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Socioemotional Adjustment as a Mediator of the Association between Exposure to Community Violence and Academic Performance in Low-Income Adolescents

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Abstract

Objective—This study examines whether exposure to community violence is indirectly related to academic performance through anxious/depressed symptoms and delinquent behaviors.

Methods—Three hundred eighteen mothers and adolescents who participated in a longitudinal investigation were interviewed when adolescents were age 10, 14, and 16.

Results—Community violence exposure at age 14 was significantly related to anxious/depressed symptoms and delinquent behaviors. Delinquent behaviors (but not anxious/depressed symptoms) were significantly associated with academic performance at age 16. Exposure to community violence was indirectly related to academic performance through delinquent behaviors. There was no significant indirect effect of exposure to community violence on academic performance through anxious/depressed symptoms. Covariates included sociodemographics and exposure to child abuse. Age 10 anxious/depressed symptoms, age 10 delinquent behaviors, and age 14 academic performance were also included in the model to control for preexisting differences in socioemotional adjustment and academic performance.

Conclusions—Results suggest that exposure to community violence may initiate a cascade of problems that spread from behavior problems to declines in academic performance. Our results highlight the need for schools to consider exposure to community violence as one form of trauma and to transform in ways that make them more trauma-sensitive. The use of trauma-sensitive practices that address the effects of violence exposure on youth may help limit the progression of adverse effects from delinquent behavior to other domains of functioning.

Keywords

low-income adolescents; community violence; anxiety; depressive symptoms; delinquent behavior; academic performance

Community Violence Exposure and the Academic Performance of Adolescents

Witnessing violence and violent victimization is strikingly common among adolescents (Snyder & Sickmund, 2006), especially those from low-income and ethnic minority backgrounds (O'Donnell, Schwab-Stone, & Mueeed, 2002; Pearce, Jones, Schwab-Stone, & Ruchkin, 2003). Homicide is also the second leading cause of death for young people between the ages of 10 and 24 (Centers for Disease Control, 2010). In low-income, urban samples, the prevalence of lifetime violent victimization among adolescents can range from 20% to 70% (Bell & Jenkins, 1993; Fitzpatrick & Boldizar 1993; Margolin & Gordis, 2000; Singer, Anglin, Song, & Lunghofer, 1995; Stein, Jaycox, Kataoka, Rhodes, & Vestal, 2003). National surveys show that roughly 40% of adolescents have witnessed community violence in their lifetime (Hanson et al., 2006; Zinzow et al., 2009). These numbers tend to be higher for youth living in low-income, urban communities (Buka, Stichick, Birdthistle, & Earls, 2001). In most studies, the prevalence of witnessing violence is typically higher than the prevalence of victimization (Lambert, Nylund-Gibson, Copeland-Linder, & Ialongo, 2010; Mrug, Loosier, & Windle, 2008). Adolescents who have been exposed to violence are at increased risk for depression, anxiety, posttraumatic stress disorder, conduct problems, violent behavior, and delinquency (Overstreet & Mazza, 2003). Although associations between exposure to violence and behavior problems are well known, much less is known about processes linking exposure to violence and academic outcomes. To address this gap in the literature, this study aimed to determine whether anxious/depressed symptoms and delinquent behaviors mediate the association between violence exposure and later academic performance.

Exposure to Violence and Socioemotional Adjustment

Exposure to community violence poses a serious threat to the health and well-being of adolescents (Ceballo, Dahl, Aretakis, & Ramirez, 2001; Howard, Budge, & McKay, 2010; Pearce et al., 2003). Community violence is most strongly associated with post traumatic stress disorder and externalizing problems, and to a lesser extent other internalizing symptoms (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009; Wilson & Rosenthal, 2003). Associations between exposure to community violence and child and adolescent socioemotional adjustment tend to remain even when other forms of violence (e.g., child maltreatment and domestic violence) or other stressors related to poverty are taken into account (McCabe, Lucchini, Hough, Yeh, & Hazen, 2005; Overstreet & Mazza, 2003).

