

# Becoming cruel: Appetitive aggression released by detrimental socialisation in former Congolese soldiers

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## Abstract

Appetitive aggression – a rewarding perception of the perpetration of violence – seems to be an adaptation common to adverse conditions. Children raised within armed groups may develop attitudes and values that favour harming others when socialized within a combat force. Combatants who joined an armed force early in their lives should, therefore, perceive aggression in a more appetitive way than those who were recruited later. We interviewed 95 former members of armed groups operating in the eastern part of the Democratic Republic of the Congo. Those combatants that were having higher levels of appetitive aggression were those who joined a rebel force earlier in life. Surprisingly, neither the amount of military training nor the amount of time spent in the forces had a significant effect on the level of appetitive aggression. Our results show that when civil socialization is replaced by socialization within an armed group early in life, self-regulation of appetitive aggression may become deficient, leading to a higher propensity towards cruelty.

## Keywords

aggressive behaviour, childhood development, civilization process, developmental psychopathology, physical aggression, proactive aggression

## The armed conflict in the Democratic Republic of the Congo

Armed groups continue to kill civilians by the million (Harff, 2003). Presently, most civil wars are characterized by extreme atrocities. Since the 1996 invasion of the Zaire by a coalition of neighbouring countries, the Democratic Republic of the Congo (DRC) has been the battleground for a series of (continental) wars with a myriad of political, military and commercial actors. These wars have involved at least nine African countries and many more internal rebellion factions (Prunier, 2009). They have resulted in one of the most devastating and cruel, yet surprisingly understudied, humanitarian disasters to date. It is estimated that, since 1998, these violent conflicts and the accompanying famine and disease have claimed millions of lives (approximately 7% of the population), the highest mortality rate of any conflict since the Second World War (The International Rescue Committee, 2008). Although we do not deny the role of natural resources in the Congo conflict as a powerful impetus for armed conflicts (Le Billon, 2001; Montague, 2002; Olsson & Fors, 2004), this explanation does not acknowledge the micro-level dynamics underlying the exertion of violence and cruelty in this country.

## A new perspective on the roots of violence

We consider the possibility that the outbreak and especially the continuous re-outbreaks of violence against civilians (Gittleman, 2007; Rodriguez, 2007; Wakabi, 2008) are rooted in a human disposition towards experiencing the perpetration of violence as intrinsically rewarding (Elbert, Weierstall, & Schauer, 2010). In other words, instead of examining exclusively economic and political factors as

driving forces of this ongoing civil war, we propose that environments in which violent behaviour remains unrestricted (as is currently the case in vast areas of the eastern DRC) foster *appetitive aggression* – that is, the type of human aggression normally restrained through civilian socialization and learned morality. Based on interviews with combatants from different armed groups in the DRC, we aim to answer the following research question: which particular factors related to socialization promote the development of appetitive aggression within an armed movement? The article will unfold in several steps: the first section explains and discusses different forms of human aggression and presents the *appetitive aggression scale* (AAS, Weierstall & Elbert, 2011), an instrument that captures appetitive aggression. Thereafter, we present three hypotheses on the influence of possible socialization factors that might contribute to the development of positive feelings toward acts of aggression, which we then test in the subsequent results section. The article concludes with a discussion of the results and the limitations of the sample under examination.

## The dichotomy of human aggression

Even though cruelty and brutality against civilians, as found in the DRC, characterize civil wars, research rarely examines these occurrences by focusing on this facet of human aggression (Berkowitz,

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1993; Geen, 2001). In research on aggression, a dichotomy between reactive and instrumental aggression has been suggested for decades and has guided aggression research (e.g., Vitiello & Stoff, 1997). Whereas reactive aggression has been defined as a response towards a threat or an aversive stimulus, instrumental aggression has been defined as goal-directed and planned. However, even reactive aggressive behaviour typically reduces the threat and may thus be positively reinforced. Hence, a distinction based on the intrinsic underlying motivation and irrespective of secondary rewards seems more appropriate. Some scholars have proposed a dichotomy between aggressive behaviour that occurs as a response to a highly negative arousal associated with an avoidance reaction (*reactive or facilitative aggression*) and aggressive behaviour that is rather driven by the anticipation of an increase in excitement and motivated by an approach behaviour (*appetitive aggression*) (Elbert et al., 2010). In contrast to the former form of behaviour, the latter is deliberately perpetrated and is associated with an increase in positive arousal caused by the exposure to violence.

