

# Posttraumatic Stress in AIDS-Orphaned Children Exposed to High Levels of Trauma: The Moderating Role of Perceived Social Support

Lucie Cluver

*Department of Social Policy and Social Work, University of Oxford, UK and Cape Town Child Welfare Society, Cape Town, South Africa*

Dylan S. Fincham and Soraya Seedat

*MRC Unit on Anxiety and Stress Disorders, Department of Psychiatry, University of Stellenbosch, South Africa*

*Poor urban children in South Africa are exposed to multiple community traumas, but AIDS-orphaned children are at particular risk for posttraumatic stress. This study examines the hypothesis that social support may moderate the relationship between trauma exposure and posttraumatic stress for this group. Four hundred twenty-five AIDS-orphaned children were interviewed using standardized measures of psychopathology. Compared to participants with low perceived social support, those with high perceived social support demonstrated significantly lower levels of PTSD symptoms after both low and high levels of trauma exposure. This suggests that strong perception of social support from carers, school staff, and friends may buffer deleterious effects of exposure to trauma, and could be a focus of intervention efforts to improve psychological outcomes for AIDS-orphaned children.*

South Africa has among the world's highest rates of community violence and household-level abuse (Jewkes et al., 2006). Furthermore, interpersonal violence is often targeted at or witnessed by children (Liang, Flisher, & Lombard, 2007). South Africa also has a mature HIV/AIDS epidemic, with increasing numbers of AIDS-orphaned children. Of 20.2 million children nationally, 3.4 million are parentally bereaved (Anderson & Phillips, 2006). In 2006, an estimated two thirds of orphanhoods were due to HIV/AIDS, but this is predicted to rise to 86%, with 2.2 million maternal AIDS-orphans by 2015 (Dorrington, Johnson, Bradshaw, & Daniel, 2005). The dual stressors of trauma exposure and HIV/AIDS have disproportionately affected children living in impoverished urban areas.

A number of studies have shown high levels of posttraumatic stress disorder (PTSD) (approximately 22–25%) among poor urban children in South Africa (Seedat, Nyamai, Njenga, Vythilingum, & Stein, 2004). In addition, there is evidence to suggest a cumulative effect of trauma exposure on PTSD symptoms, whereby multiple traumatic experiences are associated with

a linear increase in symptoms of PTSD and depression (Suliman et al., in press).

This study stems from a larger study of mental health among AIDS-orphaned children located in poor urban townships of Cape Town (for a detailed description see Cluver & Gardner, 2007; Cluver, Gardner, & Operario, 2007, 2008). This is the only known study to date to have examined PTSD among AIDS-orphaned children, and found that AIDS-orphans demonstrated significantly higher levels of PTSD symptoms and higher rates of clinical-level PTSD than both orphans by other causes and nonorphans (Cluver, Gardner, & Operario, 2007). Extent of exposure to community violence (e.g., robbery, assault, witnessing shootings) and household violence (e.g., domestic violence, physical and sexual abuse) positively predicted PTSD symptoms across all groups of children (Cluver, Gardner, & Operario, 2008). However, the extent of violence exposure did not differ between AIDS-orphaned, other-orphaned, and nonorphaned children. This suggests that AIDS-orphaned children are particularly vulnerable to developing PTSD in the high-violence contexts in which poor urban children live.

This study was undertaken in collaboration between Oxford University and Cape Town Child Welfare Society. The study was made possible by support from the UK Economic and Social Research Council. The authors wish to thank the children who participated in the study, and their families, the participating schools and organizations, and interviewers. Thanks to Dr. Stephan Collishaw for providing comments on an earlier draft.

Correspondence concerning this article should be addressed to: Lucie Cluver, Department of Social Policy and Social Work, Oxford University, 32 Wellington Square, Oxford OX1 2ER, England. E-mail: lucie.cluver@sores.ox.ac.uk.

