Prev Sci
DOI 10.1007/s11121-012-0344-8

Behavioral Adaptation Among Youth Exposed to Community Violence: a Longitudinal Multidisciplinary Study of Family, Peer and Neighborhood-Level Protective Factors

Sonia Jain · Alison Klebanoff Cohen

Abstract Several studies across fields have documented the detrimental effects of exposure to violence and, separately, the power of developmental assets to promote positive youth development. However, few have examined the lives of youth exposed to violence who demonstrate resilience (that is, positive adjustment despite risk), and hardly any have examined how developmental assets may shape resilient trajectories into adulthood for youth exposed to violence. What are these resources and relationships that high-risk youth can leverage to tip the balance from vulnerability in favor of resilience? We used generalized estimating equations to examine multilevel longitudinal data from 1,114 youth of ages 11–16 from the Project on Human Development in Chicago Neighborhoods. Behavioral adaptation was a dynamic process that varied over time and by level of violence exposure. In the short term, being a victim was associated with increased aggression and delinquency. In the long term though, both victims and witnesses to violence had higher odds of behavioral adaptation. Baseline family support and family boundaries, friend support, neighborhood support, and collective efficacy had positive main effects for all youth. Additionally, having family support, positive peers, and meaningful opportunities for participation modified the effect of exposure to violence and increased odds of behavioral adaptation over time. Policies, systems, and programs across sectors should focus on building caring relationships/supports with family members and friends, positive peers, and meaningful opportunities especially for witnesses and victims of violence, to promote behavioral resilience and related outcomes into adulthood for high-risk youth.

S. Jain · A. K. Cohen (✉)
Health and Human Development Program, WestEd,
Oakland, CA, USA
e-mail: acohen@wested.org

S. Jain
e-mail: sjain@wested.org

Published online: 13 February 2013

Keywords Adolescents · Multilevel analysis · Resilience · Urban health · Violence

Introduction

Adolescents living in urban neighborhoods regularly witness or are victims of community violence. Nationally representative estimates range from one third of girls and one half of boys witnessing community violence to 70 % experiencing violent crime during adolescence (Aisenberg and Herrenkohl 2008), making it necessary for them to negotiate and adapt to interpersonal violence as part of their development (Ozer and Weinstein 2004). Many (estimated as high as 70 %) young or adult offenders or perpetrators of crime tend to have a history of child abuse/neglect or other forms of violence exposure (Jennings et al. 2012). This is particularly common among urban minority youth (Maldonado-Molina et al. 2010; Reingle and Maldonado-Molina 2012), emphasizing the importance of intervening early and modifying/buffering the effects of violence exposure and providing opportunities and services/supports to help youth exposed to violence cope and recover towards resilience (Reid and Sullivan 2012).

Exposure to violence affects the behavioral trajectories of individuals over the course of their lives (Bacchini et al. 2011; Cooley-Strickland et al. 2009; DuRant et al. 1994; Kliewer et al. 2004; Lambert et al. 2008; McDonald and Richmond 2008; Wilson et al. 2009), as well as psychosocial, academic, and positive developmental outcomes (Osofsky 2003; Sampson et al. 1997). However, there is considerable evidence that youth functioning varies substantially among those exposed to violence (Margolin, 2005), with a significant portion of youth successfully adapting over time in spite of adversities (Benard 2004; DuRant et al. 1994; Garmezy et al. 1984; Masten et al. 1999; Werner and Smith 2001). A resilience perspective

suggests that youth may bounce back from adversity, cope, and recover constructively towards "normal" health in a few years (Luthar et al. 1993). Resilience is the process of positive adaptation despite risks and adversity (Garmezy et al. 1984; Luthar 2003), typically due to protective factors buffering and/or modifying the effect of risk factors (Rutter 1985). In this study, we examine how peer-, family-, and neighborhood-specific protective factors may buffer the effects of violence exposure to contribute to behavioral adaptation, that is functioning within the normal or better range of behavioral problems from a developmental perspective (Masten and Obradovic 2006).

Given that violence, especially in urban neighborhoods, is an enduring problem of epidemic proportions (Thornberry et al. 1995), it is imperative not only to focus on prevention of risk factors but also to understand more about the processes that promote positive development over time among adolescents exposed to violence. Individual, family, peer, and neighborhood factors appear to each modify the effect of exposure to violence on positive adjustment (Aisenberg and Herrenkohl 2008). This is illustrative of the ecological transactional framework (Cicchetti and Lynch 1993; Dawes and Donald 2000; Overstreet and Mazza 2003), which nests the developing child within the dynamic social context of family, community, and society. The developmental assets framework also discusses assets at multiple levels as they relate to key developmental processes (Benson 2002; Benson et al. 1998; Leffert et al. 1998). For example, the Search Institute (Benson 2002) highlights four external developmental assets, including supportive relationships, empowerment, boundaries and expectations, and constructive use of time. Aligned with resilience theory, the developmental assets framework suggests that meaningful opportunities and relationships with adults are positive experiences that, when reinforced by systems and policies, can protect youth from exposure to violence's harmful psychosocial and biological effects, prevent them from engaging in future high-risk violent behaviors, and enhance positive behavioral and related developmental outcomes (Scales 1999). The overlap between the developmental assets and ecological–transactional frameworks can complement, strengthen, and expand existing resilience research and practice.

However, much of the research has focused on factors at only one level, thereby limiting our understanding of how individual youth nested within families within communities may be comprehensively protected and nurtured (Fergus and Zimmerman 2005; Ungar 2011). Protective factors promote the likelihood of attaining positive outcomes and lessen the likelihood of negative consequences of risks like violence exposure (Jessor et al. 1998). Protective factors include individual-level factors such as educational attainment (Krohn et al. 2010); peer-level factors such as friend support (Harding 2009; Harding 2008; Molnar et al. 2008); family-level factors such as parental presence, parental support, and home environment (Beyers et al. 2003; Gorman-Smith et al. 2004; Hammack et al. 2004; Kliewer et al. 2004; Lynch and Cicchetti 1998; Yang et al. 2007); and community-level factors such as social capital (Campbell and Schwarz 1996; Leventhal and Brooks-Gunn 2000; Youngblade et al. 2007). However, few studies have examined how these factors at multiple levels, within the context of developmental assets framework, affect youth exposed to violence (Jain et al. 2012).

Additionally, numerous longitudinal studies have considered psychological resilience among children exposed to other adversities like chronic poverty (Garmezy 1985), parental psychopathology (Rutter 1985; Werner and Smith 1992), and child abuse and neglect (Garbarino et al. 1992)—but surprisingly little research has documented resilience in multiple domains of functioning among youth exposed to community violence. This strengths-based study capitalizes on the multilevel, multiwave data available from the Project on Human Development in Chicago Neighborhoods (PHDCN), to document domain-specific resilience and assess the relevance of developmental assets at home, among peers, and in the community that may contribute to their behavioral adaptation over time. In particular, we are interested in how protective factors (from multiple domains) interact with exposure to violence to affect behavioral adaptation. Behavioral adaptation has implications for achieving stage-salient milestones in relevant domains in early adulthood, including having jobs, healthy intimate relationships, social competence, typical emotional or behavioral issues, and other youth-defined successes (Roisman et al. 2004).

