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Running head: CSA, PTSD, SUBSTANCE USE, AND REVICTIMIZATION

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Child Sexual Abuse, PTSD, and Substance Use: Predictors of Revictimization in Adult Sexual
Assault Survivors

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Abstract

This study examined the unique effects of child sexual abuse (CSA) simultaneously with posttraumatic stress disorder (PTSD) symptom clusters, problem drinking, and illicit drug use in relation to sexual revictimization in a community sample of female adult sexual assault (ASA) victims. Participants ($N = 556$) completed two surveys a year apart. CSA predicted more PTSD symptoms in ASA victims. PTSD numbing symptoms directly predicted revictimization, whereas other PTSD symptoms (i.e., reexperiencing, avoidance, and arousal) were related to problem drinking, which in turn predicted revictimization. Thus, numbing symptoms and problem drinking may be independent risk factors for sexual revictimization in ASA victims, particularly for women with a history of CSA.

Key words: child sexual abuse, PTSD, substance use, sexual revictimization

Child Sexual Abuse, PTSD, and Substance Use: Correlates of Revictimization in Adult Sexual
Assault Survivors

Increased risk of sexual revictimization in women previously sexually assaulted in childhood, adolescence, or adulthood is a phenomenon now well-documented in the literature (Classen, Palesh, & Aggarwal, 2005; Collins, 1998; Gidycz, Hanson, & Layman, 1995; Krahe, Scheinberger-Olwig, Waizenhöfer, & Kolpin, 1999; Messman-Moore & Long, 2000), yet limited research has examined mechanisms underlying increased risk. Both child and adult sexual assault (ASA) are related to posttraumatic stress disorder (PTSD; Briere & Runtz, 1987; Seedat & Stein, 2000), and researchers have also found a strong relationship between PTSD and sexual revictimization (Arata, 2000; Bolstad & Zinbarg, 1997; Boney-McCoy & Finkelhor, 1995; Ullman & Brecklin, 2002). Substance use (i.e., problem drinking and/or illicit drug use) is also associated with risk of sexual revictimization (Abbey, Zawacki, Buck, Clinton, & McAuslan, 2003; Greene & Navarro, 1998; Koss & Dinero, 1989; Rich, Combs-Lane, Resnick, & Kilpatrick, 2004; Ullman, 2003). Thus, PTSD and substance use may be important mediating factors that increase women's risk for revictimization. Further, PTSD and substance use may be outcomes of revictimization although this is unclear from past research, most of which is cross-sectional. Thus, women who experienced sexual victimization both as a child and as an adult may experience more PTSD symptoms and more substance use compared to women who experienced only adult sexual victimization. To resolve the ambiguity of these relations, child sexual abuse (CSA), PTSD, and substance use (i.e., problem drinking, illicit drug use) were examined as possible predictors of sexual revictimization in female ASA survivors over the course of one year.

PTSD and Revictimization

Some research suggests that CSA leads to revictimization, which in turn leads to PTSD symptoms (Arata, 2000; Nishith, Mechanic, & Resick, 2000; Schumm, Hobfoll, & Keogh, 2004). Thus, revictimization as an adult might reignite the sequelae of earlier assault experiences. Most studies upon which this hypothesis is built were cross-sectional, however, and PTSD could have been both a consequence of and a risk factor for revictimization. Thus, longitudinal research is required to shed light on this issue. In fact, two longitudinal studies have identified PTSD as a risk factor for sexual victimization. Acierno, Resnick, Kilpatrick, Saunders, and Best (1999) found that a diagnosis of PTSD increased women's risk for ASA, while Noll, Horowitz, Bonanno, Trickett, and Putnam (2003) found that PTSD symptoms mediated the relationship between CSA and subsequent revictimization. However, these studies examined only predictors of revictimization and not predictors of PTSD. The relationship between sexual victimization (either as a child or adult), PTSD, and revictimization may form a feedback loop such that sexual victimization leads to PTSD, which in turn increases the risk of revictimization, and subsequent increased PTSD symptoms, etc. Thus, the present study utilized a longitudinal design to explore the relationships between CSA, PTSD, and revictimization in a large community sample of female ASA survivors. We predicted that CSA would be related to more PTSD symptoms and that more PTSD symptoms would be associated with greater rates of revictimization over the course of one year.