### Defining appetitive aggression

Appetitive aggression can often be found in armed conflict. However, as it has been generally neglected in empirical research, quantitative data have not yet been available. We have therefore begun to systematically investigate human attraction towards aggression in recent studies. Our empirical evidence suggests that appetitive aggression is a broad phenomenon among combatants, and we would therefore expect to have similar findings in any active conflict region characterized by irregular forces including child soldiers (Weierstall, Schaal, Schalinski, Dusingizemungu, & Elbert, 2011; Weierstall, Schalinski, Crombach, Hecker, & Elbert, 2012). We assessed appetitive aggression using the *Appetitive Aggression Scale* (AAS, Weierstall & Elbert, 2011). The AAS gauges the human attraction to commit violent acts. The appetitive aspect of aggression is characterized by violence-related cues such as the struggling of the victim, irrespective of secondary rewards such as gaining status or reproductive success, as would be required for instrumental aggression. In line with a cycle of violence (Elbert, Rockstroh, Kolassa, Schauer, & Neuner, 2006), it is demonstrated that those combatants who participated in more criminal acts also experienced aggression as more appetitive (e.g., Weierstall et al., 2011). Contrary to common beliefs, this subtype of aggression is not limited to a deviant minority often and misleadingly characterized as “psychopaths” or “sadists,” but rather applies to a large portion of those who were actively involved in fighting. In line with other fields of aggression research in which the functionality of aggressive behaviour was neglected (see also Ferguson & Dyck, 2012), this misconception is caused by the perception of aggressive behaviour in combatant populations from an often moral and prejudiced perspective and generally considering it as unfavourable.

### The functionality of aggression

A point of discussion remains the reasons why humans develop intra-species killing in the first place. Theoretical approaches such as the Homicide Adaptation Theory (Duntley & Buss, 2008, 2011) have, in line with others, emphasized that human hunting behaviour as well as intra-species killing may have evolved as a profitable strategy during evolution, leading to greater reproductive success (Nell, 2006). Others have proposed a more benevolent and cruelty-avoidant

human nature, in which aggression might be a consequence of a lack of self-control or of a certain socialization (e.g., Baumeister, 1997, de Waal, 1997). Even though both arguments regarding human nature remain speculative and cannot be falsified, the functionality of aggressive behaviour must not be neglected: aggressive behaviour has been found to be beneficial for acquiring resources as well as group bounding (e.g., Hawley, Little, & Rodkin, 2007), wealth (Anderson & Bushman, 2002), social status (Crombach, Weierstall, Hecker, Schalinski, & Elbert, 2013) and reproductive success (Bernhardt, 1997).

### Appetitive aggression and the adaptation to a cruel environment

We have observed that those combatants who had higher scores on the AAS reported fewer symptoms of trauma-spectrum disorders (Weierstall et al., 2013; Weierstall, Huth, Knecht, Nandi, & Elbert, 2012). These results are in line with the assumption that perpetrators in the “killer-mode” process violence-related cues differently and might benefit from behaving cruelly, as this prevents the perpetrators from becoming traumatized by their own atrocities and leads to an adaption to a hostile environment. Consequently, irrespective of human nature in general, at least a large part of those who perpetrate violence have the potential to adapt to a cruel environment by developing aggressive behaviour. In a recent literature review, Belsky (2008) pointed out that, especially in children exposed to mass violence, aggressive tendencies might develop as “psychological-behavioural responses ... as part of a strategy to ‘prepare’ the organism for fitness-enhancing functioning in the future.”

### Shifting socialization and the development of cruel behaviour

The balance between the potential to behave aggressively on the one hand, and aggression control mechanisms that inhibit the unspecific enactment of violent acts against in-group members on the other hand, seems to be dependent on the environment. Consequently, processes in the environment must be responsible for shaping aggressive behaviour. It is widely accepted that the expression of aggression and the degree to which aggressive behaviour is accepted or punished is determined by a socializing environment (Dietz, 1998; Snyder & Patterson, 1995), often associated with a “moral sense” (Jones, 2008). Already decades ago, socialization was felicitously defined as

a broad term for the whole process by which an individual, born with behavioural potentialities of enormously wide range, is led to develop actual behaviour which is confined within a much narrower range - the range of what is customary and acceptable for him according to the standards of his group. (Child, 1954; p. 655)

