Article

Journal of Interpersonal Violence
28(6) 1338–1362

DOI: 10.1177/0886260512468239
http://jiv.sagepub.com
SAGE

How Much Does "How Much" Matter? Assessing the Relationship Between Children's Lifetime Exposure to Violence and Trauma Symptoms, Behavior Problems, and Parenting Stress

Laura J. Hickman, PhD[1] Lisa H. Jaycox, PhD[2] Claude M. Setodji, PhD[2] Aaron Kofner, MS[2] Dana Schultz, MPP[2] Dionne Barnes-Proby, MSW[2] and Racine Harris, BA[2]

Abstract

The study explores whether and how lifetime violence exposure is related to a set of negative symptoms: child internalizing and externalizing behavior problems, child trauma symptoms, and parenting stress. Using a large sample of violence-exposed children recruited to participate in intervention research, the study employs different methods of measuring that exposure. These include total frequency of all lifetime exposure, total frequency of lifetime exposure by broad category (i.e., assault, maltreatment, sexual abuse, and witnessing violence), and polyvictimization defined as exposure to

[1]Portland State University, Portland, OR, USA
[2]RAND Corporation

Corresponding Author:
Laura J. Hickman, Criminology & Criminal Justice Division, Hatfield School of Government, College of Urban and Public Affairs, Portland State University, P.O. Box 751, Portland, OR 97207, USA
Email: Lhickman@pdx.edu

multiple violence categories. The results indicate that only polyvictimization, constructed as a dichotomous variable indicating two or more categories of lifetime exposure, emerged as a consistent predictor of negative symptoms. The total lifetime frequency of all violence exposure was not associated with negative symptoms, after controlling for the influence of polyvictimization. Likewise, in the presence of a dichotomous polyvictimization indicator the total lifetime frequency of exposure to a particular violence category was unrelated to symptoms overall, with the exception of trauma symptoms and experiences of sexual abuse. Taken together, these findings suggest that total lifetime exposure is not particularly important to negative symptoms, nor is any particular category of exposure after controlling for polyvictimization, with the single exception of sexual abuse and trauma symptoms. Instead, it is the mix of exposure experiences that predict negative impacts on children in this sample. Further research is needed to continue to explore and test these issues.

Keywords

child abuse, domestic violence, mental health and violence, PTSD, community violence

Introduction

In recent years, there has been a steady growth in the empirical and theoretical literature on the topic of children's exposure to violence. Whether at home, at school, or in the community, such exposure raises concerns about the obvious potential for physical harm and also the longer term developmental and mental health risks for children. According to findings from the Department of Justice Office of Juvenile Justice and Delinquency Prevention's National Survey for Children Exposed to Violence (employing a nationally representative sample of children age 17 and younger) 61% had been exposed to a broad range of crime, violence, and abuse experiences including physical assault (46%), property offenses (25%), maltreatment by an adult parent or caregiver (10%), witnessing violence at home or in the community (25%), and sexual abuse (6%; Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009).

Although not all children experience measurable harm (Schultz et al., in press), exposure to violence has been linked in numerous studies to various developmental and mental health consequences, including depression (Kliewer, Lepore, Oskin, & Johnson, 1998), anxiety (Singer, Anglin, Song, & Lunghofer, 1995), post-traumatic stress disorder (PTSD; Berman, Kurtines,

Silverman, & Serafini, 1996; Breslau, Davis, Peterson, & Schultz, 1997) and behavioral or developmental problems (Bell & Jenkins, 1993; Farrell & Bruce, 1997; Garbarino, Dubrow, Kostelny, & Parto, 1992; Gilbert et al., 2009; Lansford et al., 2002; Martinez & Richters, 1993; Morris, 2009). Exposure to violence can also impact academic achievement in children (Bowen & Bowen, 1999; Delaney-Black et al., 2002; Grogger, 1997; Hurt, Malmud, Brodsky, & Giannetta, 2001; Schwartz & Gorman, 2003) and is associated with increased parenting stress among caregivers (Crusto et al., 2010; Gewirtz, DeGarmo, & Medhanie, 2011).

Although the body of empirical evidence examining the potential consequences of exposure to violence is growing, the measurement of violence exposure in existing studies has been limited (Acosta et al., 2012). Across a series of studies, Finklehor et al. (e.g., Finkelhor, Ormrod, & Turner, 2007a; Finkelhor, Ormrod, & Turner, 2007b; Finkelhor, Ormrod, & Turner, 2009; Finkelhor, Ormrod, Turner, & Hamby, 2005; Turner, Finkelhor, & Ormrod, 2010) have faulted prior literature for often focusing narrowly on one type of exposure, rather than examining the potential impacts of exposure to multiple types of violence. This can be seen as a reflection of a more general problem in the examination of children's exposure to violence; in which studies are conducted in silos rather than taking a comprehensive approach (Kracke & Hahn, 2008). These researchers argue for the inclusion of measures of "polyvictimization," or exposure to multiple forms of violence (as opposed to exposure to multiple incidents of the same type), as a more comprehensive representation of child experiences and a potentially influential factor in negative outcomes (Finklehor et al., 2007b). Polyvictimization in childhood may have lasting impacts, as it has been identified as a significant predictor of psychological distress in a sample of adult women (Richmond, Elliott, Pierce, Aspelmeier, & Alexander, 2009).

In previous work, Finkelhor et al. have defined polyvictimization using the Juvenile Victimization Questionnaire (JVQ; Hamby, Finkelhor, & Ormrod, & Turner, 2004a, 2004b), which taps 34 different *specific types* of exposure to violence. Examples include assault, witnessing violence against a caregiver, experiencing neglect, family abduction, sexual assault, and household burglary. The extent of polyvictimization is defined according to the number of types of violence to which they were exposed with more types indicating greater polyvictimization. Using this approach and data from the National Survey of Children's Exposure to Violence, Turner, Finklehor, and Ormrod (2010) found that polyvictimization was more important to explaining PTSD symptoms than repeat exposure of a specific type.

Although defining polyvictimization according to exposure to a specific type appears promising, it needs to be tested in a wider variety of samples and alternative operationalizations need to be explored. One possibility is that polyvictimization could be defined as exposure to broad categories of violence, instead of a tally of exposure to specific types (that could range across one or more categories). The JVQ instrument is constructed in a manner that allows for the conceptualization of polyvictimization by category. Its 34 exposure type items are separated in the instrument into *five broad categories* of exposure: (a) conventional crime (8 type items), (b) child maltreatment (4 type items), (c) victimization by peers and siblings (6 type items), (d) witnessing violence (9 type items), and (e) sexual victimization (7 type items). Each of these five categories, or modules, were developed for the JVQ to represent conceptually consistent grouping of exposure types, based on legal definitions, research, and clinical practice (Hamby et al., 2004b). Defining polyvictimization according to exposure category would allow for additional insights into the potential impacts of violence exposure. For example, it may be that children experiencing multiple types of maltreatment (but no other exposure categories) experience different impacts relative to children who experience the same total number of different types but spread across conventional crime, child maltreatment, and sexual victimization categories.