Delinquent Behavior

Exposure to violence predicts delinquent behavior (Barr et al., 2012; Mrug & Windle, 2010). A nationally representative survey of adolescents ages 12 to 17 years old found that exposure to community violence predicted delinquency one year later, even after controlling for past delinquency (Barr et al., 2012). The relation between exposure to community violence and delinquent behavior is found in cross-sectional (Rosario, Salzinger, Feldman, Ng-Mak, 2003) and longitudinal research (O'Donnell, Schwab-Stone, & Ruchkin, 2006) and

in both nationally representative surveys (Barr et al., 2012; Margolin, Vikcerman, Oliver, & Gordis, 2010) and studies using convenience sampling techniques (Peacock, McClure, & Agars, 2003).

Anxiety and Depressive Symptoms

Exposure to community violence is also related to symptoms of anxiety and depression (Fowler et al., 2009). Adolescents exposed to high levels of community violence report more trait-anxiety and fears than adolescents exposed to low levels of community violence (Cooley-Quille et al. 2001; Gaylord-Harden, Cunningham, & Zelencik, 2011). Negative coping (Dempsey, 2002) and posttraumatic stress (Ruchkin et al., 2007) have been found to mediate associations between exposure to violence and anxiety. Studies have also linked exposure to community violence to depression (Gaylord-Harden et al., 2011; Wilson & Rosenthal, 2003).

Mediating Mechanisms

Several mechanisms underlying associations between exposure to violence and youth outcomes have been proposed. Exposure to violence may be indirectly related to delinquent behavior through emotion regulation, social cognitive biases, and normative beliefs about violence (Guerra, Huesmann, & Spindler, 2003; Margolin & Gordis, 2004; Schwartz & Proctor, 2000). From a social information-processing perspective, violence exposure may reinforce distrust of adult protection and perceptions that the world is “hostile and unjust” (Temple 2000). Under circumstances of perceived injustice and lack of adult protection and authority, antisocial behavior may be viewed as a valid means of problem solving, handling conflict, meeting goals, securing resources, or managing emotions. Moreover, the sense of fatalism and hopelessness that stem from community violence exposure may reduce the perceived consequences associated with antisocial behavior (Crick & Dodge, 1994; Temple, 2000). Variants of stress and coping theories have primarily been used to explain the relation between exposure to violence and psychological symptoms. Exposure to greater levels of stress, including the stress of violence in the community is associated with a broad range of negative outcomes. Studies have suggested that exposure to violence may diminish children’s feelings of safety and security and may increase negative coping (e.g., ignoring the problem or screaming and yelling), which is related to poor psychological outcomes (Dempsey, 2002; Kliewer et al., 2006).

Exposure to Violence and Academic Outcomes

Although quite a bit is known about relations between exposure to community violence and socioemotional adjustment, little is known about associations between exposure to violence and academic achievement (Cooley-Strickland et al., 2009). A small number of studies examining such links have found evidence that exposure to violence may be detrimental to school grades, achievement test scores, and IQ (e.g., Howard et al., 2010; Ratner et al., 2006; Thompson & Massat, 2005). Research in this area, however, has been primarily limited to cross-sectional studies of young children or early adolescents (Howard et al., 2010; Thompson & Massat, 2005). The limitations of cross-sectional studies are well documented, and given evidence that violence exposure tends to increase across the period

of adolescence (Dempsey, 2002; Weist, Acosta, & Youngstrom, 2001), more longitudinal studies including older adolescents are needed to increase our understanding of how exposure to community violence may influence academic performance.

The existing literature on exposure to violence and academic achievement has also given short shrift to possible mechanisms underlying relations between exposure to community violence and academic achievement. It is plausible that psychological and behavior problems resulting from violence exposure can lead to academic difficulties. Past research has demonstrated that behaviors associated with delinquency, such as disruptive behavior, inattention, and impulsivity can interfere with adolescents' ability to learn and perform well at school. Adolescents who exhibit behavior problems, like delinquency, are more likely to skip school or face disciplinary actions that force them to miss school (Achenbach, 1993; Dishion, Patterson, Stoolmiller, & Skinner, 1991; Webster-Stratton & Dahl, 1995). Likewise, key characteristics associated with anxiety and depressive symptoms, including poor social skills, cognitive deficits, withdrawal, and/or lack of motivation, can also impede school performance (Roeser, Eccles, & Sameroff, 2000; Zahn-Waxler, Klimes-Dougan, & Slattery, 2000).

