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Research article

Gender, violence and resilience among Ugandan adolescents

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ABSTRACT

Resilience, commonly understood as the ability to maintain adaptive functioning in the face of adversity, has emerged as a salient entry point in the field of positive youth development. This study makes a unique contribution by exploring dimensions of resilience among adolescents in Uganda, examining associations between violence from different perpetrators and resilience, and testing whether sex moderates these relationships. Analyses are based on data from 3706 primary school students. Exploratory factor analysis (EFA) identified five factors underlying the construct of resilience: Emotional Support; Family Connectedness; School Connectedness; Social Assets; and Psychological Assets. We used regression analysis to investigate associations between these dependent variables, background characteristics, and experiences of violence (including exposure to intimate partner violence against female caregivers). Results reflect a complex relationship between violence and resilience, with patterns varying by perpetrator (e.g., teacher, peers, caregivers) and some evidence that the sex of the student moderates these dynamics. Overall, there is a consistently negative relationship between all violence measures and Psychological Assets. In addition, teacher violence is associated with lower resilience across factors and both caregiver violence and exposure to IPV are consistently associated with decreased Family Connectedness. These findings suggest that adolescents experiencing (and exposed to) violence from adults may be particularly vulnerable to internalizing and/or externalizing behaviors and withdrawal from the family. Findings point to preventing violence from teachers complemented with enhancing family relationships as promising avenues for resilience-strengthening interventions, and also emphasize the need to consider gendered strategies to ensure girls and boys benefit equally.

1. Introduction

In recent years, much of the discourse on promoting youth development has shifted from an emphasis on mitigating risks to a focus on nurturing strengths (Ager, 2013; Almedom & Glandon, 2007; Richardson, 2002). One of the ways this focus has been articulated is through a construct known as *resilience* – the ability of some individuals to adapt and maintain positive functioning in the face of significant adversity while others faced with similar difficulties experience negative outcomes (Luthar, Cicchetti, & Becker, 2000). Adolescence represents a pivotal life-stage focused on learning, exploration, identity consolidation and relationship building (Lippman et al., Lippman, Moore, & McIntosh, 2011). This period is also characterized by dynamic brain development, shaping many

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of the cognitive and emotional patterns an individual will sustain in adulthood (Blakemore & Mills, 2014), thus providing an opportune moment to bolster resilience and build a foundation for life-long health and wellbeing. The potential to foster positive development among adolescents has been termed a "triple dividend," as it can trigger immediate benefits, positive changes in future adult life and for future generations (Patton et al., 2016).

At the same time, adolescence presents a high potential for crisis and vulnerability to violence (Guedes, Bott, Garcia-Moreno, & Colombini, 2016). Risks such as experiencing sexual, physical or emotional violence, experimentation with drugs or alcohol, the onset of mental disorders, or engagement in risky sexual behaviors may be exacerbated by more structural forms of adversity (poverty and unemployment, discriminatory racial and gender norms, armed conflict and mass displacement, exposure to harmful practices, etc.) (Patton et al., 2016). Significant stress or trauma at a young age often triggers long-lasting consequences. For example, violence against children has been linked to a wide range of adverse outcomes extending into adulthood, including mental health problems and suicide (Norman et al., 2012; Thumann et al., 2016); poor reproductive health and substance abuse; (Norman et al., 2012; Pinheiro, 2006); neglect of medical care (Bair-Merritt, Blackstone, & Feudtner, 2006); anti-social behaviors (Smith, Ireland, & Thornberry 2005), low academic performance (Boden, Horwood, & Fergusson, 2007), as well as perpetration of violence against future generations (Amato, 2000; Fulu et al., 2017; Holt et al., 2008).

Theories of resilience offer conceptual models to understand how young people overcome adverse conditions as well as how practitioners can use this knowledge to improve strengths and build positive characteristics over the lifetime (Zolkoski & Bullock, 2012). While initial work on resilience in adolescence focused on personal qualities of individuals identified as resilient–such as self-esteem and autonomy–more recent literature conceptualizes resilience as a socio-ecological phenomenon (Brooks, 2006; Jaffee et al., 2007). Expanding analyses beyond individual characteristics to include family dynamics as well as the broader social and community environment underscores that availability of (and access to) developmentally supportive resources are integral components of an individual's capacity to overcome adversity (Luthar et al., 2000; Ungar, 2011).

There currently exists a substantial body of literature examining the determinants of resilience among "at risk" youth, including some exploration of the potential relationships between the experience of violence, resilience, and negative outcomes. For instance, Salami (2010) found that the relationship between violence exposure and PTSD was moderated by features of resilience such as self-esteem and social support, such that adolescents who displayed higher resilience were less likely to exhibit PTSD after violence exposure. Other studies have shown that baseline resilience can improve outcomes following sexual abuse in children (Cicchetti & Toth, 2005; Daigneault et al., 2013; Maniglio, 2009). Similarly, Kliewer, Murrelle, Mejia, Torres de G and Angold (2001) found that among children exposed to violence in the family, higher levels of emotional support were correlated with a decreased risk of internalizing emotional problems.

Collectively, this research has furthered our understanding of how resilience may help mitigate the effects of some forms of violence. However it is likely that the relationship between resilience and violence is complex and bi-directional—for example, less resilient youth may be at increased risk of violence, while the experience of violence itself may compromise an individual's resilience. Who perpetrates violence (caregiver, teacher, peer, stranger, etc.) may also influence these dynamics; however such nuanced assessments are absent in the literature.

