly recruited combatants are more likely to integrate violent cues into their fear network, voluntary combatants may integrate violent cues in the hunting network, which Elbert et al. (2010) view as the underlying mechanism of the buffering effect of appetitive aggression. In the present study we therefore examined the voluntary combatants (for further details about differences between forcibly recruited and voluntary combatants see Hecker et al., 2013).
We hypothesized that a) according to the dose-response-effect or building block effect (Anda et al., 2006; Mollica, McInnes, Poole, & Tor, 1998; Neuner, Schauer, Karunakara, et al., 2004) traumatic event types correlate positively with PTSD symptom severity and b) we predicted a protective influence of appetitive aggression on PTSD symptom severity. Consequently, we hypothesized a negative correlation between appetitive aggression and PTSD symptom severity. However, according to Elbert et al. (2010) the negative relation between appetitive aggression and PTSD symptom severity may wane if the level of traumatization exceeds a certain threshold. This is plausible, as a ceiling effect of symptom severity is inherent in every diagnostic instrument. Following Weierstall et al. (2013) we thus hypothesized that c) we detect the protective influence of appetitive aggression on PTSD symptom severity if we exclude combatants with the highest level of traumatization from our analyses.

5.4 Method

5.4.1 Participants

Between March and May 2011 224 face-to-face interviews were conducted in Goma in the province of North Kivu, DRC. From this sample, 107 combatants reported that they volunteered to join an armed group. Two interviews were excluded from all analyses because for logistical reasons, they could not be completed. Most interviews, 60% (n = 63), took place at a UN demobilization transit camp, 38% (n = 40) were conducted at a reintegration center for former child soldiers and former combatants and 2% (n = 2) at a military detention facility. As is typical for ‘new wars’ (Elbert et al., 2006; Shaw, 2000), objective boundaries between forcible and voluntary recruitment are often difficult to draw. This held true in the conflict in the eastern DRC. In specific cases where it was unclear from their history, we relied on the individual combatant’s subjective perception of his recruitment.

All participants were male (N = 105). The mean age was 25.72 (SD = 7.45, Range: 15 – 50). In total, 69% (n = 72) were born in the DRC and 31% (n = 33) in Rwanda. Participants belonged to a variety of armed groups and forces, including ‘Forces Démocratiques pour la Libération du Rwanda (FDLR), ‘Congrès National pour la Défense du Peuple (CNDP)’, several local ‘Mai Mai’ groups and the Congolese Government Army (FARDC). On average, they served as combatants for 8.02 years (SD = 5.75, range: 0.44 – 28). The mean age, with which they joined an armed group for the first time, was 16.73 years (SD = 6.29 range: 0 – 31). In total, 21% (n = 22) fulfilled the clinical diagnosis of PTSD. The time since the participants demobilized ranged from one week to six years. The great majority (75%) of the
participant left their armed group within the year before the assessment. Less than 10% of the participants demobilized more than 3 years prior to the assessment.

5.4.2 Procedure

Four clinical psychologists (TH, KH, AM, MS) and a nurse trained in psychological assessment from the University of Konstanz, who all had extensive work experience in Africa’s conflict zones, conducted the semi-structured interviews with the help of three interpreters. The interpreters were trained in the concepts of mental disorders and aggression before the assessment. All instruments were translated into Kiswahili, Kinyarwanda or Lingala, and the translation was intensely discussed to guarantee a precise interpretation. Two of the experts could understand the native languages well enough to continuously supervise and assure valid translation. The interviewers further standardized the form of assessment by practicing in joint interviews to achieve a high inter-rater reliability. Subsequently, one interviewer and one translator individually interviewed each interviewee in a calm and quiet setting. Each interview took on average one and a half hours.

The Ethical Review Board of the University of Konstanz, the United Nations’ mission in the DRC (MONUSCO), and the respective Congolese non-governmental non-profit organization in charge of the reintegration center approved the present study. Due to the participants’ illiteracy, we collected oral informed consent. In addition, we asked the respective institutions for permission to interview underage child soldiers, as their caregivers were either dead or not available. Participants received financial compensation of about 2 U.S. dollars. Other aspects of the data gathered during the extensive investigations are presented by Hecker et al. (2013; 2012) and Hermenau et al. (2013).

5.4.3 Measures

After an informal conversation and the informed consent, the first part of the interview consisted of socio-demographic information (e.g., place and year of birth). Then, the former combatants were interviewed about their military career (e.g., how they were recruited and length of service).
Exposure to traumatic life experiences over the combatant’s entire lifetime was assessed using a checklist of 20 war- and non-war-related potentially self-experienced and witnessed traumatic events (e.g., physical assault, assault by weapon, rape, life-threatening injury and accident). This checklist was a version of a previously published checklist (Neuner, Schauer, Karunakara, et al., 2004) that we adapted to fit the cultural context. This checklist showed a high test–retest reliability ($r = 0.73$, $p < 0.001$) and significant accordance with the CIDI Event List (Ertl et al., 2010) in an earlier study with former child soldiers in the Great Lakes Region. The number of times a specific event had been experienced was not assessed, as distorted memory in PTSD renders this measure unreliable (Elbert & Schauer, 2002; Kolassa & Elbert, 2007; McNally, 2006). For the analyses we computed a sum score of all traumatic event types (range: 0 to 20). On average, the participants reported $M = 13.91$ ($SD = 2.56$, range: 8 - 19) different traumatic event types.

The PTSD symptom severity was determined by using the PTSD Symptom Scale-Interview (PSS-I; Foa et al., 1993). The PSS-I assesses the 17 DSM-IV symptom criteria for PTSD on the basis of the subjectively most traumatic event that occurred at least one month prior to the assessment. All items refer to symptoms experienced in the previous month. Each of the items was answered on a 4-point scale ranging from not at all/only one time (0) to five or more times per week/almost always (3). The PSS-I is widely used to diagnose PTSD and has good psychometric properties (e.g. Cronbach’s Alpha = .86 & inter-rater reliability = .93; Foa et al., 1993; Foa & Tolin, 2000). It has been validated for various cultural settings, and also for former child soldiers (Ertl et al., 2010). We analyzed the data dimensionally so that potential cultural differences could be taken into account. Therefore, we computed a PTSD severity score (range: 0 to 51) by adding all symptom scores. On average, the participants reported a PTSD severity score of $M = 9.14$ ($SD = 8.57$, range: 0 - 45). In the present sample the Cronbach’s Alpha coefficient was .90.

Appetitive aggression was assessed with the Appetitive Aggression Scale (AAS; Weierstall & Elbert, 2011), which has been validated with over 1600 ex-combatants and proven its good psychometric properties in comparable samples in Uganda (Weierstall et al., 2012), Rwanda (Weierstall et al., 2011), and the DRC (Hecker et al., 2012). The AAS consists of 15 items regarding the perception of violence or appetitive aggression (e.g., “Is it exciting for you if you make an opponent really suffer?”, “Once fighting has started do you get carried away by the violence?” or “Is fighting the only thing you want to do in life?”). The interviewer rated the level of the interviewee’s agreement on a 5-point Likert scale ranging from disagree (0) to agree (4). The items were based on the definition of the instrumental aggression subtype according to Vitiello and Stoff (1997) and the ICD-10 addiction criteria (World Health
Aggression inoculates PTSD symptom severity

Organization, 1992). Further items were compiled on the basis of interviews with child soldiers about the appetitive experience of aggression and violence (Elbert et al., 2010). In the validation study, the AAS score showed a Cronbach’s Alpha coefficient of .85 and further analyses revealed that the AAS measures a distinct construct of human aggression (for further details see Weierstall & Elbert, 2011). For the analysis we computed a sum score of all 15 items. It ranged from 0 to 60. On average, the participants reported an AAS score of $M = 27.69$ ($SD = 13.70$, range: 1 - 60). In the present sample the Cronbach’s Alpha coefficient was .88. In a multiple regression analysis of the same sample (see also Hecker et al., 2012), which explained 26% of the variances of the AAS score, the AAS score correlated significantly with perpetrated violence types ($\beta = .40$), voluntary enlistment ($\beta = .20$) and joining as a child ($\beta = .14$).

5.4.4 Data analysis

All analyses used a two-tailed $\alpha = .05$. First, we conducted a multiple sequential regression analysis including all voluntary combatants ($N = 105$) to investigate the correlation between PSS-I score, the number of traumatic event types, and the AAS score. In the first step, only the number of traumatic event types was included as a predictor. In the second step, the AAS score was added to the model. The regression model fulfilled all necessary quality criteria for linear regression analyses. The residuals did not deviate significantly from normality ($Kolmogorow-Smirnov-Z = 1.14$, $p = .150$), linearity, or homoscedasticity. No univariate outliers could be identified. However, Cook’s Distance revealed four multivariate outliers ($2 SD > M$). Consequently, these multivariate outliers were excluded from the analysis. The maximum Variance Inflation Factor did not exceed 1.12. Hence, we do not need to take multicollinearity into account.

In a second step, we excluded all combatants with a PSS-I score higher than 21 (Weierstall et al., 2013). These were the upper 10% ($n = 9$) of the present sample. Then we conducted again a multiple sequential regression analysis as we did before. Again, the regression model fulfilled all necessary quality criteria for linear regression analyses. The residuals did not deviate significantly from normality ($Kolmogorow-Smirnov-Z = 1.11$, $p = .174$), linearity, or homoscedasticity. No univariate outliers could be identified. However, Cook’s Distance revealed five multivariate outliers ($2 SD > M$). As a result, these multivariate outliers were excluded from the analysis. The maximum Variance Inflation Factor did not exceed 1.13. Hence, we do not need to take multicollinearity into account.
5.5 Results

The first regression model with only the number of traumatic event types as a predictor of the PTSD symptom severity score explained 7% of the variability of the PSS-I score ($R^2 = .08$, $F(1, 99) = 8.27, p = .005$). As shown in Table 5.1, the number of traumatic events correlated positively with the PSS-I score. Adding the AAS score as an additional predictor did not improve the model ($\Delta R^2 < .01$, $F(1, 98) = 0.70, p = .405$). In other words, our analysis revealed that only the number of traumatic event types correlated significantly with the PTSD symptom severity, and not the AAS score. Thus, we replicated the building block effect of cumulative exposure to traumatic stressors but did not find a protective influence of appetitive aggression on PTSD symptom severity for all combatants.

Table 5.1
Results of regression analysis predicting PSS-I

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>B</th>
<th>SE of B</th>
<th>$\beta$</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traumatic event types</td>
<td>0.89</td>
<td>0.27</td>
<td>.32</td>
<td>3.31***</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traumatic event types</td>
<td>1.02</td>
<td>0.29</td>
<td>.36</td>
<td>3.57***</td>
</tr>
<tr>
<td>AAS Score</td>
<td>-0.75</td>
<td>0.06</td>
<td>-.13</td>
<td>-1.31</td>
</tr>
</tbody>
</table>

Note. $R^2 = .08, N = 101$,


5.5.1 Exclusion of the combatants with a high PTSD symptom severity

Given a ceiling effect for trauma symptom severity, we excluded all combatants with a PSS-I score higher than 21. The regression model with only the number of traumatic event types as a predictor of the PTSD symptom severity explained 11% of the variability of the PSS-I score ($R^2 = .12, F(1, 89) = 12.49, p = .001$). After adding the AAS score as an additional predictor, the regression model explained 17% of the variance. The change in $R^2$ was significant ($\Delta R^2 = .06, F(1, 88) = 6.61, p = .012$).
As shown in Table 5.2, the number of traumatic event types was positively related to the PSS-I score. The AAS score correlated negatively with the PSS-I Score. In other words, after excluding the combatants with a PSS-I score higher than 21, we found the building block effect and we also noticed a protective influence of appetitive aggression on the PTSD symptom severity (see Figure 5.1).

Table 5.2
Results of regression analysis predicting PSS-I score (excluding combatants with a PSS-I score higher than 21)

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>PSS-I score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
</tr>
<tr>
<td>Traumatic event types</td>
<td>0.86</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
</tr>
<tr>
<td>Traumatic event types</td>
<td>1.08</td>
</tr>
<tr>
<td>AAS Score</td>
<td>-0.13</td>
</tr>
</tbody>
</table>

Note. \( R^2 = .18, \ N = 91, \)

B: unstandardized regression weight, SE: standard error, \( \beta \) = standardized regression weight, \( T \): t-test statistics. *\( p \leq .05 \). **\( p \leq .01 \). ***\( p \leq .001 \).

Figure 5.1: (a) Partial regression from the number of traumatic event types to the PSS-I score (building block effect). (b) Partial regression from the AAS score to the PSS-I score (protective influence).
5.6 Discussion

The results of the present study revealed that the number of traumatic event types correlated positively with PTSD symptom severity. Concordant with prior research (Mollica et al., 1998; Neuner, Schauer, Karunakara, et al., 2004), our data thus confirmed the building block effect in former combatants: repeated exposure to different types of traumatic stressors cumulatively heightens the risk for PTSD symptoms. On average the former combatants reported that they had experienced about 14 different types of traumatic stressors. Following Neuner, Schauer Karunakara, et al. (2004), for a sample of civilian survivors we would expect PTSD rates between 50% and 60%. However, only some 20% of the present sample fulfilled the clinical criteria for a PTSD diagnosis. Additionally, the former combatants reported on average only a low PTSD symptom severity. Elbert et al. (2010) suggested that appetitive aggression might explain why many combatants do not suffer from trauma-related disorders, even if they had gone through tremendously distressing experiences and ongoing threats of war and death. They suggested that the appetitive and fascinating element of violence prevents the incorporation of the cruel, genuinely traumatizing experiences into the fear network (Elbert et al., 2006). In agreement with prior findings (Weierstall et al., 2011, 2012) we found a negative correlation between appetitive aggression and PTSD symptom severity in the present sample, i.e., replicated a protective influence of appetitive aggression. However, consistent with Weierstall et al. (2013) we found this protective influence only after excluding those combatants showing the highest PTSD symptom severity. In concordance, Elbert et al. (2010) argued that there is no ultimate defense against trauma-related disorders and the protective influence of appetitive aggression on PTSD symptom severity may wane as the level of traumatization exceeds a certain threshold. They argue, that due to recurrent traumatization, the fear network is extended and may overlap with the hunting network. Consequently, positive or appetitive memories that are linked to the perpetration of violence may not only trigger the hunting network but also the fear network.

In line with Elbert et al. (2010) and our prior findings (Hecker et al., 2013, 2012; Hermenau et al., 2013) we argue that perceiving aggressive behavior as fascinating and arousing can be advantageous in a cruel and violent environment such as that experienced in an armed group, as it reduces the risk of trauma related disorders like PTSD. On the one hand, appetitively aggressive combatants seem to be less likely to perceive perpetrating violence as traumatic (Hecker et al., 2013). On the other hand they seem to be better prepared to cope with traumatic life experiences up to a certain level. Hence, appetitively aggressive combatants have a higher chance of survival in violent environments but may have difficulties integrating into civil society after demobilization. However, further research is
needed to investigate how appetitive aggression develops and how it serves as a buffer against the risk of developing PTSD symptoms. The protective influence of appetitive aggression on PTSD symptom severity has been shown in different conflict zones in Africa and South America and seems to be robust. Future studies should focus on possible moderating or mediating effects of appetitive aggression. For example it may moderate or mediate the building block effect. If a combatant experiences a great variety of traumatic stressors too frequently, the building block effect may outweigh the protective influence of appetitive aggression. Future research might reveal whether there is a general or an individual threshold, depending on other factors, such as the meaning of the events and the conflict at large for the individual (Hecker et al., 2013; Schauer, Neuner, & Elbert, 2011). Furthermore, future studies may focus on alcohol and substance abuse and its interrelation to perpetrated violence and appetitive aggression as well as factors that help to overcome the threshold for killing another human, e.g. dehumanization of the enemy or in-group and out-group perception or dissociative experiences.

