

Violence Exposure and Emotional Trauma as Contributors to Adolescents' Violent Behaviors

Li-yu Song, PhD; Mark I. Singer, PhD; Trina M. Anglin, MD, PhD

Objective: To investigate the degree to which violence exposure and symptoms of psychological trauma are related to adolescents' own violent behaviors.

Design and Setting: Anonymous self-report questionnaire administered to students in 6 public high schools (grades 9-12).

Participants: Sixty-eight percent of the students attending the participating schools during the survey participated in the study (N=3735). Ages ranged from 14 to 19 years; 52% were female; and 35% were African American, 33% white, and 23% Hispanic.

Results: Multiple regression analysis determined that vio-

lence exposure and symptoms of psychological trauma together explained more than 50% of the variance in both male and female self-reported violent behavior. The independent effects of exposure to violence explained about one quarter of the variance in both male and female adolescents' violent behaviors. Anger was found to be the leading trauma symptom.

Conclusion: Our findings suggest that health clinicians and other professionals who encounter adolescents should routinely screen them for both exposure to violence and symptoms of anger.

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THE PAST decade has witnessed sharp increases in this country's youth-related violence. From 1989 to 1994, the arrest rate for serious violent crimes (murder, robbery, rape, and aggravated assault) for teenagers rose 46%. From 1985 to 1994, the rate of homicides committed by youth aged 14 to 17 years increased by 172%.¹ Such increases have come in the face of compelling evidence that the rates of homicides committed by adults older than 25 years have been consistently decreasing since 1985.² In addition, a longitudinal national probability sample of youth has demonstrated, using self-report data, the high absolute magnitude of youth involvement in serious violent offending: at the peak age of 17 years, about 36% of African American and 25% of white (non-Hispanic) males reported involvement in at least 1 serious violent offense.³

It is not well recognized that adolescents are at greater risk for being victims of serious crime than adults. National statistics based on the Uniform Crime Report and the National Crime Survey show that compared with individuals older than 19 years, youth aged 12 to 19 years experience 3 times as many rapes, more than twice as many robberies, and more than

3 times as many assaults. Additionally, data from the National Family Violence Survey reveal that compared with spouse-to-spouse violence, rates of parent-to-child violence are 4 times higher for any violence and 2 times higher for severe violence.⁴ A recent national telephone survey of 2000 randomly selected youth between the ages of 10 and 16 years found that 41% of the sample had been victimized in some fashion, ranging from simple and aggravated assault to sexual abuse.⁵

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Another recent large study of more than 3700 high school students (using the sample and data from which this current report is based) found considerable levels of victimization at home, in school, and in the community. Across research sites, 33% to 44% of male students reported being slapped, hit, or punched at school within the past year, with about 75% of

From the Mandel School of Applied Social Sciences, Case Western Reserve University, Cleveland, Ohio (Drs Song and Singer), and the Maternal and Child Health Bureau, Rockville, Md (Dr Anglin).

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SUBJECTS AND METHODS

The study used a survey design in which high school students were administered a self-report questionnaire during regular school hours. Six public high schools were surveyed including 2 Cleveland, Ohio, city high schools; 1 Cleveland-area suburban high school; 1 small city high school in northeast Ohio; and 2 Denver, Colo, city high schools. Further details describing the sampling procedure and the participating sample can be found in a previous publication.⁶ The study protocol was approved by the University Review Committee for Human Studies of Case Western Reserve University, Cleveland, Ohio.

VARIABLES AND INSTRUMENTATION

Demographic Variables

Demographic information included age, sex, race/ethnicity, family composition, and educational level of mother and father.

Recent Violent Behaviors

Violent behaviors were measured by asking students to report how often during the past year they had engaged in each of 6 violent acts: threatening others with physical harm, slapping or punching someone before the other person hit them, slapping or punching someone after they had been hit, beating up or mugging someone, attacking someone with a knife, and shooting at someone. A 6-point Likert scale ranging from "never" (0) to "almost every day" (5) was used to assess the frequency of each type of violence.

