J Youth Adolescence (2013) 42:250–262
DOI 10.1007/s10964-012-9895-z

EMPIRICAL RESEARCH

Psychological Symptoms Linking Exposure to Community Violence and Academic Functioning in African American Adolescents

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Received: 3 August 2012 / Accepted: 18 December 2012 / Published online: 1 January 2013

Abstract African American adolescents are exposed disproportionately to community violence, increasing their risk for emotional and behavioral symptoms that can detract from learning and undermine academic outcomes. The present study examined whether aggressive behavior and depressive and anxious symptoms mediated the association between exposure to community violence and academic functioning, and if the indirect effects of community violence on academic functioning differed for boys and girls, in a community sample of urban African American adolescents ($N = 491$; 46.6 % female). Structural equation modeling was used to examine the indirect effect of exposure to community violence in grade 6 on grade 8 academic functioning. Results revealed that aggression in grade 7 mediated the association between grade 6 exposure to community violence and grade 8 academic functioning. There were no indirect effects through depressive and anxious symptoms, and gender did not moderate the indirect effect. Findings highlight the importance of targeting aggressive behavior for youth exposed to community violence to not only improve their behavioral adjustment but also their academic functioning. Implications for future research are discussed.

Keywords Community violence exposure · Academic functioning · Aggressive behavior

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Introduction

Urban, particularly low-income, African American youth disproportionately reside in neighborhoods characterized by poverty, crime, and violence (Carlo et al. 2011; Centers for Disease Control and Prevention [CDC] 2010), increasing their risk for exposure to community violence as witnesses and victims (CDC 2010). In fact, considerable research indicates that African American adolescents living in urban neighborhoods are exposed to community violence at higher rates than their Caucasian peers (e.g., Bureau of Justice Statistics 2006; Cooley et al. 1995; Gibson et al. 2009; Selner-O'Hagan et al. 1998). For example, African American youth living in high poverty neighborhoods witness community violence at higher rates than Caucasian youth (Gibson et al. 2009), and rates of victimization by serious violent crimes such as homicide, rape, and aggravated assault, are twice as high for African Americans than for their Caucasian counterparts (Bureau of Justice Statistics 2006). Furthermore, African American adolescents and young adults are six times more likely to be victims of homicides than Caucasians (Aguirre et al. 2008; Bureau of Justice Statistics 2006). Thus, exposure to community violence is a significant concern for many urban African American adolescents.

The differences in the neighborhoods of residence and exposure to community violence between low-income urban African American adolescents and their Caucasian peers parallel race differences in academic outcomes for these groups of youth. Compared to their Caucasian counterparts, African American students generally underperform in vocabulary, reading, and math (NCES 2000), and are less likely to complete high school (Chapman et al. 2011). Exposure to crime and violence has been highlighted as a primary reason that disadvantaged neighborhoods have

adverse effects on adolescents' academic development (Sampson et al. 1997). It has been suggested that youth exposed to high rates of crime and violence may expect to live shorter lives, and have few achievement related expectations due to a sense of foreshortened future (Cauce et al. 2011; Fitzpatrick 1993; Meyers and Miller 2004). As a result, community violence seems particularly relevant for understanding racial differences in academic functioning.

Several studies highlight the adverse effects of adolescents' exposure to community violence on their academic development. Exposure to community violence has been linked with lower grade point average (Bowen and Bowen 1999; Hurt et al. 2001; Overstreet and Braun 1999; Schwartz and Gorman 2003), standardized test scores in reading and math (Overstreet and Braun1999; Schwartz and Gorman 2003), and school attendance (Bowen and Bowen 1999) in cross-sectional research. In addition, Henrich et al. (2004) found that witnessing community violence was associated with lower standardized test scores in reading, writing, and math 2 years later (Henrich et al. 2004). While the available evidence documents associations between exposure to community violence and academic achievement, however, less is known about reasons for the association.

Psychological Symptoms as Mechanisms

African American adolescents' exposure to community violence can lead to a range of symptoms and problems that detract from learning and lead to decreased academic functioning. For example, compared to youth who have not experienced community violence, youth exposed to community violence tend to report more problems with aggression, depression, and anxiety (Gorman-Smith and Tolan 1998; Guerra et al. 2003; Richards et al. 2004); each predicts poorer academic functioning (Gorman-Smith and Tolan 1998; Guerra et al. 2003; Richards et al. 2004; Masten 2005). Thus, it is possible that exposure to community violence is associated with low academic functioning because its negative emotional and behavioral consequences make it difficult to perform well academically.

