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From Violence Exposure to Development of Sexual Risk in Low-Income Urban Girls: The Role of Psychopathology

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Abstract

This longitudinal study examined psychopathology as an explanatory mechanism linking childhood violence exposure (CVE) to sexual risk in 177 African American girls recruited from mental health clinics serving low-income communities in Chicago. Beginning at average age 14, girls completed five interviews over two years and a sixth assessment including trauma history. CVE reflected sexual, physical, or witnessed violence before age 12. Latent growth modeling accounted for developmental change across the six time points. Externalizing, but not internalizing, symptoms mediated the pathway from CVE to number of partners (indirect effect = .16, 95% CI_{BCBS} = .04 - .29) and inconsistent condom use (indirect effect = .11, CI_{BCBS} = .004 - .21). Externalizing problems associated with CVE may help to explain its relationship with sexual risk in low-income, treatment-seeking African American girls. Behavioral interventions addressing aggression, impulsivity, and general risk-taking may be most effective in reducing sexual risk in this population.

Keywords

adolescent girls; African American; sexual risk; violence exposure; psychopathology

Introduction

African American (AA) adolescent girls presenting for mental health services represent a vulnerable population in need of effective intervention to reduce risk for sexually transmitted

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infections (STIs). Youth in psychiatric treatment tend to engage in higher rates of sexual risk behaviors than their peers [1]. Furthermore, young AA women suffer from disparate rates of STIs, including human immunodeficiency virus (HIV) and Acquired immune deficiency syndrome (AIDS). According to the Centers for Disease Control and Prevention (CDC), HIV/AIDS is the leading cause of death for Black women ages 25-34 years [2], and Black women receive new HIV/AIDS diagnoses at a rate 23 times that of white women [2]. Furthermore, AA women ages 15-24 are the highest risk demographic group for both Chlamydia and Gonorrhea, based on United States (US) public health department documentation [3]. A nationally representative study with US high school girls reported that 44% of AA girls, compared to 20% of White and Mexican American girls, were infected with a STI [4]. Physiological development makes adolescent girls and young women particularly vulnerable to STIs [2, 5]. In addition, disparities associated with living in impoverished, underserved communities likely account for disproportionate rates of STIs among young AA women [6].

Violence exposure represents one disadvantage associated with growing up in a low-income inner city neighborhood [7], and childhood violence exposure (CVE) may be one important factor contributing to health risk in urban AA girls with mental health concerns. Adverse childhood experiences are linked to negative health consequences including sexual risk behavior, STIs, and substance use [8, 9]. Likewise, stress is implicated as a root cause of health disparities, such as heightened rates of HIV/AIDS, impacting US ethnic minority groups [6, 10]. Community mental health agencies offer a viable context for reducing sexual risk in this vulnerable population of girls. Therefore, research is needed to understand the mechanisms linking violence exposure to sexual health risk in low-income AA girls presenting for mental health treatment.

Different forms of violence exposure may impact development in similar ways and, as such, have been linked to similar developmental outcomes. Sexual risk is associated with various forms of violence exposure, including physical victimization, sexual victimization, and witnessed community violence [e.g., 11, 12-14]. This pattern has been found in urban, AA girls seeking psychiatric services [15]. However, most research has focused on sexual victimization, limiting our understanding of the broader effects of violence on sexual risk. The current study defines violence broadly as exposure to a range of violent experiences in childhood, including physical and sexual victimization and witnessed violence occurring at home, at school, or in the neighborhood. In addition, very few studies have examined mechanisms that might explain the link between CVE and sexual risk. Finally, few studies examine sexual behaviors as developmental processes that change over time. Informed by a developmental psychopathology framework [16], the current study considers change in sexual behavior, symptomatology, and relationships with CVE over a time period reflecting early to late adolescence. This approach recognizes these phenomena as dynamic processes influenced by developmental (e.g., age) and environmental (e.g., violence) variables.

Psychopathology may play a prominent role in linking CVE to sexual risk in girls. Violence exposure is associated with both internalizing symptoms, such as depression and anxiety, and externalizing symptoms, such as delinquency and disruptive behaviors [7, 17]. A review of twenty-six studies supported links between community violence exposure and

mental health symptoms among youth living in urban neighborhoods [18]. These same kinds of mental health problems are associated with increased sexual risk [1, 19, 20]. In a quasi-experimental study, 16–18 year-old women seeking treatment at an urban sexual health clinic reported higher rates of depression, substance use, and risky sexual behavior, relative to a socio-demographically matched control group [21]. In a study with 12–16 year-old urban AA girls seeking mental health services, externalizing problems were associated with increased likelihood of sexual activity [22]. Among sexually active girls in the same study, anxiety, depression, and rule-breaking behaviors were associated with more sexual partners [23].

