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The Relationship between Childhood Abuse and Violent Victimization in Homeless and Marginally Housed Women: The Role of Dissociation as a Potential Mediator

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Abstract

Objective—Previous studies have established a link between childhood abuse and dissociation. Other work has shown childhood abuse increases the likelihood of violent victimization in adulthood. Although it has been posited that dissociation may mediate childhood abuse and adult violent victimization, research investigating this hypothesis is sparse, particularly for extremely vulnerable populations such as homeless and unstably housed individuals. We investigated the relationship between childhood abuse and dissociation on violent victimization in a cohort of homeless and unstably housed women. We also assessed whether dissociation mediated childhood abuse and violent victimization in this sample.

Methods—Participants were asked at an initial assessment and a six-month follow-up to report any physical and/or sexual violence experienced in the previous six months. Questionnaires recording history of specific types of childhood abuse, dissociation, and other factors were also recorded at the initial assessment.

Results—Hierarchical logistic regression models revealed that childhood sexual abuse (OR = 3.10; $p < 0.01$) and severe dissociation (OR = 1.99; $p < 0.01$) were significantly associated with recent physical violence, and childhood sexual abuse (OR = 3.88; $p < 0.01$) and dissociation (OR = 1.87; $p < 0.05$) were also associated with recent sexual violence. Dissociation mediated neither childhood abuse on recent physical violence or recent sexual violence.

Conclusion—Developing approaches that effectively identify and treat dissociation as a part of an overall framework of trauma-informed care in homeless and unstably housed women may be an effective way to decrease future physical violence in this vulnerable population.

Keywords

violent victimization; sexual violence; dissociation; child abuse; homeless women

Dissociation, which involves detachment from one's physical and emotional experiences and is associated with symptoms such as depersonalization (feeling as if one is detached from his or herself), de-realization (where the outside world feels unreal), and other amnesic/fugue states, is generally understood to be a psychological defense in the face of current and past trauma (van der Kolk, 2003). There is some evidence that dissociation is linked to genetic factors within the context of early trauma exposure (e.g. Koenen et al., 2005). Furthermore, childhood physical and sexual abuse are associated with elevated dissociative symptoms in homeless veteran populations (Carlson, Garvert, Macia, Ruzek, & Burling, 2013) and younger populations including homeless teens (Tyler, Cauce, & Whitbeck, 2004). In fact, child abuse appears to be one of the more robust predictors of dissociation in adulthood (Kessler & Bieschke, 1999; Hetzel & McCanne, 2005). Adult survivors of childhood abuse are more likely to experience dissociative symptoms than individuals who are not survivors of childhood abuse in both clinical (e.g. Chu & Dill, 1990) and non-clinical populations (e.g. Dorahy et al., 2014). Several studies across a variety of cultures and populations have demonstrated that survivors of childhood sexual abuse are more likely to develop dissociative symptoms than those who have experienced other types of childhood abuse (Dorahy, Middleton, Seager, Williams, & Chambers, 2015; Gaon, Kaplan, Perry, & Witztum, 2013; Rivera-Vélez, González-Viruet, Martínez-Taboas, & Pérez-Mojica, 2014). Furthermore, numerous studies have noted that individuals who are victims of childhood abuse (childhood sexual abuse in particular) are more likely to become victims of violence in adulthood (see Lalor & McElvaney, 2010 for a review).

Given that survivors of childhood abuse are at increased risk of exposure to other traumas across the lifespan (Duncan, Saunders, Kilpatrick, Hanson, & Resnick, 1996), Chu (1999) has suggested that dissociation experienced after childhood sexual abuse may mediate the influence of childhood sexual abuse on future increased risk for adult violent victimization (e.g. falling victim to some sort of physical or sexual violence perpetrated by one or more people). Although the mechanisms behind violent victimization remain varied and unclear, it is suggested that elevated dissociative symptoms may be linked to a suppressed anticipatory anxiety response, which increases the likelihood that individuals with a history of childhood abuse may put themselves in potentially dangerous situations (Chu, 1992). Research investigating this theory has been limited and results have been inconsistent. One study that investigated the relationship between posttraumatic stress disorder (PTSD) and dissociative symptoms in a sample of college women found no evidence that dissociative symptoms mediated violent victimization (Sandberg, Matorin, & Lynn, 1999). However, other studies have found evidence that dissociation may be associated with an increased likelihood of violent physical and sexual victimization in both clinical and non-clinical adult samples (Hetzel & McCanne, 2005; Myrick, Brand, & Putnam, 2013). Whether differences in results are due to different populations, different research questions, or other factors is unclear. Few investigations have directly assessed the relationship between violence and dissociation among homeless and unstably housed women and none have attempted to establish a causal

or directional relationship between child abuse, dissociation, and recent adult violent victimization. The dearth of relevant research leaves a notable gap in our understanding of how childhood abuse and dissociation may lead to violent victimization, especially for particularly vulnerable populations such as homeless and unstably housed women.