Aggression

A considerable body of research shows that adolescents' exposure to community violence is linked to aggression (Gorman-Smith and Tolan 1998; Halliday-Boykins and Graham 2001; Purugganan et al. 2003) and related behaviors, including retaliatory beliefs (McMahon et al. 2009), delinquency (Rosario et al. 2003) and violent behavior (Gorman-Smith et al. 2004). In fact, associations between community violence and aggressive and violent behaviors are stronger than other outcomes (for reviews see Fowler et al. 2009; Margolin and Gordis 2000). Guerra et al. (2003) found that elementary and middle school students who witnessed community violence were more likely to imitate violence and aggressive behaviors than students who did not witness community violence (Guerra et al. 2003). Likewise, researchers found that youth who witnessed community violence exhibited aggressive behavior 1 year later (Ozer 2005) and antisocial behavior 2 years later (Schwab-Stone et al. 1999). Of concern, adolescents' aggressive behavior is associated negatively with their academic achievement (for a review see Wilson et al. 2009). For example, numerous studies have found an association between adolescents' classroom aggression and their academic achievement (e.g., Basch 2011; Miles and Stipek 2006). Youth who are aggressive may spend more time fighting, arguing, being disciplined (e.g., in school detentions, suspensions), or avoiding school, and therefore less time attending to academic work and learning (Basch 2011). Relatedly, research examining the link between aggression and school engagement showed adolescents' aggression directly affected their academic engagement and ability to learn (Hinshaw and Anderson 1996; Miles and Stipek 2006).

Depression

The association between exposure to community violence and depression is less consistent than that with aggression (for a review see Fowler et al. 2009). Depressive symptoms identified in community violence exposed youth include intrusive thoughts and feelings, difficulties with concentration, hopelessness, and lack of belongingness (Osofsky 1995; Schwartz and Gorman 2003), and the association between exposure to community violence and depressive symptoms is found in cross sectional (DuRant et al. 1995; Howard et al. 2002; McGee 2003) and longitudinal research (Gorman-Smith and Tolan 1998; Rosenthal and Wilson 2003). Moreover, Zinzow et al. found that witnessing community violence was associated with major depressive episodes in a national sample of adolescents (Zinzow et al. 2009). A number of studies have demonstrated that depressive symptoms can impair adolescents' ability to function well academically (e.g., Da Fonseca et al. 2008; Fröjd et al. 2008; Hysenbegasi et al. 2005). For example, characteristics of depression such as impaired ability to concentrate, loss of interest, poor initiative, social withdrawal, and self-criticism affect cognitive performance and can diminish motivation to learn and overall academic achievement (Latzman and Swisher 2005). In fact, previous studies have found associations between depression and low grade point average among middle and high school students (Fröjd et al. 2008; Puig-Antich et al. 1993;

Reinherz et al. 1991), even after one-year follow up (Shahar et al. 2006).

Anxiety

Exposure to community violence has been linked to anxious symptoms (Cooley-Quille et al. 2001; Gorman-Smith and Tolan 1998; Rosenthal 2000), and there is evidence that these symptoms persist long term (Hammack et al. 2004; Ozer 2005; Ruchkin et al. 2007). Post-traumatic stress symptoms, such as physiological arousal due to hyperactivation and constant threat management (LeDoux 1992) are common for adolescents living in the midst of community violence (Perry 1997), and several studies have found associations between exposure to community violence and post-traumatic stress symptoms and Post Traumatic Stress Disorder (PTSD; Mazza and Reynolds 1999; McCart et al. 2007; Ozer and Weinstein 2004). Adolescents' anxious symptoms can negatively impact their academic performance (Mazzone et al. 2007; McDonald 2001; Wood 2006), but few have examined this empirically. Ialongo et al. (1994) found that first-grade children with high anxiety in the fall were eight times more likely to be in the lowest quartile for reading achievement and two and a half times more likely to be in the lowest quartile for math achievement the following spring (Ialongo et al. 1994). Similarly, adolescents with severe anxious symptoms have a significantly greater likelihood of receiving failing grades (Stein and Kean 2000) and anxiety can distract students from their learning and overall academic achievement (Parks-Stamm et al. 2008). For example, Wood (2006) found that elevated anxiety produces a physiological arousal that narrows adolescents' attention and impairs their ability to concentrate on other non-threatening stimuli, such as academics. Thus, anxious symptoms may compromise the adolescents' academic performance.