The goal of the present study was to expand upon previous research linking violence exposure [15] and psychopathology [22, 23] to sexual risk in a sample of low-income, AA girls seeking mental health services. This analysis examined externalizing (e.g., aggression, conduct problems) and internalizing (e.g., depression, anxiety) psychopathology as potential mediators of the relationship between CVE and sexual risk behavior. We hypothesized that: (1) CVE would predict more sexual partners and more inconsistent condom use reported across six longitudinal time points; (2) CVE would predict increased internalizing and externalizing symptoms across five longitudinal time points; (3) CVE would indirectly predict sexual risk through increased psychopathology. Latent growth modeling was used to account for developmental patterns in sexual risk and psychopathology.

Methods

Design and Participants

Participants (N=177) were drawn from the sample of a longitudinal study that recruited AA girls from eight outpatient mental health clinics serving urban, mostly low-SES communities in Chicago. This original longitudinal study focused on mother-daughter relationships, mother-daughter communication, and girls' peer and partner relationships in relation to girls' HIV-risk behavior. During initial contact with clinics, staff asked parents of eligible girls (12–16 years-old, self-identified as Black or African American) for permission to share their contact information with the researchers. Exclusion criteria included cognitive impairment (n = 6) or child welfare custody (n = 3). Most referred families (82%) participated in the baseline interview (T1; N = 281), and 266 completed baseline and were eligible for follow-up. Retention rates were 81% at six months (T2), 77% at twelve months (T3), 76% at eighteen months (T4), and 81% at 24 months (T5). Based on self or caregiver reports on the Computerized NIMH Diagnostic Interview Schedule for children (CDISC) [24], 66% met subthreshold or threshold criteria [25] for a psychiatric diagnosis. At baseline, 38% of caregivers reported that girls were receiving mental health services, 53% had recently sought services, 7% were on a waitlist, and 2% had an appointment scheduled.

During 2009–2010 (T6), participants who completed the baseline assessment and at least one follow-up were invited into a new study involving assessment of trauma and victimization history, given the high rates of crime and violence in neighborhoods where the sample resided and plausible links to sexual risk. Of eligible participants, 74% were enrolled, but one case was dropped due to lack of comprehension and inconsistent responding. Of those invited, 3% were not interested, and 23% could not be located, did not respond to contact

attempts, or had moved out of the state. On average, 3.27 years passed since T1 and 1.14 years since T5. Mean age was 17.72 years (SD = 1.65; range = 14.25 – 22.67). Average SES was 2.38 on the Hollingshead Index [26], reflecting semi-skilled work. Most female caregivers were biological mothers (76%), 71% described themselves as single parents, and 57% reported post high school education. Girls who completed T6 did not differ significantly from those lost to attrition on baseline measurements of any key demographic characteristics or variables in the current analysis including age (14.43 vs 14.52; $t = -.63$, $df = 209.25$, $p > .10$), SES rating (2.38 vs 2.22; $t = 1.05$, $df = 253$, $p > .10$), internalizing (15.83 vs 16.04; $t = -.18$, $df = 264$, $p > .10$) or externalizing (15.24 vs 15.54, $t = -.24$, $df = 264$, $p > .10$) mental health symptoms on the Youth Self Report, past six month number of sexual partners (.51 vs .79; $t = -.89$, $df = 264$, $p > .10$), consistency of condom use (.48 vs .62; $t = -.97$, $df = 264$, $p > .10$), or proportion reporting sexual experience (31.6% vs 37.1%, $\chi^2 = .79$, $df = 1$, $p > .10$).

All procedures were approved by relevant Institutional Review Boards. After receiving a complete description of the study, reviewing important points (e.g., anticipated risks and benefits), and having the opportunity to ask questions, girls provided informed assent or consent (if 18 years or older), and female caregivers provided consent. The assessments at each wave included a structured protocol containing a combination of paper-and-pencil, interviewer-administered, and computer-assisted measures. Assessments were completed in private rooms in the university laboratory or occasionally at participants' homes. Assessors were undergraduate or graduate student research assistants, or staff with research experience and/or training in psychology or a related field. All assessors were trained to deliver the structured protocol and supervised by the investigators and authors of this paper. Participants were assured that their data was kept private and confidential.