Especially the aim of military training has often been described as a means to dehumanize the enemy and turn combatants into killing machines by breaking moral barriers (Engen, 2008; Gibson & Haritos-Fatouros, 1986). In a recent study on former combatants in the DRC, it was demonstrated that the age of entry into the rebel forces is a crucial factor in the development of appetitive aggression amongst combatants (Hecker, Hermenau, Maedl, Elbert, & Schauer, 2012): upon entry into a combat force, the process of civil socialization that is essential for a regulation of appetitive aggression is

impaired and replaced by the socialization in a armed movement that fosters violent and aggressive behaviour. According to the learned inhibition of appetitive aggression that would be cultivated during civil socialization (i.e., when a child learns in a peaceful social context which values, attitudes and behaviour are acceptable), the inhibitory regulation of intra-species killing is disrupted upon entry into a combat force. Socialization in an armed group, in this case, learning what appropriate behaviour is for a member of a rebel group, is then dominated by breeding violence.

## Research questions

In this article, we examine two main sets of factors that are believed to promote the development of appetitive aggression: while the first one addresses variables related to the socialization process, the second factor considers the perpetration of violence itself.

1) In line with the aforementioned results, we investigated whether the socialization in an armed force, measured by the time spent in a rebel movement and the amount of military training received by a combatant, contributes to the development of appetitive aggression. As in the study by Hecker and colleagues (2012), we conceptualized the shift in socialization as the age upon entry into the rebel forces to assess the impact of an early interruption of civil socialization. We hypothesized that the age at entry into a combat force, the time spent amongst the rebels and the duration of military training would be significant predictors of appetitive aggression.

2) Apart from the socialization process, we expected that the simple perpetration of violence (i.e., self-committed violence) is sufficient for increasing one's susceptibility to perceive aggression as appealing. Previous studies (such as Crombach, Weierstall, Hecker, Schalinski, & Elbert, 2011; Weierstall & Elbert, 2011) demonstrated that there is a positive relation between Appetitive Aggression and the number of combat actions. We hypothesized that the perpetration of violence in this particular environment would make combatants become ever-more cruel. Since those who actively seek to join an armed force might be more prone to experience appetitive aggression, we controlled for group differences between those combatants who voluntarily joined the armed forces and those who were abducted by the same forces.

## Method

### Participants

The study sample consisted of 95 members of Congolese armed forces between the ages of 15 and 46 years ( $M = 21.76$ ,  $SD = 7.04$ ). Most of the participants were adolescents when they entered an armed force for the first time ( $M = 15.5$ ;  $SD = 5.6$ ). Five participants were female. A power analysis was calculated for every statistical model using G\*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007). The a-priori estimates based on previous observations were confirmed and revealed that the sample size was sufficient for all analyses in this study (all  $(1-\beta) > .80$ ). The majority of participants were recruited with the help of *welcome centres* for ex-combatants. These centres provide shelter and elementary help for those combatants who are released, who have escaped or have been demobilized by the United Nations Organization Mission in the Democratic Republic of the Congo (MONUC). Some other former combatants were traced with the help of these centres and interviewed at their working place.

In total, we obtained 95 observations. When participants indicated that they had been members of more than one organization, the data referring to the longest period in one organization were included in the analyses. Of the interviewees, 51 combatants belonged to one of the different *Maï Maï* militias, five combatants used to be active in the *Rassemblement Congolais pour la Démocratie*, 13 joined or had been abducted into *Les Forces Armées de la République Démocratique du Congo*, six were active in *L'Alliance des Forces Démocratiques pour la Libération du Congo*, five in *Le Congrès National pour la Défense du Peuple*, eight in *Les Patriotes Résistants Congolais*, five in the *Forces Démocratiques de la Libération du Rwanda/Interahamwe*, and two had been members of minor or unknown groups. Out of the 95 participants, 49 reported that they had voluntarily joined the armed forces, and 14 of these 49 indicated that they had joined an armed group more than once. Another 23 combatants stated that they had voluntarily joined an armed group at least once but were also abducted one or more times during their life; 23 other combatants told that they were only abducted. In further analyses, we therefore grouped the participants into three groups: 1) *non-abductees* ( $n = 49$ ): *combatants who on their own accord joined at least once*, 2) *mixed* ( $n = 23$ ): *combatants who voluntarily joined but were also abducted at least once at an earlier stage* and 3) *abductees* ( $n = 23$ ): *those combatants who were only abducted*. The Ethical Review Board of the university approved the study and all participants gave their informed consent. Participants did not receive any material compensation for participation in this research.