The few studies that have focused on potential mediators have reported mixed findings. Henrich and colleagues' (2004) longitudinal investigation of middle school students found that although witnessing violence was negatively related to academic achievement, depressive symptoms and aggression did not mediate this relation. Further, violent victimization was not associated with academic achievement. By contrast, a cross-sectional investigation by Schwartz and Gorman (2003) found that symptoms of depression and disruptive behavior mediated the relation between violent victimization and academic performance among a sample of elementary school students. A more recent study by Busby, Lambert, and Ialonga (2013) tested a longitudinal structural equation model linking adolescents' exposure to community violence in grade 6 to academic functioning in grade 8 through aggressive behavior, depressive symptoms, and anxious depressed symptoms assessed in grade 7. This study found that exposure to community violence was indirectly related to academic functioning through aggressive behavior. Depressive and anxious symptoms did not act as mediators. Discrepancies in findings in this set of studies may be related to differences in the operationalization of exposure to violence, age of the samples examined, or study design (i.e., cross-sectional vs. longitudinal).

The Current Study

Our study draws on the concept of developmental cascades, which posits that that functioning in one domain can spill over into functioning in another domain (Cox, Mills-Koonce, Proper, & Gariépy, 2010). In this study, we hypothesize that exposure to violence may trigger a negative cascade from behavior problems to academic achievement problems. Longitudinal research suggests that externalizing problems, such as delinquency, are particularly likely to cascade into problems with academic achievement over time (Masten et al., 2005). The current study extends the existing literature on community violence exposure and academic achievement by focusing on a sample of low-income adolescents that were followed longitudinally. We hypothesized that exposure to community violence

would increase anxious/depressed symptoms and delinquent behaviors, which in turn, would be related to declines in academic performance. Anxious/depressed symptoms and delinquent behaviors are tested simultaneously, making it possible to examine one meditational pathway, while controlling for the other meditational pathway. In this manner we can determine whether anxious/depressed symptoms and delinquent behavior both show similar cascade-like effects.

This study addresses important gaps in the literature regarding whether and why exposure to violence may have a negative impact on academic performance. Building on the findings of Schwartz and Gorman (2003) and Busby, Lambert, and Ialongo (2013), our study uses a longitudinal design, incorporates multiple methods and multiple informants, and includes controls for prior behavior and prior academic achievement—important improvements over existing studies. Another contribution of the current study is our focus on delinquent behaviors. Although delinquent behaviors are related to exposure to violence and academic achievement, delinquent behavior has received less attention as a potential mediator of the association between exposure to violence and academic performance.

Method

Study design

The sample is from a prospective study of teenage mothers and their children. Pregnant adolescents were recruited from an urban hospital prenatal clinic from 1990 to 1995. Assessments occurred during the second trimester and at delivery, when the infants were also evaluated. Follow-up assessments of the teenage mothers and their children occurred at ages 6, 10, 14, and 16 years. Study protocols were approved by the Institutional Review Boards of the Magee-Womens Hospital and the University of Pittsburgh.

Participants—All pregnant 12- to 18-year-olds attending the prenatal clinic were eligible for the study and 413 live-born singletons and their mothers who were assessed at delivery. Further details about the core study may be found elsewhere (Cornelius et al., 2002). A total of 318 mother-child pairs were seen at the 14-year assessment (77% of the birth cohort); 23 mothers refused to participate, 54 were lost to follow-up, nine had moved out of state, two children had been adopted, and seven children had died.

Mothers and children were interviewed by trained interviewers and completed self-report measures in office. At each assessment, the teenage mothers reported on their sociodemographic information, psychological symptoms, substance use, and home environment. The mothers also reported on their child's academic progress and completed scales rating their child's behavior. At the age 14- and 16-year assessments, the children reported their own behavior, grades, academic performance, exposure to violence, and child abuse.

