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Exposure to Different Types of Violence and Subsequent Sexual Risk Behavior among Female STD Clinic Patients: A Latent Class Analysis

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Abstract

Objective—Diverse forms of violence, including childhood maltreatment (CM), intimate partner violence (IPV), and exposure to community violence (ECV), have been linked separately with sexual risk behaviors. However, few studies have explored multiple experiences of violence simultaneously in relation to sexual risk-taking, especially in women who are most vulnerable to violent experiences.

Methods—Participants were 481 women (66% African American, $M_{age} = 27$ years) attending a publicly-funded STD clinic who reported on their past and current experiences with violence and their current sexual risk behavior. We identified patterns of experience with violence using latent class analysis (LCA) and investigated which combinations of experiences were associated with the riskiest sexual outcomes.

Results—Four classes of women with different experiences of violence were identified: Low Violence (39%), Predominantly ECV (20%), Predominantly CM (23%), and Multiply Victimized (18%). Women in the Multiply Victimized and Predominantly ECV classes reported the highest levels of sexual risk behavior, including more lifetime sexual partners and a greater likelihood of receiving STD treatment and using substances before sex.

Conclusions—Women with different patterns of violent experiences differed in their sexual risk behavior. Interventions to reduce sexual risk should address violence against women, focusing on experiences with multiple types of violence and experiences specifically with ECV. Additional research is needed to determine the best ways to address violence in sexual risk reduction interventions.

Keywords

sexual risk behavior; child sexual abuse; child abuse; intimate partner violence; community violence

Sexually transmitted diseases (STDs) are highly prevalent, with nearly 19 million new infections per year in the United States (CDC, 2009). HIV rates are also high, with over 56,300 new infections a year (Hall et al., 2008). Among women, African Americans are disproportionately at risk, with a new HIV infection rate nearly 15 times greater than that of

White women and nearly four times greater than that of Latino women (CDC, 2010). HIV, STDs, and risky sexual behavior have been tied to diverse forms of violence, including childhood maltreatment (CM), intimate partner violence (IPV), and exposure to community violence (ECV; Brady, 2006; Senn & Carey, 2010; Wilson & Widom, 2011). These diverse forms of violence occur at high rates for low-income, urban women and often co-occur (Dong et al., 2004; Senn, Carey, & Vanable, 2010). However, few studies have explored various forms of CM, IPV, and ECV simultaneously in relation to sexual risk-taking. Therefore, the current study aims to fill this gap in the literature by using latent class analysis (LCA) to identify patterns of past and current experience with violence in a population of women attending an STD clinic, and exploring which combinations of violent experiences are related to the riskiest sexual outcomes.

Women's Experiences of Violence

Longitudinal studies show that many women have experienced CM, with 17–27% of women in representative community samples having experienced physical abuse, 13–14% psychological or emotional abuse, 5–17% neglect, and 8–32% childhood sexual abuse (CSA; Briere & Elliott, 2003; Scher, Forde, McQuaid, & Stein, 2004). IPV in adulthood is also common, with 9% of women in a national sample reporting rape, 30% reporting physical violence, and 48% reporting psychological aggression by intimate partners during their lifetime and 1% of women reporting rape, 4% reporting physical violence, and 14% reporting psychological aggression by intimate partners during the past year (Black et al., 2011). ECV is yet another adversity facing many women, with two thirds of urban women in a clinic sample reporting lifetime exposure to community violence and 20% reporting having witnessed community violence in the past year (Clark et al., 2008).

These forms of violence are not independent; many women are victims of more than one type of violence. Children who are maltreated often experience multiple types of maltreatment (e.g., Finkelhor, Turner, Ormrod, & Hamby, 2009; Higgins & McCabe, 2001a; Margolin & Gordis, 2000). Additionally, women who experience CSA (Senn et al., 2010; Wingood & DiClemente, 1997a) or who are physically abused as children (Renner & Slack, 2006; Stern & Zevon, 1990) are at greater risk of experiencing IPV as adults. Women who experience community violence are also more likely to experience IPV (Raghavan, Mennerich, Sexton, & James, 2006). Because of the overlap among these different types of violence, it is difficult to disentangle the effects of specific types of violence. Thus, there is a need for research to investigate how these types of violence cluster together, and to investigate the relation between combinations of violent experiences and sexual risk behavior.

Associations Between Violence and Sexual Risk-Taking

Childhood maltreatment and sexual risk-taking

Various forms of CM, including physical abuse, psychological abuse, and neglect, have been associated with sexual risk-taking (Jones et al., 2010; Wilson & Widom, 2011). Most often implicated is CSA, which is associated with a number of high-risk sexual behaviors such as early voluntary sexual intercourse, having many sexual partners and frequent short-term sexual relationships, unprotected sexual intercourse, having partners at risk for HIV infection, using drugs and alcohol prior to sex, and exchanging sex for drugs, money, or shelter, and with adverse outcomes such as unplanned pregnancy, sexual re-victimization, and STD infection (for review, see Senn et al., 2008; Jones et al., 2010; Mosack et al., 2010). Some studies suggest that experiencing multiple forms of maltreatment in childhood may put individuals at greater risk for sexual risk behavior (e.g., Bensley, Van Eenwyk, &

Wynkoop Simmons, 2000; Jones et al., 2010), although other studies have identified CSA as a unique risk factor (Senn & Carey, 2010).

