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Sexual Victimization, Alcohol Intoxication, Sexual-Emotional Responding, and Sexual Risk in Heavy Episodic Drinking Women

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Abstract

This study used an experimental paradigm to investigate the roles of sexual victimization history and alcohol intoxication in young women's sexual-emotional responding and sexual risk taking. A nonclinical community sample of 436 young women, with both an instance of heavy episodic drinking and some HIV/STI risk exposure in the past year, completed childhood sexual abuse (CSA) and adolescent/adult sexual assault (ASA) measures. A majority of them reported CSA and/or ASA, including rape and attempted rape. After random assignment to a high alcohol dose (.10%) or control condition, participants read and projected themselves into an eroticized scenario of a sexual encounter involving a new partner. As the story protagonist, each participant rated her positive mood and her sexual arousal, sensation, and desire, and then indicated her likelihood of engaging in unprotected sex. Structural equation modeling analyses revealed that ASA and alcohol were directly associated with heightened risk taking, and alcohol's effects were partially mediated by positive mood and sexual desire. ASA was associated with attenuated sexual-emotional responding and resulted in diminished risk taking via this suppression. These are the first findings indicating that, compared to non-victimized counterparts, sexually victimized women respond differently in alcohol-involved sexual encounters in terms of sexual-emotional responding and risk-taking intentions. Implications include assessing victimization history and drinking among women seeking treatment for either concern, particularly women at risk for HIV, and alerting them to ways their histories and behavior may combine to exacerbate their sexual risks.

Keywords

Child Sexual Abuse; Sexual Assault; Alcohol; Sexual Risk Taking; Affect

INTRODUCTION

Sexual victimization is associated with women's subsequent HIV/STI-related sexual risk taking (e.g., Koenig, Doll, O'Leary, & Pequegnat, 2004). Explanations emphasize distal factors (e.g., Morokoff et al., 2009), postulating that post-victimization psychological reactions lead to increased exposure to high risk sexual encounters (e.g., Senn, Carey, & Vanable, 2008). In contrast, little is known about contextual proximal factors influencing sexual-emotional responses in such encounters and consequent risk behavior. Specifically, we know little about whether victimized women—once in a risky situation—respond differently in sexual-emotional terms than non-victimized women, and whether these differences affect risk taking. That is, victimized women may exhibit distinct patterns of sexual-emotional responding that may, in turn, function as proximal mediators between past victimization and sexual risk taking. Thus, we do not know enough about victimization-related situational responding to inform evidence-based interventions targeting victimized women.

Sexual Victimization History and Sexual Risk Related Behaviors

Victimized women report more sexual partnerships (Testa, VanZile-Tamsen, & Livingston, 2005) and sexual risks (Testa, Hoffman, & Livingston, 2010) than non-victimized women. Surveys linking sexual risk behavior with previous childhood sexual abuse (CSA) (see reviews by Lalor & McElvaney, 2010; Malow, Devieux, & Lucenko, 2006) and adult sexual assault (ASA) (Brener, McMahon, Warren, & Douglas, 1999; Campbell, Sefl, & Ahrens, 2004) emphasize distal explanatory factors. Presumably, victimization fosters trauma symptoms and mood disturbances, which, in turn, foster problematic coping styles and relational instability resulting in greater exposure to risk opportunities.

Experiments support the possibility that victimized women exhibit heightened risk because they respond to sexual situations differently than non-victimized women. In an experiment assessing unprotected sex intentions with in-the-moment sexual scenarios in which women projected themselves into an eroticized consensual encounter with a casual partner, Schacht et al. (2010a) found that women with CSA histories exhibited lower condom use likelihood than women with either ASA or no victimization histories. Using the same paradigm and focusing on behavioral mediators, Stoner et al. (2008) found that ASA victimized women were less sexually assertive than non-victimized women, resulting in less condom insistence and greater likelihood of unprotected sex.

Other experiments have examined victimized women's sexual-emotional responses to sexual stimuli. Compared to non-victimized women, victimized women exhibited smaller increases in physiological sexual arousal (Gilmore et al., 2010; Rellini, Hamilton, Delville, & Meston, 2009; Rellini & Meston, 2006; Schacht et al., 2007) and greater negative affect (Rellini & Meston, 2011), but there were no significant differences in self-reported sexual arousal.

However, Schacht et al. found that, when intoxicated, victimized women reported more subjective sexual arousal than intoxicated non-victimized women and sober victimized women, and higher positive mood than non-victimized women and sober victimized women.

Overall, previous experiments indicate that victimized women (1) respond situationally in ways that lead directly or indirectly to greater sexual risk intentions and (2) exhibit different sexual-emotional responding than non-victimized women: less sexual arousal, greater negative mood, and—when intoxicated—greater positive mood. An implication of these two points is that differential sexual-emotional responding—particularly indices likely to be sensitive to victimization history—may mediate victimization and risk taking. Yet, this possibility has not been examined directly.

Alcohol, Relationships, and Sexual Risk Related Behaviors

Evaluating the roles of dispositional versus situational factors, Cooper (2010) concluded that alcohol was one of the strongest known contextual determinants of sexual risk behavior. Despite earlier ambiguity in cross-sectional and event-level data about the nature of alcohol's role, it is now well-established through longitudinal surveys (e.g., Cooper, 2010) and rigorous experiments (e.g., see reviews by Hendershot & George, 2007; Rehm, Shield, Joharchi, & Shuper, 2012) that alcohol can and does have a causal impact on sexual risk behaviors.

Experiments aimed at identifying proximal mediating mechanisms of intoxicated risk taking have focused primarily on cognitive-behavioral factors rather than on sexual-emotional factors. This focus reflects the degree to which theories of HIV-related sexual risk taking (e.g., the theory of reasoned action [Ajzen & Fishbein, 1980] and the cognitive mediation model [Norris, Masters, & Zawacki, 2004]) have emphasized rational decision-making processes over emotional heat-of-the-moment processes. However, self-reported sexual arousal's link with risk-taking has been evaluated as a unidimensional sexual-emotional construct.

