



## The association of maltreatment and socially deviant behavior—Findings from a national study with adolescent students and their parents



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### ABSTRACT

Research has consistently demonstrated that violence and maltreatment are important risk factors for socially deviant behavior among adolescents. This link has not been systematically examined among adolescents in Sub-Saharan Africa. In this study, we assessed adolescents' exposure to violence and maltreatment as well as their socially deviant behavior in a national sample of 700 adolescent students in Tanzania (52% girls). In addition to adolescents' self-reports, we also included their parents' perspective ( $N = 332$ , 53% females). After controlling for other risk factors, we found significant positive associations between emotional violence by teachers, as well as neglect, emotional and physical violence by parents with adolescents' self-reported delinquent and rule breaking behavior. Positive associations were also found between self-reported parental use of physical violence with adolescents' delinquent and rule breaking behavior, as reported by their parents. Furthermore, emotional violence by teachers and physical violence by parents were positively associated with adolescents' self-reported aggressive behavior. These results suggest a strong association between violence and maltreatment at home and at school with socially deviant behavior among adolescents. Our findings emphasize the need to inform parents, teachers, and the population at large about the potentially adverse consequences associated with violence and maltreatment on the healthy development of children and adolescents.

### 1. Introduction

Socially deviant behavior is defined as noncompliant behaviors that are deemed inappropriate by parents or other authority figures in society (Dodge, Coie, & Lynam, 2007). Socially deviant behavior includes aggressive behaviors (e.g., hurting others, frequent fighting), delinquent behaviors (e.g., stealing, drug use, damaging public properties), as well as other rule breaking behaviors (e.g., truancy). Socially deviant behavior of children and adolescents poses challenges for parents, caregivers, and teachers across the globe, and research findings from different regions of the world indicate that adolescents are particularly likely to engage in behaviors that most adults would define as unacceptable (Puzzanchera, 2009; Shivakumara, Mane, Ravindra, Lamani, & Pal, 2014; Youngblade et al., 2007). Thus, it is not surprising to commonly hear parents, guardians and teachers complaining about adolescents' outbursts of anger, acts of delinquency, fights, and school absenteeism.

Most studies on socially deviant behavior of adolescents have been

conducted in developed countries (e.g., Dodge et al., 2007; Lansford & Deater-Deckard, 2012; Lansford, Wager, Bates, Petit, & Dodge, 2012). However, recent studies claim that socially deviant behavior are currently becoming more prevalent among adolescents in developing countries (Abdullah, Ortega, Ahmad, & Ghazali, 2015; Sadeghi, Farajzadegan, Kelishadi, & Heidari, 2014). Furthermore, findings from developed nations indicate that adolescents' exposure to violence by parents, primary caregivers, and other authority figures are important risk factors of adolescents' socially deviant behavior (e.g., Shields & Cicchetti, 2010; Wall & Bath, 2007). Thus far, this link has only marginally been investigated in Sub-Saharan African countries. Therefore, with this study we aimed to investigate this link in a large and national sample of school attending adolescents in Tanzania, a country where violence against children and adolescents is highly prevalent both at home (Nkuba, Hermenau, & Hecker, 2018) and at school (Hecker, Goessmann, Nkuba, & Hermenau, 2018), while, at the same time, authority figures complain about increasing socially deviant behavior of adolescents (Semali & Vumilia, 2016).

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### 1.1. Socially deviant behavior among adolescents in Sub-Saharan Africa

Though most studies on the socially deviant behavior of adolescents have been conducted in developed countries, there are a variety of studies that provide evidence that socially deviant behavior among adolescents is also a matter of concern in developing countries (e.g., Abdullah et al., 2015; Abdulmalik, Ani, Ajuwon, & Omigbodun, 2016; Olashore, Akanni, & Olashore, 2017; Shivakumara et al., 2014). A number of studies indicate the same for several countries in Sub-Saharan Africa, such as the Democratic Republic of the Congo, Ethiopia, Ghana, and Nigeria (Acquah, Lloyd, Davis, & Wilson, 2014; Adelekan, Ndom, Ekpo, & Oluboka, 1999; Amedahe & Owusu-Banahene, 2007; Ashenafi, Kebede, Desta, & Alem, 2001; Boakye, 2013; Kashala, Elgen, Sommerfelt, & Tylleskar, 2005)

In Tanzania, data from the *Basic Education Statistic in Tanzania* (BEST) indicated that, despite great efforts by the government in providing education to children in the country, only one third of adolescents attend secondary school and less than one percent enroll in higher education. This is due, in part, to a high dropout rate, which is – among other factors – associated with socially deviant behaviors, such as delinquent behavior, aggression, or truancy (United Republic of Tanzania, 2012, 2014, 2016). For example, data from UNICEF (2011) statistics indicate that 20% of students who entered their first year of formal schooling in 2004 had dropped out before completing their primary education. One of the main reasons cited was related to disciplinary incidences. Moreover, BEST indicated that 76,002 students were expelled from secondary schools in 2011 alone for reasons such as truancy (72%) and delinquent behavior (3.8%), while only 14% of dropouts were related to low parental commitment and neglect in supporting their children's education (United Republic of Tanzania, 2011). In addition, the rate of dropout as a result of delinquent behavior and truancy rose from 33% in 2007 to 76% in 2011 (United Republic of Tanzania, 2011). Similarly, Semali and Vumilia (2016) reported a high level of teachers' complaints about the socially deviant behavior of students, such as the use of abusive language, destruction of school property, and fighting among adolescent students in Tanzania.