Evidence of Psychological Symptoms as Mechanisms

The few studies focusing on the role of aggressive behaviors and depressive and anxious symptoms in the link between exposure to community violence and academic functioning primarily have been cross-sectional studies. Schwartz and Gorman (2003) found that witnessing community violence was associated with urban children's symptoms of depression and disruptive behavior, which in turn were linked to poor academic achievement. In another cross sectional study, Voisin et al. (2011) found that exposure to community violence was associated with African American boys' withdrawal, PTSD symptoms, and aggression, which in turn were associated with their connectedness to their teachers. For girls, exposure to community violence was linked to school engagement through aggressive behavior (Voisin et al. 2011). Longitudinal studies are rare, however, with some research suggesting that psychological symptoms associated with exposure to community violence can adversely affect academic outcomes (Rosenthal and Wilson 2003), but other research finding no such support for mediation (e.g., Henrich et al. 2004). In sum, while prior cross-sectional research suggests that internalizing and externalizing responses to exposure to community violence may mediate the association between community violence and academic outcomes, less is known about the effects of exposure to community violence on academic achievement over time. Also lacking from the available literature are prospective studies examining whether and how the effects of exposure to community violence on later academic functioning varies for boys and girls.

Different patterns of association between exposure to community violence and aggression, depression, and anxiety for boys and girls suggest that the pathways linking exposure to community violence and academic adjustment may differ for boys and girls. For example, males generally report more self-protective (e.g., carrying a weapon) and aggressive behaviors in response to witnessing community violence (for a review see Fowler et al. 2009). On the other hand, several studies indicate that exposure to community violence is associated with anxious symptoms for girls, but not boys (White et al. 1998). These differences are in line with propositions about gender socialization, and are consistent with gender schema theory (Bem 1981) and social learning theory (Bandura 1977). For example, youth may be expected to act in ways consistent with traditional gender roles and reinforced for such behaviors, including boys' aggressive responses to exposure to community violence and girls' more emotional responses. Given gender differences in emotional and behavioral consequences of exposure to community violence, different types of symptoms may link community violence and academic functioning for boys and girls. This study examines this possibility.

Present Study

The disproportionate residence of urban, particularly low-income, African American youth in neighborhoods characterized by crime and violence increases their risk for exposure to community violence and its adverse effects, including problems in academic functioning (Henrich et al. 2004; Hurt et al. 2001; Schwartz and Gorman 2003). However, reasons for the association between exposure to community violence and academic functioning are not well understood. The current study used a longitudinal design to examine whether aggressive behavior and depressive and anxious symptoms mediate the association between

exposure to community violence and academic performance in a community sample of urban African American adolescents. It was hypothesized that exposure to community violence would be associated with aggressive behaviors, and depressive and anxious symptoms, which in turn would be associated with lower academic functioning. Different mediating pathways were expected for boys and girls, given prior research indicating that during adolescence males and females differ in their responses to exposure to community violence (Farrell and Bruce 1997; Voisin et al. 2011). Specifically, it was expected that the association between exposure to community violence and academic functioning will be mediated by aggression for boys, and by depressive and anxious symptoms for girls.

Method

Participants

Participants were 491 African American middle school students originally assessed in the fall of first grade as part of a longitudinal study examining the impact of two school-based preventive intervention trials targeting early learning and aggressive behaviors. These students were drawn from a sample of 678 urban first graders were recruited from 27 first grade classrooms in 9 different elementary schools. Of the 678 children who participated in the intervention trial in first grade, 585 (86.3 %) students were African American. Of the 585 African American youth in the original sample, 491 had written parental consent, provided verbal assent, and participated in the 6th, 7th, or 8th grade follow up assessments. These 491 participants comprised the sample of interest for this study. Of these 491, 401 (90.2 %) had data in each of grades 6, 7, and 8; 35 (7.1 %) had data at only two of the grades; and 13 (2.6 %) had data at only one of the grades. At their sixth grade assessment, the sample ranged in age from 10 to 13 ($M = 11.75$). Approximately half (53.4 %) of the sample is male and 71.3 % of the sample is low socioeconomic status, as indicated by receipt of free or reduced-cost lunches. Chi square tests indicated that the 94 youth who did not participate in the grade 6th–8th grade follow up assessments, did not differ from the youth in this study in terms of gender ($\chi^2 = 1.94$, *ns*), intervention status ($\chi^2 = 1.18$, *ns*), socioeconomic status ($\chi^2 = .65$, *ns*), or first grade aggressive behavior ($t = 1.29$, *ns*), depressive symptoms ($t = .021$, *ns*), or anxious symptoms ($t = .68$, *ns*).