Methods

Dataset

We utilized data from the PHDCN, which collects neighborhood-, family-, and individual-level data over three waves during adolescence and young adulthood. Our final sample of 1,114 youth is composed of all 12- and 15-year-old youth with nonmissing data at baseline (i.e., cohorts 12 and 15) from the PHDCN's Longitudinal Cohort Study of Adolescents, neighborhood data from community-based surveys, and census data and police department homicide data for additional neighborhood-level variables. We opted to use cohorts 12 and 15 for this study for several reasons, including because: (1) exposure to community violence is highest during adolescent years and (2) adolescents are exposed to more potentially protective social spheres outside the home (e.g., peers, school, community) than children. We were also interested in measuring whether resilience sustains into early adulthood, driven by previous research and long-term implications. The Longitudinal

Cohort Study is a random sample of children and youth who were selected from a random sample of 80 neighborhood clusters at baseline using a multistage probability design. About 25 youth per neighborhood cluster were interviewed three times at 2–3-year intervals.

The neighborhood-level data were aggregated from a separate community survey conducted in 1994–1995 (baseline) of 8,872 randomly selected adult residents randomly sampled from 343 neighborhood clusters. It assessed their perceptions of their neighborhood quality, safety, and sense of community. Neighborhood clusters were geographically sensible and homogenous in terms of race/ethnicity, socioeconomic status, family structure, and housing density. The 1990 census and police homicide data from 1995 provided information about the crime rate and neighborhood structural variables. The sampling procedures and consent processes used in the PHDCN are described in detail elsewhere (Earls and Buka 1997).

Our final analytic sample included participants with nonmissing data at baseline who had the outcome measured at least once. Of the total 1,517 youth who participated in cohorts 12 and 15 at wave 1, 1,238 had complete data on exposure to violence, 100 were missing the outcome for one wave, and 39 were missing data on at least one covariate (these categories are not mutually exclusive). Assuming that data were missing at random, we used longitudinal models to impute values for the missing responses in subsequent waves when only one wave was missing data; if more than one wave was missing data, then no imputation was done. Our final sample included 1,114 youth in 78 neighborhoods. Participants dropped from the analysis were more likely to be Black, from single-parent families, and have fewer assets (e.g., family boundaries, collective efficacy, or other adult support), but they had similar externalizing problem scores and exposure to violence compared to the included participants.

Measures

Primary Dependent Variable: Behavioral Adaptation

Using a 14-item reduced version of Achenbach's Youth or Young Adult Self-Report scale (Achenbach 1991), a continuous externalizing problem score was calculated. This scale included nine items on aggression and five items on delinquency. For purposes of this study, a binary outcome variable which we refer to as behavioral adaptation was created to identify youth operating within a "normal or lower" range of externalizing problems: individuals less than 0.50 standard deviation above the gender-specific median were classified as "behaviorally adapted or resilient." Those with a high externalizing problem score, i.e., above the 0.50 standard deviation of the median, were coded as "not adapted." We purposely did not use the clinical cutoffs (*T* scores above >65 for externalizing problem score) to classify resilience because these scores are less sensitive, and there is greater potential for differential misclassification in our sample (i.e., more youth who are not well adjusted behaviorally would have been categorized as such). We opted to use average or better behavioral externalizing scores to define our outcome to reflect that nonexceptional functioning was still worth acknowledging, given the significant adversity (Luthar 2003; Owens and Shaw 2003; Zucker et al. 2003).

Primary Independent Variable: Exposure to Community Violence

Youth's exposure to 18 different violent events in the community in the past year was measured using the My ETV scale ((Buka et al. 1997; Kindlon et al. 1996; Selner-O'Hagan et al. 1998) at wave 2, the earliest wave for which a validated comprehensive measure of exposure to community violence is available. The My ETV scale assesses frequency, type, and intensity of exposure to different types of community violence, including seeing someone shoved, kicked, or punched; seeing someone attacked with a knife; hearing a gunshot; and seeing someone shot. In this study, no measures of violence in the home were included. Two subscales of *witnessing* (seven items; α=0.74) and *victimization* (seven items; α=0.57) were developed, as a sum of yes/no responses (Brennan et al. 2007). The psychometric properties of these scales have been tested in diverse populations using item-response theory and Rasch modeling (Brennan et al. 2007; Selner-O'Hagan et al. 1998). Based on the continuous scales, victims were defined as individuals who had been a victim of at least one act of violence (and may or may not have witnessed additional events), witnesses were those who had reported witnessing at least one act of violence in the past year but had not been victim to any, and nonexposed people neither witnessed nor were victim to violence. All the victims had witnessed at least one instance of violence (all youth who were victims had also witnessed violence), generating three exposure groups: unexposed, witnesses, and victims.

Protective Factors: Family, Peer, and Neighborhood Levels

The protective factors of interest were at the family, peer, and neighborhood levels and were potentially amenable to community intervention/change. We posit that these protective factors may promote behavioral adaptation and may also interact with exposure to violence. We identified measures from the PHDCN that corroborated with Search Institute (Benson and Leffert 1999) external assets of support, opportunities, boundaries and expectations, and empowerment and the California Healthy Kids Survey Resilience module (WestEd 2012). We then developed scales accordingly

based on aforementioned theory and empirical evidence. Neighborhood-level protective factors included social cohesion, neighborhood social capital, and collective efficacy (Sampson et al. 1997), as well as an index of organizations and services in the neighborhood.

We used exploratory factor analysis and item deletion reliability tests to identify multiple facets of caring relationships and support from within the Provision of Social Relations Instrument (Turner et al. 1983). We classified these as follows: (a) *family support* (six items; Cronbach's α=0.73), (b) *friend support* (eight items; α=0.71), and (c) *other adult support* (four items, α=0.53). From the community survey data, we used Sampson's social cohesion subscale (Sampson et al. 1997) to create a *neighborhood support* variable (α=0.80), a sum of five Likert-scaled items about residents' willingness to help, trust each other, get along, share the same values, and perceive the community as close-knit.

Protective factors within the developmental assets framework domain of "expectations and boundaries" were identified by peers, family members, and community. *Positive peer influence* used ten items from the Deviance of Peers survey developed and validated by Huizinga et al. (1991) (α=0.62) to capture whether friends model responsible behavior, e.g., the number involved in sports, community, religious activities, family, and after-school activities, or were considered good students or good citizens. A *family boundaries and expectations scale* which was administered as part of the Home Environment Survey included 13 items (Caldwell and Bradley 1984) (α=0.63) assessing parental monitoring and having clear rules and consequences at home. The *neighborhood social control* scale (Sampson et al. 1997) (α=0.80), which was administered as part of the community survey to adult residents, was composed of five items that captured perception of neighborhood boundaries, i.e., neighbors will intervene if children are skipping school, hanging out on a street corner, or spray painting graffiti.

