Parent–Adolescent Relationship Quality and Nondisclosure as Mediators of the Association Between Exposure to Community Violence and Psychological Distress

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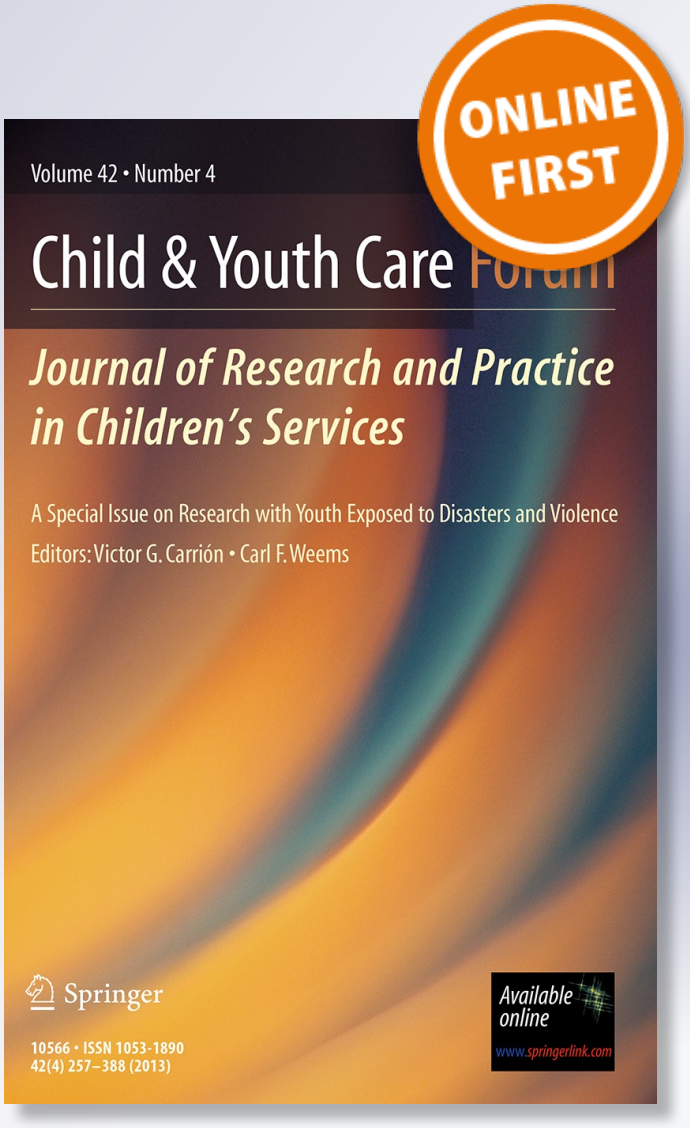

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ORIGINAL PAPER

Parent–Adolescent Relationship Quality and Nondisclosure as Mediators of the Association Between Exposure to Community Violence and Psychological Distress

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Abstract
Background African American youth residing in urban poverty have been shown to be at increased risk for exposure to violence and for psychological symptoms, but there has been little investigation of mediating processes that might explain this association.
Objectives This study tested the quality of parent–adolescent relationships and adolescent nondisclosure to adults as mediating mechanisms through which exposure to community violence may lead to psychological symptoms.
Methods The current study surveyed a sample of 152 low-income urban African American early adolescents (aged 12–14). Participants completed self-report questionnaires assessing exposure to community violence, nondisclosure, parent–adolescent relationship, and psychological symptoms (i.e., internalizing and externalizing symptoms).
Results Path analyses revealed that parent–adolescent relationship quality and nondisclosure both functioned as mediators of the relation between exposure to community

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violence and both internalizing and externalizing symptoms, though significant direct effects for violence exposure on externalizing symptoms remained. Decomposition of effects revealed that nondisclosure was a stronger mediator than parent–adolescent relationship quality. Results also indicated that exposure to violence can lead to externalizing (but not internalizing) symptoms first by way of parent–adolescent relationship quality and then nondisclosure.

Conclusions Combined, these findings suggest that the development of preventive interventions designed to assist adults and parents improve communication and strengthen relationships with adolescents might reduce the negative effects of exposure to community violence on adolescent mental health.

Keywords Nondisclosure · Mediating mechanisms · Community violence · African-American · Mental health · Parent–adolescent relationships

Introduction

It is well-established that African American children and adolescents are at disproportionate risk for residing in low-income urban neighborhoods characterized by high rates of crime and violence (Bureau of Justice Statistics 2010; U.S. Census Bureau 2010). Numerous studies have also documented that exposure to community violence is a major risk factor for psychological problems (Horn and Trickett 1998; Ozer and Weinstein 2004) including both internalizing and externalizing disorders (Bradshaw et al. 2009; Buka et al. 2001; Cooley-Quille et al. 2001; Gorman-Smith et al. 2004; Hammack et al. 2004; Margolin and Gordis 2000; Saltzman et al. 2001; Tolan et al. 2003).

Despite the well-documented link between exposure to community violence and psychological symptoms, little is known about the processes that mediate this association (Grant et al. 2006; Margolin and Gordis 2000). What is known is that interpersonal processes likely play a role. Interpersonal theory has provided the theoretical background for numerous studies examining family processes as mediators of the relation between stress and psychological symptoms among young people (Conger and Rueter 1995; McLoyd et al. 1994). For example, Conger and Rueter (1995) found that changes in parent–adolescent relationship quality mediate the relation between acute economic loss and adolescent psychological problems. As parents become distressed in response to economic problems, they often become less nurturing and more hostile toward their children. These relationship changes lead, in turn, to psychological problems in adolescents (Conger and Rueter 1995; Conger et al. 1999, 2000, 2002). A recent meta-analysis provides strong evidence, across multiple studies, in support of this mediational model for economic stress (Grant et al. 2003).

Far fewer studies have tested for mediators of the association between exposure to community violence and internalizing and/or externalizing symptoms in youth (Bradshaw et al. 2009; Grant et al. 2006), and only a handful of these studies have examined interpersonal variables as potential mediators (Aisenberg 2001; Linares et al. 2001; Punamäki et al. 1997; Roosa et al. 2005; Spano et al. 2009). Results of these studies provide preliminary evidence that parent–adolescent relationship quality may also serve as a mediator of the association between exposure to community violence and psychological symptoms among youth.