Exposure to Physical Violence

This construct was measured by the recent exposure to violence (22 items) and past exposure to violence (10 items) scales. Both are Likert scales tapping 5 specific acts of violence, including threats, slapping/hitting/punching, beatings, knife attacks, and shootings. In the recent exposure to violence scale, separate items were designed to capture the sites where the violence occurred: home, school, or neighborhood. Reports on knife attacks and shootings and the past exposure to violence items were not site specific. Based on the results of principal component analyses conducted as part of our previous study,⁶ the recent exposure to violence scale was found to contain 5 variable clusters: witnessing neighborhood violence, witness/victim of home violence, witnessing of school violence, witness/victim of a shooting/knife attack, and victim of neighborhood or school violence. Three variable clusters emerged from our previous study in the past exposure to violence scale: witnessing past violence, witness/victim of a shooting/knife attack, and victim of past violence. The variables of recent and past witness/victim of a shooting/knife attack were combined to measure lifetime exposure to a shooting/knife attack because of a high correlation between them ($r=0.62$). Thus, 7 variables were included in the study to measure exposure to physical violence.

Sexual Abuse/Assault

Adolescents were asked if they had been "made to do a sexual act" against their wishes during 2 time domains: during the past year or "while growing up," not including the past year. Similar questions were asked about their witnessing someone else being made to perform a sexual act against his or her wishes. Two variables denoting the degree to which

males and females from large city schools reporting having witnessed someone being beaten up in school within the past year. More than 45% of students from large cities reported having witnessed someone being shot at or shot within the past year.⁶ Finally, a study of younger children revealed that 47% of children in the first and second grades had witnessed a shooting and 31% had witnessed a stabbing.⁷ Numerous other studies echo these high levels of violence exposure among children and adolescents.^{2,8-12}

Exposure to violence has been linked to a number of mental health and behavioral sequelae including depression,^{7,13,14} stress,^{9,15} fears and worries,^{13,16} aggression,¹⁷ anxiety,^{6,18} low self-esteem,^{19,20} posttraumatic stress,^{14,21} and self-destructive behaviors.^{22,23} Such sequelae have profound effects on children's intrapsychic and social functioning.

Results from most studies examining the relationship between violence exposure and delinquent behavior suggest that violent delinquents are more likely than non-violent delinquents and controls to have experienced physical abuse.^{17,24-27} In a recent small study of 225 urban black adolescents, symptoms of depression and hopelessness, previous victimization, and corporal punishment were found to be associated with self-reported use of violence.²⁸ Further analyses of data from this study found that frequency of fighting was partially related to previous exposure to vio-

lence and victimization.²⁹ An important prospective study of young children demonstrated that physical abuse is a risk factor for the development of aggressive behaviors, and that children exposed to such abuse were more likely than unexposed children to acquire distorted and deficient patterns of information processing (eg, were more likely to attribute hostile intent to others, were less attentive to relevant social cues, and were less capable of generating competent solutions to interpersonal problems).³⁰ Numerous other studies also suggest that being a witness to or victim of violence, including intrafamilial abuse, is associated with self-reported violence and delinquency.³¹⁻³⁴

While these studies have documented levels of violence exposure among youth, described the psychological and behavioral consequences of such violence exposure, and evidenced the relationship between violence exposure and violent behaviors in a bivariate manner, few if any have investigated the combined influences of exposure to violence and symptoms of psychological trauma on adolescents' violent behaviors. Our previous investigation⁶ indicated the significant associations between violence exposure and symptoms of psychological trauma. Violence exposure variables explained significant amounts of variance in both total trauma scores (29%) and all subscale scores, ie, depression, anxiety, posttraumatic stress, anger, and dissociation (range, 19%-27%). In this study, we use the sample and data collected in our previous study to

sexual abuse/assault had occurred during a subject's lifetime, one for personally experiencing and one for witnessing, were computed by combining and averaging "recent" and "past" exposure.

Trauma Symptoms

Trauma symptoms were measured using the Trauma Symptom Checklist for Children (TSC-C).³⁵ The 54-item instrument was developed to assess sequelae of childhood trauma/abuse and was written to be understandable to children as young as 8 years. The TSC-C contains 6 subscales: anxiety, depression, posttraumatic stress, dissociation, anger, and sexual concerns. Each item is presented in 4-point Likert format ranging from "never" (0) to "almost all the time" (3). Scale scores are derived by summing responses to individual items. Requests by school administrators resulted in the removal of all items related to the sexual concerns subscale. The total scale and the 5 subscales used in this study have been found to demonstrate acceptable reliability (Cronbach α all above .80) in our previous study⁶ and other studies.³⁵ Concurrent validity of the TSC-C subscales has been also demonstrated.