Category-defined polyvictimization may not only help advance theoretical development but it could also yield certain practical advantages for intervention development, service provision, and related evaluation research. That is, eligibility screening may be more efficient or feasible if children are screened for a limited number of broad exposure categories compared with a relatively large number of specific exposure types.

The present study aims to build knowledge about the impact of violence exposure on children by using different methods of capturing that exposure, including a category-defined measure of polyvictimization. Rather than a nationally representative sample, the present study employs a large sample of children recruited to participate in an intervention due to their identified exposure to violence. Specifically, the objectives of the study are to explore whether and how violence exposure is related to a set of negative symptoms that have been identified in previous literature : (a) child internalizing and externalizing behavior problems, (b) child PTSD symptoms, and (c) parenting stress. Using items and exposure categories drawn from the JVQ instrument, relationships are tested using different methods of measuring violence exposure. These include total frequency of all lifetime exposure, total frequency of lifetime exposure by broad category (i.e., assault, maltreatment,

sexual abuse, and witnessing violence) and polyvictimization defined as exposure to multiple violence categories.

We expect that lifetime exposure frequency will be positively associated with negative symptoms (i.e., higher lifetime exposure frequency will be related to more child behavior problems, and higher levels of PTSD symptoms). We also expected polyvictimization to be positively associated with negative symptoms in children. Because of the novelty of the broad violence category frequency measure employed here, the analyses are exploratory and were conducted without a specific expectation for results.

Method

The data for this study are drawn from the National Evaluation of Safe Start Promising Approaches (SSPA), funded by the U.S. Department of Justice's Office of Juvenile Justice and Delinquency Prevention (OJJDP). Launched in 2005, SSPA was developed to implement and evaluate evidence-based program models intended to help children who had been exposed to violence and their families (Hyde, Kracke, Jaycox, & Schultz, 2008). The SSPA programs employed a range of intervention components, but all included some type of therapeutic component, most also offered case management, and many also provided a range of other services as well (Schultz et al., 2010).

The entire SSPA initiative consisted of 15 sites and services were delivered in the context of a rigorous evaluation of the programs' outcomes, conducted by a single national evaluation team using standardized measures (Jaycox et al., 2011). The present study makes use of data from the nine SSPA sites that employed experimental designs randomly assigning individual families to an intervention or control group. Use of the prerandomization baseline data precludes any potential influence of the SSPA interventions themselves on the relationships of interest here.

Each of the nine sites had their own eligibility criteria for recruiting participants, but all required exposure to violence for inclusion. Six of the nine sites recruited families of children exposed to all forms of violence, defined as witnessing violence in the home, at school, in the community, or experiencing, neglect, maltreatment, and physical and sexual abuse. The remaining three sites recruited children exposed to domestic violence, but many of these children had been exposed to other forms of violence as well. Most sites recruited young children, including infants in seven sites, and the two remaining sites required a minimum age of 3. Maximum age varied, with one site capping age at 13 but maximum age at six sites was less than 9 years old. Referral sources also varied, but five received referrals from social service

agencies, two sites recruited exclusively from domestic violence shelters, one from within a child welfare system, and one from within a medical setting.

Eligibility screening procedures varied by site, as did the approved Institutional Review Board procedures for obtaining informed consent (from primary caregivers, and legal guardians if different) and child assent (for children age 7 and older). At a minimum, enrollment required a willing English- or Spanish-speaking primary caregiver who had lived with the child for at least 30 days and a child exposed to violence (in some form) falling within each site's specific age range. If more than one child in the family fell within the eligibility criteria, a "target" child was selected to serve as the focus of the research assessments (usually the child referred for therapy or identified by the caregiver as the most in need of services, but if more than one child still met these criteria then the target child was chosen randomly, according to the most recent birthday).

Study Sample

The sample consists of children recruited by one of the nine sites who had been exposed to at least one incident of violence in their lifetime. The resulting sample of 768 children were just under 5 years old on average (mean = 4.97, *SD* = 2.66) and slightly more female (52%) than male (48%). Mothers were the primary caregivers in the vast majority of cases (88%) and most caregivers were living without a spouse or partner in the home (73%). Although race and ethnicity data were collected separately, most caregivers endorsing Hispanic ethnicity chose not to endorse a separate race category. Hispanic children made up 28% of the sample, followed by Black (24%) and White (21%), with the remaining 27% endorsing multiple race categories. Most caregivers were unemployed but not looking for work (38%) and just over one in four (26%) were employed full time. The remainder were unemployed and looking for work (24%) or employed part time (11%). Thirty-eight percent of the caregivers had at least some college course work, while 30% had graduated high school or equivalent, and the remaining 32% had less than a high school education.

Data Collection and Measures

Data were collected in-person by trained interviewers who administered a standardized assessment battery to primary caregivers. The present study used only the baseline data from the National Safe Start Evaluation, which were collected prior to the assignment of families to a specific experimental

condition. Caregiver-reported measures used in the present study consist of demographic characteristics, child exposure to violence, child post-traumatic stress disorder symptoms (PTSD), child behavior problems, caregiver everyday stressors, and total parenting stress. Caregiver and child demographic information was collected using a modification of the instrument employed in the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN study; LONGSCAN, 2010), a consortium of longitudinal research studies assessing the etiology and impact of child maltreatment. The questions covered a host of demographic characteristics (sex, race/ethnicity, marital status, caregiver and household income, etc.) and also caregiver and child physical health, emotional problems, and support or assistance received. Caregivers were asked race and Hispanic ethnicity questions separately. Because Hispanic caregivers very frequently declined to also select a race category, we collapsed race/ethnicity into a variable that indicated whether caregivers selected White race only, Black race only, Hispanic ethnicity only, or other (indicating multiple race/ethnicity endorsements).

Child exposure to violence was measured via the caregiver report version of the Juvenile Victimization Questionnaire (JVQ; Hamby et al., 2004a, 2004b). The National SSPA evaluation shortened the original JVQ instrument from 34 items to 17 items. The present study makes use of 16 of these items, eliminating one item on emotional pain caused by sibling/peer rejection or name-calling. We excluded this item because we see crying due to name-calling or exclusion from play by another young child or sibling as a common experience in this young sample (average age just under 5, 75% younger than 6.5 years), and one which bears little resemblance to the other types of violence exposure on the scale.

The remaining 16 items tap 16 types of violence exposure within four categories of (a) child physical assault (3 items including hitting/hurting the child with and without weapons), (b) child maltreatment by an adult (3 items including physical neglect, family abduction, and psychological/emotional abuse), (c) witnessing violence (7 items including seeing an assault on a parent or sibling, seeing other assaults with and without weapons, seeing murder, and see or hearing gunshots, bombs or riots), and (d) sexual abuse (3 items including touching genitals with or without force by an adult and forced sexual activity by a peer). For every item a caregiver endorsed, they were asked how many times this had happened to the child in his/her lifetime.