At the 14-year follow-up, 71% of mothers were Black and 29% were White. Ninety-one percent of mothers had completed at least 12 years of school and mean monthly household income was \$2,253 ($SD = \$1,698$) at age 14. The sample included 158 girls and 160 boys.

The mean adolescent age at the 14-year follow-up was 14.5 years ($SD = 0.6$; range = 13–16) and the mean age at the 16-year follow-up was 16.5 years ($SD = 0.6$; range = 15–19).

Measures

The independent variable, exposure to violence, and the mediating variables, anxious/depressed symptoms and delinquent behaviors, were assessed at age 14. The dependent variable, academic performance, was assessed at age 16. Covariates from age 10 and 14 were also included in the model.

Independent Variable

Exposure to violence—At age 14, adolescents completed a modified version of the Screen for Adolescent Violence Exposure (SAVE), a self-report scale that assesses exposure to traumatic violence (Hastings & Kelley, 1997). A sample of 1,200 inner-city adolescents was used to develop the SAVE empirically; excellent reliability (alpha coefficients ranged from .65 to .95) and validity were demonstrated (Hastings & Kelley, 1997). A subset of 14 items focusing on victimization by violence (e.g., “had shots fired at me” and “someone has pulled a knife on me”) and witnessing violence (e.g., “seen someone get shot” and “have seen someone get killed”) comprised the exposure to violence measure. Adolescents indicated on a 2-point scale (0 = *no*, 1 = *yes*) whether they had been exposed to each form of violence. Responses were summed to form the total score ($\alpha = .72$).

Mediating Variables

Anxious/depressed symptoms—The Youth Self-Report and Profile (YSR; Achenbach & Rescorla, 2001) is designed to provide a mental health profile of adolescents ages 11 to 18. Achenbach and Rescorla (2001) report good test-retest reliability and discriminative validity on large normative samples. The YSR has similar competence and problem items to the Child Behavior Checklist (CBCL/6–18), but is completed by the adolescent. At age 14, adolescents responded to a series of statements on a 3-point response scale (*not true*, *somewhat or sometimes true*, *very true or often true*), indicating how well a series of 112 items described their behavior. The YSR yields both broad-band and narrow-band factors of internalizing and externalizing problems. The narrow-band factor anxious/depressed symptoms was used in the current study (13 items; $\alpha = .82$).

Delinquent behavior—Delinquent behavior was assessed at age 14 with the rule-breaking behavior subscale of the YSR (Achenbach & Rescorla 2001). Rule-breaking behavior is a narrow-band subscale comprised of 15 items. Example items are “I break rules at home, school, or elsewhere” and “I run away from home”. The sum of the 15 items was used as the score for this variable ($\alpha = .73$).

Dependent Variable

Academic performance—Six items were used to assess academic performance at age 16. Mothers indicated on a 4-point scale (0 = *failing*; 1 = *below average*; 2 = *average*; 3 = *above average*) how well their child was doing in each of four subject areas: reading, English, or language arts; history or social science; math; and science. Mothers also reported

on a 4-point scale how well they thought their child was doing in school overall (0 = *poor*; 1 = *fair*; 2 = *well*; 3 = *very well*). Adolescents were asked to indicate what grades they earned in school (1 = *mostly Fs*, 2 = *mostly Ds*, 3 = *mostly Cs*, 4 = *mostly Bs*, 5 = *mostly As*). Scores on these six items were standardized and summed to form a composite score.

Covariates

Sociodemographic variables—Mothers' education (number of years of school completed), child gender (0 = *female*, 1 = *male*), and race (0 = *African American*, 1 = *White*) were included as covariates.