The degree to which the results of the present study can be generalized is limited. First, the cross-sectional study design and the specific sample would not allow us to establish causality. Although we interviewed all voluntary ex-combatants who were enrolled in the demobilization program of the United Nations and the reintegration program of the Congolese organization in charge of the reintegration center at the time of assessment, the present sample may not necessarily be representative for voluntary ex-combatants. Moreover, the sample consists mainly of deserted combatants, who might not be comparable to active combatants. Although many deserted combatants reported appetitive aggression, difficult living conditions (e.g. lack of weapons, medical supply or food) and traumatic experiences (e.g. life danger, severe injuries or witnessing killing of comrades) in the armed groups made them leave the armed group. We would expect higher appetitive aggression and therefore a better psychological functioning among active combatants. In the present study we only included combatants who had voluntarily joined an armed group. Although we tried to rate the combatant’s own perception of his recruitment, in some cases the decision to join was the result of limited choices in a resource-poor region of instability (Guy, 2009b; Schauer & Elbert, 2010). This sometimes blurred the boundaries between forcible and voluntary recruitment and might have influenced the results of the present study. The ex-combatants talked openly about appetitive aggression. Generally, the respondents greatly appreciated the opportunity to detail their view of the situation in the eastern DRC and to report their own experiences. A potential bias, like the influence of social desirability or of demand characteristics, can never be ruled out for subjective reports. However, the validity
of the reported number of different types of traumatic life experiences has been assured by a positive association between hair cortisol levels and the number of lifetime traumatic event types in former child soldiers in an earlier study (Steudte et al., 2011).

5.7 Conclusions

The present study has added further support to the notion that repeated exposure to different types of traumatic stressors cumulatively heightens the risk of trauma-related suffering in former combatants. With the present study we validated prior findings from other conflict zones in Africa and Latin-America (Weierstall et al., 2013, 2011, 2012) showing that appetitive aggression may provide a defense against trauma-related disorders under certain circumstances. Our findings indicate that some former combatants seem to adapt to the cruel and violent environment of armed groups and are able to cope with the adverse conditions. After demobilization, attraction to violence and aggressive behavior, however, pose challenges for the integration of ex-combatants into civil society as it heightens the risk of voluntary re-recruitment (Hermenau et al., 2013). Thus, our findings may offer one possible explanation at the individual level as to why struggles to end the ongoing conflict in the DRC have engendered so little success. To address the combatants’ needs and to improve reintegration programs, we advocate adding mental health components to reintegration programs. In addition to trauma-related sufferings, attraction to violence and enhanced levels of aggressive behavior must be addressed. Demobilization and reintegration of former combatants remain important for solving ongoing conflicts and re-establishing a legitimate authority that provides the public services needed for the development of a peaceful society.
5.8 Acknowledgements

This research was supported by the NGO vivo international and by the Deutsche Forschungsgemeinschaft (DFG). We are grateful to the former combatants for their readiness to participate and willingness to talk about often intimate and painful subjects. We thank our local team members, Roger Buhendwa Zashurwa, Ben Ombeni Cigolo, and Flory Barhimanya Kahisa for translating the interviews, their commitment to our work, and their empathy with participants. Moreover, we thank the staff of the training center Equipe d’Education et d’Encadrement des Traumatisés de Nyiragongo in Goma and the staff of the demobilization camp of the United Nations in Goma for their help. We are grateful to Roland Weierstall for his statistical support as well as to Justin Preston and James Moran who critically reviewed the manuscript. Last but not least, we thank Heike Riedke and Dr. Harald Hinkel for their support with logistics. Their extensive knowledge of the Great Lakes Region was essential to the success of this study.
6 Drugs boosting conflict? A micro-level test of the linkage between substance use and violence

6.1 Abstract

Many studies have emphasized the role of natural resources in the onset and duration of armed conflict. Due to its characteristics, drugs are considered to be one of the most influential resources. However, the dynamics of how this particular commodity is linked to conflict is still not well understood. Most scholars have focused on the revenue aspects of drugs and only few have mentioned the micro-level aspect, i.e. the effect of drugs intake and alcohol consumption on combatant's behavior during the conflict. With the help of a dataset based on 224 interviews held with former combatants in the Democratic Republic of the Congo, we examined this latter dynamic. Our analyses show, after controlling for armed group-level and individual-level variables, that drug intake and alcohol consumption boost the amount of perpetrated violent actions by combatants.

*Keywords*: conflict, drugs, alcohol, violence

6.2 Introduction

Natural resources have played a conspicuous role in the history of armed conflicts. Especially with the sharp drop in foreign assistance to many governments and non-state armed groups due to the end of the Cold War, belligerents have become more dependent upon mobilizing private sources of support to sustain their military and political activities (Le Billon, 2001). This search for finance defined a new political economy of war, in which armed conflict increasingly becomes the means to individual commercial ends: gaining access to valuable resources (Keen, 1998).

The relationship between conflict and natural resources was first examined by Collier and Hoeffler (1998, 2004). They found a strong relation between a state’s reliance on the export of natural resources, and the likelihood it will suffer from civil war. Subsequently research has determined that the strength of this relationship is influenced by the type of natural resources, their illegal nature, their level of obstructability, and the nature of the conflict (Ross, 2003). Drugs, which are lootable, illegal, and not easily obstructable, are then also considered as one of the ‘deadliest’ natural resources available: They have been positively linked to conflict duration in diverse statistical studies as well as in more qualitative accounts.
However, the way in which drugs interact with conflict is not well understood (Cornell, 2007). Some authors have emphasized the revenue aspect, while other authors have suggested a more micro-level linkage: Substance use play an important role in the combatant's behavior on the battlefield. It makes them more aggressive and violent and at the same time removes learned constraints against the use of violence, which in turn might increase the duration and/or boost the conflict.

Although difficult to test, most research has emphasized the revenue aspect of drugs, while neglecting this important micro-level interaction between drugs and conflict. This study will, therefore, investigate this latter mechanism. It is important to note, however, that we do not deny the existence of the revenue mechanism. Notwithstanding, we are of the opinion that the picture is more complicated than is portrayed so far in the literature. And gaining a better understanding of the entire set of dynamics that appear to be generating and sustaining a range of contemporary civil conflicts is necessary for anyone thinking of policy prescriptions that might facilitate a lasting peace (Keen, 2000).

In testing the linkage between drugs and conflict on a micro-level, we first start by providing an overview. In doing so, we show that little attention has been devoted to testing the causal mechanisms linking substance use to aggression and violence. Thereafter, we explain how we created the unique dataset based on recent interviews held in the eastern provinces of the Democratic Republic of the Congo (DRC) with combatants of different factions. During more than 200 intensive interviews, we have asked these recently demobilized fighters questions concerning their drug intake and alcohol consumption and their violent behavior during their time spend in the armed groups. Using this information, we statistically test this possible micro-level linkage between substance use and violent behavior. We conclude with a discussion of the results and how they should influence future research in this area.

6.3 Theory

In the current discussion on the determinants of civil war onsets, much attention is devoted to the relationship between economic incentives and armed conflict. Especially, after the end of the Cold War when armed movements could no longer rely on the financial support of the super powers, economic motivations have increasingly been blamed for action of belligerent parties on civil wars (Cornell, 2007; Piazza, 2012). Or as Grossman states, “in such insurrections the insurgents are indistinguishable from bandits or pirates” (Grossman, 1999, p. 269). In particular, academic literature has centered on the role of natural resources, in overcoming this resource constraint and thereby influencing the nature of the conflict. Collier and Hoeffler (1998, 2004) were among the first who examined this possible relationship. In their pioneering cross-sectional studies they found that states that rely on the export of
natural resources face a higher risk of civil war than resource-poor states. Subsequently, research has offered some more detailed insights in the link between primary commodities and conflict. Fearon and Laitin (2003), for example, who use a different data set, find that countries that export oil – but not other types of primary commodities – are more likely to undergo a civil war. Other scholars have focused more on the differences between types of primary commodities. Lujala (2010), for instance, shows that the lootability (or accessibility) of natural resources increases the feasibility of insurgency and lengthens the duration of a civil war. At the same time, she shows that these lootable resources (such as secondary diamonds and gemstones) have no link to conflict initiation. An important contribution in this tradition is also made by Ross (2003). He concludes from a study of 15 cases that the level to which a commodity is linked to conflict depends on its lootability, obstructability, and legality.

Taking this research into account, drugs can be considered as one of the most troublesome resources. Drugs, like opium, marijuana, and coca leaves, are a lootable resource. They have a high monetary value but are compact and easy to appropriate, store, and transport, thereby proving to be convenient financial resources for armed groups (Cornell, 2007; Piazza, 2012). Unlike timber and oil, drugs are not easily obstructable (there is no need for a complicated enterprise to cultivate it); they require little control over infrastructure or time to process, which enhances exploitation. Additionally, the illegality of drugs also makes them benefit insurgents disproportionally, because they are less susceptible to be influenced by international prohibition regimes (Cornell, 2007; Piazza, 2012). Notwithstanding, it is surprising that compared to other commodities, such as oil and gemstones, few studies have focused on the linkage between drugs and conflict. This relative lack of research might be due to the fact that the dynamics between drugs and conflict are presently not too well understood (Cornell, 2007).

Most authors emphasize the revenue aspect of drugs, when linking it with conflict. The trade in illegal drugs generates enormous revenues for armed groups that can be used, for example, to recruit and pay members, to acquire weapons, to establish command bases, to forge alliances with other armed groups and, ultimately, to become more effective and deadly (Piazza, 2012). The study of Holmes, Gutierrez de Pineres, and Curtin (2006) is an example of this focus. They show in their examination of the relationship between coca production and Colombian guerilla violence that coca eradication, measured in hectares, is positively and significantly correlated with leftist guerrilla violence. However, the mere presence of coca cultivation (measured in hectares in cultivation even after eradication efforts) is insignificant. Also Piazza (2012) confirms that drugs, in the form of opium, is an important driver for conflict and violence. He concludes that Afghanistan’s provinces that feature opium cultivation are at a significantly higher risk of experiencing terrorist attacks and of seeing their
citizens harmed in terrorist incidents than provinces that do not cultivate opium. Illicit drug markets are then also considered to be a crucial contributor to terrorism because they finance the existence and survival of the Taliban and Al Qaeda.

Besides these impressive examples of case studies on the linkage between drug production and/or drug cultivation and conflict (in whatever form), more cross-sectional and time-series studies also explore this revenue aspect. Fjelde and Nilsson (2012) for example, examine the variation in interrebel violence and state that this kind of violence should be higher in civil wars where the rebel organizations can fund their struggle through the sale of valuable natural resources. They show in their analyses that drugs production, in contrast to gemstone production, is significantly related to this particular form of violence. However, these results remain tentative. Some other studies, however, do not show a clear linkage between drug cultivation, its theorized revenue, and conflict. For example, Buhaug, Gates and Lujala (2009) in their study on the variation of civil conflict duration, show that gemstones and petroleum production in conflict areas prolong conflict duration, but that drug is not related to civil conflict duration. In some of their models, drugs have even the opposite effect of what was expected. Also Wood (2010) showed in his quantitative analysis on rebel violence that the presence of gemstones or drugs in the conflict zone is statistically unrelated to the level of rebel violence against the civilian population.

These mixed results indicate that testing the revenue aspect of drugs and how this aspect influences conflict is challenging. Not only, is the number of countries involved in large-scale production of opium and coca low (drugs is a rare commodity), but obtaining reliable data on drug cultivation and production across time and space presents an additional problem for reliable statistical analysis. Additionally, it seems as if these different results are due to the various operationalization of the term ‘conflict’: Some studies are focused on civil war duration, others on civilian killings or on interrebel violence. Furthermore, the production of drugs and conflict might reinforce itself. Lind, Moene, and Willumsen (2012) for example, state that the conflict in Afghanistan creates new illegal poppy cultivation opportunities since the state is not able to induce a regime of tight control. Consequently, some scholars (although not denying the revenue dynamics of drugs per se) have focused more on the individual level when researching how drugs relate to conflict and violence. In other words, they are examining whether substance use influence violent behavior. As such, they leave the idea of ‘selling drugs’, ‘drugs cultivation’, and concepts such as ‘revenue’. Instead, they look at the effect of drugs on combatant’s behavior.
There are some preliminary indications that the use of drugs influences behavior in a negative sense. First, there is some anecdotal evidence given by the combatants themselves that indicates that substance use removes learned constraints against violence and incites aggression and violence. A Congolese captain, cited by Baaz and Stern (2008) explained: “War is crazy, it destroys the minds of people. Some people just go crazy. Rape is a result of that too, especially the bad rapes. Also, a lot is because of drugs. If you take drugs, drink, or other things – it is not good. And many, many…most take drugs.” Also in our interviews, former fighters emphasized the linkage between drugs and violence. Participant (2080) explained: “In Mai-Mai Janvier [officially called Alliance des Patriotes pour un Congo Libre et Souveraine], they smoked marijuana. When they smoked, they were eager to go fighting. But when they did not smoke, they were lazy”. Also former combatant (2054) told us: “As a soldier I took a lot of drugs. I was drinking beer, smoking marijuana and sniffing petrol. Drugs help you to have no fear and just to shoot. In the CNDP [Congrés National pour la Défense du Peuple] we raped a lot of women. Soldiers rape, because they get out of control from smoking all this marijuana.”

In academic research, and especially in the field of political science, drugs usage is often linked to discipline problems in the armed groups. Ross (2003) for example, argues that drugs as a lootable resource, create opportunities for soldiers of all ranks to earn money by extracting or transporting the resources themselves, or extorting money from others who do (Ross, 2003). This results in a reduced level of discipline and central control within the armed group that controls the resources. These problems are not only likely to lengthen conflicts by making it harder for commanding officers to impose the terms of a settlement on their own forces, but more importantly, discipline problems, have in turn, been positively linked to civilian abuse. Humphreys and Weinstein (2006) showed, for instance, in their analysis of Sierra Leonean factions that the higher level of indiscipline permitted inside the armed factions, the greater the perpetrated abuses outside the faction. This is also confirmed by Weinstein (2007). He argues that a rebel group’s access to easily accruable income, for example, from lootable natural resources such as drugs, are central in shaping the organizational structure of the movement and its strategies regarding treatment of non-combatants: It makes the organization more violent.

Furthermore, some other studies in the field of psychology give additional insights in the linkage between substance use and violent behavior. However, the connection between substance use and violent behavior is complex and is suggestive rather than conclusive (Boles & Miotto, 2003). Overall, these more psychological studies suggest a direct link between substance use and violent behavior. Substances decrease the threshold of using violence, i.e. it removes the learned constraints. At the same time, particular substances seem to incite violence directly via aggression and rage.
Although the reviewed macro-level studies have focused mostly on the impact of drugs such as marijuana and cocaine, in the field of psychology, alcohol is most often connected to violence and aggression. Although alcohol is legal in many countries, it is the most common and perhaps influential drug available. It is, for instance, estimated that close to 4% of all deaths globally are attributed to alcohol consumption (Ezard, 2012; Rehm et al., 2009). Research indicates that the most commonly accepted mechanism for alcohol-induced aggression is through the disinhibition of fear via anxiolytic action (Lavine, 1997). For example, alcohol can affect cognitive function in such a way as to decrease the capacity to plan actions in response to threatening situations. Alcohol may also increase the perception of pain as a cause of greater defensive aggression (Boles & Miotto, 2003). Additionally, alcohol may also serve as a triggering mechanism to instigate aggressive acts for those who already have violent propensity and find themselves in “aggressive” situations (Feldman, 1977).