### 1.2. Associations of violence with socially deviant behavior among adolescents

Previously, several studies, mostly from developed nations, have reported robust associations between child and adolescent exposure to violence and socially deviant behavior, such as aggressive and delinquent behavior, and substance abuse (Chang, Schwartz, Dodge, & McBride-Chang, 2003; Finigan-Carr, Gielen, Haynie, & Cheng, 2016; Keenan & Wakschlag, 2002; Webster-Stratton & Taylor, 2001; Wong, 2000). The strongest positive associations have been repeatedly shown to exist between violent discipline methods (in homes and schools) and aggressive as well as delinquent behaviors (Gershoff, 2002, 2010, 2013; Gershoff et al., 2010; Repetti, Taylor, & Seeman, 2002). For example, Flannery, Singer, Williams, and Castro (1998) reported that aggressive behavior was three times higher for girls and two times higher for boys among adolescents who were exposed to high levels of violence at home when compared with adolescents from low violence homes. Longitudinal studies revealed that violent punishment was associated with increased aggression during school-age years (Berlin et al., 2009; Mulvaney & Mebert, 2007). Concordantly, histories of maltreatment and violent punishment at age 10 were reported to be a predictive measure for higher levels of persistent serious delinquency and violent behavior in adolescence (Stouthamer-Loeber, Wei, Homish, & Loeber, 2002; Weaver, Borkowski, & Thomas, 2008). Furthermore, meta-analytic findings provided further evidence of the association between violent punishment and numerous forms of socially deviant behavior: Violent punishment was associated with, among other things, an increase in child aggression, child delinquent behaviors, and antisocial behavior, and an increase in aggression, criminal, and antisocial

behavior in adulthood (Gershoff, 2002; Gershoff & Grogan-Kaylor, 2016).

Emotional violence also seems to be a potent form of maltreatment that has been linked with aggression, and later psychopathology (Hibbard, Barlow, & MacMilan, 2012; Iffland, Sansen, Catani, & Neuner, 2012). For example, emotional abuse and parental verbal aggression was associated with later anger and hostility (Teicher, Samson, Polcari, & McGreenery, 2006).

Furthermore, neglect has been associated with externalizing problems. For example, Kotch et al. (2008) conducted a longitudinal study following children from birth until the age of 8. They discovered support for an association between early neglect and aggression later in life. In a community sample of primary school age children (6–9) in Tanzania, we also found a positive association between neglect and externalizing problems (Hecker, Boettcher, Landolt, & Hermenau, 2018).

### 1.3. Other factors associated with socially deviant behavior among adolescents

However, there is no doubt that also other factors contribute to the development of socially-deviant behavior problems in children and adolescents, including biological, familial, or social factors. For example, peer violence has strong associations with aggressive and violent behavior in adolescents (Arseneault, Bowes, & Shakoor, 2010). Moreover, children's age and gender also seem to contribute to the degree of delinquent, rule-breaking, and aggressive behavior (Anderson & Bushman, 2002). Children living outside their family of origin may also be at higher risk for aggressive and delinquent behavior (Hermenau et al., 2011). Furthermore, other studies reported strong associations between parental stress, household income, and other familial factors and socially deviant behavior of children (Neece, Green, & Baker, 2012). Other sociodemographic factors, such as parental age and gender, may influence the report of maltreatment and socially-deviant behaviors (Lereya, Samara, & Wolke, 2013).

### 1.4. Contextualizing the present study

Though a variety of studies in high-income countries have consistently linked children's and adolescents' exposure to violence with current and future socially deviant behavior, very few studies have investigated this in low-income countries. The few studies that examined this link in low-income countries thus far point to similar relationships. For example, exposure to violent punishment both at home and in school was linked to aggressive behavior in children in Nigeria (Ani & Grantham-McGregor, 1998). Acquah et al. (2014) presented evidence for a strong association of parenting strategies with aggressive and delinquent behavior, such as truancy, alcohol use, bullying and fighting. Moreover, studies with adolescents from Burkina Faso, Ghana, Kenya, Malawi, and Uganda found relationships between adolescents' exposure to violence and other adverse events during childhood and delinquent behaviors (Boakye, 2013; Kabiru, Beguy, Crichton, & Ezech, 2010; Kabiru, Elung'ata, Mojola, & Beguy, 2014). In Tanzania, a recent study found positive associations between exposure to violence and aggressive behavior and conduct problems in a non-representative sample of primary school aged children (Hecker, Hermenau, Isele, & Elbert, 2014). Findings were similar in studies with at-risk samples of orphans (Hermenau et al., 2011; Hermenau, Hecker, Elbert, & Ruf-Leuschner, 2014). Moreover, high levels of socially deviant behavior (theft, truancy, cigarette, alcohol and drug use) among school attending adolescents reported were linked with teachers' use of violent discipline methods in a qualitative study based on a small and non-representative sample (Yaghambe & Tshabangu, 2013).

However, the link between exposure to violent punishment and maltreatment at home and at school and adolescents' socially deviant behavior has not been systematically examined among adolescent

students in Tanzania. For example, studies with representative samples that would allow a broad generalizability of the findings are still lacking. This is all the more important as parents, caregivers and teachers often argue that violent punishment may have different effects than in the Western world due to its purported role as part of African culture (Nkuba, Hermenau, & Hecker, 2018; Nkuba, Hermenau, Goessmann, & Hecker, 2018b). It has been argued that the aforementioned adverse consequences may not hold for societies or communities in which many of the specific acts of violence against children are culturally normed and highly prevalent. Recently, the Tanzanian government reportedly confirmed that the use of corporal punishment in public schools persists (Tanzania Daily News, 2013). Given such societal support for violence against children, it is vital for both individuals and societies to have a better understanding of the potential effects of violence. In particular, we must study whether the negative consequences of physical and emotional violence of children are diminished in societies where such acts are legal and socially accepted.