Table 1 displays a condensed version of each of the 16 exposure type items (separated into the four exposure categories) and the number of caregivers endorsing each. The assignment of exposure items to categories mirrors the JVQ instrument with one exception—the item asking whether “a

Table 1. Caregiver Endorsement of Individual Violence Exposure Types by Exposure Category

	n = 768[a]
Witnessing violence	
See or hear a parent/guardian pushed, slapped, hit, punched, or beat up by another parent, or boyfriend/girlfriend?	541 (70%)
See or hear a parent (or guardian) hit, beat, kick, or physically hurt child's brothers or sisters, not including a spanking on the bottom?	117 (15%)
See anyone get attacked or hit on purpose with a stick, rock, gun, knife, or other thing that would hurt?	164 (21%)
See anyone get attacked or hit on purpose without a weapon?	313 (41%)
Anyone close to your child ever murdered, like a friend, neighbor, or family?	57 (7%)
In a place where he/she could see or hear people being shot, bombs going off, or riots?	95 (12%)
Ever in a war where he/she could see real fighting with guns or bombs?	9 (1%)
Maltreatment	
Ever get scared or feel really bad because grown-ups in his/her life called names, said mean things, or said they didn't want him/her?	200 (26%)
Neglect means that grown-ups didn't take care of child the way they should (not enough food, not taken to the doctor when sick, or no safe place to stay. Has child been neglected?	90 (12%)
Did a parent ever take, keep, or hide child from you or another parent?	145 (19%)
Child assault	
Did anyone ever hit or attack your child on purpose WITH an object or weapon?	100 (13%)
Did anyone ever hit or attack your child WITHOUT using an object or weapon?	241 (31%)
Not including spanking on the child's bottom, did a grown-up in your child's life ever hit, beat, kick, or physically hurt your child in any way?	136 (18%)
Sexual abuse	
Grown-up child knows ever touch child's private parts or make child touch their private parts? Or force child to have sex?	65 (8%)
Grown-up child does not know ever touch child's private parts or make child touch their private parts? Or force child to have sex?	4 (1%)
Did another child or teen make child do sexual things?	67 (9%)

[a]Numbers represent caregiver endorsement of at least one incident and are not mutually exclusive. Percentages are based on the full sample of 768 and do not add to 100.

grown-up in your child's life hit, beat, kick, or physically hurt the child." The full JVQ assigns this caregiver physical assault item to the maltreatment category, which the JVQ manual refers to as "intended to parallel offenses of concern to child protection agencies" (Hamby et al., 2004b, p. 7). Because

this category contains no other physical abuse items, we placed this item with the two other physical assault items taken from the JVQ's "conventional crime" category. Despite its category placement, the JVQ groups these three items together as part of its physical assault composite score. Thus, in the present study we refer to the category form by these three items as "child assault" to more accurately reflect the nature of the three items included.

Caregiver reports of child PTSD symptoms were captured using the Trauma Symptom Checklist for Young Children PTSD subscale (TSCYC; Briere et al., 2001). It was administered only for children ages 3 to 10 and consisted of 27 items asking caregivers to rate the frequency in the last month of things the child does, feels, or experiences (e.g., bad dreams or nightmares, being bothered by memories of something that happened to him or her) on a 4-point scale with higher scale scores indicating more PTSD symptoms. In the SSPA national evaluation, the internal consistency Cronbach's α for this scale was 0.93. Discriminant, predictive, and construct validity have been demonstrated for the TSCYC in multiple samples and studies (Briere et al., 2001; Pollio, Glover-Orr, & Wherry, 2008).

Child problem behaviors were assessed on different measures, depending upon child age. For children age 3 and older, behavior problems were captured using the Behavior Problems Index (BPI; Peterson & Zill, 1986). Caregivers were asked about their agreement with a series of statements about the child's behavior in the past month (e.g., has been too fearful or anxious; has argued too much). For children ages 1 to 3, behavior problems were measured using the Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2002). It contains 31 items that ask caregivers to rate behavioral problems (e.g., seems nervous, tense, or fearful; is restless and can't sit still) on a 3-point scale (1 = *not true* or *rarely*, 2 = *somewhat true* or *sometimes*, and 3 = *very true* or *often*). In previous research, the BITSEA scores were found to correlate highly with concurrent evaluator problem ratings and to predict problem scores one year later (Briggs-Gowan, Carter, Irwin, Wachtel, & Cicchetti, 2004). Using an item response theory (IRT) procedure, the scores from the separate instruments were combined to create an age calibrated "total behavior problems" measure that could be used for all children ages 1 and older (see Jaycox et al., 2011). The calibration procedure was conducted using the graded response model (Samejima, 1997) in the Multilog software (Thissen, 1991). The resulting score for behavior problems was a standardized score, with a mean of 0 and a standard deviation of 1, where a higher score indicates more behavior problems.

Caregiver reports of parenting stress were measured using the 36-item Parenting Stress Index—Short Form (PSI-SF; Reitman, Currier, & Stickle,

2002). The PSI-SF measures total parenting stress and contains three scales, each with 12 items: parental distress, dysfunctional parent-child interaction, and difficult child characteristics. Caregivers indicated their level of agreement (on a 5-point scale) with statements about themselves or feelings about/interactions with their child (e.g., I often have the feeling that I cannot handle things very well, my child rarely does things for me that make me feel good). Like prior research, the SSPA national evaluation found the scale to show good internal consistency, with Cronbach's αs of 0.87 for the parental distress scale, 0.88 for the parent-child dysfunction scale, 0.89 for the difficult child scale, and 0.94 for the total stress scale. For both the computed total score and each subscale, higher scores indicate more stress.

Caregiver everyday stressors, or problems faced in everyday life, were measured via the 20-item Everyday Stressors Index (ESI) used in the LONGSCAN study (LONGSCAN, 2010). In prior research, the ESI construct validity was supported by discrimination of everyday stressors from measures of maternal depression and psychosomatic symptoms using factor analytic procedures (Hall, 1983). ESI scores also were found to be positively and significantly associated with depressive symptoms and psychosomatic symptoms (Hall & Farel, 1988). The items tap resource-related problems (such as owing money or getting credit, not having enough money for basic necessities, problems with housing, employment concerns) and personal/family problems (such as health, interpersonal conflicts, problems related to children, and having too many responsibilities). Higher scores indicate more problems.