Although alcohol is clearly the drug with the most evidence to support a intoxication–violence relationship, studies have also found a relationship between physical aggression and drug use, although the results are less robust (Hoaken & Stewart, 2003). The association between cocaine use and physical aggression is one of the relations that is well established (Inciardi & Pottieger, 1994; Macdonald et al., 2003; Miller et al., 1991). Less is known, however, about the association between violence and marijuana use (Moore & Stuart, 2005). The use of cannabis is widely perceived by recreational users as a harmless drug, a view fostered by some sections of the press and even (surprisingly) by a leading medical journal (Ashton, 1999). Cannabis in most recreational settings decreases aggressive feelings in humans and increase sociability. However, no drug is without unwanted effects. For example marijuana use may also remove learned constraints against violence and thus may incite aggressive and violent behavior. Furthermore, research has shown that predisposed individuals (those that suffer from psychiatric illnesses such as schizophrenia or who have preexisting antisocial personality traits), especially if under stress, become aggressive after taking cannabis (Grenyer et al., 1999). There is also some evidence that chronic use of marijuana can eventually alter the nervous system in a way that disrupts social communications; an effect that may increase one’s involvement in altercations that escalate to violence (Reiss & Roth, 1993). Furthermore, its abuse is also connected to crimes of violence, although there are relatively few sources of data on patterns of illicit drug use and violence (Boles & Miotto, 2003). For example, Spunt, Goldstein, Brownstein and Fendrich (1994) show that marijuana was often used in the 24-hour period before homicide. All in all, these studies reveal somehow mixed or contradictory findings concerning the link between marijuana intoxication and aggressive behavior or violence but we can conclude that under certain circumstances
marijuana consumption seem to lower the threshold for aggressive and violent behavior (Moore & Stuart, 2005; Reiss & Roth, 1993).

Notwithstanding, if substance use caused violence only by making individuals behave more aggressively, violence would be equally common in all places where drinking and drug consumption occurs. Consequently, it is important to note that substance use operates in environmental, social, situational, and cultural context that influence the potential for violent outcomes (Collins, 1993; Reiss & Roth, 1993). Additionally, it is important to note that substance use affects individuals differently, based on their physiology, psychology, history, gender, and other personal and cultural factors. For example, drug use may interact with an individual’s personality or temperament characteristics, such as impulsivity and hyperactivity, to increase the risk of offensive commission (Lang, 1993). Researchers have found then also difficult to cut through these complexities to specify the particular effects of alcohol and drugs on violence (Boles & Miotto, 2003).

Besides the anecdotal evidence, the indirect linkages between drugs and violence as identified in the field of political science, and the partly confirmatory studies in the field of psychology, few studies have examined the relationship between substance use and violence perpetrated on the battlefield. This is surprising because this linkage is often suggested. Some authors, for instance, consider hallucinatory drug intake a critical factor that has contributed to the desensitization of soldiers during their prolonged exposure to violent aggression and that has prepared them for combat (Schauer & Elbert, 2010). Maclure and Denov (2006), focusing on child soldiers, state for example, that the abundant use of alcohol and hallucinatory drugs unquestionably contributed to the desensitization of children and their transition from disoriented and highly impressionable youngsters into effective combatants. However, this linkage has never been empirically tested. In the following section, we attempt to fill this scientific niche.

### 6.4 Research Design

Testing the micro-level linkage between substance use and combat action requires disaggregated quantitative data. This study employs, therefore, information retrieved from systematic interviews with former combatants that were active in the DRC. The history of this country has been one of civil war and violence. After independence in 1960, unrest and rebellion plagued the country, until 1965, when Mobutu seized control of the country and declared himself president. Under his rule, the country, then called Zaire, became a dictatorship that came to an end when Kabila, backed by Rwanda and Uganda, captured the capital and removed Mobutu from office in 1996. Nonetheless, Congo’s troubles continued. A
Drugs boosting conflict

rift between Kabila and his former allies sparked a new rebellion. Angola, Namibia and Zimbabwe took Kabila’s side against Rwanda and Uganda’s influence in the DRC, turning the country into a vast battleground for many years. In 2003, an official peace agreement was signed. Notwithstanding, the eastern provinces of the DRC are still the site of one of the world’s worst on-going humanitarian crises and many warring factions are still straying through large areas of the country, raiding villages and committing severe human right abuses (International Crisis Group, 2009).

The data used to explore the micro-level linkage was collected between March and May 2011 in Goma, the capital of the North Kivu province in the eastern part of Congo. During this period, 224 former combatants were interviewed (2 women and 222 men) with the help of locally trained translators. Since 25% of all the interviewed former fighters were originally from Rwanda, these translators had to be able to speak Kinyarwanda besides Kiswahili. The former combatants were on average 24 years old at the time of the interview (with a minimum of 13 and a maximum of 50), and had 5 years of formal education (with a minimum of 0 and a maximum of 14 years). In total, 72% of the semi-structured interviews took place at the demobilization camp of the United Nations, 27% were conducted at a vocational training center for war-affected youth, and only 1% of the interviews took place at the military detention facility. The demobilization camp is a transition camp for all combatants who leave any armed groups in the province of North Kivu. Participants, however, stayed only between 20 and 72 hours in the demobilization camp before being sent to other places. In 8 cases, this led to the preliminary termination of the interview. Consequently, they were removed from the analysis.

Participants belonged to a variety of armed groups and forces. Most of them belonged to the different Maï-Maï groups (74%), followed by the Forces Démocratiques pour la Libération du Rwanda (FDLR; 38%), the Congrès National pour la Défense du Peuple (CNDP; 9%), the National Army Forces Armées de la République Démocratique du Congo (FARDC; 5%), the Rassemblement Congolais pour la Démocratie (RCD; 3%), and some other smaller armed groups such as the Rwandan Armed Forces from before 1994.

The Ethical Review Board of the University of Konstanz approved the study and the United Nations and the respective Congolese non-governmental non-profit organization allowed us to interview all participants enrolled in their program. All participants gave their informed consent orally after explaining to them that they could refuse to answer questions, stop the interview at any time, and that there were no negative consequences for them when they did so. Additionally, we guaranteed that we would use the given information only for scientific purposes and that we would never reveal their identity. In addition to the oral consent of the
participants, we asked the respective institutions for permission to interview underage former child soldiers, as their caregivers were not available. Participants received financial compensation of about 2 U.S. dollars.

6.5 Operationalization

6.5.1 Dependent variable:

*Perpetrated violence*

Capturing the amount of perpetrated violence by a former combatant during his or her time in the armed group is challenging. Often, former combatants cannot remember the exact number of combat actions they were involved in since their memory is distorted due to trauma related sufferings, e.g. posttraumatic stress disorder (Kolassa & Elbert, 2007; McNally, 2006). Consequently, asking about frequency results in an unreliable measure. However, previous research indicated that former combatants remember the different types of violence they perpetrate (Hecker et al., 2013). We, therefore, captured perpetrated violence with the help of seven questions concerning self-committed violence types: (1) *Have you ever severely injured or mutilated someone?*; (2) *Have you killed someone?*; (3) *Have you ever attacked a village or settlement?*; (4) *Have you ever physically assaulted someone (e.g. beat, hit or slapped)?*; (5) *Have you ever physically assaulted someone with a weapon?*; (6) *Have you ever sexually assaulted someone (e.g. touched the private parts, vaginal or anal rape or introduced object in any part of the body)?*; and (7) *Have you ever participated in a massacre (i.e. killing a group of civilians)?* Each offense type was coded as committed (coded as 1) or not committed (coded as 0). With these answers, a simple additive index was built capturing the total sum scores per former combatant, running from 0 (indicating that the former combatant did not participate in many violent events) to 7 (indicating that the former combatant was active in all types of violent events). The Cronbach's alpha coefficient, measuring the internal consistency or reliability of this measure, is 0.76, meaning that the different questions are significantly related to each other and were suitable for building this index (Nunnaly, 1978). The interviewed former combatants perpetrated on average 4 of these violent actions, with some (15 former combatants) perpetrating none and others (13 former combatants) a maximum of 7. Table 6.1 shows more descriptive statistics of this measure.
Table 6.1
Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std.</th>
<th>Min</th>
<th>Max</th>
<th>Obs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perpetrated violence</td>
<td>3.87</td>
<td>1.84</td>
<td>0</td>
<td>7</td>
<td>217</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>0.53</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
<td>223</td>
</tr>
<tr>
<td>Alcohol functioning</td>
<td>0.18</td>
<td>0.39</td>
<td>0</td>
<td>1</td>
<td>222</td>
</tr>
<tr>
<td>Drug use</td>
<td>0.17</td>
<td>0.38</td>
<td>0</td>
<td>1</td>
<td>223</td>
</tr>
<tr>
<td>Drug functioning</td>
<td>0.82</td>
<td>0.39</td>
<td>0</td>
<td>1</td>
<td>94</td>
</tr>
<tr>
<td>Recruitment</td>
<td>0.49</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
<td>220</td>
</tr>
<tr>
<td>Age joined</td>
<td>16.83</td>
<td>5.89</td>
<td>0</td>
<td>37</td>
<td>224</td>
</tr>
<tr>
<td>Duration</td>
<td>6.54</td>
<td>5.26</td>
<td>0.04</td>
<td>28</td>
<td>224</td>
</tr>
<tr>
<td>No. of armed groups</td>
<td>1.52</td>
<td>0.79</td>
<td>1</td>
<td>5</td>
<td>224</td>
</tr>
<tr>
<td>Military rank</td>
<td>2.84</td>
<td>1.82</td>
<td>1</td>
<td>8</td>
<td>212</td>
</tr>
<tr>
<td>FDLR</td>
<td>0.52</td>
<td>0.59</td>
<td>0</td>
<td>2</td>
<td>224</td>
</tr>
</tbody>
</table>

6.5.2 Independent and control variables

Narcotic usage

To measure the narcotic usage of the former combatants, we asked them several questions. First, we asked them whether they have taken drugs in the last four weeks (coded 0 if no and 1 if yes). We purposefully gave them this time frame, to enhance their memory. On this question, 17% of the former combatants indicated to have consumed drugs (drug use). Marijuana and a hallucinogenic drug plant called “36 oiseaux” (translated: 36 birds) were mostly used. These drugs have been available in all armed groups and were used throughout the day. Most former combatants indicated to especially have taken drugs before going to combat (34%) and only a few (4%) stated to have taken drugs right after fighting. This shows that only a few former combatants in our sample consider drugs as a self-medication against trauma-related disorders due to combat experience.

Measuring the quantity of the drug intake is problematic, due to the different formats and different ways of using it. We, instead, measured whether the drugs caused any problems by asking the former combatants, if their drug consumption caused any problems with their family, at work, and/or with the law (drug functioning). The question was coded 0 if the combatant indicated not to have encountered any problems and 1 if he or she did. On average, 82% of the former combatants indicated to have suffered from some problems in functioning due to the intake of drugs. Table 6.1 shows more descriptive statistics of these two drugs measures.
Besides our focus on drug intake, we asked some additional questions concerning the consumption of alcohol. We asked the former combatants, whether they have used alcohol \((\text{alcohol use})\) in the last four weeks (coded 0 if no, coded 1 if yes). From the 223 former combatants, who answered this question, 53% indicated that they drank alcohol in the previous four weeks. Most of them drank beer or banana beer (35%) or hard liquor including liquor that they brew at home (17%). We also asked to what extent the consumption of alcohol caused any (occupational, family, and health) problems for the respondent \((\text{alcohol functioning}; \text{coded 0 if no and 1 if yes})\). Less than 20% indicated to have suffered from these kinds of problems due to alcohol consumption. Table 6.1 shows more descriptive statistics of these measures.

**Voluntary or abducted**

A possible intervening variable that might influence the level of perpetrated violence is whether the former combatant joined on a voluntarily basis or was abducted into the armed group. Although the decision to join is in some cases the result of limited and equally harsh choices in a resource poor region of instability, voluntary combatants might feel more in control of their lives and might perceive the armed group as less threatening than forcibly recruited combatants would (Hecker et al., 2013, 2012). It is then also highly likely that those former combatants that were abducted are less willing to cross personal boundaries by perpetrating violence. To control for this, we included a measure capturing this (coded 0 if abducted, and 1 if the combatant joined voluntarily). This measure shows that 51% of the former combatants have been abducted into their first armed group. Table 6.1 shows more descriptive statistics of this measure.

**Age joined**

Previous research has also indicated that the amount of perpetrated violence depends on the age of the former combatant at the time of joining (Hecker et al., 2012). Some authors, for example, suggest that children may be more willing to fight for honor or duty, for revenge or for protection from violence (Brett & Specht, 2004; Redress, 2006). Also Schauer and Elbert (2010) state that children are easier to retain in the group because they are more malleable and adaptable, and hence easier to indoctrinate. They stick more to authorities without questioning them. Additionally, moral and personality development is not yet completed in children, reducing their inhibition against performing crimes against humanity. To control for this possible effect, we included a variable measuring the age of the former combatant at the time of joining (voluntarily or were abducted into). On average the former combatants were 17 years old when they joined. Some were born in the group (coded as being 0 years old
when joining) and others were recruited much later in their life. See Table 6.1 for the descriptive statistics.

**Duration in armed group**
The duration a combatant spends in the armed group might have a profound impact on the amount of violence that he or she perpetrates. Especially the initial period of staying within the armed group is often characterized by extensive forms of violence. New combatants are almost always subjected to harsh life-threatening initiation procedures, such as severe beatings, forced killings, magic-spiritual rituals (e.g. tattooing, scarring, spraying with blood or ‘holy’ water), and forced drug intake, in order to make them ‘proper soldiers’ and fear the repercussions of escape. To control for this possible effect, we included a variable measuring the total duration in an armed group in years. On average a combatant stayed more than 6.5 years, with one former combatant staying 28 years and another for not more than 2 weeks (0.04 years). See again Table 6.1 for more descriptive statistics.

**Number of groups**
The amount of perpetrated violent actions might also depend on the number of armed groups the former combatant was active in. We, therefore, asked the former combatants to tell us in how many armed groups they served. On average a former combatant was a member of 1.5 armed groups, with a maximum of 5 armed groups. Table 6.1 shows more descriptive statistics of this measure.

**Rank**
Another possible influential variable is the rank of the combatants. Some initial research showed that combatants with a higher position have perpetrated more violence compared to those without a rank (Crombach et al., 2013). To account for this possible effect, we included in the analyses a variable measuring the highest received military rank of the combatant. Only 18 combatants indicated not to have received any ranks at all. On average, combatants received the rank of sergeant. Three former combatants received the rank of colonel, which is also the highest rank in our sample. See Table 6.1 for more descriptive statistics.

**FDLR**
The last control variable we included in the analyses is one capturing the number of times a former combatant was a member of the FDLR. This group is particular known for their extremely cruel behavior on the battlefield. Romkema (2007, p. 30), for instance, states that “the FDLR is undoubtedly among the worst human rights violators in the North and South Kivu provinces” and that “the FDLR has beyond any doubt the largest and most negative
impact on local communities”. Since we do not possess any information on how long a former combatant was a member of a particular armed group, we attempt to control for this effect by counting the number of times a former combatant was a member of the FDLR. The variable ranged from 0 to 2, and has an average of .5. See Table 6.1 for more statistics.