Measures

Lifetime Victimization and Trauma History (LTVH).—At T6, girls completed the LTVH [27], a 30-item gated instrument that assesses lifetime trauma and victimization history through a structured in-person interview. The LTVH was developed with a diverse sample of adults (49% female; 35% Black) who tended toward lower income and education levels, and the measure demonstrated validity relative to other self-reports and documented cases of child abuse [27]. A youth version was created by the authors of the adult measure through pilot testing and language modifications. Questions refer to “scary and upsetting things” that happen to people “at home, in their neighborhood, or someplace else” and cover a range of potentially traumatic experiences through objective questions (see examples below). Participants reported whether they had each experience, and follow-up questions asked about the ages when the event first and last occurred. CVE reflected physical victimization (e.g., “Has anyone ever shot at you, stabbed you, hit you, kicked you, beaten you, punched you, slapped you around, or hurt your body in some other way?”), sexual victimization (e.g., “Has anyone--male or female--ever forced or pressured you into doing something sexual that you didn't want to do? By 'something sexual,' we mean someone putting an object or part of their body inside your private sexual parts, inside your rear end, or inside your mouth; we also mean someone putting your private parts inside their mouth.”), or witnessed violence (e.g., “Have you ever seen or been present when someone

was murdered or hurt very badly?” “Have you ever seen or heard another person be threatened with a weapon (for example, a gun or a knife?)” that occurred before age 12. Multiple questions assessed each form of violence.

AIDS-Risk Behavior Assessment (ARBA).—At T1-T6, girls completed the ARBA [28], a computer-assisted structured interview assessing adolescent sexual behavior, drug use, and needle use [28]. The ARBA was derived from five well-established measures used in large-scale studies to examine drug use, sexual behavior, and HIV/AIDS-risk behaviors in youth. Two variables indicated sexual risk in the current analysis. *Number of partners* was determined from responses to questions asking the number of male and female partners in the past 6 months, considering vaginal, oral, and anal sex. To address extreme deviations from normality, outliers were set at two standard deviations above the mean. Thus, the highest score at each time point includes that number and any higher numbers. *Condom use inconsistency* reflected responses to the question, “Of the times you had vaginal sex in the past 6 months, how often did you or your partner use condoms/latex protection?” rated on a 5-point likert-type scale. This information was coded: 0 = no vaginal sex; 1 = always used condoms; 2 = more than half the time; 3 = half the time; 4 = some of the time; 5 = never used condoms. Only condom use during vaginal sex was included because girls most commonly reported this type of sex.

Psychopathology.—At T1-T5, girls completed the Youth Self Report (YSR), a widely used measure of behavioral and emotional problems in adolescents ages 11-18 [29]. Reports on the YSR yielded raw and T-scores for internalizing (depression, anxiety, somatic complaints) and externalizing (aggression, rule-breaking) syndromes. Extensive evidence of reliability and validity has been reported for the YSR [29]. In this study, internal consistency was high for both internalizing and externalizing at all waves with Cronbach alphas ranging from .84 to .88 for internalizing and .90 to .92 for externalizing. At baseline, 33.3% of the sample reported borderline or clinically significant (T-score ≥ 60) internalizing symptoms, and 45.2% reported borderline or clinically significant externalizing symptoms. Raw scores were used in analyses.

Analyses

Relationships between CVE, sexual risk, and psychopathology were examined with latent curve modeling (LCM) using MPlus 7, a structural equation modeling (SEM) approach that considers developmental change and within-sample heterogeneity. Latent growth factors represent the intercept (i.e., level) and slope (i.e., change) in a variable measured at multiple time points [30]. The first stage of LCM involved testing growth models reflecting overall patterns of change (unconditional models) from T1 to T6 in sexual risk and from T1 to T5 in psychopathology. The intercept represented level at T1, and the slope represented increase or decrease across time.

In the second stage (conditional models), we examined models with CVE as a time-invariant covariate of the slope and intercept factors. Age at baseline was also included as a covariate to account for age-related differences in sexual risk and psychiatric symptoms. Relationships between CVE and intercepts reflected differences between groups (i.e., those reporting CVE

compared to those not reporting CVE) in the level of sexual risk or psychopathology. Relationships between CVE and slopes indicated differences between groups in the pattern of change. In the third stage, we tested a model with psychopathology growth factors mediating relationships between CVE and sexual risk growth factors. Statistical significance was evaluated with two-tailed z-scores, and effect size with standardized path coefficients (β). Strength of mediational relationships was evaluated with tests of indirect effects [31] and bias-corrected bootstrapped confidence intervals [32].