© 2009 International Society for Traumatic Stress Studies. Published online in Wiley InterScience (www.interscience.wiley.com) DOI: 10.1002/jts.20396

For AIDS-orphaned children who are experiencing PTSD, it is therefore important to identify environmental factors that could potentially buffer the psychological effects of trauma exposure. Using the framework proposed by Bronfenbrenner (1979), we hypothesized that the negative effects of severe multiple disadvantage in a particular sphere or spheres of a child's life could be moderated by protective factors in other spheres. According to Baron and Kenny (1986), a moderating variable specifies for whom or under what conditions an independent variable predicts a dependent variable. One such variable may be perceived social support; or perceived financial, physical, and emotional help from family, friends, and the community at large. Social support is considered to have beneficial effects, particularly in buffering responses to extreme stress (Dirkzwager, Bramsen, & van der Ploeg, 2003). Orphaned children may be lacking in social support owing to illness or death of family members, or may have distorted cognitions of themselves and others, which of itself may lead to reduced perceptions of social support.

Social support has been shown to moderate PTSD symptoms among combat veterans (King, King, Fairbank, Keane, & Adams, 1998), adult victims of violent crime (Andrews, Brewin, & Rose, 2003), and abuse (Hyman, Gold, & Cott, 2003), and among children exposed to natural disaster (LaGreca, Silverman, Vernberg, & Prinstein, 1996) and violent crime (Berman, Kurtines, Silverman, & Serafini, 1996). A meta-analysis of adult trauma victims found lack of social support during or after the trauma to be a major risk factor in PTSD development (Brewin, Andrews, & Valentine, 2000).

No known studies have examined relationships between social support, trauma exposure, and PTSD among AIDS-orphaned children. We hypothesized that perceived social support would moderate the relationship between trauma exposure and PTSD symptoms, whereby AIDS-orphaned participants exposed to high levels of community and household trauma who perceived their social support to be high would demonstrate significantly lower levels of PTSD symptoms than those who perceived their social support to be low. In particular, we predicted that perceived social support would buffer the deleterious effects of trauma exposure in our sample of South African AIDS-orphaned children.

## METHOD

### Participants

One thousand twenty-five children and adolescents aged 10–19 years from poor urban areas were recruited. We used data from 425 AIDS-orphaned children, excluding 241 orphaned by non-AIDS causes and 278 nonorphans, for two reasons. First, the AIDS-orphaned group demonstrated significantly higher levels of posttraumatic stress symptoms than either nonorphans or other orphans (Cluver et al., 2008); second, because we specifically wished to address protective factors for PTSD in this population.

Recruitment took place during 2005–2006, from deprived urban areas of Cape Town formerly designated for Black Africans under apartheid. Participants were recruited from 9 schools, 18 nongovernmental organizations, and from door-to-door sampling. Purposive sampling aimed for high generalizability by oversampling populations unlikely to be included in a school study: street children (via shelters and feeding schemes), child-headed and youth-headed households, and nonschool attendees. The study used the United Nations definition of orphanhood, i.e., loss of one or both parents, and the World Health Organization (WHO) definition of adolescence as 10–19 years (WHO, 2003). To exclude acute bereavement reactions, children orphaned in the previous 6 months were not interviewed.

Death certificates are unreliable sources regarding HIV/AIDS in South Africa, and clinical data are rarely available. A “verbal autopsy” method was used to determine cause of parental death, validated in previous South African research (Hosegood, Vanneste, & Timaues, 2004), as well as in other African countries. In a South African validation study, sensitivity of the verbal autopsy method was 89%, specificity 93%, and positive predictive value 76% (Kahn, Tollman, Garenne, & Gear, 2000). Parental death due to AIDS was determined by the presence of three or more AIDS-defining illnesses, such as oral candidiasis or Kaposi's sarcoma (WHO, 2005). Where diagnoses were in doubt, symptoms were reviewed by two independent medical practitioners. Non-AIDS causes of parental death included road accidents (24%), suicide (3%), and homicide (28%). Eighty-one orphans (11%) were excluded from the present analyses due to unknown or uncertain cause of parental death.