"Opportunities" were measured in terms of quantity and quality at the individual level. Quantity of opportunities was measured as amount of time spent in structured activities. To assess quality, we considered meaningful participation per week in school or after-school activities (*Youth Interview Schedule*, Philadelphia Family Management Study 1990). To assess neighborhood availability of opportunities, we used an *organizations and services* index, which included eight items on the presence of various local organizations and programs such as parks, block group, neighborhood watch group, mental health center, and six items on youth services such as recreational programs, after-school programs, and mentoring/counseling services. These data were collected at baseline (1995) by videotaping and coding characteristics of 80 sampled blocks from 343 neighborhood clusters in Chicago. All scales were individually standardized to have a mean of zero and standard deviation of one.

Neighborhood-level predictors: In addition to the above-noted neighborhood-level factors, we examined whether collective efficacy influenced behavioral adaptation, within the context of violence. Collective efficacy (Sampson et al. 1997) was calculated as a sum of the cohesion and social control subscales mentioned above based on aggregated independent resident responses from the community survey (α=0.89); higher scores represented greater collective efficacy.

Individual- and Neighborhood-Level Confounders

Sociodemographic variables that were controlled for in the analyses include age, gender, family socioeconomic position (composite of parental income, education, and occupational code), family structure, and race/ethnicity. We controlled for two neighborhood-level factors in the analyses. We constructed a measure of concentrated poverty, which was the first principal component of three US Census items: percent of persons unemployed, receiving public assistance, and living below the federal poverty line in 1990. We also used perceived violence in the community, which was a sum of five items on the community survey completed by a separate adult sample assessing how often the respondent had witnessed a robbery or mugging, a fight among neighbors, a fight with weapon, sexual assault or rape, or a gang fight in the last 6 months; a higher score represented greater perceived violence at baseline.

Analyses

All analyses were done using SAS version 9.0 (SAS Institute 1999). First, among the final sample of 1,114 youth, differences in protective factors and individual- and neighborhood-level characteristics were examined by ETV group using chi-square tests and *t* tests. We then considered the magnitude and significance of bivariate Pearson correlations between the primary outcome, risk of ETV, and protective factors. Systematic differences between respondents and nonrespondents were also examined.

Next, generalized estimating equations (GEE) with a logit function were estimated regressing intercept at wave 2 and change in log odds of behavioral adaptation between waves 2 and 3 onto individual and neighborhood-level predictors at baseline (Bryk and Raudenbush 1987; Liang and Zeger 1986; Subramanian et al. 2003). Unstructured within-subject correlations of binary response between waves 2 and 3 were modeled, partly to account for the temporal association between predictors and outcome and to adjust for clustering. GEE was the preferred analytic method for this study because GEE provides statistically robust estimates that adequately account for variation in the outcome at multiple levels, adjusts for expected autocorrelation across

time (within individuals) and space (between individuals within neighborhoods), and makes fewer assumptions while still allowing for population average estimates to be made (Fitzmaurice et al. 2004; Hanley et al. 2003; Hubbard et al. 2010; Wolfinger and Chang 1998).

Multilevel GEE models were sequentially built starting with a null model that included no predictors, then in order adding time (age), the primary risk variable (exposure-to-violence group), level 2 controls (sex, race, socioeconomic position, family structure), and level 3 controls (neighborhood perceived violence and concentrated poverty).

Results

Sample Characteristics

Table 1 presents the individual and neighborhood characteristics at baseline of 1,114 youth in 78 Chicago neighborhoods, stratified by the exposure-to-violence group. The total sample consisted of approximately half females and half males, and was highly racially/ethnically (35 % African American/Black, 48 % Hispanic, 15 % White, 3 % other) and socioeconomically diverse, with one out of three youth from a single-parent household. The unexposed was the smallest group (21.4 %); witnesses (44.8 %) were the plurality, and victims composed just over one third of the study population (33.8 %). The average age of participants at baseline was 13.5 years (range, 11–16), 15.5 years (range, 12–20) at wave 2, and 18.1 years (range, 15–22) at wave 3. There was no significant difference in age or socioeconomic position across groups. Blacks were overrepresented in the witness and victim groups compared to the unexposed (37 and 41 % vs. 20 %, $p<0.05$); whites were underrepresented among witnesses and victims (13 % each vs. 23 %, $p<0.05$); and Hispanics were more evenly represented in each group (45–54 %, $p>0.05$). Victims (55 %) were more likely than witnesses (48 %) and unexposed (40 %) to be male. Witnesses and victims were more likely to live in single-parent households (33 and 30 % vs. 21 %), and in poorer neighborhoods compared to the unexposed ($p<0.05$) (Table 1).

Table 1 Sample characteristics by exposure-to-violence group, N=1,114 youth in 78 neighborhoods, Project on Human Development in Chicago Neighborhoods

	Unexposed n=238 (21.4 %)	Witness group n=499 (44.8 %)	Victim group n=377 (33.8 %)
Individual-level covariates	Mean (SD)	Mean (SD)	Mean (SD)
Age at baseline (range, 11–16 years)	13.2 (1.5)	13.5 (1.5)	13.8 (1.5)
Socioeconomic position[a] (−2.60, 3.63)	0.03 (1.4)	−0.06 (1.4)	0.06 (1.5)
Sex	Percent	Percent	Percent
Male (n=542; 49 %)	40.3 %**	47.7 %**	55.2 %
Female (n=572; 51 %)	59.7 %**	52.3 %**	44.8 %
Race			
Black (n=384; 35 %)	20.2 %*,**	36.7 %	40.6 %
Hispanic (n=532; 48 %)	53.8 %	47.1 %	44.8 %
White (n=166; 15 %)	22.7 %*,**	12.8 %	12.7 %
Other race[b] (n=32; 3 %)	3.4 %	3.4 %	1.9 %
Family structure			
2 Biological parents (n=511; 46 %)	57.6 %*,**	45.7 %**	38.7 %
1 Biol–1 nonbiol (n=213; 19 %)	17.7 %**	17.2 %**	22.6 %
1 Biological parent (n=322; 29 %)	21.4 %*,**	29.5 %	32.9 %
2 Nonbiological parents (n=68; 6 %)	3.4 %*	7.6 %	5.8 %
Neighborhood level at baseline	Mean (SD)	Mean (SD)	Mean (SD)
Collective efficacy (−1.9, 2.6)	−0.04 (1.0)	−0.05 (0.9)	0.01 (1.0)
Organizational services (−0.2, 0.3)	0.17 (0.10)	0.16 (0.09)	0.17 (0.10)
Concentrated poverty[a] (−1.1 to 2.7)	−0.24 (0.77)*,**	−0.0 (0.76)	−0.0 (0.78)
Perceived violence (1.3–2.9)	1.93 (0.34)	1.96 (0.34)	1.93 (0.35)
Behavioral adaptation			
Wave 1	83.2 %*,**	71.5 %**	55.7 %
Wave 2	85.3 %*,**	70.2 %**	42.4 %
Wave 3	95.0 %*,**	88.8 %**	80.1 %
Over time	82.8 %*,**	63.7 %**	36.6 %

Sample size is based on complete data for cohort 12 and 15 at wave 2 for ETV, all covariates and nonmissings for both waves 2 and 3 outcome. The witness group includes youth who had witnessed at least one act of violence in the past year (=1); victim group (=1) includes youth who had been a victim of at least one act of violence and had witnessed one act or not. The unexposed group had witnessed or been a victim of no act of violence in the past year

*$p<0.05$ vs. witness group; **$p<0.05$ vs. victim group

[a]Socioeconomic status is based on principal component of parental income, education, and occupation. Neighborhood concentrated poverty is a principal component of percent poverty, percent unemployed, and the percent on public assistance

[b]Other race includes Asian, Pacific Islanders, and Native Americans

In terms of the protective factors, the unexposed group had significantly higher levels of baseline family support and positive peers compared to the other two groups, and victims reported significantly lower friend support, family boundaries, and positive peer influence than other exposure-to-violence groups. Other adult support, hours spent in structured activities, neighborhood cohesion, and neighborhood control were similar across all exposure-to-violence groups ($p>0.05$).