Our prior work among homeless and unstably housed women found extremely high levels of childhood abuse (Wong, Shumway, Flentje, & Riley, in press), as well as recent violent victimization (Riley et al., 2014). Within the same sample of homeless and unstably housed women, we have also shown that recent sexual violence is strongly associated with other subsequent negative outcomes such as the increased likelihood of stimulant use initiation (Riley et al., 2015). The disproportionately common occurrence of violence against unstably housed women, and the strong influence of violence on a variety of other mental health conditions, makes these critical issues to address in this population (Wenzel, Leake, & Gelberg, 2001; Riley et al., 2014).

The current study aimed to increase our understanding of the relationships between childhood abuse, dissociation, and violent victimization (sexual and/or physical violence) in the same population of homeless and unstably housed adult women. Using the Chu model, which hypothesizes that dissociation resulting from childhood sexual abuse increases risk for future sexual violence, as a frame we asked women to report any violent victimization six months prior to an initial assessment and in the intervening six months prior to a follow-up assessment. Our hypothesis was that after accounting for psychiatric comorbidity and other sociocultural factors unique to homeless persons, childhood physical abuse, childhood sexual abuse and dissociation would still predict both physical and sexual violence between the initial assessment and the six-month follow-up interview. We also hypothesized that dissociation would mediate the influence of childhood physical abuse and sexual abuse on physical and sexual violence.

Methods

Participants

This prospective analysis was conducted within the Shelter, Health, and Drug Outcomes among Women (SHADOW) Study, a community-based observational cohort study designed to understand risks for poor health and victimization among homeless and unstably housed women. As we have described elsewhere (Riley et al., 2014), a mobile outreach team used systematic probability sampling to recruit a cohort reflective of the larger San Francisco homeless and unstably housed female population. Details regarding recruitment have been previously published (Riley et al., 2014). In brief, study participants were recruited from homeless shelters, free meal programs and low-income single room occupancy (SRO) hotels. Eligibility was limited to biological females who were 18 years old and who had a history of housing instability (slept in public or in homeless shelters, or stayed with a series of friends because they did not have any other option).

Three-hundred homelessness or unstably housed women were enrolled in the cohort between 2008 and 2010, and followed every six months for a total of 7 time points ranging for a follow-up period of up to 3 years from recruitment date. In accordance with the aims of

the parent study, HIV-positive women were oversampled so that they comprised 50% of the total cohort. The two-hundred-eighty-one participants who completed enrollment and 6-month follow-up interviews were included in the current study. Participants engaged in check-in visits with study staff between semi-annual study visits to update contact information and to ensure they remained engaged in study activities. All participants provided written informed consent. Upon enrollment, structured interviews were conducted in a private space at a community-based field site. Study questionnaires were interviewer-administered. Socially sensitive questions, including those regarding violent victimization and drug use, were administered via an audio computer-assisted self-interviewing (ACASI) approach in which participants listened to questions through headphones and entered responses into a computer. All questionnaires and study procedures were pilot tested to ensure appropriateness for the target population. Reimbursement of \$15 was given for each study interview. Study procedures were approved by the Institutional Review Board at the University of California, San Francisco.

Measures

Measurement of violent victimization—Violent victimization was assessed using questions based on the Severity of Violence Against Women Scales (Marshall, 1992), which were tested previously in this cohort (Riley et al., 2014). Physical violence was defined as being hit, slapped, kicked, bitten, choked, shot, stabbed, or struck with an object. Sexual violence was defined as being forced to have sex of any kind. Physical and sexual violence occurring before age 18 were classified as childhood abuse. Adult violent victimization occurring in the preceding six months was assessed at the baseline and at the six-month follow-up.

Dissociative Experiences Scale—Dissociation was assessed at the initial assessment using the Dissociative Experiences Scale (DES), a 28 item scale where items related to dissociative experiences are rated on a 10-point scale. Items assess feelings of depersonalization (“Some people sometimes have the experience (that) . . . they actually see themselves as if they were looking at another person. What percentage of the time do you have the experience?”), de-realization (“Some people have the experience of feeling that other people, objects, and the world around them are not real. What percentage of the time do you have the experience?”), and other dissociative experiences (Bernstein & Putnam, 1986). The DES demonstrates excellent convergent and predictive validity in clinical and non-clinical populations (Van Ijzendoorn & Schuengel, 1996). Higher scores on the DES indicate more self-reported dissociative experiences. The DES total score was computed as the sum of the 28 items. The DES does not provide a diagnosis of a dissociative disorder; however, for the purposes of this study it was defined as a score > 45 (Van Ijzendoorn & Schuengel, 1996).