More detailed information for the recent exposure to violence scale, past exposure to violence scale, TSC-C scale, and measures for sexual abuse/assault has been presented previously.⁶

ANALYSIS PROCEDURES

Principal component analysis on the violent behavior scale items was first conducted to ensure that the 6 scale items measured the same construct. The procedure and criteria used for this analysis were the same as the principal

component analyses conducted on the recent exposure to violence and past exposure to violence scales reported in our previous study.⁶ Subsequently, 2 steps of multiple regression analyses were performed separately for males and females. First, a series of simultaneous regression analyses was conducted to examine the associations between each of the TSC-C total scores and subscale scores and the violence exposure variables. Violence exposure variables included variable clusters of the recent exposure to violence scale and the past exposure to violence scale, the "lifetime victim of sexual abuse/assault" score, and the "lifetime witness to sexual abuse/assault" score.

The second step of analysis developed models to compare the respective effects of violence exposure and trauma symptoms on adolescents' own violent behaviors. Violent behaviors served as the dependent variable in 3 separate regression models. Model 1 (hereafter referred to as M_1) contained only the violence exposure variables as the independent variables. In Model 2 (M_2), we examined the effects of the TSC-C subscale scores (depression, anxiety, posttraumatic stress, anger, and dissociation) on violent behaviors. Model 3 (M_3) examined both violence exposure variables and TSC-C subscale scores as independent variables. By subtracting the explained variance (R^2) of M_3 from M_1 , the unique contribution of trauma symptoms on violent behaviors was obtained. Likewise, the extent to which violence exposure uniquely explained violent behaviors was assessed by subtracting the explained variance of M_3 from M_2 . Finally, the variance of violent behaviors attributed to the association between violence exposure and trauma symptoms was assessed by subtracting the total variance (M_3) from the unique contributions of violence exposure and trauma symptoms.

further investigate the degree to which violence exposure and symptoms of psychological trauma are related to adolescents' own violent behaviors. Violence exposure and symptoms of psychological stress are hypothesized to have significant associations with violent behaviors.

RESULTS

DESCRIPTION OF THE SAMPLE

The final sample used for univariate analyses contained 3735 high school students. Mean age was 16 years (range, 14-19 years; SD, 1.2 years). Fifty-two percent of respondents were female. The sample's racial/ethnic composition was 35% African American, 33% white, 23% Latino, and 9% other. Fifty-three percent of students indicated they were living with both their mother and father. Fifty-six percent of the students had at least 1 parent who graduated from high school but not college; for 16% of students, neither parent had graduated from high school. Slightly more than 1 in 4 students (28%) had at least 1 parent who graduated from college.

UNIVARIATE ANALYSES

Across all 4 sites, 47% to 64% of male adolescents had threatened someone with physical harm. More than half of the males

at all sites reported hitting someone before the other person hit them, and 71% to 79% of males reported hitting someone after they had been hit. From 28% to 43% of males in the 3 city sites had beaten someone up during the past year. Within these same city sites, between 17% and 25% of adolescent males reported having shot at someone within the past year. Rates of female violent behaviors also varied by school site. Between 15% and 42% of female adolescents had threatened someone with physical harm within the past year. Between 27% and 57% reported hitting someone before the other person hit them, with 41% to 76% reporting having hit someone after they had been hit. Lower percentages of female adolescents than male adolescents reported having attacked someone with a knife or having shot at someone during the past year, with the exception of Cleveland, where the percentages of reported knife attacks were highly similar for males and females (10.0% and 10.5%, respectively).

Table 1 reveals that mean scores and SDs for each of the TSC-C subscales and the total symptoms score were higher for female adolescents than for male adolescents.