Behavioral adaptation varied over time and by level of risk exposure, ranging from 42 to 95 %. Victims were least likely to be behaviorally resilient at all three waves (37 %), followed by witnesses (64 %) and unexposed (83 %), as expected. Behavioral adaptation increased significantly for witnesses and victims by wave 3.

Multilevel GEE Models: Testing Main and Interactive Effects of Protective Factors

Tables 2, 3, and 4 display the results of the final conditional multilevel models of the generalized estimating equations, showing the association between exposure to violence, interactive effects of multilevel protective factors at baseline, and the odds of behavioral adaptation at wave 2 (intercept) and over time from wave 2 to wave 3 (slope), controlling for individual- and neighborhood-level covariates as well as wave 1 behavioral adaptation. A youth victim (odds ratio=0.72, 95 % CI 0.54, 0.97) or a witness (odds ratio=0.50, 95 % CI 0.35, 0.80) had lower odds of behavioral adaptation compared to the unexposed group ($p<0.05$), holding all other factors constant (Table 2). So, witnesses to violence had 50 % lower odds, and victims 28 % lower odds, of meeting the criteria for behavioral adaptation (i.e., have normal or better behavioral problems) than the unexposed group.

Support/Caring Relationships

All adolescents, regardless of exposure to violence, with higher baseline family ($p<0.05$) and friend support ($p<0.10$ borderline) had higher odds of behavioral adaptation at wave 2, i.e., have normal or better behavioral problems, and greater increase in resilience from wave 2 to 3, even after controlling for individual and neighborhood risks (perceived violence and concentrated poverty), frequency of violence exposure, and wave 1 adaptation (Table 2). Having greater baseline family support increased the odds of having normal or better behavioral functioning for the unexposed (by 50 %) and victims (by 33 %) more so than for witnesses (0.5 %), however, had greater increase in behavioral adaptation for witnesses (15 %) over time compared to victims (Table 4).

Table 2 Associations between protective factors and odds of behavioral adaptation at waves 2 and 3: main effects

	Model A: effect at wave 2 Odds ratio (95 % CI)	Model B: slope between wave 2 and 3 Odds ratio (95 % CI)
Intercept	2.74 (1.65,4.62)***	2.40 (1.50, 3.60)***
Witness or not	0.50 (0.27, 0.92)	1.21 (0.54, 2.70)
Victim or not	0.72 (0.44, 0.86)*	0.76 (0.35, 1.64)
Caring relationships/support		
Family support	1.2 (1.0, 1.3)*	0.98 (0.90, 1.07)
Friend support	1.1 (1.0, 1.3)****	1.0 (0.92, 1.09)
Other adult support	1.1 (0.9, 1.2)	1.07 (0.98, 1.17)
Neighborhood support	1.1 (0.9, 1.3)	0.88 (0.81, 0.98)**
Boundaries and expectations		
Positive peers	1.2 (1.0, 1.4)	1.06 (0.97, 1.16)
Family boundaries	0.9 (0.8, 1.1)	1.13 (1.04, 1.27)**
Neighborhood control	1.1 (0.9, 1.3)	0.86 (0.79, 0.94)
Opportunities		
Meaningful participation	1.1 (0.9, 1.3)	1.03 (0.93, 1.05)
Organizational services	1.81 (−1.0, 2.2)	1.07 (0.42, 1.61)
Neighborhood-level protective factor		
Collective efficacy	1.11 (0.91, 1.35)	0.87 (0.79, 0.95)**

Outcome variable is the log odds of behavioral adaptation (proportion of youth with low or average externalizing scores, i.e., within 0.50 standard deviation of sample and normative median (T score <55), compared to those with higher than normative externalizing scores. Coefficients were converted to odds ratio and 95 % confidence intervals by taking the natural log of each coefficient. Analyses controlled for sex, race, socioeconomic position, family structure, age (centered at wave 2), ETV group (0, 1, 2), and frequency of witnessing or victimization, wave 1 adaptation or not. All protective factors are continuous measures at baseline standardized to a mean of 0 and standard deviation of 1

* $p<0.05$; ** $p<0.01$; *** $p<0.001$; **** $p<0.10$

Boundaries and Expectations

Having positive peers at baseline (under the domain of boundaries and expectations) increased the odds of behavioral adaptation 7 years later, for the unexposed by 42 %, witnesses by 13 %, and victims by 9 % by wave 3 (Table 3, $p=0.05$) (Table 4).

Opportunities

Meaningful participation in structured opportunities at baseline significantly modified the association between exposure to violence and behavioral adaptation at wave 2 (Wald test for interaction χ^2 statistic=5.44, $p=0.07$) (Table 3). Each unit increase in hours spent in opportunities at baseline was associated with an increased odds of adaptation for the unexposed group by 2.7 times (odds ratio=2.66 (95 % CI 1.23, 5.75)) (Table 4). Participation in meaningful opportunities was most

Table 3 Modifying effects of each protective factor at baseline and exposure to violence on behavioral adaptation at wave 2 and rate of change by wave 3, Project on Human Development in Chicago Neighborhoods, N=1,114 youth in 78 neighborhoods

	Intercept models		Slope models	
	Chi-square	p value	Chi-square	p value
Family support	7.18**	0.07	10.05*	0.01
Friend support	1.17	0.56	0.39	0.82
Other adult support	3.7	0.16	2.43	0.30
Neighborhood support	0.34	0.84	0.55	0.74
Positive peers	1.06	0.59	5.95*	0.05
Family boundaries	0.01	1.00	0.94	0.62
Neighborhood control	1.07	0.56	1.02	0.60
Meaningful participation	5.44**	0.07	2.42	0.30
Organizational services	3.04	0.22	3.02	0.22
Collective efficacy	0.83	0.66	0.33	0.85

All protective factors are continuous measures at baseline standardized to a mean of 0 and standard deviation of 1. Dependent variable is the log odds of behavioral adaptation (proportion of youth with externalizing score within 0.50 SD above the sample median (=0) vs. ones above the 0.50 cutoff=0). Log odds coefficients were converted to odds ratio and 95 % confidence intervals by taking natural log of each coefficient. The odds ratio shown is an estimate of the odds of behavioral adaptation associated with 1 SD increase in the asset for the unexposed group, controlling for covariates. All models control for sex, race, family socioeconomic position, family structure, age (centered at wave 2), ETV group (0, 1, 2), frequency of witnessing and victimization, wave 1 behavioral adaptation, and neighborhood-level controls (concentrated poverty and perceived violence)

* p<0.05; ** p<0.10

beneficial for the unexposed group though victims (by 7 %) and witnesses (by 0.5 %) also had slightly higher odds of behavioral adaptation at wave 2 with each unit increase in hours spent in structured activities. Organizations and services had borderline interactive effects for witnesses (Table 4).