Two experiments revealed that self-reported sexual arousal during a hypothetical sexual encounter predicted sexually riskier outcomes, in conjunction with alcohol intoxication among men (MacDonald, MacDonald, Zanna, & Fong, 2000) and independent of alcohol intoxication in a mixed sex sample (Abbey, Saenz, & Buck, 2005). However, neither study used an eroticized scenario capable of generating a high level of sexual arousal. Norris et al. (2009) used the eroticized in-the-moment paradigm described earlier and assessed arousal unidimensionally across three time points in the scenario. High dose alcohol increased early arousal and indirectly increased later arousal, but had neither a direct nor indirect effect on risk-taking. The lack of an indirect effect of alcohol on risk-taking was attributed to “the rather lengthy string of mediating variables in the model” focusing on cognitive-behavioral factors (Norris et al., 2009). Using the same paradigm, George et al. (2009) assessed arousal bi-dimensionally—self-reported and physiological genital arousal—and found that self-reported arousal, but not physiological arousal, mediated alcohol's effects on greater risk-taking.

Thus, while previous experimentation shows some evidence that self-reported arousal mediates intoxicated risk taking, two important questions pertaining to the current project remained unaddressed. First, while subjective sexual arousal is an important facet of the sexual-emotional experience preceding an intercourse decision, it is not the only facet. This experience is rich in other powerful emotionally motivating processes, such as positive mood and sexual desire, and thus comprises a multidimensional sexual-emotional composite. At present, we know very little about these co-occurring emotional dimensions for women while acutely intoxicated, the degree to which they parallel subjective sexual arousal, and whether they play a demonstrable mediating role in intoxicated risk taking. Compared to previous experiments, a key aim here was to focus primarily on sexual-emotional mediators rather than cognitive-behavioral mediators in order to capture a multidimensional snapshot of this pivotal moment. Second, we know nothing about whether sexual-emotional responding plays a mediational role in the intoxicated risk taking of sexually victimized women, and addressing this question was another key aim of this work.

In an extensive analysis of dispositional versus situational factors, Cooper (2010) concluded that relationship factors were also strong contextual determinants of risk behavior. Relationship factors play a significant role in how women respond in sexual encounters. Zawacki et al. (2009) used the eroticized in-the-moment paradigm and found that perceived relationship potential was jointly determined by relationship motivation, alcohol intoxication, and partner familiarity and that increased relationship potential led to increased sexual risk taking via several cognitive-behavioral factors. This experiment did not address victimization history or sexual-emotional factors, but it did support the importance of considering alcohol and relationship factors jointly, especially relationship potential, when examining sexual risk.

Present Study

While it has become well established that sexually victimized women differ from non-victimized counterparts by exhibiting greater sexual risk taking and while there has been considerable theorizing about distal factors determining this difference, there has been insufficient research on proximal factors and processes to address an important underlying question: Do victimized women actually respond differently in sexual encounters than non-victimized counterparts? The present work addresses this knowledge gap and advances previous work by examining the effects of proximal contextual factors on risk taking and the role played by sexual-emotional responses understood to be sensitive to victimization history. Alcohol and relationship variables are important contextual factors, given the patterns of alcohol use (e.g., Hughes, McCabe, Wilsnack, & West, 2010) and relationship instability (e.g., Testa, VanZile-Tamsen, & Livingston, 2005) that many victimized women exhibit. Experimental evaluation of the ideas that victimized and non-victimized women respond differently, and that alcohol and relationship factors may moderate this difference, could be informative clinically by indicating whether and how past victimization manifests in the moment to affect sexual risk, and by providing evidence-based suggestions for prevention intervention content.

Women's sexual risk taking was operationalized as self-reported likelihood of engaging in unprotected sex with a new sex partner and assessed with the eroticized in-the-moment paradigm mentioned earlier. Three sets of variables were investigated: (1) women's self-reported history of childhood sexual abuse and adult/adolescent sexual assault; (2) situational influences that have been theorized and empirically shown to affect women's sexual risk-taking: acute alcohol intoxication and potential for a lasting romantic relationship; (3) sexual-emotional responding, including positive mood, subjective sexual arousal, sexual sensation, and sexual desire. Based on theory and previous research, we examined a model—Fig. 1—testing whether distal victimization experiences and proximal situational conditions would independently and jointly exert influences on sexual risk taking and whether these influences would occur directly or indirectly through sexual-emotional responding. The following specific hypotheses and questions were investigated:

- Sexual victimization hypothesis: Consistent with previous surveys (e.g., see reviews by Lalor & McElvaney, 2010; Malow et al., 2006) and experiments (e.g., Schacht et al., 2010a; Stoner et al., 2008), we hypothesized that women with histories of sexual victimization—CSA, ASA, and both—would exhibit greater intent to have unprotected sex than women without such histories (Hypothesis 1).
- Sexual victimization exploratory questions: We examined two related and previously unexamined questions for which there was little basis for clear-cut hypotheses. First, does victimization history have a discernible effect on sexual-emotional states (in this case: arousal, desire, sensation, and positive mood) during the heat of the moment of a sexual encounter? Second, if victimization history has effects on the heat of the moment experience, do these effects mediate between victimization history and sexual risk taking?
- Alcohol hypotheses: Consistent with previous findings (e.g., see reviews by Hendershot & George, 2007; Rehm et al., 2012), we hypothesized that acute alcohol intoxication would increase intent to have unprotected sex (Hypothesis 2). The key novel hypothesis was that alcohol would have indirect effects on risk taking through multiple aspects of in-the-moment sexual-emotional responding. In accordance with alcohol myopia theory (Steele & Josephs, 1990) and previous findings (Davis et al., 2007), intoxication should heighten attention to impelling sexual cues—sexual arousal, sexual desire, sexual sensation, and positive mood—resulting in an indirect effect increasing willingness to have unprotected sex (Hypothesis 3).
- Relationship potential hypothesis: Consistent with a previous finding (Zawacki et al., 2009), we hypothesized that, when the potential for a lasting relationship is depicted as high rather than low, women would exhibit greater willingness to have unprotected sex (Hypothesis 4).