Full information maximum likelihood (FIML) estimation was used to handle missing data. This method uses all data available for each case and thus avoids biases and loss of power associated with traditional approaches [33, 34]. Models were tested with a maximum likelihood estimator that is robust to non-normality and non-independence of observation (MLR), equivalent to the Yuan-Bentler T2* test. We evaluated multiple indices of model fit [30, 35]. Although non-significant χ^2 is desirable, we considered a χ^2 to degrees of freedom (df) ratio of less than three to be adequate regardless of statistical significance [30, 35].

Results

Descriptive Information and Bivariate Correlations

As shown in Table 1, nearly half the sample (43.5%; $n = 77$) reported CVE. Physical violence was most commonly reported in childhood (27.1%), compared to sexual violence (9%) or witnessed violence (21.5%). Most of these individuals (71.4%) reported only one form of exposure; 24.7% reported exposure to two forms; and only 3.9% reported all three. At baseline, 33.3% met borderline or clinical significance (T-score ≥ 60) for internalizing symptoms and 45.2% for externalizing symptoms. Internalizing symptoms decreased from mean T-score of 52.28 ($SD = 10.18$) at baseline to 47.07 ($SD = 9.52$) at T5. Mean externalizing T-scores decreased from 56.86 ($SD = 10.69$) to 53.39 ($SD = 10.96$). At baseline, 31.6% of girls reported experience of vaginal, anal, or oral sex, and 68.9% reported sexual experience by T6. Mean number of partners increased from .41 ($SD = .87$) at baseline to .84 ($SD = 1.14$) at T6, indicating that most girls reported no sex partners at each 6-month interval and few reported more than one partner (8% at baseline to 20% at T6). Condom use inconsistency increased from mean of .41 ($SD = .98$) at baseline, reflecting no sexual activity on average, to 1.41 ($SD = 1.79$) at T6 when 31% of the sample reported unprotected sex.

Bivariate relationships were examined before proceeding with LCM. Correlations were used in the preliminary stage of analysis to determine variables to be included in multivariate models, and patterns are emphasized rather than individual correlations. No specific conclusions are made based on these bivariate relationships. As shown in Table 2, CVE was associated with increased sexual risk. These relationships were moderate and statistically significant at T1 and T6 but were smaller in magnitude, and in some cases not statistically significant, at other points. Also shown in Table 1, CVE correlated moderately and significantly with externalizing psychopathology at all five waves but was not generally associated with internalizing problems. Externalizing symptoms were also generally associated with sexual risk, and these relationships tended to be moderate in size.

Internalizing symptoms were associated with more partners at T1-T4 but not with inconsistent condom use.

Unconditional Models

Sexual risk.—The model with growth processes for number of partners and inconsistent condom use from T1 to T6 yielded adequate fit, with χ^2 : df less than 2 (Table 2). Levels of both variables were significant at baseline and increased over time. The level of inconsistent condom use and number of partners reported at baseline were strongly correlated ($\beta = .66$, $p < .001$). Their slopes were also moderately correlated ($\beta = .45$, $p < .05$) indicating increase in partners was associated with increase in inconsistent condom use. This model included covariance between residuals (measurement error) for number of partners and condom use measured at the same time point, and between the same variables measured at T1, T3, and T5; and T2, T4, and T6.

Psychopathology.—The model with growth processes for internalizing and externalizing psychopathology also provided an acceptable fit, with χ^2 : df less than 2 (Table 2). Both internalizing and externalizing symptoms were significant at baseline and decreased over time. Levels of internalizing and externalizing psychopathology were correlated ($\beta = .51$, $p < .001$). The slopes were also moderately correlated, although this relationship did not reach statistical significance ($\beta = .45$, $p > .05$). This model included covariance between residuals for internalizing and externalizing symptoms measured at the same time point.

Conditional Models

A model with age and CVE predicting sexual risk yielded an adequate fit (Table 3). Separate models were run with the intercepts set at the baseline and T6. CVE was associated with more partners and more inconsistent condom use at T1 but only condom use at T6. CVE was not associated with the slope for either variable. A model with age and CVE predicting psychopathology yielded an adequate fit (Table 3). CVE was associated with the level of externalizing at both T1 and T5 and internalizing at T5, but not the slope of either form of psychopathology.