Assessment Design

Adolescents reported about their exposure to community violence in grade 6. In grade 7, youth reported about their depressive and anxious symptoms, and teachers reported about aggressive behavior. Information about academic functioning was obtained through teacher reports about academic readiness and grades in grade 8 and participants' scores on 8th grade standardized reading achievement tests. A face-to-face interview was used to gather data from the teachers and youth at each assessment point. This study was approved by the University's Institutional Review Board. Written informed consent was obtained from parents and verbal assent was obtained from the youth.

Measures

Exposure to Community Violence

Exposure to community violence was assessed using the Children's Report of Violence Exposure (CREV; Cooley et al. 1995), a self-report instrument developed for children and adolescents to assess the frequency of exposure to community violence through three modes, witnessing, victimization, and hearsay (Cooley et al. 1995). Participants reported about their past year community violence victimization (i.e., whether they had been beaten up, robbed or mugged, shot or stabbed), witnessing (i.e., whether they had witnessed anyone being beaten up, robbed or mugged, shot or stabbed, or killed), and hearsay (i.e., if their family or peers witnessed or experienced the aforementioned events). These reports of victimization, witnessing, and hearsay were used as indicators of a latent variable representing exposure to community violence in the past year. The CREV has shown to be reliable in African American youth and to be related to psychological wellbeing (Cooley et al. 1995).

Aggression

Aggressive behavior was measured using the aggressive/disruptive behavior subscale of the Teacher Observation of Classroom Adaptation-Revised (TOCA-R; Werthamer-Larsson et al. 1991). The TOCA-R is a brief measure of each child's adequacy of performance on the core tasks in the classroom as defined by the teacher. It is a structured interview administered by a trained member of the assessment staff. The interviewer records the teacher's ratings of the adequacy of each child's performance over of the past 3 weeks on a 6-point scale (1 = *never true*, 6 = *always true)* in the following domains: accepting authority (aggressive behavior); social participation (shy or withdrawn behavior); self-regulation (impulsivity); motor control (hyperactivity); concentration (inattention); and peer likeability (rejection). A summary aggression score was created by taking the mean of the 5-item aggressive/disruptive subscale (grade 7 $\alpha = .87$). In terms of

predictive validity, the aggressive/disruptive behavior subscale significantly predicted adjudication for a violent crime in adolescence and a diagnosis of Antisocial Personality Disorder at age 19–20 in the first generation JHU PIRC trial and follow-up (Petras et al. 2004; Schaeffer et al. 2003).

Depressive and Anxious Symptoms

Anxious and depressive symptoms were assessed using the Baltimore How I Feel (BHIF; Ialongo et al. 1999), a 45-item, youth self-report measure of depressive and anxious symptoms. The BHIF was designed as a first-stage measure in a two-stage epidemiologic investigation of the prevalence of child and adolescent mental disorders as defined in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., rev.; *DSM-IV*; American Psychiatric Association 1994). Items were generated directly from *DSM-IV* criteria or drawn from existing child self-report measures, including the Children's Depression Inventory (Kovacs 1983), the Depression Self-Rating Scale (Asarnow and Carlson 1985), the Hopelessness Scale for Children (Kazdin et al. 1986), the Revised Children's Manifest Anxiety Scale (Reynolds and Richmond 1985), and the Spence Children's Anxiety Scale (Spence 1997). Children reported the frequency of depressive and anxious symptoms over the last 2 weeks on a 4-point scale (1 = *never*, 4 = *most times*), recoded such that the items are scored 0–3 and a score of 0 indicates no symptoms. Summary scores were created by summing across the 19 depression items to yield a depression subscale score (grade 7 $\alpha = .82$), and the remaining 26 items for the anxiety subscale score (grade 7 $\alpha = .87$). In terms of predictive validity, the BHIF depression subscales were significantly associated with a diagnosis of Major Depressive Disorder on the Diagnostic Interview Schedule for Children IV (Schaffer et al. 2000), and the BHIF anxiety subscales were significantly associated with a diagnosis of Generalized Anxiety Disorder on the Diagnostic Interview Schedule for Children IV.