Intimate partner violence

Women who have experienced IPV are more likely than nonabused women to report sex with risky or multiple partners, unprotected sex, alcohol or drug use prior to sex, exchanging sex for money, unplanned pregnancy, and STD and HIV infection (Coker, 2007; El-Bassel et al., 1998). Additionally, women with physically abusive partners are more likely to experience verbal abuse, emotional abuse, and threats of physical abuse when they discuss condoms than are women not in abusive relationships (Wingood & DiClemente, 1997b).

Exposure to community violence

Neighborhood and community violence and exposure to crime have been associated with greater lifetime sexual risk-taking (Brady, 2006), alcohol and drug use prior to sex (Voisin et al., 2007), HIV-related risk behaviors (Voisin, 2005), and STD and HIV infection (Buffardi, Thomas, Holmes, & Manhart, 2008). Victimization by crime also predicts high-risk sex among young adults (Collins, Ellickson, Orlando, & Klein, 2005).

Theoretical Explanations for Associations Between Violence and Sexual Risk

Numerous theories may explain the association between violence and sexual risk behaviors. Some theories focus on a specific type of violence. For example, CSA may lead to sexual risk behavior through traumatic sexualization, where a child's sexual behaviors are inappropriately shaped through rewards or attention (Finkelhor & Browne, 1985). CM may disrupt typical developmental trajectories through psychological effects, posttraumatic stress disorder (PTSD), cognitive consequences, or peer problems (Higgins & McCabe, 2001b; Margolin & Gordis, 2000), and these disruptions may interfere with emotion regulation (Rellini, Vujanovic, Gilbert, & Zvolensky, 2011). Individuals may then engage in sexual risk as a mechanism to regulate emotions and to cope with abuse-related thoughts (Felitti et al., 1998). The Theory of Gender and Power (TGP; Connell, 1987; Wingood & DiClemente, 2000) suggests that social mechanisms (e.g., women's lower wages) lead to gender-based inequalities, including IPV, which increase women's risk of HIV. Disordered and violent neighborhoods may convey a disregard for individuals' well-being and may communicate that behaviors that are normally prohibited, such as sexual risk behaviors, are tolerated (Brady, 2006; Cohen et al., 2000).

Alternatively, broader theories or explanations may account for the associations between diverse forms of violence and sexual risk-taking. For example, theories of allostasis suggest that the physiological systems in the body attempt to maintain equilibrium when individuals experience stress (McEwen, 1998); this maintenance of internal equilibrium increases allostatic load (i.e., "wear and tear"), undermining the capacity to regulate cognition, emotion, and behavior (Evans, 2003). Experiences with violence may increase allostatic load, leading to decreased self-regulation (Evans, 2003; Felitti et al., 1998; McEwen & Seeman, 1999; Rellini et al., 2011) and increased sexual risk-taking (e.g., Crockett, Raffaelli, & Shen, 2006). Alternatively, violence experienced by females may amplify the sexual division of power, placing women at risk for both future victimization and sexual risk behavior (Wingood & DiClemente, 1998). Structural factors, such as low SES, are associated both with violence (Cunradi, Caetano, & Schafer, 2002) and with STDs and HIV (Ickovics et al., 2002). Psychological distress may also serve as the link between diverse forms of violent experiences and sexual risk behavior. Experiences with violence may lead to PTSD, anxiety, or depression (Dutton et al., 2006; Mazza & Reynolds, 1999; Neumann,

Houskamp, Pollock, & Briere, 1996). Psychological distress, in turn, is associated with sexual risk behavior (DiClemente et al., 2001).

The Current Study

Based on previous empirical work, we know that diverse forms of violence are linked with sexual risk behaviors, and that many women experience multiple forms of violence. However, few studies have explored various forms of CM, IPV, and ECV simultaneously in relation to sexual risk-taking. In addition, studies that have considered multiple forms of violence have generally used an analytic approach based on the general linear model (i.e., ANOVA or regression; e.g., Senn & Carey, 2010), examining the influence of individual variables. Because of the shared variance in different forms of violence, we may gain new insights by using a different analytic approach. LCA is a method for using a number of indicators (e.g., violence types) to identify a small number of underlying subgroups present in the data (rather than subgroups that are pre-defined by the researcher), and is an appropriate method here because of the known overlap in forms of violence. LCA allows us to identify a small number of subgroups characterized by the observed variables (Lanza & Rhoades, 2011), affording a parsimonious way of examining how different combinations of violent experiences relate to sexual risk behaviors.

Therefore, in the present study, our goals were as follows:

1. To identify patterns of past and current experience with violence in a population of women attending an STD clinic using LCA. Based on prior research, we expected co-variation among the different violence types, and thus anticipated that classes of women experiencing multiple forms of violence would emerge.
2. To explore which combinations of experiences with violence are related to the riskiest sexual behavior outcomes. Prior research has found that experiencing multiple forms of violence is associated with worse outcomes (Felitti et al., 1998); therefore, we hypothesized that women experiencing numerous forms of violence would report the riskiest sexual behaviors, whereas women experiencing few forms of violence would report less risky behavior.