In addition, very few studies explore sex-based differences in resilience profiles or whether gender influences resilience outcomes (notable exceptions include Jaffee et al., 2007; McGloin & Widom, 2001; Sun & Stewart, 2007). In Uganda, similar to many other countries regionally and globally, cultural expectations and treatment of girls and boys are markedly different, reflecting pervasive gender inequality rooted in entrenched patriarchal beliefs (Kyegombe et al., 2015; Wyrod, 2008). These gender differences may become even more pronounced in adolescence when attitudes towards gender roles and norms are frequently solidified (Barker, 2000; Kaufman, 2000), thus underscoring the salience of examining gender differences during this life-stage. While some resilience research includes sex as a covariate, to our knowledge no study has tested whether sex moderates the relationship between violence and resilience outcomes.

To date, much of the existing knowledge base on youth resilience is informed by research in high-income countries where structural, cultural and social conditions often differ from other contexts. Ungar (2004) emphasizes that specific features of resilience are, at least in part, social and culturally determined, and thus cannot be expected to remain constant across different settings. One of the few resilience-focused studies set in Uganda—which looks at the impacts of prosocial behaviors on depression and anxiety symptoms in Northern Uganda—similarly recognizes the need for locally defined concepts of distressing life conditions as well as potential protective factors (Haroz, Murray, Bolton, Betancourt, & Bass, 2013). The present analysis aims to address these gaps by exploring the dimensions of resilience, and associations with experiences of violence, among adolescents attending primary school in Luwero district, Uganda. In particular, we focus on the experience of various forms of violence, including exposure to intimate partner violence (IPV) against female caregivers, in order to better understand how specific experiences of violence are independently correlated with resilience outcomes. We analyze data separately for girls and boys and test empirically whether sex is a moderator on any of the significant associations observed. To our knowledge this is the first study to explicitly examine characteristics of adolescent resilience in the Ugandan general population (previous research in Uganda has looked at resilience among specific populations, such as child soldiers and children in post-conflict communities; Haroz et al. 2013; Klasen et al., 2010). Findings are expected to highlight dimensions of resilience that may be most salient among adolescents experiencing violence, thus pointing to promising areas for interventions to bolster resilience in contexts characterized by a high prevalence of VAC and other adversity.

2. Methods

2.1. Setting & participants

In Uganda there are no nationally representative statistics on the prevalence of violence against children and adolescents, however existing studies suggest that between 74% and 98% of children report lifetime experiences of physical, emotional, sexual violence, or neglect, with much of this violence perpetrated by caregivers and teachers (Child, Naker, Horton, Walakira, & Devries, 2014; Naker, 2005). In addition, social norms in the country largely condone the use of physical punishment to discipline children and adolescents (Naker, 2007; Saile et al., 2014). Structural conditions such as pervasive poverty may compound the effects of violence, where 20% of the population live in extreme poverty (UNDP, 2014).

The analysis used baseline data from the Good School Study (GSS), a cluster randomized controlled trial conducted in Luwero District (Devries et al., 2015). The GSS was designed to evaluate the Good School Toolkit (GST) (http://raisingvoices.org/download-good-school-toolkit/), an intervention developed by Raising Voices (www.raisingvoices.org) which aims to foster changes in the operational culture of schools in an effort to reduce school violence (Devries et al., 2015). The full study protocol is published elsewhere (Devries et al., 2013). In brief, participants were selected in two stages. After excluding 97 schools with fewer than 40 Primary 5 students and 20 additional schools with ongoing interventions in progress, 42 schools were randomly selected from a list of the 151 remaining schools in the district. A maximum of 130 students from Primary 5, 6 and 7 were randomly selected from each school. Participation rate among sampled students was 77%. The reason for non-participation was mainly absenteeism from school during the period of data collection (19%). The total sample included 3706 students (52% girls), with the majority (84%) between 11 and 14 years of age.

Parents were informed about the study and could opt to withdraw their children; informed written consent was obtained from all students. Referral mechanisms were in place to ensure any disclosure of serious maltreatment was referred to local child protection services (Child et al., 2014) and students were notified that all information would be kept private. Ethical approval was obtained from the Ugandan National Council for Science and Technology (SS 2520) and the Ethics Committee of the London School of Hygiene and Tropical Medicine (#6183).

2.2. Measures

All measures for this study are self-reported from the cross-sectional baseline of the GSS. Specifically, we included: (1) conceptual dimensions of resilience; (2) background characteristics of respondents; and (3) self-reported experience of violence and exposure to intimate partner violence (IPV).

Conceptual dimensions of resilience: We drew from the available items in the survey assessing children's resources at the individual, family, peer, and school levels, as the GSS survey was not originally designed to assess resilience. Specifically, we selected conceptually relevant questions from the following modules of the survey: socio-demographic questions related to the individual respondent and her/his household; 17-items from the Strengths and Difficulties Questionnaire (SDQ) (Goodman, Ford, Simmons, Gatward & Meltzer, 2000); child connectedness items (home; peer; and school) adapted from commonly used scales in adolescent health behavior surveys (e.g., Joyce & Early, 2014; Resnick et al., 1997); and other questions related to children's participation in school and their perceived self-efficacy in terms of educational outcomes. We used exploratory factor analysis (EFA) to identify dimensions of resilience (see below). Potential items were selected as follows: one of the co-authors (SN) mapped all existing survey items that corresponded to hypothetical domains of resilience. The list was subsequently reviewed (independently) by three co-authors (CC, ANP, KD). The final list was comprised of 35 potential items (Table 1).

Background characteristics: Individual characteristics consisted of age; any physical disability (self-reported trouble seeing, hearing, walking/with movement, or with speech); and sex (accounted for in the multi-group analysis). In addition, we included: (1) meals as a proxy for socio-economic status (SES): reported number of meals eaten the day prior to the survey (none or one; two; three or more); (2) household structure: whether respondent lives with biological parents (no biological parent versus at least one biological parent); and (3) crowding: number of other children who share the same sleeping area (none; one; two-four; five or more).