History of child abuse—Adolescents' history of child abuse was measured using the Childhood Trauma Questionnaire (Bernstein & Fink, 1998) at age 14. The Childhood Trauma Questionnaire is a self-report instrument that provides a brief, reliable, and valid assessment of lifetime physical and emotional abuse, emotional and physical neglect, and sexual abuse during childhood. The questionnaire consists of 28 statements about experiences during childhood that respondents rate on a 5-point scale, ranging from 1 = never true to 5 = very often true. Subscale scores were dichotomized based on suggested cut-points for determining moderate to severe abuse and neglect. Dichotomized scores for each subscale were used to classify individuals as having a history of each type of trauma. Cutoff scores of 13 or higher for emotional abuse, 10 or higher for physical abuse, 8 or higher for sexual abuse, 15 or higher for emotional neglect, and 10 or higher for physical neglect were given a score of 1. The sum of each of the dichotomized subscale scores was used as the total score.

Anxious/depressed symptoms, delinquent behavior, and academic performance—At age 10, mothers completed the anxious/depressed symptoms (14 items; $\alpha = .80$) and delinquent behavior (13 items; $\alpha = .71$) subscales of the Child Behavior Checklist (CBCL; Achenbach, 1991). The anxious/depressed symptoms and delinquent behavior subscales parallel the anxious/depressed symptoms and rule-breaking behavior subscales measured by the YSR. The delinquent behavior subscale was renamed rule-breaking behavior in later versions of the CBCL and YSR. The rule-breaking behavior subscale of the YSR contains items focusing on alcohol and tobacco use and breaking rules that are not included in the delinquent behavior subscale of the CBCL. Age 14 academic performance was also included as a covariate. Academic performance was measured in the same manner at ages 14 and 16.

Data Analysis

Path analysis in Mplus version 6.1 was used to test the hypothesized model (Muthén, 1998–2007). Mplus handles missing data using full information maximum likelihood (FIML) estimation, which yields parameter estimates that tend to be less biased than those generated by ad hoc missing data techniques (e.g., listwise deletion; Schafer, 2002). FIML uses all available data to estimate parameters, thus cases that do not have complete data for all of the variables tested in the model can still be included in the analyses. Unlike imputation methods for handling missing data, which assign values for each missing data point, FIML uses an iterative procedure to generate the parameters of the population most likely to have

produced the available sample data. The final analytic sample was 318 mother-child pairs for the current study. Complete data for all measures from the three phases (10, 14 and 16 years) used in this analysis were available for 242 mother-child pairs. The percent of missing data on all variables ranged from 0 to 11%.

To test indirect effects, bias corrected bootstrapped confidence intervals based on 5000 bootstrap resamples were estimated. Bias corrected bootstrap methods provide empirical estimates of indirect effects that accommodate nonnormality of the sampling distribution of the indirect effect. A significant indirect effect is indicated when the confidence interval for the point estimate of the indirect effect does not include zero (Preacher & Hayes, 2008).

Specification of covariates

Mothers' education, child gender (0 = *female*, 1 = *male*), and race (0=*African American*, 1 = *White*) were included as covariates. Adolescents' history of child abuse as reported at age 14 was also controlled because of its association with exposure to violence and socioemotional adjustment. Additionally, age 10 anxious/depressed symptoms and delinquency, as reported by mothers, and age 14 academic performance were modeled as covariates, in order to test the hypothesized model while taking into account prior adjustment and academic performance. Direct paths from maternal education, race, and sex to exposure to violence, anxious/depressed symptoms, delinquent behaviors, and academic performance were included. Direct paths from child abuse history to anxious/depressed symptoms, delinquent behaviors, and academic performance were also specified. A correlational path was included between exposure to community violence and child abuse history. Child sex and child abuse history were correlated with each other and with age 14 academic performance, age 10 anxious depressed symptoms, and age 10 delinquency. At both age 10 and age 14, correlations between anxious/depressed symptoms and delinquency were included. Age 14 academic performance was correlated with exposure to violence, as well as age 10 and age 14 anxious/depressed symptoms and delinquency.