### Measures

Posttraumatic stress symptoms were measured using Amaya-Jackson's Child PTSD Checklist. This 28-item scale is derived from criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* (American Psychiatric Association, 1994), uses a 4-point (Likert) severity scale, and has been used extensively in Cape Town (e.g., Seedat et al., 2004; Seedat, van Nood, Vythilingum, Stein, & Kaminer, 2000). Discriminant and concurrent validity were good when compared to diagnostic, clinician-administered interviews, Kiddie-Schedule for Affective Disorders and Schizophrenia (K-SADS; Chambers, Puig-Antich, & Hirsch, 1985; Kaufman, Birmaher, & Brent, 1997) and the Clinician-Administered PTSD Scale for Children and Adolescents (Nader et al., 1996; Newman et al., 1998). The scale shows high test-retest reliability ( $r = .91$ ), and internal consistency (Cronbach's  $\alpha$  ranges from .82 to .95.; Amaya-Jackson, Newman, & Lipschitz, 2000). The text-based checklist was accompanied by cartoons derived from the Levonn/Andile PTSD scale (Richters, Martinez, & Valla, 1990), which was found to be accessible for Xhosa-speaking adolescents in Cape Town (Ensink, Robertson, Zissis, & Leger, 1997). To define clinical-level criteria for PTSD,

a *DSM-IV* clinical cut-off was used of 1 = reexperiencing, 3 = avoidance/numbing, and 2 = hyperarousal symptoms, and a conservative symptom threshold of *most of the time* (Erwin, Newman, McMackin, Morrissey, & Kaloupek, 2000).

Children's exposure to violence was measured using the Child Exposure to Community Violence Checklist (Richters & Martinez, 1993), adapted to reflect common types of violence in South African townships, and modified after piloting with children and local social workers. Community-based violence included witnessing of or victimization by the Western Cape's four most common community crimes: robbery, assault, stabbings, and shootings (South African Police Services, 2004). Household-based violence included witnessing of domestic violence, child exposure to sexual abuse and physical abuse. In the context of high levels of corporal punishment, physical abuse was defined conservatively as being hit with an object likely to cause "actual or potential physical harm" (World Health Organisation, 1999), i.e., a broomstick, switch, stick, or metal piping. Children also identified any other witnessed or experienced traumas, such as rape.

Social support was assessed using the standardized Social Support Scale (Adolescent Pathways Project, 1992), measuring different types of social support for urban adolescents in each microsystem of family, peers, and school, and used previously in Cape Town (Van der Merwe & Dawes, 2000; Ward, 2005). Cronbach's alpha coefficients were .86 for the carer subscale, .85 for the sibling subscale, .67 for the teacher subscale, .72 for the school principal subscale, .76 for friends subscale, .95 for the other subscale, and .77 for the total scale.

A number of other sociodemographic factors were measured, such as household composition, poverty, and child caregiving history. These measures are reported in full elsewhere (Cluver et al., 2007). Where possible, census items and standardized scales were used.

## Procedures

Ethical protocols were approved by Oxford University, the University of Cape Town, and the Department of Education (Western Cape). Participants and caregivers gave voluntary informed consent. Children completed anonymous self-report questionnaires lasting 40–60 minutes with the assistance of interviewers. Interviewers were Xhosa-speaking social workers, psychologists, or community health workers, trained in working with AIDS-affected children. Participating organizations received staff training in child protection and child mental health, and participants received refreshments and certificates. Confidentiality was maintained, except where children were at risk of significant harm or requested assistance.

## Data Analysis

Statistical analyses were performed using the SPSS 15.0 (SPSS Inc., 2006) and ModGraph-I (Jose, 2003) software programs. Tests were

two-tailed and alpha ( $\alpha$ ) was set at .01. Although listwise deletion of cases with missing data is the procedure most likely to produce unbiased parameter estimates (Howell, 2008), doing so would have substantially reduced the sample size and power of the study. According to Acock (2005), the use of least squares has also been shown to be a very good approach to missing data. Therefore, missing data were imputed via regression estimation after testing for systematic trends in missingness. Independent samples *t* tests and one-way ANOVA tests were computed to examine between-groups effects. Pearson product-moment correlation coefficients were computed to examine bivariate associations between continuous variables.