Experience of violence: We used four measures of violence: any lifetime experience of physical, emotional, or sexual violence from: (1) teachers/school staff; (2) peers; and (3) caregivers. Given the ubiquity of physical violence in the Ugandan setting (e.g., 94% of girls and 93% of boys in the GSS baseline reported any physical violence by teachers; Devries et al., 2013) we restricted physical violence to more severe forms (see Table 2). Subsequently the reference category for these measures includes children who reported only less-severe forms of physical violence. The fourth violence measure was exposure to IPV against female caregivers in the home, widely recognized as a form of child maltreatment (UNICEF, 2006) and an important risk factor for a range of adverse health and behavioral outcomes (Bair-Merritt et al., 2006) including later perpetration and victimization of violence (Contreras et al., 2012; Jaffee et al., 2007; Lee, Cheung, & Kwong, 2012). We also assessed poly-victimization through a measure indicating whether the respondent experienced zero, one, two, three, or all four forms of violence. Due to the collinearity of the variable with other violence measures it was excluded from the final regression models, however we consider poly-victimization as an independent, supplementary analysis.

Exact questions used for the creation of violence exposure variables are displayed in Table 2. The GSS focused on teacher/staff perpetrated violence as a primary outcome, thus more questions were available for assessing violence in this category. All questions on direct experience of emotional, physical and sexual violence were adapted from the IPSCAN Child Abuse Screening Tool Children's Version (ICAST-C) (Zolotor et al., 2009).

Table 1
Resilience items included in EFA (grouped by hypothesized domain).

Domain	Corresponding items	Origin
1.Self-mastery; self-confidence (8 items)	I get restless; I cannot sit still for long (reverse)	SDQ
	I am easily distracted; I find it difficult to concentrate (reverse)	SDQ
	I am nervous in new situations. I easily lose confidence (reverse)	SDQ
	I have many fears, I'm easily scared. (reverse)	SDQ
	I am usually on my own. I generally play alone or keep to myself. (reverse)	SDQ
	I finish the things I'm doing. My attention is good.	SDQ
	How would you describe your grades in school? Excellent, very good, good, fair, or poor?	Developed for GSS
	Overall, do you think that you have difficulties in one or more of the following areas: emotions, concentration, behavior or being able to get on with other people? (responded none)	SDQ
2. Social skills/empathy (11 items)	I try to be nice to people. I care about their feelings	SDQ
	I usually share with others (food, games, pens etc.).	SDQ
	I am helpful if someone is hurt, upset or feeling ill.	SDQ
	I have one good friend or more	SDQ
	I fight a lot. I can make other people do what I want (reverse)	SDQ
	Other people of my age generally like me.	SDQ
	I'm kind to younger children	SDQ
	I am often accused of cheating or lying (reverse)	SDQ
	I often volunteer to help others	SDQ
	I get along better with adults than with people my own age (reverse)	SDQ
	Have you ever used physical violence against anyone, like hitting, slapping, punching or kicking? (responded no)	Developed for GSS
3. Family connectedness (6 items)	I feel like my parents/caregivers care about me.	Connectedness scale
	I feel safe at home.	Connectedness scale
	I feel like I belong at home.	Connectedness scale
	I like to spend time at home.	Connectedness scale
	I am scared of my parents/caregivers (reverse)	Connectedness scale
	In the past year, how often has a parent or caregiver helped you with your schoolwork?	Developed for GSS
4. Peers connectedness (3 items)	I feel close to students at my school.	Connectedness scale
	I have friends that I can talk to about important things.	Connectedness scale
	I have friends that I can count on for support.	Connectedness scale
4. School connectedness/ meaningful participation (7 items)	I feel that my teachers care about me.	Connectedness scale
	I feel safe in school.	Connectedness scale
	I feel like I belong at school.	Connectedness scale
	I like to spend time at school.	Connectedness scale
	I am scared of my teachers. (reverse)	Connectedness scale
	Have you ever been involved in making up rules for how students should behave at your school?	Developed for GSS
	In your school, are students' views about how to improve the school taken seriously?	Developed for GSS

Descriptive statistics (Table 3) illustrate a high-risk environment for many students in the sample: one in three are living with no biological parent; about half report they had eaten two meals or less on the previous day; and approximately 15% share a sleeping space with five or more other children. In addition, violence is highly prevalent, in particular peer violence (43% girls, 47% boys) and teacher-perpetrated violence (33% girls and boys). Reported violence by caregivers is markedly lower (10% girls, 6% boys). This may reflect that much of the violence perpetrated by caregivers is through less severe forms of physical abuse, not included in the measure. Over one in four children report being exposed to IPV. Finally, poly-victimization is common, with over 33% (girls and boys) reporting two or more types of violence.

2.3. Data analysis strategy

*Exploratory factor analysis (*EFA) was used to identify factors underlying the construct of resilience in the sample. The majority of the potential resilience items were administered on a 3- and 4-point Likert scale, and therefore analyzed as ordinal variables. In line with Rhemtulla, Brosseau-Liard and Savalei (2012), exploratory factor analysis (quartimin oblique rotation) was performed with weighted least square with adjusted mean and variance (WLSMV) estimator. The number of factors to extract was determined as follows: eigenvalue greater than 1; model fit indices (i.e., CFI/TLI $\geq$ 0.95 and RMSEA $\leq$ 0.05); and factors' interpretability.

First, we conducted an EFA to determine the number of factors to extract comparing eigenvalue and fit indices of the models. Second, once the best fitting model was identified, we evaluated the factor loadings pattern to detect weak indicators (loadings $<$ 0.40 or cross-loadings $>$ 0.40). Third, another EFA was conducted excluding the weak indicators to confirm the good fit of the N-factor model. Factor reliability was tested using factor determinacy, which ranges from 0 to 1. Coefficients greater than 0.80 indicate good reliability (Muthén & Muthén, 2011). In order to empirically assess whether the EFA results differ by sex, we used multiple-group confirmatory factor analysis (MG-CFA) to test the N-factor model in both sub-groups (girls and boys) simultaneously. Goodness-of-fit was evaluated through model fit indices (i.e., CFI/TLI $\geq$ 0.95 and RMSEA $\leq$ 0.05).