6.6 Results

Before presenting the multivariate analyses, we show some descriptive statistics that gives more insight in the influences of drug intake on the combatants’ emotional state. To capture the effect of substance use on the emotional state, we described to the former combatants some possible effects of drugs intake. For instance, we asked whether they felt powerful or mighty after they took the drugs or whether the drugs took away pain and fear. The former combatants could agree or disagree with these statements. Figure 6.1 presents these results.

Figure 6.1 shows the percentage of combatants acknowledging that taking drugs has a particular effect. Although, these descriptive statistics only focus on drugs intake and not on alcohol, they give a first insight in a possible relationship between the usage of drugs and violent behavior. The figure shows that most combatants felt no fear, more powerful and more aggressive after drugs consumption. In contrast, only few former fighters indicated that the intake of drug made them calm, made them hallucinate and made them feel no pain. This coincides with the results of the previous mentioned research that links drugs to aggressive behavior.
We performed several multivariate linear regression analyses to statistically confirm these descriptive results. None of the calculated models suffered from multicollinearity. Additionally, we calculated the models with all theoretically possible interaction variables. However, none of these interaction variables were statistically significant. Besides these models, we have additionally calculated every model with an ordered logit regression. However, no significant different results between these two methods could be detected. Table 6.2 shows the regression analyses with the usage of alcohol as the dependent variable.

Figure 6.1: The effect of drugs according to the former combatants
The first model in Table 6.2 shows the relationship between alcohol consumption and the perpetrated violence by the former combatants. This model only takes into account whether they have used alcohol in the last four weeks or not. Whether this consumption caused any problems in functioning is tested in the second model of the table. As the first model shows, there is a highly statistically significant relationship between their alcohol consumption and their level of perpetrated violence (coefficient of 0.653). Most of the control variables are also highly statistically significant. The negative coefficient of -0.103 indicates that the younger the combatant, the more likely they have perpetrated a larger amount of different violent types. This result is also confirmed by other research, indicating that young combatants are more inclined to be aggressive and violent on the battlefield (Andvig & Gates, 2009; Somasundaram, 2002). The effect of the duration variable is also statistically significant. The negative coefficient of -0.050 indicates that the shorter a combatant stayed with the armed group, the more different forms of violence he or she has.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Full</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.781***</td>
<td>4.929***</td>
<td>4.674***</td>
<td>4.807***</td>
<td>5.147***</td>
</tr>
<tr>
<td></td>
<td>(0.419)</td>
<td>(0.413)</td>
<td>(0.421)</td>
<td>(0.415)</td>
<td>(0.388)</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>0.653***</td>
<td>0.629***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.218)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol functioning</td>
<td>0.735***</td>
<td>0.716***</td>
<td>0.730***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.276)</td>
<td>(0.275)</td>
<td>(0.277)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age joined</td>
<td>-0.103***</td>
<td>-0.102***</td>
<td>-0.106***</td>
<td>-0.106***</td>
<td>-0.103***</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Duration</td>
<td>-0.050**</td>
<td>-0.050**</td>
<td>-0.070***</td>
<td>-0.071***</td>
<td>-0.043**</td>
</tr>
<tr>
<td></td>
<td>(0.022)</td>
<td>(0.022)</td>
<td>(0.024)</td>
<td>(0.024)</td>
<td>(0.021)</td>
</tr>
<tr>
<td>No. of armed groups</td>
<td>0.204</td>
<td>0.219</td>
<td>0.169</td>
<td>0.180</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.143)</td>
<td>(0.144)</td>
<td>(0.144)</td>
<td>(0.144)</td>
<td></td>
</tr>
<tr>
<td>Military rank</td>
<td>0.132***</td>
<td>0.157**</td>
<td>0.177**</td>
<td>0.205***</td>
<td>0.182***</td>
</tr>
<tr>
<td></td>
<td>(0.065)</td>
<td>(0.065)</td>
<td>(0.069)</td>
<td>(0.069)</td>
<td>(0.063)</td>
</tr>
<tr>
<td>Recruitment</td>
<td>0.575**</td>
<td>0.529**</td>
<td>0.644***</td>
<td>0.604***</td>
<td>0.558**</td>
</tr>
<tr>
<td></td>
<td>(0.228)</td>
<td>(0.228)</td>
<td>(0.230)</td>
<td>(0.230)</td>
<td>(0.228)</td>
</tr>
<tr>
<td>FDLR</td>
<td></td>
<td></td>
<td></td>
<td>0.381*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.216)</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>205</td>
<td>204</td>
<td>205</td>
<td>204</td>
<td>204</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.1913</td>
<td>0.1817</td>
<td>0.1999</td>
<td>0.1922</td>
<td>0.1762</td>
</tr>
</tbody>
</table>

Note: Reported are the standardized beta coefficients. Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1
drugs boosting conflict

perpetrated. This negative relation disconfirms our initial idea. However, although statistically significant due to the large sample size, the effect size is rather small. Therefore, we are reluctant to draw any strong conclusions about the influence of this variable on the level of perpetrated violence.

Military rank and recruitment also have an important effect; the higher their military rank, the more likely a former combatant has perpetrated different violence types. Furthermore, those fighters that joined voluntarily are more likely to perpetrate more different forms of violence than those that were abducted. This latter result is confirmed by a study conducted by Hecker et al. (2013) In their study on the impact of perpetrated violence on the mental health of the combatant, they found that those combatants that joined voluntarily reported more perpetrated violence types than forcibly recruited combatants.

The second model is looking at whether those combatants who indicated that they have problems functioning due to their alcohol usage perpetrate more violence. The positive and statistically significant coefficient of 0.735 indeed confirms this idea. Those former combatants that endured more problems due to their alcohol usage perpetrate more violence than those who did not suffer from these problems. The direction and strength of all other control variables remain robust in this particular model. Like in the previous model, however, the number of armed groups from which the former combatants where a member of, has no significant influence on the level of perpetrated violence.

The third and fourth models are the same as the previous two models. However, we included one extra variable, controlling for the membership of the FDLR. Due to this variable, the adjusted R-square increased in both models. In both models, membership of the FDLR has a positive influence on the level of perpetrated violence, i.e. those former combatants that were a member of this particular armed group perpetrate more different forms of violence than those who are not a member of this particular group. These results validate our survey data by confirming the destructive role of the FDLR in the Congolese conflict.

In the last model, i.e. the full model, all main variables are included that are statistically significant in the previous models. Since the two alcohol variables, measuring alcohol usage and possible problems in functioning due to this usage, are correlated with each other, we decided to focus on the one measuring the functioning of the former combatants, since its effect is somewhat stronger. As can be seen from Table 6.2, no significant changes could be detected and the effect of the variables remains robust. In addition, the adjusted R-square, measuring the explained variance, is consistent with all the other models.

Table 6.3 shows the results of the multivariate regression analyses focused on drug consumption. It is important to note that it is highly likely that the presented effects are underestimated. Not only was the intake of drugs strictly forbidden in the different
demobilization camps, but also because certain drugs are not recognized. This is especially the case for members of the different Maï-Maï factions. These factions are known for their rituals and adherence to magical-religious practices that protect combatants during battle and help them fight (Kelly, 2010). One of these practices is the intake of a mixture of local hallucinating plants by cutting themselves and placing the mixture of plants directly in the blood stream before going to combat. However, this is considered to be a ‘traditional medicine’ rather than a drug.

Additionally, in certain armed groups, such as in the FDLR, the consumption of drugs by their members is strictly forbidden. However, our data show that although forbidden, from the 98 former FDLR combatants (those combatants that were a member of the FDLR before they got demobilized) in our sample, 18 said to have taken drugs in the last four weeks. This is not surprising, considering the fact that the FDLR is heavily involved in the production and distribution of drug -at least in the territory of Uvira (Romkema, 2007). This is confirmed by one of the interviewed former combatants (participant 2087), who told us: “They [the FDLR] took people’s fields by force and turned them into marijuana fields. Now they sell it and earn a lot of money.” Also another participant (2069) confirms: “The FDLR grows marijuana in places like Masisi or Kimua. It is their business.”

The first model in Table 6.3, confirms the idea of what some of the former combatants (for instance former combatant 2092) told us already: “When soldiers smoke marijuana, they cause trouble. They start to fight and you have to watch them so that they do not run away and rape.” The highly significant coefficient of 0.796 indeed shows that those former combatants that admitted to having taken drugs in the previous four weeks were more likely to perpetrate more types of violent actions. Drugs in this sense seem to remove the learned constrains against violence. Additionally, all the other control variables have the same direction as for alcohol use: Those former combatants that joined when they were younger perpetrate more violence, those that joined voluntarily are more violent than those that were abducted, and those having a higher rank have perpetrated more types of violent actions than those that have a lower rank. And again, the number of armed groups of the former combatants does not play any statistically significant role.
Table 6.3
Drug usage and perpetrated violence

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Full</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.832***</td>
<td>5.164***</td>
<td>4.723***</td>
<td>4.968***</td>
<td>5.061***</td>
</tr>
<tr>
<td>Drug use</td>
<td>0.796***</td>
<td>0.765***</td>
<td>0.787***</td>
<td>(0.281)</td>
<td>(0.280)</td>
</tr>
<tr>
<td>Drug functioning</td>
<td>-0.388</td>
<td>-0.615</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age joined</td>
<td>-0.097***</td>
<td>-0.069**</td>
<td>-0.100***</td>
<td>-0.077**</td>
<td>-0.097***</td>
</tr>
<tr>
<td>Duration</td>
<td>-0.052**</td>
<td>0.011</td>
<td>-0.071***</td>
<td>-0.038</td>
<td>-0.045**</td>
</tr>
<tr>
<td>No. of armed groups</td>
<td>0.228</td>
<td>0.109</td>
<td>0.192</td>
<td>0.046</td>
<td></td>
</tr>
<tr>
<td>Military rank</td>
<td>0.147**</td>
<td>0.114</td>
<td>0.192***</td>
<td>0.232**</td>
<td>0.173***</td>
</tr>
<tr>
<td>Recruitment</td>
<td>0.548**</td>
<td>0.355</td>
<td>0.619***</td>
<td>0.528</td>
<td>0.579**</td>
</tr>
<tr>
<td>FDLR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>205</td>
<td>91</td>
<td>205</td>
<td>91</td>
<td>205</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.1876</td>
<td>0.0533</td>
<td>0.1962</td>
<td>0.1126</td>
<td>0.1813</td>
</tr>
</tbody>
</table>

Note: Reported are the standardized beta coefficients. Standard errors are in parentheses;
*** p<0.01, ** p<0.05, * p<0.1

The result presented in the second model is more surprising. Those former combatants indicated that they suffered from problems due to their drug intake are less likely to have perpetrated types of violent acts than former combatants that did not indicate to suffering from problems due to consumption of drug. Although this variable is not significant related to the perpetrated violent actions, it is worth noting that this negative effect is probably due not only to the small number of observations, but also to the fact that those who indicated to have suffered from problems related to drug use are probably heavy drug users and abusers. It is, therefore, highly likely that their drug consumption interferes with their normal daily functioning, i.e. they could not fulfill their duties as soldiers within the armed groups. Consequently, there are likely to be less involved in combat and have stayed more often in military detention. We see a first indication of this mechanism when comparing the average perpetrated amount of violence types between those that have indicated to suffer from problem due to drugs intake (average of 4.25) to those that did not seem to encounter any
problems (average of 4.88). However, due to a limited amount of observations and a skewed distribution across these two groups of former combatants, it is not possible to test whether this difference is statistically significant. Future research should then also investigate this more in depth. Also many of the control variables, previously statistically significant and robust, turned out to have no effect on the level of perpetrated violent actions. The only variable that remains robust is the age of the former combatants when they joined or were abducted into the armed group for the first time. It is not surprising that the adjusted R-square is low.

Again, we added the control variable measuring the membership rate of the FDLR in the third and fourth model. The adjusted R-square increased significantly in these models and the positive and statistically significant coefficient of 0.383 and 0.986 indicate that those former combatants that were a member of the FDLR perpetrate more violent types than those that were not a member of the FDLR. Adding this particular control variable increased not only the adjusted R-square but also strengthen the effect of military rank and recruitment method (joining voluntarily or getting abducted into the armed group) on the different perpetrated types of violent actions.

In the last model of Table 6.3, we included all the major statically significant variables. The conclusion remains robust in comparison to the first and third model: Those former combatants that admitted to have used drugs in the last four weeks have likely perpetrated more violent actions.

Although the literature on substance use has treated alcohol and drugs often as separated substances that are differently linked to violence and aggressive behavior, we show in Figure 6.2 the full model with the 95% confidence interval level. In this model we combine drug use and alcohol use together with all the robust control variables. We have focused on these two particular variables, since drug functioning is insignificant and since this combination results in the most observations. The figure shows that all of the pictured variables are at least significant at the 5% confidence interval: None of the variables crosses the null line. Both drugs intake as well as alcohol consumption is positively related to the amount of perpetrated violence. However, the influence of drugs on the perpetrated types of violence is somewhat higher.
Drugs boosting conflict

Figure 6.2: Dot plot of full model.

Note: Presented are the standardized regression coefficients plotted against the 95% confidence interval.

All the control variables are statistically significant: Younger combatants are more violent, those with a higher rank perpetrate more violence, and lastly, those that joined on a voluntarily basis are more violent. Again, this model shows that the influence of both drug intake and alcohol use remains robust across models.

6.7 Conclusion

Most scholars examining the link between drugs and conflict have focused on the revenue dynamic linking these two concepts. Selling drugs give armed groups the means to prolong the conflict by allowing them to buy, for example, weapons and to attract recruits. However, few scholars have focused on another possible ongoing dynamic, i.e. how drugs intake is related to the combatant’s behavior on the battlefield. With a unique dataset based on 224 interviews held with former combatants in the DRC, we tested this possible linkage. Our analyses show that alcohol and drugs consumption are highly related to the different types of violent actions the combatants perpetrated in the armed groups. These results remain robust after controlling for other possible individual and group explanations.
There are, however, some important limitations to this study. Although, we interviewed many combatants from different armed groups and forces, they were selected on a non-random basis. It is, therefore, highly likely that those combatants that are very aggressive and violent or have preexisting violent tendencies are still active in the different armed groups. Consequently, the real effect of drugs on violent behavior might be underestimated by our calculated models. Additionally, there is the question concerning the generalizability of our results. Future research should indicate whether the linkage between substance use and perpetrated violence is also present when interviewing combatants in different conflict settings. Notwithstanding, this study is the first attempt to examine the drugs-conflict nexus on a micro-level.

It is also important to note that we do not consider the use of alcohol or other drugs as a cause of violence. However, the analyses show that substance use boosts the likelihood of violence in the context of armed conflict. Both alcohol as well as drugs, such as marijuana, impair judgment and reason and reduce inhibitions. This is also confirmed by many combatants themselves that indicate that they often are intoxicated before going to battle. Hence, the widespread use of alcohol and drugs, while not the sole explanation, surely contributes to the high level of committed violence. We also think it is important that after the war, international and non-governmental organizations should address the impact of drugs on the former combatant adequately. Demobilization programs should be set up, which include assistance for alcohol and drug addiction for these soldiers. Only then we can decrease the likelihood of re-outbreak of violence.