Most studies on violence and problem behavior of children have relied solely on parent reports (Schneider, MacKenzie, Waldfoegel, & Brooks-Gunn, 2014). Yet, adolescents are important informants about their own experiences (Barry, Frick, & Grafeman, 2008; Breen, Daniels, & Tomlinson, 2015; Chan, 2012) and coherence between self-report and findings at the molecular level could strengthen the credibility of adolescents' reports (Hecker, Radtke, Hermenau, Papassotiropoulos, & Elbert, 2016). Therefore, it is recommended to include both parents' and adolescents views because different informants contribute distinct yet overlapping perspectives which can lead to a greater understanding of the association between maltreatment and socially deviant behavior (Barry et al., 2008; Chan, 2012). Notwithstanding, investigations that included the perspectives of multiple informants often showed discrepant responses between reports. This was especially true for studies that compared adolescents' and their parents' views, with only low to moderate levels of agreement (Chan, 2012; Duke, Ireland, & Borowsky, 2005; Martin, Ford, Dyer-Friedman, Tang, & Huffman, 2004).

Furthermore, previous studies looked at exposure to violence in specific settings (e.g., only at home, at school or in institutional care) without controlling for violence in other settings and without controlling for other potentially confounding factors such as peer violence, parental stress, sociodemographic factors, etc.

### 1.5. Objectives

In contrast to previous studies that were mainly based on small, non-representative samples (Hecker et al., 2014), or at-risk samples (Hermenau et al., 2011) and that did not control for violence in other settings or other potentially influencing factors, the present study aimed at examining the link between violence and maltreatment at home and at school with socially deviant behavior in a large national sample of adolescent students, while controlling for other potentially influencing factors. Furthermore, we aimed to include the perspective of both adolescents and their parents or guardians on maltreatment and social deviant behavior. We hypothesized that emotional and physical violence by parents and teachers as well as neglect by parents would be positively associated with adolescents' delinquent and rule breaking as well as their aggressive behavior.

## 2. Material and methods

### 2.1. Participants

A total sample of 700 students (52% girls, mean age: 14.92 years,  $SD = 1.02$ , range: 12–17) participated in the study (see Table 1). In total, 54% ( $n = 376$ ) of the students lived with both of their parents, 28% ( $n = 197$ ) with one parent, 18% ( $n = 124$ ) with other relatives and/or in other facilities. The 332 parents or primary caregivers participating (53% females; age: 43.47 years,  $SD = 9.02$ ) had a mean of

7.69 years ( $SD = 2.66$ ) of formal education. Parent or caregiver employment ranged from formal 13% ( $n = 42$ ), to informal but reliable 33% ( $n = 110$ ), informal and unreliable 44% ( $n = 146$ ), and no employment 10% ( $n = 35$ ). The majority of parents reported a monthly household income pursuant to the government analysis of monthly household income for Tanzanian families which was around 25 USD as per reports from 2001 to 2007 (United Republic of Tanzania-Repoa, 2009).

### 2.2. Procedure

The study included six (of a total 25) regions in Tanzania (i.e., Arusha, Dar es Salaam, Iringa, Kagera, Kigoma, and Lindi). Five regions were selected randomly, one from each of the five zones of the country (Coast zone, Central zone, Northern Highland zone, Southern Highland zone and Lake zone), which were stratified according to the Tanzanian government categorizations of regions with consideration paid to geographical locations, cultural comparability, political background and economic activities. This approach ensured the representation of different strata of the Tanzanian society. Additionally, the largest city in Tanzania, Dar es Salaam, was added intentionally due to its unique population composition and significant contribution to the total number of secondary schools in Tanzania (United Republic of Tanzania, 2014). In each region one mixed-day secondary school from the regional capital was randomly selected. Similarly, one rural district was randomly selected from which one single mixed-day secondary school was also randomly selected. In Dar es Salaam, one of the city's municipalities was randomly chosen, from which one mixed-day secondary school was selected at random. Within each selected school, 120 students in the 8th and 9th year of formal schooling were stratified by gender and then randomly selected.

Before beginning data collection, the research team trained six native Swahili speaking research assistants in data collection. The training was conducted for one week. A standardized introduction and questionnaire administration procedures were developed at the end of the training. This ensured high objectivity and reliability during questionnaire administration among different research assistants. A pilot study at one mixed-day secondary school in Dar es Salaam was conducted to ensure the feasibility of the questionnaire administration.

Prior to data collection, a letter explaining the study aims and procedures was sent together with an informed consent form to the parents or caregivers to seek parental consent. In total, 63% of the forms were returned. To ensure common and clear understanding of the relevant details of the study, the research team provided information to all selected participants in a formal information session. Students who signed informed consent forms filled out questionnaires in groups of 3 to 5 on the school grounds under supervision of a research assistant. To ensure sufficient privacy, the students were seated so that it was impossible for anyone to see how the questions were answered. The completion of questionnaires took an average of 45 min.

The parents were contacted through letters and phone calls. Of the 700 parents contacted in all schools, 332 (48%) parents were willing and able to participate. Parents were invited to come to the respective schools. One parent (either the father, the mother, or a legal guardian) was asked to sign an informed consent document (finger prints were accepted in case of illiteracy). Due to the high illiteracy rate and inexperience with self-administered questionnaires, each parent filled out the questionnaire in a one-on-one interview setting within an average completion time of 30 min. Research assistants were instructed to read the questions to the participants and to provide further information if needed. A compensation of approximately three USD was given to each participating parent.

The study was performed in accordance with the ethical standards laid down in the current version of the Declaration of Helsinki (2013). The present study was approved by the University of Dar es Salaam on behalf of Tanzanian Commission for Science and Technology and the

**Table 1**  
Descriptive statistics.

	Students' self-report (N = 700)		Parent Reports (N = 333)	
	M or n	SD or %	M or n	SD or %
Age	14.92	1.02	43.47	9.02
Gender (Male)	335	48	155	47
Both parents living	556	79	–	–
Peer violence (at least once in lifetime)	449	64	–	–
Emotional violence by teachers	20.46	21.16	–	–
Physical violence by teachers	31.24	30.82	–	–
Emotional violence by parents	21.71	21.20	26.59	20.30
Physical violence by parents	23.10	30.39	18.89	20.79
Neglect by parents	11.48	15.05	10.72	14.29
Delinquent and rule breaking behavior (DRBBS)	10.38	6.84	9.72	7.08
Aggressive behavior (RPQ)	13.07	5.85	–	–
Parental stress (CBI)	–	–	9.23	4.43
Household income per month (< 100 US \$)	–	–	215	65

Note. M = mean; SD = standard deviation; N = total number of respondents; % = percentage; n = number of responses in a particular category.