Results

Variable descriptive and bivariate correlations

Variable descriptives and bivariate correlations are presented in Table 1. Roughly 79% of adolescents were exposed to one or more forms of violence. Adolescents most frequently reported seeing someone get beaten up (72%), seeing someone get badly hurt (44.4%), seeing someone pull a gun on someone else (22.7%), having to run for cover when people started shooting (21.9%), and seeing someone pull a knife on someone else (18.3%). The overall pattern of correlations provided preliminary support for the hypothesized mediation model. Exposure to community violence was negatively correlated with academic performance and positively correlated with anxious/depressed symptoms and delinquent behaviors. Also as predicted, delinquent behaviors were positively correlated with academic performance. Contrary to our prediction, anxious/depressed symptoms were not correlated with academic performance.

Structural equation model

Fit indices suggested that the hypothesized indirect effects model provided acceptable fit to the data, $\chi^2 (16, N = 318) = 34.59, p \text{ italic} > .01$; Comparative Fit Index (CFI) = .94; Tucker-Lewis Index (TLI) = .88; Root Mean Square Error of Approximation (RMSEA) = .06; Standardized Root Mean Square Residual (SRMR) = .04. Predictors in the model explained 21% of the variance in anxious/depressed symptoms, 34% of the variance in delinquent behaviors, and 27% of the variance in academic performance. In terms of covariates, girls had more anxious depressed/symptoms and higher academic achievement than boys, but gender was not related to exposure to violence or delinquent behavior. Black adolescents had more exposure to violence than White adolescents. White adolescents had more anxious/depressed symptoms and delinquent behaviors, as well as higher academic achievement than Black adolescents. Age 10 delinquent behaviors were positively related to age 14 delinquent behaviors, but age 10 anxious/depressed symptoms were only marginally related to age 14 anxious/depressed symptoms. There was a significant, positive correlational path between linking history of child abuse and exposure to violence. History of child abuse was also positively related to anxious/depressed symptoms and delinquent behaviors but was not related to academic achievement. Maternal education was not significantly related to any model variables.

In terms of the relationships of primary interest, direct effects were mostly consistent with our hypotheses regarding mediation (Figure 1). Exposure to violence was positively related to anxious/depressed symptoms and delinquent behaviors ($b = .26, p \text{ bold} > .05$; $b = .62, p < .01$; respectively). As predicted, delinquent behaviors were negatively associated with academic performance ($b = -.23, p < .05$). Contrary to our prediction, anxious/depressed symptoms were not significantly related to academic performance ($b = .08, ns$). In support of our hypothesis regarding mediation, exposure to violence was indirectly related to academic performance through delinquent behaviors ($b = -.14, 95\% \text{ CI } [-.28, -.03]$). However, contrary to our hypothesis, exposure to violence was not indirectly related to academic performance through anxious/depressed symptoms ($b = .02, 95\% \text{ CI } [-.01, .07]$; see Table 2).

Discussion

The current study highlights community violence as a hazard that has important implications for the well-being of low-income adolescents. Our study makes a novel contribution to the literature by using longitudinal data to help illuminate the link between community violence exposure and academic achievement. We investigated whether adolescents' violence exposure is indirectly related to academic performance through increases in anxious/depressed symptoms and delinquent behaviors. Consistent with our hypothesis, we found that, after controlling for child abuse history and demographic factors as well as earlier anxious/depressed symptoms, delinquent behaviors, and academic performance, exposure to violence in early adolescence was related to an increase in delinquent behaviors, which, in turn, was related to declines in academic performance in mid-adolescence. Moreover, exposure to community violence was related to increases in anxious/depressed symptoms. However, contrary to our prediction, anxious/depressed symptoms were not related to

academic performance. Thus anxious/depressed symptoms did not mediate the association between violence exposure and academic performance.

The results from our study are in line with a sizable literature showing associations between violence exposure and internalizing and externalizing behaviors (Fowler & Braciszewski, 2009) and are consistent with recent work showing that aggressive behaviors but not anxious and depressive symptoms mediate the association between community violence exposure and academic achievement (Busby, Lambert, & Ialongo, 2013). The results of the current study also fit with the literature on developmental cascades which focuses on how functioning in different developmental domains is linked (Sameroff, 2000). Longitudinal studies suggest that externalizing problems, more so than internalizing problems, are related to increases in academic problems over time (Masten et al., 2005).