6.8 Acknowledgement

The Deutsche Forschungsgemeinschaft (DFG) and the non-governmental organization (NGO) victim’s voice (vivo) international supported the research. We are grateful to all the former combatants for their readiness to participate and willingness to talk about often intimate and painful subjects. We also thank Dr. Lilli Banholzer, Désiré Muhire Biyonga, Ben Ombeni Cigolo, Prof. Dr. Thomas Elbert, Valentin Gold, Katharin Hermenau, Dr. Harald Hinkel, Prof. Dr. Katharina Holzinger, Flory Barhimanya Kahisa, Dr. Anna Maedl, Heike Riedke, Dr. Maggie Schauer, Penelope Summers, and Roger Buhendwa Zashurwa for their support, assistance with the data collection, and for help with logistics. Additionally, we want to thank the staff of the UN Demobilization camp and of the Tumaini Reintegration-Center in Goma.
7 Addressing post-traumatic stress and aggression by means of narrative exposure – a randomized controlled trial with ex-combatants in the eastern DRC

7.1 Abstract

Former child soldiers and ex-combatants are at high risk of developing trauma-related disorders and appetitive aggression, which reduce successful integration into peaceful societies. In a randomized controlled clinical trial we offered Narrative Exposure Therapy for Forensic Offender Rehabilitation (FORNET) to 15 ex-combatants aiming to reduce traumatic stress and appetitive aggression compared to “treatment as usual”. Measures included the PTSD Symptom Scale-Interview and the Appetitive Aggression Scale assessed prior to treatment, 2 weeks and 6 months after the treatment. We also assessed closeness to combatants as an index of reintegration. The treatment group reported reduced PTSD symptoms and less contact with combatants. Appetitive aggression decreased substantially in both groups. The results indicate that it is feasible to add psychological treatment to facilitate the reintegration process.

Keywords: NET, PTSD, appetitive aggression, integration, ex-combatants, child soldiers, FORNET, DR Congo

7.2 Background

Experiences of war and armed conflict have a massive impact upon the mental health of humans (Betancourt et al., 2010; Guy, 2009b; Hoge, 2011). Young men and boys who participate in combat, often suffer from being both victims and perpetrators in armed conflicts (Betancourt, Simmons, Borisova, & Brewer, 2008; Maclure & Denov, 2006; Medeiros, 2007; Schauer & Elbert, 2010). In the ongoing conflict in the eastern Democratic Republic of the Congo (DRC) between foreign armed groups, local militias and the Congolese governmental army particularly young men and boys are involved in frequent fighting (Guy, 2009b). As a consequence of the extreme forms of violence that they experience, they are at high risk of suffering from trauma related disorders, for example posttraumatic stress disorder (PTSD; Annan, Brier, & Aryemo, 2009; Elbert et al., 2006; Ertl, Pfeiffer, Schauer, Elbert, & Neuner, 2011; Hill & Langholtz, 2003; Stott, 2009).
In addition to mental health problems, living in a violent environment can also result in higher rates of aggressive behavior (Betancourt et al., 2010; Schauer & Elbert, 2010), independent of PTSD. Young men formerly associated with armed groups often report that they got used to perpetrating violence and even started to perceive violence as fascinating and appealing (Elbert et al., 2010; Maclure & Denov, 2006). Based on our research with former child soldiers in Uganda, we introduced the concept of appetitive aggression, defined as perceiving aggressive behavior towards others as positive and fascinating, without gaining any immediate external benefit (Elbert et al., 2010; Hecker et al., 2012). Studies with different samples in Uganda, Rwanda and the DRC showed that appetitive aggression can buffer the risk of developing PTSD under certain conditions and was related to higher rates of perpetrated violence (Hecker et al., 2012; Weierstall et al., 2011, 2012).

Child soldiers (defined as children associated with armed forces under the age of 18) in particular seem to be at risk of developing PTSD and appetitive aggression as a response to the violent environment (Guy, 2009a; Hermenau et al., 2013; Hill & Langholtz, 2003; Weierstall et al., in press). Appetitive aggression can be seen as advantageous in a violent environment such as an armed group (Weierstall et al., in press) and was related to higher ranks in child soldiers (Crombach et al., 2013; Hermenau et al., 2013). These changes in the behavior and mental state of the child soldiers caused by war experiences can pose a challenge to reintegration (Betancourt et al., 2010; Boyden, 2003; Medeiros, 2007).

Following disarmament and demobilization, integration of ex-combatants and child soldiers into civil society is implemented to stabilize countries after armed conflicts (Annan et al., 2009; Kingma, 1997; McMullin, 2004). Reintegration programs consist of different equally important components (Stott, 2009; Williamson, 2006). One component is formal education and vocational training (Betancourt et al., 2008). Having a perspective for the future is essential for the reintegration of ex-combatants and former child soldiers (Annan et al., 2009; Betancourt et al., 2008; Boyden, 2003; Stott, 2009). If former child soldiers and ex-combatants see no perspective for the future, many might consider voluntarily re-joining armed groups (Stott, 2009). The success of the education and training can be blocked by mental health problems and aggression (Annan et al., 2009). PTSD symptoms like concentration problems, flashbacks, sleeping problems and hyperarousal can lead to impaired functionality and a greater risk of dropping out of the program (Betancourt et al., 2008; Mogapi, 2004). Likewise, aggressive behavior that leads to interpersonal problems can cause discontinuation of reintegration programs (Boyden, 2003). If ex-combatants drop out of the reintegration programs they are at high risk for violent and delinquent behavior. This is also true for sexual violence. In the eastern DRC, rates of reported rape committed by civilians (including ex-combatants) increased, whereas rates of reported rape committed by
armed groups remained stable (Bartels et al., 2011; Malemo et al., 2011). Bartels et al. (2011) concluded that one reason for the increase of civil rape is probably the failed reintegration of ex-combatants. In a study with former Congolese child soldiers, we found that high appetitive aggression is related to repeated reenlistment in armed groups (Hermenau et al., 2013). Participants reporting high appetitive aggression had a long history of failed reintegration. Consequently, reintegration programs need to address mental health and aggression so that ex-combatants can fully profit from integration efforts (Hill & Langholtz, 2003). Furthermore, they need to find closure with their past as well as change their self-image from “combatant” to “civilian” (Boyden, 2003; Williamson, 2006). Even though some reintegration programs include a counseling or psychosocial component, they are often not evaluated and adjusted to the individual combatant’s needs (Hoge, 2011; Maedl et al., 2010; Malan, 2000; Mogapi, 2004; Stott, 2009). Stott (2009) states that reintegration programs shifted their focus from individual psychological help to a community level, neglecting that social reintegration can only be successful if individual psychological suffering is addressed as well. A combination of the essential components of reintegration, like community approaches and economic support, with psychological support may be most effective in targeting successful reintegration (Betancourt et al., 2008; Mogapi, 2004; Stott, 2009).

Based on our working experience in Uganda, Rwanda and the DRC, we developed an intervention to bridge this gap in reintegration programs. It broadly follows the logic of the evidence-based trauma-focused Narrative Exposure Therapy (NET; Ertl et al., 2011; Hoge, 2011; Schauer et al., 2011). However, we adapted it to address both traumatic experience and perpetrated violence. As Medeiros (2007) stated, it is crucial to overcome the dichotomy of victim and perpetrator to address the complexity of the former combatants’ feelings and experiences.

The Narrative Exposure Therapy for Forensic Offender Rehabilitation (FORNET) aims to reduce both PTSD symptoms and appetitive aggression by recalling the experiences through narrative exposure. It helps the former combatant to anchor not only fearful and traumatic experiences but also positive feelings that might have been linked to various forms of aggressive behavior in the past. The role change from a combatant to a civilian is specifically addressed and reinforced. Additionally, visions for the future are developed in order to foster successful integration into society. We conducted a pilot study in the eastern DRC with former combatants and child soldiers participating in a reintegration program offering vocational training and education.
We hypothesized that the treatment with FORNET would reduce both PTSD symptoms and the level of appetitive aggression and with it aggressive behavior six months post-treatment. Furthermore, we predicted that the FORNET would help the ex-combatants to find closure with their military past and to foster integration into civil society.

7.3 Method

7.3.1 Sample

All interviews and therapies were conducted in a reintegration center led by a Congolese non-governmental non-profit organization for war-affected youth in Goma, DRC. Only male former combatants and child soldiers were included in this study (from now on denoted as ex-combatants) who reported combat experience, thus the initial sample consisted of 58 participants. They were enrolled in a one-year vocational training in different manual trades to foster their reintegration process. Additionally, the reintegration center offered them support through social workers. At the start of the treatment these ex-combatants had already participated for eight months in the vocational training. Participants were on average 19.00 years old (standard deviation \( SD = 2.02 \), range: 16 to 25) and reported on average 6.13 years of formal education \( (SD = 3.98, \text{range: 0 to 14}) \). They joined the first armed group with an age of 12.40 years \( (SD = 2.65, \text{range: 5 to 18}) \) and stayed on average 3.60 years with armed groups \( (SD = 3.98, \text{range: less than 1 year to 10 years}) \). They joined one to four (mean \( M = 1.83, SD = 0.87 \)) armed groups belonging to a wide range of militia and self-defense groups including the FDLR (Forces démocratique pour la libération du Rwanda [Democratic forces for the liberation of Rwanda]), CNDP (Congès nationale du peuple [National congress of the people]) and several local Mai-Mai militia groups.

7.3.2 Design and Procedure

Out of a sample of 58 participants at the baseline assessment, we included all 38 participants who were present at the time of the pretest at the reintegration center and matched them into 19 pairs of ex-combatants (see Figure 7.1). We then randomly assigned one member of each pair to the treatment group and the other one the control group. The series of random number was obtained via http://www.random.org. Matching criteria were symptoms of posttraumatic stress, assessed with the PTSD Symptom Scale-Interview, and appetitive aggression, assessed with the Appetitive Aggression Scale, at the baseline assessment (see Table 7.1). Thus, our treatment group and control group both contained not
only extremely burdened ex-combatants, but the full spectrum of severity. We had four drop-outs in the treatment group: Two therapies could not be completed, one due to transferal into another program and one due to the participant’s motivational reasons, one participant had to be excluded due to inconsistent answers and one participant could not be relocated for the follow-up assessment. For the analyses we also had to exclude the matched controls of the drop-outs. Thus, we included $n = 15$ matched pairs in the analyses (see Figure 7.1).

Participants were informed that their participation would be entirely voluntary and that no monetary compensation would be offered. All persons were willing to participate and provided their informed consent verbally. In addition, the head of the reintegration center gave his informed consent for underage participants, as their caregivers had either died or were not available. The Ethical Review Board of the University of Konstanz and the local authorities of the collaborating organization approved the present study.

The authors and two additional interviewers, who were all psychologists from the University of Konstanz and had extensive work experience in East Africa, conducted the interviews and implemented the intervention. Three highly experienced interpreters, who were trained in the concepts of mental disorders, aggression, and FORNET, translated from English to Kiswahili and Kinyarwanda. As these interpreters have served on several occasions investigating gender-based violence and trauma in the eastern DRC since 2009, a refresher training describing the specific aspects of the present study of two days proved to be sufficient. The translated instruments were already used in comparable studies (Hecker et al., 2012, 2013). One of the authors speaks Kiswahili and thus could assure valid translation and supervise the work of the interpreters. With the help of an interpreter, each participant was interviewed individually in a calm, quiet setting. The pairing of interviewers and translators was continuously rotated. The interview took on average one hour.
Figure 7.1: Flow of participants through the study.
First, we assessed PTSD and appetitive aggression at the baseline assessment (see Figure 7.1). Four months later, we conducted pre-treatment interviews with all participants. Subsequently, the treatment group received FORNET. The sessions were usually scheduled every other day, which led to a total duration of about two weeks for every FORNET. Participants in both groups (FORNET and control group) were re-interviewed one to two weeks after the last FORNET session and six months later (follow-up). At follow-up, all former combatants had completed their vocational training, which marked the end of the support of the reintegration center. They received a certificate and started to look for work, i.e. now their real reintegration challenge began. At the same time, the conflict in the Kivu region intensified once more, as a part of the Congolese military deserted and armed groups could again gain important territories. Most of the participants were still living in Goma, but some of them were situated in other areas in the Kivu provinces. With the help of the reintegration center, we were able to relocate 33 participants. Blind interviewers conducted a follow-up interview with each of them. After the interview each participant received 5 US $ as compensation and - if necessary - transportation fees.

7.3.3 Measures

To reduce potential cultural bias, all instruments were applied as interviews by clinical experts and the same interview-set was used at pre-, post-, and follow-up assessment, with minor changes to take the varying situational context of each assessment into account. In addition, a baseline assessment was conducted four months prior to the pre-test and treatment. At the baseline assessment only PTSD and appetitive aggression were assessed. The baseline data was used for the assignment to treatment and control group.

Socio-demographic data and DDR information (only pre-assessment)
The first part of the interview consisted of information about the age, place of birth, and level of education of the interviewee. Additionally, we asked about their experience of being in armed groups.

Mental health
Symptom severity of post-traumatic stress disorder was assessed using the PTSD Symptom Scale-Interview (PSS-I; Foa et al., 1993). It consists of 17 items, in which each item corresponds to one PTSD symptom as specified in DSM-IV. Each symptom is rated on a 4-point scale (0-3) in terms of the frequency of the symptom in the past four weeks. A PSS-I score (range 0-51) was computed by totaling the frequency scores for all symptoms. The PSS-I was validated in the African Great Lakes region by Ertl et al. (2010). The Cronbach’s
Alpha coefficient was $\alpha = .86$ and the inter-rater reliability .93 for the PSS-I sum score (Foa & Tolin, 2000). Cronbach’s Alpha for this study ranged between $\alpha = .67$ and $\alpha = .91$.

Appetitive aggression was assessed with the 15-item Appetitive Aggression Scale (AAS; Weierstall & Elbert, 2011), which has been validated with over 1600 ex-combatants and former child soldiers and proven its good psychometric properties in comparable samples of former child soldiers and combatants (Hecker et al., 2012; Weierstall et al., 2011, 2012). Each item consists of a question regarding the perception of violence or appetitive aggression (e.g. Is it exciting for you if you make an opponent really suffer?; Once fighting has started, do you get carried away by the violence?; Is fighting the only thing you want to do in life?). The interviewer rates the level of the interviewee’s agreement on a five-point Likert scale. Cronbach’s Alpha coefficient of the sum score was .85 (Weierstall & Elbert, 2011). For this study Cronbach’s Alpha ranged between $\alpha = .76$ and $\alpha = .87$. For the analyses a sum score of all 15 items was computed, ranging from 0 to 60.

**Integration**

We asked 6 questions about current contact with combatants. This gave us a measure of the current closeness to military life, which conversely provided us with an index of level of integration into civil life. The questions included, for example contact with active combatants, to former commanders and to delinquent former combatants who are not successfully integrated into civil society (for details see Table 7.1). We computed a sum score ranging from 0 to 6, in which a higher score stands for higher closeness to combatants and lower integration into civil life. For this study Cronbach’s Alpha was $\alpha = .68$ due to the heterogeneity of the questions.

**Table 7.1**

**Items to assess the current closeness to military life**

<table>
<thead>
<tr>
<th>Closeness to combatants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you spoken to or heard from your former unit during the last four weeks?</td>
</tr>
<tr>
<td>Have you spoken to or heard from any current combatants in the last four weeks?</td>
</tr>
<tr>
<td>Have you been offered a job as a soldier or combatant since you have left the last armed group or army?</td>
</tr>
<tr>
<td>Do you know how to contact your former commander?</td>
</tr>
<tr>
<td>Do you know any former comrades who have engaged in criminal activities in the last four weeks?</td>
</tr>
<tr>
<td>Do you know any former comrades who left the armed group, but are now combatants again?</td>
</tr>
</tbody>
</table>
At pre-assessment, we assessed the preparedness to re-join armed groups with the help of three questions. One question asked whether the combatant would have a feeling of losing something if they rejoin an armed group (reversed item). We also asked about the probability of joining an armed group again and specific plans to realize this. The total score ranged from 0 to 3, with a higher score representing a higher preparedness to re-join armed groups.