PRINCIPAL COMPONENT ANALYSIS

We performed principal component analysis on the 6 items designed to reflect adolescents' own violent behaviors. Overall, these 6 items had significant correlations with each other (range, 0.21-0.64). The results indi-

Table 1. Distributions of TSC-C Total Scores and Subscale Scores*

Variable	Males, Mean (SD)	Females, Mean (SD)
Total symptom scores	0.66 (0.43)	0.90 (0.51)
Depression	0.50 (0.45)	0.86 (0.60)
Anxiety	0.48 (0.41)	0.78 (0.51)
Posttraumatic stress	0.67 (0.51)	0.97 (0.62)
Anger	0.91 (0.67)	1.00 (0.69)
Dissociation	0.62 (0.49)	0.78 (0.54)

*Mean equals the score divided by the number of scale items.

cated that the scale measured only 1 construct, namely violent behaviors. This variable cluster accounted for 51% of the variance among the items. Each item had a high correlation with the variable cluster (range, 0.56-0.81). The 6 items in this scale had high acceptable reliability (Cronbach $\alpha=0.79$). As a result, a factor score that includes the relationship between each item and the variable cluster was computed to represent levels of adolescents' own violent behaviors; this score was used in the subsequent multiple regression analyses.

MULTIPLE REGRESSION ANALYSES

Taking missing values into account, the final sample for all regression analyses contains 3330 students (1738 females and 1592 males).

VIOLENCE EXPOSURE AND TRAUMA SYMPTOMS

Separate multiple regression analyses were conducted to examine the association between violence exposure and trauma symptoms for males and females. **Table 2** reports the types of violence exposure that had significant effects on the trauma symptom subscales. The "violence exposure" variables explained a significant amount of variance across symptom subscales, with explained variance ranging from 14% (depression) to 31% (anger) for males, and from 24% (dissociation) to 30% (posttraumatic stress) for females. Overall, violence exposure variables accounted for a larger amount of variance across TSC-C subscales for females than males, in part due to females having a wider range of score variation than males across the TSC-C subscales (see Table 1 for SDs).

RELATIONSHIPS AMONG VIOLENCE EXPOSURE, TRAUMA SYMPTOMS, AND VIOLENT/AGGRESSIVE BEHAVIORS

A model including demographic variables (age, race/ethnicity, parental education, and family composition) in addition to violence exposure and trauma symptom variables was tested. The results indicated that these demographic variables explained less than 1% of the variance in violent/aggressive behaviors after violence exposure and trauma symptom variables were taken into account for both males and females. As a result, we excluded the demographic variables from the model and focused on the associations among the violence exposure, trauma symptoms, and violent/aggressive behavior variables.

Table 2. Model Comparisons of Predictors of Adolescent Violent/Aggressive Behaviors Equated for Males (n = 1592) and Females (n = 1738)*

Models	Males		Females	
	β	B	β	B
Model 1: Violence exposure only				
Past victim of threat, slap, or beating	NS	NS	NS	NS
Past witnessing of threat, slap, or beating	.17	.14	.12	.15
Recent witnessing in neighborhood	.24	.22	.16	.19
Recent victim and witnessing at home	.16	.13	.21	.28
Recent witnessing at school	.17	.15	.15	.19
Recent victim at school or in neighborhood	.19	.18	.26	.28
Exposure to shooting or knife attack	.51	.44	.33	.32
Victim of sexual abuse	NS	NS	NS	NS
Witnessing sexual abuse	.16	.08	NS	NS
Adjusted R^2	.50		.42	
Model 2: Trauma symptoms only				
Depression	-.41	-.16	-.12	-.09
Anxiety	.23	.08	NS	NS
Posttraumatic stress	NS	NS	.01	.08
Anger	1.04	.60	.66	.61
Dissociation	NS	NS	NS	NS
Adjusted R^2	.31		.29	
Model 3: Violence exposure and trauma symptoms				
Past victim of threat, slap, or beating	NS	NS	NS	NS
Past witnessing of threat, slap, or beating	.10	.09	.07	.09
Recent witnessing in neighborhood	.20	.18	.13	.16
Recent victim and witnessing at home	.13	.10	.19	.25
Recent witnessing at school	.13	.11	.13	.16
Recent victim at school or in neighborhood	.17	.17	.24	.26
Exposure to shooting or knife attack	.44	.38	.27	.26
Victim of sexual abuse	NS	NS	NS	NS
Witnessing sexual abuse	.17	.08	NS	NS
Depression	NS	NS	-.09	-.07
Anxiety	NS	NS	-.15	-.10
Posttraumatic stress	-.16	-.07	NS	NS
Anger	.61	.36	.45	.41
Dissociation	NS	NS	-.01	-.07
Adjusted R^2	.57		.51	

* β indicates unstandardized regression coefficients; B, standardized regression coefficients; and NS, not significant.