Statistical Approach

To explore the relationship between lifetime violence exposure and children's behavioral and mental health symptoms and with parenting stress, the analyses proceeded using several statistical models. For each outcome and in each model, we used multiple linear regression to estimate the effects of the frequency of exposure and the different types of exposures. As there can be similarity within sites that can lead to site to site variability and thus heteroskedasticity in the models, we used the Huber–White variance sandwich estimator (Huber, 1967; White, 1980) to control for such cluster effect. All analyses were conducted using SAS 9.2

For each outcome, we estimated the regression first with no covariates, and then repeated them to see if these unadjusted relationships were sustained in the presence of control variables. In this process, we estimated a set of three multivariate models for each of the three outcomes. Three models within each set varied the amount of detail used to capture violence exposure

after controlling for background characteristics, site fixed effects, and controls for cluster effects. Specifically, each set contained the following three model specifications of violence exposure. Model 1 included a single measure of total lifetime frequency of violence exposure incidents of all types. This model allows an examination of the influence of total lifetime violence exposure overall, regardless of type.

Model 2 in each set added a second variable that indicated "polyvictimization," whether the victimization represented (a) one category of violence or (b) fell across two or more categories of violence. This second model tapped into whether (holding total lifetime frequency constant) exposure to more than one category of exposure (i.e., polyvictimization) is associated with worse symptoms than exposure to a single category of violence.

For the third model in each set, the total lifetime frequency variable was replaced with four variables that subdivided this total lifetime frequency into specific categories of exposure: (a) frequency of maltreatment incidents, (b) frequency of witnessing violence, (c) frequency of assault victimization, and (d) frequency of sexual abuse. This final model type captures whether symptoms are independently related to the frequency of exposure to specific categories of violence, while accounting for all the other exposure experiences.

Control variables included demographic characteristics of the child or caregiver/household that may have some association with child symptoms or parenting stress. These include age, race, sex, caregiver–child relationship, caregiver health status, number of children and presence of spouse/partner in the home, and caregiver education and employment status. Caregiver foreign birth status is included because a number of the SSPA interventions operated in areas with large immigrant populations. To control for variation among the families related to program enrollment site, we also included a set of site indicator variables in each model. We tested for and ruled out the possibility of high multicollinearity among the independent variables included in the models.

As a sensitivity analysis, we assessed whether breaking several measures into subcategories may yield more detailed information than looking at only a "total" or "combined" version of these variables. In each sensitivity analysis, the frequency of total exposure was replaced by the frequency of a specific type of exposures (e.g., sexual assault exposures alone), ignoring all the other exposure types. Because the results of the sensitivity analysis did not differ from those of the combined versions of the variables, only the latter results are reported here. Also, for the child behavior problems measure, we estimated separate model sets for internalizing problems and externalizing

problems, comparing these results with the combined total problems measure. Because results of the three sets of models did not substantively differ, only total behavior problems are reported for the sake of parsimony.

For the polyvictimization measure, we tested models that included three categories of exposure: (a) one type, (b) two types, or (c) three or four types. (Too few children experienced all four measured categories of violence to estimate a four level category.) We found no substantive difference in results using this three-category treatment of polyvictimization relative to a two-category definition, defining exposure according to (a) one category and (b) two or more category. Thus, in the interest of brevity we present only the two-category dummy variable polyvictimization results here, as the three-category treatment yields no additional information about the impacts of violence exposure in the sample.

Results

First, we present a description of the total lifetime violence exposure of the 768 children in the study sample, all of whom had been identified as being exposed to violence at baseline as a pre-requisite to being in the study. As Table 2 shows, primary caregivers reported that children were exposed to an average of nearly 15 incidents of exposure to violence (*SD* = 19.47) over their lifetime. For 44% of children, their lifetime exposure (however frequent) was limited to one category of violence, whereas 56% had been exposed to more than one violence category in their lifetime. The most common category of exposure was witnessing violence (87%), followed by experiencing maltreatment (43%) and experiencing physical assault (40%). Sexual victimization was the least common type of exposure, with caregivers reporting that 17% of children had experienced this at least once in their lifetime.

Witnessing violence was not only the most common category of lifetime exposure, it was also the category most frequently experienced. Caregivers reported that children in the sample witnessed, on average, 8.8 violent incidents in their lifetime (*SD* = 11.59). This category was followed distantly by an average of 3.41 lifetime incidents of maltreatment (*SD* = 6.88), 3.29 lifetime incidents of assault (*SD* = 7.44), and 0.4 incidents of sexual victimization (*SD* = 1.81).

In Table 2, we present polyvictimization as a four category variable for the purposes of sample description. Polyvictimization is treated as a dichotomous variable in subsequent analyses because (as previously discussed) a dichotomous definition of polyvictimization (one category = 0, two or more

Table 2. Child Total Lifetime Violence Exposure Distribution

	Total Lifetime Violence Exposure *n* = 768
Lifetime Violence Exposure Frequency	%, Mean (*SD*)
Total lifetime exposure frequency	14.96 (19.47)
Witnessing violence	
At least once	87%
Number of incidents	8.67 (11.59)
Child maltreatment	
At least once	43%
Number of incidents	3.41 (6.88)
Child assault	
At least once	40%
Number of incidents	3.29 (7.44)
Child sexual abuse	
At least once	11%
Number of incidents	0.42 (1.81)
Lifetime Polyvictimization	%
One category of exposure	44%
Two categories of exposure	30%
Three categories of exposure	21%
Four categories of exposure	5%

categories = 1) did not differ substantively from models that further subdivided polyvictimization.

Table 3 presents the results of the unadjusted analyses (i.e., without control variables) revealing the associations between the three negative symptoms and violence exposure, specified with increasing detail. The results indicate that total lifetime exposure frequency (Model 1) along with polyvictimization (Model 2) are significantly associated with both child behavior problems and PTSD symptoms. Parenting stress, however, was only significantly related to the presence of polyvictimization—not how many times a child had been exposed to violence overall.

When lifetime exposure frequency is examined according to the category of exposure (Model 3), child behavior problems were significantly associated with the lifetime frequency of physical assault, sexual abuse, and the experience of

Table 3. Unadjusted Association Between Total Lifetime Violence Exposure and Symptoms

	Model 1			Model 2			Model 3		
	B	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Child behavior problems									
Total lifetime exposure frequency	0.01	0.00	0.27*	0.01	0.00	0.16*			
Polyvictimization (=1)				0.48	0.07	0.25*	0.47	0.07	0.24*
Frequency of maltreatment[a]							0.01	0.01	0.05
Frequency of witnessing[a]							0.01	0.00	0.08
Frequency of assault[a]							0.01	0.00	0.07*
Frequency of sexual abuse							0.03	0.01	0.05*
Model R^2	0.07			0.12			0.13		
Child PTSD symptoms									
Total lifetime exposure frequency	0.19	0.05	0.27*	0.14	0.04	0.19*			
Polyvictimization (=1)				5.13	0.78	0.19*	4.97	1.01	0.19*
Frequency of maltreatment							0.24	0.21	0.11
Frequency of witnessing							0.13	0.06	0.11
Frequency of assault							0.03	0.07	0.02
Frequency of sexual abuse							0.65	0.16	0.09*
Model R^2	0.07			0.11			0.11		
Parenting stress									
Total lifetime exposure frequency	0.23	0.11	0.19	0.12	0.10	0.10			
Polyvictimization (=1)				9.63	1.36	0.20*	9.38	1.56	0.20*
Frequency of maltreatment							0.09	0.22	0.03
Frequency of witnessing							0.08	0.11	0.04
Frequency of assault							0.23	0.12	0.07
Frequency of sexual abuse							0.25	0.20	0.02
Model R^2	0.03			0.07			0.07		

[a]These coefficients appear equal due to rounding and the −1 to 1 scale of the dependent variable.
*$p < .05$.

polyvictimization. PTSD symptoms were also significantly associated with the lifetime frequency of sexual abuse and polyvictimization. Only the presence of polyvictimization was significantly related to the parenting stress measure, not the frequency of any particular category of violence exposure.