Individual characteristics—Demographic, social, structural, and behavioral characteristics previously associated with health and violence among low-income women were used to describe the cohort. Socioeconomic status was measured in terms of dichotomous indicators of low income (based on a median split of monthly income), any unmet subsistence needs (e.g. insufficient access to food, clothing, a restroom, a place to

wash or a place to sleep) Gelberg, Gallagher, Andersen, & Koegel, (1997), and homelessness (sleeping in a shelter or public place). Substance use was measured by dichotomous indicators of any current cocaine use, any current methamphetamine use, any current opiate use, and current at-risk alcohol use (> 7 drinks/week for women; NIAAA, 2005). Mental health diagnoses were assessed at the initial assessment by the computerized Diagnostic Interview Schedule (DIS) for the DSM-IV (American Psychiatric Association, 1994). Thirty-nine psychiatric diagnoses were assessed, including anxiety disorders (panic attack, specific phobia, social phobia, agoraphobia, generalized anxiety disorder, PTSD), mood disorders (major depressive episode, dysthymia, hypomanic episode, manic episode), psychotic disorders (schizophrenia, schizophreniform disorder), substance use disorders (e.g. meeting criteria for withdrawal, abuse, and dependence) associated with alcohol, amphetamines, cocaine, opiates, and sedatives; abuse and dependence associated with hallucinogens, inhalants, marijuana, and phencyclidine; and dependence on other drugs), as well as somatization disorder, pain disorder, and dementia. All diagnoses assessed the presence versus absence of disorders.

Data Analysis

STATA Statistical Software: Release 13.1 was used to conduct all statistical analyses (StataCorp LP, 2013 College Station, TX). Descriptive statistics were first generated for the variables described above. We then employed two separate hierarchical logistic regression models to understand the effects of four main characteristics on physical violence and sexual violence at the six-month follow up. The four main effects were childhood physical abuse, childhood sexual abuse, violent victimization during the six months prior to the initial assessment, and dissociation reported at the initial assessment. Specifically, physical violence in the six months prior to initial assessment was used to predict physical violence in the six months after initial assessment. Similarly, sexual violence in the six months prior to initial assessment was used to predict sexual violence in the six months after initial assessment. Main effects were estimated controlling for age, race, and, in accordance with our prior work regarding significant correlates of violence in this cohort (Riley et al., 2014), whether participants had recently experienced unmet subsistence needs. Ten theoretically and diagnostically relevant psychiatric diagnosis variables were created from the thirty-nine diagnoses assessed by the DIS. Related diagnoses were grouped into categories reflecting depressive, anxiety, bipolar, psychotic, alcohol, cannabis, amphetamine, cocaine, and opiate disorders, while uncommon diagnoses, such as dementia, were not included. We then used the Variance Inflation Factor (VIF) to evaluate multicollinearity. Out of the ten psychiatric diagnoses, two highly dependent variables, any anxiety disorder; VIF = 13.02 and any bipolar disorder; VIF = 12.56 ($\chi^2 = 47.65$; $p < 0.001$) were dropped from the final list of variables that were included in the final analyses due to multicollinearity (e.g. VIF > 10; Hair, Black, Babin, Anderson, & Tatham, 2006).

Hierarchical modeling included four steps. The initial model included age in years, race, and dichotomous indicators of unmet subsistence needs, and violent victimization (e.g. physical or sexual violence depending on the model) in the six months prior to initial assessment. The second step of the model included childhood physical abuse and childhood sexual abuse. The third step included mental health and substance use diagnoses. The final step included

dissociation as measured by the DES total score. Interactions between dissociation and relevant covariates such as the presence of a substance use disorder were also tested because substance use is associated with symptoms similar to dissociation. Omnibus χ^2 tests were used to assess model fit in predicting either physical violence or sexual violence at each step of analysis. McFadden's R^2 was used to assess proportion of model variance explained. Wald χ^2 tests used to assess whether each subsequent model was incrementally more predictive of violent victimization from the previous one.

Mediation analyses were based on significant relationships between childhood physical and sexual abuse, dissociation, and physical and sexual violence identified in the logistic regression analyses. Bootstrapping was used to assess whether dissociation mediated childhood abuse and violent victimization. Bootstrap estimates on 10,000 replications were obtained using a user written binary mediation ado program (Ender, 2011) in conjunction with STATA's native bootstrap code. Bootstrapping is generally recommended over other methods of testing indirect effects because it does not assume normality and has greater power while maintaining control over Type I error rates (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008).

Results

Sample Characteristics

Compared to the entire cohort (N=300), a lower proportion of study participants included in follow-up analyses were homeless at baseline (43% vs. 66%, $p < 0.01$); no statistically significant differences existed between excluded and included participants according to drug use or mental health variables. Among those enrolled, 93% completed a six-month follow-up and were included in the current analysis (Riley et al., 2015). Approximately 70% of study participants included in the current analysis were women of color. The mean age was 47 years (Table 1). Approximately 56% of participating women had reported being survivors of childhood physical abuse and 32% reported being survivors of childhood sexual abuse.

In terms of time-varying study factors, almost half of study participants reported having unmet subsistence needs at baseline, and 49% had slept in a shelter or public place during the 6 months prior to initial assessment. The median monthly income was \$931.50 compared to \$5,419 for the City of San Francisco during the same time period (U. S. Census Bureau, 2009). Housing and income did not change significantly between the study periods measured here ($p > 0.05$). Physical and sexual violence during the 6 months prior to initial assessment was reported by 27% and 9% of participants, respectively (Table 1). The mean and median DES scores were 52.74 and 38 respectively. DES scores in this sample were positively skewed and 43% (121 participants) had elevated levels of dissociation (a score > 45 on the DES; Van Ijzendoorn & Schuengel, 1996). DES scores did not change significantly between the study periods measured here ($p > 0.05$).

