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Sexual assault trauma: Does prior childhood maltreatment increase the risk and exacerbate the outcome?*

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ABSTRACT

Background: Some individuals who have been sexually assaulted as adolescents or adults have also been abused in childhood, although it is not clear how different forms of childhood maltreatment are related to adolescent/adult sexual assault, and how earlier abuse alters the relationship between sexual assault and current symptomatology.

Objective: We sought to determine which types of child maltreatment are associated with adolescent or adult sexual assault, whether such child maltreatment interacts with sexual assault to predict more severe symptoms, and if sexual assault has unique symptom correlates after controlling for prior child maltreatment.

Participants and Setting: Participants were 398 women recruited online.

Results: A total of 36 % of women had experienced unwanted sexual contact at age 13 or younger (childhood sexual abuse [CSA]), 32 % had experienced unwanted sexual contact at age 14 or later (adolescent/adult sexual assault), and 24.4 % had experienced both. Of all forms of child maltreatment, only CSA was associated with sexual assault, doubling the risk relative to those without a history of CSA. CSA and sexual assault were each uniquely associated with current symptomatology, however there was no interaction between sexual assault and CSA on psychological symptoms.

Conclusions: CSA is associated with a greater risk of later sexual assault, and both CSA and sexual assault have additive effects on adult symptomatology. However, prior sexual abuse does not appear to exacerbate the effects of sexual assault, and sexual assault is associated with lasting psychological sequelae even when controlling for sexual abuse.

1. Introduction

The prevalence of sexual assault among adult women in the U.S. is generally estimated to be between 15 % and 22 % (Black et al.,

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2011; Elliott, Mok, & Briere, 2004; Michael, Gagnon, Laumann, & Kolata, 1994; Tjaden & Thoennes, 2000), with 19 % of university women reporting attempted or completed sexual assault since entering college (Krebs, Lindquist, Warner, Fisher, & Martin, 2009), and 12 % of high school girls reporting at least one instance of sexual assault (Black et al., 2011). In one of the most authoritative studies, the Centers for Disease Control's National Intimate Partner and Sexual Violence Survey (Black et al., 2011) reported that 18 % of women in America had been forced to engage in sexual activity without consent, through physical force, threat, or due to incapacitation at some time in their lives; within the prior 12 months, 6% had experienced other forms of sexual violence, including unwanted sexual contact, sexual coercion, or unwanted non-contact sexual experiences. A recent meta-analysis indicated that almost half of child sexual abuse survivors are sexually revictimized later in their lives (Walker, Freud, Ellis, Fraine, & Wilson, 2017).

The potential impacts of sexual assault on women, as described in the psychological literature, are substantial, and generally include increased levels of anxiety, depression, posttraumatic stress disorder (PTSD), suicidality, dissociation, substance abuse, sexual disturbance, and negative self-perceptions (Dworkin, Menon, Bystrynski, & Allen, 2017; Ullman, Relyea, Peter-Hagene, & Vasquez, 2013). As noted in several studies, these effects may persist over the long-term (e.g., Elliott et al., 2004; Kilpatrick, Edmunds, & Seymour, 1992). However, research often examines adult sexual assault in isolation, rather than controlling for the effects of antecedent types of victimization that also might contribute to later symptomatology.

1.1. Child maltreatment as a risk factor for adult sexual assault

Among risk factors such as younger age, sexual minority status, poverty, and consumption of alcohol or drugs (Abbey, Zawacki, Buck, Clinton, & McAuslan, 2004; Daigle, Fisher, & Cullen, 2008; Fernandez, 2011; Hequembourg, Livingston, & Parks, 2013), women's likelihood of sexual assault appears to be considerably greater among those abused as children, perhaps especially those who have also experienced childhood sexual abuse (CSA; Classen, Palesh, & Aggarwal, 2005; Van Bruggen, Runtz, & Kadlec, 2006; Walker et al., 2017). Although sexual revictimization has been the subject of several previous studies (e.g., Filipas & Ullman, 2006; Hequembourg et al., 2013; Messman-Moore & Long, 2003), research has been limited primarily to CSA, with other forms of childhood maltreatment being excluded (for a systematic review, see Walker et al., 2017). Notably, the few studies that have examined multiple forms of childhood maltreatment have provided inconsistent results (e.g., Desai, Arias, Thompson, & Basile, 2003; Nishith, Mechanic, & Resick, 2000; Schaaf & McCanne, 1998; Van Bruggen et al., 2006). Thus, the relative contributions of each form of childhood maltreatment to sexual revictimization remain unclear.

1.2. Contribution of abuse symptoms to later sexual assault effects

Because a significant proportion of sexual assault survivors also report childhood maltreatment, it might be argued that at least some of the symptoms attributed to adult victimization include unidentified long-term sequelae of antecedent child abuse, and/or the interaction between abuse and adult assault. This possibility has research, clinical, and forensic implications.