### Settings and procedure

The structured interview that forms the basis of this study was developed with the help of an interdisciplinary team consisting of political scientists and clinical psychologists from the University of Konstanz and the non-governmental organization *vivo*.<sup>1</sup> The survey was conducted between March and May of 2009. Most of the interviews took place in Bukavu, the capital of the eastern DRC province South Kivu. Other interviews were held in Bunyakiri, a so-called "red zone" (i.e., a specific area where often clashes between different armed groups take place). Interviews were carried out in English and translated into the spoken language of the respondent by local trained interpreters.

### Measures

**Appetitive aggression.** For the assessment of appetitive aggression, we used the 15-item AAS (Weierstall & Elbert, 2011). A statement regarding the appetitive perception of aggressive behaviour and the perpetration of violence was given for each item and the participant had to decide how much he or she agreed with the statement. Responses were coded on a five-point Likert scale ranging from 0 ("I totally disagree") to 4 ("I totally agree"). All item scores were summed to a total score ranging from 0 to 60 points. The statements were based on the definition of the proactive aggression subtype according to Vitiello and Stoff (1997), the ICD 10 criteria for addiction and perpetrators' reports about the appetitive experience of violence from clinical practice. The scale has been validated with over 1,600 former combatants from different populations (including Rwandan genocide perpetrators, former Congolese combatants, Ugandan child soldiers) and has been administered to over 3,000 former combatants in recent years. It has proven its factorial

**Table 1.** Percentage of agreements with the given statements in the Appetitive Aggression Scale (AAS) by the three groups.

Item	Group		
	Non-abductees	Mixed	Abductees
1. Do you like to listen to other people telling you stories of how they killed others?	34.7%	43.5%	30.4%
2. Does the challenge of defeating a strong opponent make the fight more pleasurable for you in comparison to the defeat of a weak opponent?	28.6%	17.4%	21.7%
3. Is it exciting for you if you make an opponent really suffer?	30.6%	26.1%	39.1%
4. Do you feel powerful when you go to a fight?	67.3%	69.6%	43.5%
5. Is it fun to prepare yourself for fighting?	49.0%	39.1%	34.8%
6. During fighting does the desire to hunt or kill take control of you?	57.1%	78.3%	52.2%
7. Do you enjoy inciting your fellows to fight?	55.1%	52.1%	30.4%
8. Is defeating the opponent more fun for you when you see them bleed?	63.3%	43.5%	56.6%
9. Once fighting has started, do you get carried away by the violence?	40.8%	26.1%	30.4%
10. Did you harm others just because you wanted to, without having a reason/order?	26.5%	4.3%	13.0%
11. Once you got used to being cruel, did you want to be crueller and crueller?	24.5%	21.7%	21.7%
12. Do you know what it is like to feel the hunger/thirst to fight?	46.9%	34.8%	26.1%
13. Is fighting the only thing you want to do in life?	26.5%	4.3%	8.7%
14. Can attacking humans be sexually arousing for you?	16.3%	13.0%	26.1%
15. When you fight, do you stop caring about whether you could be killed?	40.8%	26.1%	17.4%

Note. For a clearer representation of the data, the two response categories "agree" and "agree a bit" were merged into "agree" as well as "disagree" and "disagree a bit" into "disagree." For each item, chi-square tests were used to compare the frequency distribution among the three groups. However, none of them reached statistical significance.

validity with all items loading onto a single factor, accounting for 32% of the variance and its divergent and convergent validity with other constructs of aggression. Cronbach's Alpha coefficient of 0.85 was appropriate.

**Number of combat actions.** To analyze if those participants who engaged in a greater number of actions also had higher appetitive violence experience scores, the *number of combat actions*, including battles, rape, killings and fights was assessed. The number of combat actions was based on the participants' reports and ranged from 0 to 120.

**Duration of military training.** To analyze if those participants who underwent military training also experienced a higher level of appetitive aggression, we included a variable that captures the duration of military training. Duration was assessed in days and based on participants' reports. For a uniform unit, one month equalled 30 days.

**Age upon entry into combat forces.** As a measure of a shift in the civil socialization process, we assessed the influence of *age of entry into combat forces* on the AAS.

**Time spent with the combat forces.** As a further indicator for combat socialization, we also assessed the length of the interval spent *with the combat forces* in those participants that had voluntarily joined the combat forces at least once. This self-report measure was also scaled in days.