Hierarchical Models Predicting Violence

Physical violence—As shown in Table 2, when demographic variables were entered in Step 1, women who reported physical violence in the previous six months had greater odds

of reporting physical violence in the following six months ($OR = 3.10$, 95% CI [1.56, 6.17]). In Step 2, physical violence in the previous six months continued to predict violence in next six months. Childhood sexual abuse emerged as a significant predictor of physical violence in the six months following the initial assessment ($OR = 2.18$, 95% CI [1.03, 3.16]). When psychiatric diagnoses were entered in Step 3, women with amphetamine use disorders had significantly greater odds of physical violence exposure ($OR = 2.06$, 95% CI [0.93, 3.44]). In the final model, women with more severe dissociation were at significantly greater odds of physical violence exposure ($OR = 1.99$, 95% CI [1.11, 2.14]; $\chi^2 = 8.57$; $p < 0.01$). Exposure to physical violence six months prior, childhood sexual abuse, and amphetamine use disorder maintained significance in predicting physical violence in the final model. There were no observed interactions between dissociation and substance use on physical violence.

Sexual violence—As shown in Table 3, in Step 1, no demographic variables had a statistically significant association with sexual violence. Sexual violence in the previous six months predicted reported sexual violence in the six months after the initial assessment ($OR = 5.20$; 95% CI [1.12, 8.21]). In Step 2, childhood sexual abuse increased the odds of women reporting sexual violence at six-month follow up ($OR = 3.88$; 95% CI [1.54, 8.21]; $\chi^2 = 9.54$; $p < 0.01$). Although psychotic disorders were found to be a significant predictor of sexual violence Step 3, they lost significance in the final step when dissociation was entered into the final step of the model ($OR = 1.87$; 95% CI [0.72, 2.21]; $\chi^2 = 6.01$; $p < 0.05$). There were no observed interactions between dissociation and substance use on predicting sexual violence.

Mediation models—We assessed 1) whether dissociation mediated childhood sexual abuse and recent physical violence six months after initial assessment and 2) whether dissociation mediated childhood sexual abuse and recent sexual violence six months after initial assessment. Bootstrapped estimates did not indicate significant indirect effects of dissociation on childhood sexual abuse and physical violence or sexual violence six months after initial assessment through dissociation (95% CI [-0.01; 0.11] and 95% CI [-0.02; 0.08]). Based on the strong relationship between violent victimization six months prior to initial assessment and violent victimization at the six-month follow-up, we examined two additional bootstrapped models to assess whether dissociation mediates between previous and future physical violence and previous and future sexual violence. Bootstrapped estimates did not indicate significant indirect effects of dissociation on physical violence reported six months prior to assessment and physical violence reported at the six month follow up (95% CI [-0.18; 0.05]) nor did they indicate significant indirect effects of dissociation on sexual violence reported six months prior to assessment and sexual violence reported at the six month follow up. (95% CI [-0.02; 0.08]).

Discussion

Results from this study indicate that, in a cohort of vulnerable women where violence is disproportionately common, childhood sexual abuse increases the odds of both physical and sexual violence two and three-fold respectively, even after adjusting for demographic characteristics, psychiatric disorder, and dissociation, while childhood physical violence

does not. Results further suggest that although dissociation confers a nearly two-fold increase for physical and sexual violence, it does not mediate the effects of childhood physical or sexual abuse on physical or sexual violence. Taken together, results show that childhood abuse and dissociation have independent direct effects on violent victimization, while indirect effects appear to be negligible. Furthermore, our results also suggest that a recent history of violent victimization is a significant predictor of future violent victimization for this cohort of homeless and marginally housed women. Although it is unclear what factors influence dissociation in our sample, according to our results recent exposure to violence during adulthood may be more so associated dissociative symptoms rather than child abuse. And while our results do not indicate the effects of child abuse influence victimization through dissociation, they do suggest that both childhood abuse and dissociation may be clinically useful predictors of risk for violent victimization in adulthood and the possible need for trauma-informed care to stem this risk.

Although recent research has evidenced links between dissociation and childhood sexual abuse (Dorahy et al., 2014), as well as elevated dissociation and violent victimization (Myrick et al., 2013), our study is the first to indicate that risk for violent victimization may be independently increased by child sexual abuse and dissociative experiences. Our results are consistent with a small but novel and recent study, which found previously sexually victimized women who exhibited blunted or reduced physiological reactivity (a key symptom of dissociation) while being exposed to sexual victimization stimuli of an emotional Stroop task were more likely to report sexual re-victimization at a six-month follow-up even after controlling for prior victimization (Waldron, Wilson, Patriquin, & Scarpa, 2015). More broadly, though our results do not focus on event level data or the chronicity of early trauma, they are consistent with previous epidemiological findings that indicate child abuse and other early childhood stressors are associated with a host of adverse outcomes, which may have a profound impact on mental health and overall wellbeing well into adulthood (Felliti et al., 1998; Anda et al., 2006).