Method

Participants

Participants were 481 women (66% African American, 19% Caucasian, 8% Multiracial, 2% American Indian, <1% Asian, <1% Pacific Islander, and 5% Other Race) attending a publicly-funded STD clinic. Women ranged in age from 18 to 55 years ($M = 27$ years; $SD = 9$ years); most had a high school education or less (56%; $n = 271$) and earned < \$15,000/year (56%; $n = 265$); 49% ($n = 235$) self-identified as unemployed. Most women were single (81%; $n = 389$); other women identified as divorced (7%, $n = 32$), separated (6%, $n = 30$), married (5%, $n = 24$), and widowed (1%, $n = 5$).

Procedures

All procedures were approved by the Institutional Review Boards of the participating institutions. A female research assistant (RA) screened patients in a private room; 85% of patients met study criteria (i.e., age 18 or older, sexually active in the past 3 months). The study was explained to eligible patients; those who were interested and demonstrated capacity to consent provided written, informed consent. Sixty-two percent of those who were eligible agreed to participate. The primary reason for declining participation was lack of time (reported by 79% of decliners). Women who were enrolled completed a calendar of

salient events to orient them to the time frame of many of the survey questions and then completed an Audio Computer-Assisted Self-Interview (ACASI) in private. Participants were reimbursed \$20 for approximately 1 hour of their time and provided with a list of local, low- and no-cost counseling centers.

Measures: Grouping Variables

Childhood maltreatment—Participants responded to eight items from the Comprehensive Child Maltreatment Scale (Higgins & McCabe, 2001a) that assessed their frequency of child maltreatment experiences before age 13 on a scale from 0 (“never or almost never”) to 4 (“very frequently”). Subscales included physical abuse (3 items, $\alpha = .79$, e.g., “How frequently were you smacked, grabbed, or shaken by your mother, father, or other caregiver?” and “How frequently did your mother, father, or other caregiver hit, punch, or kick you?”), psychological maltreatment (2 items, $\alpha = .89$, e.g., “How often did your mother, father, or other caregiver provoke you, make you afraid, or use cruelty?”), and neglect (3 items, $\alpha = .70$, e.g., “How often were you not given regular meals or baths, clean clothes, or needed medical attention?”). Responses were dichotomized, so that participants who reported their parents at least occasionally engaged in these behaviors (a response of 1 or higher on the 0-to-4 scale) were considered to have experienced the corresponding form of CM.

Childhood sexual abuse—To assess CSA, we adapted items from Finkelhor (1979). Items were revised to reduce the possibility of reporting the same experience twice, and to eliminate noncontact sexual abuse items. Participants reported details of their sexual experiences before age 18; they could report experiences with up to 10 different people. Items included (a) “How old were you at the time?”; (b) “How old was the other person?”; (c) “What happened? Check all that apply” (response options were kissing, sexual touching, receiving oral sex, giving oral sex, vaginal sex, or anal sex); and (d) “Did the other person threaten or force you?” Women were included in the CSA category if they (a) reported oral, vaginal, or anal sex at age 12 or younger with someone 5 or more years older; (b) reported oral, vaginal, or anal sex at age 16 or younger with someone 10 or more years older; (c) reported oral, vaginal, or anal sex at age 16 or younger where they were forced or threatened with force; or (d) responded “yes” to an item asking whether they were ever sexually abused as a child. In our sample, there were 65 participants who had sex at age 12 or younger with someone 5 or more years older, 84 participants who had sex at age 16 or younger with someone 10 or more years older, 113 participants who had sex at age 16 or younger involving force/threat, and 156 participants who self-defined as sexually abused. Some participants met multiple criteria.

Intimate partner violence—IPV items were adapted from Cohen et al. (2000) and Feldhaus, Koziol-McLain, and Amsbury (1997). Participants indicated whether they had been hit, kicked, punched, or otherwise hurt by a current or former sexual partner; whether they had been pressured or forced to have sexual contact by a current or former sexual partner; and whether a current or former sexual partner had threatened to hurt or kill them or prevented them from behaviors such as seeing friends or seeking medical attention during the past year (all coded such that 0 = never or not in the past year and 1 = yes). Women who reported any of these experiences were coded as having experienced IPV.

Exposure to community violence—Participants responded to 5 items from the Exposure to Violence subscale of the City Stress Inventory (Ewart & Suchday, 2002). Items assessed the frequency of violent experiences in the participant’s neighborhood (e.g., “A family member was stabbed or shot”) on a scale from 0 (“never”) to 3 (“often”). Items were

averaged ($\alpha = .81$). This measure was normalized using a natural log transformation and standardized for the LCA.

Measures: Sexual Risk Behaviors

Lifetime and recent sexual partners—Participants reported the number of men and women they had sex with in their lifetime and in the past 3 months; these reports were summed to indicate the total number of lifetime and recent partners.

Unprotected sexual acts—Unprotected sex (past 3 months) was assessed by asking participants how many times they had engaged in vaginal sex and anal sex without a condom. Participants were asked these questions separately for steady and non-steady partners. Responses were summed to indicate the number of unprotected sexual events in the past 3 months.

Alcohol and drug use before sex—Participants reported the frequency with which they used (a) alcohol and (b) drugs prior to sex during the past 3 months on a 5-point scale from “never” to “almost always”; dummy variables indicated whether they ever did so.