METHOD

Participants

Participants were recruited from an urban community using online and print advertisements soliciting single female social drinkers to participate in a research study on male-female social interactions. Women were eligible if they reported being between the ages of 21–30 years, typically consumed at least five drinks per week, had an instance of heavy episodic drinking (consistent with NIAAA's [2011] definition of binge drinking as consuming four or more drinks over two hours) on at least one occasion in the past year, and had at least one instance of unprotected sex in the past year. Further eligibility criteria required at least one of the following current HIV/STI risk factors: (1) new sex partner in the past year; (2) two or more sex partners in the past year; (3) having had an STI; or (4) knowing or suspecting that a past year sex partner had himself had a concurrent sexual relationship, an STI and/or HIV, a same-sex sexual encounter, ever used IV drugs, or been incarcerated in the last 12 months. These HIV/STI risk factors were adapted from previous research (e.g., Magnus et al., 2009; Moreno, Morrill, & El-Bassel, 2011; Senn, Carey, Vanable, Coury-Doniger, & Urban, 2006). Individuals were excluded if they had medical conditions or took prescription medications that contraindicated alcohol use. The Brief Michigan Alcohol Screening Test (Pokorny, Miller, & Kaplan, 1972) was used to exclude women with a history of problem drinking (as defined by a score of 5 or more or negative reactions to alcohol). All study methods were approved by the University Human Subjects Division.

A total of 448 women participated in the study.¹ Data from 12 were lost or excluded due to equipment failure or failure of the relationship potential manipulation check. The final data set included 436 women (M age = 24.8 years, SD = 2.6). The majority of the sample self-identified as Caucasian (72.2%), 6.4% self-identified as African American/Black, 5.3% as Asian/Pacific Islander, 6.7% as Hispanic/Latina, 0.9% as Native American, and 12.6% as Multiracial or other. Current full- or part-time employment was reported by 58.6% of women and 81.3% of women had at least some college education. Full- or part-time student status was reported by 34.4% of women and 73.7% of women reported a yearly income of \$40,999 or below. These demographic characteristics were consistent with those of the metropolitan area in which data were gathered.

On average, women consumed 14.0 drinks per week (SD = 8.0), 70.4% of women reported a binge-drinking episode at least once a month in the past year, and 51.6% of women reported drinking when they had sexual intercourse with a man about half of the time or more frequently. Participants reported a mean of 14.8 (SD = 11.5; capped at 50) lifetime vaginal

¹Of the 2375 calls received in response to the advertisements, 2125 women were screened for eligibility, of which 120 declined to participate with no explanation. Of the remaining 2005 women, 1437 were screened but found ineligible to participate. Because potential participants could be screened out for multiple reasons, the following categories for exclusion are not mutually exclusive. Women were screened out for drinking fewer than 5 drinks per week on average (n = 727); not having had a binge drinking episode in the past year (n = 296); drinking too much alcohol or having problems with alcohol or having an indication of alcoholism according to the B-MAST (n = 133); not having had sex with a man in the past year (n = 221); using a condom every time they had sex in the past year (n = 441); having had sex in the past year but exhibiting none of the indicators of increased sexual risk (n = 350); having a medical issue or prescription drug use contraindicated for alcohol consumption (n = 96); and not being in the age range (n = 48). Of the 568 who were eligible, 448 participated in the study. The women who were eligible but did not participate in the study either did not show up for their appointment, cancelled their appointment, or were unable to find an appointment time that worked with their schedule.

sex partners and 59.6% of women did not use a condom the last time they had sexual intercourse. Previous STI diagnoses, indicating unprotected sex that could also put women at risk of HIV, were reported by 35.6% of women, with human Papillomavirus and Chlamydia being the most commonly reported (by 17.7% and 17.2% of women, respectively). Sixty percent of women reported one or more partner-related HIV-risk behaviors over the past 12 months.

Procedure

When participants arrived at the laboratory, a trained female experimenter verified that their blood alcohol concentration (BAC) was 0.00 using a handheld breathalyzer (Alco-Sensor IV, Intoximeters, Inc.) Each participant was weighed to calculate her alcohol dose and took a urine test to ensure she was not pregnant. Participants completed background questionnaires, which included demographics, sexual experiences, drinking habits, and history of sexual victimization in childhood and adulthood. They entered data into the computer in a private room.

The computer calculated a code to assign participants to experimental conditions according to victimization history while keeping the experimenter masked to this information. Four mutually exclusive groups were child sexual abuse only (CSA), adult sexual assault only (ASA), both (CSA-ASA), or no sexual victimization.²

For group assignment purposes, CSA was defined as having experienced any form of sexual contact at the age of 13 or younger. ASA was defined as having experienced sexual contact or attempted or completed oral, vaginal or anal penetration at the age of 14 or older, without her consent or when she was too intoxicated to stop what was happening. Finally, participants were block randomized into either the “high relationship potential” (HRP) or “low relationship potential” (LRP) experimental scenario condition, and to either a control (no alcohol, .00 BAC) or alcoholic (target peak BAC = .10) beverage condition, to create a 2 × 2 (relationship potential by beverage) design within each of the four victim groups.