Mediator Model

Because internalizing symptoms were not strongly or consistently related to either CVE or sexual risk in previous analyses, only externalizing psychopathology was included as a mediator of the relationship between CVE and sexual risk. To establish temporal order, the intercept for externalizing was set at T1, and the intercepts for sexual risk were set at T6. Additional covariance among residuals of the observed variables was allowed to improve model fit. The mediator model provided an adequate fit ($\chi^2 = 194.30$, $df = 124$, $p < .05$; CFI = .94; TLI = .92; RMSEA = .06; SRMR = .07), with χ^2 : df less than 2. As shown in Figure 1, CVE predicted greater externalizing problems ($\beta = .27$, 95% CI = .11 - .42, $p = .01$), which predicted more partners ($\beta = .52$, 95% CI = .35 - .70, $p = .001$) and inconsistent condom use ($\beta = .32$, 95% CI = .13 - .51, $p = .001$). Indirect pathways from CVE to the intercepts for number of partners (indirect effect = .14, 95% CI_{BCBS} = .03 - .26) and inconsistent condom use (indirect effect = .10, CI_{BCBS} = .01 - .19), via externalizing symptoms, were both significant. Although not statistically significant, moderately sized

positive coefficients indicated that less decrease in externalizing symptoms was associated with a greater level of and more increase in inconsistent condom use. The full model explained 34% of variance in number of partners at T6 and 26% of variance in inconsistent condom use at T6.

Discussion

Within a framework that accounted for change over time, this study supported psychopathology as a developmental mechanism partially explaining the link from CVE to sexual risk in low-income, mental health treatment-seeking AA girls. The relationship with CVE was different for different types of sexual risk. In a model including growth processes (developmental patterns) for both number of partners and inconsistent condom use, the relationship with condom use persisted through all six waves of the study, whereas the relationship with number of partners did not. Links between CVE and patterns of sexual risk in this sample have been more thoroughly examined elsewhere [36]. When considered in separate models, relationships with CVE persist through all six waves for both number of partners and condom use. However, when both variables are considered together, unique patterns are revealed for these variables, which could suggest that patterns of risk in relation to violence exposure are specific to the outcome examined.

Nonetheless, an indirect relationship through psychopathology was supported for both sexual risk outcomes. This indirect relationship was found for externalizing symptoms of delinquent and aggressive behavior, but not for internalizing symptoms of anxiety and depression, as CVE was not strongly associated with internalizing symptoms in our sample. Although some studies have linked CVE to anxiety and depression [17, 18], a meta-analysis of 26 peer-reviewed journal articles from 1997-2007 concluded that externalizing problems (delinquency, perpetration of violence, antisocial behavior, hostility, anger, and aggressive behavior) were more strongly and consistently associated with CVE in urban adolescents than were internalizing problems [18]. Thus, our findings are not surprising given patterns revealed in the broader literature.

Externalizing symptoms were also associated with more sexual partners and less consistent condom use in our sample, a relationship that held in a complex developmental model. Internalizing symptoms, by contrast, were correlated with more sexual partners reported by girls but not with inconsistent condom use. The literature on this topic reveals inconsistent findings. For example, a cross-sectional study using baseline data of 266 girls from the sample included in the present study [22] found no correlation between internalizing (or externalizing) disorders and condom use, but did find a relationship between both internalizing and externalizing disorders and number of sexual partners. In another sample of primarily AA women presenting for treatment at an urban sexual health clinic, depression was associated with several sexual risk indicators, including sex trading, sex under the influence of alcohol or drugs, or a partner who used intravenous drugs, but not with lack of condom use or multiple partners [37]. Thus, relationships between psychopathology and sexual risk behavior in low income AA women and girls may depend on the specific sexual risks evaluated.

Nonetheless, sexual risk in young, low-income, urban AA women with histories of CVE may represent an outcome of externalizing psychopathology. Externalizing disorders involve problems with behavioral inhibition and impulse control, which could lead to risky sexual behaviors. In fact, lessor [38] suggested that sexual risk constitutes one factor in a broader syndrome of “problem behavior” that also involves substance use and delinquency. Our findings may also be explained by the association between conduct problems and dating violence [39], which increases risk of unwanted and unprotected sex [40]. More generally, CVE models a way of interacting with others and the world that lacks forethought or concern for consequences and can foster a perception that the world is unsafe and unpredictable. These cognitive biases may preclude safe sex behavior or make it seem inconsequential. Understanding the role of mental health problems in the relationship between CVE and sexual risk can guide the development of interventions targeting this population. Our findings may also help those treating urban AA girls for problematic behavior, such as rule-breaking and aggression, to conceptualize these behaviors in terms of health risk and in the context of childhood adversity.