History of sex work—Participants reported the number of times in their lifetime they had engaged in sex in order to get money, drugs, food, or a place to stay; this variable was recoded to indicate whether each participant had ever engaged in sex work.

Treatment for STDs—Participants reported the number of times in their life they had been treated for an STD (e.g., Chlamydia, gonorrhea, or syphilis). A dummy variable indicated whether they had ever been treated.

All sexual behavior items have been used in prior research with low-income urban women (e.g., Carey et al., 2000; Carey et al., 2004).

Measures: Demographic and Background Variables

At study enrollment, patients reported their age and indicated the racial or ethnic group with which they most closely identified. They also indicated their level of education, annual income, current employment status, and current marital status using categorical response options.

Data Analysis

Data were inspected for outliers ($> 3 \times$ the interquartile range [IQR] from the 75th percentile); outliers were trimmed (to $3 \times$ IQR from the 75th percentile + 1). Data that were non-normally distributed (i.e., number of lifetime sexual partners, number of recent sexual partners, number of episodes of unprotected sex) were normalized with a natural log transformation, although untransformed values are reported in tables for interpretation.

We performed an LCA using Mplus, Version 5.21 (Muthén & Muthén, 1998–2010). Analyses used the MLR estimator (Asparouhov & Muthén, 2005), a robust full information maximum likelihood estimator. Model solutions were evaluated primarily on the basis of the Bayesian information criterion (BIC; Schwarz, 1978), which performs better than other information criteria and likelihood ratio tests in identifying the appropriate number of latent classes (Nylund, Asparouhov, & Muthén, 2007). Better fitting models are indicated by lower BIC values. Secondary indicators considered included the Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMRT; Lo, Mendell, & Rubin, 2001), the Akaike Information Criterion (AIC; Akaike, 1987), and entropy (Ramaswamy, Desarbo, Reibstein, & Robinson, 1993). The LMRT is used to compare a solution with more classes to one with fewer; a

significant LMRT indicates that the target solution fits the data better than the solution with one fewer class. Similar to BIC, better fitting models are indicated by lower AIC values; however, the AIC may identify too many classes, especially with large samples (Nylund et al., 2007). Finally, relative entropy is a measure of classification certainty, with values near 1 indicating high certainty in classification.

Once the best-fitting solution was identified, most likely class memberships were saved, and class membership was used as the independent variable for ANCOVAs and logistic regressions examining demographics and sexual behavior. When examining sexual risk behaviors, we controlled for demographic factors.

Results

Preliminary Results

Rates of violence and sexual risk—CM, IPV, and experiences with ECV were prevalent in this sample (Table 1). Physical CM was reported by 53% of participants, psychological CM by 59% of participants, neglect by 46% of participants, and CSA by 45% of participants. Additionally, 19% of women reported experiencing IPV in the past year. The mean level of ECV was .71 ($SD = .66$) on a 0-to-3 scale: 38% of participants reported that a family member had been attacked or beaten at least once during the past year, 26% that a family member had been stabbed or shot, 47% that a friend had been stabbed or shot, 66% that a family member had been questioned by the police, and 43% that a friend had been robbed or mugged.

Sexual risk behavior also occurred at high rates in this sample. Participants reported an average of 22 partners during their lifetime (median = 13) and 2 partners during the past 3 months (median = 1). Additionally, unprotected sexual intercourse occurred frequently, with participants reporting an average of 18 unprotected acts of vaginal or anal intercourse in the past 3 months (median = 9) and 48% of participants reporting never using condoms. A history of exchanging sex for money, drugs, food, or a place to stay was reported by 31% of women, and over four-fifths of the sample (84%) had been treated for an STD at some point in their lifetime. Finally, substance use in conjunction with sex was common, with 67% of participants reporting alcohol use before sex, and 42% reporting drug use before sex during the past 3 months.

Associations between different forms of violence—As expected, different forms of violent experiences were related (Table 1). Women who had experienced any form of CM were 2 to 8 times as likely to have experienced other forms of CM as compared to women who were not maltreated. Women who had experienced any form of CM were also twice as likely to have recent experiences with IPV. Women who had experienced either CM or IPV also lived in significantly more violent neighborhoods than women who had not.

Research Goal 1: Extraction of Latent Classes

Indicators of the LCA were history of childhood physical abuse, childhood psychological maltreatment, childhood neglect, and childhood sexual abuse (all dichotomous); recent experience of IPV (dichotomous); and recent ECV (standardized). LCAs were conducted that specified 1 to 6 classes (Table 2). The best fitting model, as indicated by the lowest sample size adjusted BIC, was the 4-class model. The LMRT also showed that the 4-class model fit the data better than the 3-class model, and that a 5-class model did not improve the fit. AIC and entropy values indicated the 4-class solution was a reasonable choice. After deciding on the 4-class solution, individuals were assigned to their most likely class (the

class to which they had the highest probability of belonging to, based on their reports of violent experiences).