Alcohol participants received beverages consisting of six parts cranberry juice and one part 190 proof grain alcohol, dosed at 1.0 ml per kg of body weight. Beverages were divided into three equal portions and consumed over a period of four minutes each, for a total of 12 minutes. Breathalyzer tests occurred approximately every four minutes until a criterion BAC of .07 was reached. This ensured that participants would be on the ascending limb of the blood alcohol curve. To control for individual differences in speed of alcohol absorption—and, consequently, elapsed time and number of breath samples to criterion—each alcohol participant was yoked to a control participant who drank only juice and was provided the same number of breath samples over the same number of minutes before beginning the experimental scenario (Schacht, Stoner, George, & Norris, 2010b). After reaching the criterion BAC (alcohol participants) or completing the yoked number of breathalyzers (controls), participants were left alone in the room to read the experimental scenario.

²Overall, victimization was operationalized in three ways. First, a categorical classification was used for the purposes of block randomization to the experimental conditions. Second, a more detailed account of continuous indicators of CSA and ASA, respectively, were calculated and are provided in Table 1. Third, for the purposes of evaluating hypothesis-testing analytic models, latent constructs were developed for CSA and ASA, respectively.

The experimental sexual scenario was developed using data from focus groups on young women's experiences of casual sexual relationships, condom use, and relationship potential, as well as experience from the team's previous research. It was pilot tested to further ensure realism.³ The approximately 1600-word scenario was written in the second person to facilitate participants' projection into the storyline.⁴ Instructions read: "You are now going to read a brief scenario and answer some questions. Imagine that you are the person being described in the scenario and try and put yourself in the situation. When the scenario involves drinking, imagine that you have had a similar amount to drink as you have had today in the lab." For participants in the alcohol condition, the protagonist drank alcohol, while for those in the control condition, she drank soft drinks. The male character's moderate drinking was constant across conditions. Participants overall rated the scenario as very realistic ($M = 5.80$, $SD = 1.37$; 1 = "not at all realistic" to 7 = "extremely realistic").

The scenario established that the protagonist had previously had protected sex with the male character, Michael, and was on the pill. She was very attracted to him. Her assessment of the relationship's potential was varied according to experimental condition (e.g., in the LRP the scenario stated that "he may not really be your type," "you're uncertain whether there's any future in this," and "you don't seem to have much in common," while in the HRP he was "your type," "you're hopeful that there might be a future in this," and "you have so much in common"). The characters went to dinner, then to Michael's place, where they began kissing and touching. Sexual activity became progressively more heated until both characters were undressed and approaching intercourse. Descriptions and dialogue were eroticized to increase the participant's sexual arousal. Michael indicated that he would get a condom, but was unable to find one. The sexual activity continued. Finally, Michael said, "I really want to make love to you, but I'll do whatever you want. Do we have to stop now?"

Measures

Childhood sexual abuse—Hulme's (2007) Childhood Sexual Abuse (CSA) questionnaire is a retrospective behaviorally-specific measure of childhood sexual experiences. Participants were provided with a list of 13 sexual acts and asked if any occurred when they were 13 years old or younger. Follow-up questions assessed specific details, including relationship to the perpetrator and duration of abuse. We added an additional question: How upsetting were these events for you at the time they occurred? (1 = not at all, 7 = extremely). Although participants who reported any childhood sexual experience prior to age 14 were assigned to the CSA group for block randomization, 10 cases were re-coded as "no-CSA" in order to exclude cases of consensual childhood sex play. The final definition of CSA included childhood sexual experiences, occurring at 13 years old or younger, that involved a person three or more years older, or when involving a person of same age or only 1–2 years older, the participant reported (1) the use of coercion, threats, or force; (2) being upset at the time of the experience; (3) having been molested or sexually abused as a child (assessed using the Childhood Trauma Questionnaire; Bernstein et al., 2003); and (4) vaginal or anal penetration at an age prior to that identified by the

³Qualitative findings indicative of the realism of the scenario are available elsewhere (Andrasik et al., 2013).

⁴The full text of the scenario is available upon request.

participant as her age of first consensual sexual intercourse. Ambiguous responses were manually coded by two researchers and reconciled to create a final score. In addition, we modeled child sexual abuse as a latent variable in order to acknowledge the complexity of this phenomenon. Based on theoretical considerations and previous literature (e.g., Aaron, 2012; Freyd, 1996; Kendall-Tackett, Williams, & Finkelhor, 1993; Senn et al., 2008), we selected three indicators: type of abuse (no CSA = 1, contact = 2, or penetration = 3), duration of abuse (no CSA = 1, once = 2, less than 1 year = 3, 1–2 years = 4, two or more years = 5), and perpetrator of abuse (no CSA = 1, stranger/other = 2, acquaintance = 3, non-parent family member = 4, parent = 5).

Adolescent and adult sexual assault victimization—The revised Koss et al. (2007) Sexual Experiences Survey assesses unwanted and nonconsensual sexual experiences since age 14. Acts include sexual contact and oral, anal, and vaginal penetration by a penis or object. Tactics used to obtain each act included verbal coercion, incapacitation, and physical force or threat of force. For each sexual act or attempted sexual act, participants reported the number of times they experienced each tactic, with response options ranging from 0 (“never”) to 3 (“3 or more times”). To acknowledge the complexity of sexual assault, we also modeled ASA as a latent variable. Indicators were three variables selected based on empirical and theoretical considerations: assault outcome (no ASA = 1, contact = 2, attempted rape = 3, completed rape = 4), assault tactic (no ASA = 1, coercion = 2, incapacitation = 3, force = 4),⁵ and penetrative assault frequency (number of completed assaults with oral, vaginal, and anal each capped at 3 and summed, for a high value of 9, to address distributional issues).⁶

Sexual-emotional response—Self-reported sexual arousal was measured following the scenario using the item “Overall, how sexually aroused do you feel at this point in the story?” (1 = not at all sexually aroused, 7 = extremely sexually aroused). Sexual sensation was measured next by asking about (1) sensations in the participant’s genitals and (2) sexual warmth in her genitals or body (1 = no sensations/warmth at all, 7 = extreme sensation/warmth); the mean of these two items was calculated to form the sexual sensation variable. All three items were adapted from previous work (Heiman, 1977). Positive mood was assessed using both items derived from the Positive and Negative Affect Scales (Watson, Clark, & Tellegen, 1988) and items selected for relevance to the scenario and to women’s sexual-emotional experience, based on previous scenario research with women. The positive mood subscale ($\alpha = .93$) included the items enthusiastic, cheerful, happy, positive, feeling good, interested, and relaxed. Sexual desire was assessed using a single item based on Kuffel and Heiman (2006): “How much do you desire to have sex with Michael?” (1 = not at all, 7 = extremely).