Neighborhood-Level Support, Boundaries, and Collective Efficacy

Neighborhood-level support or cohesion significantly and negatively influenced the rate of change from wave 2 to 3; that is, each unit increase in neighborhood cohesion at wave 1 was associated with a decreased odds of behavioral adaptation for all youth from wave 2 to 3. Neighborhood collective efficacy at baseline was not associated with the odds of behavioral adaptation at wave 2, above and beyond the inclusion of all individual- and neighborhood-level risks, including continuous exposure to violence (frequency), wave 1 behavioral adaptation, and peer- and family-level protective factors (Table 2). However, notably, neighborhood-level collective efficacy was significantly associated with the growth in behavioral adaptation for all youth, including for witnesses and victims; its effect on building resilience over time was robust to the inclusion of peer- and family-level assets and exposure-to-violence group, remaining significant and not varying by the exposure-to-violence groups.

Discussion

This longitudinal, strengths-based study explored whether multilevel protective factors deemed fundamental for positive youth development build behavioral resilience among an ethnically diverse sample of at-risk youth in an urban city. Almost 80 % of our sample had witnessed or had been victims of violence, comparable to other studies of urban adolescents (Ozer and Weinstein 2004). (We also note that those who are exposed to violence may also be violent

Table 4 Group-specific odds of behavioral adaptation at wave 2 or over time within unexposed, witness, and victim groups, as a result of baseline protective factors

	Unexposed group	Witness or not	Victim group or not	
Family support	1.50 (1.01, 2.24)*	0.66 (0.43, 1.01)***	0.88 (0.61, 1.40)	On wave 2 functioning
	1.28 (0.96, 1.69)***	0.90 (0.67, 1.21)	0.75 (1.01, 1.79)***	On rate of change
Positive peers	1.42 (1.17, 1.72)**	0.80 (0.63, 1.13)***	0.76 (0.62, 0.95)*	On rate of change
Meaningful participation	2.66 (1.23, 5.75)*	0.37 (0.17, 0.83)	0.40 (0.18, 0.83)*	On wave 2 functioning
Organizational services	2.8 (−0.87, 6.5)	−3.54 (−7.87, 0.78)***	−1.81 (−6.08, 2.45)	On wave 2 functioning

All protective factors are continuous measures at baseline standardized to a mean of 0 and standard deviation of 1. Dependent variable is the log odds of behavioral adaptation (proportion of youth with externalizing score within 0.50 SD above the sample median (=1) vs. ones above the 0.50 cutoff=0). Log odds coefficients were converted to odds ratio and 95 % confidence intervals by taking natural log of each coefficient. The odds ratio shown is an estimate of the odds of behavioral adaptation associated with 1 SD increase in the protective factor for the unexposed group, controlling for covariates. All models control for sex, race, family socioeconomic position, family structure, age (centered at wave 2), ETV group (0, 1, 2), frequency of witnessing and victimization, wave 1 behavioral adaptation, and neighborhood-level controls (concentrated poverty and perceived violence). Group-specific models were run only for factors that had a significant modifying effect (see Table 3). For all interactive models, see Table 3

* p<0.05; ** p<0.01; *** p<0.10

offenders (Jennings et al. 2012), adding further nuances and potential confounding to study participants' risk profiles.) The majority of witnesses and victims displayed normal or better range of behavioral problems over time, especially 2–3 years after exposure. This concurs with classical longitudinal studies' findings (Goldstein and Brooks 2005; Rutter 1993; Werner and Smith 1992, 2001) that resilience generally is not apparent until post adolescence and into early adulthood. Since problem behaviors diminish by young adulthood even among the general population (Achenbach et al. 2003; Ferdinand and Verhulst 1995; Loeber and Hay 1997), some desistance in problem behaviors was expected for all groups.

Specifically, we examined whether developmental assets deemed salient for all children and youth through the lifespan were protective for adolescents exposed to various levels of community violence, above and beyond individual- and neighborhood-level confounders. We found strong evidence in support for specific developmental assets in building behavioral adaptation at wave 2 and rate of change until wave 3. Main and interactive effects were considered important, and both have implications for informing interventions and policies. Family support, friend support, neighborhood support, and family boundaries had main effects—they were associated with reduced aggression and delinquency for all youth including those exposed to violence. Family support, other adult support, positive peers, and meaningful participation at baseline were differentially associated with wave 2 functioning or rate of change for youth exposed to different levels of violence. Family support was associated with the most protection for victims by wave 3, whereas family support and positive peers were associated with growth in behavioral resilience for witnesses. It appears that positive peers, especially during mid–late adolescence and early adulthood years, have as strong an association as family support with increased behavioral adaptation and reduced aggression and delinquency among youth exposed to violence.

Adolescents who lived in neighborhoods of higher collective efficacy (vs. lower) at baseline and were subsequently exposed to violence did not seem to have fewer behavioral problems at wave 2, though it helped them to achieve behavioral adaptation over time by early adulthood. However, the finding that youth living in neighborhoods with increasing levels of cohesion and support at baseline had lower odds of behavioral adaptation over time is counterintuitive to what we would expect. This finding may be explained partly by the quality of community cohesion, i.e., interacting with negative social norms, or not accounting for the 5–7 years time gap between exposure and outcome and youth moving, such that youth might be moving to other neighborhoods with lower support. A study of health risk behaviors (Ahern et al. 2008) found that strong neighborhood cohesion was not associated with positive health outcomes if the neighborhood's social norms promoted unhealthy behavior. A similar phenomenon may exist here, but requires further examination.

This resilience study had several limitations including availability of reliable and valid measures at all time points, such that protective factors were measured at wave 1 and risk was measured at wave 2. Also, the data are only from one city (Chicago) and so are illustrative but may not be generalizable to all populations. Future prospective cohort studies could overcome such limitations. An additional analytic limitation is that, for the purposes of imputing longitudinal measures for which one wave of data were missing, we assumed that our data were missing at random, but we were unable to test this assumption. The strengths of the study included multidisciplinary, multilevel theory-based investigation of various developmental assets for youth exposed to violence and controlling for objective and perceptive measures of community violence and other neighborhood controls.

Implications for Research

Future resilience studies should continue to build on multidisciplinary studies within criminology, youth development, and public health. We recommend employing both quantitative and qualitative youth-driven approaches to operationalizing and measuring positive stage-salient outcomes and domain-specific resilience, as well as accounting for changes in protective factors, communities, and within individual lives. Stratifying analyses by race and gender to truly account for the population-specific exposures and competencies, and examining how schools, peers, and neighborhoods might interact with each other and with individual assets (recognizing that resilient youth is also an active agent) along the pathways are greatly needed. We concur with many (Arrington and Wilson 2000; Crockett and Crouter 1995; Garcia Coll and Vazquez Garcia 2000; Masten and Coatsworth 1998) that racial/ethnic and socioeconomic segregation directly experienced by youth of color fundamentally shapes their competencies and must be specified and delineated accordingly. Instead of controlling for other neighborhood adversities as we did, it may be more realistic to consider cumulative neighborhood risks (Rutter 1979; Sameroff and Seifer 1995). Finally, rigorously evaluating strength-based programs, systems, and policies in terms of what works and is effective for a range of developmental outcomes is critical. We recommend integrating criminology and public health literatures on neighborhoods to inform holistic approaches to promoting resilience among urban youth.