As shown in Table 3, the 4-class model included the following classes: (1) a class of individuals with below-average probability of having experienced all types of CM, CSA, and recent IPV and below-average levels of ECV ("Low Violence," 39% of the sample); (2) a class of individuals with below-average probability of having experienced CM, average probability of having experienced CSA and recent IPV, and above-average levels of ECV ("Predominantly ECV," 20% of the sample); (3) a class of individuals with above-average probability of having experienced CM, average probability of having experienced CSA and recent IPV, and below-average levels of ECV ("Predominantly CM," 23% of the sample); and (4) a class of individuals with above-average probability of having experienced all types of CM, CSA, and recent IPV and above-average levels of ECV ("Multiply Victimized," 18% of the sample).

ANOVAs indicated that members of the Low Violence class were significantly less likely to have experienced all types of childhood violence and recent IPV than members of all other classes, while members of the Multiply Victimized class were more likely to have experienced childhood neglect, CSA, and recent IPV than members of any other classes. However, members of the Predominantly CM and the Multiply Victimized classes did not differ in their probability of having experienced childhood physical or psychological maltreatment. Members of the Low Violence and Predominantly CM classes did not differ in their levels of exposure to community violence, nor did members of the Predominantly ECV and Multiply Victimized classes.

Research Goal 2: Comparison of Classes

After extracting the four latent classes, individuals were assigned to their most likely class and were compared on a number of demographic variables as well as the sexual risk behavior outcomes of interest. We conducted group comparisons using one-way ANCOVAs and Scheffe post hoc tests (controlling for demographics), as well as logistic regressions controlling for demographics. Continuous variables that were skewed (including lifetime sexual partners, recent sexual partners, number of unprotected sexual acts, and age) were normalized with natural log transformations for ANCOVAs. Results of these analyses are presented in Table 4.

Demographic characteristics—Differences among the classes were observed in terms of ethnicity, education, unemployment, and income, but not age or marital status. Members of the Predominantly ECV class were more likely to be Black, while members of the Low Violence and Predominantly CM classes were more likely to be White. Members of the Predominantly ECV and Multiply Victimized classes were most likely to have received a high school education or less, to be unemployed, and to have an annual income of less than \$15,000. Because there were demographic differences between classes, we controlled for demographics in other analyses.

Sexual risk behavior—Significant differences among the classes were observed for seven of the eight sexual risk behaviors considered.

Lifetime sexual partners—Members of the Low Violence class reported significantly fewer lifetime partners than did members of the Predominantly ECV, Predominantly CM, and Multiply Victimized classes (using logs, $M_{\text{diff}} = -.19$, $CI_{.95} = -.28, -.09$, $p < .001$; $M_{\text{diff}} = -.10$, $CI_{.95} = -.19, -.01$, $p = .04$; $M_{\text{diff}} = -.20$, $CI_{.95} = -.29, -.10$, $p < .001$, respectively).

The Predominantly ECV, Predominantly CM, and Multiply Victimized classes did not differ in their number of lifetime partners.

Recent sexual partners—Members of the Low Violence class reported significantly fewer partners in the past 3 months than did members of the Multiply Victimized class (using logs, $M_{\text{diff}} = -.07$, $CI_{.95} = -.12, -.02$, $p < .01$). None of the other classes differed significantly from one another in terms of their number of recent partners.

Number of unprotected sexual acts—There were no significant differences between classes in terms of number of unprotected sexual acts.

Not using condoms—Members of the Predominantly ECV class had a significantly higher probability of not using condoms in the past 3 months than did members of the Low Violence, Predominantly CM, and Multiply Victimized classes (OR = 2.48, $CI_{.95} = 1.45, 4.27$, $p < .001$; OR = 1.89, $CI_{.95} = 1.03, 3.44$, $p = .04$; OR = 2.05, $CI_{.95} = 1.08, 3.88$, $p = .03$, respectively). Nearly half of women in the Predominantly ECV class did not use condoms in the past 3 months.

Alcohol use before sex—Members of the Predominantly ECV and Multiply Victimized classes were significantly more likely to use alcohol before engaging in sex than were members of the Low Violence (OR = 1.89, $CI_{.95} = 1.08, 3.29$, $p = .03$ and OR = 2.52, $CI_{.95} = 1.34, 4.73$, $p < .01$, respectively) and the Predominantly CM classes (OR = 1.92, $CI_{.95} = 1.02, 3.60$, $p = .04$ and OR = 2.56, $CI_{.95} = 1.27, 5.15$, $p < .01$, respectively). Nearly 80% of the members of the Multiply Victimized class and three-quarters of the members of the Predominantly ECV class used alcohol before sex in the past 3 months.

Drug use before sex—Members of the Multiply Victimized and Predominantly ECV classes were significantly more likely to use drugs before sex than were members of the Low Violence class (OR = 3.43, $CI_{.95} = 1.94, 6.08$, $p < .001$ and OR = 2.09, $CI_{.95} = 1.22, 3.56$, $p < .01$, respectively). Additionally, members of the Multiply Victimized class were more likely than members of the Predominantly CM class to use drugs before sex (OR = 2.56, $CI_{.95} = 1.35, 4.85$, $p < .01$). Over 60% of the members of the Multiply Victimized class used drugs before sex in the past 3 months, while less than a third of those in the Low Violence class did.