Table 2
Violence Exposure Variables.

Variable	Items	Coding
(1) Teacher violence	*Emotional violence:* Cursed, insulted, shouted at or humiliated you? Referred to your skin colour/gender/religion/tribe or health problems you have in a hurtful way? Stopped you from being with other children to make you feel bad or lonely? Tried to embarrass you because you were an orphan or without a parent? Embarrassed you because you were unable to buy things? Stole or broke or ruined your belongings? Threatened you with bad marks that you didn't deserve? Accused you of witchcraft? *Severe physical violence*: Burnt you as punishment? Choked you? Tried to cut you purposefully with a sharp object? Severely beat you up? Tied you up with a rope or a belt at school? *Sexual violence*: Teased you or made sexual comments about your breasts, genitals, buttocks or other body parts? Touched your body in a sexual way or in a way that made you uncomfortable? Showed you pictures, magazines, or movies of people or children doing sexual things? Made you take your clothes off when it was not for a medical reason? Opened or took their own clothes off in front of you when they should not have done so? Kissed you when you didn't want to be kissed? Made you touch their genitals, breasts or buttocks when you didn't want to? Touched your genitals, breasts or buttocks when you didn't want them to? Gave you money/things to do sexual things? Involved you in making sexual pictures or videos? Threatened or pressured you to have sex or do sexual things with them? Actually made you have sex with them by threatening or pressuring you, or by making you afraid of what they might do? Made you have sex with them by physically forcing you?	Coded 1 if answered yes about lifetime experience (from teacher/school staff) to any of the items; coded 0 if answered no to all
(2)Peer violence	*Emotional violence/neglect*: Insulted you, or called you rude or hurtful names? Accused you of witchcraft? Locked you out or made you stay outside? Not given you food? *Severe physical violence*: Punched you, kicked you, or hit you with a closed fist? Cut you with a sharp object or burnt you? *Sexual violence*: Disturbed or bothered you by making sexual comments about you? Kissed you, when you did not want them to? Touched your genitals or breasts when you did not want them to, or in a way that made you uncomfortable? Threaten or pressure you to make you do something sexual with them? Make you have sex with them, because they threatened or pressured you? Had sex with you, by physically forcing you?	Coded 1 if answered yes about lifetime experience (from female/male student) to any of the items; coded 0 if answered no to all
(3) Caregiver violence	Same items as for peer violence above	Same Coding as for peer violence above
(4)IPV Exposure	Have you ever seen or overheard your parents or caregivers shouting at each other? Have you ever seen or overheard your father hit or beat your mother?	Coded 1 if answered yes to any of the items; coded 0 if answered no to all

Regression analysis to test the association between resilience factors with background characteristics and experiences of violence: We used a multiple outcome regression analysis approach where the dependent variables consisted of the raw scores (summed) of the five resilience factors (treated as continuous variables). All theoretical covariates were included in the final model. Maximum likelihood with robust standard error (MLR) estimator was used to account for missing data, univariate and multivariate outliers (Muthén & Muthén, 2011). We ran separate models for girls and boys using multiple-group regression analysis (Muthén, 2007, 2009Muthén, 2007, 2009), which simultaneously estimates parameters in both sub-groups. We opted to use multiple-group regression rather than performing the analysis on the pooled sample (i.e., girls + boys) given theoretical considerations for gender as a potential moderator across all relationships.

Evaluation of moderating effect of respondent's sex on the relationship between resilience factors and any of the independent variables: The MODEL TEST function (Wald test for parameter difference) in Mplus 7.4 (Muthén & Muthén, 2011) was used to empirically assess any differences observed in the girls' and boys' estimates (Muthén, 2009). More specifically, we tested all parameters that were statistically significant in one sub-group but not significant in the other group ($p < 0.05$), or estimates that were statistically significant in both sub-groups but differed in terms of magnitude. Statistically significant pairwise comparisons (Wald test) would suggest that sex has a moderating effect on the association.

All analyses were conducted using Mplus 7.4 (Muthén & Muthén, 2011) and adjusted for intra-class correlation (to account for the clustered nature of the data within schools).

3. Results

3.1. Dimensions of resilience

EFA was conducted to identify latent dimensions underlying the pool of items selected to assess resilience (Table 1). Eight factors

Table 3
Means (SD) or Percentages (N) of independent variables, by sex.

Measures	Girls		Boys		P[a]
Risk Factors	n = 1937 (52.3%)		n = 1769 (47.7%)		
Age, mean	12.79	(1.39)	13.24	(1.53)	< 0.001
Physical disability, %					
No	95.7	(1853)	94.6	(1674)	
Yes	4.3	(84)	5.4	(95)	
total	100	(1937)	100	(1769)	0.127
Meals, %					
1 meal	14.8	(286)	13	(230)	
2 meals	35.1	(679)	43.2	(764)	
3+ meals	50.2	(971)	43.8	(775)	
total	100	(1936)	100	(1769)	0.008
Family structure, %					
lives with no biological parent	35.1	(678)	39.4	(690)	
lives with at least one	64.9	(1253)	60.6	(1062)	
total	100	(1931)	100	(1752)	0.032
Crowding, %					
0 other	11.2	(216)	14.8	(262)	
1 other	29	(562)	28	(495)	
2–4 other	45.4	(879)	41.3	(731)	
5+ other	14.5	(280)	15.9	(281)	
total	100	(1937)	100	(1769)	0.059
Experience of Violence					
(1) Teacher violence, %	33.4	(646)	33.3	(589)	0.982
(2) Peer violence, %	42.8	(829)	47.4	(839)	0.115
(3) Caregiver violence, %	9.9	(192)	5.5	(97)	< 0.001
(4) IPV Exposure, %	25.7	(497)	26.1	(461)	0.821
(5) Poly-victimization (violence types), %					
none	*34.1*	(660)	33.6	(594)	
one	*32.5*	(629)	32.5	(575)	
two	*22.3*	(432)	23.0	(406)	
three	*10.0*	(193)	10.0	(177)	
four	*1.2*	(23)	1.0	(17)	
total	100	(1937)	100	(1769)	0.980