Furthermore, there is substantial evidence for an association between parent–adolescent relationship quality and psychological symptoms (e.g., Brumariu and Kerns 2010; Fowler et al. 2009; Pinderhughes et al. 2001; Guttmann-Steinmetz and Crowell 2006), and growing evidence of negative effects of exposure to community violence on parent–adolescent relationships (Brooks-Gunn et al. 1993; Furstenberg 1993; Lovejoy et al. 2000; Smetana et al. 2006; Stern and Smith 1995; Yearwood and McClowry 2006) Taken together, these findings suggest that disruptions to the parent-adolescent relationship may represent an important process linking exposure to community violence with youth psychological distress.

There also is preliminary evidence to suggest that exposure to community violence may predict a related interpersonal process that becomes more characteristic of parent–adolescent and adult–adolescent relationships during adolescence: nondisclosure. For example, Ozer and Weinstein (2004) found that nearly half of their ethnically diverse 7th grade sample withheld violence exposure information because they were concerned about making listeners uncomfortable or upset. In addition, these youth reported higher PTSD symptoms, compared to youth who willingly disclosed.

Results of studies on adolescents' motives for nondisclosure, and similar constructs (e.g., secrecy), provide further insight into why exposure to community violence might predict nondisclosure (Darling et al. 2006; Finkenauer et al. 2002; Kerr and Stattin 2000; Smetana et al. 2006). For example, consistent with other studies, Dinizulu et al. (accepted) found evidence for two primary motives for nondisclosure to adults in a sample of urban African American early adolescents exposed to violence: (1) concerns that disclosure would result in threats to autonomy, and (2) concerns that the recipient of the relationship, in which the information was disclosed, could not bear the disclosure (e.g., the recipient may not believe the information or blame the adolescent). These motives may be especially salient for youth exposed to community violence, because parents and adults are likely to experience distress upon disclosure, which may prevent parents and adults from providing youth with the types of responses they seek (Ozer and Weinstein 2004). Parents may also be motivated to protect their adolescent by curbing their autonomy (Aisenberg 2001; Linares et al. 2001). Together with findings that withholding information about stressful experiences is linked to psychological symptoms in adolescents (Dinizulu et al., accepted; Finkenauer et al. 2002; Frijns et al. 2005; Kliewer et al. 1998), these findings suggest that nondisclosure may also serve as an important interpersonal mediator of the association between exposure to community violence and adolescent psychological distress.

Finally, the quality of the parent–adolescent relationship may predict the level of adolescent nondisclosure. If the parent–adolescent relationship is characterized by poor communication, distrust, and distance, adolescents may be less inclined to disclose their experiences to parents (Darling et al. 2000; Engels et al. 2006; Finkenauer et al. 2002; Kerr and Stattin 2000; Miller and Lane 1991; Smetana et al. 2006).

Taken together, reviewed findings build on interpersonal theories of psychopathology (e.g., Rudolph et al. 2008) and provide an empirical basis for testing the hypotheses that interpersonal variables, i.e., parent–adolescent relationship quality and nondisclosure, mediate the association between exposure to community violence and internalizing and externalizing symptoms in youth (McMahon et al. 2003). In particular, there is evidence for each of the links in a mediational chain in which exposure to community violence predicts parent–adolescent relationship quality (Roosa et al. 2005) and nondisclosure (Dinizulu et al., accepted; Ozer and Weinstein 2004); and, parent–adolescent relationship quality (Ceballo and McLoyd 2002; Pinderhughes et al. 2001; Xue et al. 2005) and nondisclosure (Frijns et al. 2005; Kliewer et al. 1998; Ozer and Weinstein 2004), in turn,

predict psychological symptoms. Further, preliminary evidence suggests that exposure to violence predicts parent–adolescent relationship quality, which in turn predicts nondisclosure (e.g., Finkenauer et al. 2002), which, in turn, predicts psychological symptoms (Dinizulu et al., accepted; Finkenauer et al. 2002; Frijns et al. 2005; Kliewer et al. 1998). The present study tested these hypothesized mediational pathways with a sample of 6th through 8th grade low-income urban African American youth.

The sampling of 6th–8th grade youth, in particular, was guided by four factors: (1) adolescents' capacity to communicate and manage information (e.g., nondisclosure, disclosure, secrecy, lying, omission) about their daily experiences builds momentum during the preadolescent years, and becomes more prominent with increasing age (Finkenauer et al. 2002; Kerr and Stattin 2000); (2) as this age group tries to negotiate more personal freedom, the parent–adolescent relationship is at risk for being strained, especially for those residing in neighborhoods characterized by violence and crime (O'Donnell et al. 2002); (3) this age group is exposed to increasing levels of community violence due to increased independence, less supervision and adult protection (Buka et al. 2001); and (4) within the context of community violence, 6th–8th grade youth are at a crossroads for developing risky behaviors (Eccles et al. 1997). The processes examined in this study may contribute to such trajectories. Thus, investigating parent–adolescent relationship quality and nondisclosure as mediators of the association between exposure to community violence and psychological symptoms may help guide prevention and intervention efforts for this vulnerable age group.

In sum, the current research used a cross-sectional design with a sample of low-income 6th–8th grade urban African American early adolescents to test the hypothesis that both parent–adolescent relationship quality and nondisclosure mediate the association between community violence and psychological distress (see Fig. 1). We also tested the hypothesis that a pathway leading from exposure to community violence would predict parent–adolescent relationship quality, which would, in turn, predict adolescent nondisclosure, which, in turn, would predict psychological symptoms. Figure 1 presents a diagram of the conceptual model tested.

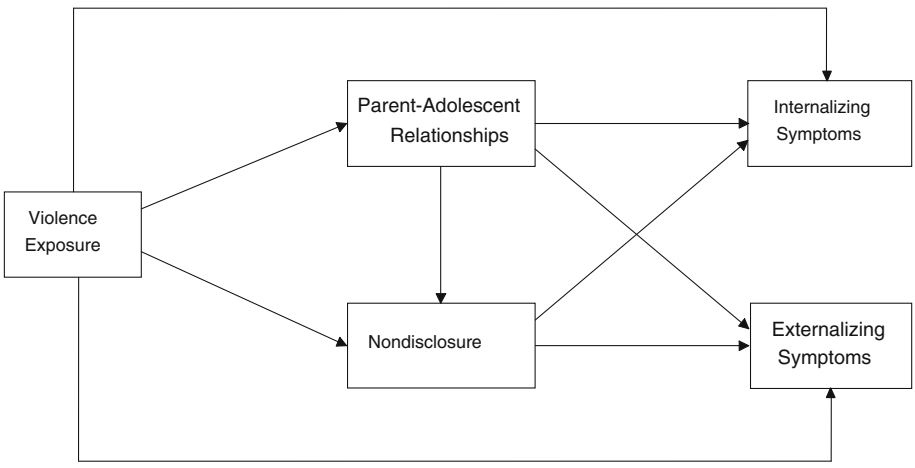

Fig. 1 Path diagram of the conceptual model tested in the present research

Method

Participants

A total of 152 urban African American youth (M = 12.77 years, SD = .87, 100 females and 52 males) in grades 6 through 8 were recruited to participate in the study. Participants were between the ages of 11 and 14 years and were attending regular education classes. Power analysis revealed that the current sample size provides 80 % power to detect predictors that explain at least 5 % of the variance in outcome measures at two-tailed $p < .05$ in multiple regression analysis.