Ethical Review Board of the University of Konstanz. Only those parents who gave their informed consent in written form and adolescents with written parental informed consent and who provided written informed consent themselves were included in this study. Other aspects of the data gathered during the extensive investigations are presented elsewhere (Hecker et al., 2018; Nkuba, Hermenau, & Hecker, 2018; Nkuba, Hermenau, Goessmann, & Hecker, 2018a).

### 2.3. Measures

Following established international guidelines (Brislin, Lonner, & Thorndike, 1973) all instruments were translated into Swahili and back translated to English in a blind written form. The first part of the questionnaires gathered demographic information, such as age, gender, and living conditions of students and parents, respectively.

#### 2.3.1. Socially deviant behavior

We assessed socially deviant behavior with the Delinquent and Rule Breaking Behavior Scale (DRBBS; a measure created by the study team) and the Reactive-Proactive Questionnaire (RPQ; Raine et al., 2006). The DRBBS assesses how often an adolescent has shown a specific delinquent or rule breaking behavior in the previous six months. The scale consists of items of the *Problem Behavior Frequency Scale* (Dahlberg, Toal, Swahn, & Behrens, 2005), e.g., ... *been in suspension or expelled from school*. In addition, we included items to cover the lived reality of Tanzanian school attending adolescents (e.g., ... *been sent to the discipline master or mistress or head of school because of disciplinary reasons?*; see Supplementary Table A and B for more details). The 16 items are rated on six answer categories from “never” (0) to “20 or more times” (6) and are then summed up to one score ranging from 0 to 96. We assessed the DRBBS both in students and parents. In the adolescent sample, we abstained from adding two items to the sum score to avoid an artificial overlap between delinquent and rule breaking and aggressive behavior (see Supplementary Table B) as these items were also part of the Reactive-Proactive Questionnaire (see next paragraph). Therefore, the self-reported DRBBS score of the adolescents ranged from 0 to 84. The *Problem Behavior Frequency Scale* showed an internal consistency of 0.76 in a sample of middle school students (Dahlberg et al., 2005). In the present study, the Cronbach's Alpha coefficient was  $\alpha = 0.70$  for the student self-report and  $\alpha = 0.78$  for the parent report. Adolescent and parent reports were significantly correlated ( $r = 0.28, p < .001$ ).

The **RPQ** assesses adolescents' self-reported aggression in the previous 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 Tanzanian context (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*). The RPQ comes with very good psychometric properties (Raine et al., 2006) and has successfully been used with children and adolescents in Tanzania (e.g., Hecker et al., 2014). In this study, we used the sum score of all items, which ranges from 0 to 44 with higher scores indicating higher rates of aggressive behavior. In the present sample the Cronbach's Alpha coefficient was  $\alpha = 0.81$ . Delinquent and rule breaking behavior (DRBBS score) and aggressive behavior (RPQ score) were significantly correlated ( $r = 0.54, p < .001$ ).

#### 2.3.2. Exposure to maltreatment

Students' experiences of violent punishment both at home and at school as well as experiences of neglect at home in the year preceding the investigation were assessed with the subscales for physical violence (physical assault), emotional violence (psychological aggression), and neglect of the parent-child version of the Conflict Tactics Scale (CTSPC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998), which was filled out by both students and parents. For the purpose of the present study, participating students completed this questionnaire twice: first referring to any violence and neglect they experienced from their parents or caregivers and second referring to violence perpetrated by teachers. Physical violence was assessed with 13 items (e.g. ... *spanked you on the bottom with a bare hand*), emotional violence with 5 items (e.g. ... *called you dumb or lazy or some other names*), and neglect with 8 items (e.g. ... *been not able to make sure that you got to a doctor or hospital when you needed it*). Parents filled out the CTSPC with their participating child in mind. The items of the scales are rated on seven answer categories from “never” (0) to “more than 20 times” (25) and are then summed up to one score per sub-scale (possible ranges are 0 to 325 for physical violence, 0 to 125 for emotional violence and 0 to 200 for neglect). The CTSPC comes with low to moderate psychometric properties for the three subscales of interest. The low alpha reliability can be explained by the fact that the items of the scale measure rather rare events, and that the correlation between items, which is the basis of alpha, are low due to extreme skewness (Straus et al., 1998). Nonetheless, CTSPC has been used worldwide and its validity has been demonstrated in numerous studies (Straus & Hamby, 1997). Cronbach's alpha coefficients in the current student sample were  $\alpha = 0.79$  for physical violence,  $\alpha = 0.63$  for emotional violence, and  $\alpha = 0.63$  for neglect. For the parent reports it was  $\alpha = 0.76$  for physical violence,  $\alpha = 0.68$  for emotional violence and  $\alpha = 0.77$  for neglect.

We only found a significant correlation between adolescent and parent reports for neglect ( $r = 0.14, p = .011$ ) but neither for physical ( $r = 0.01, p = .988$ ) nor for emotional violence ( $r = -0.04, p = .450$ ).

#### 2.3.3. Peer violence

We assessed *peer violence* using three items of the Maltreatment and

Abuse Chronology of Exposure (Teicher & Parigger, 2015). The items in this sections were: (1) “Has any peer in your whole life ever called you names or said hurtful things more than a few times a year?”, (2) “Has any peer in your whole life ever said things behind your back, posted derogatory messages about you, or spread rumors about you?”, and (3) “Has any peer in your whole life ever hit you so hard or intentionally harmed you in such a way that you were injured?” These items were answered in two categories which are Yes (1) or No (0) and were then summed up to one sum score (possible range: 0–3).