⁵Several findings support this scaling, in which forcible rape is considered more severe than incapacitated assault (Abbey, BeShears, Clinton-Sherrod, & McAuslan, 2004; Jacques-Tiura et al., 2011; 2012; Testa et al., 2003; Zinzow et al., 2010).

⁶Each type of penetrative assault was summed across all tactics, resulting in scores of 4 or greater. Thirty-four participants reported 4 or more oral penetrative experiences; 64 participants reported 4 or more vaginal penetrative experiences; 9 participants reported 4 or more anal penetrative experiences. These responses were coded into the “3” category and retained in the sample. This recoding resulted in the high value of 9 for the summed frequency variable.

Likelihood of risky sex—A likelihood of risky sex composite variable was created using three items adapted from our previous work: “How likely are you to: rub your clitoris against Michael’s penis,” “have vaginal sex without a condom,” and “let Michael put his penis inside of your vagina but only if he pulls out before ejaculating” (1 = not at all likely, 7 = extremely likely). These three items had an alpha of .89.

Analytic Approach

We used structural equation modeling (SEM) to test the theoretical model in Fig. 1, which represents all of the hypothesized relationships among variables. We used Mplus statistical modeling software for Windows, version 6 (Muthén & Muthén, 2010), employing maximum likelihood estimation with robust SE. All mediator variables (positive mood, subjective sexual arousal, sexual sensation, and sexual desire) were allowed to intercorrelate.

RESULTS

Preliminary Analyses

Based on the CSA and ASA definitions outlined above, 30% of our sample reported having experienced childhood sexual abuse (CSA) and 80% reported one or more incidents of adolescent or adult sexual assault (ASA). Sixteen percent reported no CSA or ASA. Details on characteristics of victimization are shown in Table 1.

Bivariate correlations among the measured variables are shown in Table 2. Experiencing more sexual assaults in adolescence or adulthood was associated with greater risky sex likelihood. Also, the more positive mood, subjective sexual arousal, sexual sensation, and sexual desire that women reported, the higher risky sex likelihood they reported. However, while we had hypothesized that CSA would affect risky sex likelihood directly, none of the correlations between risky sex and any of the CSA indicator variables were significant; thus, we removed the CSA-to-risky sex likelihood path from the hypothesized model before testing it (see Fig. 1).

Further, we had hypothesized that relationship potential and two-way interactions between (1) alcohol and relationship potential and (2) alcohol and ASA would affect risky sex likelihood directly. However, in preliminary hierarchical linear regression analyses, the interaction terms were not statistically significantly associated with risky sex likelihood and, in a preliminary analysis of variance, risky sex likelihood did not differ for the two relationship potential groups. Thus, we removed the main effect of relationship potential and the two-way interactions from the hypothesized model before testing it (see Fig. 1).

Model Testing

The tested model fit the data well, $\chi^2(39) = 46.88, p = .18$; RMSEA = .022; CFI = .997; SRMR = .030; this model accounted for 29% of the variance in risky sex likelihood. Inspection of modification indices suggested no areas of meaningful misfit. Factor loadings of indicator variables onto latent constructs were substantial, significant, and in the expected direction (see Table 3). Since we were working within a model generating framework (Byrne, 2011; Jöreskog, 1993), we fixed non-significant paths (from alcohol to subjective

sexual arousal and sexual sensation, and from subjective sexual arousal and sexual sensation to risky sex likelihood) to zero and re-ran the model. While this alternative model was slightly more parsimonious, its fit to the data was no better; thus, to avoid misspecification, we selected the previous model.

Direct and Indirect Effects

Figure 2 depicts the final model with standardized path coefficients. CSA was positively associated with ASA. ASA was directly, positively associated with risky sex likelihood; it was negatively associated with positive mood and sexual desire. Alcohol consumption was positively associated with positive mood and risky sex likelihood and negatively associated with sexual desire. Positive mood and sexual desire were directly, positively associated with risky sex likelihood. We also tested the significance of specific and total indirect effects of alcohol, ASA, and CSA on risky sex likelihood. Results are shown in Table 4.

Alcohol hypotheses—As hypothesized, alcohol had a direct positive effect on risky sex likelihood. Alcohol's indirect effects on risky sex likelihood via sexual-emotional responding, however, were mixed: alcohol increased positive mood, but decreased sexual desire. Positive mood and sexual desire both directly increased risky sex likelihood; thus, although alcohol increased risky sex likelihood directly and via positive mood, it also decreased risky sex likelihood through diminishing sexual desire.

Victimization hypotheses—The model supported both of our victimization hypotheses. CSA positively predicted ASA and ASA positively predicted risky sex likelihood. Furthermore, the model addressed our exploratory question: ASA decreased three of four sexual-emotional response variables (positive mood, sexual sensation, and sexual desire) and, through these diminishing effects, indirectly decreased risky sex likelihood. Similarly, CSA acted via ASA and positive mood, sexual sensation, and sexual desire to indirectly decrease risky sex likelihood.