Implications for Policy and Practice

Much of the media and research on urban youth tend to disproportionately focus on the few individuals that get caught up in the juvenile and adult justice systems. This contributes to the negative image and stereotypes of urban youth. Evidence documenting the strengths and successes of urban high-risk youth provides insights into what works and hopefully will lead to positive changes in societal perceptions of urban youth and better inform the ways policies and programs are practiced. Primary prevention of violence in urban neighborhoods should continue to be the ultimate goal; however, in addition to prevention of underlying root causes of violence, this study suggests that policies and programs should focus on building specific developmental assets at home, among peers, and in urban neighborhoods. Our study found that family, friend, and neighborhood support or caring relationships with parents/teachers/community were each associated with positive behavioral adaptation among all youth including witnesses and victims. Many promising programs are using strength-based approach to successfully promote supportive caring relationships, though evidence of specific best practices and lessons learned need to be better documented in order to be replicated in different settings and with victims. For example, the Triple P program increases family support and improves behavioral and emotional functioning among children from participating families (Sanders 1999). Partnerships and expertise of community-based youth development programs and community building efforts should be further leveraged by systems (e.g., juvenile justice, public health) and institutions (e.g., schools) to systematically provide familial, peer, and neighborhood support and assets for highest-risk youth (Catalano et al. 2004).

Policymakers should recognize, build upon, and marshal the strengths of high-risk youth and their environments. Specifically, institutions and neighborhood efforts that work with victims and offenders of violence such as juvenile justice systems and schools should partner and collaborate with public health programs, mental health systems (Becker et al. 2004; O'Donnell et al. 1999), schools (Telleen et al. 2009), and nontraditional community-based youth development organizations (Randall et al. 1999) to incorporate meaningful opportunities such as sports, drama, and reading into regular programming, and utilize best practices to effectively engage families and peer networks of youth witnesses, victims, and offenders to break the cycle of violence and ensure healthy development. Providing opportunity for high-risk youth can be done without a lot of cost—such opportunities already exist within Boys and Girls Clubs, neighborhood-based activities, schools, and employment where it remains. Future research should examine whether it is the type, quality, or concentration of such opportunities to meaningfully engage youth. Resources and efforts need to be tailored towards securing support, positive peers, and meaningful opportunities at home, among peers, and in the community to build upon existing assets and ensure lasting positive change for youth exposed to violence.

References

Achenbach, T. M. (1991). *Manual for the youth self-report and 1991 profile*. Burlington: University of Vermont, Department of Psychiatry.

Achenbach, T., Dumenci, L., & Rescorla, L. A. (2003). Are American children's problems still getting worse? A 23-year comparison. *Journal of Abnormal Child Psychology, 31*, 1–11.

Ahern, J., Galea, S., Hubbard, A., Midanik, L., & Syme, S. L. (2008). "Culture of drinking" and individual problems with alcohol use. *American Journal of Epidemiology, 167*, 1041–1049.

Aisenberg, E., & Herrenkohl, T. (2008). Community violence in context: Risk and resilience in children and families. *Journal of Interpersonal Violence, 23*, 296–315. doi:10.1177/0886260507312287.

Arrington, E., & Wilson, M. N. (2000). A re-examination of risk and resilience during adolescence: Incorporating culture and diversity. *Journal of Child and Family Studies, 9*, 221–230.

Bacchini, D., Concetta Miranda, M., & Affuso, G. (2011). Effects of parental monitoring and exposure to community violence on antisocial behavior and anxiety/depression among adolescents. *Journal of Interpersonal Violence, 26*, 269–292. doi:10.1177/0886260510362879.

Becker, M. G., Hall, J. S., Ursic, C. M., Jain, S., & Calhoun, D. (2004). Caught in the crossfire: The effects of a peer-based intervention program for violently injured youth. *Journal of Adolescent Health, 34*, 177–183. doi:10.1016/j.jadohealth.2003.04.001.

Benard, B. (2004). *Resiliency: What we have learned*. San Francisco: WestEd.

Benson, P. L. (2002). Search Institute. In: New directions for youth development. Wiley Periodicals, Inc.

Benson, P. L., & Leffert, N. (1999). *Developmental assets: A synthesis of the scientific research on development*. Minneapolis: Search Institute.

Benson, P., Leffert, N., Scales, P., & Blyth, D. (1998). Beyond the "village" rhetoric: Creating healthy communities for children and adolescents. *Applied Developmental Science, 2*, 138–159.

Beyers, J. M., Bates, J. E., Pettit, G. S., & Dodge, K. A. (2003). Neighborhood structure, parenting processes, and the development of youth's externalizing behaviors: A multilevel analysis. *American Journal of Community Psychology, 31*, 35–53.

Brennan, R., Molnar, B., & Earls, F. (2007). Refining the measurement of exposure to violence (ETV) in urban youth. *Journal of Community Psychology, 35*, 603–618.

Bryk, A. S., & Raudenbush, S. W. (1987). Application of hierarchical linear models to assessing change. *Psychological Bulletin, 101*, 147–158.

Buka, S. L., Selner-O'Hagan, M. B., Kindlon, D. J., & Earls, F. J. (1997). *The "My exposure to violence interview" administration and scoring manual, version 3*. Boston: Harvard School of Public Health.

Caldwell, B., & Bradley, R. (1984). *Home observation for measurement of the environment (HOME)—revised edition*. Little Rock: University of Arkansas.

Campbell, C., & Schwarz, D. F. (1996). Prevalence and impact of exposure to interpersonal violence among suburban and urban middle school students. *Pediatrics, 98*, 396–402.

Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S., & Hawkins, J. D. (2004). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *The Annals of the American Academy of Political and Social Science, 591*, 98–124. doi:10.1177/0002716203260102.

Cicchetti, D., & Lynch, M. (1993). Toward an ecological/transactional model of community violence and child maltreatment: Consequences for children's development. *Psychiatry: Interpersonal and Biological Processes, 56*, 96–118.

Cooley-Strickland, M., Quille, T. J., Griffin, R. S., Stuart, E. A., Bradshaw, C. P., & Furr-Holden, D. (2009). Community violence and youth: Affect, behavior, substance use, and academics. *Clinical Child and Family Psychology Review, 12*, 127–156. doi:10.1007/s10567-009-0051-6.

Crockett, L. J., & Crouter, A. C. (1995). *Pathways through adolescence: Individual development in relation to social contexts*. Mahwah: Lawrence Erlbaum.

Dawes, A., & Donald, D. (2000). Improving children's chances: Developmental theory and effective interventions in community contexts. In D. Donald, A. Dawes, & J. Louw (Eds.), *Addressing childhood adversity* (pp. 1–25). Cape Town: David Philip.