The hypothesized moderating effect of perceived social support on the relationship between trauma exposure and PTSD symptoms was assessed using a three-step hierarchical factorial regression analysis. At step 1 of the regression model, age was entered as a covariate. At step 2 age, perceived social support, and trauma exposure were entered simultaneously. At step 3 age, perceived social support, trauma exposure, and a perceived social support/trauma exposure interaction term were entered simultaneously. The interaction term was derived by first centering the variables, then multiplying the centered terms together. The variables were centered by subtracting mean scores from associated data points. This was done to increase the interpretability of the interaction and to control for multicollinearity (Aiken & West, 1991; Judd & McClelland, 1989).

Post hoc probing of the interaction effect was done by analyzing three simple slopes. The first simple slope represented the regression of PTSD symptoms on trauma exposure at one standard deviation below the centered mean of perceived social support (low perceived social support). The second simple slope represented the regression of PTSD symptoms on trauma exposure at the centered mean of perceived social support (medium perceived social support). The third simple slope represented the regression of PTSD symptoms on trauma exposure at one standard deviation above the centered mean of perceived social support (high perceived social support).

## RESULTS

### Demographic Characteristics and Bivariate Analyses

Demographic characteristics of the sample are shown in Table 1.

Older participants demonstrated significantly higher levels of PTSD symptoms than younger participants ( $r = .17$ ,  $p < .01$ ). There were no significant differences in PTSD symptoms between males and females, or between those who lived in formal or informal structures. There were no significant differences between maternally bereaved and paternally bereaved children, or between maternally bereaved and double-orphaned children. However, paternally bereaved children demonstrated significantly higher levels of PTSD than doubly bereaved children,  $F(2, 422) = 4.06$ ,

**Table 1.** Demographic Characteristics of the Sample ( $N = 425$ )

Variable	<i>N</i>	Valid %	<i>M</i> ( <i>SD</i> )
Age	424	99	14.32 (2.40)
Age at first parental bereavement	371	87	10.25 (3.69)
Ethnicity	418	98	
Xhosa	410	98	
Non-Xhosa <sup>a</sup>	8	2	
Gender	418	98	
Male	206	49	
Female	212	51	
Type of household	395	93	
Informal structure	172	43	
Formal structure	223	57	
Moving homes	417	98	
1 home	140	34	
2 or more homes	277	66	
Parent deceased	415	98	
Mother	141	34	
Father	169	41	
Both mother and father	105	25	
Trauma exposure	418	98	6.99 (4.86)
Perceived social support	425	100	38.09 (6.20)

<sup>a</sup>The eight non-Xhosa children included two SeSotho, two Zulu, and four children of mixed heritage.

$p < .05$ . Those who had not moved homes demonstrated significantly higher levels of PTSD than those who had moved between two or more homes,  $t(415) = 2.42$ ,  $p < .05$ . Finally, higher levels of PTSD symptoms were significantly associated with higher levels of trauma exposure ( $r = .60$ ,  $p < .01$ ), and lower levels of perceived social support ( $r = -.30$ ,  $p < .01$ ).

### Multivariate Associations

Regression results are shown in Table 2.

Although age, moving homes, and having a parent deceased were correlated with PTSD symptoms, only age remained significantly associated with PTSD symptoms in a multivariate model. As such, only age was covaried in the final model reported here. At step 1 of the regression model, age significantly accounted for 3% of the variance in PTSD symptoms. As age increased by 2.4 years, PTSD score increased significantly by 2.87 units.<sup>1</sup>

Controlling for age at step 2, the linear combination of trauma exposure and perceived social support significantly accounted for 34% of the variance in PTSD symptoms ( $\Delta R^2 = .34$ ). Both

<sup>1</sup> Standardized beta coefficients represent the number of standard deviations that the dependent variable will change as a result of a one standard deviation change in the predictor variable (Field, 2000).

trauma exposure and perceived social support exerted significant main effects. Independent of the effect of perceived social support, a 4.86 unit increase in trauma exposure was associated with an 8.31 unit increase in PTSD symptoms. Independent of the effect of trauma exposure, a 6.20 unit increase in perceived social support was associated with a 1.66 unit decrease in PTSD symptoms.