Academic functioning

Teachers reported about participants' academic readiness and grades on the TOCA–R (Werthamer-Larsson et al. 1991). The 7-item academic readiness scale assesses effort, attention, eagerness to learn, and engagement in academic activities. Items are scored on a 6-point scale (1 = "*never true*;" 6 = "*always true*"), with higher scores indicating greater academic readiness (eighth grade $\alpha = .95$). Teachers reported about participants' grades ($\alpha = .96$) in their class over a period of 3 weeks on a 5-point scale (1 = *excellent*, 5 = *failing*). This scale is reversed coded with low scores indicating high performance. Reading achievement was measured using the Kaufman Test of Educational Achievement-Brief and Comprehensive Forms (Kaufman and Kaufman 1998). The K-TEA is an individually administered diagnostic battery that measures reading, mathematics, and spelling skills. The brief form of the K-TEA is designed to provide a global assessment of achievement in each of the latter areas. The K-TEA norms are based on a nationally representative sampling of over 3,000 children from grades 1–12, and internal consistency for the reading scale exceeded .90 in the norming sample. Teacher reported grades and academic readiness, and reading achievement were used as indicators of a latent variable representing academic functioning.

Results

Data Analytic Strategy

Structural equation modeling (SEM) was used to examine the hypothesized associations among study constructs. A benefit of the SEM framework is that it allows for the simultaneous examination of variables in a single model, allowing one to account for other variables in the model (Hoyle and Smith 1994). SEM allows for the examination of directional predictions and modeling of indirect effects. In addition, it avoids problems of overestimation and underestimation of mediated effects by controlling for measurement error and permits estimation of models that include multiple mediators (Kline, 1998).

SEM was conducted using the M*plus* 6.1 statistical package (Muthén and Muthén 1998–2012), and full information maximum likelihood estimates were obtained; this approach allows for missing data under missing at random (MAR; Little and Rubin 1989; Rubin 1987) assumptions. Overall model fit was evaluated using multiple indicators of fit: the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Hu and Bentler (1999) suggest that CFI values above .95 indicate good fit. RMSEA values less than .08 and SRMR values less than .10 indicate acceptable fit (Kline 1998).

To test mediation, the strength and significance of the indirect effects of exposure to community violence to the hypothesized mediators (i.e., aggressive behavior, depressive symptoms, anxious symptoms), and from these to the academic functioning (i.e., teacher-reported grades and academic readiness, reading achievement) were examined using the confidence interval based test recommended by MacKinnon et al. (2002). Multiple group analysis was used to examine gender differences. For these analyses, models were estimated under two conditions: when there were no

constraints on the hypothesized moderated path for males and females (i.e., freely estimated model) and when the hypothesized moderated path was constrained to be equal for males and females (i.e., constrained model). A worse fit for the constrained model compared to the freely estimated model suggests moderation.

Descriptive Statistics

Means, standard deviations, and bivariate associations for study variables are presented in Table 1. Participants' reports of exposure to community violence (through witnessing, victimization, and hearsay) ranged from 0 to 7 violent events ($M = 1.19$). In grade 6, approximately 59.6 % of the sample reported exposure to community violence through witnessing, victimization, or hearsay in the past year. Boys and girls did not differ in their reports of exposure to community violence. There were no differences in boys' and girls' reports of their depressive or anxious symptoms, but teachers reported significantly more aggressive behavior for boys than for girls. Teachers reported significantly higher grades and academic readiness for girls than for boys. There were no gender differences in reading achievement.

Exposure to community violence and aggression were associated positively for boys, but not girls. Exposure to community violence was associated positively with depressive symptoms and with anxious symptoms for boys and girls. Aggression was associated positively with grades and negatively associated with academic readiness for girls and boys, but was not associated with reading achievement. For boys and girls, depressive symptoms were associated with lower grades, less academic readiness, and lower reading achievement. Similarly, for boys and girls, anxious symptoms were associated with lower grades, less academic readiness, and lower reading achievement.