To examine the extent to which these results could be explained by differing demographic characteristics or variation between the nine different sample enrollment sites, multivariate models were estimated including these control variables. Tables 4, 5, and 6, present the results of the models estimated for each symptom (site fixed effect variable results are not shown). In each model, White is the excluded race/ethnicity variable, less than high school is the excluded caregiver education variable, and full time is the excluded caregiver employment variable. In each table, dichotomous variables are identified with a listing of the high value (=1) shown next to the variable name. The low value equals 0 in each case.

Table 4 presents the results for child behavior problems. Like the unadjusted results in Table 3, Model 1 shows a significant relationship between behavior problems and the frequency of total lifetime exposure. Adjusting for demographic and site fixed effects, however, influenced the results of Model 2: total lifetime exposure frequency is no longer significant in the model with the dichotomous polyvictimization variable . In other words, total lifetime frequency appears less important than whether those experiences are spread across more than one category of violence exposure. Model 3 further elaborates this finding. Even when the frequency of specific exposure categories was taken into account, polyvictimization emerged as the only significant predictor of increased child behavior problems in the adjusted models.

Table 5 presents the results for the child PTSD symptoms. Like the unadjusted results, Models 1 and 2 show that both total lifetime exposure frequency and polyvictimization have an independent and significant association with PTSD symptoms. When lifetime frequency of specific exposure categories is taken into account (Model 3), polyvictimization again independently predicts PTSD symptoms. Furthermore, frequency of sexual abuse victimization was the only exposure category to emerge as a significant predictor of PTSD symptoms.

In the adjusted models for parenting stress, like the unadjusted models, total lifetime exposure frequency was not significant alone or when polyvictimization was held constant (see Table 6 Models 1 and 2, respectively). As Model 3 in Table 6 shows, polyvictimization was the lone exposure variable significantly predictive of elevated parenting stress.

Table 4. Adjusted Association Between Lifetime Violence Exposure and Child Behavior Problems

	Model 1 *n* = 713			Model 2 *n* = 713			Model 3 *n* = 599		
Child Behavior Problems	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Total lifetime exposure frequency	0.01	0.00	0.18*	0.01	0.00	0.12			
Polyvictimization (=1)				0.32	0.08	0.16*	0.36	0.08	0.19*
Frequency of maltreatment							0.01	0.01	0.05
Frequency of witnessing							0.00	0.00	0.05
Frequency of assault							0.00	0.00	0.04
Frequency of sexual abuse							0.00	0.01	0.01
Caregiver is mother (=1)	−0.09	0.10	−0.03	−0.09	0.10	−0.03	−0.11	0.11	−0.03
Caregiver age	−0.01	0.00	−0.07	−0.01	0.01	−0.07	−0.01	0.01	−0.08
Child age	0.03	0.02	0.09	0.03	0.02	0.07	0.02	0.02	0.06
Hispanic race/ethnicity (=1)	−0.13	0.11	−0.06	−0.10	0.10	−0.05	−0.00	0.11	0.00
Black race/ethnicity (=1)	−0.32	0.06	−0.14*	−0.30	0.06	−0.13*	−0.21	0.08	−0.10*
Other race/ethnicity (=1)	−0.13	0.07	−0.06	−0.11	0.08	−0.05	−0.08	0.09	−0.04
Caregiver born in the U.S. (=1)	0.22	0.06	0.11*	0.23	0.07	0.12*	0.20	0.07	0.10*
Education: high school/GED (=1)	−0.06	0.09	−0.03	−0.06	0.10	−0.03	−0.04	0.06	−0.02
Education: college (=1)	0.03	0.08	0.01	0.01	0.08	0.01	−0.01	0.07	0.00
Employed: part time (=1)	−0.28	0.15	−0.09	−0.24	0.13	−0.08	−0.24	0.13	−0.08
Employed: none but seeking (=1)	−0.23	0.04	−0.10*	−0.23	0.06	−0.11*	−0.19	0.09	−0.09
Employed: retired or not seeking (=1)	−0.11	0.03	−0.06*	−0.12	0.03	−0.06*	−0.10	0.03	−0.05*
Caregiver: good/excellent health (=1)	−0.16	0.07	−0.08	−0.14	0.07	−0.07	−0.08	0.07	−0.04
Child: good/excellent health (=1)	−0.40	0.09	−0.12*	−0.40	0.10	−0.12*	−0.28	0.14	-0.08
Living with spouse/partner (=1)	−0.09	0.07	−0.04	−0.07	0.08	−0.03	−0.06	0.06	−0.03
No. of children under 18 in home	0.03	0.02	0.04	0.03	0.02	0.04	0.04	0.02	0.05
Child sex (male = 1, female = 0)	0.11	0.11	0.06	0.11	0.10	0.06	0.09	0.11	0.05
Sum of caregiver resource problems	0.04	0.00	0.24*	0.04	0.00	0.24*	0.04	0.01	0.23*
Model R^2	0.29			0.31			0.31		

*$p < .05$.

Discussion and Conclusions

The goal of this study is to present a nuanced look at the relationship of violence exposure to several negative symptoms that have been previously identified in the literature. The study employed a large sample of children recruited to participate in intervention research due to their previous exposure

Table 5. Adjusted Association Between Lifetime Violence Exposure and Child PTSD Symptoms