[a] Independent samples *t*-test P-values (continuous variables); Chi-square test P-values (nominal and ordinal variables); estimates adjusted for intra-class correlation (ICC) within schools.

with eigenvalue greater than 1 were initially identified, however the five-factor model showed optimal fit (CFI/TLI 0.95/.94, RMSEA = 0.01). Ten items had loadings < 0.40 and were therefore excluded (Table 4). Good fit was confirmed for the remaining 25 items (CFI/TLI 0.99/.98, RMSEA = 0.01). All factor loadings were above 0.40 and no cross-loadings greater than 0.40 were found. In line with our hypothesis, a five-factor model reflecting psychological, social, family, peer support, and school-level dimensions was successfully identified, though some of the items shifted between the hypothesized domains and the final outcome. The five factors extracted showed good reliability and were moderately inter-correlated (Table 5), suggesting that these factors cannot be summed into a resilience total score (Luthar & Brown, 2007). Rather, they assess distinct resilience-related constructs. Mean scores (raw sum) for each factor are presented in Table 6.

As noted above, multiple-group confirmatory factor analysis (MG-CFA) was performed to test the fit of the 5-factor model in boys and girls, simultaneously. The goodness-of-fit indices suggest a good fit (CFI/TLI 0.95/.95, RMSEA = 0.02), indicating that the factorial structure identified through the EFA is consistent irrespective of sex. However boys report higher scores than girls for two of the factors (Emotional Support and Social Assets, Table 6).

3.2. Associations between violence, gender and resilience

Regression analysis was used to explore associations between background characteristics, experiences of violence and dimensions of resilience (e.g., each of the five factors: Emotional Support, School Connectedness, Family Connectedness, Social Assets, and Psychological Assets). Overall results (Tables 7a and 7b) reflect that the relationship between experiences of violence and resilience is complex, with a different pattern emerging depending on who perpetrates the violence.

Background Characteristics: Respondent's age and physical disability are not significantly associated with any resilience factors for girls or boys. While the relationship between physical disability and social assets approaches statistical significance in the girls' model, surprisingly the correlation is positive, such that girls with a physical disability report higher social assets scores. As expected, having eaten more meals on the previous day (suggesting higher SES) corresponds with higher resilience scores in both girls and boys

Table 4
Five-Factor Resilience Model (EFA Results; Total Sample).

	Emotional Support	School Connectedness	Family Connectedness	Social Assets	Psychological Assets
	FS = 0.79	FS = 0.87	FS = 0.91	FS = 0.92	FS = 0.86
I have friends that I can talk to about important things	**0.64***	0.08	−0.03	0.01	−0.00
I have friends that I can count on for support	**0.49***	0.20*	0.05	−0.03	−0.00
I feel that my teachers care about me	0.08*	**0.56***	0.04	−0.01	0.06*
I feel safe in school	0.04*	**0.70***	−0.02	0.00	0.04*
I feel like I belong at school	0.03	**0.62***	0.03	0.03	−0.01
I like to spend time at school	−0.12*	**0.49***	0.18*	−0.02	−0.10*
I feel like my parents/caregivers care about me	−0.00	0.09*	**0.65***	−0.06*	0.03
I feel safe at home	0.03*	0.00	**0.79***	−0.02	0.05*
I feel like I belong at home	−0.06*	0.09*	**0.73***	0.02	−0.01
I like to spend time at home	0.09*	−0.07*	**0.53***	0.06*	−0.04
I usually share with others	0.03	0.04	−0.06	**0.67***	0.00
I try to be nice to people; I care about their feelings	−0.03	−0.00	−0.01	**0.57***	−0.03
I am helpful if someone is hurt, upset or feeling ill	−0.08*	0.03	0.03	**0.67***	0.01
I have one good friend or more	−0.25*	0.06	−0.04	**0.49***	0.05*
Other people of my age generally like me	−0.24*	−0.04	0.01	**0.48***	−0.03
I am kind to younger children	0.01	−0.03	0.00	**0.67***	−0.04
I often volunteer to help others	0.04	−0.01	0.01	**0.68***	−0.02
I finish the things I'm doing; my attention is good	0.11*	−0.08*	0.01	**0.60***	0.06*
I get restless; I cannot sit still for long (reverse)	−0.04	0.05	−0.08*	−0.04	**0.49***
I am usually on my own; I generally play alone/by myself (reverse)	0.01	0.03	0.02	−0.16*	**0.52***
I fight a lot; I can make other people do what I want (reverse)	−0.17*	0.00	0.01	−0.02	**0.52***
I am easily distracted; I find it difficult to concentrate (reverse)	−0.12*	0.03	−0.03	−0.01	**0.58***
I am nervous in new situations; I easily lose confidence (reverse)	0.05	−0.07	0.05	0.06	**0.54***
I am often accused of cheating or lying (reverse)	0.01	0.01	0.09*	0.01	**0.52***
I have many fears, I'm easily scared (reverse)	0.15*	−0.05	−0.00	0.07*	**0.52***

Items excluded due to poor loading (< 0.40), by hypothesized domain:
Self-mastery/self-confidence: How would you describe your grades in school; Overall, do you think that you have difficulties in one or more of the following areas: emotions, concentration, behavior or being able to get on with other people; Social skills/empathy: I get along better with adults than with people my own age; Have you ever used physical violence against anyone, like hitting, slapping, punching or kicking; Family connectedness: I am scared of my parents/caregivers; In the past year, how often has a parent or caregiver helped you with your schoolwork; Peer connectedness: I feel close to students at my school; School connectedness: I am scared of my teachers; Have you ever been involved in making up rules for how students should behave; In your school, are students' views about how to improve the school taken seriously.
FD = factor determinacy; * $p < 0.05$.