The relationship between PTSD and revictimization may depend on which PTSD symptoms are currently "activated." For example, Wilson, Calhoun, and Bernat (1999) found that arousal, but not reexperiencing or avoidance symptoms, increased the ability of sexually revictimized women to recognize risk in a scenario depicting date rape. Further, numbing

symptoms were associated with less risk recognition. Thus, a PTSD diagnosis in and of itself may not necessarily be a risk factor for sexual revictimization. Rather, the specific PTSD symptoms that predominate at any given moment may increase the likelihood of revictimization. This suggests that a better understanding of sexual revictimization may be gained by investigating PTSD symptom clusters (i.e., intrusion, avoidance/numbing, arousal) separately. In particular, researchers have found that numbing symptoms are a key feature of PTSD (Foa, Riggs, & Gershuny, 1995) and, although they comprise one symptom cluster in the *Diagnostic Manual of Mental Disorders Fourth Edition (DSM-IV; American Psychiatric Association [APA], 1994)*, some argue for a distinction between avoidance and numbing symptoms (e.g., Tull & Roemer, 2003). For example, Foa et al. (1995) reported that numbing symptoms were associated with greater overall PTSD severity and were better than other PTSD symptom clusters at discriminating between ASA survivors with and without PTSD. This suggests that numbing symptoms are important predictors of revictimization, and should be disaggregated from other symptom clusters in studies examining pathways to revictimization. Therefore, this research sought to determine whether numbing symptoms have independent or different effects on revictimization than do other PTSD symptoms (i.e., reexperiencing, avoidance, and arousal).

Substance Use and Revictimization

There is also evidence that the relationship between substance use (i.e., problem drinking, illicit drug use) and sexual victimization is bi-directional. For example, research shows that CSA precedes alcohol use (e.g., Wilsnack, Wilsnack, Kristjanson, Vogelanz-Holm, & Harris, 2004), which makes sense given that CSA occurs in childhood, presumably before children have access to alcohol. Further, a meta-analytic review revealed that greater CSA severity was related to greater severity of alcohol abuse in a dose-response fashion (Moncrieff & Farmer, 1998).

Although few studies have specifically investigated revictimization in relation to substance use, in a retrospective study of college women Messman-Moore and Long (2002) found that those with CSA histories were more likely to be diagnosed with a substance use disorder than others, but did not test whether substance use mediated the relationship between CSA and ASA.

However, some trauma survivors report ASA occurring both before and after alcohol use (Lis-Turlejska & Polak, 2002). We predicted that CSA would be associated with greater substance use, and in turn, increased substance use would relate to increased revictimization risk.

PTSD, Substance Use, and Revictimization

Complicating efforts to understand the relationships among these variables, there is evidence that sexual victimization increases the risk of comorbid PTSD and substance use in survivors (e.g., Kilpatrick, Acierno, Saunders, Resnick, Best, & Schnurr, 2000; Kilpatrick, Ruggiero, Acierno, Saunders, Resnick, & Best, 2003). The most common explanation for substance use in traumatized individuals suffering from PTSD is the self-medication model or tension reduction hypothesis, which has received extensive support from psychological research (e.g., Dansky, Brady, Saladin, Killeen, Becker, & Roitzsch, 1996; Epstein, Saunders, Kilpatrick, & Resnick, 1998; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; McFarlane, 1998; Stewart & Israeli, 2002). According to this model, victims use substances in an attempt to cope with unpleasant affective experiences associated with PTSD. There is also evidence for associations among PTSD, substance use, and revictimization (Messman-Moore & Long, 2003; Najavits, Weiss, & Shaw, 1997; Ullman & Brecklin, 2002). For example, based on a meta-analysis of multiple studies with varying methodologies, McFarlane (1998) suggested that causal relationships may be found among trauma, alcohol abuse, and PTSD. Specifically, traumatic events lead to PTSD symptoms, which increase susceptibility to alcohol abuse and further

victimization (but see Acierno et al., 1999). Therefore, based on this research and theory, the direct effects of PTSD on revictimization as well as indirect effects mediated by substance use were examined.