Controlling for age and main effects at step 3, the interaction between trauma exposure and perceived social support was significant and accounted for 8% of the variance in PTSD symptoms ( $\Delta R^2 = .08$ ). Post hoc simple slope analyses showed that the relationship between trauma severity and PTSD symptoms was positive when perceptions of social support were high,  $B = 2.04$  ( $SE = 0.17$ ),  $t(421) = 11.91$ ,  $p < .01$ ; medium,  $B = 1.82$  ( $SE = 0.13$ ),  $t(421) = 13.95$ ,  $p < .01$ ; and low,  $B = 1.59$  ( $SE = 0.06$ ),  $t(421) = 23.58$ ,  $p < .01$ . This suggests that trauma exposure predicted PTSD at every level of perceived social support. In addition, the slope for PTSD on trauma exposure was steeper for participants expressing high perceived social support. In sum, perceived social support buffered the deleterious effects of trauma exposure at all levels of trauma.

### DISCUSSION

Although rates of PTSD among South African children living in communities characterized by poverty and violence is high (Seedat et al., 2004), AIDS-orphaned children are a particularly high-risk group for the development of PTSD (Cluver et al., 2007, 2008). Nonetheless, a strong perception of support from carers, siblings, schoolteachers, school principals, friends, and others may moderate, or buffer, the deleterious effects of exposure to trauma. Evidence for this comes from our finding that participants who perceived their social support to be high demonstrated significantly lower levels of PTSD symptoms than those who perceived their social support to be low. This finding supports theoretical frameworks of intervention in child well-being, such as Bronfenbrenner (1979), and is congruent with evidence that suggests that perceived social support may act as a protective factor against the onset of clinical-threshold PTSD in other populations (Andrews et al., 2003; Berman et al., 1996; Hyman et al., 2003; LaGreca et al., 1996). More specifically, these findings support hypotheses that PTSD may develop similarly across different types of trauma, from child maltreatment to war to orphanhood, but may be lower with high levels of perceived social support (Vranceanu, Hobfoll, & Johnson, 2007).

There are a number of limitations that should be noted. First, the study's cross-sectional design does not allow determination of causality between factors, or distinction between orphanhood and preorphanhood distress. For example, PTSD symptoms (such as avoidance) may have been contributing factors to reduced levels of social interaction, and thus reduced social support. Also, familial HIV-infection and associated stigma may have contributed towards reduced social support to the children of HIV-infected

**Table 2.** Hierarchical Factorial Regression Analysis

Model	$R^2$	$B$	$SE B$	$\beta$
Step 1	0.03**			
Age		1.22	0.30	.19**
Step 2	0.37**			
Age		0.51	0.24	.08*
Trauma exposure		1.70	0.12	.55**
Perceived social support		-0.28	0.10	-.11**
Step 3	0.45*			
Age		0.51	0.24	.08*
Trauma exposure		1.79	0.13	.57**
Perceived social support		-0.35	0.10	-.14**
Trauma exposure * perceived social support		0.03	0.01	.10*

\*  $p < .05$ . \*\*  $p < .01$ .

parents (Deacon, 2006). Longitudinal data are necessary to determine effects of any interventions aiming to increase social support to AIDS-orphaned children and children in AIDS-affected families. Additionally, though we acknowledge the complex relationship between social support and mental health outcomes in children and adolescents whose parents have HIV/AIDS (Lee, Detels, Rotheram-Borus, & Duan, 2007), we have not examined the possible confounding influence of comorbid conditions (e.g., depression and conduct problems) on social support here. This warrants further exploration in a prospective design.

An additional limitation is the risk of method overlap: Children suffering from PTSD symptoms such as numbing and hyperarousal may have felt more isolated and threatened, and thus perceived lower levels of social support. However, children's experience of social support can only be measured by self-report, and perceived social support is inherently at least partially subjective. To limit method overlap, the study used a standardized social support scale, which focused on specific examples of support, i.e. "Is this person helpful if you need money or other things?" or "Is this person helpful when I have a personal problem?"