DuRant, R. H., Cadenhead, C., Pendergast, R. A., Slavens, G., & Linder, C. W. (1994). Factors associated with the use of violence among urban black adolescents. *American Journal of Public Health, 84*, 612–617.

Earls, F., & Buka, S. L. (1997). *Project on Human Development in Chicago Neighborhoods: Technical report*. Rockville: National Institute of Justice.

Ferdinand, R., & Verhulst, F. C. (1995). Psychopathology from adolescence into young adulthood: An 8-year follow-up study. *The American Journal of Psychiatry, 152*, 1586–1594.

Fergus, S., & Zimmerman, M. A. (2005). Adolescent resilience: A framework for understanding healthy development in the face of risk. *Annual review of public health, 26*, 399–419.

Fitzmaurice, G. M., Laird, N. M., & James, H. W. (2004). *Applied longitudinal analysis*. Hoboken: Wiley.

Garbarino, J., Dubrow, N., Kostelny, K., & Pardo, C. (1992). *Children in danger*. San Francisco: Jossey-Bass Publishing.

Garcia Coll, C. T., & Vazquez Garcia, H. A. (2000). Cultural influences on developmental processes and outcomes: Implications for the study of development and psychopathology. *Development and Psychopathology, 12*, 333–374.

Garmezy, N. (1985). Stress-resistant children: The search for protective factors. In J. E. Stevenson (Ed.), *Recent research in developmental pathopathology* (Vol. 4, pp. 213–233). Oxford: Pergamon Press.

Garmezy, N., Masten, A. S., & Tellegen, A. (1984). The study of stress and competence in children: A building block for developmental psychopathology. *Child Development, 55*, 97–111.

Goldstein, S., & Brooks, R. B. (2005). *Handbook of resilience in children*. New York: Kluwer Academic/Plenum Publishers.

Gorman-Smith, D., Henry, D. B., & Tolan, P. H. (2004). Exposure to community violence and violence perpetration: The protective effects of family functioning. *Journal of Clinical Child & Adolescent Psychology, 33*, 439–449.

Hammack, P. L., Richards, M. H., Luo, Z., Edlynn, E. S., & Roy, K. (2004). Social support factors as moderators of community violence exposure among inner-city African American young adolescents. *Journal of Clinical Child & Adolescent Psychology, 33*, 450–462. doi:10.1207/s15374424jccp3303_3.

Hanley, J. A., Negassa, A., Edwardes, M. D., & Forrester, J. E. (2003). Statistical analysis of correlated data using generalized estimating equations: An orientation. *American Journal of Epidemiology, 157*, 364–375.

Harding, D. J. (2008). Neighborhood violence and adolescent friendships. *International Journal of Conflict and Violence, 2*, 28–55.

Harding, D. (2009). Violence, older peers, and the socialization of adolescent boys in disadvantaged neighborhoods. *American Sociological Review, 74*, 445–464.

Hubbard, A. E., Ahern, J., Fleischer, N. L., Laan, M. V. D., Lippman, S. A., Jewell, N., Bruckner, T., et al. (2010). To GEE or not to GEE: Comparing population average and mixed models for estimating the associations between neighborhood risk factors and health. *Epidemiology, 21*, 467–474. doi:10.1097/EDE.0b013e3181caeb90.

Huizinga, D., Esbensen, F.-A., & Weiher, A. W. (1991). Are there multiple paths to delinquency? *The Journal of Criminal Law and Criminology, 821*, 83–118.

Jain, S., Buka, S., Subramanian, S., & Molnar, B. E. (2012). Protective factors for youth exposed to violence: Role of developmental assets in building emotional resilience. *Journal of Youth Violence and Juvenile Justice, 10*, 107–129.

Jennings, W. G., Piquero, A. R., & Reingle, J. M. (2012). On the overlap between victimization and offending: A review of the literature. *Aggression and Violent Behavior, 17*, 16–26. doi:10.1016/j.avb.2011.09.003.

Jessor, R., Turbin, M. S., & Costa, F. M. (1998). Risk and protection in successful outcomes among disadvantaged adolescents. *Applied Developmental Science, 2*, 194–208.

Kindlon, D., Wright, B., Raudenbush, S., & Earls, F. (1996). The measurement of children's exposure to violence: A Rasch analysis. *International Journal of Methods in Psychiatric Research, 6*, 187–194.

Kliewer, W., Cunningham, J., Diehl, R., Walker, J. M., Atiyeh, C., Neace, B., Duncan, L., et al. (2004). Violence exposure and adjustment in inner-city youth: Child and caregiver emotion regulation skill, caregiver–child relationship quality, and neighborhood cohesion as protective factors. *Journal of Clinical Child & Adolescent Psychology, 33*, 477–487.

Krohn, M. D., Lizotte, A. J., Bushway, S. D., Schmidt, N. M., & Phillips, M. D. (2010). Shelter during the storm: A search for factors that protect at-risk adolescents from violence. *Crime & Delinquency*. doi:10.1177/0011128710389585.

Lambert, S. F., Copeland-Linder, N., & Ialongo, N. S. (2008). Longitudinal associations between community violence exposure and suicidality. *Journal of Adolescent Health, 43*, 380–386. doi:10.1016/j.jadohealth.2008.02.015.

Leffert, N., Benson, P. L., Scales, P. C., Sharma, A. R., Drake, D. R., & Blyth, D. A. (1998). Developmental assets: Measurement and prediction of risk behaviors among adolescents. *Applied Developmental Science, 2*, 209–230.

Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin, 126*, 309–337.

Liang, K., & Zeger, S. (1986). Longitudinal data analysis using generalized linear models. *Biometrika, 73*, 13–22.

Loeber, R., & Hay, D. (1997). Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology, 48*, 371–410.

Luthar, S. S. (2003). *Resilience and vulnerability: Adjustment in the context of childhood adversities*. New York: Cambridge University Press.

Luthar, S., Doernberger, C., & Zigler, E. (1993). Resilience is not a unidimensional construct: Insights from a prospective study of inner-city adolescents. *Development and Psychopathology, 5*, 703–717.

Lynch, M., & Cicchetti, D. (1998). An ecological-transactional analysis of children and contexts: The longitudinal interplay among child maltreatment, community violence, and children's symptomatology. *Development and Psychopathology, 10*, 235–257.

Maldonado-Molina, M. M., Jennings, W. G., Tobler, A. L., Piquero, A. R., & Canino, G. (2010). Assessing the victim-offender overlap

among Puerto Rican youth. *Journal of Criminal Justice, 38*, 1191–1201. doi:10.1016/j.jcrimjus.2010.09.008.

Margolin, G. (2005). Children's exposure to violence: Exploring developmental pathways to diverse outcomes. *Journal of Interpersonal Violence, 20*, 72–81.

Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *The American Psychologist, 53*, 205–220.

Masten, A. S., & Obradovic, J. (2006). Competence and resilience in development. *Annals of New York Academy of Sciences, 1094*, 13–27.

Masten, A. S., Hubbard, J. J., Gest, S. D., Tellegen, A., Garmezy, N., & Ramirez, M. (1999). Competence in the context of adversity: Pathways to resilience and maladaptation from childhood to late adolescence. *Development and Psychopathology, 11*, 143–169.