Researchers studying sexual victimization have seldom disentangled substance use to specifically examine the effect of alcohol independently of other drugs, a distinction that some suggest is important (e.g., Dansky et al., 1996; Grice, Brady, Dustan, Malcolm, & Kilpatrick, 1995; Saladin et al., 2003). For example, alcohol and drug use may predict different victimization risks, given that Grice et al. reported that cocaine-dependent individuals reported more ASA experiences than did alcohol-dependent individuals. Also, Kilpatrick, Acierno, Resnick, Saunders, and Best (1997) surveyed women three times over the course of two years and found that recent assault predicted subsequent alcohol use but not drug use, and although alcohol use was not related to revictimization, drug use was. Alternatively, revictimization risk may not differ depending on whether alcohol or drugs are used to cope with PTSD symptoms if any substance impairs survivors' ability to recognize risk in their environment, increasing the likelihood of revictimization. Therefore, this study sought to determine whether the type of substance used affects the risk of revictimization by examining problem drinking and illicit drug use separately.

Finally, no known studies have investigated the effect of specific PTSD symptom clusters on substance use and risk of revictimization. For example, numbing symptoms may be related to greater revictimization risk by interfering with victims' ability to recognize sexual assault risk. On the other hand, other PTSD symptoms such as arousal and re-experiencing may relate to greater risk-taking behavior such as heavy drinking, which may help to dampen these symptoms, but also contribute to greater revictimization risk. Therefore, it was predicted that numbing

symptoms would be directly related to revictimization and other PTSD symptoms would be indirectly related to this outcome through problem drinking and/or illicit drug use.

Summary

Researchers who have studied sexual victimization, PTSD, and substance use have found relationships among these factors, but the use of cross-sectional designs has made it difficult to draw firm conclusions about these relationships. Furthermore, extant longitudinal studies of revictimization have included women with and without victimization histories (e.g., Kilpatrick et al., 1997; Noll et al., 2003) and have not examined CSA, PTSD symptom clusters, problem drinking, and illicit drug use in relation to risk of revictimization within samples of ASA victims. This research builds on past studies by examining women who are at high risk for sexual revictimization due to previous sexual assault experiences; that is, cross-sectional studies have found that the most robust predictor of future victimization is prior victimization (Collins, 1998; Gidycz et al., 1995; Krahe et al., 1999). Yet research has yielded little clarification about the mechanisms underlying this relation. The high risk of revictimization may be a consequence of PTSD and substance use experienced as a result of prior victimization. Thus, revictimization risk might be highest among women who have had multiple sexual victimizations (i.e., both CSA and ASA) and who are likely to experience greater PTSD and substance use (i.e., problem drinking, illicit drug use) than women who experienced ASA only; that is, compared to women who experience sexual victimization only as adults, ASA survivors who also have a history of CSA may experience more PTSD symptoms and more substance use, which in turn may increase their risk of experiencing another sexual victimization. Therefore, we investigated how CSA, PTSD, problem drinking, and illicit drug use act separately and in concert to affect susceptibility to sexual revictimization in a community sample of ASA survivors.

Method

Participants and Procedure

The present study analyzed mail survey data from a longitudinal study of sexual assault survivors consisting of two waves of data collection occurring one year apart. A broad range of strategies was used to recruit a large, diverse sample of ASA survivors. Advertisements were placed in local newspapers and fliers were distributed throughout the Chicago metropolitan area on college campuses, around the community (e.g., bookstores), to mental health agencies, and rape crisis centers. Women aged 18 or older with unwanted sexual experiences since age 14 were asked to participate in a confidential mail survey. Interested women callers were mailed the initial survey (Time 1) along with a cover letter and information sheet describing the study, a list of community resources for women survivors of violence, and a postcard to return if they were interested in participating in the one-year follow-up survey (Time 2). Women were sent \$20 for their participation after returning the Time 1 survey.

Of those women who requested the initial survey, 1,084 returned it, a 90% response rate. Participants who returned the postcard indicating interest in the Time 2 survey were mailed the second survey with an up-to-date community resource sheet approximately one year after they completed the Time 1 survey. Specifically, Time 1 surveys were date-stamped upon receipt and all participants were at risk for revictimization for one year when they were mailed the Time 2 survey. Women were paid \$20 again for completion of the Time 2 survey. Most women who completed the Time 1 survey expressed an interest in the follow-up, and 909 participants were successfully contacted a year later. Time 2 surveys were returned by 625 women, a 69% response rate. Bivariate analyses indicated that there were no significant differences between women who completed the Time 1 survey only and women who completed both surveys in terms

of marital status, income, ethnicity, PTSD symptoms, drinking behavior, illicit drug use, or assault characteristics (i.e., ASA severity, CSA history). Women who completed only the Time 1 survey, however, were slightly younger ($M = 31.60$, $SD = 11.06$) than women who completed both surveys ($M = 33.10$, $SD = 10.86$), $t(1068) = -2.20$, $p < .05$. In addition, 45% of women who completed only the Time 1 survey reported marijuana use during the past year compared to only 35% of participants who completed both surveys, $\chi^2(1, N = 1060) = 12.12$, $p < .05$.