The nature of the sample also precluded the use of alternative (i.e., caregiver or teacher) informants for PTSD-related symptoms: 6% of AIDS-orphaned children did not attend school, and class sizes of 50–70 were judged to limit teacher capacity as informants. The use of caregiver report would have introduced systematic bias of poorer reporting for children living on the streets, in child-headed households, and with very unwell or distressed caregivers. However, the purposive oversampling of difficult-to-reach groups, such as child-headed households and street children, allowed for representation of groups within the orphan population who are usually excluded from school or community samples.

Children's perceptions of social support and PTSD symptoms may also be influenced by their own HIV status. Rates of HIV testing in South Africa are extremely low (Kalichman & Simbayi, 2003). It was very unlikely that the sample included any children

who had been perinatally infected, as survival rates into middle childhood (before the 2004 rollout of antiretroviral medication) were low (Newell et al., 2004). Any participants who disclosed HIV-positive status were excluded from the overall study ( $n = 15$ ). However, HIV prevalence for Western Cape adolescents is estimated at 2–6%, implying that a small proportion of participants may have been infected postnatally, with possible traumatic responses to the trauma of diagnosis, or potential neurocognitive effects of even asymptomatic HIV. The potential for HIV infection was highest among the group of street children who were interviewed, as most reported having engaged in transactional sex. It is important that future research explores further the potential effects of social support on PTSD for HIV-infected children.

In conclusion, it is essential that effective interventions are developed to mitigate the interactive stressors of AIDS-orphanhood and trauma exposure on childhood PTSD. This study aims to contribute to both the theoretical understanding of the impacts of multiple traumas on children, and to the development of evidence-based policy for AIDS-orphaned children. Policies should continue to aim to reduce incidence of AIDS-orphanhood (through programs such as antiretroviral provision to caregivers) and to reduce community and domestic violence. However, in South Africa, already-high levels of both these stressors are likely to continue to increase. In such circumstances, it may be helpful to carefully screen for mental health problems in orphaned children and target factors in their lives that have been shown to have protective value. In South Africa, the National Strategic Plan for HIV/AIDS (Department of Health, 2007), includes a focus on improving social support for orphaned and vulnerable children. This study provides the first evidence to demonstrate that social support is associated with lower levels of PTSD: a specific but serious impact of AIDS-orphanhood. Interventions aimed at improving social support should be rigorously evaluated to determine their effectiveness on long-term mental health outcomes.