**Data analyses.** As a first step, we analyzed the extent of appetitive aggression in our sample. Moreover, we calculated group differences for the variables of number of combat actions, military training duration, age upon entry into combat forces and time spent with the combat forces, which in turn were entered into the two regression models to predict the appetitive aggression score.

Thereafter, we performed two linear regression analyses for the two research questions. In the first regression analysis, we tested the hypotheses that an early interruption of civil socialization, measured by the age upon entry into combat forces, as well as the socialization in an armed force, measured by the military training duration, and the time spent with the combat forces would be significant predictors for the degree of appetitive aggression. We controlled for the age at the time of the interview. To detect general group differences, we also added two dichotomous variables. For the group dichotomous variable, *abductees*, all participants from this particular group were coded as "1," while all other participants were coded as "0." For the second dichotomous variable, *mixed*, we used the corresponding dichotomous coding. To examine our second research question of the impact of the self-committed violence on the propensity towards appetitive aggression, we calculated another linear regression, in which we regressed the AAS score on the number of combat actions as well as on the two group dichotomous variables. For the final models, we tested whether all possible two-way interactions would improve the model fit. We, therefore, calculated the Akaike Information Criterion (AIC, Akaike, 1987) to compare the fit of different models. Calculations and statistical modelling were carried out using R for Mac OSX Version 2.3.1 (R Development Core Team, 2006) as well as SPSS 19 for Mac.

## Results

### Degree of appetitive aggression

To evaluate the degree of Appetitive Aggression, we first calculated the frequencies for the participants' agreements with the given statements in the AAS. Table 1 provides an overview of all 15 items. For clarity purposes, responses of "strongly agree" and "agree" were merged, as were responses of "strongly disagree" and "disagree." The table shows that some items met the perception of violence in

**Table 2.** Differences in the four predictor variables between the three groups.

Measure	Group			Group difference (ANOVA)
	Non-abductees	Mixed	Abductees	
Number of Combat Actions ( $M \pm SD$ )	7.8 $\pm$ 19.1	10.5 $\pm$ 8.2	5 $\pm$ 5.9	$F_{2,73} = .61$ ; $p = .548$ , $\eta_p^2 = .02$ , $(1-\beta = .95)$
Military Training Duration (days; $M \pm SD$ )	139 $\pm$ 225	174 $\pm$ 244	135 $\pm$ 158	$F_{2,73} = .23$ ; $p = .795$ , $\eta_p^2 = .01$ ( $1-\beta = .95$ )
Age of Entry into Combat Forces ( $M \pm SD$ )	20 $\pm$ 7	15 $\pm$ 4	16 $\pm$ 6	$F_{2,73} = .30$ ; $p = .739$ , $\eta_p^2 = .01$ ( $1-\beta = .95$ )
Time Spent with the Combat Forces (days; $M \pm SD$ )	907 $\pm$ 198	2051 $\pm$ 1,284	812 $\pm$ 116	$F_{2,73} = 6.74$ ; $p = .002$ , $\eta_p^2 = .13$ ( $1-\beta = .95$ )

**Table 3.** Results of regression analyses predicting AAS scores from the participant's current age and the age at entry into the rebel forces ( $N = 84$ ).

	AAS score			
	Full model		Selected model	
	$\beta$	$p$	$\beta$	$p$
<b>Age of entry into combat forces</b>	0.82	0.006	0.58	0.003
<b>Current age</b>	-0.64	0.016	-0.42	0.027
Time spent with the combat forces	-0.16	0.363		
Military training duration	-0.06	0.630		
abductees group dummy	-0.13	0.267		
mixed group dummy	-0.14	0.245		
$R^2_{adj}$	0.07 ( $p = 0.068$ )		0.09 ( $p = 0.009$ )	

Note. Uncorrected standardized regression coefficients are displayed. Voluntary joiners were used as the reference group. Those predictors were selected that best improved the model fit (bold).

many Congolese combatants while other items only applied to a minority of combatants.

We calculated chi-square tests for differences in the distribution of the answers given in the three groups. None of them were of statistical significance. The total AAS scores ranged from 11 to 52 points ( $M = 26.64$ ,  $SD = 8.32$ ). For group differences, we calculated a one-way ANOVA with the factor *group* for differences in Appetitive Aggression (volunteers:  $M = 24.7$ ,  $SD = 8.4$ , mixed:  $M = 25.4$ ,  $SD = 5.1$ , abductees:  $M = 28.1$ ,  $SD = 8.3$ ). Against our expectations, there was no static effect for the factor *group* ( $F_{2,85} = 1.55$ ,  $p = .219$ ,  $\eta_p^2 = .04$ ). We found, therefore, no evidence to support that those who joined an armed group on their own accord were more likely to experience aggressive acts as appetitive.