Our final sample for the purposes of this paper included 556 women who reported an ASA experience (i.e., rape, attempted rape, sexual coercion, or sexual contact since the age of 14) at Time 1 and completed both surveys. All participants were treated in accordance with the ethical guidelines of the University of Illinois at Chicago.

Measures

The Time 1 survey included questions about demographic background, history of sexual victimization, ASA characteristics, PTSD, problem drinking, and illicit drug use. The Time 2 survey asked about any new sexual victimization that may have occurred since Time 1.

Demographics. Participants reported current age, ethnicity, household income, education, current employment, current school status, sexual orientation, marital status, and parental status (see Table 1 for descriptive statistics).

<<<Insert Table 1 here>>>

Adult sexual assault. The Sexual Experiences Survey (SES; Koss & Gidycz, 1985) was used to identify women who had experienced adult sexual victimization since the age of 14. In the SES, the word “rape” is not used. Rather, behavioral questions are asked that correspond to definitions of rape, attempted rape, sexual coercion, and sexual contact. Rape was defined as vaginal, oral, or anal intercourse without consent by force or threat of force or when the victim

was intoxicated. Attempted rape was defined as the same experience except that the items read the “man tried to make you have sex,” but “that intercourse did not occur.” Sexual coercion was defined as sexual intercourse subsequent to use of verbal pressure or misuse of authority, but no threats of force or actual physical force was used. Sexual contact was defined as unwanted fondling or kissing that did not involve attempted penetration subsequent to verbal pressure, misuse of authority, threats of harm, or actual physical force. The SES has reported internal consistency reliability of .69 and test-retest reliability at one week apart of 93% (Koss & Gidycz, 1985). If respondents had multiple experiences on the SES, they were asked for details about the experience they considered to be the most serious. A dichotomous variable was created to indicate whether participants reported any ASA experience assessed by the SES at Time 1 (no/yes). The Time 2 survey used the SES to identify women who had any ASA experiences “since the last survey” (no/yes).

Childhood sexual assault history. At Time 1, women answered each SES question again with respect to whether they had each experience noted above before age 14 to assess history of any CSA experiences (no/yes; Koss, Gidycz, & Wisniewski, 1987).

PTSD symptoms. PTSD was assessed with the Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995). The PDS is a standardized 17-item self-report instrument used to provide a PTSD diagnosis using the *DSM-IV* (APA, 2000) criteria. This scale was selected because it has been validated with sexual assault survivors (Foa, Cashman, Jaycox, & Perry, 1997). Women were asked about their reactions to the unwanted sexual assault experience that they just described, and they rated how often each symptom had bothered them during the past 30 days on a 4-point scale ranging from 0 (*not at all*) to 3 (*almost always*). The PDS has been shown to have acceptable test-retest reliability ($k = .74$) for a PTSD diagnosis over a two-week interval, 87%

agreement, and a Pearson correlation of .83 between two administrations. The PDS has also demonstrated good internal consistency ($\alpha = .92$) and adequate convergent validity ($k = .59$) with the Structured Clinical Interview for the DSM-IV Axis I Disorders (SCID-I; Spitzer, Williams, Gibbon, & First, 1990) PTSD module, indicating 79% agreement between the two measures (Foa et al., 1997). The measure also demonstrated good reliability in this sample ($\alpha = .91$). Participants reported a range of 0 to 51 symptoms ($M = 19.05$, $SD = 12.37$), and 68% ($n = 380$) of the sample met the criteria for a diagnosis of PTSD.