All study activities were approved by the Institutional Review Board at DePaul University, Chicago. Participants were recruited from schools located in low-income urban neighborhoods, designated as high or moderate risk based on published summary data from local public schools, law enforcement agencies, and the latest available U.S. Census data. These data included percentages of low-income residents, crime statistics, and annual percentage of school turnover. Participating schools were comprised of 70–98 % African American students.

After providing informed consent, one parent/guardian from each adolescent's household completed a demographic form. Of the 152 youth who were consented and assented, 140 parents/guardians returned demographic forms. Although we did not obtain data on parents'/guardians' incomes or occupations, school data indicated that 95–98 % of students at participating schools were considered low-income based on receipt of reduced-price or free lunches. Of 121 parents/guardians who responded to the question, approximately 23 % had not completed high school, 61 % received their high school diploma and 16 % received their GED. Sixty-four percent had no further education beyond high school, 26 % received a vocational certificate, and only 10 % received an associate's, bachelor's or master's degree. Further, out of 105 parents/guardians who responded to the question, 60 % reported receiving government assistance (e.g., SSI, LINK).

Study Design

Recruitment

African American youth were recruited from 6th, 7th, and 8th grade classrooms within a convenience sample of three K-8 urban schools (from different neighborhoods, meeting the descriptions above, in a large Midwestern city). During classroom visits, graduate students explained the study and distributed written information and consent/assent and demographic forms for parent/guardians to complete. Students were instructed to share these materials with their parents/guardians and return completed forms to their teachers. Students who returned consent forms were provided with a bag of chips regardless of whether parents/guardians provided permission to participate. Approximately 60 % of 256 eligible youth who were approached agreed to participate in the study and provided evidence of parent consent. All consented and assented adolescent participants completed the study.

Data Collection

Within each school, participants were pulled from class to participate in the study. Doctoral students administered surveys to groups of participants in a large room. Whenever

possible, ethnic matches between participants and doctoral administers were arranged. Survey measures were administered anonymously. Students who participated in the study received two movie passes (worth approximately $19) immediately after completing the measures. Participants also received debriefing forms and questions concerning their feelings about the study and their possible interest in additional debriefing or mental health services. No participant identified the need for additional debriefing or services.

Measures

Nondisclosure

Nondisclosure was assessed using the Reasons for Keeping Things Private scale (RFKTP; unpublished measure; McIntosh 2003), a 16-item self-report questionnaire assessing potential reasons why youth might not disclose information to parents and other adults, and the frequency with which they nondisclose for each reason. Representative questions are: "How often do you keep something to yourself because your parent/other adult would overreact?" and "How often do you keep something to yourself because you want freedom from rules?" Frequency is rated on a 3-point Likert scale (1 = never, 2 = sometimes, 3 = a lot). Cronbach's alpha for the RFKTP total score was .87. Supporting the convergent validity of this instrument (Dinizulu, unpublished manuscript) as a measure of nondisclosure, RFKTP scores correlated 0.40 ($N = 152$, $p < .0001$) with the degree to which respondents considered lying or cheating to characterize themselves (as assessed by YSR item 43), where lying is conceptualized as a specific form of nondisclosure (Darling et al. 2006).

Parent–Adolescent Relationships

To assess the quality of parent–adolescent relationships, the Inventory of Parent and Peer Attachment (IPPA; Armsden and Greenberg 1987) was used. The IPPA consists of 28 items making up three subscales: Trust, Communication, and Alienation. For this study, a total of 26 items instead of 28 were used. Two items were discarded due to similar content and wording to two items listed on the nondisclosure measure. Each item is scored by the participant as "Always or almost always true," "Often true," "Sometimes true," "Seldom true," or "Almost never or never true." Depending on whether the item is negatively (e.g., "Talking over my problems with my parents makes me feel ashamed or foolish") or positively stated (e.g., "I like to get my parents' point of view on things I'm concerned about"), responses are coded normally or reverse-coded. Total scores were calculated for each participant. The IPPA has demonstrated high internal consistency in prior research with urban African American adolescents (Gonzales et al. 1996). In the present study, internal consistency also was good (alpha = .85).

Exposure to Violence

Life-time exposure to violence was assessed using a modified version of the Exposure to Violence Survey—Screening Version (Richters and Martinez 1993), a 58-item, true–false self-report questionnaire developed on 5th and 6th grade low-income urban African American youth. Breaking dichotomous scales into continuous scales has been found to provide more information (see Stöber et al. 2002); therefore, in the current study,

participants responded to the items based on a 5-point Likert scale ranging from "never" to "has happened more than six times." This modified version of this measure has also been used in another study (Carter and Grant 2012). The measure asked respondents to report how often they had witnessed or experienced 27 types of violence or crime including gang violence, drug trafficking, burglary, police arrests, assaults, physical threats, sexual assaults, weapon carrying, firearm use, and intentional injuries such as stabbings, gunshots, suicides, and murders. To ensure that all items used in the present analyses assessed community violence, a total of seven items pertaining specifically to domestic violence (e.g., "I have seen someone else get punched or kicked by a member of their family") or use of weapons in the home (i.e., "I have seen or heard gun fired in my home.") were excluded. Sample items used to indicate exposure to community violence include: "I have been beaten up or mugged" and "I have seen someone else get attacked or stabbed with a knife." Richters and Martinez (1993) report good test retest reliability for the measure ($r = .90$) and the modified version used in the present study demonstrated excellent internal consistency ($\alpha = .95$).