DISCUSSION

There were three major findings. First, as predicted, high intoxication and three indicators of sexual-emotional responding directly increased sexual risk, emphasizing that situational conditions and processes were important proximal determinants of risk taking. Second, our overarching supposition—that sexually victimized women respond differently than non-victimized women in alcohol-involved sexual encounters and that these responses relate to differential risk taking outcomes in the moment—was largely supported by the findings. Third, while the model supported these hypothesized pathways, it also identified pathways that were counterintuitive. Overall, these findings inform and complicate our understanding of the well-established associations between previous sexual victimization and sexual risk taking and between alcohol intoxication and sexual risk taking.

Alcohol Effects

Consistent with our alcohol hypotheses, intoxication had direct effects on sexual risk. This direct pathway was consistent with many previous findings (for reviews, see Hendershot &

George, 2007; Rehm et al., 2012) and was consistent with an alcohol myopia theory account in which alcohol focuses the drinker on impelling cues conducive toward increased risk taking (e.g., Davis et al., 2007).

Our key novel hypothesis about alcohol was also supported. Intoxication had significant effects via an indirect pathway involving sexual-emotional responses. The indirect pathway indicated that alcohol's effect on sexual risk was partially mediated by positive mood, which further bolsters the alcohol myopia theory analysis by suggesting a greater attentional focus on sexually impelling cues rather than inhibiting cues. Unexpectedly, however, alcohol simultaneously had a suppressant effect on risk via sexual desire. While incongruous, this finding was consistent with another recent experiment. Gilmore et al. (in press) found that intoxicated women reported less sexual desire than sober women. However, in that study, the effect was moderated by sex-related alcohol expectancies: among intoxicated women, high-believers in alcohol-induced sexual disinhibition reported more sexual desire than low-believers. Conceivably, in the current study, alcohol's effect on sexual desire may have been similarly moderated by expectancies. This possibility should be explored in future research.

Previous Sexual Victimization

Consistent with our model, victimization history predicted risk taking independently of in-the-moment sexual-affective responding. This was also consistent with previous survey (e.g., Senn et al., 2008) and experimental (e.g., Schacht et al., 2010a) findings. For CSA, this association was not direct, but emerged only indirectly via ASA. The absence of a direct CSA pathway was inconsistent with a previous finding (Schacht et al., 2010a) in which CSA women reported a lower likelihood of condom use than ASA or non-victimized women, though that study did not evaluate CSA and ASA as a sequential path to sexual risk.

In contrast to CSA, ASA was directly associated with increased sexual risk in the current study. This was consistent with previous findings using global indicators of risk (e.g., Senn et al., 2008), as well as with previous experimental findings incorporating mediating mechanisms indicative of behavioral passivity. Stoner et al. (2008) found that ASA predicted less sexual assertiveness, resulting in less condom insistence and greater likelihood of unprotected sex. The latter finding fits the possibility that ASA victims exhibit a greater likelihood than non-victims to cede to situational pressures from a partner to forego condom use (Quina, Harlow, Morokoff, Burkholder, & Dieter, 2000). This possibility is consistent with some empirical findings (Testa, VanZile-Tamsen, & Livingston, 2007) and theoretical accounts (e.g., Quina, Morokoff, Harlow, & Zurbriggen, 2004) about how previous sexual victimization might influence responding in subsequent sexual encounters. Similarly, Masters et al. (in press) reported that ASA predicted greater anticipation of the partner's negative reaction to condom insistence, resulting in greater likelihood of "abdicating" to his desires, and greater likelihood of unprotected sex. Taken together, these findings (1) indicate that indeed sexually victimized women, once in a sexual encounter, do respond differently than non-victims in ways that lead to riskier choices; and (2) suggest that important mechanisms in such choices include a greater concern about a partner's reaction, a tendency to be less assertive about condom usage, and a greater willingness to abdicate and cede to his desires.

There were two important exploratory questions for which there was little basis for clear-cut hypotheses: Does victimization history affect sexual-emotional states during the heat of the moment and, if so, do these effects function as mediators between victimization history and risk-taking? Our findings showed that, indeed, ASA predicted sexual-emotional responses, which, in turn, predicted risk taking. First, ASA was negatively associated with sexual-emotional responses. Compared with nonvictimized women, ASA women exhibited significantly less positive mood, sexual sensation, and sexual desire, and marginally less subjective sexual arousal during the heat-of-the-moment sexual scenario. This finding was generally consistent with previous findings showing that, compared to nonvictimized women, ASA women exhibited less physiological sexual arousal (Gilmore et al., 2010; Rellini et al., 2009; Rellini & Meston, 2006; Schacht et al., 2007) and more negative affect (Rellini & Meston, 2011). While there is no clear explanation for this pattern, it has been speculated that, for sexually victimized women, subsequent sexual encounters may elicit conditioned negative reactions originating from the victimization experience (e.g., Simon & Feiring, 2010). Alternatively, ASA victimization may foster a less positive mood globally that, while not specific to sexual encounters, might nonetheless affect them.

On the second exploratory question regarding the role of sexual-emotional responses in risk taking, an interesting and counterintuitive pattern emerged. Through its attenuating effects on positive mood, sexual sensation, and sexual desire, ASA indirectly decreased risky sex. Coupled with the direct positive association between ASA and increased risk taking, a paradoxical pattern is suggested in which ASA may directly increase sexual risk behavior, yet also indirectly decrease it through lower positive mood and sexual desire. These contradictory pathways may reflect the complex patterns sometimes evident in survey and clinical data, whereby victimized women report attenuated sexual-emotional responding to sexual encounters, yet proceed to exhibit sexually risky behavior patterns (e.g., Simon & Feiring, 2010). More research is needed to clarify and replicate these counterintuitive possibilities. Experimental methods could prove especially valuable in disentangling the processes that precede sexual risk outcomes, while qualitative approaches could provide increased understanding of the nuances involved in women's sexual risk decisions.