PTSD symptom clusters were separated according to *DSM-IV* (APA, 2000) criteria so that four clusters were represented: reexperiencing/intrusion, avoidance, arousal, and numbing symptoms. Reexperiencing/intrusion symptoms consist of items related to having upsetting thoughts, images, and nightmares; feeling as if the experience was happening again; and experiencing emotional and/or physical reactions when reminded of the experience. Avoidance symptoms relate to trying not to think about the experience. Arousal symptoms relate to having trouble falling or staying asleep, feeling irritable or angry, having trouble concentrating, and/or being overly alert or easily startled. Numbing symptoms include not being able to remember part of the experience, having less interest in important activities, feeling distant from people, and/or feeling emotionally numb. Separation of the avoidance symptoms from numbing symptoms is consistent with other researchers' factor analytic findings (e.g., Foa et al., 1995) and has been utilized by other researchers (e.g., Tull & Roemer, 2003). The average frequency of women reporting each symptom was computed for numbing symptoms ($M = 1.03$, $SD = .85$) and other PTSD symptoms (i.e., reexperiencing, avoidance, arousal, numbing; $M = 1.22$, $SD = .76$).

Problem drinking. The Michigan Alcoholism Screening Test (MAST; Selzer, 1971) was used to assess past-year problem drinking.¹ The MAST is a widely used, 25-item standardized

self-report screening instrument for alcohol abuse and dependence. The MAST has good internal-consistency reliability ($\alpha = .91$) with a psychiatric outpatient sample (Zung, 1980). Reliability was also good with the current sample ($\alpha = .87$). The number of alcohol problems in the past year was coded as a continuous measure of total past-year drinking problems based on Selzer's (1971) guidelines. Thus, certain items were weighted more strongly than others (e.g., drinking fairly often before noon was given a weight of "1" whereas a drunk driving arrest was given a weight of "2"), and "problem drinkers" were considered those with a summed score of five or more points. Participants reported a range of 0 to 53 symptoms ($M = 5.88$, $SD = 8.58$), and 29% ($n = 159$) of the sample met the criteria for problem drinking.

Illicit drug use. Participants were asked if they had used any of the following substances in the past year: marijuana/hashish, cocaine, heroin, and/or psychedelics (e.g., LSD, Ecstasy). A sum of the total types of illicit drugs used was computed, but marijuana use was excluded from this total to distinguish it from heavier illicit drug use. Participants reported a range of 0 to 3 illicit drugs used ($M = .36$, $SD = .68$) with 26% ($n = 143$) of the sample reporting some drug use.²

Results

Of the 556 women, 54% ($n = 300$) also reported having had a CSA experience (i.e., rape, attempted rape, sexual coercion, or sexual contact that occurred before the age of 14). Forty-five percent ($n = 248$) of the sample experienced another unwanted sexual experience between surveys. Women who reported both CSA and ASA at Time 1 ($n = 147$; 49%) were significantly more likely to be revictimized over the course of one year than were woman who reported ASA only at Time 1 ($n = 101$; 40%), $\chi^2(1, N = 555) = 5.26, p < .05$.

An observed variables path analysis was conducted to test a partially mediated model of sexual revictimization at one-year follow-up with a structural equation modeling framework using Amos 7 (Arbuckle, 2006). The model included 556 participants, exceeding the suggested ratio of 10 cases for each model parameter (Kline, 1998). All measures were univariate normal with skew less than three and kurtosis less than three (Kline, 1998), except problem drinking as measured by the MAST, which had a higher kurtosis (6.13). Because the measure was not too skewed (2.35), the untransformed variable was used, given that with larger samples effects of violations of normality assumptions regarding kurtosis are minimal (Tabachnick & Fidell, 2001). Descriptive statistics for observed variables are presented in Table 2. First order correlations are presented in Table 3. None of the first-order correlations were above .80, indicating that multicollinearity across variables was not a problem with these data at the measurement level (Kline, 1998).

<<< Insert Tables 2 and 3 here>>>

The hypothesized path model was tested using maximum likelihood estimation. Problem drinking and illicit drug use were correlated in the model because these variables were expected to be positively associated with each other based on past research (Kilpatrick et al., 2000).