Structural Equation Modeling

To test the indirect effects of grade 6 exposure to community violence on grade 8 academic functioning and achievement, we estimated a model containing paths from exposure to community violence in grade 6 to aggression, depressive and anxious symptoms in grade 7, and from these to academic performance and achievement in grade 8 (see Fig. 1). As noted above, exposure to community violence was a latent variable with witnessing, victimization, and hearsay as indicators. Academic functioning was a latent variable with teacher-reported grades, teacher-reported academic readiness, and reading achievement as indicators. Intervention status and lunch status were controlled in all models, and grade 7 depressive and anxious symptoms were allowed to correlate. The indirect model fit the data well ($\chi^2(39) = 86.57$, $p < .001$; CFI = .96; RMSEA = 0.05, SRMR = .06.), with the significant Chi square likely reflecting its sensitivity to sample size (Bentler and Bonnet 1980). In this model, exposure to community violence in grade 6 was associated positively with aggressive behavior in grade 7 ($\beta = .14$, $p < .01$), which in turn was associated negatively with teacher-rated academic performance in grade 8 ($\beta = -.71$, $p < .001$). Exposure to community violence in grade 6 was associated positively with grade 7 depressive symptoms ($\beta = .11$, $p < .001$) and anxiety symptoms ($\beta = .07$, $p < .05$); however, neither was associated with grade 8 teacher-reported academic functioning. There was a significant indirect effect from community violence → aggressive behavior → academic functioning ($\beta = -.10$, $p < .01$; 95 % CI −.16, −.04), suggesting that aggressive behavior mediates the association between exposure to community violence and academic functioning. Neither intervention status nor lunch status were associated with academic functioning. The addition of the direct path from exposure

Table 1 Correlations, means, and standard deviations among study variables

Variables	1.	2.	3.	4.	5.	6.	7.
Community violence (6th)	–	.15*	.26**	.19**	−.11	.09	.01
Aggressive behavior (7th)	.05	–	.06	.08	−.38**	.29**	−.02
Depressive symptoms (7th)	.20**	.07	–	.66**	−.24**	.23**	−.15*
Anxious symptoms (7th)	.15*	−.00	.76**	–	−.20**	.21**	−.17**
Academic readiness (8th)	−.15*	−.32**	−.25**	−.22**	–	−.81**	.29**
Grades (8th)	.15*	.28**	.27**	.21**	−.86**	–	−.22**
Reading achievement (8th)	.00	−.12	−.23*	−.22**	.25**	−.33**	–
Males' mean (SD)	1.29 (1.36)	1.85 (.71)	.60 (.35)	.62 (.39)	3.68 (1.09)	3.16 (1.05)	36.65 (6.69)
Females' mean (SD)	1.08 (1.42)	1.53 (.54)	.66 (.44)	.67 (.44)	4.43 (1.01)	2.61 (.96)	36.71 (5.56)
t test	1.64	5.35**	−1.68	−1.32	−7.58**	5.81**	.09

Correlations for males are above the diagonal; correlations for females are below the diagonal

* $p < .05$; ** $p < .01$; *** $p < .001$

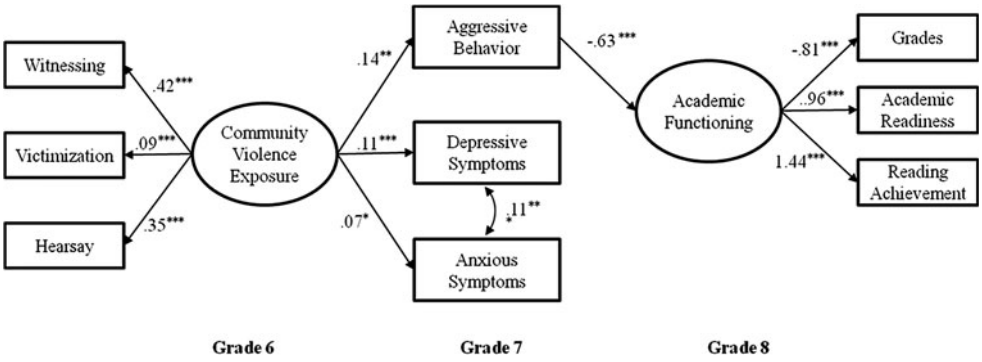

Fig. 1 Standardized coefficients for indirect pathway from 6th grade community violence exposure to 8th grade academic outcomes. *$p < .05$. **$p < .01$. ***$p < .001$

to community violence to academic functioning did not improve model fit ($\Delta\chi^2(1) = 2.57$, *ns*) and the path from exposure to community violence to academic functioning was not significant in this model, also consistent with mediation.

It was hypothesized that the indirect effect of exposure to community violence → aggressive behavior → academic functioning differed for boys and girls due to differences in the association between community violence and aggression for boys and girls. To test this hypothesis, a model with this path freely estimated for boys and girls was compared to a model with this path constrained to be equal for boys and girls. These models were not significantly different ($\Delta\chi^2 = .57$, *ns*), suggesting that gender did not moderate the path between exposure to community violence and aggressive behavior.