McDonald, C. C., & Richmond, T. R. (2008). The relationship between community violence exposure and mental health symptoms in urban adolescents. *Journal of Psychiatric and Mental Health Nursing, 15*, 833–849. doi:10.1111/j.1365-2850.2008.01321.x.

Molnar, B. E., Cerda, M., Cerda, M., Roberts, A. L., Roberts, A., & Buka, S. L. (2008). Effects of neighborhood resources on aggressive and delinquent behaviors among urban youths. *American Journal of Public Health, 98*, 1086–1093.

O'Donnell, L., Stueve, A., SanDoval, A., Duran, R., Atnafou, R., Haber, D., Johnson, N., et al. (1999). Violence prevention and young adolescents' participation in community youth service. *Journal of Adolescent Health, 24*, 28–37.

Osofsky, J. D. (2003). Prevalence of children's exposure to domestic violence and child maltreatment: Implications for prevention and intervention. *Clinical Child and Family Psychology Review, 6*, 161–170.

Overstreet, S., & Mazza, J. (2003). An ecological-transactional understanding of community violence: Theoretical perspectives. *School Psychology Quarterly, 18*, 66–87.

Owens, E. B., & Shaw, D. S. (2003). Poverty and early childhood adjustment. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adjustment in the context of childhood adversities* (pp. 267–292). New York: Cambridge University Press.

Ozer, E. J., & Weinstein, R. S. (2004). Urban adolescents' exposure to community violence: The role of support, school safety, and social constraints in a school-based sample of boys and girls. *Journal of Clinical Child & Adolescent Psychology, 33*, 463–476. doi:10.1207/s15374424jccp3303_4.

Philadelphia Family Management Study (1990). *Youth interview schedule*. Philadelphia: University of Pennsylvania.

Randall, J., Swenson, C. C., & Henggeler, S. W. (1999). Neighborhood solutions for neighborhood problems: An empirically based violence prevention collaboration. *Health Education & Behavior, 26*, 806–820. doi:10.1177/109019819902600605.

Reid, J. A., & Sullivan, C. J. (2012). Unraveling victim-offender overlap: Exploring profiles and constellations of risk. *Victims & Offenders, 7*, 327–360. doi:10.1080/15564886.2012.685216.

Reingle, J. M., & Maldonado-Molina, M. M. (2012). Victimization and violent offending: An assessment of the victim-offender overlap among Native American adolescents and young adults. *International Criminal Justice Review, 22*, 123–138. doi:10.1177/1057567712443966.

Roisman, G. I., Masten, A. S., Coatsworth, J. D., & Tellegen, A. (2004). Salient and emerging tasks in the transition to adulthood. *Child Development, 75*, 123–133.

Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M. W. Kent & J. E. Rolf (Eds.), *Primary prevention of psychopathology: Vol. 3. Social competence in children* (pp. 49–74). Hanover: University Press of New England.

Rutter, M. (1985). Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. *British Journal of Psychiatry, 147*. doi:10.1192/bjp.147.6.598.

Rutter, M. (1993). Resilience: Some conceptual considerations. *Journal of Adolescent Health, 14*, 626–631.

Sameroff, A. J., & Seifer, R. (1995). Accumulation of environmental risk and child mental health. In H. E. Fitzgerald & B. M. Lester (Eds.), *Children in poverty: Research, health and policy issues* (pp. 233–258). New York: Garland.

Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science, 277*, 918–924. doi:10.1126/science.277.5328.918.

Sanders, M. R. (1999). Triple P-Positive Parenting Program: Towards an empirically validated multilevel parenting and family support strategy for the prevention of behavior and emotional problems in children. *Clinical Child and Family Psychology Review, 2*, 71–90.

SAS Institute. (1999). *SAS user's guide* (8th ed.). Cary: SAS Institute, Inc.

Scales, P. (1999). Reducing risks and building developmental assets: Essential actions for promoting adolescent health. *Journal of School Health, 69*, 113–119.

Selner-O'Hagan, M., Buka, S., Kindlon, D., Raudenbush, S., & Earls, F. (1998). Urban youth exposure to violence. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 39*, 215–224.

Subramanian, S. V., Jones, K., & Duncan, C. (2003). Multilevel methods for public health research. In I. Kawachi & L. F. Berkman (Eds.), *Neighborhoods and health*. New York: Oxford University Press.

Telleen, S., Kim, Y. O., & Pesce, R. (2009). An ecological developmental community initiative to reduce youth violence: Safe schools/healthy students. *Journal of Prevention & Intervention in the Community, 37*, 326–338. doi:10.1080/10852350903196340.

Thornberry, T. P., Huizinga, D., & Loeber, R. (1995). The prevention of serious delinquency and violence: Implications from the Program of Research on the Causes and Correlates of Delinquency. In J. C. Howell, B. Krisberg, J. D. Hawkins, & J. J. Wilson (Eds.), *Sourcebook on serious, violence, and chronic juvenile offenders* (pp. 213–237). Thousand Oaks: Sage Publications.

Turner, R., Frankel, B., & Levin, D. (1983). Social support: Conceptualization, measurement, and implications for mental health. In J. R. Greeley (Ed.), *Research in community and mental health. Volume III* (pp. 67–111). Greenwich: JAI Press.

Ungar, M. (2011). The social ecology of resilience: Addressing contextual and cultural ambiguity of a nascent construct. *American Journal of Orthopsychiatry, 81*, 1–17. doi:10.1111/j.1939-0025.2010.01067.x.

Werner, E. E., & Smith, R. S. (1992). *Overcoming the odds: High risk children from birth to adulthood*. Ithaca: Cornell University Press.

Werner, E. E., & Smith, R. S. (2001). *Journeys from childhood to midlife: Risk, resilience and recovery*. Ithaca: Cornell University Press.

WestEd. (2012). California healthy kids survey resilience & youth development supplement. WestEd, Health and Human Development. At http://chks.wested.org/resources/h11Full_rydm_0809.pdf. Accessed 29 Oct 2012.

Wilson, H. W., Stover, C. S., & Berkowitz, S. J. (2009). Research review: The relationship between childhood violence exposure and juvenile antisocial behavior: A meta-analytic review. *Journal of Child Psychology and Psychiatry, 50*, 769–779. doi:10.1111/j.1469-7610.2008.01974.x.

Wolfinger, R., & Chang, M. (1998). *Comparing the SAS GLM and MIXED procedures for repeated measures*. Cary: SAS Institute, Inc.

Yang, H., Stanton, B., Li, X., Cottrel, L., Galbraith, J., & Kaljee, L. (2007). Dynamic association between parental monitoring and communication and adolescent risk involvement among African-

American adolescents. *Journal of the National Medical Association, 99*, 517–524.

Youngblade, L., Theokas, C., Schulenberg, J., Curry, L., & Chan, I. (2007). Risk and promotive factors in families, schools, and communities: A contextual model of positive youth development in adolescence. *Pediatrics, 119*, S47.

Zucker, R. A., Wong, M. M., Puttler, L. I., & Fitzgerald, H. E. (2003). Resilience and vulnerability among sons of alcoholics: Relationship to developmental outcomes between early childhood and adolescence. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adjustment in the context of childhood adversities* (pp. 76–103). New York: Cambridge University Press.