Numbing symptoms were entered as a separate variable independent of other PTSD symptoms (i.e., reexperiencing, avoidance, arousal), although numbing symptoms and other PTSD symptoms were correlated in the model. To improve the fit and identify the most parsimonious model, nonsignificant paths (except for the predicted effect of numbing symptoms on revictimization and the direct effect of CSA on revictimization) were removed from the preliminary path model based on the significance of the betas. An overall nonsignificant chi-square ($\chi^2[7, 556] = 12.90, p = .08$) and satisfactory goodness-of-fit statistics indicate a good fit for this revised model (IFI = .99; NFI = .98, and RMSEA = .04).³ See Figure 1 for the final path model with standardized beta weights.⁴

<<<Insert Figure 1 here>>>

Results of the model indicated that in this sample of ASA survivors, CSA had a direct positive effect on both numbing symptoms and other PTSD symptoms (i.e., reexperiencing, avoidance, arousal). As predicted, numbing symptoms mediated the relationship between CSA and subsequent revictimization at Time 2.⁵ The other PTSD symptoms, however, did not significantly predict revictimization. Instead, the other PTSD symptoms predicted problem drinking, which then predicted another sexual victimization experience at Time 2. Further, CSA only indirectly predicted problem drinking through other PTSD symptoms, which is consistent with past research suggesting that PTSD generally precedes problem drinking. That is, CSA led to more reexperiencing, avoidance, and arousal symptoms, which in turn led to drinking problems. However, there was no direct effect of CSA on problem drinking. The other PTSD symptoms predicted problem drinking, but not illicit drug use. Conversely, numbing symptoms did not predict problem drinking, but they did significantly predict illicit drug use. Drinking problems, but not illicit substance use, predicted sexual revictimization at Time 2. Of

importance, when controlling for PTSD symptoms (both numbing and other symptoms) and substance use (i.e., problem drinking, illicit drug use), the direct relation between CSA and revictimization at Time 2 was not significant, providing evidence for the hypothesized mediating effects of PTSD symptoms and substance use on the relation between CSA and revictimization.

Discussion

This study examined possible mechanisms through which CSA may contribute to increased risk of sexual revictimization in a community sample of female ASA victims completing two mail surveys one-year apart. As in past research, a history of CSA was associated with increased risk of being sexually revictimized during the study. Numbing symptoms of PTSD and problem drinking each contributed to increased risk of revictimization during the study.

The present study extended past research by using a longitudinal design to test a path model of PTSD symptoms and substance use, variables that have been consistently associated with sexual victimization in past cross-sectional studies (Epstein et al., 1998; Grice et al., 1995; Kilpatrick et al., 2003). Using a longitudinal methodology, the present study examined a temporal sequence among these factors based on past evidence and investigated how specific PTSD symptom clusters, problem drinking, and illicit drug use act separately and in concert to affect susceptibility to sexual revictimization. No known studies have explored all of these relations simultaneously in a sample of ASA victims. Although this study could not determine temporal relations with certainty because PTSD and substance use were both measured at Time 1, past research suggests that PTSD symptoms generally precede the development of problem drinking behaviors (Kessler et al., 1995), especially in victimized populations (Epstein et al., 1998; McFarlane, 1998; Stewart & Israeli, 2002). In this study, problem drinking, but not past

victimization experiences (i.e., CSA), increased the likelihood of sexual revictimization. CSA predicted PTSD numbing symptoms, which increased the likelihood of future sexual victimization. Although past cross-sectional studies have found that the single most robust predictor of future victimization is prior victimization (Collins, 1998; Gidycz et al., 1995; Krahe et al., 1999), the present results suggest that once PTSD symptoms and problem drinking behaviors are accounted for, CSA does not directly predict future victimization. This is the first longitudinal study to simultaneously examine the relationships among these predictors of sexual revictimization in a sample of ASA victims and suggests that CSA-related sequelae may contribute to increased risk of additional sexual revictimization, even in women who have experienced ASA.

Another interesting finding was that numbing symptoms were significantly related to illicit drug use but not problem drinking, while the other PTSD symptoms were related to problem drinking but not illicit drug use. Hence, it appears that numbing symptoms and problem drinking may be independently associated with risk of sexual revictimization. Further, past research suggests that drinking alcohol may help to alleviate survivors' unpleasant reexperiencing and arousal symptoms, and through negative reinforcement, lead to problem drinking (Dansky et al., 1996; McFarlane, 1998; Stewart & Israeli, 2002). The link between numbing symptoms and illicit drug use is more difficult to explain. It may be that numbing symptoms and illicit drugs are simply indicators of poorer psychological functioning overall, considering that the illicit drug category consisted of heroin, cocaine, and psychedelic drug use. Alternatively, the use of these heavy drugs may be a way for survivors to cope with their numbing symptoms, as an attempt to try to "feel" again. More research is clearly needed to investigate this intriguing relationship. Further, it is noteworthy that illicit drug use did not

significantly predict another sexual victimization experience, although it is possible that we did not find a relationship because our measure assessed illicit drug use but not problem use or abuse, which past research shows relates to revictimization (e.g., Grice et al., 1995). Also, our drug use variable had a restricted range of responses (0-3), which might account for its lack of predictive power.