Table 5
Pearson's Correlation Coefficient (*P*).

	Emotional Support	School Connectedness	Family Connectedness	Social Assets	Psychological Assets
Emotional Support	1.00				
School Connectedness	0.23 (< 0.001)	1.00			
Family Connectedness	0.18 (< 0.001)	0.39 (< 0.001)	1.00		
Social Assets	0.10 (< 0.001)	0.19 (< 0.001)	0.13 (< 0.001)	1.00	
Psychological Assets	0.05 (0.001)	0.08 (< 0.001)	0.11 (< 0.001)	0.01 (.718)	1.000

for all resilience factors except Emotional Support (girls) and Psychological Assets (boys), where estimates are approaching statistical significance. Not living with any biological parents is associated with lower Family Connectedness and fewer Psychological Assets for both girls and boys. The relationship between crowding and resilience differs by sub-group; in the girls' estimates, crowding is associated with higher School Connectedness. For boys, crowding is negatively associated with Social Assets and there is no significant relationship to School Connectedness.

Experiences of violence: All violence measures are negatively associated with Psychological Assets for both girls and boys, with relatively large coefficient sizes compared to other estimates. The teacher violence measure is consistently associated with lower resilience; girls who have experienced violence from a teacher report lower resilience scores across all five factors and boys report lower scores in four of the five factors (not significant for Emotional Support in the boys' model). For all respondents (girls and boys), peer violence is negatively associated with Psychological Assets. No other significant relationships are observed between peer

Table 6
Aggregate scores for Resilience Factors: Mean (SD), by sex.

Resilience Outcomes	Girls n = 1937		Boys n = 1937		P[a]
Emotional Support (0–6)	2.93	(1.74)	3.27	(1.71)	< 0.001
School Connectedness (0–12)	9.25	(2.29)	9.32	(2.26)	0.502
Family Connectedness (0–12)	9.44	(2.42)	9.39	(2.24)	0.694
Social Assets (0–16)	13.48	(2.50)	13.79	(2.24)	0.003
Psychological Assets (0–14)	10.79	(2.62)	10.96	(2.68)	0.277

[a] Independent samples *t*-test P-values; estimates adjusted for clustering within schools.

Table 7a
Regression analysis – Girls.

Estimate (CI 95%)	Emotional Support	School Connectedness	Family Connectedness	Social Assets	Psychological Assets
Age	−0.02(-0.06–0.03)	−0.02(-0.06–0.01)	0.00 (−0.04–0.05)	−0.01(-0.05–0.03)	0.02(−0.03–0.07)
Physical disability	0.06(−0.13–0.24)	−0.01(-0.23–0.22)	−0.12(-0.33–0.10)	0.20(.03–0.37) ¥	−0.18(-0.40–0.05)
Meals	0.05(0–0.09) ¥	0.11(.07–0.15)***	0.14(.09–0.19)***	0.06(.01–0.11)*	0.07(.03–0.11)***
No biological parent	−0.07(-0.16–0.02)	−0.01(-0.1–0.08)	−0.19(-0.27–−0.11)***	−0.01(-0.08–0.06)	−0.10(-0.17–−0.03)*
Crowding	−0.02(-0.06–0.01)	0.06(0.03–0.09)***	−0.01(-0.04–0.02)	0.02(−0.02–0.05)	.01(−0.02–0.04)
Teacher violence	−0.15(-0.23–−0.06)**	**−0.41(-0.53–−0.3)*****	−0.15(-0.25–−0.05)**	−0.16(-0.24–−0.08)***	−0.28(-0.36–−0.2)***
Peer violence	−0.03(-0.10–0.04)	0.06(−0.04–0.16)	**0.02(−0.07–0.11)**	0.07(−0.03–0.17)	−0.22(-0.31–−0.13)***
Caregiver violence	−0.06(-0.16–0.04)	0.13(−0.04–0.29)	−0.46(-0.6–−0.32)***	−0.04(-0.19–0.11)	−0.33(-0.45–−0.21)***
IPV exposure	−0.01(-0.11–0.09)	−0.09(-0.17–−0.01) ¥	−0.2(-0.30–−0.09)***	0.05(−0.06–0.15)	**−0.16(-0.25–0.07)*****

Standardized Estimates; ¥ p < 0.10 and > .05; * p < 0.05; ** p < 0.01; *** p < 0.001, **bold** indicates p < 0.05 for Wald test (girls versus boys).

Table 7b
Regression analysis – Boys.