History of sex work—Members of the Predominantly ECV, Predominantly CM, and the Multiply Victimized classes were significantly more likely to have engaged in sex work than were members of the Low Violence class (OR = 2.75, $CI_{.95} = 1.48, 5.12$, $p < .001$; OR = 3.05, $CI_{.95} = 1.65, 5.64$, $p < .001$; OR = 16.06, $CI_{.95} = 8.25, 31.25$, $p < .001$, respectively). Members of the Multiply Victimized class were more likely to have ever engaged in sex work than were members of the Predominantly ECV and Predominantly CM classes (OR = 5.83, $CI_{.95} = 2.99, 11.39$, $p < .001$ and OR = 5.27, $CI_{.95} = 2.69, 10.33$, $p < .001$, respectively). Nearly three-quarters of the members of the Multiply Victimized class had engaged in sex work.

Treatment for STDs—Members of the Predominantly ECV and the Multiply Victimized classes were more likely to have ever been treated for an STD than were members of the Low Violence class (OR = 3.39, $CI_{.95} = 1.34, 8.56$, $p < .01$ and OR = 2.94, $CI_{.95} = 1.21, 7.13$, $p = .02$, respectively). Over three-quarters of members of the Low Violence and the Predominantly CM classes had been treated for STDs, while over 90% of members of the Predominantly ECV and the Multiply Victimized classes had been treated.

Discussion

Women attending an urban STD clinic reported high rates of exposure to violence, including CM, IPV, and ECV. Rates of violence in our sample were higher than those in the general population (Black et al., 2011; Briere & Elliott, 2003; Scher et al., 2004); however, they are consistent with similar samples of low-income, urban women (El-Bassel et al., 1998; Mosack et al., 2010). All types of violence were associated with one another, with women who experienced one type of violence being more likely to experience other forms as well. This overlap may make untangling the effects of individual violence types using traditional analytical methods difficult. LCA allowed for the identification of common patterns of violent experiences. We identified four classes of women with different experiences of violence in childhood and adulthood, and showed that these patterns of violence related to different sexual risk behaviors.

Women in the Multiply Victimized class reported more sexual risk behavior, in general, than women in the Low Violence class. These results are consistent with research identifying cumulative violence (e.g., experiences with more types of violence) as associated with sexual risk behavior (Felitti et al., 1998). There are multiple possible explanations for the finding that women in the Multiply Victimized class reported the most sexual risk behavior. This result is consistent with allostatic load or cumulative stress theories (McEwen & Seeman, 1999) that suggest that exposure to increasing levels of environmental stress—such as multiple forms of violence across the lifespan—may have adverse physiological and socioemotional consequences. Researchers have suggested that one result of increased allostatic load may be decreased self-regulation and, as a result, risky sexual behavior (e.g., Evans, 2003; Rellini et al., 2011). Alternatively, TGP (Connell, 1987; Wingood & DiClemente, 2000) may explain our findings. The social forces that lead men to have more power than women may contribute both to men perpetrating violence against women and to women being unable to refuse risky sexual behavior. Women who are in environments where the power imbalance between men and women is the greatest may be the most likely to experience violence, as well as the most likely to be unable to refuse sexual risk behaviors. Associations between violent experiences and sexual risk behaviors may also have a psychological explanation. Research has suggested that exposure to violence may lead to psychological distress (e.g., Dutton et al., 2006) or, alternatively, desensitization to risk exposures (Ng-Mak, Salzinger, Feldman, & Stueve, 2004), both of which are associated with sexual risk-taking (DiClemente et al., 2001). Further research is necessary to determine the best explanation for associations between violence and sexual risk behavior.

In addition to Multiply Victimized and Low Violence classes, two intermediate classes of violence were identified: women with relatively high ECV but relatively low frequency of CM, and women with relatively high frequency of CM but low ECV. Our findings suggest a unique influence of ECV. Although members of the Predominantly ECV class were substantially less likely to experience CM than were members of the Predominantly CM class and were equally likely to experience CSA and recent IPV, they reported riskier sexual behavior. Indeed, their levels of sexual risk were nearly as high as those in the Multiply Victimized class. This finding was surprising because ECV is the only type of violence exposure in the current study that does not necessarily reflect direct victimization; direct victimization may have a more powerful influence on behavior than witnessing violence (Berenson, Wiemann, & McCombs, 2001). However, current violence exposure, even if it is witnessed rather than direct, may be more strongly associated with risk behavior than violence that occurred years or even decades previously (i.e., CM). The association between ECV and sexual risk behavior has received little research attention relative to other forms of violence. Our findings suggest that further research on the relation between ECV and sexual risk behavior is needed.

ECV may play an important role in sexual risk behavior because it is more proximal to the risk behavior than other types of violence, such as CM. Alternatively, neighborhood factors may be especially important in determining sexual risk behaviors because they influence both women and their sexual partners. Individuals tend to live in close proximity to their sexual partners (Zenilman, Ellish, Fresia, & Glass, 1999); if both members of a couple live in the same neighborhood and experience the same level of ECV, this violence could exert an effect on both partners' risk behavior. A different possibility is that women who live in violent neighborhoods may be willing to engage in sexual risk behavior to obtain or maintain a relationship for increased (perceived) safety and security. ECV might also influence community norms, consistent with theories suggesting that neighborhood disorder and violence impact risk behavior by indicating an acceptance for behaviors that are usually prohibited (Brady, 2006; D. Cohen et al., 2000). This idea is supported by our finding that alcohol and drug use prior to sex were common among those in classes with high levels of ECV; substance use is another commonly prohibited behavior that may be influenced by community norms. Finally, the high levels of sexual risk behavior in the Predominantly ECV class may be consistent with allostatic theories even though members of this class seem to have fewer cumulative stressors throughout the lifespan than do members of the Multiply Victimized class, as ECV may be correlated with other, unmeasured stressors that impact allostatic load. For example, people who live in violent neighborhoods often experience economic stress, have less social support, and may have more concerns over their children's safety and well-being. Future research is needed to determine which, if any, of these theories explain the relation between ECV and sexual risk behavior.