Our results are consistent with self-medication theory (Stewart & Israeli, 2002) and suggest that women who have experienced CSA are more likely to develop PTSD symptoms. These symptoms in turn increase vulnerability to sexual revictimization, possibly in part because of problem drinking. Other research suggests that problem drinking makes women easier targets for sexual predators, due to less ability to detect risk in their immediate environment (Cloitre, Scarvalone, & Difede, 1997).

There are a number of weaknesses in the present study. The lack of a comparison group of non-sexually victimized women precludes drawing any conclusions regarding differences between ASA survivors and women who have not been sexually victimized as adults in terms of the relations between CSA history, PTSD symptoms, substance use, and likelihood of future sexual victimization. Another weakness of the present study is the use of the SES (Koss & Gidycz, 1985), a validated measure of ASA experiences, to assess child sexual assault. Although we modified the measure to assess unwanted sexual experiences described before age 14, there may be other types of CSA experiences that were not captured by the SES. Further, we did not distinguish if there was at least a five year age difference between victim and perpetrator, which has become a standard question when assessing CSA. In addition, some participants may have experienced ongoing sexual victimization (e.g., intimate partner violence) before completion of the first survey and/or during the year between surveys. This could have implications for

different outcomes, especially in light of a recent study comparing single-incident assault, multiple-incident assaults with the same perpetrator, and multiple-incident assaults with different perpetrators that suggested that the latter group was at greater risk for developing PTSD and binge drinking (Casey & Nurius, 2005).

The MAST (Selzer, 1971) was used in the present study as an indicator of problem drinking. An actual measure of substance abuse/dependence, such as the Structured Clinical Interview for the DSM-IV Axis I Disorders (SCID-I; Spitzer et al., 1990), would have been preferable for clarifying the temporal relationship between PTSD and substance use/abuse and maintenance (dependence) onset. The Graduated Frequency Measure (GFM; Rehm, Greenfield, Walsh, Xie, Robson, & Single, 1999) of alcohol consumption was unusable due to excessive missing data, and problematic drug use was not assessed. Rather, the measure of illicit drug use in this study was limited to any use of hard drugs, rather than assessment of frequency, intensity, or problems associated with drug use.

Finally, time frames of PTSD and drinking measures were different, in that PTSD symptoms were assessed in the past month, but problem drinking was assessed using a past-year time frame. The relationships between PTSD symptoms and substance use were correlational, precluding our ability to make conclusions regarding causal influence. Despite these issues, the results suggest that it may be important to include both use and problematic use of alcohol and drugs separately in future studies of sexual revictimization risk.

With respect to examining specific PTSD symptom clusters, only numbing symptoms were separately examined in relation to revictimization. Although there was no theoretical basis for individually examining the other PTSD symptoms, future research could explore how reexperiencing, arousal, and avoidance symptoms differentially affect substance use, sexual

revictimization vulnerability, and risk recognition/behavior. Feuer, Nishith, and Resick (2005) hypothesized that numbing/arousal and avoidance/reexperiencing operate via different mechanisms, construing arousal and numbing as automatic physiological responses and reexperiencing and avoidance as cognitive/behavioral responses. Research is needed to examine how distinct PTSD symptom clusters emerge to help explain specific psychosocial outcomes of different survivors of sexual and nonsexual traumatic events.

This study adds to the literature by demonstrating the unique effects of PTSD symptom clusters on revictimization within a sample of female ASA victims. These results confirm that a history of CSA increases ASA victims' vulnerability for future sexual victimization, and suggest that PTSD symptoms and problem drinking partially mediate this effect. While this study could not examine the temporal links between PTSD symptoms and problem drinking and/or illicit drug use specifically, such analyses are warranted in future longitudinal studies of sexual assault victims to better understand how these factors interrelate over time in relation to revictimization risk. Such research may also help to identify subgroups of victims who are at higher risk for revictimization (e.g., CSA victims with prominent numbing symptoms and/or problematic alcohol or drug use).