ESTIMATE (CI 95%)	Emotional Support	School Connectedness	Family Connectedness	Social Assets	Psychological Assets
Age	−0.03(-0.08–0.02)	0.01(−0.04–0.05)	0.02(−0.03–0.06)	−0.01(-0.05–0.04)	0.02(−0.03–0.07)
Physical disability	0.14(−0.08–0.36)	0.01(−0.14–0.16)	−0.14(-0.33–0.05)	−0.11(-0.3–0.08)	−0.05(-0.25–0.15)
Meals	0.09(.04–0.13)***	0.08(.03–0.13)**	0.13(0.09–0.18)***	0.07(0.02–0.12)*	0.05(0–0.09) ¥
No biological parent	0.02(−0.07–0.10)	0.02(−0.06–0.10)	−0.18(-0.25–−0.11)***	0.01(−0.09–0.11)	−0.11(-0.19–−0.02)*
Crowding	0.02(−0.03–0.07)	0.00(−0.03–0.03)	−0.01(-0.07–0.05)	−0.06(-0.1–−0.02)*	0.00(−0.04–0.04)
Teacher violence	−0.10(−0.21–0.01)	**−0.18(−0.28–−0.07)*****	−0.12(−0.2–−0.03)*	−0.21(−0.34–−0.08)**	−0.34(-0.43–−0.24)***
Peer violence	0.04(−0.03–0.10)	0.04(−0.07–0.15)	**.19(.1–0.27)*****	0.02(−0.09–0.13)	−0.24(−0.33–−0.15)***
Caregiver violence	−0.19(−0.36–−0.02) ¥	−0.11(−0.33–0.12)	−0.37(−0.64–−0.10)*	0.02(−0.26–0.31)	−0.35(−0.57–−0.13)**
IPV exposure	−0.09(−0.19–0.01)	−0.17(−0.28–−0.05)*	−0.16(−0.25–−0.07)***	−0.13(−0.23–−0.03)*	**−0.32(−0.41–−0.24)*****

Standardized Estimates; ¥ p < 0.10 and > .05; * p < 0.05; ** p < 0.01; *** p < 0.001; **bold** indicates p < 0.05 for Wald test (girls versus boys).

violence and resilience in the girls' model. Interestingly, boys who have experienced peer violence report higher Family Connectedness. The caregiver violence measure is negatively associated with Family Connectedness (girls and boys), as well as Psychological Assets (girls and boys) and Emotional Support (approaching significance, boys model only). Similarly, exposure to IPV is associated with a lower Family Connectedness and Psychological Assets scores (girls and boys). In addition, boys exposed to IPV report lower School Connectedness (result approaching significance in the girls' model) and lower Social Assets scores (boys only), suggesting that exposure to IPV is related to dimensions of resilience outside of the home.

While we were unable to include poly-victimization as a covariate (due to collinearity), we explored relationships between resilience and a single violence measure capturing poly-victimization in a supplementary analysis. Results indicate a consistent, inverse relationship, such that students (girls and boys) exposed to multiple types of violence report lower resilience scores in four of the five factors (all apart from Social Assets, see Supplementary Table 1).

Wald test to assess sex as a moderator: Statistically significant Wald test results (e.g., pairwise comparison of girls versus boys in cases where parameters differed in terms of statistical significance or magnitude) are bolded in Table 7a and 7b, indicating that sex moderates five of the relationships observed: crowding is associated with an increase in girls' School Connectedness scores (no statistically significant association for boys) and a decrease in boys' Social Assets scores (no statistically significant association for girls); peer violence is associated with an increase in Family Connectedness score for boys (no statistically significant association for girls); and girls' estimates (compared to boys') suggest a stronger negative correlation between the teacher violence measure and School Connectedness, as well as between IPV exposure and Psychological Assets.

4. Discussion

The present study is the only evaluation of the factors underlying resilience among the general population of primary school-going children or adolescents in Uganda. Assessing resilience in this context is critical, particularly in light of the distinct and multi-dimensional risk profile during this life-stage (similar to other countries in the region) which include: a high burden of violence (Devries et al., 2013), social acceptability of some forms of violence (Abramsky et al., 2014; Naker, 2007), and pervasive gender inequality (Mirembe & Davies, 2001). In addition, to our knowledge no other empirical study from a low- or middle-income context has explicitly compared relationships between experiences of violence carried out by different perpetrators and dimensions of resilience (to explore whether the former is associated with variations in the latter). Finally, this is one of the only studies globally to test whether sex moderates the dynamics between background characteristics, violence, and resilience during adolescence.

This research offers several insights to the bourgeoning resilience literature focused on low- and middle-income settings. First, exploratory factor analysis results indicate a robust factorial model that is well-aligned with an ecological perspective of resilience (Brooks, 2006; Jaffee et al., 2007), with factors reflecting distinct sources of resilience at individual (Psychological Assets), relational (Social Assets, Family Connectedness, Emotional Support) and community (School Connectedness) levels. As has been argued elsewhere (Ungar, 2004), resilience is context specific, thus identifying models to assess resilience among adolescents in peri-urban Uganda offers a valuable contribution to the existing literature.

Second, multivariate results underscore that experiences of violence are linked to resilience outcomes across levels, frequently extending beyond the environment where violence occurs. For instance, we find an independent, inverse relationship between teacher violence and Family Connectedness (girls and boys) suggesting that violence perpetrated by a teacher—in many cases a trusted adult in a position of authority—may have implications for relationships with other important adults, such as parents (however it is also possible that these findings are influenced by unobserved confounders affecting both the risk of teacher-perpetrated violence and Family Connectedness). Exposure to IPV is negatively associated with School Connectedness (boys only), again demonstrating the potential for violence experienced in a specific setting (e.g., the home) to affect resilience in other areas.

Third, the negative association observed between IPV exposure with multiple resilience factors—even after controlling for any direct experience of violence by caregivers—aligns with the large and growing literature around the serious harms associated with exposure to IPV (Bair-Merritt et al., 2006; Graham-Bermann, Gruber, Howell, & Girz, 2009; Holt et al., 2008). The correlation between IPV exposure and lower resilience may be linked to compromised parenting ability of one or both caregivers in the context of intra-couple violence (Holt et al., 2008). This may be especially true in Uganda, as the majority of IPV is men's perpetration of violence against women, and women also take on the majority of the caretaking responsibilities (Abramsky et al., 2012).

Fourth, the consistently negative associations of the violence measures with Psychological Assets and Family Connectedness offer potential insights into the manner in which adolescents respond to violence. While these patterns should be interpreted with care given the cross-sectional nature of the data, results may imply the tendency for adolescents to respond through internalizing and/or externalizing behaviors (reflected as lower Psychological Assets scores) and withdrawal from the family, irrespective of the perpetrator. As we cannot rule out reverse causality, it is also possible that children with fewer Psychological Assets or less stable family environments are at increased risk for violence.