7.3.4 Narrative Exposure Therapy for Forensic Offender Rehabilitation (FORNET)

The guidelines for FORNET have only been published in German (Elbert, Hermenau, Hecker, Weierstall, & Schauer, 2012), which together with an unpublished extension, served as the guiding manual. For clarity, we detail it in the following section. Several studies have shown that NET can be effective within four to six sessions (Neuner, Schauer, Klaschik, Karunakara, & Elbert, 2004; Neuner et al., 2008; Schaal, Elbert, & Neuner, 2009). The effectiveness as a short-term intervention is essential for implementing NET or FORNET in unstable environments like a refugee camp or a region of on-going conflict like the eastern DRC. Correspondingly, the treatment in this study consisted of six sessions in total. Five of these were individual sessions and one was a group session. Each session lasted between one and two hours.

Individual sessions

In the first session after psychoeducation the client begins with the "lifeline" exercise. Following the logic of NET (Schauer et al., 2011) the ex-combatant lays out his path of life along a rope or string, which symbolizes the person’s life up until now. He places flowers on the string for happy major events and good times in life and stones for fearful and traumatic events. In addition, we introduced sticks to symbolize active involvement in violent acts. In this way, combat, participation in a massacre, rape etc. were not colored by a priori moral judgment. Using the stick as a symbol also avoids imposing any particular emotional valence upon the violent acts. This is important, as these are frequently emotionally ambivalent situations. For the violent acts in particular, the therapist focuses on the first time they perpetrated violence (e.g. first killing, first rape, first experience of looting). Additionally, the therapist asks about violent acts involving strong emotions, which are therefore easily cued by reminders (e.g. fight in which he felt most powerful, fight in which he felt most fear, fight in which a close friend was injured or killed). The entry into and the exit out of an armed group both mark important moments in the life of the combatant. Thus, the entry and the exit of each armed group should be marked or at least mentioned during the lifeline exercise. The client is free to choose symbols and also to combine them. Hence, sticks can also be
combined with stones or flowers to emphasize the complex emotions felt during the active involvement in violent acts.

The following four sessions are closely based on the approach of NET including the unconditional acceptance of every emotion. Both the recall of positive and of negative affective responses are encouraged even when the worst offenses are recalled. The therapist encourages the client to verbalize and relive all the feelings connected to perpetrated violent acts. It is essential that the therapist takes an accepting and supporting rather than judging position. The therapist also guides the client to contrast between NOW and THEN. Besides the feelings and cognitions of the past, the client’s current view of the event, including his thoughts, feelings and bodily sensations, is taken into account.

The therapist supports the client in following his lifeline chronologically from his birth to the present time. As in NET, the therapist has an active role and helps the client to relive the emotions, cognitions, and bodily sensations experienced during his most traumatic events (stones) and while perpetrating violent acts (sticks). The memorized feelings (e.g., then I was shocked and afraid) are contrasted with the feelings that arise in the here and now, when the memories are recalled (e.g., when I think back, I get angry). In this way the therapist helps the client to anchor the cognitions and emotions that are recalled with the event in the past. Both, traumatic experiences and perpetrated violent acts become integrated into the memory. After the exposition of a violent act, an attribution of meaning from the client’s current point of view can be elaborated. Moral judgments, especially by the therapist, should be avoided.

During the sessions, the therapist focuses on the most traumatic events and specific perpetrated violent acts, which are connected to strong emotions and positive arousal (sensation of being powerful) or negative arousal (fear). The violent acts are commonly the first killing or attack of other humans, rape or looting. In consideration of the limited number of sessions it is essential to select, with the help of the lifeline exercise, the events that are most important to the client. A detailed description of the approach on different violent events can be found in Elbert et al. (2012). In the following we describe a typical example of dealing with the first killing/injury: While focusing on the first killing/injuring of another person by the client, the therapist should fully explore all emotions, both negative and positive, that were potentially linked to the first killing (primary emotions like disgust, fear, or joy and self-conscious emotions like guilt or pride), following the logic of NET. It is important to go through the first killing/injuring in great detail, to emphasize subsequent changes in the case of repeated violent acts. During the first killing/injuring, it often happens that the client becomes keenly aware of his/her own vulnerability. This cognition should be verbalized during therapy along with any sensations, including the description of the victim (What did the victim look like? Did he scream? Did he bleed?). Finally, the therapist and client focus on
how the client overcame the inhibition threshold to kill/injure another person. The therapist concentrates on the cognitions (out-group, enemy) and emotions which made the client overcome this threshold (e.g., fear, anger, feelings of hatred or revenge). Subsequently, the client is encouraged to mention his current thoughts, feelings about of the event and the meaning for him and his/her life.

Furthermore, the last exit out of an armed group is discussed in detail. The therapist and the client collect reasons for leaving the armed group and focus on the negative experiences as a combatant.

During the last individual session, the autobiography finally reaches the present and the narration of the most emotionally arousing events in chronological order is thus completed. With the help of the therapist, it is now possible for the client to understand his development. This provides a strong basis for discussing future developments. At the end of the therapy, the therapist and the client also elaborate hopes and wishes for the future.

Group Session

A group session follows these five individual sessions. In the group session, the role change from combatant to civilian is addressed and reinforced. A group consisted of three to four clients and one or two therapists. The therapist structures and guides the discussion. He/she encourages the clients to hold and discuss different views and to be open to the experiences of others. Furthermore, the therapist encourages them to take responsibility for their life and to develop aims, in order to foster successful reintegration into civil society.

At first, the clients review their own life as a combatant and discuss the positive and negative aspects of being a combatant. At this point, the old role of a combatant is discussed in a broader sense, as clients might not wish to disclose specific experiences addressed during the individual sessions. Subsequently, the therapist focuses on the role change from combatant to civilian and on the connected feelings and emotions of the clients (e.g. How difficult was it to hand over your weapon? How did you feel when you actually did it – how do you feel about it right now?). In the following part, the therapist directs the discussion to the current situation. The clients then have a discussion amongst themselves regarding positive aspects and difficulties in their current life as a civilian and collect advantages of being a civilian in comparison to being a soldier. The therapist encourages them to develop strategies together to overcome their difficulties. The group session ends with the future plans and wishes of each client and thoughts about the realization of these plans.
7.3.5 Data Analysis

No variable deviated significantly from normal distribution and variance-covariance matrices showed homogeneity. Therefore, we used parametric analyses including t-tests, repeated-measures analysis of variance (ANOVA) and analysis of covariance (ANCOVA). Due to the directional hypotheses, analyses were computed one-tailed on an alpha-level of $\alpha = .05$. Concerning the effect size, $\eta^2 \geq .01$ indicates a small effect, $\eta^2 \geq .06$ a moderate effect, and $\eta^2 \geq .14$ a large effect. Cohen’s $d$ was considered small with $d \geq 0.2$, moderate with $d \geq 0.5$, and large with $d \geq 0.8$. All analyses were performed with version 20 of the SPSS software.

7.4 Results

Table 7.2 shows the symptom level of PTSD, levels of appetitive aggression, and closeness to combatants in the two groups for each of the baseline, pre-, post- and follow-up assessments as well as preparedness to re-join an armed group at pre-assessment.

<table>
<thead>
<tr>
<th></th>
<th>Treatment group ($n = 15$)</th>
<th>Control group ($n = 15$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>PSS-I score baseline</td>
<td>10.20</td>
<td>5.92</td>
</tr>
<tr>
<td>PSS-I score pre</td>
<td>14.31</td>
<td>10.64</td>
</tr>
<tr>
<td>PSS-I score post</td>
<td>11.47</td>
<td>5.18</td>
</tr>
<tr>
<td>PSS-I score FU</td>
<td>8.93</td>
<td>7.61</td>
</tr>
<tr>
<td>AAS score baseline</td>
<td>32.20</td>
<td>12.77</td>
</tr>
<tr>
<td>AAS score pre</td>
<td>33.13</td>
<td>7.63</td>
</tr>
<tr>
<td>AAS score post</td>
<td>26.93</td>
<td>11.13</td>
</tr>
<tr>
<td>AAS score FU</td>
<td>11.93</td>
<td>8.62</td>
</tr>
<tr>
<td>Preparedness to re-join pre</td>
<td>0.60</td>
<td>1.06</td>
</tr>
<tr>
<td>Closeness to combatants pre</td>
<td>3.53</td>
<td>1.77</td>
</tr>
<tr>
<td>Closeness to combatants post</td>
<td>2.07</td>
<td>1.28</td>
</tr>
<tr>
<td>Closeness to combatants FU</td>
<td>2.13</td>
<td>1.89</td>
</tr>
</tbody>
</table>

*Note. M = mean, SD = standard deviation*
7.4.1 Post-traumatic stress symptoms

We performed a repeated-measures ANOVA on the PSS-I scores of baseline, pre-, post- and follow-up assessment. Independent variable was treatment group vs. control group. The Mauchly-Test indicated a violation of sphericity, therefore we used the Greenhouse-Geisser correction. PSS-I score showed no statistically significant main effect over the four points of assessment and no statistically significant main effect of the group variable was found. The PSS-I score varied between groups over the four points of assessment ($F(3,84) = 2.61$, $p = .036$) with a moderate effect of $\eta^2 = .09$. A t-test comparing pre- and follow-up PSS-I scores within each group revealed a tendency towards a difference between the pre- and follow-up score in the treatment group ($t(14) = 1.74$, $p = .052$), whereas the increase for the control group was not significant ($t(14) = -1.5$, $p = .078$, $d = .48$). Cohen's $d$ indicated a moderate effect for the decrease in the treatment group with $d = 0.58$. The ANCOVA for between-groups effects revealed that both groups differ significantly in their follow-up PSS-I scores while controlling for pre-assessment scores ($F(1,27) = 4.70$, $p = .020$) with a large effect of $\eta^2 = .15$. As shown in Table 7.2, the treatment group reported less PTSD symptom severity than the control group at the follow-up assessment.

7.4.2 Level of appetitive aggression

We performed a repeated-measures ANOVA on the AAS scores of baseline, pre-, post- and follow-up assessment. Independent variable was treatment group vs. control group. We found a main effect of the AAS score over time with $F(3,84) = 36.89$ ($p < .001$, $\eta^2 = .57$). Both groups decrease in their AAS score over the four points of assessment (see Table 7.2). However, the groups did not differ significantly, nor did the AAS score significantly vary between groups over time ($F(3,84) = .33$, $p = .402$, $\eta^2 = .01$).

7.4.3 Closeness to combatants

To test the integration hypothesis, we conducted an ANCOVA on closeness to combatants scores of pre-, post- and follow-up assessment. The independent variable was treatment group vs. control group. We included the preparedness to voluntarily re-join armed groups at the pre-assessment as covariate. Preparedness to voluntarily re-join armed groups was entered as a covariate, as preparedness has been found to be related to failed reintegration (Stott, 2009). Following Tabachnik and Fidell (2006), we included the covariate to adjust the mean of the dependent variable to simulate the case that all participants would have scored equally on the covariate. The closeness to combatants score showed a statistically
significant main effect over the three points of assessment \( F(2,54) = 2.43, p = .049, \eta^2 = .08 \). We found no statistically significant main effect of the group variable. The covariate interacted significantly with the closeness to combatants over time with \( F(2,54) = 3.68 (p = .016, \eta^2 = .12) \). The closeness to combatants score varied between groups over the three points of assessment with \( F(2,54) = 2.51, p = .046 \) with a medium effect of \( \eta^2 = .09 \). A t-test comparing pre- and follow-up scores within each group revealed a significant difference between the pre- and follow-up assessment score in the treatment group \( t(14) = 2.12, p = .026 \), whereas we found no difference in the control group \( t(14) = 0.64, p = .268 \). Cohen’s \( d \) indicated a moderate effect for the decrease in the treatment group with \( d = 0.77 \) and almost no effect in the control group \( d = .15 \). An ANCOVA with the pre-assessment score and the preparedness to voluntarily re-join armed groups as covariates showed no significant difference between treatment and control group at the follow-up assessment \( F(1,26) = 2.15, p = .078, \eta^2 = .08 \). Means are displayed in Table 7.2.

### 7.5 Discussion

Reintegration of young men formerly associated with armed groups can only be successful if the essential needs of the ex-combatants are considered (Mogapi, 2004; Stott, 2009). Psychological suffering has to be addressed in combination with other reintegration components like community approaches and education to ensure successful reintegration (Betancourt et al., 2008; Stott, 2009). In the present study we implemented FORNET in a reintegration center to address symptoms of posttraumatic stress as well as appetitive aggression. This intervention was hypothesized to help the participants to be able to profit entirely from the reintegration program. We hypothesized that the treatment group would show lower PTSD symptoms and appetitive aggression, and would be better reintegrated than the control group six months after the treatment.

The hypothesis that the FORNET would be superior to a control group in reducing the severity of PTSD symptoms at follow-up assessment was supported. The treatment group differed significantly from the control group over time. In contrast to the control group, the treatment group showed a decrease in PTSD symptoms. The moderate effect is not surprising, as we included all ex-combatants, i.e., also those with limited PTSD symptoms and only a few presented with a full PTSD diagnosis. This seems to be justified given that symptoms may increase with time and in fact, controls showed a tendency towards increased severity of PTSD symptoms, potentially promoted by the unstable situation in the eastern DRC with increasing tension. The former combatants were confronted with insecurity and combat situations, which may act as potential triggers of their traumatic experiences.
Despite these adverse conditions, we still observed an improvement in the treatment group. While controlling for pre-assessment scores, the treatment group differed significantly from the control group at the follow-up assessment.

In general, the findings are consistent with other studies implementing NET (Ertl et al., 2011; Schauer et al., 2011) to reduce PTSD symptoms. Moreover, this pilot study shows that FORNET successfully reduces PTSD symptoms in former child soldiers and ex-combatants in a current conflict zone. Before the present study, child soldiers were treated only as victims. In contrast, we addressed the whole range of experiences of former child soldiers and ex-combatants accepting their past as having been both victims and perpetrators. Besides the work with traumatic experiences, we demonstrated that it is also feasible to therapeutically re-process with former combatants their experiences of perpetrating violence.

Our results do not support the hypothesis that FORNET is superior to the control group in reducing levels of appetitive aggression. Both groups decreased over time. This overall decrease may be due to the reintegration program in which the participants were enrolled. The reintegration center offered them not only vocational training and education, but also social support. During the reintegration program the participants learned how to act and interact in a civil context. This may have supported a role change from “combatant” to “civilian” (Boyden, 2003; Williamson, 2006) in the participants, which in turn produced a decrease of appetitive aggression. Therefore, it is possible that the reduction in aggression may mainly be a result of the comprehensive program of the reintegration center. Moreover, the AAS may not be sensitive enough to measure the subtle and complex changes in the mind of ex-combatants. The questions of the AAS are strongly related to armed conflict and may not fit to the circumstances of civil life. This study cannot determine the influence of FORNET on appetitive aggression beyond the general decrease in reported appetitive aggression due to the reintegration program. Future research should investigate more closely the effect of FORNET not only on the subjective appetitive aggression but also on aggressive behavior in general by using self-report and reports by others as well as more objective measures, e.g. biological markers like the response or average levels of testosterone and cortisol. Furthermore, it would be helpful to include the participant’s perspective on his perpetrated acts before and after the therapy to evaluate a possible change of perspective.
Concerning reintegration, we found that on average both groups reported to be less close to combatants over time. This might be due to the support through the reintegration program. All participants started to change their role from “combatant” to “civilian” (Boyden, 2003; Williamson, 2006). However, the treatment group differed from the control group. Within-group comparisons of pre- and follow-up scores revealed that participants treated with FORNET reported significantly less closeness to combatants with a moderate effect, whereas the control group showed no significant difference between pre- and follow-up scores. The treatment group reported less contact with active combatants as well as delinquent ex-combatants. Through FORNET they found closure with their military life and oriented more towards civil life. However, we did not find a significant difference between groups in the follow-up scores, while controlling for pre-assessment scores and the readiness to re-join armed groups. Other measures of reintegration were difficult to implement as the participants were at the end of the program just starting to look for work. Therefore, we could not use common markers like work, marriage or land ownership.