**Group differences in the predictor variables.** The group differences were calculated for the four predictor variables to control for potential confounding factors in the regression analyses. Apart from the time spent in the combat forces, there was no significant group difference in any of the variables (see Table 2).

Bonferroni-corrected post-hoc comparisons for the factor *group* revealed that this effect could be traced back to the longer period the *mixed* group (who stayed significantly longer with the rebels than the participants in the other two groups) spent in the bush.

**Appetitive aggression and the relation to the socialization process.** We calculated a linear regression in line with our first research question. Appetitive aggression was regressed on the age upon entry into the combat forces, the current age as a control variable, the time spent with the combat forces, the duration of military training and the two group dichotomous variables *abductees* and *mixed*. Moreover, all possible two-way interactions were added to the full

model. AIC was used for the selection of the best-fitting model. For the final model (Table 3), the interaction terms as well as the group dichotomous variables were excluded, as they did not significantly improve the model fit. Moreover, neither the time spent with the combat forces nor the duration of military training was a statistically significant predictor variable. The current age, as well as the age upon entry into the rebel forces, were significant predictors for Appetitive aggression across groups.

As Table 3 shows, combatants of the same age reported higher appetitive aggression the earlier in life they entered an armed force. The effect size for the model was found to be small to moderate ( $f^2 = 0.12$ ). As the Variance Inflation Factor (VIF) did not exceed 3.2, multicollinearity may be neglected. Performance of the Levene test of homogeneity of variances on the residuals revealed that there was no significant difference in homoscedasticity between the two groups ( $F_{2, 82} = .71$ ,  $p = .495$ ). The residuals also did not significantly differ from the normal distribution (Kolmogorov-Smirnov  $Z = .95$ ,  $p = .330$ ). Moreover, there was no severe influence of outliers in the proposed models (maximum Cook's  $d = .38$ ).

However, even though the time spent with the combat forces and the duration of military training did not significantly contribute to the variance in the proposed model, we found strong correlations between time spent with the combat forces, military training duration and age. More precisely, participants that were older had also spend more time in the combat forces ( $r = .44$ ,  $p < .001$ ) and those who stayed longer with the combat forces also received more military training ( $r = .38$ ,  $p = .001$ ). In other words, we found age to be a significant predictor for the level of appetitive aggression, but this effect cannot be attributed to the military training or duration with the rebels, even though these variables are correlated.

#### **The impact of the exposure to violence on appetitive aggression.**

To test whether the perpetration of violence is related to the level of appetitive aggression, we calculated a linear regression, in which we regressed appetitive aggression on the number of combat actions of the combatants. We controlled for possible group differences by adding the two group dichotomous variables to the model as well as the two two-way interactions with the number of combat actions. Once again, model selection was based on the AIC score. It revealed that the best-fitting model included the number of combat actions as well as the abductees' group dummy variables, while the interaction terms had to be excluded from the final model (Table 4).

In line with previous results, we found a relation between the number of combat actions and a person's propensity towards appetitive aggression. Moreover, participants who had merely voluntarily joined a combat force without having had a history of abduction generally had a higher AAS score after controlling for the number of involved combat actions. In other words, non-abductees already had a comparably high AAS score after their exposure to only a small number of violent acts.

**Table 4.** Results of regression analyses predicting AAS scores from the number of combat actions as well as from the abductees and mixed group dummy variables ( $N = 69$ ).

	AAS score			
	Full model		Selected model	
	$\beta$	$p$	$\beta$	$p$
<b>Number of combat actions</b>	0.18	0.156	0.39	< 0.001
<b>abductees group dummy</b>	-0.34	0.007	-0.25	0.022
<i>mixed group dummy</i>	-0.21	0.118		
$R^2_{adj}$	0.07 ( $p = 0.068$ )		0.22 ( $p = 0.001$ )	

Note. Uncorrected standardized regression coefficients are displayed. Voluntary joiners were used as the reference group. Those predictors were selected that best improved the model fit.