Limitations

The current study has limitations that should be noted. First, the measure of exposure to violence does not assess details about the contexts in which youth were exposed. Recent research suggests that violence experienced in different contexts is differentially related to adolescents' socioemotional adjustment (Mrug & Windle, 2010). To address this issue, we used adolescents' history of child abuse as a covariate in an attempt to examine the effects of community violence over and above child abuse, one form of violence experienced in the home. We were unable to account for domestic violence or differentiate violence that took place at school. School violence is of particular concern given our study's focus on academic performance. Data on school safety and other research, however, give us reason to believe that adolescents were primarily reporting on violence in the community. A recent report suggests that the types of violent acts that were the focus of our study are rare in the school context (Robers, Zhang, & Truman, 2010). Second, our measure of academic performance was a composite of parent and self-reported grades. Ideally academic performance would have been derived from official school records. Moderate to high correlations among items and between reporters suggested that our composite representing academic performance provided a valid representation of academic performance.

Despite these limitations, this study has several strengths. It expands upon previous research that has focused primarily on the socioemotional effects of violence exposure. It also extends similar work on young children and pre- or early adolescents to a sample of older adolescents, which is important because of evidence of increases in exposure to violence over the period of adolescence and stronger effects of violence exposure on internalizing and externalizing behaviors for adolescents compared to younger children (Fowler et al., 2009; Weist et al., 2001). Another strength of this study is that longitudinal data on adolescent adjustment was included, making it possible to control for preexisting differences in socioemotional adjustment and academic performance. We were also able to control for the confounding effects of exposure to child abuse, increasing confidence that the significant findings are indeed due to the effects of violence exposure.

Research Implications

Our results suggest three primary directions for future research. The first is identifying pathways from violence exposure to externalizing behaviors by investigating potential mediators such as self-regulation, cognitive appraisals, normative beliefs about violence, and coping skills. The second is examining other social and cognitive mediators that may underlie the association between community violence exposure and academic performance. For example, recent research suggests that sleep disturbances may act as a mediator of this association (Lepore & Kliever, 2013). Other potential mediators include substance use, memory, and attention problems. Studies employing observational tasks that tap into memory, attention, and self-regulation may further elucidate underlying mechanisms. The third is identifying protective factors within and outside of the family, in order to find ways to help buffer adolescents from some of the costs of community violence. Recent work in this vein has pointed to participation in extracurricular activities, family support, collective efficacy, and positive parent-child relationships as protective factors (Francois, Overstreet, & Cunningham, 2012; Hardaway, McLoyd, & Wood, 2012; Jain, Buka, Subramanian, & Molnar, 2012; Proctor, 2006).

Clinical and Policy Implications

The results of the current study indicate that behavior problems that stem from exposure to community violence are detrimental to academic performance. To address this issue, school-level policies need to shift in order to better support students exposed to community violence. Our results highlight the need for schools to consider exposure to violence as one form of trauma and implement policies and practices that have been shown to be effective for youth exposed to trauma. One approach is to transform schools in ways that make them more trauma-sensitive. Trauma-sensitive schools make “addressing trauma’s impact on learning on a school-wide basis” central to their mission (Cole, Eisner, Gregory, & Ristuccia, 2013, p. 11) by incorporating trauma-sensitive practices into the way the school is run, how classrooms are managed, and how school personnel address behavior problems that students exposed to trauma present (Bornstein, 2013; Cole et al., 2013). In trauma sensitive schools, school staff recognize the effects of trauma on student behavior and academic achievement, and they use this understanding to respond appropriately when students misbehave or experience difficulties in school. Trauma-sensitive schools also work to help students feel safe, minimize exposure to trauma triggers, foster positive relationships between students and school staff, help students learn to better regulate their emotions and behavior, and promote academic achievement (Cole et al., 2013).