Two additional points are worth noting about our victimization findings. First, consistent with our model and previous research (Messman-Moore & Long, 2003), CSA predicted ASA. Significant, although modest, bivariate correlations showed that each CSA indicator correlated positively with each ASA indicator. Generally, this suggests that more severe CSA experiences were associated with more severe ASA experiences. Based primarily on empirical findings, this re-victimization trend can be attributed most conservatively to distal processes whereby reactions to CSA foster coping styles and relational skill impairments that lead to greater exposure to encounters posing a risk for ASA victimization (Messman-Moore & Long, 2003).

Second, the high victimization prevalence rate alone (84% of the current sample) also attests to the strong associations among victimization, alcohol use, and sexual risk. Prevalence rates are substantially lower in nationally representative sampling (Tjaden & Thoennes, 2006). Previously, researchers have detected substantial prevalence rates by recruiting female drinkers (68%) (Stoner et al., 2007). In the current study, by recruiting moderate drinkers

with a binge-drinking episode and elevated HIV/STI risk, we detected remarkably high prevalence rates for a nonclinical, relatively high-functioning (in terms of employment, education, and income) community sample.

Strengths and Limitations

The current study had both strengths and limitations. The victimization factors were modeled multidimensionally as latent variables, such that each was characterized uniquely by the features loading most heavily on CSA (type, duration, and perpetrator of abuse) and ASA (assault outcome, tactic, and frequency), respectively. This approach more fully represents the complexity of both victimization phenomena than do single-item and dichotomous indicators. Alcohol factors, including dosage, BAC limb, and absorption times were tightly controlled through rigorous procedures involving consistent BAC monitoring, specific BAC criterion starting points, and yoked controls. To better approximate real-world risky sexual situations, the experimental scenario was eroticized to create a sexual ambience during the sexual decision-making process. Although laboratory analogues of sexual situations can never fully capture all elements of real sexual situations, participants overall rated the scenario as very realistic and there is considerable evidence supporting both the internal and external validity of such analogues.⁷ Another strength was our sampling of predominantly urban community residents, broadening the base of sample characteristics beyond clinical and college samples. Finally, by using both survey and experimental methods, we were able to integrate distal and proximal factors and demonstrate their mutual influence on sexual risk. This is consistent with recommendations that person and situation variables be examined simultaneously to promote a more comprehensive understanding of sexual risk-taking (Cooper, 2010).

Limitations included the lack of an alcohol expectancy (placebo) condition, sample characteristics, and the prospect of volunteer bias. First, previous work has shown that expectancy set (the belief that one has been drinking) enhances self-reported and physiological arousal independent of low-dosage intoxication (Wilson & Lawson, 1976). Because of the difficulty of convincing placebo participants that they have received a high dose of alcohol (Martin & Sayette, 1993), and our specific interest was high dosage effects,

⁷The internal validity (did participants effectively project themselves into our heat-of-the-moment paradigm?) and external validity (is their behavior in the protocol indicative of how they would behave in real life?) questions posed by this methodology are important and warrant careful consideration. Generally, participants are very effective at this projection protocol. We know this from the several sources. First, in numerous published studies (both experimental and qualitative) from our labs using projection protocols involving sexual assault resistance (rather than sexual risk), the evidence for effective projection is highly robust based on post experimental ratings of “realism” and “typical of real life” and post-experimental interviews (Masters et al., 2006) in which participants describe the phenomenology of their projection experience. Second, in a method paper by an independent research team, effective projection was also evident in protocols involving sexual assault resistance (Noel, et al., 2008); Third, in projection protocols involving sexual risk (as is the case here), there are now more than half a dozen studies published from our labs and the evidence for effective projection is highly robust based on post experimental ratings of “realism” and “typical of real life.” Fourth, in three published studies from our labs involving sexual risk, evidence of effective projection was not limited to self-report, but was augmented by physiological indicators of sexual-genital response (e.g., George et al., 2009). In those studies, both subjective and physiological indicators of sexual arousal showed that participants had projected effectively and, accordingly, exhibited moderate to high levels of arousal. Fifth, on the issue of external validity or correspondence between our projection protocol behavior specifically and real-world behavior, we found that women’s reports of their past and projected future condom use were significantly correlated with their likelihood of having unprotected sex in our projection protocol (Kajumulo, Davis, & George, 2009; Norris, Kiekel, Purdie, & Abdallah, 2010). Finally, on a more general point about the correspondence between lab and real-world data, the truism that laboratory behavior has low external validity has been largely vanquished empirically. This has been exemplified in meta-analyses of aggression (e.g., Anderson & Bushman, 1997) and is perhaps best exemplified by an extensive analysis of effects sizes from over 38 lab-vs.-field study pairs across a wide range of behaviors (Anderson, Lindsay, & Bushman, 1999).

we did not manipulate alcohol expectancy set. Second, sample characteristics limited the generalizability of our findings. Regarding alcohol use, abstainers, light drinkers, and heavy problem drinkers were excluded, while only heavy episodic drinkers were included. These inclusion/exclusion criteria prevent us from generalizing the observed relationships to women whose drinking habits do not fit the range reported by our participants. For example, women who do not engage in heavy episodic drinking may be less likely to drink to the intoxication level manipulated in our study; thus, these findings may not apply to their typical drinking levels. Moreover, because our alcohol administration paradigm required participants to be of legal drinking age (21 or over), it is unclear whether the current findings would generalize to underage drinking women whose contextual risks for sexual risk behavior may differ from those of their older peers. Similarly, our high rates of sexual victimization and our exclusion of women at lower risk for HIV/STI also limit our generalizability. In sum, because the alcohol consumption patterns, sexual risk indicators, and sexual victimization histories of this study's sample were high relative to the general population, care must be taken when generalizing the current findings to other groups of women. That noted, the participants in this study were recruited due to their elevated risk levels and thus they are an important focus of research in this area. Third, volunteers for sexuality research tend to have more sexual experience and liberal sexual attitudes than non-volunteers (Strassberg & Lowe, 1995). Our findings should be interpreted in accordance with these sample limitations.