The model comparisons yielded similar results for both sexes. Violence exposure variables in M_1 explained a large amount of variance related to violent behaviors for both males ($R^2=50\%$) and females ($R^2=42\%$). Trauma symptoms (M_2) yielded smaller R^2 s (31% and 29% for males and females, respectively) when compared with violence exposure (M_1). For males, violence exposure variables uniquely explained 26% of the variance in violent behaviors ($M_3 - M_2$, or 57% - 31%), and only 7% of the variance in violent behaviors ($M_3 - M_1$, or 57% - 50%) was uniquely attributed to trauma symptoms. As a result, 24% of the variance in males' violent behaviors ($M_3 - [M_3 - M_2] - [M_3 - M_1]$, or 57% - 26% - 7%) was jointly contributed by violence exposure and trauma symptoms (**Figure**). For females, violence exposure variables had significant unique contributions (22%) on violent behaviors ($M_3 - M_2$, or 51% - 29%). Trauma symptoms also had smaller but significant unique effects (9%)

on violent behaviors ($M_3 - M_1$, or 51% - 42%). As shown in the Figure, the association between violence exposure and trauma symptoms jointly contributed 20% of the variance in violent behaviors for girls ($M_3 \alpha - [M_3 - M_2] - [M_3 - M_1]$, or 51% - 22% - 9%).

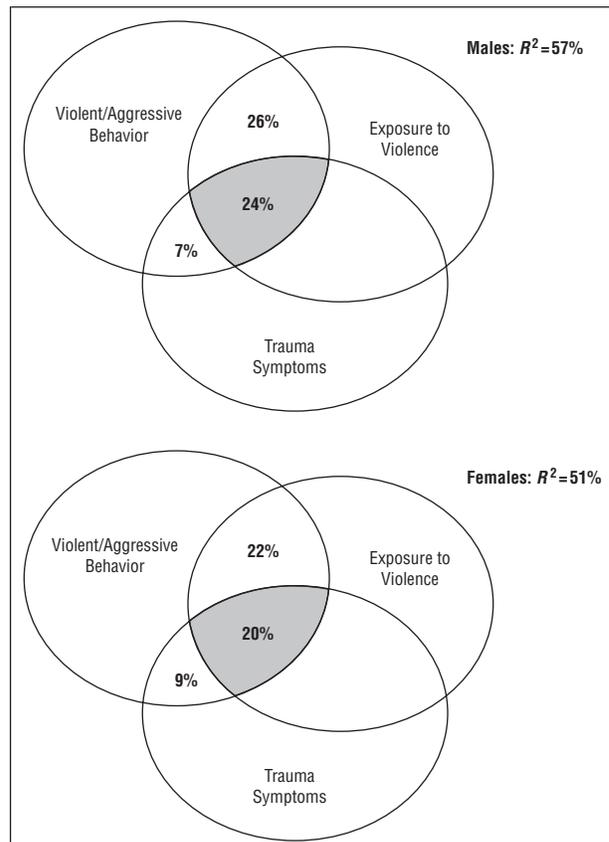
The significant violent exposure variables in predicting violent behaviors remained stable across M_1 and M_3 . The trauma symptom subscales that significantly affected violent behaviors were somewhat different between M_2 and M_3 , which can be attributed to high correlations among the 5 subscales. When there are high correlations among the independent variables in the multiple regression analysis, it becomes less stable in estimating the unique contribution of each independent variable on the dependent variable. However, among the 5 trauma symptom subscales, the anger subscale was by far most strongly associated with violent behaviors in both M_2 and M_3 . Further tests were conducted to examine how the high correlations among the trauma symptoms might influence the effect of anger on violent behaviors. Therefore, models were modified to include only the anger subscale as the sole trauma symptom variable in M_2 and M_3 . The exclusion of the other 4 subscales of trauma symptoms yielded a small decrease in R^2 for both models (1% in M_2 and 2% in M_3 for males, and 1% in M_2 and 3% in M_3 for females). These results provide further evidence that anger is the trauma symptom most highly associated with violent behaviors.

Some sex differences emerged from the analyses regarding the important predictors of violent behaviors. The results of M_3 revealed that for males, exposure to shooting or knife attack was the strongest predictor of violent behaviors, followed closely by anger. The other important variables were witnessing violence in neighborhood and being a victim of violence at school or in the neighborhood. For girls, violent behaviors were most strongly related to anger. Other important predictors of violent behaviors included: exposure to shooting or knife attack, being a witness to or victim of home violence, and being a victim of or witness to violence at school or in the neighborhood.