Psychological Symptoms

Internalizing and externalizing symptoms were assessed using the Youth Self Report (YSR; Achenbach and Rescorla 2001). The YSR includes 112 items, which adolescents rate on a 3-point scale as 0 = not true, 1 = somewhat or sometimes true, or 2 = very true or often true of themselves during the past 6 months. The YSR consists of two empirically derived broad-band syndrome subscales that reflect internalizing (35 items) and externalizing (32 items) symptoms. Sample items assessing internalizing symptoms, which include withdrawal, somatic complaints, anxiety, and depression, are: "I am too fearful or anxious," and "I cry a lot." Sample items assessing externalizing behaviors, which include delinquency and aggression, are: "I get in many fights" and "I physically attack people." Normative data for the YSR are based on a nationally representative community sample of children and adolescents with separate norms for boys and girls (Achenbach and Rescorla 2001). For ease of interpretation, total raw scores were calculated for the internalizing and externalizing subscales, and converted to T-scores based on the normative sample. Reliability and validity are well established for the YSR (Achenbach and Rescorla 2001). For the present sample, Cronbach's alpha was .89 for internalizing symptoms and .92 for externalizing symptoms.

Results

Descriptive, Correlational, and Collinearity Analyses

Means, standard deviations, ranges of scores, and correlations among variables are presented in Table 1. Exposure to community violence, parent–child relationships, nondisclosure, and internalizing and externalizing symptoms were all significantly intercorrelated in the expected directions. Of the two potential mediators, nondisclosure was more highly correlated than parent–child relationships with the remaining variables.

Frequency analyses were conducted to determine the most frequently reported reasons for adolescent nondisclosure. Results revealed the following three reasons to be most common: (1) "to keep from being punished" (endorsed by 90 % of the sample); (2) "because you don't want your parent/other adults to worry about you" (endorsed by 88 %

Table 1 Pearson correlations, means, and standard deviations for study variables ($N = 152$)

Study variables	1	2	3	4	5	6
1. Exposure to community violence	–	–	–	–	–	–
2. Parental–adolescent relationships	−.16*	–	–	–	–	–
3. Nondisclosure	.42*	−.46*	–	–	–	–
4. Internalizing symptoms	.21*	−.36*	.35*	–	–	–
5. Externalizing symptoms	.34*	−.36*	.45*	.61*	–	–
6. Gender	−.01	−.05	−.04	.03	.13	–
Mean	39.59	92.78	30.78	58.53	55.76	1.67
SD	28.82	18.09	11.97	9.99	10.92	0.48
Range	0–110	39–134	0–58	30–90	29–87	1–2

For gender, 1 = male, 2 = female

SD standard deviation

* Statistically significant at two-tailed $p < .05$

of the sample); and (3) "to keep from getting into an argument" (endorsed by 84 % of the sample). Frequency analyses were also conducted to report the following range of scores for each variable (see Table 1).

Based on established clinical cut-off scores (Achenbach and Rescorla 2001) for the YSR internalizing subscale, 16 % of the sample reported elevated and 10 % reported clinically significant symptoms. For externalizing symptoms, 11 and 9 % of the sample reported clinically elevated and clinically significant scores, respectively. Before conducting path analysis, we examined the degree of multicollinearity among the four predictors in the path model when using them to predict internalizing and externalizing symptoms in multiple regression. As evidence that the predictors are unique from one another, collinearity diagnostics revealed relatively large variable tolerances for nondisclosure (0.66), parental (0.78), violence exposure (0.82), and gender (0.99) indicating sizeable proportions of variance in each predictor that cannot be explained by the other predictors in the model (Cohen et al. 2003). In addition, gender was not associated with violence exposure, $t(150) = 0.15$, $p > .88$, Cohen's $d = 0.03$, parental–adolescent relationships, $t(150) = 0.58$, $p > .56$, $d = 0.10$, nondisclosure, $t(150) = 0.46$, $p > .64$, $d = 0.08$, internalizing symptoms, $t(150) = 0.40$, $p > .69$, $d = 0.07$, or externalizing symptoms, $t(150) = 1.57$, $p > .11$, $d = 0.27$.

Path Analysis

We sought to test the hypothesis that level of parent–adolescent relationships and nondisclosure mediate the impact of exposure to community violence on internalizing and externalizing symptoms. Because girls are at heightened risk for internalizing distress (Achenbach et al. 1987; Carlson and Grant 2008; Maschi et al. 2008) and girls outnumbered boys nearly 2–1 in the present sample (65.8 vs. 34.2 %, respectively), we controlled for the effects of gender (1 = male, 2 = female) by including this variable as a covariate in our path analyses, and by specifying gender as a predictor of both the mediators and the outcome measures in our mediational analyses. Because we did not expect the indirect effects in the model to fully mediate the impact of violence exposure on psychological

symptoms, the path model included the direct effects of violence exposure on internalizing and externalizing symptoms. In addition, because we did not expect the predictors in the model to fully explain the relationship between internalizing and externalizing symptoms, we allowed the residual variance of these two outcome measures to intercorrelate in the path analysis (Dehon and Weems 2010; Kline 2011); and although we did not expect gender to correlate with exposure to community violence, we freed the correlation between these two exogenous variables to be estimated in the model as is typically done in path analysis (observed $r = -.01$, $p < .90$).

To estimate the hypothesized path model, we conducted structural equation modeling analyses using LISREL 8.8 (Jöreskog and Sörbom 1996) with maximum-likelihood estimation based on the covariance matrix derived from the entire sample. In assessing the goodness-of-fit of the proposed path model, it is important to note that the model is exactly identified and therefore produces a perfect fit to the data (Bollen 1989; Kline 2011). Although goodness-of-fit statistics for this "saturated" model are thus irrelevant (i.e., by definition, $\chi^2 = 0$, $df = 0$), the model provides a viable means of testing research hypotheses by estimating: (1) standardized (β) and unstandardized (b) path coefficients, standard errors (SEs), and their p values; (2) total, direct, and indirect effects for exogenous predictor variables, as well as tests of mediation; and (3) the proportion of variance explained in each endogenous outcome variable. In addition, we used structural equation modeling to impose constraints on this baseline path model, in order to use Chi square difference tests to compare the goodness-of-fit of nested path models that fixed direct effects at zero; if omitting direct effects did not significantly worsen model fit, then we could conclude that indirect effects were more important than direct effects in the model (Dehon and Weems 2010).

To evaluate mediation in more depth, we also assessed the strength and statistical significance of indirect effects. First, we compared the size of direct paths in the full model to the size of these same direct effects when severing the link between the potential mediators and the outcome variables. The degree to which including the indirect pathways in the model reduces the magnitude of the direct effects indicates the strength of the indirect effects in predicting children's internalizing and externalizing problems (Dehon and Weems 2010). We also decomposed the total effects of violence exposure, in order to compute the proportion of the total effects that each indirect effect represents (MacKinnon and Dwyer 1993). To directly compare the strength of indirect effects, we used Preacher and Hayes' (2008) SPSS bootstrap macro program to compute pairwise contrasts between specific indirect effects, by calculating the difference, dividing it by its standard error, and deriving a p value from the standard normal distribution.