Discussion

The overrepresentation of urban African American adolescents in low income and high crime neighborhoods increases their risk of exposure to community violence (CDC 2010) and its adverse outcomes, including lowered academic performance (Henrich et al. 2004; Schwartz and Gorman 2003). However, mechanisms linking exposure community violence and educational outcomes are not well understood, limiting the ability to develop useful interventions for these youth. The present study investigated whether aggression, depression, and anxiety mediated the association between exposure to community violence and academic functioning in a community sample of urban African American adolescents. Aggressive behavior mediated the association between exposure to community violence and academic performance and this pattern was evident for males and females. The results of this research have implications for prevention and intervention efforts to decrease low academic performance among community violence exposed youth.

That aggression mediated the association between exposure to community violence and academic achievement in this longitudinal study is consistent with prior cross-sectional research with urban youth (Schwartz and Gorman 2003; Voisin et al. 2011). In a cross-sectional study, Schwartz and Gorman (2003) found that disruptive behaviors mediated the association between urban elementary school children's exposure to community violence and their academic achievement. Likewise, Voisin et al. (2011) found that aggression mediated the association between exposure to community violence and grade point average for African American high school females. Community violence exposed adolescents may begin to believe that aggressive and violent responses are normal and effective, which can lead to increased aggression and misbehavior (Miller et al. 1999) and negatively impact their academic performance. In addition to out of class time for misbehavior, adolescents with aggressive behaviors are more likely to be in detention and suspension (McConville and Cornell 2003; Sugai and Horner 2008). Thus, they likely have fewer positive interactions with teachers and peers, less time for classroom instruction, and reduced opportunities to participate in school activities; each has been linked to lower academic performance and school engagement (Sugai and Horner 2008).

While exposure to community violence was associated with depressive and anxious symptoms, there was no association between these symptoms and academic functioning or achievement. In contrast, Schwartz and Gorman (2003) found that urban elementary school children exposed to community violence displayed depressive and anxious symptoms, and these symptoms were linked to poor academic performance (Schwartz and Gorman 2003). Likewise, in study of African American high school students, Voisin et al. (2011) found that males exposed to community violence experienced symptoms of depression and anxiety, and these symptoms negatively affected student–teacher connectedness. It is possible that depressive and anxious symptoms were not associated with academic achievement because, unlike adolescents who are aggressive, adolescents with depressive and anxious symptoms may be less defiant and defensive with teachers; this difference in behavioral style may increase teachers'

willingness to provide these adolescents with additional academic support such as after school tutoring. Aggressive behavior, on the other hand, may limit teachers' and peers' willingness to provide academic support and decrease adolescents overall academic achievement (Farrell and Bruce1997; Gorman-Smith and Tolan 1998). Therefore, depressive and anxious symptoms may be less of a risk factor for low academic performance than aggressive behaviors.

Contrary to expectation, there were no gender differences in the association between exposure to community violence and aggressive behaviors, and aggressive behavior emerged as a mechanism linking exposure to community violence and academic performance for boys and girls. Similarly, other studies have not found gender differences in the effect of exposure to community violence on aggression (Mrug et al. 2008; Schwab-Stone et al. 1999; Schwartz and Proctor 2000). Some research suggests that parents living in violent neighborhoods may be less likely to try to reduce adolescents' aggressive behavior because they believe that aggressive behavior is necessary for adolescents to defend themselves (Duncan et al. 1994). Instead, parents may communicate the value of aggressive behavior as protective against exposure to community violence regardless of their child's gender; if so, males and females exposed to community violence might display similar aggressive behaviors. Relatedly, aggressive behaviors may be perceived as normative in violent contexts and girls and boys may display similar levels and types of aggression in these settings (e.g., Hudley et al. 2001; McMahon et al. 2009).

Our results should be considered in light of the study's limitations. Given this study's focus on individual behavior linking exposure to community violence and academic functioning, family and school level variables relevant for academic functioning were not examined. It is possible that family (e.g., parental involvement, family functioning) and school (e.g., school engagement, school cohesion) factors can provide social and emotional support that motivate adolescents to achieve and may protect against poor academic performance (Gorman-Smith et al. 2004); in addition, school-level effects can have implications for academic performance (e.g., Koth et al. 2008; Stewart 2008). Regarding measurement, while it is generally accepted that adolescents are well equipped to report about their depressive and anxious symptoms (Grant et al. 2004), multiple reporters of adolescents' depressive and anxious symptoms would have been beneficial as the lack of association between adolescent reports of depressive and anxious symptoms and academic functioning may have occurred due to a rater effect. Because aggressive behaviors were measured using teacher reports, these findings reflect aggressive behavior in the school context; aggression in other contexts also may be relevant for academic functioning. Finally, these results likely generalize only to African American youth from similar socioeconomic and geographic backgrounds.