We also found that homeless and unstably housed women who reported recent violent victimization were at increased odds of being exposed to future violence. Previous research suggests that violent victimization may alter individual level characteristics that may increase the odds of them being re-victimized (Lauritsen & Quinet, 1995). Furthermore, recent evidence suggests that women are more impacted by violent victimization than men (Ruback, Clark, & Warner 2013). However, the same study did not identify any specific characteristics that increased the likelihood of violent victimization, but found a cluster of risky behavioral characteristics that were associated with violent re-victimization. Moreover, it is unclear what psychological factors might be behind the increase of these risky behaviors following violent victimization. Although dissociation increases the odds of future violent victimization in this cohort, we found no evidence that dissociation mediated past and future violent victimization. This suggests that some other unknown variable or set of biological, psychological, behavioral, and/or environmental variables may be operating in a complex manner, possibly with dissociation, as a result of recent victimization to put these women at risk for re-victimization.

Previous studies by our group and others that have investigated challenges in housing instability have consistently indicated violence is a normative aspect of the environments where homeless women live (Bourgois, Prince, & Moss, 2004; Hankin, Smith, Daugherty, & Houry, 2010; Knight et al., 2014). While results presented here do not contain enough detail to isolate the mechanism, they are consistent with the hypothesis that childhood sexual abuse and dissociation contribute to increased odds of violent physical victimization by decreasing sensitivity to threats and/or increasing the threshold for enduring situations where physical violence is likely to occur. Taken as a whole, our results suggest dissociative symptoms may be a clinically relevant diagnostic feature within the broader context of traumatic experiences that should be taken into consideration when working with particularly vulnerable populations such as homeless and unstably housed individuals. Specifically, subsequent physical victimization may be reduced by identifying individuals experiencing dissociative symptoms as part of an overall framework of trauma-informed care for homeless and unstably housed persons. These individuals then could be linked to appropriate programs and/or providers that specialize in trauma-informed mental healthcare to help these individuals cope with or reduce their dissociative symptoms and possibly keep them out of harms way.

Our findings are consistent with the basic idea of the Chu model (1992) where childhood sexual abuse and dissociation are not only associated with, but greatly increase the odds of violent victimization. However, they also differ in important ways as our results did not support dissociation mediating previous and future violent victimization. This difference may be related to the fact that dissociation was extremely skewed in this population. Alternatively, the lack of evidence to support mediation may suggest that while child sexual abuse may put women at risk, possibly due to difficulty distinguishing between threatening and non-threatening situations, the dissociation experienced by homeless women is linked to trauma experienced after childhood. Irrespective of whether dissociation mediates between these two variables, our results confirm significant independent influences on recent violent victimization from childhood victimization and dissociation.

While research findings associated with childhood sexual abuse have been relatively consistent in regards to its link to dissociation, childhood physical abuse findings have been more varied. Previous studies report significant associations between physical abuse and dissociative symptoms (Mulder, Beautrais, Joyce, & Fergusson, 1998). In addition, childhood physical and sexual abuse were equally likely to be associated with dissociative symptoms (Foote, Smolin, Kaplan, Legatt, & Lipschitz, 2006; Hetzel & McCanne, 2005). Others reported non-significant relationships between childhood physical abuse and dissociation (Dorahy et al., 2015). Our finding that childhood physical abuse was not associated with either type of violent victimization in adjusted analysis may be reflective of the idiosyncratic aspects of this cohort (e.g., of socio-environmental stressors) compared to other populations.

Amphetamine use disorder was also associated with increased odds of being the victim of physical violence. We reported previously that recent sexual violence increased the risk stimulant use six months later, wherein we hypothesized that women may be self-medicating to manage physical and emotional pain related to an ongoing unsafe situation (Riley et al.,

2015). Our finding that amphetamine use disorder was associated with increased risk for physical violence over time may explicate the other side of this process where either the means required to procure amphetamine (e.g. in exchange for sex or enduring an abusive relationship because a partner has access to amphetamine or engaging in violent acts to acquire amphetamine) or the dangerous situations that may occur while under the influence of amphetamine may put homeless or unstably housed women at an increased risk for violence. However, the lack of event-level data precludes our ability to assess under what circumstances violent victimization occurred. Future studies may further explore the relationship to amphetamine use and physical violence by ascertaining how specific events (e.g. exchange for amphetamine) increase the likelihood of violent victimization and or engaging in physical violence.

We previously reported that the influence of childhood abuse on adult violent victimization is type specific (e.g. childhood physical abuse predicts adult physical victimization and childhood sexual abuse predicts adult sexual victimization) (Wong, Shumway, Flentje, & Riley, in press). While the current study was consistent with our previous research in observing that childhood sexual abuse predicted recent sexual violent victimization and childhood physical abuse did not, this consistency did not extend to recent physical violence in the full models. While this may have been due to only including a sub-sample of study participants in the current study, it may also be influenced by different covariates used in each analysis (e.g. various psychological disorders such as depression and PTSD) and only the current study included dissociation which also appears to have affected other outcome variables.