Although the Sobel test (Sobel 1982) can be used to assess the significance of indirect (mediated) effects, experts in mediation analysis have recommended against this procedure (Hayes 2009; Preacher and Hayes 2008) because the test assumes the sampling distribution of indirect effects is normal, which it is not (Shrout and Bolger 2002), and thus produces biased results that are prone to Type II errors (Fritz and MacKinnon 2007). To overcome these problems, bootstrapping has been recommended as a more accurate alternative strategy that provides greater power in assessing the statistical significance of mediation (MacKinnon et al. 2004; Mallinckrodt et al. 2006) The issue of statistical power is particularly relevant in the present study, for which $N = 152$. In particular, to achieve sufficient (i.e., 80 %) power assuming the effects of violence exposure on the mediators and of the mediators on psychological symptoms are modest (i.e., βs = .26), the Sobel test would require a sample size of 196, whereas the bias-corrected bootstrap procedure would require a sample size of 148 (Fritz and MacKinnon 2007, Table 3, p. 237). Thus, to detect modest-sized mediation, the

present sample provides 82 % power (i.e., 152/148 × 0.80) when using bootstrapping, but only 62 % power (i.e., 152/196 × 0.80) when using the Sobel test.

Accordingly, instead of using the Sobel test, we assessed the statistical significance of mediation by conducting bootstrap analyses of indirect effects (with 5,000 resamples) adjusting for both bias and skewness in bootstrap distributions (Mallinckrodt et al. 2006). In estimating the bootstrap standard error (*BSE*) and 95 % bootstrap confidence interval (*BCI*) for each indirect effect, we controlled for the effect of the other mediators as well as for the effects of gender on the endogenous variables in the path model, using Preacher and Hayes' (2008) SPSS bootstrap macro program for testing multiple mediators.

Figure 2 displays the standardized path coefficients for the hypothesized path model. Note that each of the structural relationships predicted a priori on the basis of existing theory were statistically significant and small to medium in magnitude: (a) exposure to violence predicted both parent–adolescent relationships, b = −.10, SE = .05, β = −.16, $p < .044$, and nondisclosure, b = .15, SE = .03, β = .35, $p < .001$; (b) parent–adolescent relationships predicted nondisclosure, b = −.27, SE = .04, β = −.40, $p < .001$, internalizing symptoms, b = −.14, SE = .05, β = −.25, $p < .003$, and externalizing symptoms, b = −.12, SE = .05, β = −.20, $p < .014$; and (c) nondisclosure predicted internalizing, b = .17, SE = .08, β = .24, $p < .03$, and externalizing symptoms, b = .26, SE = .08, β = .28, $p < .001$. We controlled for gender in the model because there was a

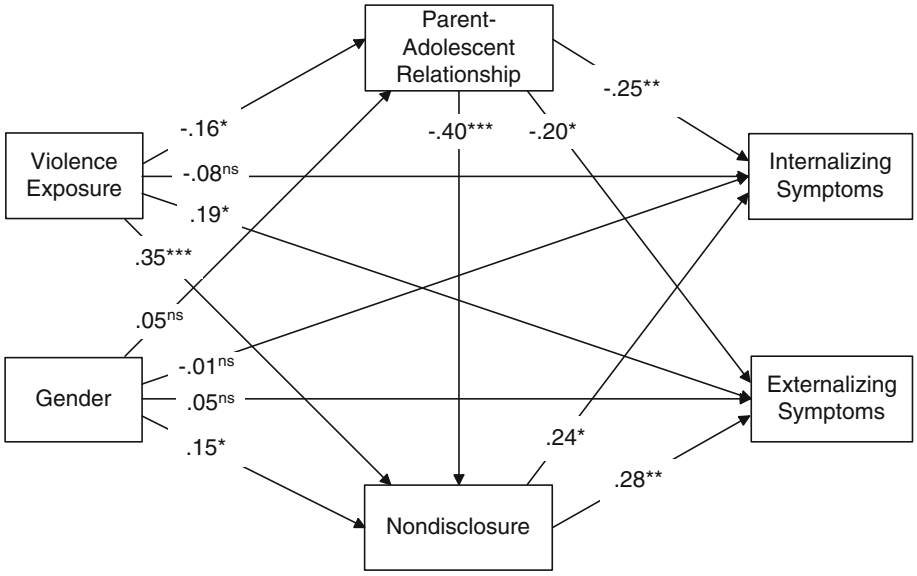

Fig. 2 Results of path analysis assessing parent–adolescent attachment and interpersonal nondisclosure as mediators of the effects of violence exposure on internalizing and externalizing symptoms, including gender as a covariate in the model, $\chi^2(0, N = 152) = 0.0$, $p = 1.00$, RMSEA = 0.0, SRMR = 0.0, CFI = 1.0, NNFI = 1.0. Path coefficients in the diagram represent standardized regression coefficients controlling for the effects of gender (1 = male, 2 = female) on parent–adolescent attachment, nondisclosure, and internalizing and externalizing symptoms. In estimating the path model, exposure to violence and gender were allowed to correlate ($r = -.01$, $p < .90$), and the residual variances of internalizing and externalizing symptoms were allowed to correlate ($r = .39$, $p < .0001$). The proportion of variance explained in each dependent variable was as follows: parent–adolescent attachment ($R^2 = .03$); nondisclosure ($R^2 = .34$); internalizing symptoms ($R^2 = .18$); externalizing symptoms ($R^2 = .28$). *ns* not statistically significant. $^*p < .05$; $^{**}p < .01$; $^{***}p < .001$

significant effect of gender on nondisclosure when controlling for violence exposure and parent–adolescent relationship. In addition, violence exposure had a significant direct link to externalizing symptoms, b = .07, SE = .03, β = .19, $p < .02$, but a nonsignificant direct link to internalizing symptoms, b = .02, SE = .03, β = .08, $p < .32$.

Indirect Effects of Violence Exposure on Psychological Symptoms

Consistent with Baron and Kenny's (1986) preconditions for establishing mediation, when controlling for gender, violence exposure had significant total effects on both internalizing and externalizing symptoms (as seen in Table 2). Second, as already established in the path analysis, violence exposure had significant direct effects on both potential mediators. Third, when controlling for both gender and violence exposure: (a) parent–adolescent relationships had significant direct effects on both internalizing and externalizing symptoms, and (b) nondisclosure had significant direct effects on both internalizing and externalizing symptoms.