The relationship between CVE and externalizing symptoms may be based in the biological effects of growing up in a stressful environment [9]. Violence exposure can disrupt neuroendocrine functioning that underlies emotional control and expression [9, 41]. In addition, repeated activation of the hypothalamic-pituitary-adrenocortical (HPA) axis, which plays a primary role in regulating and managing stress response [42], can have long-lasting effects on multiple neurological structures and functions [41]. During adolescence, the prefrontal cortex is particularly vulnerable to stress and the effects of earlier stressors [42]. Given that prefrontal functions relate to behavioral modulation and self-control, evaluating long-term consequences, making decisions, and solving problems [41, 42], dysregulation of this system may be manifest as externalizing problems. Due to biologically mediated stress, young women may be at a disadvantage in areas such as impulse control and evaluation of long-term consequences, impairing their ability to make healthy decisions about sexual partners or practice safe sex.

Findings from this study suggest that addressing externalizing psychopathology, and its underlying neurobiology, may be key to developing effective interventions to reduce sexual risk in urban AA girls seeking mental health services. Problems with aggressive or delinquent behavior may identify the girls most vulnerable for sexual health consequences, underscoring the importance of careful assessment. Interventions that target a broad range of impulsive and risk-taking behaviors could be most effective in reducing rates of risky sexual behavior and STIs. Moreover, health promotion and preventive efforts that address the impact of violence exposure and related risk behaviors may be most useful for girls growing up in disadvantaged inner-city communities. Our findings suggest that early adolescence may be an especially salient point for intervention, but CVE may continue to influence sexual risk over time via externalizing psychopathology. Future research is needed to understand how the patterns identified here may lead to negative sexual health outcomes, such as pregnancy or sexually transmitted infections, and how intervention may reduce these outcomes.

The design of this study offers a number of important strengths by evaluating longitudinal patterns of sexual risk in a highly vulnerable and underrepresented population of girls and controlling for the effects of poverty. However, several limitations must be noted. First, although reports of violence exposure before age 12 provide an approximation of temporal order, a causal relationship cannot be determined. It is plausible, for example, that an overall pattern of risky behavior preceded and even brought about exposure to violence. Second, assessment of CVE was based on girls' retrospective reports, which can be influenced by memory errors and other biases [43]. Third, reported sexual behavior could represent abusive or coercive experiences. Although approximately 70% of the sample reported sexual experience by the final time point and only 22% reported experiences of sexual victimization, it is not straightforward to differentiate teen sexual experiences that are truly consensual from those that involve some level of coercion. However, any sexual contact puts girls at risk for HIV and other STIs. Fourth, sample size and associated power did not allow for examination of individual forms of violence exposure as predictors, although they may be associated with unique patterns of sexual risk. Finally, the sample of low-income AA girls seeking mental health treatment may not generalize to other adolescent girls, and families who participated in this longitudinal study may not reflect typical individuals in the community.

Summary

A growing body of literature links childhood violence exposure (CVE) to sexual risk, and this relationship has been found in low-income African American girls and women, who are at disproportionate risk for sexually transmitted infections (STIs). However, little is known about the mechanisms linking violence exposure to sexual risk. The purpose of this study was to examine internalizing and externalizing psychopathology as mediators of the relationship between CVE and sexual risk in treatment-seeking AA girls recruited from low-income communities in Chicago and followed from early (average age 14) to late (average age 17) adolescence. A broad definition of violence exposure included experiences of physical, sexual, and witnessed violence before age 12. Analyses employed latent growth modeling to account for developmental changes in risk behavior (number of partners and inconsistent condom use) and psychopathology (internalizing and externalizing symptoms) from early to late adolescence. Findings highlight the prominent role of externalizing psychopathology in linking CVE to sexual risk among low-income, urban AA girls with histories of seeking psychiatric services. Growth models reflecting change from early to late adolescence indicated an overall increase in sexual risk (number of partners and inconsistent condom use) and decrease in both internalizing and externalizing symptoms over time. Controlling for age, CVE was associated with an increased number of partners and more inconsistent condom use, although this relationship was no longer significant for number of partners by late adolescence. CVE was also associated with increased externalizing symptoms in both early and late adolescence, but was only associated internalizing psychopathology in late adolescence. In an age-adjusted multivariate growth model, CVE was associated with increased externalizing psychopathology in early adolescence, which in turn predicted a higher number of partners and less consistent condom use in late adolescence. Externalizing symptoms may represent a broad, pervasive, and enduring

developmental pattern impacting multiple domains including sexual health risk. Thus, interventions to reduce rates of STIs in this population might be most efficacious by addressing general problems with impulsive, risk-taking behaviors. Future research is needed to uncover specific biological mechanisms underlying this pattern, which may enhance targeted research and intervention efforts.