There are several limitations of note regarding results presented here and their interpretation. First, data in this study were obtained via self-report. While efforts were made to ensure that participants would feel comfortable disclosing personal information (e.g., private rooms for data collection and computer assisted interviewing for sensitive questions), our findings still may be influenced by inaccuracy due to socially desirable responding. Also, while efforts were made to facilitate each participant's accurate recollection (e.g., prompts), our findings may still be influenced by limited recall. Underreporting for either reason could have resulted in an underestimation of childhood or recent victimization within our sample; however, this would have biased our results toward the null, indicating observed effects sizes were at least as robust as those reported. Although over-reporting is possible, women in this study were not incentivized for revealing episodes of victimization over the course of the study. Accurate recall could vary as a function of dissociation where elevated dissociative symptoms could have contributed to denial or repression of the victimization episode. Secondly, although the DES has been shown to have excellent reliability and validity in regards to identifying the presence of elevated dissociative symptoms, it does not have the capacity to diagnose or differentiate between dissociative disorders. As a consequence, we were not able to include the diagnosis of a dissociative disorder (e.g. Dissociative Identity Disorder) in our analyses. Future studies that explore dissociation should consider using measures/methods that yield dissociative disorder diagnosis when assessing study participants to increase validity. Additionally, while our results do not provide a systemic strategy for reducing homelessness, interventions based our results have the potential to compliment and/or be integrated into larger systems-focused programs designed to meet this

goal (e.g. Housing First Services; Padgett, Gulcur, & Tsemberis, 2006). Finally, our sample size may have contributed to the lack of broader findings associated with our mediation analyses. This difference could be the reflection of limited power in the current study due to a relatively small sample of individuals who experienced violent victimization. This is more probable given our odds ratios for dissociation predicting physical violence (OR = 1.99) and sexual violence (OR = 1.87) at the six month follow up suggest only modest effect sizes when converted to Cohen's d approximations ($d=0.27$ and $d=0.25$ for the effect size of dissociation on physical and sexual violence respectively with a Cohen's d between 0.20 – 0.50 indicating small to medium effect size; Chen, Cohen, & Chen, 2010). Thus, with the addition of increased statistical power, a larger sample would also afford us the capacity to explore the magnitude of the relationship between child abuse, dissociation, and recent violent victimization in more detail. Thus, future studies designed specifically to assess which variables, including but not limited to dissociation, mediate childhood abuse and violent victimization in a larger and geographically more diverse sample of homeless and unstably housed individuals may yield more robust findings with larger effect sizes.

This study aimed to elucidate the relationship between childhood abuse, dissociation, and adult violent victimization. Results shown here indicate that childhood sexual abuse explains a large and significant amount of variability in both sexual victimization and physical victimization among homeless and unstably housed adult women, while childhood physical abuse does not. They also indicate that while current dissociation explains the longitudinal assessment of future physical violence, it does not mediate associations between childhood victimization and recent victimization, possibly due to limited magnitude of the relationship between childhood victimization, dissociation, and recent violent victimization in this sample. These findings occur in the context of extreme poverty and account for simultaneous influences of previous recent violent victimization and amphetamine use. Given the consistency of the relationship between dissociation and physical violence over time, identifying individuals who have high levels of dissociation within a broader context of trauma-informed care for homeless and unstably housed women and linking them with specialized mental healthcare and other services may be an additional targeted means to modify risk and reduce physical violence in this particularly vulnerable population.

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Table 1

Participant characteristics at initial assessment (N = 281)

| Demographics | N (%) |
|--|-----------------|
| Age, mean (SD) ⁺ | 46.99 ± (8.62) |
| Race | |
| African American | 122 (43.42) |
| Asian/Pacific Islander | 9 (3.20) |
| Latina | 15 (5.34) |
| Other | 49 (17.44) |
| White | 86 (30.60) |
| High school graduate | 186 (66.19) |
| Income < \$931.50/mo | 193 (68.68) |
| HIV positive | 142 (50.53) |
| Years spent homeless, mean (SD) ⁺ | 6.05 ± (6.39) |
| > 1 night sleeping in public or shelter/6 mo | 137 (48.75) |
| Unmet subsistence needs in the last 6mo [‡] | 138 (49.11) |
| Victimization History | |
| <u>Recent Adult Victimization</u> | |
| Physical Violence within the last 6 mo | 82 (27.33) |
| Sexual Violence within the last 6 mo | 27 (9.00) |
| <u>Childhood Abuse</u> | |
| Childhood sexual abuse | 88 (31.54) |
| Childhood physical abuse | 157 (56.27) |
| Current Mental Health Diagnoses | |
| PTSD | 141 (50.90) |
| Depressive Disorder (any) | 189 (67.26) |
| Psychotic Disorder (any) | 60 (21.43) |
| Alcohol Use Disorder | 179 (63.93) |
| Cannabis Use Disorder | 45 (26.67) |
| Amphetamine Use Disorder | 104 (37.14) |
| Cocaine Use Disorder | 185 (66.07) |
| Opiate Use Disorder | 111 (39.64) |
| DES mean (SD) | 52.74 ± (46.28) |

Note.