Finally, as one of the first studies to examine the potential moderation effect of gender, we find some evidence that the associations between violence and resilience may differ for girls and boys. For example, in the boys' model, estimates of the relationship between Psychological Assets and all four forms of violence are larger relative to girls (Wald test confirms sex as a moderator in the association with IPV exposure). For girls, on the other hand, we find a stronger (inverse) relationship between teacher violence and School Connectedness relative to boys. These differences perhaps reflect that boys are more likely to react to trauma at the individual-level, an interpretation that is consistent with other literature indicating that girls are more prosocial than boys (Heyman & Legare, 2004) and may employ more "emotionally focused" coping strategies—including developing empathy and seeking help from others (Sun & Stewart, 2007). Future research may benefit from further investigating gendered aspects of the process through which girls and boys respond to violence and potentially shift away from adverse outcomes towards resilience.

While most of the significant associations are in the expected direction, a few unanticipated results are worth noting. For instance, boys experiencing peer violence report higher Family Connectedness scores, a finding that may suggest boys seek out or achieve more connection in the home when coping with bullying or other abusive behaviors at school. Conversely, we observe that crowding at home is associated with higher School Connectedness (girls only), thus perhaps girls forced to compete for resources at home may be more primed to bond within the school environment (again pointing to the possibility that girls tend towards social connections when experiencing stress or adversity). In addition, the lack of any significant relationships between physical disability and resilience is surprising, particularly as other studies have found that disabilities are a risk factor for poor mental health (UNESCO, 2010) and violence victimization (Devries et al., 2014). Such relationships may not have been detected because students with severe disabilities are less likely to be in school (Kuper et al., 2014) and subsequently may have been under-represented in the sample.

Overall, findings underscore the salience of violence in differentiating between profiles of resilience among adolescents. Future research could consider longitudinal designs, which could examine whether adolescents with stronger resilience profiles maintain more favorable development outcomes over time, particularly after experiencing violence or other trauma. In addition, examining the potential moderating effects of neighborhood factors would provide a more comprehensive assessment that includes the community level. Finally, while our analysis focuses on the relationship between each type of violence (e.g., teacher, peer, etc.) in isolation, poly-victimization rates are high. Our supplementary analysis supports other studies suggesting that multiple forms of violence have a compounding affect (Clarke et al., 2016; Finkelhor et al., 2011; Herrenkohl et al., 2008), however more research is needed to better understand the specific risk and resilience factors for adolescents experiencing overlapping violence.

4.1. Limitations

Despite several strengths, this study also has limitations. As the survey was not originally designed to measure resilience, some potential domains are not optimally captured, in particular self-esteem which is included in several other measures of resilience (Constantine & Benard, 2001). Moreover, given that GSS research focused on evaluating impact on teacher-perpetrated violence, more items were included in the teacher module and, as a result, our measures of peer and caregiver violence may have been less sensitive. As with all self-reported violence data, under-reporting is possible. This may have been more pronounced with reports of caregiver violence since the majority of the questionnaire focused on the school environment and children were not specifically prompted to consider violence in the home environment. Finally the cross-sectional nature of the data precludes our ability to make any causal interpretations of the relationships observed.

4.2. Implications for practice

While studies have convincingly analyzed youth resilience as a socio-ecological construct, there currently exist few systemic, multi-faceted interventions that can work to nurture resilience across domains. Recognizing that the choice of where to invest is contingent upon adequate opportunities for intervention, our findings suggest fertile avenues for programming. For instance, results demonstrate teacher-perpetrated violence in particular is highly prevalent and that school violence can have cross-cutting implications. As such, efforts to transform schools into sites to build resilience rather than perpetuate risks—by reducing violence and promoting close, affective relationships between teachers, students, and peers—may lay a foundation for greater resilience and healthier life trajectories. This may be especially true in sub-Saharan Africa, where schools are frequently sites where multiple forms of violence occur (UNICEF Kenya, CDC, & Kenya National Bureau of Statistics, 2012). Systemic, school-level interventions such as the Good School Toolkit have demonstrated effectiveness in preventing violence by teachers and transforming schools into safer, more connected spaces for all (Devries et al., 2015, 2016; WHO, 2016).

Our findings also signal the importance of fostering emotional closeness within families and addressing violence by caregivers. The most sustainable pathway to reducing adolescent exposure to IPV is to prevent partner violence from occurring in the first place, and growing evidence suggests that interventions to prevent men's use of violence against women – such as *SASA!* in Uganda – can have positive effects on children as well (Kyegombe et al., 2015). Considerations for integrated programming situated between the home and the school may be especially promising for nurturing the potential for resilience that exists within each individual.

Future programs may be further strengthened by considering complementary strategies for adolescents who are experiencing violence either in school or at home (or both), with tailored activities to support the specific dimensions of resilience most likely to be affected (for example Psychological Assets). While further exploration is needed, our observation that sex moderates some of the violence-resilience relationships further suggests that careful consideration of gendered risks (and strengths) is required to ensure that all children benefit equally.

5. Conclusions

The current study contributes to our understanding of resilience among Ugandan primary school students. Findings elucidate the complex relationship between various forms of violence and five features of resilience, offering initial insights into how adolescents navigate their experiences of violence in a context where prevalence is high and social norms accept the use of violence against children in some situations. Building on the momentum from a strengths-focused discourse on youth development, there exists an urgent need—particularly in settings characterized by serious and overlapping risks—for culturally-relevant programmatic experimentation and testing of interventions that strive to build resilience across multiple domains and help direct adolescents towards enhanced well-being.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.chiabu.2017.06.015.

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