Implications and Conclusions

We found clear evidence that victimized women respond differently than non-victimized counterparts in an alcohol-involved sexual situation. Because research on victimization and sexual risk behavior has been restricted to explanations relying on distal associations and has been unable to examine what transpires proximally in the moments preceding sexual decisions, the current findings greatly extend prior work. These findings strongly suggest that something about prior victimization threads its way into the current sexual situation to influence affect, sexual responding, and risk outcomes. Further research is needed to identify what features of victimization or reactions to it drive the link to differential responding in subsequent sexual encounters. Also, high intoxication achieved through a heavy-episodic-drinking style clearly heightened sexual risk taking, consistent with previous research and theory (George et al., 2009; Schacht, et al., 2010a).

Given that victimized women drink more and engage in more frequent heavy episodic drinking than their nonvictimized counterparts, our findings demonstrate a clear risk nexus. By virtue of both their drinking quantity and style, sexually victimized women are at substantially elevated risk for behavior that can lead to STI/HIV infections. Despite its limitations, the current study documents differential in-the-moment responding and identifies important mediating mechanisms that may contribute to the work of those who design risk reduction interventions tailored to victimized women.

These findings also suggest clinical implications. First, when working with identified CSA/ASA victims, clinicians would be advised to assess alcohol consumption, including frequency, quantity, and heavy episodic drinking style. Second, when working with women

suffering alcohol abuse and/or dependence, clinicians would be advised to assess for sexual victimization history. Third, in either case, clinicians might provide these women with information about the exacerbated STI/HIV risk associated with their victimization history and drinking pattern, taking care to do so in a non-blaming and therapeutically supportive style. Fourth, pending replication of the current findings and continued research explicating these effects, prevention interventions targeting previously victimized women could include content both on distal dynamics that contribute to individuals winding up in risky sexual encounters, and on proximal dynamics regarding how intoxication and victimization history fuel riskier behavioral intentions and outcomes.

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Figure 1. Hypothesized model with revisions based on preliminary analyses

Note. Dotted lines and boxes represent hypothesized paths and variables that were not significant in preliminary analyses and were removed to produce the tested model.

Figure 2. Final Model with Standardized Estimates

Note. All paths shown in the figure are significantly different from zero ($p < .05$).

Table 1

Frequencies of Sexual Victimization and HIV/STI Risk Characteristics in Sample

Childhood Sexual Abuse	
Type	Frequency (%)
No CSA	70
Contact	11.5
Penetration	18.5
Duration	
No CSA	70
Once	11.7
< 1 year	6.2
1 to 2 years	2.6
> 2 years	9.5
Perpetrator	
No CSA	70
Stranger/other	3.5
Acquaintance	13.9
Non-parent family member	9.6
Parent	3.0
Adult/Adolescent Sexual Assault	
Outcome	
No ASA	19.5
Contact	6.0
Attempted rape	13.3
Completed rape	61.2
Tactic	
No ASA	19.5
Coercion	8.0
Incapacitation	39.0
Force	33.5
Frequency*	M = 2.06 (SD 2.38)
HIV/STI Risk	
Mean lifetime vaginal sex partners	M = 14.8** (SD 11.5)
Did not use condom at last intercourse	59.6 (260)
Previous STI diagnosis	35.6 (154)

* Includes completed rape (oral, anal, or vaginal) with each type capped at 3, total capped at 9.

** Capped at 50.

Table 2
Means, Standard Deviations, and Bivariate Correlations Among Measured Variables (N = 436)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. CSA type	—	.84**	.88**	.21**	.21**	.26**	-.06	-.06	-.07	-.10*	.04
2. CSA duration		—	.82**	.17**	.18**	.23**	-.06	-.05	-.05	-.11*	.00
3. CSA perpetrator			—	.16**	.17**	.17**	-.08	-.05	-.07	-.11*	.00
4. ASA outcome				—	.83**	.61**	-.14**	-.09	-.10*	-.09	.05
5. ASA tactic					—	.53**	-.12*	-.08	-.07	-.12*	.01
6. ASA frequency						—	-.10*	-.02	-.04	.03	.10*
7. Positive mood							—	.53**	.52**	.42**	.33**
8. Subjective arousal								—	.90**	.55**	.29**
9. Sexual sensation									—	.49**	.24**
10. Sexual desire										—	.50**
11. Risky sex likelihood											—
Mean	1.49	1.69	1.72	3.16	2.86	2.06	4.80	5.00	4.57	5.39	4.24
SD	0.79	1.27	1.19	1.20	1.09	2.38	1.52	1.88	2.02	1.84	1.98

Note.

* $p < .05$.

** $p < .01$.

Table 3

Factor Loadings for Latent Variables

	Standardized estimate	SE
Child sexual abuse		
Type	.95**	.01
Duration	.88**	.02
Perpetrator	.93**	.02
Adult/adolescent sexual assault		
Outcome	.97**	.02
Tactic	.86**	.02
Frequency	.63**	.02

Note.

**
 $p < .01$.

Table 4

Testing Significance of Indirect Effects on Risky Sex Likelihood

	Standardized estimate	SE
Effect of alcohol	-.054	.030
Via Positive mood	.023 [*]	.011
Via Sexual desire	-.077 ^{**}	.024
Effect of ASA	-.074 [*]	.028
Via Positive mood	-.024 [*]	.011
Via Sexual desire	-.049 [*]	.023
Effect of CSA	-.016 [*]	.007
Via ASA and Positive mood	-.005 [*]	.003
Via ASA and Sexual desire	-.011	.006

Note.

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