## REFERENCES

- Acock, A. C. (2005). Working with missing values. *Journal of Marriage and the Family*, 67, 1012–1028.
- Adolescent Pathways Project. (1992). Social support scale: Psychometric development summary. New York: New York University.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Amaya-Jackson, L., Newman, E., & Lipschitz, D. (2000, July). The Child and Adolescent PTSD Checklist in Three Clinical Research Populations. Paper presented at the Annual Meeting of the American Academy of Child and Adolescent Psychiatry, New York, NY.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Anderson, B., & Phillips, H. (2006). Trends in the percentage of children who are orphaned in South Africa: 1995–2005 (Report No. 03-09-06). Pretoria: Statistics SA.
- Andrews, B., Brewin, C. R., & Rose, S. (2003). Gender, social support, and PTSD in victims of violent crime. *Journal of Traumatic Stress*, 16, 421–427.
- Berman, S., Kurtines, W., Silverman, W., & Serafini, L. (1996). The impact of exposure to crime and violence on urban youth. *American Journal of Orthopsychiatry*, 66, 329–336.
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology*, 68.
- Q3 Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Chambers, W., Puig-Antich, J., & Hirsch, M. (1985). The assessment of affective disorders in children and adolescents by semi-structured interview: Test-retest reliability of the Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present Episode version. *Archives of General Psychiatry*, 42, 696–702.
- Cluver, L., & Gardner, F. (2007). Risk and protective factors for psychological well-being of orphaned children in Cape Town: A qualitative study of children's views. *AIDS Care*, 19, 318–325.
- Cluver, L., Gardner, F., & Operario, D. (2007). Psychological distress amongst AIDS-orphaned children in urban South Africa. *Journal of Child Psychology and Psychiatry*, 48, 755–763.
- Cluver, L., Gardner, F., & Operario, D. (2008). Effects of stigma and other community factors on the mental health of AIDS-orphaned children. *Journal of Adolescent Health*, 42, 410–417.
- Deacon, H. (2006). Towards a sustainable theory of health-related stigma: Lessons from the HIV/AIDS literature. *Journal of Community & Applied Social Psychology*, 16, 418–425.
- Department of Health. (2007). *HIV and AIDS and STI Strategic Plan for South Africa 2007–2011*. Pretoria: Author.
- Dirkzwager, A., Bramsen, I., & van der Ploeg, H. (2003). Social support, coping, life events, and posttraumatic stress symptoms among former peacekeepers: A prospective study. *Personality and Individual Differences*, 34, 1545–1559.
- Dorrington, R., Johnson, L., Bradshaw, D., & Daniel, T. (2005). The demographic impact of HIV/AIDS in South Africa. National and Provincial indicators for 2006. Cape Town: Centre for Actuarial Research, South African Medical Research Council and Actuarial Society of South Africa.
- Ensink, K., Robertson, B., Zissis, C., & Leger, P. (1997). Post-traumatic stress disorder in children exposed to violence. *South African Medical Journal*, 87, 1526–1530.
- Erwin, B., Newman, E., McMackin, R., Morrissey, C., & Kaloupek, D. (2000). PTSD, malevolent environment, and criminality among criminally involved male adolescents. *Criminal Justice and Behavior*, 27, 196–215.
- Field, A. (2000). *Discovering statistics: Using SPSS for Windows*. London: Sage.
- Hosegood, V., Vanneste, A., & Timaeus, I. (2004). Levels and causes of adult mortality in rural South Africa: The impact of AIDS. *AIDS*, 5, 663–671.
- Howell, D. (2008). The analysis of missing data. In W. Outhwaite & S. Turner (Eds.), *Handbook of social science methodology* (pp. 127–154). London: Sage.
- Hyman, S. M., Gold, S. N., & Cott, M. A. (2003). Forms of social support that moderate PTSD in childhood sexual abuse survivors. *Journal of Family Violence*, 18, 295–300.
- Jewkes, R., Dunkle, K., Koss, M. P., Levin, J. B., Nduna, M., Jama, N., et al. (2006). Rape perpetration by young, rural South African men: Prevalence, patterns and risk factors. *Social Science & Medicine*, 63, 2949–2961.
- Jose, P. (2003). ModGraph-I: A programme to compute cell means for the graphical display of moderational analyses. Retrieved May 21, 2008, from <http://www.victoria.ac.nz/psyc/staff/paul-jose/files/modgraph/modgraph.php>
- Judd, C. M., & McClelland, G. H. (1989). *Data analysis: A model-comparison approach*. New York: Harcourt, Brace, & Jovanovich.
- Kahn, K., Tollman, S., Garenne, M., & Gear, J. (2000). Validation and application of verbal autopsies in a rural area of South Africa. *Tropical Medicine and International Health*, 5, 824–831.
- Kalichman, S., & Simbayi, L. (2003). HIV testing attitudes, AIDS stigma, and voluntary HIV counselling and testing in a Black township in Cape Town, South Africa. *Sexually Transmitted Infections*, 79, 442–447.
- Kaufman, M., Birmaher, B., & Brent, D. (1997). Schedule for Affective Disorders and Schizophrenia for School-Age children (K-SADS-PL): Initial reliability and validity data. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34, 980–988.
- King, L. A., King, D. W., Fairbank, J. A., Keane, T. M., & Adams, G. A. (1998). Resilience-recovery factors in post-traumatic stress disorder among female and male Vietnam veterans: Hardiness, postwar social support, and additional stressful life events. *Journal of Personality and Social Psychology*, 74, 420–434.
- LaGreca, A., Silverman, W., Vernberg, E., & Prinstein, M. (1996). Symptoms of posttraumatic stress in children after Hurricane Andrew: A prospective study. *Journal of Consulting and Clinical Psychology*, 64, 712–723.
- Liang, H., Flisher, A. J., & Lombard, C. J. (2007). Bullying, violence, and risk behavior in South African school students. *Child Abuse & Neglect*, 31, 161–171.
- Lee, S. J., Detels, R., Rotheram-Borus, M. J., & Duan, N. (2007). The effect of social support on mental and behavioral outcomes among adolescents with parents with HIV/AIDS. *American Journal of Public Health*, 97, 1820–1826.
- Nader, K., Krieger, J., Blake, D., Pynoos, R., Newman, E., & Weathers, F. (1996). *Clinician-Administered PTSD Scale for Children and Adolescents for DSM-IV*. Boston, MA: National Center for PTSD.
- Newell, M. -L., Coovadia, H., Cortina-Borja, M., Rollins, N., Gaillard, P., & Dabis, F. (2004). Mortality of infected and uninfected infants born to HIV-infected mothers in Africa: A pooled analysis. *The Lancet*, 3641, 1236–1243.
- Richters, J., & Martinez, P. (1993). The NIMH Community Violence Project: 1. Children as victims of and witnesses to violence. *Psychiatry*, 56, 7–21.
- Richters, J., Martinez, P., & Valla, J. (1990). *Levonn: A cartoon-based interview for assessing children's distress symptoms*. Bethesda, MD: University of Maryland/NIMH.
- Seedat, S., Nyamai, C., Njenga, F., Vythilingum, B., & Stein, D. (2004). Trauma exposure and post-traumatic stress symptoms in urban African schools. *British Journal of Psychiatry*, 184, 169–175.
- Seedat, S., van Nood, E., Vythilingum, B., Stein, D., & Kaminer, D. (2000). School survey of exposure to violence and posttraumatic stress symptoms in adolescents. *Southern African Journal of Child and Adolescent Mental Health*, 12, 38–44.