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Fig.1.

Mediator model linking childhood violence exposure (CVE) to sexual risk. Ovals represent latent growth factors. Solids lines represent significant paths, and dotted lines represent non-significant paths. Path estimates, above the lines, are linear regression coefficients. Age was included in the model with paths to all latent growth factors.

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

Table 1.

Descriptive Information for Study Variables

Variable	N	Range	Mean	SD
Baseline age	177	12-16	13.93	1.22
<i>Number of partners in past six months</i>				
Time 1	177	0-4	.41	.87
Time 2	154	0-6	.56	1.18
Time 3	153	0-4	.59	1.09
Time 4	158	0-7	.73	1.36
Time 5	170	0-6	.69	1.10
Time 6	171	0-7	.84	1.14
<i>Inconsistent condom use in past six months</i>				
Time 1	173	1-5	.42	.98
Time 2	148	0-5	.63	1.40
Time 3	149	0-5	.60	1.24
Time 4	156	0-5	.79	1.46
Time 5	166	0-5	1.01	1.68
Time 6	171	0-5	1.41	1.79
<i>Internalizing psychopathology</i>				
Time 1	177	36-88	55.26	10.07
Time 2	154	29-87	49.97	9.34
Time 3	154	27-73	48.95	9.18
Time 4	158	27-71	48.30	9.36
Time 5	171	27-72	46.85	9.42
<i>Externalizing psychopathology</i>				
Time 1	177	29-87	56.68	10.77
Time 2	154	27-72	54.66	11.93
Time 3	154	29-78	53.23	11.50
Time 4	158	29-82	54.06	11.48
Time 5	171	29-80	53.13	11.27

Note: N = sample size for each variable at each time point; SD = standard deviation. Number of partners reflects oral, vaginal, or anal sex partners in the past six months; at each time point, outliers were set at two standard deviations above the mean to address extreme deviation from normality (and thus the highest scores include that number and any higher numbers). Inconsistent condom use reflects scaled scores ranging from “0” (no vaginal sex during the past six months) to “5” (never used condoms during vaginal sex in the past six months).

Table 2.
Bivariate Relationships between Childhood Violence Exposure, Sexual Risk, and Psychopathology

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Childhood Violence Exposure													
2. T1 Number of partners	.25**												
3. T1 Inconsistent condom use	.24**	.69**											
4. T2 Number of partners	.18*	.65**	.40**										
5. T2 Inconsistent condom use	.15	.48**	.59**	.58**									
6. T3 Number of partners	.24**	.52**	.46**	.69**	.47**								
7. T3 Inconsistent condom use	.18*	.55**	.50**	.51**	.59**	.63**							
8. T4 Number of partners	.15	.46**	.40**	.65**	.38**	.72**	.45**						
9. T4 Inconsistent condom use	.11	.40**	.29**	.60**	.47**	.49**	.66**	.63**					
10. T5 Number of partners	.10	.24**	.32**	.44**	.28**	.50**	.45**	.49**	.47**				
11. T5 Inconsistent condom use	.15	.34**	.41**	.27**	.28**	.32**	.52**	.28**	.57**	.52**			
12. T6 Number of partners	.20**	.10	.25**	.21**	.21*	.41**	.32**	.38**	.42**	.55**	.44**		
13. T6 Inconsistent condom use	.25**	.27**	.32**	.22**	.20*	.38**	.42**	.28**	.36**	.50**	.57**	.57**	
14. T1 Internalizing	.07	.21**	.10	.32**	.10	.22**	-.02	.24**	-.01	.10	-.03	.04	.07
15. T1 Externalizing	.27**	.49**	.32**	.42**	.26**	.40**	.20*	.40**	.28**	.30**	.26**	.23**	.27**
16. T2 Internalizing	.12	.17*	.15	.27**	.10	.26**	.07	.33**	.08	.11	.02	.17*	.17*
17. T2 Externalizing	.20*	.48**	.29**	.51**	.26**	.46**	.17	.54**	.40**	.41**	.30**	.34**	.35**
18. T3 Internalizing	.07	.11	.11	.28**	.05	.25**	.05	.25**	.10	.11	-.05	.06	.03
19. T3 Externalizing	.19*	.38**	.26**	.46**	.25**	.44**	.18*	.48**	.31**	.44**	.17*	.27**	.29**
20. T4 Internalizing	.10	.06	.05	.20*	.10	.24**	.10	.18*	.10	.12	.06	.08	.14
21. T4 Externalizing	.26**	.37**	.27**	.40**	.33**	.40**	.22**	.36**	.30**	.42**	.22**	.29**	.36**
22. T5 Internalizing	.17*	.05	.10	.19*	.10	.17*	.12	.12	.01	.05	-.02	.03	.10
23. T5 Externalizing	.27**	.35**	.21**	.42**	.30**	.40**	.20*	.36**	.30**	.41**	.26**	.35**	.43**