⁺Age and years spent homeless were continuous variables within the models;[‡]Insufficient access to bathroom, place to wash, clothing, food, or shelter

Table 2 Hierarchical logistic regression models predicting physical violence in the six months following initial assessment (N = 281)

| Variable | Step 1 | | Step 2 | | Step 3 | | Step 4 | | Omnibus test | R ² |
|--------------------------------------|--------|-----------------------------|--------|-----------------------------|--------|-----------------------------|--------|-----------------------------|----------------------------|----------------|
| | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | | |
| Step 1. Demographic variables | | | | | | | | | | |
| Age ⁺ | 0.99 | (0.96 – 1.01) | 1.00 | (0.97 – 1.03) | 1.00 | (0.97 – 1.04) | 1.00 | (0.97 – 1.03) | $\chi^2 = 21.74^{**}$ | 0.10 |
| Race | | | | | | | | | | |
| Black/AA | 0.55 | (0.24 – 1.26) | 0.53 | (0.20 – 0.76) | 0.42 | (0.20 – 0.89) | 0.37 | (0.20 – 0.89) | | |
| Latina | 1.39 | (0.33 – 5.90) | 0.41 | (0.10 – 1.64) | 0.37 | (0.08 – 1.57) | 0.33 | (0.08 – 1.57) | | |
| Asian/PI | 1.36 | (0.23 – 7.91) | 2.15 | (0.52 – 8.45) | 2.76 | (0.52 – 8.87) | 2.69 | (0.52 – 8.87) | | |
| Other | 0.88 | (0.49 – 1.60) | 0.78 | (0.37 – 1.63) | 1.04 | (0.74 – 5.45) | 0.95 | (0.43 – 2.11) | | |
| Unmet needs last 6 mo [#] | 1.66 | (1.43 – 3.44) | 2.73 | (1.52 – 4.88) | 2.27 | (1.00 – 3.88) | 1.04 | (0.74 – 5.45) | | |
| Physical violence in previous 6 mo | 3.10 | (1.56 – 6.17) ^{**} | 2.98 | (1.51 – 5.91) ^{**} | 2.96 | (1.42 – 6.12) ^{**} | 2.82 | (1.35 – 5.88) ^{**} | | |
| Step 2. Child Abuse | | | | | | | | | | |
| Childhood physical abuse | | | 0.78 | (0.38 – 1.57) | 0.81 | (0.39 – 1.66) | 0.89 | (0.43 – 1.84) | $\chi^2 = 23.34^{**}$ | 0.11 |
| Childhood sexual abuse | | | 2.18 | (1.03 – 4.76) ^{**} | 2.10 | (1.10 – 4.05) ^{**} | 2.04 | (1.17 – 3.78) [*] | | |
| Step 3. Psychiatric disorders | | | | | | | | | | |
| PTSD | | | | | 1.19 | (0.63 – 2.28) | 1.08 | (0.56 – 2.07) | $\chi^2 = 21.22$ | 0.09 |
| Depressive Disorder (any) | | | | | 1.53 | (0.67 – 3.29) | 1.42 | (0.67 – 2.98) | | |
| Psychotic Disorder (any) | | | | | 1.13 | (0.60 – 2.47) | 1.04 | (0.40 – 2.21) | | |
| Alcohol Use Disorder | | | | | 2.06 | (0.93 – 3.44) | 1.95 | (0.97 – 3.94) | | |
| Cannabis Use Disorder | | | | | 0.99 | (0.42 – 2.60) | 0.96 | (0.41 – 2.25) | | |
| Amphetamine Use Disorder | | | | | 1.88 | (0.34 – 2.44) [*] | 1.71 | (0.93 – 3.16) [*] | | |
| Cocaine Use Disorder | | | | | 1.24 | (0.65 – 2.96) | 1.23 | (0.61 – 2.88) | | |
| Opiate Use Disorder | | | | | 1.12 | (0.57 – 2.22) | 1.05 | (0.53 – 2.07) | | |
| Step 4. Dissociation | | | | | | | 1.99 | (1.11 – 2.14) ^{**} | $\chi^2 = 33.81^{***}$ | 0.12 |
| Test of Increment | | | | | | | | | | |
| | | | | | | | | | Wald $\chi^2 = 12.80^{**}$ | |
| | | | | | | | | | Wald $\chi^2 = 7.36$ | |
| | | | | | | | | | Wald $\chi^2 = 8.57^{**}$ | |

Note. OR = odds ratios; CI = confidence interval; pseudo R² given by McFadden's R²;

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[†] Age was a continuous variable within the model;

[#] Insufficient access to bathroom, place to wash, clothing, food, or shelter;

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$.