	Model 1 *n* = 555			Model 2 *n* = 555			Model 3 *n* = 467		
Child PTSD symptoms	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Total lifetime exposure frequency	0.15	0.05	0.21*	0.12	0.04	0.17*			
Polyvictimization (=1)				3.06	0.95	0.11*	3.48	1.39	0.13*
Frequency of maltreatment							0.24	0.19	0.12
Frequency of witnessing							0.12	0.08	0.11
Frequency of assault							–0.02	0.08	–0.01
Frequency of sexual abuse							0.23	0.10	0.03*
Caregiver is mother (=1)	0.11	1.08	0.00	0.20	1.17	0.00	–0.21	1.78	0.00
Caregiver age	–0.09	0.07	–0.05	–0.08	0.07	–0.05	–0.07	0.08	–0.04
Child age	0.35	0.26	0.05	0.29	0.24	0.04	0.07	0.26	0.01
Hispanic race/ethnicity (=1)	0.19	2.34	0.01	0.42	2.31	0.01	1.42	2.55	0.05
Black race/ethnicity (=1)	–1.30	2.31	–0.04	–1.22	2.31	–0.04	0.06	2.61	0.00
Other race/ethnicity (=1)	0.51	1.87	0.02	0.61	1.85	0.02	0.72	1.90	0.02
Caregiver born in the U.S. (=1)	0.50	0.96	0.02	0.59	0.88	0.02	0.06	0.93	0.00
Education: high school/GED (=1)	–0.27	1.52	–0.01	–0.34	1.59	–0.01	–0.00	1.13	0.00
Education: college (=1)	–1.01	1.26	–0.04	–1.28	1.14	–0.05	–1.97	1.12	–0.07
Employed: part time (=1)	–1.32	2.46	–0.03	–1.17	2.32	–0.03	–1.27	2.17	–0.03
Employed: none but Seeking (=1)	–1.83	1.74	–0.06	–1.76	1.81	–0.06	–0.70	1.90	–0.02
Employed: retired or not seeking (=1)	–0.70	0.99	–0.03	–0.77	0.92	–0.03	–0.42	1.08	–0.02
Caregiver: good/excellent health (=1)	–4.04	0.68	–0.15*	–3.72	0.67	–0.13*	–2.92	0.75	–0.11*
Child: good/excellent health (=1)	–4.57	2.03	–0.10	–4.39	2.16	–0.09	–2.51	2.64	–0.05
Living with spouse/partner (=1)	–2.19	1.31	–0.07	–2.05	1.37	–0.07	–1.43	1.07	–0.05
No. of children under 18 in home	–0.45	0.27	–0.05	–0.40	0.24	–0.04	–0.40	0.28	–0.04
Child sex (male = 1, female = 0)	1.65	0.89	0.06	1.50	0.80	0.06	1.41	0.74	–0.06
Sum of caregiver resource problems	0.31	0.10	0.13*	0.30	0.10	0.12*	0.27	0.11	0.12*
Model R^2	0.25			0.26			0.26		

*$p < .05$.

to violence. Caregivers reported that the children in the sample were exposed to an average of nearly 15 incidents of violence in their lifetime. This is a substantial number considering that the average child age was just under five and 75% were younger than 6.5 years. Witnessing violence was the most common category of lifetime exposure and the category most frequently experienced. Just over half (56%) were exposed to more than one category of violence in their lifetime.

Table 6. Adjusted Association Between Lifetime Violence Exposure and Parenting Stress

	Model 1 $n = 749$			Model 2 $n = 749$			Model 3 $n = 632$		
Parenting Stress	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Total lifetime exposure frequency	0.15	0.09	0.12	0.10	0.07	0.08			
Polyvictimization (=1)				5.42	1.73	0.11*	6.28	1.61	0.13*
Frequency of maltreatment							0.11	0.18	0.03
Frequency of witnessing							0.04	0.14	0.02
Frequency of assault							0.17	0.14	0.05
Frequency of sexual abuse							–0.29	0.18	–0.02
Caregiver is mother (=1)	0.72	3.07	0.01	0.83	3.26	0.01	0.56	4.14	0.01
Caregiver age	–0.04	0.13	–0.02	–0.03	0.13	–0.01	–0.06	0.16	–0.02
Child age	0.79	0.58	0.09	0.66	0.63	0.08	0.78	0.62	0.09
Hispanic race/ethnicity (=1)	–2.76	3.09	–0.05	–2.15	3.12	–0.04	–1.90	2.43	–0.04
Black race/ethnicity (=1)	–0.39	2.19	–0.01	0.01	2.17	0.00	–0.57	2.06	–0.01
Other race/ethnicity (=1)	–2.67	1.62	–0.05	–2.33	1.68	–0.04	–2.87	1.47	–0.05
Caregiver born in the U.S. (=1)	–3.67	2.76	–0.07	–3.43	2.75	–0.07	–4.91	3.11	–0.10
Education: high school/GED (=1)	–2.92	3.85	–0.06	–2.97	4.12	–0.06	–2.35	3.35	–0.05
Education: college (=1)	–6.21	2.26	–0.13*	–6.56	2.23	–0.13*	–7.39	2.60	–0.15*
Employed: part time (=1)	–3.93	1.74	–0.05	–3.38	1.70	–0.05	–2.41	2.01	–0.03
Employed: none but seeking (=1)	–1.52	2.23	–0.03	–1.65	2.40	–0.03	–0.17	3.22	0.00
Employed: retired or not seeking (=1)	0.88	1.16	0.02	0.66	1.19	0.01	1.46	1.52	0.03
Caregiver: good/excellent health (=1)	–6.66	1.03	–0.13*	–6.33	1.05	–0.13*	–3.78	0.97	–0.08*
Child: good/excellent health (=1)	–8.97	1.77	–0.10*	–8.91	1.85	–0.10*	–8.30	2.37	–0.09*
Living with spouse/partner (=1)	0.31	1.82	0.01	0.70	2.06	0.01	–0.61	1.85	–0.01
No. of children under 18 in home	0.59	0.41	0.04	0.64	0.42	0.04	0.41	0.31	0.02
Child sex (male = 1, female = 0)	0.18	2.54	0.00	0.17	2.36	0.044	0.18	2.86	0.00
Sum of caregiver resource problems	1.11	0.15	0.26*	1.09	0.15	0.26*	1.05	0.17	0.25*
Model R^2	0.27			0.28			0.28		

*$p < .05$.

In testing for relationships between violence exposure and negative symptoms, the most striking result is that polyvictimization (defined as exposure to broad categories of violence rather than to specific types), emerged as a consistently important predictor. Significant relationships were identified across each of the three symptoms in all unadjusted and adjusted models.

In testing different definitions of polyvictimization, we found that only a dichotomous variable was needed to capture this effect. Exposure to two or more different categories of violence exhibited significantly worse symptoms

than those exposed to a single category, regardless of the frequency of that lifetime exposure. In other words, a minimum of two categories was the "tipping point" in these data. Breaking polyvictimization out to include three or more categories did not yield comparatively different findings. It is also noteworthy that, in the presence of a dichotomous measure of polyvictimization (see Tables 4, 5, and 6), total lifetime frequency of exposure was not independently related to two of the three symptoms in adjusted models. Moreover, the lifetime frequency of violence exposure was not significantly related to parenting stress in any unadjusted model.

No single category of violence exposure independently influenced child behavior problems or parenting stress. Polyvictimization alone emerged as the significant predictor of these symptoms. Child PTSD symptoms, however, were independently related to both polyvictimization and frequency of sexual abuse. Though their measurement of polyvictimization differed, this PTSD finding is consistent with the results of Turner et al. (2010), using the same measure of PTSD symptoms.