Limitations notwithstanding, this study suggests several implications for practice. Given the adverse behavioral and educational consequences of being exposed to community violence, it is important for educators and counselors to conduct assessments of exposure to community violence. Exposure to community violence is often undetected by service providers (Guterman and Cameron 1999; Voisin 2007); increasing public awareness of the scope of exposure to community violence and the use of standardized measures of assessing exposure to community violence in practice settings may be useful (Voisin 2007). In addition, the association between exposure to community violence and depressive and anxious symptoms highlights the need for regular assessments of these problems in youth who have been exposed to community violence.

Implementation of community and school-based preventive interventions addressing community violence for youth exposed or at risk of exposure may be helpful for many urban youth and help prevent aggressive behaviors before they occur, and interventions aimed at preventing or reducing aggression may be useful. For example, Coping Power (Lochman and Wells 1996), a preventive intervention focusing on social competence, self-regulation, and positive parental involvement, and the Positive Alternative Thinking Strategies (PATHS; Kusche and Greenberg 1994) program focusing on increasing self-control, emotional awareness, and interpersonal problem solving skills, each have demonstrated effects for aggressive behaviors (e.g., Curtis and Norgate 2007; Kam et al. 2003). In addition, given the link between exposure to community violence and academic performance through aggression, educational policies should include interventions aimed at decreasing adolescents' aggressive behaviors. Aggressive adolescents' disruptive behaviors and rule breaking may lead to several disciplinary actions, such as in-school detentions and school suspensions, which interfere with utilities for learning (Raby 2012). These types of interventions to punish aggressive behaviors can inadvertently negatively affect students' academic performance. Alternative disciplinary strategies such as School Wide Positive Behavioral Interventions and Supports (SWPBIS; Bradshaw et al. 2010) should be considered, and prevention strategies that promote effective problem solving strategies and non-aggressive behaviors (e.g., social skills training; Darensbourg et al. 2010; Fenning and Rose 2007) should be integrated into the academic curriculum.

Findings from this study add to the literature examining the role of exposure to community violence in adolescents' academic functioning. Results indicate that aggressive behavior is one mechanism linking exposure to community violence and academic functioning for African American boys and girls. This finding is particularly important given low income urban

African American adolescents' disproportionate exposure to community violence (Bureau of Justice Statistics 2006), and the seemingly parallel disparities in academic outcomes (Vanneman et al. 2009). To optimally inform interventions to eradicate these longstanding academic achievement disparities and improve academic outcomes, future research will benefit from the identification of specific types of aggressive behaviors (e.g., verbal aggression, fighting, destructive behavior) most relevant for understanding the association between exposure to community violence and academic functioning to inform intervention efforts. In addition, understanding achievement-related mechanisms that link exposure to community violence and academic functioning is important. For example, youth exposed to community violence may have a sense of foreshortened future (Gellman and DeLucia-Waack 2006; Wright and Steinbach 2001) or perceive limited life opportunities (Davis and Siegel 2000); these may lessen adolescents' future academic expectations and achievement motivation, and therefore possibly also their academic achievement (Wigfield and Eccles 2002). Finally, it is important to note that not all adolescents who are exposed to community violence experience negative consequences. Future research should examine factors that promote resilience within these youth. Prior research highlights racial identity and racial socialization as protective factors against low academic achievement for African American adolescents (Byrd and Chavous 2009; Evans et al. 2012). Identifying relevant protective factors for African American youth will allow researchers to develop and implement optimal interventions for youth exposed to community violence and promote academic success for these youth.

Acknowledgments This work was supported by grants from the National Institute of Mental Health (MH057005: PI Ialongo; MH078995: PI Lambert) and the National Institute on Drug Abuse (DA11796: PI Ialongo). We thank the Baltimore City Public Schools for their collaborative efforts and the parents, children, teachers, principals, and school psychologists and social workers who participated in this study.

Author contributions DB conceived the study, participated in the analysis and interpretation of the data, and drafted the manuscript; SL conceived the study, performed the statistical analysis and interpretation of the data, and helped to draft the manuscript; NI was responsible for the design and coordination of the study, and performed the measurement. All authors read and approved the final manuscript.

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