Limitations

Two strengths of the current study are the use of LCA to identify patterns of violent experiences and the use of a diverse, at-risk sample of women attending an STD clinic. However, the patterns of violence experienced by these women may not be typical; in particular, rates of violence exposure are higher than average. Rates of sexual risk behavior in this sample were also high. Thus, results may not generalize to other populations of women. Furthermore, these women were recruited as adults, so reports of CM and CSA were retrospective self-reports, and thus may be subject to over- or under-reporting. Given the extended amount of time that may have elapsed between women's experiences of CM and their self-report in the current study, as well as the sensitive nature of the questions, responses may be subject to recall and response biases (Widom & Morris, 1997; Widom & Shepard, 1996). To minimize problems associated with self-report, we used ACASI, which has been shown to reduce underreporting of sensitive information (Schroder, Carey, & Vanable, 2003).

In addition, there are several limitations related to our measures and analyses. First, although we used an established measure of CM, the forms of maltreatment assessed varied in severity, and some women endorsing items may have experienced harsh punishment rather than abuse. This is a potential explanation for the high levels of endorsement of different forms of CM in our sample, and may be a reason why ECV showed stronger associations with sexual risk behavior than did CM. Second, some of our measures of sexual risk behavior, particularly lifetime measures (e.g., number of partners), may include behaviors that occurred prior to experiences with violence, limiting our ability to draw conclusions about the direction of effects. Third, although the use of LCA allows for a new perspective on how patterns of violent experiences relate to sexual risk behaviors, there are limitations to the method, including the potential for identified classes to differ based on the sample or measures considered and the possibility of some individuals fitting multiple classes reasonably well (McCutcheon, 1987).

Clinical and Policy Implications

The current study suggests that patterns of violent experiences are related to sexual risk behaviors. As a result, women—especially low-income, urban women who experience violence at high rates (Dong et al., 2004; Senn et al., 2010)—are at risk not only from violence itself, but also from sexual behavior that may lead to HIV, other STIs, and unplanned pregnancy.

Our study has several clinical implications. First, the clustering of different types of violence suggests that clinicians who work with women who have experienced one type of violence should inquire about other types of violence. Second, the ties between experiences of violence and sexual risk behavior suggest that physicians, clinicians, and interventionists working with women who experience violence or who are at risk for STIs/HIV may need to consider the overlap between the two. With the understanding that multiple violent experiences are common for those who are the riskiest sexually, interventionists working to reduce risk of HIV may try to provide the women they work with resources for coping with intimate partner and community violence and for overcoming past experiences with CM and CSA. Similarly, clinicians working with women experiencing IPV or other forms of violence may address strategies for safer sex. Further research is needed to better understand how and why experiences of violence are associated with sexual risk behavior, to inform the development of interventions that reduce sexual risk behavior among women experiencing violence.

Research Implications

This research makes clear that women attending an urban STD clinic often experience multiple forms of violence. Given the overlap between different experiences of violence, examining any single form as a predictor of outcomes (sexual-risk related or not) may provide an incomplete picture and potentially lead to inaccurate conclusions. When examining individual violent experiences rather than patterns of violence, researchers may attribute effects to one form of violence (e.g., CM), when there is a more proximal explanation (e.g., ECV). More studies should attempt to untangle the complex associations between multiple forms of violence, and between different violent experiences and health outcomes.

In conclusion, we identified four patterns of violence experiences among women attending an STD clinic, and found differences in sexual risk behavior between these classes. Sexual risk-taking was most common among women who experienced many types of violence and among those who experienced high levels of ECV. These results suggest the importance of assessing and addressing violence in the context of sexual risk reduction interventions.

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Table 1

Prevalence of and Associations Among Different Forms of Violence.

	CM: Physical	CM: Psychological	CM: Neglect	CSA	IPV
Prevalence	53% OR, 8.22 AOR, 8.17	59% OR, 6.29 AOR, 5.98	46% OR, 2.38 AOR, 2.10	45%	19%
CM: Psychological					
CM: Neglect					
CSA					
IPV					
ECV ($M = .71, SD = .66$)					

 $p < .001$

**
 $p < .01$.

Abbreviations: OR = odds ratio; AOR, adjusted odds ratio (adjusted for education, income, employment, race, and age); B = unstandardized beta; AB = adjusted unstandardized beta (adjusted for education, income, employment, race, and age); CM = childhood maltreatment; CSA = childhood sexual abuse; IPV = intimate partner violence; ECV = exposure to community violence; OR = odds ratio.

Table 2

Latent Class Analysis Model Fit Indices for 1- through 6-Class Solutions.