NOTE: Pearson correlation coefficients are presented for relationships between continuous variables, and point-biserial correlation coefficients are presented for relationships between CVE and continuous variables.

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Table 3.

Unconditional Growth Curve Models

Model	Model Fit Statistics	Intercept Factor		Slope Factor		Covariance	
		M	Var (S.E.)	M	Var (S.E.)	β	
<i>Sexual Risk</i>	$\chi^2 = 85.04$, $df = 50$; $p < .05$ CFI = .92; TLI = .89; RMSEA = .06; SRMR = .08						
Number of partners		.45***	.81 (.22)	.38***	.05 (.01)	-.59**	
Inconsistent condom use		.46***	.84 (.25)	.65***	.06 (.02)	-.21	
<i>Psychopathology</i>	$\chi^2 = 66.30$, $df = 36$; $p < .05$ CFI = .97; TLI = .97; RMSEA = .07; SRMR = .05						
Internalizing		1.93***	51.93 (8.27)	-1.24***	1.11 (.48)	-.68**	
Externalizing		1.68***	75.93 (11.57)	-0.39***	2.40 (.54)	-.43**	

NOTE: M = mean; Var = variance; S. E. = standard error; χ^2 = chi-square statistic reflecting overall model fit ($p > .05$ indicates a good fit); CFI = Comparative Fit Index (.90 indicates a good fit); TFI = Tucker-Lewis Index (.90 indicates a good fit); RMSEA = Root Mean Square Error of Approximation (.05 is considered a very close fit; .05 - .10 is considered a moderate fit); WRMR = Weighted Root-Mean-Square Residual (used for binary outcomes, .9 is considered a good fit); SRMR = Standardized Root-Mean-Square Residual (used for continuous outcomes, .08 is considered a good fit).

* $p < .05$

** $p < .01$

*** $p < .001$

Table 4.
Conditional Growth Curve Models with Age and Childhood Violence Exposure as Covariates

Outcome	Model Fit Statistics	Covariate	Path coefficient (β)	
			Intercept (T1)	Slope (T6)
Sexual Risk	$\chi^2 = 108.14$, $df = 66$, $p < .05$ CFI = .92, TLI = .89; RMSEA = .06, SRMR = .07			
<i>Number of partners</i>		Age	.20**	.13
		CEV	.21**	.17
<i>Inconsistent condom use</i>		Age	.36***	.15
		CEV	.20**	.19*
Outcome	Model Fit Statistics	Covariate	Intercept (T1)	Slope (T5)
Psychopathology	$\chi^2 = 88.95$, $df = 48$, $p < .05$ CFI = .97, TLI = .95; RMSEA = .07, SRMR = .05			
<i>Internalizing</i>		Age	.04	.01
		CVE	.09	.18*
<i>Externalizing</i>		Age	.11	-.03
		CVE	.25**	.28***

NOTE: CVE = childhood violence exposure; Path coefficients (β) reflect relationships between CVE or age and the intercept and slope terms. χ^2 = chi-square statistic reflecting overall model fit ($p > .05$ indicates a good fit); CFI = Comparative Fit Index (.90 indicates a good fit); TLI = Tucker-Lewis Index (.90 indicates a good fit); RMSEA = Root Mean Square Error of Approximation (.05 is considered a very close fit; .05 - .10 is considered a moderate fit); WRMR = Weighted Root-Mean-Square Residual (used for binary outcomes, .9 is considered a good fit); SRMR = Standardized Root-Mean-Square Residual (used for continuous outcomes, .08 is considered a good fit).

*
p .05

**

p .01

p .001