Our study suggests that youth exposed to community violence may especially benefit from the alternative approaches to school discipline offered in trauma-sensitive schools. These schools focus on understanding the causes of misbehavior and employing constructive disciplinary strategies, designed to promote academic achievement, maintain the students’ connection to school, and avoid punitive disciplinary measures. Trauma-sensitive schools eschew harsh school disciplinary policies, such as zero tolerance policies, suspensions, and expulsions, which are harmful, ineffective, and may even increase the likelihood of later involvement in the justice system (American Psychological Association, 2008; Boccanfuso and Kuhfield, 2011; Osher, Bear, Sprague, & Doyle, 2010). The results of the current study

suggest that alternative discipline strategies may be particularly important for youth exposed to community violence to the extent that they help prevent behavior problems from cascading into later academic achievement problems. Thus far, school districts in Massachusetts and Washington State have been at the forefront of creating trauma-sensitive schools; however school and state-level policies that support trauma-sensitive schooling should be adopted more widely. Expanding these initiatives will likely benefit all students, even those who have not directly experienced trauma (Tishelman et al., 2013). Several resources are available that guide schools in becoming trauma sensitive (Cole, O'Brien, Gadd, Ristuccia, Wallace, & Gregory, 2005).

Although school-wide approaches seem to have the most potential for being effective at helping students exposed to violence, schools can adopt other practices on a smaller, more targeted scale to help students. Teachers and school psychologists—particularly those working with adolescents from high-risk neighborhoods—should increase their awareness of how neighborhood context can impact adolescent well-being, be knowledgeable about the signs and symptoms of violence exposure, and be able to connect adolescents to the necessary psychological services. Schools can use screening tools and trauma-informed psychological evaluation practices that have been tailored for use in schools to identify youth exposed to violence (Tishelman et al., 2010). In some schools, it may be appropriate to screen low-achieving students for violence exposure. Adolescents who are known to have been exposed to community violence should be provided access to school-based mental health services and academic support. School-based trauma- and grief-focused treatment has been shown to improve the academic performance of adolescents exposed to community violence (Saltzman, Pynoos, Layne, Steinberg, & Aisenberg, 2001).

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Figure 1.

Path model of relations among study variables * $p < .05$; ** $p < .01$. *Note.* Unstandardized estimates are above the standardized estimates, which are in parentheses. Covariates and some direct paths were included in the model, but are not shown for simplicity. Mothers' education, child gender, race, history of child abuse, age 10 anxious/depressed symptoms, age 10 delinquent behaviors, and age 14 academic performance were included as covariates. Indirect effects are shown in Table 2.

Table 1

Intercorrelations Between Study Variables

Study Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Male gender	--	--	-										
2. White race	--	--	-.05	-									
3. Maternal education	12.82	1.54	.10	-.03	-								
4. Child abuse history (14)	2.04	.85	-.02	-.05	.01	-							
5. Anxious/depressed symptoms (10)	2.66	2.99	-.01	.10	-.04	.15*	-						
6. Delinquent behavior (10)	2.11	2.26	.19**	-.13*	-.11	.02	.47**	-					
7. Academic performance (14)	.00	4.53	-.11*	.03	.13*	-.10	-.14*	-.23**	-				
8. Exposure to violence (14)	2.19	1.99	.09	-.24**	-.04	.21**	.00	.10	-.22**	-			
9. Anxious/depressed symptoms (14)	3.28	3.63	-.15*	.15**	-.11	.34**	.20**	-.01	-.12*	.16**	-		
10. Delinquent behavior (14)	4.18	3.26	-.05	.04	-.03	.42**	.13*	.12*	-.22**	.43**	.42**	-	
11. Academic performance (16)	.00	4.76	-.18**	.11	.11	-.14*	-.11	-.23**	.48**	-.15*	-.03	-.21**	-

*
 $p < .05$;**
 $p < .01$.*Note.* Numbers in parentheses represent the age at which the variable was assessed.

Table 2

Decomposition of Effects

Effect	Estimate	95% CI
Exposure to Violence -> Academic Performance	.13	-.10, .35
Total Indirect Effect	-.12 ^a	-.26, -.01
Specific indirect effect via		
Anxious/Depressed Symptoms	.02	-.01, .07
Delinquent Behavior	-.14 ^a	-.28, -.03

^a Empirical 95% confidence interval does not include zero. Unstandardized estimates are shown.