2.3.4. Parental stress

Parental stress was measured with the Copenhagen Burnout Inventory (CBI; Kristensen, Borritz, Villadsen, & Christensen, 2005). This instrument assesses the individual risk and extent of stress and burnout related to work, family, and service provision. In this study, we considered the six items measuring the personal burnout of parents. The answer categories ranged from never (0) to always (4) and were then summed up to one sum score (possible range: 0–24). Psychometric properties of the personal burnout subscale are reported to be good with the Cronbach's alpha coefficient of  $\alpha = 0.87$  (Kristensen et al., 2005). The Cronbach's alpha coefficient for our sample was  $\alpha = 0.74$ .

2.4. Data analysis

To test the hypothesis that maltreatment at home and at school is positively associated with socially deviant and aggressive behavior among adolescents, we conducted three hierarchical multiple regression analyses. Preliminary analyses confirmed the tenability of all assumptions for linear regression models. Missing values made up 3.6% ( $n = 25$ ) of the adolescent data. All missing values were completely at random (Little's MCAR test:  $\chi^2(46) = 48.62, p = .368$ ). Missing values made up 2.1% ( $n = 7$ ) of the parent data set. All missing values were completely at random (Little's MCAR test:  $\chi^2(16) = 9.95, p = .869$ ). For regression analysis, missing values were replaced by mean values on item level (i.e., individual mean score using the other items of the respective scale or sub-scale). The assumption of normal distribution of the residuals of the dependent variable following West, Finch, and Curran (1995) could be met for all models. The maximum variance inflation factor did not exceed 1.99. Therefore, multicollinearity between predictor variables could be ruled out. Linearity, homoscedasticity, and independence of residuals were tenable. Effect sizes were calculated using Cohen's  $f^2$ , with  $f^2 \geq 0.02$  indicating a small effect,  $f^2 \geq 0.15$  a medium effect, and  $f^2 \geq 0.35$  a large effect (Cohen, 1992). Analyses were performed with IBM SPSS Statistics Version 24. Level of significance was set to an alpha of 0.05 and analyses were calculated two-tailed.

3. Results

3.1. Association between maltreatment and students' self-reported delinquent and rule breaking behavior

The first step of the regression analysis showed that adolescents' demographic variables (step 1) were significantly related to adolescents' self-reported delinquent and rule breaking behavior (see Table 2). Adding exposure to peer violence (step 2) further improved the model. By adding physical and emotional violence, and neglect by parents and physical and emotional violence by teachers (step 4), the model was further improved. The full model explained 35% of the variability of adolescents' delinquent and rule breaking behavior ( $adj. R^2 = 0.35, F(9, 699) = 43.23, p < .001, f^2 = 0.54$ ). As indicated in Table 2, exposure to emotional violence by teachers, and to emotional and physical violence and neglect by parents were positively related to adolescents' self-reported delinquent and rule breaking behavior.

Table 2

Regression analysis predicting self-reported delinquent and rule breaking behavior of adolescents.

Predictor variables	Delinquent and rule breaking behavior (DRBBS score)			
	B	SE of B	$\beta$	T
Step 1 <sup>a</sup>				
Age of adolescent	0.75	0.26	.11	2.92**
Gender of adolescent (0 = female, 1 = male)	-0.46	0.52	-.03	-0.88
Adolescent's parents living	0.50	0.04	.04	0.98
Step 2 <sup>b</sup>				
Age of adolescent	0.76	0.25	.11	3.06**
Gender of adolescent (0 = female, 1 = male)	-0.39	0.51	-.03	-0.078
Adolescent's parents living	0.33	0.50	.02	0.65
Peer violence	1.70	0.26	.24	6.67***
Step 3 <sup>c</sup>				
Age of adolescent	0.83	0.21	.12	3.94***
Gender of adolescent (0 = female, 1 = male)	-0.23	0.43	-.02	-0.54
Adolescent's parents living	0.09	0.42	.01	0.21
Peer violence	0.88	0.22	.13	4.04***
Emotional violence by teachers	0.08	0.01	.26	6.16***
Physical violence by teachers	-0.01	0.01	-.05	-1.31
Emotional violence by parents	0.07	0.01	.21	4.91***
Physical violence by parents	0.03	0.01	.15	3.80***
Neglect by parents	0.03	0.01	.14	3.94***

Note. N = 700. B: unstandardized regression weight, SE: standard error,  $\beta$  = standardized regression weight, T: t-test statistics; \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

<sup>a</sup> Test statistics:  $adj. R^2 = 0.01, F(3, 696) = 3.33, p = .019, f^2 = 0.01$ .

<sup>b</sup> Test statistics:  $\Delta R^2 = 0.06, F(1, 695) = 44.45, p < .001, f^2 = 0.06$ .

<sup>c</sup> Test statistics:  $\Delta R^2 = 0.29, F(5, 640) = 61.96, p < .001, f^2 = 0.41$ .

3.2. Association between maltreatment and adolescents' delinquent and rule breaking behavior reported by their parents

Neither adolescents' nor parents' demographic factors were significantly associated with students' delinquent and rule breaking problems reported by their parents (step 1). Adding parental stress (step 2) improved the model significantly. Adding emotional and physical violence and neglect by parents (step 3) further improved the model. The full regression model of the parent reports explained 20% of the variance of adolescents' delinquent and rule breaking behavior reported by their parents ( $adj. R^2 = 0.20, F(9, 322) = 9.93, p < .001, f^2 = 0.25$ ). As indicated in Table 3, physical violence by parents was positively related to adolescents' delinquent and rule breaking behavior that was reported by their parents. Surprisingly, we found a significant negative association between emotional violence by parents and adolescents' delinquent and rule breaking behavior that was reported by their parents. Yet, the bivariate correlation was not significant ( $r = 0.08, p > .05$ ).