The effect size for the mode was large ( $f^2 = 0.31$ ). The VIF did not exceed 1.0, implying that multicollinearity did not pose a problem. The Levene test of homogeneity of variances revealed no significant difference in homoscedasticity between the residuals of the three groups ( $F_{2, 67} = 1.41, p = 0.251$ ). Again, the residuals did not differ significantly from the normal distribution (Kolmogorov-Smirnov  $Z = 1.09, p = 0.187$ ). There was also no severe influence of outliers for the proposed models (maximum Cook's  $d = .78$ ).

## Discussion

In this study, we surveyed a sample of former combatants active in the eastern DRC in order to assess their degree of appetitive aggression. Consistent with previous findings in studies on former combatants (Weierstall et al., 2011, 2012), we found that appetitive aggression was present in many combatants and is, therefore, not a rare and abnormal variant of human behaviour.

Our results partially support our first hypothesis on the impact of the socialization process on appetitive aggression: We confirmed the results by Hecker and colleagues (2012) that appetitive aggression is more pronounced in those who had experienced an early interruption of civil socialization, measured by the age upon entry into combat forces. However, neither time spent in the combat forces nor the duration of military training was a significant predictor. We found that older combatants who had stayed longer in an armed group had received more military training. However, only the current age was a significant predictor.

For our second hypothesis, we could confirm, in line with previous studies, that the perpetration of violence is a significant predictor for appetitive aggression. Notably, the analyses show that, when controlling for the number of combat actions, combatants who voluntarily joined the armed forces at least once, reported an overall higher attraction to violence, compared to those combatants that were abducted.

### *The problem of early recruitment and later domestication*

In our analyses, we tested both the effect of an early interruption of civil socialization and the effect of socialization in an armed force, in one model. However, only the early disruption of civil socialization turned out to be a significant predictor. In other words, children

and adolescents who grow up in cruel social environments that foster violence have a higher propensity towards appetitive aggression, even if we cannot distinguish at this point if this environment has made them cruel, or if the environment has failed to teach them how to regulate biologically prepared appetitive aggressive behaviour (Elbert et al., 2010). But why is the developmental context of utter importance? Even though we did not primarily focus on child soldiering, 85% of our participants were under the age of 18 at the time of recruitment. One factor that contributes to the variance of future aggressive behaviour in adults is the manifestation of early signs of deviant behaviours and the consequence of various forms of maladjustment in the course of emotional deregulation, conduct problems, low peer acceptance and peer rejection during childhood and adolescence (Card, Stucky, Sawalani, & Little, 2008). Another source of variance stems from a disruption of socialization in the normally developing individual. Especially this lack of early socialization seems to be crucial: developmental theories such as the Primary Socialization Theory (PST, Oetting & Donnermeyer, 1998) have emphasized the context of interactions especially with regards to the three socialization sources (the family, the peers and the school). Numerous studies with children and adolescents have proven that socialization processes during childhood and adolescence shape future aggressive behaviour and aggression regulation (e.g., Loeber & Hay, 1997; Tremblay et al., 2004; Viemerö, 1998). Whether or not the socializing input is also related to sensitive periods cannot be answered, as information on sensitive periods for the development of aggressive behaviour is not readily available. However, there are indications for aggressive behaviour that androgen-sensitive periods, perhaps during early childhood and puberty, might be associated with increased aggressiveness later in life (Berenbaum, & Resnick, 1997; Harrison, Connor, Nowak, Nach, & Melloni, 2000). Especially as a release of testosterone is related to aggression (e.g., van Goozen, Cohen-Kettenis, Gooren, Frijda, & van de Poll, 1995; Weierstall, Moran, Giebel, & Elbert, in press), an increased flooding with androgens like testosterone during the acting out of violence in such periods that are essential for the masculinization of the brain could account for this effect.

### *Dealing with the cycle of violence*

One decade ago, it was estimated that around 300.000 child soldiers were used in armed conflicts (Machel, 2000). Current estimates are possibly much higher, as the child soldier rate has been constantly increasing (Schauer & Elbert, 2010). Most children are recruited under several surrounding forces, including cultural, social, economical or political pressures (Machel, 2000), but also under a threat to their lives and traumatizing conditions. They are faced with extreme suffering, a lack of medical care and often with severe abuse (Schauer & Elbert, 2010). Consequently, many of them suffer from serious mental health problems and have a higher risk for depression, anxiety disorders and predominantly posttraumatic stress disorder (Ertl, Pfeiffer, Schauer, Elbert, & Neuner, 2011; Kohrt et al., 2008; Pfeiffer & Elbert, 2011). The first effective treatment programs using Narrative Exposure Therapy (NET, Schauer, Neuner, & Elbert, 2011) have been implemented for the treatment of mental health problems in former combatants (e.g., Ertl et al., 2011; Schauer & Elbert, 2010). The NET is a manualized, evidence-based, short-term and culturally-universal intervention for trauma victims, in which the patient generates a bibliographic life account from his or her birth to the present day, focusing on the detailed exploration of