Furthermore, the on-going conflict in the eastern DRC poses additional challenges to young men struggling to reintegrate. Infrastructure and economy barely exist. Many ex-combatants stayed in Goma instead of going back to their villages due to the danger of combat in the villages and the risk of being forcibly recruited again. However, other studies stated that PTSD symptoms and aggressive behavior hinder the success of vocational training (Annan et al., 2009; Betancourt et al., 2008; Boyden, 2003) and that the transition from “combatant” to “civilian” is essential for efficient reintegration (Williamson, 2006). Using FORNET in combination with vocational training and social support, we addressed both successfully. It was possible to bridge the gap of reintegration programs even under the circumstances of on-going conflict in the eastern DRC. This pilot study proved the feasibility of FORNET, found first evidence of a positive outcome, and highlighted the importance of addressing the whole range of experiences while treating former combatants. Further studies may investigate if it would be beneficial to increase the number of group sessions as well as to include other treatment modules such as anger management in the group sessions.

Some methodological aspects limit the generalization of these findings. We included a small sample recruited from only one reintegration center in the pilot study; therefore, the sample might not be representative for ex-combatants in the eastern DRC. Furthermore, all reintegration centers have slightly different programs. Although we had comparatively little drop-out, it is still important to keep in mind that two participants were excluded in the beginning of the treatment phase and two more during follow-up assessment. Moreover, the on-going conflict in the eastern DRC may have influenced the ex-combatants in various
ways. Even though, the majority of the participants stayed in Goma, some went back to their village and many still have relatives living in combat zones. The unstable situation may have influenced their mental health status in different ways. All in all, the former child soldiers and combatants talked very openly about their experiences and mental health. They appreciated the opportunity to share their own experiences. However, a potential bias, like social desirability, can never be entirely ruled out for subjective reports.

7.6 Conclusion

In the present pilot study we treated young men formerly associated with armed groups with FORNET to support them in their struggles for reintegration. By means of narrative exposure we were able to reduce posttraumatic stress and also closeness to combatants, relative to a matched control group. Ex-combatants treated with FORNET were more able to find closure with their past. Appetitive aggression decreased substantially in both groups. Despite the challenges in an on-going conflict zone, we showed that it is feasible to implement psychological treatment in a reintegration center focusing on the whole range of experiences, thus bridging the gap in reintegration programs. To achieve successful reintegration of ex-combatants it is desirable to combine economic and community-based approaches with psychological elements aiming to reduce traumatic stress and aggression in burdened ex-combatants.

7.7 Acknowledgements

The authors wish to thank the former combatants and former child soldiers, who participated in this study and the Congolese translators. We also want to thank the very motivated and reliable staff of the reintegration center, especially Pascal Badibanga Zagabe, Leonce Kyakimwa, Lydie Mirimo Ajua, David Ngufu and Matata Banyene. Furthermore, we want to thank Charlotte Salmen for conducting the follow-up interviews and James Moran for conducting the follow-up interviews as well as proofreading the manuscript. Sources of support: Deutsche Forschungsgemeinschaft (DFG), vivo international.

Trial registration clinicaltrials.gov Identifier: NCT01625117
8 General discussion

The present thesis examines the interplay between exposure to and perpetration of organized and family violence and its impact on mental health and aggression. The research literature suggests a strong link between exposure to violence and mental health problems, such as trauma-related illnesses, depression, or substance abuse (Amone-P’Olak et al., 2007; Catani et al., 2008; Hermenau et al., 2011; Neuner, Schauer, Karunakara, et al., 2004; Odenwald, Lingenfelder, et al., 2007). Further, following the ‘cycle of violence’ hypothesis (Curtis, 1963; Elbert et al., 2006), previous research has provided evidence for a positive association between exposure to violence and aggressive behavior (Catani et al., 2008; Gershoff, 2002; Weaver et al., 2008).

Findings concerning the impact of perpetrating violence on mental health problems are however, contradictory, ranging from increasing (MacNair, 2001, 2002) to buffering the risk for mental disorders (Weierstall et al., 2011, 2012). Elbert et al. (2010) have suggested that the perpetrator’s partial defense against trauma-related disorders might be best explained in terms of the phenomenon of ‘appetitive aggression’, which is a subtype of instrumental aggression and defined as perceiving aggressive behavior towards others as fascinating, arousing and thrilling even without gaining any external benefit. This phenomenon has only recently begun to receive attention. Prior research has revealed that appetitive aggression seems to be common in violent offenders (Weierstall et al., 2013; Weierstall & Elbert, 2011). Appetitive aggression has been linked with increased levels of perpetrated violence (Weierstall et al., 2012), lower rates of trauma-related symptoms (Weierstall et al., 2011), higher levels of voluntary enlistment (Weierstall et al., in press), and higher social status in armed groups (Crombach et al., 2013).

The present thesis focuses on the phenomenon of appetitive aggression and its predictors and correlates in ex-combatants and former child soldiers in the eastern DRC and examined whether appetitive aggression buffers the risk of developing trauma-related symptoms. Further, the present thesis investigated the interplay between exposure to and perpetration of organized and family violence and its impact on mental health and aggression in Tanzanian primary school children as well as ex-combatants and former child soldiers in the eastern DRC. In addition to these questions, the thesis examines the link between alcohol and drug consumption and the perpetration of violence from a political science perspective. To facilitate the rehabilitation of violent offenders, it is crucial to overcome the dichotomy of victim and perpetrator in order to address the complexity of the perpetrators’ feelings and experiences (Medeiros, 2007). Therefore, the present thesis presents a pilot randomized
controlled trial testing the efficacy of a psychological intervention addressing both traumatic experiences and perpetrated violence in order to break the cycle of violence.

8.1 Discussion of the results

In the following section I will discuss the results of the studies in this work, based on the research questions of the current thesis (see section 1.9).

8.1.1 Predictors of appetitive aggression

Our first goal was to examine the phenomenon of appetitive aggression and its correlates in ex-combatants and former child soldiers in the eastern DRC. The results of the second article showed that perpetrating violence, joining voluntarily and as a child were positively related to appetitive aggression. Consistent with prior findings (Weierstall et al., 2011, 2012), perpetrating violent acts had a strong relationship with appetitive aggression in our study. Furthermore, combatants who joined voluntarily were more likely to report high levels of appetitive aggression. In a study with former child soldiers in the DRC, Weierstall et al. (in press) found similar results. These results indicate that appetitive aggression facilitates the decision to join an armed group. From an evolutionary perspective, this would support the idea that humans, particularly men, have an innate appetite for aggression (Elbert et al., 2010; Jones, 2008; Nell, 2006), which may drive young men to voluntary enlist in armed groups. Moreover, the results of the first article investigating the relation between exposure to violence and aggressive behavior indicate that high levels of family violence result in higher levels of aggression in children and adolescence, which in turn may also increase the likelihood of voluntary enlistment. Concordantly, joining as a child was positively associated with appetitive aggression. This finding is congruent with results of Waller (2006), who found that many child soldiers seem to adapt well to the violent environment of an armed group. Accordingly, appetitive aggression can be seen as advantageous for children living in a violent environment such as an armed group as appetitive aggressive children are more likely to be both acknowledged and feared by their peers (Crombach et al., 2013; Hermenau et al., 2013; Weierstall et al., in press).

Neither the duration within the armed group nor holding a military rank was linked to appetitive aggression. As some combatants reported high and others low levels of appetitive aggression, independent of the time they spent within the armed group, this finding implies that some combatants already showed appetitive aggression before joining an armed group. This supports the idea that some combatants exhibit an innate appetite for aggression. In contradiction to our results, Crombach et al. (2013) found a positive relation between military
rank and appetitive aggression. However, a positive relation might hold only for combatants who joined as children, as Hermenau et al. (2013) showed for child soldiers and ex-combatants in the DRC. As child soldiers in contrast to adult combatants commonly begin their military career from the bottom, appetitive aggression seems to help them to gain respect, social status and higher military positions within an armed group.

All in all, the findings regarding predictors and correlates of appetitive aggression imply that combatants reporting high levels of appetitive aggression are characterized by having joined an armed group voluntarily and as minors. Combatants with higher appetitive aggression perpetrated increased levels of violent acts. Whether or not this is the cause or the consequence of appetitive aggression cannot be conclusively answered with the cross-sectional design of the presented study. Future research should investigate the causal relations of appetitive aggression. Our findings suggest on the one hand that combatants with high levels of appetitive aggression have already exhibited an appetite for aggression before joining the armed group. On the other hand, joining young and perpetrating violence on a regular basis seem to intensify appetitive aggression.

8.1.2 Exposure to and perpetration of violence and (appetitive) aggression

As already mentioned in the previous section, the results of the second article showed that in accord with prior findings (Weierstall et al., 2011, 2012), perpetrating violent acts correlated positively with appetitive aggression. Beyond that, the first article investigated the association between exposure to violence, particularly corporal punishment, and aggressive behavior in Tanzanian primary school students. Results revealed a positive association between corporal punishment and children’s aggressive behavior. Thus, children reporting more corporal punishment by parents or by caregivers themselves show higher rates of aggressive behavior. Our findings were congruent with the ‘cycle of violence’ hypothesis stating that exposure to violence breeds violent behavior in victims (Curtis, 1963; Elbert et al., 2006; Widom, 1989) and prior reports from other settings (Ani & Grantham-McGregor, 1998; Connor et al., 2004; Fantuzo & Mohr, 1999; Gershoff, 2002; Hermenau et al., 2011; Schilling et al., 2007). The effect size of the association between corporal punishment and children’s aggressive behavior suggests a significant influence. In line with our findings, longitudinal research shows that exposure to corporal punishment in childhood predicts aggression and antisocial or delinquent behavior in adolescence and adulthood (Dodge et al., 1995; Mulvaney & Mebert, 2007; Weaver et al., 2008).
Thus, the results of the first article provide further evidence for the ‘cycle of violence’ hypothesis that exposure to violence heightens the likelihood of aggressive and violent behavior. The second article investigating the phenomenon of appetitive aggression, however, did not find a significant correlation between exposure to violence and appetitive aggression in ex-combatants and former child soldiers in the eastern DRC. Yet, this might be due to the extremely high levels of exposure to violence in that specific sample. In this setting we did not focus on family violence, but as we can expect comparable levels of corporal punishment and family violence in both the DRC and in Tanzania, the association between corporal punishment and children’s aggressive behavior may also be similar. Hence, based on the results of the first article and on longitudinal studies researching the association between family violence and aggressive behavior, we hypothesize that high levels of family violence in war-torn regions like the eastern DRC may lead to increased levels of aggression in adolescence and thus may facilitate voluntary enlistment in armed groups. This might also explain the surprisingly high amount of voluntary recruitment of adolescents in the eastern DRC. However, further research is needed to empirically test the link between family violence, increased aggression and voluntary enlistment of adolescents in war-torn regions.

In summary, the results regarding the interplay between exposure to and perpetration of violence and aggressive behavior indicate a positive relation between exposure to violence and aggressive behavior. This finding is in line with the ‘cycle of violence’ hypothesis and provides further evidence that violence breeds violence. Our results, furthermore, show a positive relation between the perpetration of violence and appetitive aggression. Further research is needed to understand the underlying mechanisms of this link. However, our results and previous findings suggest a vicious cycle: Appetitive perception of violence seems to increase cruelty and in turn cruelty reinforces the appetitive perception of violence.

### 8.1.3 Exposure to and perpetration of violence and mental health

In concordance with prior research (Amone-P’Olak et al., 2007; Catani et al., 2008; Hermenau et al., 2011; Mollica et al., 1998; Neuner, Schauer, Karunakara, et al., 2004; Odenwald, Lingenfelder, et al., 2007), the third and the fourth article of the present thesis revealed that the number of traumatic event types correlated positively with PTSD symptom severity. Our data thus confirmed the building block effect in former combatants: Repeated exposure to different types of traumatic stressors cumulatively heightens the risk for PTSD symptoms.
Consistent with MacNair (2001, 2002), we found a positive relation between PTSD symptom severity and perpetrated violence. However, this was only true for forcibly recruited combatants. Furthermore, our study showed that in contrast to forcibly recruited combatants, voluntary combatants showed no correlation between perpetrated violence and PTSD symptom severity. Although both groups had comparable levels of PTSD symptom severity, in voluntary combatants it was specifically self-experienced violence and not perpetrated violence that was positively correlated with PTSD symptom severity. Consistent with prior findings (Weierstall et al., in press), voluntary combatants reported high levels of appetitive aggression. This result is also in accord with the notion that they perceived perpetrating violence as fundamentally fascinating and appealing (Elbert et al., 2010). Consequently, it is important to avoid valuing the perpetration of violence per se as traumatic, as is commonly done in a number of studies (e.g. Bayer et al., 2007; Vinck et al., 2007). In fact, the results of the third article indicate that perpetrating violence is traumatic for many, however, not for all combatants. Whether perpetrating violence is traumatic seems to depend very much on the perception of violence. Further studies regarding the mental health of perpetrators should consider assessing the perpetrator’s perception of committing violent acts.

In short, the results regarding the impact of exposure to and perpetration of violence on the mental health of perpetrators suggest a positive relation between exposure to violence and mental health problems that is in line with the literature. The association between the perpetration of violence and the mental health of perpetrators seems, however, to be less clear. Our findings indicate that perpetrating violence may not necessarily qualify as a traumatic stressor. In fact, the perception of violence may influence whether the perpetration of violence affects the mental health of the offender. Further studies are needed to replicate and thus confirm our findings.

**8.1.4 Appetitive aggression and mental health**

In the second article we did not find a protective influence of appetitive aggression on the mental health of perpetrators in the total sample of ex-combatants and former child soldiers. However, the third article revealed substantial differences between forcibly recruited and combatants who enlisted voluntarily, for example voluntary combatants reported a higher level of appetitive aggression and showed no correlation between perpetrated violence and PTSD symptom severity. We suggested that the perception of violence may influence whether the perpetration of violence affects the mental health of offenders. Further, we can conclude from these findings that forcibly recruited and voluntary combatants process violent cues differently. Whereas forcibly recruited combatants are more likely to integrate violent
cues into their fear network, voluntary combatants may integrate violent cues into the hunting network, which Elbert et al. (2010) posit as the underlying mechanism of the buffering effect of appetitive aggression.

With this in mind, we examined the voluntary combatants and concentrated on the research question whether the appetitive perception of violence buffers the risk of developing PTSD symptoms. The results showed that on average the former combatants reported having experienced about 14 different types of traumatic stressors. Following Neuner, Schauer Karunakara, et al. (2004), in a sample of civilian survivors we would expect PTSD rates of between 50% and 60%. However, only about 20% of the voluntary combatants fulfilled the clinical criteria for a PTSD diagnosis. Additionally, the former combatants reported on average only a low PTSD symptom severity. In agreement with prior findings (Weierstall et al., 2011, 2012), we found a negative correlation between appetitive aggression and PTSD symptom severity in combatants, who have voluntarily enlisted for service. We thus replicated a protective influence of appetitive aggression.