3.3. Association between maltreatment and adolescents' self-reported aggressive behavior

The first step of the regression analysis showed that adolescents' demographic variables (step 1) were significantly related to adolescents' self-reported aggressive behavior (see Table 4). Adding exposure to peer violence (step 2) further improved the model. By adding physical and emotional violence by parents and teachers, as well as neglect by parents (step 3), the model was further improved. The full model explained 17% of the variability of adolescents' aggressive behavior ( $adj. R^2 = 0.17, F(9, 690) = 16.30, p < .001, f^2 = 0.20$ ). As indicated in Table 4, exposure to emotional violence by teachers and exposure to physical violence by parents were positively related to adolescents' self-reported aggressive behavior.

**Table 3**  
Regression analysis predicting adolescents' delinquent and rule breaking behavior reported by parents.

Predictor variables	Delinquent and rule breaking (DRBBS score)			
	B	SE of B	$\beta$	T
<b>Step 1<sup>a</sup></b>				
Age of adolescent	0.82	0.39	.12	2.10*
Gender of adolescent (0 = female, 1 = male)	-0.17	0.79	-.01	-0.21
Age of parent	0.06	0.05	.08	1.31
Gender of parent (0 = female, 1 = male)	0.13	0.82	.01	0.15
Household income per month	-0.09	0.67	-.01	-0.12
<b>Step 2<sup>b</sup></b>				
Age of adolescent	0.65	0.37	.10	1.74
Gender of adolescent (0 = female, 1 = male)	-0.01	0.75	.01	-0.01
Age of parent	0.03	0.04	.04	0.67
Gender of parent (0 = female, 1 = male)	0.84	0.79	.09	1.06
Household income per month	0.33	0.65	.03	0.51
Parental stress	0.48	0.09	.30	5.64***
<b>Step 3<sup>c</sup></b>				
Age of adolescent	0.67	0.35	.10	1.90
Gender of adolescent (0 = female, 1 = male)	0.12	0.71	.01	0.16
Age of parent	0.03	0.04	.03	0.60
Gender of parent (0 = female, 1 = male)	1.24	0.76	.09	1.63
Household income per month	0.51	0.61	.04	0.84
Parental stress	0.43	0.08	.27	5.03***
Emotional violence by parents	-0.05	0.02	-.014	-2.53*
Physical violence by parents	0.12	0.02	.35	6.47***
Neglect by parents	0.03	0.02	.09	1.60

Note. N = 332, B: unstandardized regression weight, SE: standard error,  $\beta$  = standardized regression weight, T: t-test statistics. \* $p < .05$ . \*\* $p < 0.01$ . \*\*\* $p < .001$ .

<sup>a</sup> Test statistics:  $adj. R^2 = < 0.01$ ,  $F(5, 326) = 1.44$ ,  $p = .208$ ,  $f^2 = < 0.01$ .  
<sup>b</sup> Test statistics:  $\Delta R^2 = 0.09$ ,  $F(1, 325) = 31.75$ ,  $p < .001$ ,  $f^2 = 0.10$ .  
<sup>c</sup> Test statistics:  $\Delta R^2 = 0.11$ ,  $F(3, 322) = 14.87$ ,  $p < .001$ ,  $f^2 = 0.12$ .

**Table 4**  
Regression analysis predicting self-reported aggressive behavior of adolescents.

Predictor variables	Aggressive behavior (RPQ score)			
	B	SE of B	$\beta$	T
<b>Step 1<sup>a</sup></b>				
Age of adolescent	0.13	0.22	.02	0.57
Gender of adolescent (0 = female, 1 = male)	-1.18	0.45	-0.10	-2.65**
Adolescent's parents living	0.62	0.44	.05	1.41
<b>Step 2<sup>b</sup></b>				
Age of adolescent	0.12	0.21	0.02	0.63
Gender of adolescent (0 = female, 1 = male)	-1.13	0.43	-0.10	-2.60**
Adolescent's parents living	0.49	0.43	.04	1.13
Peer violence	1.26	0.22	.21	5.77***
<b>Step 3<sup>c</sup></b>				
Age of adolescent	0.20	0.20	.04	0.98
Gender of adolescent (0 = female, 1 = male)	-1.12	0.41	-0.10	-2.71**
Adolescent's parents living	0.37	0.40	.03	0.91
Peer violence	0.84	0.21	.14	4.00***
Emotional violence by teachers	0.06	0.01	.22	4.64***
Physical violence by teachers	0.01	0.01	.01	0.21
Emotional violence by parents	0.01	0.01	.01	0.03
Physical violence by parents	0.03	0.01	.17	3.76***
Neglect by parents	0.01	0.01	.05	1.26

Note. N = 700. B: unstandardized regression weight, SE: standard error,  $\beta$  = standardized regression weight, T: t-test statistics; \*\* $p < .01$ . \*\*\* $p < .001$ .  
<sup>a</sup> Test statistics:  $adj. R^2 = 0.01$ ,  $F(3, 696) = 2.93$ ,  $p = .033$ ,  $f^2 = 0.01$ .  
<sup>b</sup> Test statistics:  $\Delta R^2 = 0.05$ ,  $F(1, 695) = 33.27$ ,  $p < .001$ ,  $f^2 = 0.05$ .  
<sup>c</sup> Test statistics:  $\Delta R^2 = 0.12$ ,  $F(5, 690) = 19.71$ ,  $p < .001$ ,  $f^2 = 0.14$ .

**4. Discussion**

The aim of the present study was to investigate the association of exposure to violence and maltreatment with adolescent students' socially deviant behavior. After controlling for potential influencing factors, we found significant positive associations between maltreatment by parents (emotional and physical violence, neglect) as well as emotional violence by teachers and adolescents' self-reported delinquent and rule breaking behavior. Furthermore, we found significant positive relations between physical violence by parents as well as emotional violence by teachers with self-reported aggressive behavior of adolescents. Surprisingly, physical violence by teachers was not significantly associated with adolescents' delinquent and rule breaking behavior. In a second step, we aimed to replicate these findings using the report of the adolescents' parents or primary caregivers. We found strong positive associations between self-reported use of physical violence against the adolescents and adolescents' delinquent and rule-breaking behavior that was reported by their parents. Surprisingly, we found a significant negative association between emotional violence by parents and adolescents' delinquent and rule-breaking behavior reported by their parents. Furthermore, the fact that we found only low or non-significant associations between adolescent and parent reports is not surprising as most studies that have included the perspectives of adolescents and their parents found low levels of agreement (Chan, 2012; Martin et al., 2004). Rather, these findings support the notion that it is important to include both parents' and adolescents views because they contribute distinct perspectives of the association between maltreatment and socially deviant behavior (Barry et al., 2008; Chan, 2012).