experienced traumatic events. However, the rate of trauma-related mental disorders in these samples is much lower than one would expect given the high exposure to traumatic stress. We suggested earlier that appetitive aggression seems to lower the risk of the perpetrator from becoming traumatized and confirmed this assumption in studies of Rwandese genocide perpetrators, Ugandan child soldiers and German World War II Veterans (Weierstall et al., 2011, 2012). Consequently, there is a highly diverse amount of evidence that former combatants from different backgrounds with greater appetitive aggression also show fewer symptoms of posttraumatic stress disorder. Children and adults who fight in armed conflicts are faced with enormous cruelty and suffering. Either these violence cues are integrated into the fear network and lead to trauma spectrum disorders or they are integrated into the hunting network associated with appetitive aggression and prevent trauma spectrum disorders on the one hand, but also make those combatants become cruel perpetrators on the other hand (see also Elbert, Weierstall, & Schauer, 2010).

In line with previous findings, this study supports the assumption that appetitive aggression is common among former combatants. The earlier the civil socialization process is disrupted, the more likely it is that combatants will resort to cruelty. It is reasonable to assume that a higher propensity towards violence might also impair the process of re-integration into a civil society. We, therefore, claim that successful demobilization programs have to offer more than just new perspectives for former combatants but also address their combat experiences. Children who lack peaceful or civil primary socialization may catch up in a “re”-socialization programme when their experiences, basal assumptions about the world, values and attitudes are properly addressed in demobilization programs. Professionals working with former combatants should acknowledge that appetitive aggression can be part of combat, child soldiering and survival in the bush and that violent behaviour may result from an intrinsically rewarding act, irrespective of secondary rewards like honour, status or material rewards.

## Limitations

The study is based on subjects' ratings for most of the assessed measures. Consequently, the data is susceptible to bias. Moreover, we assessed a sample of former fighters who were at the time of the interview not involved in armed conflict. The extent to which the results from this study can be generalized to active combatants cannot be determined. The sample size allowed for sufficient effect sizes but a further sub-grouping was not possible. This would be of interest for future studies, as we obtained participants in the mixed group that had been abducted prior to a voluntary entry into the armed forces, but also participants for whom it was the opposite case. Even if we could identify self-committed violence as well as the age upon entry into combat forces to be important factors that foster appetitive aggression, a significant proportion of variance remains unexplained. Considerable literature emphasizes the multifactorial determinants of aggressive behaviour (Coie & Dodge, 1998; Raine, 1993). Consequently, it is reasonable to assume that appetitive aggression is also the product of the interaction between psychological, biological, and social influences. However, we suggest that especially a more detailed assessment including dynamic measures of socialization might deepen the understanding of the socialization in an armed group on appetitive aggression. Social learning processes and the

selective rewarding are crucial for the acquisition of aggressive behaviour and might play an important role in this context too. Despite these limitations, it was possible to confirm and extend the results of Hecker and colleagues (2012) for a different setting.

## Conclusion

With the present investigation, we underline the importance of appetitive aggression as a significant motivation for combatants in conflict regions to behave cruelly. Our results show that an attraction to cruelty can evolve in an unfavourable environment where the process of civil socialization is interrupted, especially for combatants of a younger age. Moreover, the self-rewarding effect of cruel behaviour is even more pronounced in those combatants who have an active motivation to seek out aggressive behaviour. Escalating violence will take place in every region where civil boundaries fall as appetitive aggression is a part of human nature.

## Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

## Acknowledgments

The Deutsche Forschungsgemeinschaft and the NGO vivo ([www.vivo.org](http://www.vivo.org)) supported the research. The support of Professor Gerald Schneider is gratefully acknowledged. We thank Dr. Elisabeth Schauer and Heike Riedke for assistance with data collection and Dr. Harald Hinkel for help with logistics.

## Note

1. For more information, see [www.vivo.org](http://www.vivo.org)

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