In summary, violence exposure had moderate unique effects on violent behaviors (26% for males, 22% for females). In addition, the experience of both violence exposure and trauma symptoms explained a similar amount of variance in violent behaviors (24% for males, 20% for females). Trauma symptoms without exposure explained a small but significant amount of variance in violent behaviors (7% for males, 9% for females). Anger was by far the most important trauma symptom in predicting violent behaviors for both sexes. Exposure to shooting or knife attack was the most influential violence exposure variable in predicting violent behaviors for males. For females, exposure to shooting or knife attack, being a victim of or witness to home violence, and being a victim of violence at school were equally associated with violent behaviors.

COMMENT

Adolescents in this study reported exhibiting a range of violent behaviors. The most violent behavior, having "shot at or shot someone" within the past year, was reported by a relatively high percentage of adolescent males from Denver and Cleveland (17.6% and 25.2%, respectively). Far lower per-



Explained variance in violent/aggressive behaviors.

centages of females across all sites reported having exhibited this type of violent behavior (0.5%-4.5%). Retaliation in response to violence ("hitting someone after they hit you") was a frequent occurrence among all students. Among males, striking first ("hitting someone before they hit you") was especially common, with more than half the boys reporting having displayed this behavior at least once in the past year. Such a high percentage of boys striking first is particularly troublesome because studies based on information processing theory have shown that children exposed to family violence and abuse may be poor judges of impending violence, may preemptively react to perceived threats, and may have low thresholds of impulse control.^{30,36} Thus, students who tend to strike first could often be incorrect in their perceptions of impending violence or attack from others.

In this study, violence exposure had moderate unique effects on violent behaviors, and the experience of both violence exposure and trauma symptoms also had moderate effects on violent behaviors. Trauma symptoms without exposure explained a smaller but significant amount of variance in violent behaviors. Certain types of violence exposure were highly associated with violent behaviors: for males, exposure to shooting or knife attack was the most influential violence exposure variable associated with violent behaviors and for females, exposure to shooting or knife attack, being a victim of or witness to home violence, and being a victim of violence at school were equally associated with violent behaviors.

Anger was by far the most important trauma symptom in predicting violent behaviors for both sexes. Since the early work of Wolfgang,³⁷ it has been appreciated that

a large proportion of homicide victims are known to the perpetrators and that the murders were committed impulsively during emotionally reactive states. Homicide is the extreme act of aggression. What are some possible links between anger and aggressive and violent behavior?

Any environmental condition that generates significant discomfort or displeasure, such as poverty, overcrowded housing, and racial inequality, can both produce aggressive inclinations and reduce disinhibitions against aggression as part of the social disorganization and weak social controls that accompany these conditions.^{38,39} At the individual level, it has been hypothesized that failure to have been protected from multiple exposures to violence while growing up can produce a chronic anger. Growing up in a harsh and frustrating environment in which violence is frequently modeled may be the common theme in causing a free-floating chronic anger or alienation from larger society.

Our findings suggest that medical clinicians and other professionals working with adolescents should routinely screen for violence exposure and symptoms of anger. Such clinical screens could occur in emergency departments, where adolescents present with violence-related injuries, and in primary care settings as part of clinical preventive services. Such screening may be helpful in identifying youth who are at high risk of displaying violent behaviors and targeting these youth for intervention services designed to minimize their exposure to future violence.⁴⁰⁻⁴³ It is equally important to screen both male and female adolescents and help them to develop their anger management skills and broaden their cognitive responses to interpersonal events.

Our study was limited in geographic scope and provided correlational rather than causal inferences. It is important to note that the relationship between violence exposure and violent behaviors is probably reciprocal. That is, victims of violence may also be perpetrators of violence, and perpetrators may also be victims. This relationship should be further studied by undertaking prospective, longitudinal studies of children's exposure to violence and their engagement in violent behaviors.

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Reprints: Mark I. Singer, PhD, Mandel School of Applied Social Sciences, Case Western Reserve University, 10900 Euclid Ave, Cleveland, OH 44106-7164 (e-mail: mxs12@po.cwru.edu).

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