Taken together, these findings suggest that total lifetime exposure is not particularly important to negative symptoms, nor is any particular category of exposure after controlling for polyvictimization, with the single exception of sexual abuse and PTSD symptoms. Instead, it is the mix of exposure experiences that predict negative impacts on children. These results are counter to the growing chorus of concerns about children witnessing violence in particular. At least among the young children recruited to participate in an intervention due to their identified violence exposure, witnessing violence alone did not influence symptoms. Children were negatively impacted when they had multiple exposures of any sort. The amount and category of exposure was largely unimportant, except in the case of trauma symptoms and experiences of sexual abuse.

Although this study is unique in that it explored violence exposure in some depth with a large and diverse sample of violence-exposed children, it is also limited by its cross-sectional nature. The findings presented here identify only associations between the measures. They cannot support statements about causal direction or rule out the possibility that these relationships are spurious. Moreover, the available data do not contain much depth of information about the individual incidents of violence. For example, in most cases, the relationship of the perpetrator of the violence to the child was unknown, as was the extent of the physical harm or emotional pain caused as a result of reported incidents. Both of these factors could be expected to be related to the issues under study here. Moreover, the broad exposure categories employed here grouped together exposure types that may have very different impact on

children (e.g., witnessing a murder vs. witnessing someone being hit or hurt without a weapon). It could be that results would differ if categories were defined according to the degree of impact on the child experiencing or observing the violence rather than the broad characteristics of the events themselves.

Because of the young age of this sample, children were not asked to self-report their own exposure to violence. Thus, there is likely to be reporting bias on the part of the caregivers, who may not recall, be aware of, or be willing to disclose the full extent of their child's lifetime violence exposure. Likewise, caregiver report is vulnerable to bias in reporting on the symptoms of interest. The overall effects of caregiver bias on these results are unknown and therefore future research examining these issues in other data sets is necessary.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was made possible through a grant (2009-IJ-CX-0072) provided by the U.S. Department of Justice's Office of Juvenile Justice and Delinquency Prevention (OJJDP).

References

Acosta, J., Barnes, D., Harris, R., Francois, T., Hickman, L. J., Jaycox, L., & Schultz, D. (2012). An examination of measures related to children's exposure to violence for use by both practitioners and researchers. *Trauma, Violence, & Abuse*, *13*(4), 187-197.

Bell, C. C., & Jenkins, E. J. (1993). Community Violence and Children on Chicago's Southside. *Psychiatry Interpersonal and Biological Processes*, *56*, 46-54.

Berman, S. L., Kurtines, W. M., Silverman, W. K., & Serafini, L. T. (1996). The impact of exposure to crime and violence on urban youth, *American Journal of Orthopsychiatry*, *66*, 329-336.

Bowen, N. K., & Bowen, G. L. (1999) Effects of crime and violence in neighborhoods and schools on the school behavior and performance of adolescents. *Journal of Adolescent Research*, *14*, 319-342.

Breslau, N., Davis, G. C., Peterson, E. L, & Schultz, L. (1997) Psychiatric sequelae of posttraumatic stress disorder in women. *Archives of General Psychiatry*, *54*, 81-87.

Briere, J., Johnson, K., Bissada, A., Damon, L., Crouch, J., Gil, E., et al. (2001). The Trauma Symptom Checklist for Young Children (TSCYC): Reliability and Association with Abuse Exposure in a Multi-Site Study. *Child Abuse and Neglect*, *25*, 1001-1014.

Briggs-Gowan, M. J., & Carter, A. S. (2002). *Brief infant toddler social and emotional assessment (BITSEA) manual*, Version 2.0. New Haven, CT: Yale University.

Briggs-Gowan, M. J., Carter, A. S., Irwin, J. R., Wachtel, K., & Cicchetti, D. V. (2004). The Brief Infant-Toddler Social and Emotional Assessment: Screening for social-emotional problems and delays in competence. *Journal of Pediatric Psychology*, *29*, 143-155.

Crusto, C. A., Whitson, M. L, Walling, S. M., Feinn, R., Friedman, S. R., & Reynolds, J., Mona, A., Joy, S. K. (2010). Posttraumatic stress among young urban children exposed to family violence and other potentially traumatic events. *Journal of Traumatic Stress*, *23*, 716-724.

Delaney-Black, V., Covington, C., Ondersma, S. J., Nordstrom-Klee, B., Templin, T., & Ager, J., James, J., Robert, J. S. (2002). Violence exposure, trauma, and IQ and/or reading deficits among urban children. *Archives of Pediatrics & Adolescent Medicine*, *156*, 280-285.

Farrell, A. D., & Bruce, S. E. (1997). Impact of exposure to community violence on violent behavior and emotional distress among urban adolescents. *Journal of Clinical Child Psychology*, *26*, 2-14.

Finkelhor, D., Ormrod, R. K., Turner, H. A., & Hamby, S. L. (2005). Measuring poly-victimization using the JVQ. *Child Abuse & Neglect*, *29*, 1297-1312.

Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2007a) Poly-victimization: A neglected component in child victimization. *Child Abuse & Neglect*, *31*, 7-26.

Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2007b). Poly-victimization and trauma in a national longitudinal cohort. *Development and Psychopathology*, *19*, 149-166.

Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2009). Lifetime assessment of poly-victimization in a national sample of children and youth. *Child Abuse & Neglect*, *33*, 403-411.

Finkelhor, D., Turner, H., Ormrod, R., Hamby, S., & Kracke, K. (2009). *Children exposed to violence: A comprehensive national survey*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice.

Garbarino, J., Dubrow, N., Kostelny, K., & Parto, C. (1992). *Children in danger: Coping with the consequences of community violence*. San Francisco, CA: Jossey Bass.

Gewirtz, A. H., Degarmo, D. S., & Medhanie, A. (2011). Effects of mother's parenting practices on child internalizing trajectories following partner violence. *Journal of Family Psychology*, *25*, 29-38.

Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *Lancet*, *373*, 68-81.

Grogger, J. (1997). Local violence and educational attainment. *Journal of Human Resources*, *32*, 659-682.

Hall, L. (1983). *Social supports, everyday stressors, and maternal mental health* (Unpublished doctoral dissertation). Chapel Hill: University of North Carolina at Chapel Hill.

Hall, L., & Farel, A. M. (1988). Maternal stresses and depressive symptoms: Correlates of behavior problems in young children. *Nursing Research*, *37*, 156-161.

Hamby, S. L., Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2004a). *The Juvenile Victimization Questionnaire (JVQ): Caregiver version*. Durham, NH: Crimes Against Children Research Center.

Hamby, S. L., Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2004b). *The Juvenile Victimization Questionnaire (JVQ): Administration & scoring manual*. Durham, NH: Crimes against Children Research Center (CV55).

Huber, P. J. (1967) The behavior of maximum likelihood estimates under nonstandard conditions. In *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability* (pp. 221-233). Berkeley, CA: University of California Press.

Hurt, H., Malmud, E., Brodsky, N .L., & Giannetta, J. (2001). Exposure to violence: Psychological and academic correlates in child witnesses. *Archives of Pediatrics & Adolescent Medicine*, *155*, 1351.