- South African Police Services. (2004). *Crime in the Republic of South Africa for the period from April to March 1994/5 to 2003/4*. Pretoria: Crime Information Analysis Centre.
- SPSS Inc. (2006). *SPSS 15.0 [Computer software]*. Chicago, IL: Author.
- Suliman, S., Mkabile, S. G., Fincham, D. S., Ahmed, R., Stein, D. J., & Seedat, S. (in press). The cumulative effect of traumatic exposure on symptoms of post-traumatic stress disorder (PTSD), anxiety, and depression in adolescents. *Comprehensive Psychiatry*.
- Q4 Van der Merwe, A., & Dawes, A. (2000). Prosocial and antisocial tendencies in children exposed to community violence. *Journal of Child and Adolescent Mental Health*, 12, 19–37.
- Vranceanu, A.-M., Hobfoll, S., & Johnson, R. (2007). Child multi-type maltreatment and associated depression and PTSD symptoms: The role of social support and stress. *Child Abuse & Neglect*, 31, 71–84.
- Ward, C. (2005). Psychometric properties of the Social and Health Assessment Subscales in a sample of children in Cape Town. Q5
- World Health Organisation. (1999). *Report of the Consultation on Child Abuse Prevention*. Geneva: Author.
- World Health Organisation. (2003). *Strategic directions for improving the health of children and adolescents*. Geneva: Author.
- World Health Organisation. (2005). *WHO/Euro Report of the Technical Consultation on Clinical Staging of HIV/AIDS and HIV/AIDS Case Definitions for Surveillance*. Copenhagen: Author.



Author Proof

## Queries

- Q1. AU: Please include the Baron and Kenny, 1986 reference in the Reference List.
- Q2. AU: Please include the Newman et al., 1998 reference in the Reference List.
- Q3. AU: Please provide inclusive page numbers for the article.
- Q4. AU: Please provide updated publication information.
- Q5. AU: Please provide the name of the journal, volume number, and inclusive page numbers for the article.



# Author Proof