**4.1. Association between maltreatment at home and socially deviant behavior**

The moderate correlation between delinquent and rule-breaking behavior and aggressive behavior underlines the view that these behaviors are different but related aspects of the overarching concept of socially deviant behavior. All in all, our analyses indicated that the more adolescents had experienced violence and maltreatment at home and at school the higher their rates of socially deviant behavior. The impact of physical violence by parents is particularly strong as we could find a significant positive relation both in adolescents' reports and parents' reports as well as in relation to delinquent and rule breaking behavior and to aggressive behavior. The strong positive association between physical violence at home and socially deviant behavior are in keeping with prior reports from Sub-Saharan Africa (e.g., Hecker et al., 2014) and from other countries worldwide (e.g., Gershoff, 2002, 2013; Gershoff et al., 2010; Repetti et al., 2002).

On the one hand, these findings can be explained by social learning theory, which states that children who are exposed to violence at home and at school learn from their parents, caregivers, and teachers to solve conflict and demonstrate power with violent behavior (Bandura, 1978). On the other hand, recent findings demonstrated that violence and maltreatment may shape the development of brain areas involved with emotion processing and regulation (Hanson et al., 2015). For example, reduced hippocampal volume has been observed in antisocial personality disorder as well as in several other psychiatric disorders. Childhood maltreatment is a major risk factor for all of these disorders (Teicher, Samson, Anderson, & Ohashi, 2016). Furthermore, child maltreatment may alter the hypothalamic-pituitary-adrenal (HPA) axis, which can result in permanent changes. For example, child maltreatment was associated with differential methylation in the proopiomelanocortin gene (POMC), one of the genes related to the HPA axis, in a study with maltreated children in Tanzania (Hecker et al., 2016). Gene  $\times$  Environment interactions suggested that the relation between maltreatment and impulsivity was stronger as children evinced more differentiating genotypes, thereby strengthening the mediational effect of impulsivity on delinquent behavior (Thibodeau, Cicchetti, &

Rogosch, 2015). This may explain why aggressive behavior is a typical consequence of experiencing, or having experienced, high and persistent stress levels (Sandi & Haller, 2015). Three main factors may contribute to the age-based progression of increased socially deviant behavior, such as drug use or aggressive behavior: (1) a sensitized stress response system; (2) sensitive periods of vulnerability; and (3) maturational processes during adolescence. Together, these factors may explain why exposure to violence and maltreatment increases risk to exhibit socially deviant behavior during adolescence (Andersen & Teicher, 2009).

Our findings concerning neglect and emotional violence by parents are, however, less clear. On the one hand, our study showed significant positive associations between neglect and emotional violence by parents with delinquent and rule breaking behavior, which is in line with previous findings (Hecker et al., 2018; 2014). However, we could not find this relation with regard to aggressive behavior nor to the parent reports. Surprisingly, we found a negative association between emotional violence by parents and adolescents' socially deviant behavior reported by their parents. One explanation for the latter finding could be that parents are not aware of all socially deviant behaviors that adolescent report. This is in line with the fact that investigations that included the perspectives of adolescents' and their parents' views showed discrepant responses and only low to moderate levels of agreement between reports (Chan, 2012; Duke et al., 2005; Martin et al., 2004). Another explanation could be that physical violence by parents is often accompanied by emotional violence and adolescents and parents may remember and report physical violence rather than emotional violence when they occur together. As a consequence, parts of the effect of physical violence may be also attributed to emotional violence. However, our findings need to be replicated and the hypothesis pointed out here requires further testing.

#### 4.2. Association between violence at school and socially deviant behavior

We found a positive association between emotional – but not physical – violence by teachers and adolescents' self-reported socially deviant and aggressive behavior. At first glance this finding is surprising. However, the high prevalence of physical violence by teachers and the fact that almost every student in Tanzania is frequently exposed to physical violence (Hecker et al., 2018) may lead to the problem that adolescents may feel more humiliated and ashamed when experiencing emotional violence in front of their peers. As the self-esteem of adolescents is very much depending on their belonging to a peer group, the threat of losing one's status in the peer-group as a consequence of the humiliation in front of the peers may explain our findings. However, this hypothesis would need to be investigated in future studies.

#### 4.3. Societal relevance of the findings

Considering the previous studies from Tanzania (Hecker et al., 2014; Hermenau et al., 2011, 2014), the current study points in a similar direction but is based on a large and national sample of school attending adolescents' and their parents. Furthermore, the findings of this study include the perspective of both adolescents and their parents. The effect size of the positive association between adolescent experiences of maltreatment at home and at school and adolescent socially deviant behavior implies a marked influence. This is particularly true for physical violence by parents and emotional violence by teachers. Considering that more than 90% of the adolescents in our sample have experienced (self-reported and reported by their parents) at least one type of physical violence at home and of emotional violence at school (Hecker et al., 2018; Nkuba et al., 2018), the effects on the levels of socially deviant behavior of so many adolescents may manifest into a considerable cause for concern at the societal level (Straus, 2001). This concern is even more troubling when one considers the cumulative effect of exposure to violence and maltreatment on an adolescent's

overall well-being, including increased socially deviant behavior and decreased mental health (Felitti et al., 1998; Gershoff, 2002; Hecker et al., 2018; Nkuba et al., 2018a; Straus, 2001). Longitudinal and prospective studies suggest that exposure to physical and emotional violence during childhood and adolescence predicts socially deviant behavior in childhood, adolescence, and adulthood (Berlin et al., 2009; Dodge, Pettit, Bates, & Valente, 1995; Mulvaney & Mebert, 2007; Stouthamer-Loeber et al., 2002; Weaver et al., 2008). As a consequence, high rates of physical violence and other types of maltreatment hold the risk that victimized children and adolescents may grow into adolescents or adults with increased aggressive and delinquent behavior, or other rule breaking behaviors. Further longitudinal and prospective studies are needed to investigate the causal relationship between violent discipline and socially deviant behavior among children and adolescents in countries and societies in which violent discipline is highly prevalent and socially normed, such as in Tanzania.