Model	AIC	BIC	LMRT	Entropy
1-class	4381.78	4388.79		
2-class	4064.62	4078.65	331.16, $p < .001$	.740
3-class	4051.33	4072.37	27.29, $p = .07$	.607
4-class	4009.04	4037.10	56.29, $p < .001$	.716
5-class	4007.70	4042.77	15.35, $p = .31$	.706
6-class	4012.45	4054.53	9.25, $p = .24$	.740

Note: AIC = Akaike Information Criterion, BIC = sample size adjusted Bayesian Information Criterion, LMRT = Lo-Mendell-Rubin Test.

Table 3

Experiences of Violence in the Four Latent Classes.

	Overall	Low Violence (<i>n</i> = 188)	Predominantly ECV (<i>n</i> = 98)	Predominantly CM (<i>n</i> = 110)	Multiply Victimized (<i>n</i> = 85)	<i>F</i> (3,462)	η^2	$\chi^2(3)$	ϕ_c
CM: Physical	53%	15% ^a	33% ^b	97% ^c	100% ^c			275.92 ^{***}	.77
CM: Psychological	59%	25% ^a	44% ^b	99% ^c	100% ^c			224.65 ^{***}	.69
CM: Neglect	46%	15% ^a	31% ^b	70% ^c	98% ^d			192.22 ^{***}	.64
CM: Sexual	45%	23% ^a	50% ^b	51% ^b	79% ^c			79.06 ^{***}	.41
Partner Violence	19%	7% ^a	25% ^b	20% ^b	40% ^c			43.57 ^{***}	.30
ECV	0.00 (1.00)	-.72 (.52) ^a	1.02 (.54) ^b	-.60 (.52) ^a	1.07 (.61) ^b	376.70 ^{***}	.71		

Note: CM = childhood maltreatment. ECV = exposure to community violence. For continuous variables, numbers presented represent means and standard deviations. Within each row, different subscripts indicate significant differences between classes according to Scheffé post-hoc tests or pairwise chi-square tests using Bonferroni-adjusted significance levels ($p < .044$).

 $p < .001$

**
 $p < .01$

*
 $p < .05$

Table 4
Demographic and Sexual Risk Behavior Differences Among the Four Latent Classes.

	Overall	Low Violence (<i>n</i> = 188)	Predominantly ECV (<i>n</i> = 98)	Predominantly CM (<i>n</i> = 110)	Multiply Victimized (<i>n</i> = 85)	<i>F</i>	<i>df</i> s	η^2	$\chi^2(3)$	ϕ_c
Demographics										
Age	27.5 (8.8)	26.7 (8.6)	28.4 (8.8)	28.3 (8.6)	27.1 (9.6)	1.69	3,477	.01		
Black Ethnicity	66%	64% ^{ab}	81% ^c	54% ^a	68% ^{bc}				17.21 ^{***}	.19
White Ethnicity	19%	22% ^b	7% ^a	26% ^b	15% ^{ab}				14.19 ^{**}	.17
Education: High School	56%	56% ^b	62% ^{bc}	41% ^a	71% ^c				19.07 ^{***}	.20
Unemployed	49%	45% ^a	58% ^b	42% ^a	55% ^{ab}				7.99 [*]	.13
Income: \$15,000	56%	53% ^b	67% ^c	39% ^a	75% ^c				30.86 ^{***}	.20
Married	5%	4%	8%	4%	5%				2.82	.08
Sexual Risk Behavior										
						<i>F</i>	<i>df</i> s	η^2	Wald(3)	
Lifetime Partners	22.4 (23.2)	17.0 (19.3) ^a	27.6 (26.4) ^b	21.1 (20.1) ^b	29.6 (27.5) ^b	7.67 ^{***}	3,467	.05		
Past 3 Month Partners	2.1 (1.8)	1.9 (1.5) ^a	2.2 (2.0) ^{ab}	2.0 (1.7) ^{ab}	2.6 (2.1) ^b	2.54 ⁺	3,467	.02		
Unprotected Sexual Acts	17.6 (22.1)	16.0 (20.5)	20.2 (22.8)	17.1 (23.2)	18.4 (22.9)	.80	3,464	.01		
Never Use Condoms	48%	27% ^a	45% ^b	33% ^a	29% ^a				11.28 ^{**}	
History of Sex Work	31%	13% ^a	32% ^b	31% ^b	71% ^c				67.24 ^{***}	
Ever Treated for an STD	84%	79% ^a	94% ^b	79% ^{ab}	92% ^b				10.40 [*]	
Alcohol Use Before Sex	67%	61% ^a	74% ^b	63% ^a	79% ^b				11.89 ^{**}	
Drug Use Before Sex	42%	31% ^a	49% ^{bc}	36% ^{ab}	62% ^c				19.73 ^{***}	

Note: CM = childhood maltreatment. ECV = exposure to community violence. For continuous variables, numbers presented represent means and standard deviations. ANOVAs were performed on log-transformed variables when non-normality was present, but non-transformed values are reported here. Within each row, different subscripts indicate significant differences between classes according to Scheffé post-hoc tests or pairwise chi-square tests or individual logistic regression odds ratios using Bonferroni-adjusted significance levels ($p < .044$).

 $p < .001$

**
 $p < .01$

*
 $p < .05$