The current study suggests that sexual revictimization risk may be increased either directly through numbing symptoms or indirectly through other PTSD symptoms, which lead to problem drinking and subsequent revictimization. That is, reexperiencing, arousal, and avoidance symptoms do not lead directly to revictimization but to more problem drinking, which in turn leads to a greater chance of being revictimized. Thus, problem drinking and numbing symptoms may serve the same purpose: to create a "chemically-induced dissociation" (Briere & Runtz, 1987) as a way of coping with the more "positive" PTSD symptoms (e.g., arousal), but that may

also put sexual victimization survivors at greater risk for future victimization, possibly due to impaired risk judgments (Wilson et al., 1999). Future research is needed to replicate these analyses and to test cognitive, behavioral, and physiological mechanisms underlying the links between sexual victimization, PTSD symptoms, and substance use in representative longitudinal samples of women.

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Footnotes

¹Unfortunately, a measure of alcohol use/consumption was not usable because it was not completed by one-third of the sample. Therefore, we analyzed problem drinking instead of alcohol use in this study.

²Alternate computations of the illicit drug use measure were also evaluated in this study including (a) an ordinal measure of illicit drug use coded: 0 = none, 1 = marijuana only, 2 = 1 illicit hard drug (i.e., heroin, cocaine, or psychedelics), 3 = 2 or more hard drugs; and (b) a dichotomous measure of illicit hard drug use (no/yes). Results were similar from analyses using these alternate computations, so only results from analyses using the summed measure are reported, which is most appropriate for the study purposes. Unfortunately, no measure of problematic drug use was collected in this study.

³We replicated this analysis with income predicting revictimization at Time 2. Income was significantly and negatively related to revictimization such that lower income was associated with increased risk of revictimization ($\beta = -.08, p = .05$). However, this model demonstrated poorer fit ($\chi^2[12, 556] = 45.67, p < .001$; IFI = .95; NFI = .93, and RMSEA = .07), and therefore the more parsimonious model has been presented.

⁴Results of the full model will be provided upon request.

⁵Mediational regression analyses and a Sobel test were used to confirm that numbing symptoms mediated the effect of CSA history on Time 2 revictimization (Sobel $t = 2.61, p = .009$; Preacher & Leonardelli, 2006).

Table 1

Descriptive Statistics for Baseline Measures of Demographic Variables (N = 556)

	<i>M</i>	<i>SD</i>
Current age	32.99	10.79
Age at time of assault	19.44	7.86
	<i>N</i>	<i>%</i>
Education		
Less than 12 th grade	75	14%
High school graduate	74	14%
Some college	220	40%
College graduate or beyond	178	33%
Employed	286	51%
Marital status		
Single	319	58%
Living with someone	87	16%
Married	66	12%
Separated/divorced	78	14%
Widowed	4	1%
Mothers	238	43%
Income		
≤\$10,000	199	36%
\$10,001-20,000	108	20%
\$20,001-30,000	90	16%
\$30,001-40,000	60	11%
\$40,001-50,000	40	7%
>\$50,000	52	10%
Ethnicity		
White	214	39%
Black	252	46%
Hispanic/Latina	35	6%
Asian	12	2%
Mixed	34	6%
Other	5	1%
Student	121	27%
Sexual orientation		
Heterosexual	418	76%
Homosexual	36	7%
Bisexual	70	13%
Unsure	29	5%

Table 2

Descriptive Statistics for Observed Variables

	<i>M</i>	<i>SD</i>	Skew	Kurtosis
PTSD Symptoms (except for numbing)	1.22	.76	.22	-.83
Numbing Symptoms	1.03	.86	.50	-.77
# of Illicit Drugs Used (except for marijuana)	.36	.68	1.85	2.67
Problem Drinking (# of MAST symptoms)	5.88	8.58	2.35	6.13

Table 3

Correlation Matrix

Variable	1	2	3	4	5	6
1. Child Sexual Abuse History (no/yes)	—	.10*	.20***	.22***	.14***	.13**
2. Revictimization at Time 2		—	.15***	.16***	.15***	.20***
3. PTSD Symptoms (except for numbing)			—	.76***	.14***	.24***
4. Numbing Symptoms				—	.19***	.24***
5. # of Illicit Drugs Used (except for marijuana)					—	.45***
6. Problem Drinking						—

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Figure Caption

Figure 1. Final model of the relationships among child sexual abuse, PTSD symptom criteria, substance use, and sexual revictimization.