Hyde, M. M., Krake, K., Jaycox, L. H., & Schultz, D. (2008). The safe start initiative: Advancing system and practice responses to children exposed to violence. *Protecting Children*, *22*, 80-95.

Jaycox, Lisa H., Hickman, Laura J., Schultz, D., Barnes-Proby, D., Setodji, Claude M., Kofner, A., Harris, Racine, Acosta, Joie, & Francois, T. (2011). *National Evaluation of Safe Start Promising Approaches: Assessing Program Outcomes*. Santa Monica, CA: RAND Corporation.

Kliewer, W., Lepore, S. J, Oskin, D., & Johnson, P. D. (1998). The role of social and cognitive processes in children's adjustment to community violence. *Journal of Consulting & Clinical Psychology*, *66*, 199-209.

Kracke, K., & Hahn, H. (2008). Nature and extent of childhood exposure to violence: What we know, why we don't know more, and why it matters. *Journal of Emotional Abuse*, *8*, 29-49.

Lansford, J. E., Dodge, K. A., Pettit, G. S., Bates, J. E., Crozier, J., & Kaplow, J. (2002). A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence. *Archives of Pediatrics and Adolescent Medicine*, *156*, 824-830.

Martinez, P., & Richters, J. E. (1993) The NIMH community violence project: II. Children's distress symptoms associated with violence exposure. *Psychiatry Interpersonal and Biological Processes*, *56*, 22-35.

Morris, E. (2009) *Youth violence: Implications for posttraumatic stress disorder in urban youth, issue report*. Washington, DC: National Urban League Policy Institute.

Peterson, J. L., & Zill, N. (1986). Marital disruption, parent-child relationships, and behavioral problems in children. *Journal of Marriage and the Family*, *48*, 295-307.

Pollio, E. S., Glover-Orr, L. E., & Wherry, J. N. (2008). Assessing Posttraumatic Stress Disorder Using the Trauma Symptom Checklist for Young Children. *Journal of Child Sexual Abuse, 17*(1), 89-100.

Reitman, D., Currier, R. O., & Stickle, T. R. (2002). A critical evaluation of the Parenting Stress Index-Short Form (PSI-SF) in a head start population. *Journal of Clinical Child and Adolescent Psychology*, *31*, 384-392.

Richmond, J. M., Elliott, A. N., Pierce, T. W., Aspelmeier, J. E., & Alexander, A. A. (2009). Poly-victimization, childhood victimization, and psychological distress in college women. *Child Maltreatment*, *14*, 127-147.

Samejima, F. (1997). Graded response model. In W. J. van der Linden & R. K. Hambleton (Eds.), *Handbook of modern item response theory* (pp. 85-100), New York, NY: Springer-Verlag.

Schwartz, D., & Gorman, A. H. (2003). Community violence exposure and children's academic functioning. *Journal of Educational Psychology*, *95*, 163-173.

Schultz, D., Jaycox, L. H., Hickman, L. J., Chandra, A., Barnes-Proby, D., Acosta, J., Beckman, A., Francois, T., & Honess-Morreale, L. (2010). *National Evaluation of Safe Start Promising Approaches: Assessing Program Implementation.* Santa Monica, CA: RAND Corporation.

Singer, M. I., Anglin, T. M, Song, L. Y., & Lunghofer, L. (1995). Adolescents' exposure to violence and associated symptoms of psychological trauma. *Journal of the American Medical Association*, *273*, 477-482.

Schultz, D., Jaycox, L. H., Hickman, L. J., Setodji, C., Kofner, A., Harris, R., & Barnes, D. (in press). The relationship between protective factors and outcomes for children exposed to violence. *Violence and Victims*.

Thissen, D. (1991). *Multilog user's guide; multiples, categorical item analysis and test scoring using item response theory*. Chicago, IL: Scientific Software.

Turner, H. A., Finkelhor, D., & Ormrod, R. (2010). Poly-victimization in a national sample of children and youth. *American Journal of Preventive Medicine*, *38*, 323-330.

White, H. (1980). A heteroskedascity-consistent covariance matrix estimator and a direct test of heteroskedascity. *Econometrica*, *48*, 817-830.

Bios

Laura J. Hickman, PhD, is an associate professor and associate director of the Criminal Justice Policy Research Institute at Portland State University. She earned her PhD in Criminology and Criminal Justice from the University of Maryland. She served as coprincipal investigator for the National Evaluation of Safe Start Promising Approaches Phase 1 and conducted and published a variety of studies on the topic of violence, victimization, and criminal justice policy.

Lisa H. Jaycox, PhD, is a senior behavior scientist at RAND Corporation. She earned her PhD in Clinical Psychology from the University of Pennsylvania and has combined clinical and research expertise in the areas of child and adolescent mental health problems, including depression and reactions to violence exposure such as post-traumatic stress disorder. She serves as principal investigator for the National Evaluation of Safe Start Promising Approaches Phase 1 and 2, and has studied and published widely in areas related to school-based interventions, mental health impact of military deployments and evaluation of mental health services.

Claude M. Setodji, PhD, is a statician at the RAND Corporation and received his PhD in statistics from University of Minnesota. His interest includes the applications of statistics to public policy, causal inference, data reduction, and visualization. He has done work in value added-modeling approaches for teacher and school accountability, quality of childcare centers and childcare development as well as the quality of the health care. He also leads the statistical analyses on the National Evaluation of Safe Start Promising Approaches Phase 1 and 2.

Aaron Kofner, MA MS, is a research programmer at the RAND Corporation. He has a master of arts in urban planning and transportation from UCLA and a master of science in applied economics and management from Cornell. He has worked as an environmental quantitative analyst at the Cadmus Group and as an economist at the Bureau of Labor Statistics. He has participated in a number of studies focused on violence and crime policy, including the National Evaluation of Safe Start Promising Approaches Phase 1 and 2.

Dana Schultz, MPP, is a policy analyst at the RAND Corporation. She has led or coled several projects involving process and outcome evaluation design, implementation, and analysis. Her research focuses on child welfare and children's exposure to violence. She serves on the leadership team for the National Evaluation of Safe Start Promising Approaches Phase 1 and serves as coprincipal investigator for Phase 2.

Dionne Barnes-Proby, MSW, is a senior research project manager at the RAND Corporation. Her research experience includes juvenile justice, education, health, welfare reform, and substance abuse. Studies include the implementation and evaluation of interventions for youth in foster care, an evaluation of welfare reform throughout California, an assessment of juvenile justice programs in Los Angeles County, and an assessment of young homeless women transitioning into adulthood. She serves as lead project manager for National Evaluation of Safe Start Promising Approaches Phase 1 and 2.

Racine Harris, BS, is a research assistant at RAND. She primarily works on health related studies, including healthcare quality, health promotion and disease prevention, and health disparities. Previously, she worked as a research program coordinator at the Johns Hopkins University Center for Immunization Research. She serves as research assistant on both National Evaluation of Safe Start Promising Approaches Phase 1 and 2.