This is all the more important as previous studies supported the notion that many parents, caregivers and teachers in Tanzania consider violent discipline to be effective in children's behavioral management (Hecker et al., 2014; Nkuba et al., 2018). Given such societal support for violence against children, it is no surprise that parents continue to use violence when raising their children under the assumption that they are not harming their children – an assumption that does not align with the social learning perspective and robust earlier evidence (Gershoff, Lansford, Sexton, Davis-Kean, & Sameroff, 2012; Gilbert et al., 2009). Instead, this study further contributes to a large body of literature that has repeatedly shown the opposite, with a robust positive association between exposure to physical violence at home as well as emotional violence at school and adolescents' socially deviant behavior. This is also supported by recent findings that indicate that maltreatment may shape the development of brain areas involved with emotion processing and regulation (Hanson et al., 2015), alter the stress response system (Andersen & Teicher, 2009; Hecker et al., 2016), which can result in permanent changes, and that Gene × Environment interactions may explain the relation between maltreatment and social deviant behavior (Sandi & Haller, 2015; Thibodeau et al., 2015). Altogether, this strongly contradicts the common assumptions among Tanzanian parents, teachers, and political decision makers that violent discipline is effective in children's behavioral management and does not harm the children immediately or in the long-term.

#### 4.4. Implications and future research

While this study provides, to the best of our knowledge, the first empirical evidence from a large national sample of adolescent students and their parents on the association between violence and socially deviant behavior, future studies that replicate our findings are important. Furthermore, longitudinal and prospective studies will be helpful in understanding the causal relations between violence and socially deviant behavior across the lifespan.

In line with the United Nation's Sustainable Development Goal Nr. 16.2 (United Nations, 2015), there is a strong need to design and implement interventions that protect children from violence and maltreatment in all educational setting, be it at home, at school, or elsewhere. A first step would be to inform parents, social workers, institutions, governmental organizations, and the population at large about the potential consequences of violence perpetrated in an educational setting. Parents' awareness about effective non-violent discipline strategies may also be a fruitful starting point for interventions. In research on violent discipline, reasons cited for using violent discipline seemed to revolve around the lack of alternative, non-violent caregiving skills (Burchinal, Skinner, & Reznick, 2010; Hermenau et al., 2011). Therefore, parents and teachers may benefit from learning non-violent parenting and disciplinary skills (for possible approaches, see e.g., Hecker, Mkinga, Ssenyonga, & Hermenau, 2017; Hermenau, Kaltenbach, Mkinga, & Hecker, 2015; Kaltenbach, Hermenau, Nkuba,

Goessmann, & Hecker, 2018; Nkuba et al., 2018b). With this aim in mind, future research should focus on developing and testing culturally appropriate preventative intervention addressing both families and schools.

#### 4.5. Limitations

There are some limitations in the present study that should be noted: first, the cross-sectional study design does not allow for the establishment of causality. However, the consistency with previous findings from longitudinal and prospective studies on the link between exposure to violence and socially deviant behavior suggests that socially deviant behavior can be regarded as a consequence of violence against children in families and elsewhere. Though we cannot rule out the possibility that adolescents who show more socially deviant behavior also experience more violent discipline, following social learning theory and recent neurobiological findings (e.g., Hanson et al., 2015; Sandi & Haller, 2015; Thibodeau et al., 2015) we argue that exposure to violence should be regarded as the entry point into a vicious cycle of violent discipline, socially deviant behavior, and more violent discipline. Violent discipline does not seem to stop socially deviant behavior, which also underlines the need for preventative interventions – independent of the causal links. Cultural bias might have influenced our findings. For example, some of the items may not always reflect typical lived realities of a Tanzanian adolescent. However, we kept this potential bias to a minimum as Tanzanian researchers played a key role in designing and implementing this study. The applicability of the instruments is further supported by the fact that the results were consistent with previous findings in Tanzania and Sub-Saharan Africa.

Although information from both adolescents and parents or primary caregivers was targeted, only just over half of the parents or primary caregivers of the adolescent students were able to participate. Furthermore, it is possible that many parents might not be aware of the full breadth of the adolescents' problematic behaviors. This may have biased the responses of the parent reports. On the other hand, including the perspective of both parents and adolescents was also a way to reduce the impact of social desirability. The two perspectives allowed us to get a realistic picture of sensitive topics like violence and maltreatment as well as socially deviant behavior. Generally, the adolescents and parents seemed to be very open about their experiences and feelings. However, potential biases, such as social desirability, can never be completely ruled out for subjective reports. We conducted this study at secondary schools. This sampling approach led to a selection bias as a high number of children in Tanzania drop out of school before reaching secondary school level. As a consequence, the results of our findings can only be generalized for adolescents attending school in Tanzania.

#### 5. Conclusions

The present study suggests that there is a strong association between exposure to violence and neglect by parents and violence by teachers and socially deviant behavior among adolescents. Our findings emphasize the need to inform the population at large about the potentially adverse consequences associated with violence and maltreatment against children and adolescents. There is a need to design and implement interventions that protect children from violence and maltreatment in all educational settings – primarily at home and at school. Educating parents, caregiver and teachers about effective non-violent discipline strategies may be a starting point. Due to the fact that violent discipline of children among society members in Tanzania is normed, societal awareness need to be emphasized.

#### Declarations of interest

None.

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#### Supplementary materials

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