When controlling for gender in the model, adding all three indirect effects of violence exposure on both internalizing and externalizing symptoms (i.e., through parental–adolescent relationships to symptoms, through nondisclosure to symptoms, and through parental–adolescent relationships to nondisclosure to symptoms) reduced the standardized direct effect of violence exposure on (a) internalizing from .21 ($p < .009$) to .08 ($p < .32$), and (b) on externalizing from .34 ($p < .0001$) to .19 ($p < .015$). We controlled for gender because a significant effect on gender was found for nondisclosure when controlling for violence exposure and parent–adolescent relationship. In addition, fixing at zero the direct effect of violence exposure on internalizing symptoms did not significantly alter model fit, $\Delta\chi^2(1) = 1.03$, $p > .31$, whereas fixing at zero the direct effect of violence exposure on externalizing symptoms significantly worsened model fit, $\Delta\chi^2(1) = 5.92$, $p < .015$. Together, these results suggest that both direct and indirect effects are important in predicting externalizing symptoms; but that the indirect effects in the path model are more important than direct effects in predicting internalizing problems (see Dehon and Weems 2010).

Bootstrap analyses revealed that the indirect effect of violence exposure: (a) via *parent–adolescent relationships* was statistically significant for both internalizing symptoms,

Table 2 LISREL parameter estimates for mediation

Paths	*b*	*SE*	β	*p* <
Precondition for mediation step 1				
Violence exposure → internalizing symptoms	.30	.06	.36	.0001
Violence exposure → externalizing symptoms	.42	.07	.46	.0001
Precondition for mediation step 2				
Violence exposure → parent–adolescent relationships	−.10	.05	−.16	.044
Violence exposure → nondisclosure	.15	.03	.35	.001
Precondition for mediation step 3				
Parent–adolescent relationships → internalizing symptoms	−.19	.04	−.34	.0001
Parent–adolescent relationships → externalizing symptoms	−.19	.05	−.32	.0001
Nondisclosure → internalizing symptoms	.27	.07	.33	.0002
Nondisclosure → externalizing symptoms	.35	.07	.38	.0001

b = Unstandardized regression coefficient from LISREL solution. *SE* = standard error = standardized path coefficient

$b = .014$, $BSE = .009$, 95 % $BCI = .001–.037$, $\beta = .04$, and externalizing symptoms, $b = .013$, $BSE = .009$, 95 % $BCI = .001–.036$, $\beta = .04$; and (b) via *nondisclosure* was statistically significant for both internalizing symptoms, $b = .030$, $BSE = .015$, 95 % $BCI = .003–.062$, $\beta = .08$, and externalizing symptoms, $b = .045$, $BSE = .014$, 95 % $BCI = .020–.075$, $\beta = .13$. Concerning the 95 % *BCI*s of these two indirect effects, because neither CI includes zero, both indirect effects are statistically significant at $p < .05$ (Tryon 2001). The two-path indirect effects for parent–adolescent relationships and nondisclosure were not significantly different in magnitude for either internalizing (95 % *BCI* for contrast = −0.049–0.023) or externalizing (95 % *BCI* for contrast = −0.067–0.003). In addition, bootstrap analyses using Hayes' (2013) PROCESS macro for SPSS revealed a small but statistically significant ($p < .05$) three-path indirect effect of violence exposure → parental–adolescent relationships → nondisclosure → symptoms on externalizing symptoms, $b = .007$, $BSE = .004$, 95 % $BCI = .001–.017$, $\beta = .02$. This same three-path indirect effect was nonsignificant for internalizing symptoms, $b = .005$, $BSE = .004$, 95 % $BCI = -.001–.013$, $\beta = .01$.

To quantify the extent to which mediation occurred, we decomposed the total effects of violence exposure on internalizing and externalizing symptoms to estimate the strength of each indirect effect as a proportion of the total effects, i.e., $b_{\text{indirect effect}}/b_{\text{total effect}}$ (MacKinnon and Dwyer 1993). Results revealed that: (a) parent–adolescent relationships mediated 19.7 % of the effect of violence exposure on internalizing symptoms and 9.8 % of the effect of violence exposure on externalizing symptoms; (b) nondisclosure mediated 40.8 % of the effect of violence exposure on internalizing symptoms and 35.2 % of the effect of violence exposure on externalizing symptoms; and (c) the three-path indirect effect mediated 5.4 % of the effect of violence exposure on externalizing symptoms. Together, the indirect effects accounted for about 60 % of the total effect of violence exposure on internalizing ($Z = 2.76$, $p < .006$) and about half (50 %) of the total effect of violence exposure on externalizing ($Z = 3.36$, $p < .0008$). These results support the conclusion that both parent–adolescent relationships and nondisclosure partially mediated the relation between exposure to community violence and internalizing and externalizing symptoms.

Indirect Effects on Narrow-Band Internalizing and Externalizing Symptoms

Besides analyzing global, broad-band internalizing and externalizing symptoms, we also assessed the generalizability of results when analyzing specific, narrow-band internalizing (Anxiety-Depression, Depression-Withdrawal, Somatic Symptoms) and externalizing subscales (Rule Breaking, Aggressive Behavior). Bootstrap analyses revealed that the indirect effect of violence exposure via *parent–adolescent relationships*: (a) on narrow-band internalizing symptoms was statistically significant for Anxiety-Depression ($b = .011$, $BSE = .007$, 95 % $BCI = .001–.028$, $\beta = .06$) and Depression-Withdrawal ($b = .008$, $BSE = .006$, 95 % $BCI = .001–.026$, $\beta = .03$), but not for Somatic Symptoms ($b = .007$, $BSE = .006$, 95 % $BCI = -.001–.024$, $\beta = .02$); (b) and on narrow-band externalizing symptoms was statistically significant for Aggressive Behavior ($b = .009$, $BSE = .007$, 95 % $BCI = .001–.026$, $\beta = .03$), but not for Rule Breaking ($b = .004$, $BSE = .004$, 95 % $BCI = -.001–.014$, $\beta = .02$). Additional bootstrap analyses revealed that the indirect effect of violence exposure via *nondisclosure*: (a) on narrow-band internalizing symptoms was statistically significant for Depression-Withdrawal ($b = .018$, $BSE = .010$, 95 % $BCI = .001–.041$, $\beta = .06$) and Somatic Symptoms ($b = .030$, $BSE = .013$, 95 % $BCI = .008–.060$, $\beta = .07$), but not for Anxiety-Depression ($b = .019$,

BSE = .011, 95 % *BCI* = −.001–.043, β = .05); and (b) on narrow-band externalizing symptoms was statistically significant for both Rule Breaking (*b* = .029, *BSE* = .008, 95 % *BCI* = .015–.046, β = .11) and Aggressive Behavior (*b* = .045, *BSE* = .012, 95 % *BCI* = .023–.072, β = .11).