Table 3
Hierarchical logistic regression models predicting sexual violence in the 6 months following initial assessment (N = 281)

| Variable | Step 1 | | Step 2 | | Step 3 | | Step 4 | | Omnibus test | R ² |
|---|--------|-----------------------------|---------------------------|-----------------------------|----------------------|-----------------------------|------------------------|-----------------------------|------------------------|----------------|
| | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | | |
| Step 1. Demographic variables | | | | | | | | | | |
| Age ⁺ | 1.05 | (0.97 – 1.04) | 1.02 | (0.97 – 1.07) | 1.04 | (0.98 – 1.11) | 1.05 | (0.98 – 1.11) | $\chi^2 = 26.68^{**}$ | 0.10 |
| Race | | | | | | | | | | |
| Black/AA | 0.21 | (0.04 – 1.14) ⁺ | 0.21 | (0.26 – 1.78) ⁺ | 0.14 | (0.24 – 2.09) | 0.71 | (0.24 – 2.15) ⁺ | | |
| Latina | 1.38 | (0.04 – 8.33) | 1.36 | (0.13 – 4.47) | 0.41 | (0.09 – 1.71) | 0.46 | (0.07 – 1.88) | | |
| Asian/PI | 1.33 | (0.83 – 7.57) | 1.33 | (0.82 – 8.76) | 4.63 | (0.74 – 10.48) | 4.78 | (0.75 – 12.37) | | |
| Other | 0.83 | (0.18 – 3.84) | 1.30 | (0.14 – 1.76) | 0.60 | (0.16 – 2.32) | 0.61 | (0.16 – 2.33) | | |
| Unmet needs in the last 6 mo [†] | 0.58 | (0.16 – 2.08) | 0.59 | (0.16 – 2.32) | 0.48 | (0.12 – 1.93) | 0.47 | (0.10 – 2.18) | | |
| Sexual violence in previous 6 mo | 5.20 | (1.12 – 8.21) [*] | 5.33 | (1.64 – 10.34) [*] | 4.33 | (1.00 – 13.89) [*] | 4.72 | (0.88 – 16.33) [*] | $\chi^2 = 28.25^{**}$ | 0.11 |
| Step 2. Child Abuse | | | | | | | | | | |
| Childhood physical abuse | 0.95 | (0.43 – 2.66) | 0.75 | (0.29 – 2.02) | 0.75 | (0.29 – 2.02) | 0.76 | (0.28 – 2.01) | | |
| Childhood sexual abuse | 3.88 | (1.54 – 8.89) ^{**} | 3.07 | (1.10 – 8.57) [*] | 3.35 | (1.25 – 9.00) [*] | 3.35 | (1.25 – 9.00) [*] | $\chi^2 = 30.33$ | 0.19 |
| Step 3. Psychiatric disorders | | | | | | | | | | |
| PTSD | | | 1.14 | (0.42 – 3.28) | 1.16 | (0.28 – 2.02) | 1.16 | (0.28 – 2.02) | | |
| Depressive Disorder (any) | | | 0.57 | (0.17 – 1.73) | 0.59 | (0.19 – 1.76) | 0.59 | (0.19 – 1.76) | | |
| Psychotic Disorder (any) | | | 6.20 | (1.44 – 26.78) [*] | 2.92 | (0.55 – 15.66) | 2.92 | (0.55 – 15.66) | | |
| Alcohol Use Disorder | | | 2.06 | (0.64 – 6.64) | 2.08 | (0.64 – 7.75) | 2.08 | (0.64 – 7.75) | | |
| Cannabis Use Disorder | | | 2.68 | (0.42 – 2.60) ⁺ | 2.70 | (0.54 – 8.26) ⁺ | 2.70 | (0.54 – 8.26) ⁺ | | |
| Amphetamine Use Disorder | | | 1.01 | (0.33 – 3.14) | 1.02 | (0.33 – 3.16) | 1.02 | (0.33 – 3.16) | | |
| Cocaine Use Disorder | | | 1.81 | (0.56 – 5.75) | 1.80 | (0.56 – 5.72) | 1.80 | (0.56 – 5.72) | | |
| Opiate Use Disorder | | | 0.83 | (0.28 – 2.44) | 0.82 | (0.28 – 2.43) | 0.82 | (0.28 – 2.43) | | |
| Step 4. Dissociation | | | 1.87 | (0.72 – 2.31) [*] | 1.87 | (0.72 – 2.31) [*] | 1.87 | (0.72 – 2.31) [*] | $\chi^2 = 38.83^{***}$ | 0.25 |
| Test of Increment | | | | | | | | | | |
| | | | Wald $\chi^2 = 9.54^{**}$ | | Wald $\chi^2 = 7.36$ | | Wald $\chi^2 = 6.01^*$ | | | |

Note. OR = odds ratios; CI = confidence interval; pseudo R² given by McFadden's R²;

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[†] Age was a continuous variable within the model;

[#] Insufficient access to bathroom, place to wash, clothing, food, or shelter;

⁺ $p < 0.10$;

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.0001$.