However, consistent with Weierstall et al. (2013) we found this protective influence only after excluding those combatants who showed the highest PTSD symptom severity. In concordance, Elbert et al. (2010) argued that there is no ultimate defense against trauma-related disorders and the protective influence of appetitive aggression on PTSD symptom severity may wane as the level of traumatization exceeds a certain threshold. They argue that due to recurrent traumatization, the fear network is extended and may overlap with the hunting network. Consequently, positive or appetitive memories that are linked to the perpetration of violence may not only trigger the hunting network but also the fear network.

All in all, the fourth article confirmed prior findings from other conflict zones in Africa and Latin-America (Weierstall et al., 2013, 2011, 2012) showing that appetitive aggression may provide a partial defense against trauma-related disorders under certain circumstances.

### 8.1.5 Substance consumption and violence

The fifth article examined the link between drug consumption and the perpetration of violence from a political science perspective. Most scholars in political science examining the link between drugs and conflict have focused on the revenue dynamic linking these two concepts (Cornell, 2007; Fjelde & Nilsson, 2012; Piazza, 2012). Selling drugs gives armed groups the means to prolong the conflict by allowing them to buy, for example, weapons and to attract recruits. However, few researchers have focused on another possible ongoing dynamic, i.e. how drug intake is related to the combatant's behavior on the battlefield. In line with prior findings (Hoaken & Stewart, 2003; Moore & Stuart, 2005; Reiss & Roth, 1993), the results of
the fifth article showed that alcohol and drug consumption are highly related to the different types of violent actions the combatants perpetrated in the armed groups. These results remain robust even after controlling for other possible individual and group explanations. Substance consumption seems to decrease the threshold for using violence, i.e. it removes the learned constraints and thus facilitates aggressive behavior. At the same time, specific substances, particularly alcohol, seem to incite violence directly via aggression and rage.

We do not consider the use of alcohol or other drugs as a cause of violence. However, the results of the present thesis suggest that substance use boosts the likelihood of violence in the context of armed conflict. Both alcohol as well as drugs like marijuana impair judgment and reason and reduce inhibitions. Many combatants themselves confirm our findings by reporting that they have often used alcohol and drugs before going to the battlefield. Hence, the widespread use of alcohol and drugs, while not the sole explanation, very likely contributes to the high level of violence in war. Moreover, the impact of alcohol and drugs is not limited to the battlefield, but also a problem within the communities and families in war and crisis regions (Catani et al., 2008).

8.1.6 Breaking the cycle of violence: Rehabilitation of violent offenders

The results of the present thesis revealed that appetitive aggression is closely linked to the perpetration of violence and may co-occur with trauma-related disorders, such as PTSD, which are strongly associated with frequent exposure to severe forms of violence. Furthermore, the present thesis provided evidence that exposure to violence is also related to higher levels of aggressive behavior. This finding supports the ‘cycle of violence’ hypothesis. Having these results in mind, it is not surprising that it is extremely difficult to pacify crisis regions or restrict the risk of violent recidivism in former offenders (Elbert et al., 2010). Likewise Elbert et al. (2010) reported that former child soldiers form small groups of outlaws in civil life, performing violent and criminal acts to a varying degree. This corresponds well with the findings in Angola showing that a high percentage of former adolescent combatants commits offences or becomes bandits (Wessells & Monteiro, 2004).

Based on these findings, the last article tested the efficacy of a psychological intervention focusing on trauma-related suffering and appetitive forms of aggression to foster the integration of former combatants into civil society and break the cycle of violence. Results revealed that the treatment group, in contrast to the control group, showed a decrease in PTSD symptoms. In general, the findings are consistent with other studies implementing NET (Ertl et al., 2011; Schauer et al., 2011) to reduce PTSD symptoms. Thus, this pilot study
shows that FORNET successfully reduces PTSD symptoms in former child soldiers and ex-combatants in a current conflict zone.

As far as we know, before this pilot study, child soldiers were examined and treated with the assumption that they are solely victims. In contrast, we addressed the whole range of experiences of former child soldiers and ex-combatants accepting their past as having been both victims and perpetrators. Besides the work with traumatic experiences, we demonstrated that it is also feasible to therapeutically re-process experiences of perpetrating violence with former combatants. Other studies stated that trauma-related disorders and aggressive behavior hinder the successful rehabilitation of violent offenders (Annan et al., 2009; Betancourt et al., 2008; Boyden, 2003). Thus, with FORNET and focusing on trauma-related suffering and appetitive forms of aggression we bridged an important gap in rehabilitation programs for violent offenders even under the circumstances of on-going conflict, such as in the eastern DRC.

Furthermore, as Stott (2009) states that reintegration programs shifted their focus from individual psychological help to a community level, neglecting that social reintegration can only be successful if individual psychological suffering is addressed as well, we provided further evidence for the importance of individual psychological support for successful offender rehabilitation.

This pilot study thus proved the feasibility of FORNET, found first evidence of a positive outcome, and highlighted the importance of addressing the whole range of experiences while treating former combatants. Providing FORNET violent offenders can be supported in their rehabilitation process and to find closure with their violent past. Finding closure with the violent past may lead to a reduction of appetitive aggression and as a consequence, a reduction in the perpetration of violence in civil life and thus may help to break the cycle of violence. Further studies should investigate, whether FORNET reduces the likelihood of voluntary re-enlistment of former combatants in the long run. Future research may also investigate the impact of FORNET on the level of family and community violence in former combatants’ families and communities.
8.2 Implications for the future

8.2.1 Future research

The present thesis has provided further evidence for the existence and prevalence of appetitive forms of aggression in war and crisis regions. Further studies may also investigate appetitive aggression in peaceful societies, for example focusing on violent offenders in prisons. In line with prior research (Weierstall et al., 2011, 2012), the present thesis revealed that appetitive aggression is closely related to enhanced levels of perpetrated violence. Yet, little is known about the causal relation between appetitive aggression and perpetrated violence. For example it remains unclear whether an innate appetite for aggression drives offenders to perpetrate violence or whether a violent environment enhances the development of appetitive aggression. Bearing in mind the findings of the present thesis, there could be some truth in both positions. Longitudinal studies can further clarify the development of appetitive aggression.

The results of this thesis indicate that perpetrating violence seems to be traumatic for some but not for all perpetrators. We suggest that the perception of violence and thus the processing of violent cues determines, whether the perpetration of violence affects the perpetrator’s mental health. Therefore, future studies should assess the perpetrator’s perception during violent offenses. The present thesis showed that alcohol and drug consumption play an important role in conflict regions and is highly associated with the perpetration of violence. Alcohol and drug use may influence the processing of violent cues and thus the perception of perpetrating violence. Future studies may investigate the link between alcohol and drug consumption more closely. Beyond that, the reason why some perpetrators perceive violence as traumatic and others perceive it as fascinating and thrilling remains still unclear. The results of the present thesis, moreover, imply that perpetrators seem to process exposure to and perpetration of violence differently since exposure to and perpetration of violence had different relationships to PTSD symptom severity in former combatants. Therefore, future studies should differentiate between the impact of exposure to violence and the impact of perpetration of violence on the perpetrator’s mental health.

In line with the results of the present thesis, the protective influence of appetitive aggression on PTSD symptom severity has been shown in different conflict zones in Africa and South America (Weierstall et al., 2013, 2011, 2012) and seems to be robust. Nevertheless future studies should focus on possible moderating or mediating effects of appetitive aggression. For example, appetitive aggression may moderate or mediate the building block effect. If a
combatant experiences a great variety of traumatic stressors too frequently, the building block effect may outweigh the protective influence of appetitive aggression. Future research might reveal whether there is a general or an individual threshold, depending on other factors, such as the meaning of the events and the conflict at large for the individual. Moreover, the causal mechanism of the protective influence of appetitive aggression on the perpetrator's mental health is still not fully understood. In line with Elbert et al. (2010), the results of the present thesis suggest that the processing of violent cues in either the fear or the hunting network may explain the partial defense of appetitively aggressive violent offenders. Studies in neuroscience may shed light on the different processing of violent cues using brain-imaging or psychophysiological studies. Moreover, longitudinal studies will be important to gain further insights into how and under what circumstances appetitive aggression buffers the risk for developing trauma-related illnesses.

The present thesis has shown that family violence is closely associated with children’s aggressive behavior in a peaceful society. Other studies have linked exposure to war violence to enhanced levels of family violence in war and conflict regions (Catani et al., 2008). However, little is known about the interplay between family violence and appetitive aggression in war and crisis regions. Following the 'cycle of violence' hypothesis, one could hypothesize that higher levels of family violence in war-torn areas would increase aggressive behavior among children and adolescents and in turn would increase voluntary enlistment in armed groups. This hypothesis needs to be tested in future studies.

The present study revealed a close link between alcohol and drug consumption with the perpetration of violence. The findings suggest that alcohol or drug use lower the threshold for aggressive behavior and thus facilitate cruelty. Further studies may investigate also the link between drug use and appetitive aggression. Additionally, the impact of drug use on violence is not fully understood, particularly the link between frequent and excessive marijuana consumption and the perpetration of violence needs further clarification.

Last but not least, this thesis provided first promising results of a psychological intervention focusing on both traumatic experiences and perpetrated violence and thus highlighted the importance of addressing the whole range of experiences while treating former combatants. Future studies should build on these initial insights by investigating whether finding closure with the violent past reduces family violence and the violence that erupts in civil life, such as forming bandits groups, and thus take the first step to break the cycle of violence.
### 8.2.2 Clinical implications

The present thesis provided evidence that family violence and corporal punishment are linked to children's aggressive behavior. Based on longitudinal findings (Gershoff, 2002; Weaver et al., 2008), we can expect higher levels of violent, antisocial, and delinquent behavior in adolescence and adulthood in societies with high levels of corporal punishment or family violence. Therefore, we advocate for developing and testing culturally appropriate prevention programs that focus on ameliorating the issue of corporal punishment. Prevention measures may focus on positive parenting and non-violent caregiving strategies. The primary reasons for the use of corporal punishment seem to be the lack of non-violent caregiving skills, excessive demands and helplessness (Hermenau et al., 2011). Therefore, parents and teachers may profit from learning non-violent parenting skills. Through these efforts, reducing corporal punishment in their homes and schools as well as fostering positive parenting would enable more children to grow up in a respectful and supportive atmosphere, thereby strengthening their development. A reduction of corporal punishment and family violence may foster the mental health of children and lower the risk of developing conduct problems or showing increased levels of aggression. In conflict regions, a reduction of corporal punishment and family violence may thus prevent children and adolescents from enlisting in armed groups.

Furthermore, the present thesis provides evidence that violent offenders exhibit appetitive perception of violence. Attraction to violence and aggressive behavior, however, may pose challenges for the integration of violent offenders into society. The present thesis has proved the feasibility of a psychological intervention addressing trauma-related suffering and appetitive forms of aggression, providing first evidence of a positive outcome for the integration of violent offenders into civil society, and highlighted the importance of addressing the whole range of experiences while treating violent offenders. Thus, for the work with violent offenders, it is crucial to overcome the dichotomy of victim and perpetrator in order to address the complexity of the perpetrators' feelings and experiences (Medeiros, 2007). Therefore, we emphasize the importance of addressing trauma-related suffering and attraction to violence in the clinical treatment and rehabilitation of violent offenders. FORNET combines these two elements and has provided promising initial results. However, further research is needed to confirm our initial findings about the efficacy of FORNET and to fully understand the mode of actions of this intervention.
8.3 Overall conclusions

Why is cruelty and violence so omnipresent in men? Violence occurs in a countless number of armed conflicts throughout the world, but it is also present within civil communities and families. Nell (2006) offered an explanation of the high prevalence of violence with an affectively positive, dopamine mediated and, therefore, rewarding perception of violence. The present thesis has replicated prior findings that violent offenders, such as ex-combatants or former child soldiers in the eastern DRC, exhibit appetitive forms of aggression (Weierstall et al., 2013, 2011, 2012). As appetitive aggression is described as fascinating, appealing and even having the qualities of addiction, our findings may offer one possible explanation at the level of the individual as to why struggles to end long-lasting conflicts, such as the ongoing conflict in the eastern DRC, have often engendered so little success. Thus, our findings affirm the importance of considering the psychology of the individual in attempting to understand the nature and dynamics of large-scale ongoing conflicts.

Moreover, the present thesis revealed that violent offenders perpetrate severe forms of violence, but that they were also frequently exposed to severe forms of violence. Thus, for the work and the research with violent offenders, it is crucial to overcome the dichotomy of victim and perpetrator in order to address the complexity of the perpetrators’ feelings and experiences (Medeiros, 2007). Therefore, we explored how these extreme forms of violence shape violent offenders. The findings of the present thesis suggest that exposure to and perpetration of organized and family violence form violent offenders in various ways. On the one hand our results indicate that exposure to violence, such as family violence or corporal punishment, is related to higher levels of aggressive behavior, for example in children. In line with the ‘cycle of violence’ hypothesis (Curtis, 1963; Elbert et al., 2006), the present thesis suggests that violence breeds further violence. Likewise appetitive aggression was related to enhanced levels of perpetrated violence. In line with prior research (Catani et al., 2008; Hermenau et al., 2011; Neuner, Schauer, Karunakara, et al., 2004), we found that exposure to violence was associated with mental problems. Perpetrated violence, however, seems to affect the perpetrator’s mental health in some but not in all cases, indicating that the perception of violence may moderate the connection between perpetrating violence and mental health. In line with this and in accord with previous studies (Weierstall et al., 2011, 2012) the present thesis showed that under certain circumstances appetitive aggression seems to buffer the risk for violent offenders to suffer from trauma-related illnesses.
Furthermore, when ex-combatants return to their civil homes, a high percentage of them commit violent offences or become bandits (Wessells & Monteiro, 2004). Thus, attraction to violence may pose challenges for the integration of violent offenders into society. The present thesis presented for the first time evidence that addressing trauma-related suffering and appetitive forms of aggression fosters the rehabilitation of violent offenders.

All in all, the present thesis, offers an explanation of why it is extremely difficult to pacify crisis regions or restrict the risk of violent recidivism in former offenders: The reasons why violent offenders commit violent offences or join gangs and armed groups again do not necessarily have to be of a monetary kind; perceiving the perpetration of violence as fascinating or thrilling and enjoying cruelty would suffice to explain why young men commit violent offences, voluntarily re-enlist in armed groups or join gangs and bandit groups in wartorn regions or other violent environments (Elbert et al., 2010). The understanding of these appetitive forms of aggression is therefore essential for social and political scientists in attempting to understand the nature and dynamics of large-scale ongoing conflicts as well as for clinical and forensic psychologists and psychiatrists to improve rehabilitation of violent offenders.

The present thesis adds further knowledge concerning the interplay between the exposure to and the perpetration of organized and family violence and its impact on mental health and aggression. Furthermore, with FORNET, we presented a new approach, accounting for both trauma-related suffering and appetitive forms of violence to foster the rehabilitation of violent offenders. The successful rehabilitation of violent offenders into civil society helps to break the cycle of violence. The findings and considerations regarding appetitive aggression and the interplay between organized and family violence, mental health and aggression are important for understanding the needs and difficulties of violent offenders and thus can improve the rehabilitation process. Thus the present thesis affirms the importance of considering the psychology of the individual in attempting to understand the nature and dynamics of large-scale ongoing conflicts, and illustrates the potentially vital role that individual clinical psychological interventions can play in the development of a peaceful society.
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