In addition, bootstrap analyses using Hayes' (2013) PROCESS macro for SPSS revealed a small but statistically significant ($p < .05$) three-path indirect effect of violence exposure → parental relationships → nondisclosure → narrow-band externalizing symptoms for both Aggressive Behavior, *b* = .007, *BSE* = .004, 95 % *BCI* = .001–.017, β = .02, and Rule Breaking, *b* = .007, *BSE* = .004, 95 % *BCI* = .001–.017, β = .02. This same three-path indirect effect was nonsignificant for all three narrow-band internalizing symptoms: Anxiety-Depression, *b* = .005, *BSE* = .004, 95 % *BCI* = −.001–.013, β = .01; Depression-Withdrawal, *b* = .005, *BSE* = .004, 95 % *BCI* = −.001–.013, β = .01; and Somatic Symptoms, *b* = .005, *BSE* = .004, 95 % *BCI* = −.001–.013, β = .01.

Equivalent Alternative Models

As is often the case in structural equation modeling, there are numerous equivalent, alternative models that yield an identical predicted covariance matrix, identical residuals, and identical goodness-of-fit statistics compared to our hypothesized path model (Hershberger 2006). Thus, it is important to consider substantively meaningful equivalent models that would provide an alternative conceptualization of the measured variables in the present investigation (MacCallum et al. 1993). One theoretically plausible equivalent path model includes the same pathways linking violence exposure to parent–adolescent relationships, nondisclosure, and internalizing and externalizing symptoms and linking parent–adolescent relationships and nondisclosure to internalizing and externalizing symptoms (while controlling for gender), but models nondisclosure as a predictor of parent–adolescent relationships rather than vice versa. For this alternative model, nondisclosure was not a significant predictor of parent–adolescent relationships (β = .04, $p = .64$.) In addition, whereas the indirect effects remained statistically significant for the a priori model, the indirect effects of violence exposure on internalizing (β = −.01, 95 % *BCI* = −.019–.013) and externalizing (β = −.01, 95 % *BCI* = −.019–.011) were no longer significant in the alternative model. Although this analysis does not enable us to rule out the plausibility of all equivalent models, it suggests that modeling parent–adolescent relationships as a predictor of nondisclosure rather than vice versa provides a better representation of the present data.

Assessing Incremental Validity

Finally, following the recommendations of Weems and Stickle (2012), we also tested an equivalent alternative structural model that assessed the incremental validity of the mediating variables in our initial path model. In particular, the partial mediation in our initial, a priori model implies that both the mediators as well as the independent variable are uniquely associated with the outcomes, and thus that both sets of variables show incremental validity (Weems and Stickle 2012). To estimate this structurally equivalent model ($\chi^2 = 0$, $df = 0$), we used violence exposure, parent–adolescent relationships, nondisclosure, and gender as correlated exogenous predictors of broad-band internalizing and externalizing symptoms. When controlling for the other predictors in the model, parent–adolescent relationships (β = −.25, $p < .003$) and nondisclosure (β = .20, $p < .03$) were both significant predictors of internalizing symptoms, whereas violence

exposure ($\beta = .08$, $p < .32$) was not. Parent-adolescent relationships ($\beta = -.20$, $p < .01$), nondisclosure ($\beta = .28$, $p < .001$), and violence exposure ($\beta = .19$, $p < .02$) were all significant predictors of externalizing symptoms. Considered together, these results support the incremental validity of (a) parent–adolescent relationships and nondisclosure as predictors of internalizing symptoms, and (b) parent–adolescent relationships, nondisclosure, and violence exposure as predictors of externalizing symptoms.

Discussion

To our knowledge, the present study is the first to test directly the hypothesis that parent–adolescent relationships and nondisclosure mediate the relation between exposure to community violence and internalizing and externalizing symptoms in a sample of urban African American early adolescents.

To test this hypothesis, a number of binary associations between each of our variables were first examined. Results of these preliminary analyses are consistent with prior research indicating that exposure to community violence affects the quality of parent–adolescent relationship (Lovejoy et al. 2000; Smetana et al. 2006; Yearwood and McClowry 2006) and that parent–adolescent relationships are associated with adolescent internalizing and externalizing distress (Brumariu and Kerns 2010; Fowler et al. 2009; Guttmann-Steinmetz and Crowell 2006; Pinderhughes et al. 2001).

Also consistent with prior research, findings indicate that nondisclosure was associated with both internalizing (Frijns et al. 2005; Ichiyama et al. 1993; Smetana et al. 2006) and externalizing symptoms (Engels et al. 2006; Gervais et al. 2000; Stouthamer-Loeber and Loeber 1986) and exposure to community violence was associated with nondisclosure (Dinizulu et al., accepted; Ozer and Weinstein 2004). Descriptive results suggest that youth avoid sharing their experiences with adults for fear that disclosure will result in reduced personal freedom or because they fear adults' emotional responses to disclosure. These findings are not surprising given that youth disclosure about exposure to violence is likely to elicit negative emotions in adults as well as protective behavior, which may curtail adolescent autonomy (Garbarino and Kostelny 1993; Margolin and Gordis 2000).

Beyond evidence for these binary associations, results provide evidence that disrupted parent–adolescent relationships and nondisclosure actually mediate the association between exposure to community violence and both internalizing and externalizing distress among low-income urban African American youth. We found evidence of partial mediation for both types of symptoms and that indirect effects of violence exposure were more relevant than direct effects for internalizing symptoms, whereas both direct and indirect effects were important for externalizing symptoms. Results also suggest a significant indirect pathway leads from exposure to violence to parent–adolescent relationships to nondisclosure to externalizing symptoms.

These findings extend prior research indicating that interpersonal processes mediate the association between violence exposure and psychological symptoms in young people (Aisenberg 2001; Linares et al. 2001; Punamäki et al. 1997; Spano et al. 2009) in several ways. First, they provide evidence that a specific type of interpersonal process (i.e., nondisclosure) is especially relevant in the association between exposure to community violence and psychological symptoms in the context of urban poverty. While both interpersonal mediators examined in this study were found to partially mediate the relationship between exposure to community violence and psychological symptoms, analysis of the strength of indirect effects revealed that nondisclosure was a much stronger mediator

than parent–adolescent relationships. This finding suggests that nondisclosure is a primary process through which exposure to community violence harms the mental health of youth.

This study is the first, to our knowledge, to examine nondisclosure as a specific interpersonal mediator of the association between exposure to community violence and psychological symptoms. Our results are consistent with the notion that exposure to community violence makes youth less likely to disclose to adults, possibly because they fear that disclosure will result in a loss of autonomy or because they fear adults' emotional responses to disclosure. Nondisclosure, in turn, means that youth will receive less adult support in managing this significant stressor and, as a result, will experience greater psychological distress.

According to Kliewer et al. (1998), youth face two main social-cognitive tasks in adapting to violence exposure: (1) they need to talk about their experiences in a way that will help them cope, and (2) they need to make sense of the experience cognitively (Lepore et al. 1996; Schwartz and Proctor 2000). Adolescent disclosure to adults may help them develop the scaffolding needed to achieve both of these tasks and alleviate distress (Garbarino et al. 1992; Lepore et al. 1996). Youth who do not disclose their exposure to violence deprive themselves of these benefits and are at risk for increased distress as a consequence (Margolin and Gordis 2000).

Results also indicate ways in which interpersonal processes relate differently to different types of psychological problems within the context of community violence exposure. In particular, interpersonal processes explained more of the variance in the association between exposure to community violence and internalizing symptoms than they explained in the association between exposure to community violence and externalizing symptoms. A significant effect for exposure to community violence on externalizing (but not internalizing) symptoms remained with parent relationships and nondisclosure included in the model. This suggests that, for symptoms such as anxiety and depression, a lack of adult support, in general, coupled with nondisclosure about the exposure itself account for much of youth's distress; but that, for symptoms such as aggression and delinquency, there are other pathways that also play a significant role. Additional potential pathways were not examined in the current study but could include variables such as social learning or modeling (Tolan et al. 2000; Tolleson 1997). Community violence may be perpetrated by powerful community figures and there may be rewards that accompany it (Cassidy and Stevenson 2005; Fishkin et al. 1997; Taylor 1997); thus, youth externalizing behavior may represent efforts to emulate that violence in some form.

In addition, for externalizing, but not internalizing symptoms, nondisclosure mediated the association between parent–adolescent relationships and symptoms such that exposure to community violence predicted parent–adolescent relationships, which predicted nondisclosure, which, in turn, predicted symptoms. This finding suggests that one of the pathways through which exposure to violence affects youth mental health is through disruptions to parent–adolescent relationships, which reduce the extent to which adolescents are willing to disclose their violence experiences with adults, which in turn heightens their distress. These results are consistent with literature that reports parent–adolescent social processes influence adolescent nondisclosure (Engels et al. 2006; Miller and Lane 1991; Smetana et al. 2006), and that disclosure is contingent upon the quality of the parent–adolescent relationship, such that adolescents are less likely to disclose their experiences to parents if the relationship is defined by poor communication, nondisclosure, alienation, and distrust (Engels et al. 2006; Miller and Lane 1991; Smetana et al. 2006).

It is unclear why nondisclosure would mediate the association between parent–child relationships and externalizing symptoms but not internalizing symptoms. One possibility

is that parent–child relationships are connected to internalizing symptoms in the context of community violence through other mechanisms (Beck et al. 1979). For example, exposure to community violence may negatively affect parent's capacity to foster youth positive beliefs about the self, the world and/or the future, leading to negative cognitions specific to internalizing symptoms, such as depression (Beck et al. 1979). Such cognitive mediators may be more powerful in explaining parent–adolescent relationship effects on internalizing symptoms than nondisclosure, which remains a significant predictor but independent of relationships effects. Additional research is needed to test such hypothesized interpretations and to examine reciprocal and dynamic associations among predictors of internalizing and externalizing distress.

Specificity effects did emerge when examining the narrow-band internalizing and externalizing subscales as the outcome. In particular, the most notable pathways were found leading from violence exposure to (1) anxiety/depression, and withdrawn/depressed by way of parent–adolescent relationship and (2) withdrawn/depressed and somatization by way of nondisclosure. These findings seem to extend to the current literature regarding interpersonal relationships affecting adolescent outcomes. In the context of community violence, when parent–adolescent relationship is in distress, that could lead to adolescents presenting more anxious, withdrawn, and depressed behaviors (Margolin and Gordis 2000) in comparison to somatization symptoms. When adolescents nondisclose information (to adults), this process may be predictive of adolescents feeling lonely, unsupported, and withdrawn, and physically, the act of withholding information has been linked to somatization and physical ailments (Finkenauer et al. 2002; Pennebaker and Beall 1986; Pennebaker and Sussman 1988; Petrie et al. 1988).

Study Limitations

The present study was limited by its cross-sectional design, precluding a full test of the order of effects among variables (Cole and Maxwell 2003). Analysis of alternative models demonstrated, however, that the hypothesized order of effects best fit the data. Future longitudinal research will be helpful to replicate and extend these findings.

The cross-sectional design also precluded the analysis of developmental effects on mediational processes. Particularly, extant research suggests that violence exposure increases across adolescence (Boynton-Jarrett et al. 2008; Dinizulu et al., accepted) as does nondisclosure (Darling et al. 2000; Smetana et al. 2006) and the quality of parent–adolescent relationships decreases (Buist et al. 2002). Considered together, these findings suggest that the associations found for early adolescents might be even stronger for older adolescents.

This study relied on self-reported experiences of community violence, nondisclosure, parent–adolescent relationships and psychological symptoms. A single informant design has the potential to inflate associations among variables. Future research should include reports from multiple informants (e.g., parents, teachers, community members) to avoid this potential pitfall and to ensure a richer and more representative assessment of variables.

Conclusion

Despite its limitations, the present study offers an important first step in testing parent–adolescent relationships and nondisclosure as mediators of the association between exposure to community violence and psychological symptoms in youth. Our results

provide a rationale for investing resources in longitudinal research to test this mediational model more fully. If evidence continues to accrue in support of this model, these findings will have important implications for the development of effective preventive interventions for youth exposed to community violence. In particular, the present study highlights the importance of parents and adults strengthening relationships with adolescents as well as helping youth who have experienced violence disclose their experiences in order to prevent or mitigate negative psychological effects.

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