From a research perspective, the potential co-occurrence of childhood abuse and later sexual assault in some individuals highlights the need to include both childhood maltreatment and sexual assault sequelae in the same analyses. When both are not considered simultaneously, univariate analyses may overestimate the role of either variable on symptomatology. For example, examining sexual abuse without taking later sexual assault into account, or the reverse, may give either variable "credit" for symptom variance that is potentially due to the other variable (Cohen, Cohen, West, & Aiken, 2003).

As well, analyses that do not consider potential interactions between trauma types cannot determine whether the effect of one form of victimization (e.g., sexual assault) depends on (i.e., is moderated by) the presence of the other (e.g., child abuse). When such interactions occur, researchers are generally counseled to avoid interpretation of the main effects (Crawford, Jussim, & Pilanski, 2014; Jaccard & Turrisi, 2003). This suggests that abuse or assault associations with psychological symptoms should not be interpreted unless an abuse x sexual assault interaction has been tested for and not found. Yet, many studies report main effects of these variables without also examining their potential interactions.

In the clinical domain, knowledge that a sexual assault survivor also may be suffering from the effects of childhood maltreatment may support the use of interventions that address the effect of both the childhood and adult events, since focusing on just one or the other might address only part of the problem. Apropos of recent conceptualizations of *complex trauma* or *complex PTSD* (see Courtois & Ford, 2013; Herman, 1992), the cumulative or interactive effects of stressors in childhood and adulthood are thought to complicate and intensify posttraumatic outcomes (Breslau, Chilcoat, Kessler, & Davis, 1999; Briere, Kaltman, & Green, 2008; Briere, Agee, & Dietrich, 2016) and result in poorer responses to treatment (see Priebe et al., 2018). Thus, exposure to multiple interpersonal traumas across the lifespan may require multimodal treatment including cognitive, exposure-based, interpersonal, emotional regulation, and relational interventions in order to provide relief from a range of psychological symptoms (Briere & Scott, 2014; Courtois & Ford, 2015; Hopper et al., 2019).

In the forensic domain, the concern is potentially more adversarial in nature. It has been suggested, for example, that the existence of previous traumatic events invokes the legal notion of *preexisting psychological injury*, where the apportionment of civil damages (i.e., psychological effects deserving financial compensation) is determined by the contribution of previous trauma (e.g., child abuse) to psychological injuries otherwise attributed to the sexual assault (see Smith, 2010; and Vallano, 2013, for reviews).

1.3. The current study

In order to investigate these various issues, we examined the multivariate relationship between various forms of childhood

maltreatment (i.e., sexual, physical, and psychological abuse, and neglect), adolescent/adult sexual assault, and their interactions, with a range of psychological symptoms in a sample of 398 women recruited online. Although we were initially interested in studying both male and female participants, the very low number of men in the sample who reported both CSA and adolescent/adult sexual assault ($n = 11$, 4.0 %) prohibited meaningful multivariate analyses, let alone generalization of findings.

Based on clinical experience and the sexual assault literature, we hypothesized the following: (1) sexual assault would be relatively common; (2) childhood maltreatment, perhaps including physical abuse, psychological abuse, and psychological neglect, but especially CSA, would be associated with a greater likelihood of sexual assault; (3) both childhood abuse and adolescent/adult sexual assault would each uniquely contribute to current psychological symptoms; and (4) childhood abuse would interact with adolescent/adult sexual assault to produce more severe effects.

2. Methods

2.1. Procedures

Participants were recruited from the Social Psychology Network (<http://www.socialpsychology.org/expts.htm>) and Psychological Research on the Net (<http://psych.hanover.edu/research/exponnet.html>). All participants received the same information about the study and online announcements had the title: "Health and childhood experiences." When accessing the study, interested individuals were provided with the following short description of the study: "The purpose of this research is to explore within the general population, different aspects of well-being and to examine the links between early childhood experiences and later psychosocial adjustment. Participation in this study will involve the on-line completion of a confidential and anonymous questionnaire." As compensation for their involvement, participants were offered entry into a draw for \$100. Informed consent was obtained from all participants and the university's Human Research Ethics Board approved the study.

2.2. Participants

The mean age of women was 29.02 years ($SD = 10.28$). Participants' self-identified race was White/Caucasian ($n = 311$, 78.1 %), Hispanic/Latino ($n = 24$, 6%), Asian ($n = 15$, 3.8 %), Black/African Canadian or African American ($n = 18$, 4.5 %), First Nations/Indigenous Canadians or Americans ($n = 7$, 1.8 %), mixed race ($n = 14$, 3.5 %), and other/did not say ($n = 9$, 2.3 %). About one third reported an annual income below \$10,000 ($n = 138$, 34.7 %), 189 women (47.5 %) reported income between \$10,000 and \$49,999, and 71 women (17.8 %) reported income greater than \$50,000. A majority of the women ($n = 267$, 67.1 %) were in a relationship and self-identified as heterosexual ($n = 352$, 88.4 %).

2.3. Measures

2.3.1. Child maltreatment

Psychological abuse and neglect were evaluated using the *Psychological Abuse* and *Psychological Neglect* scales of the Psychological Maltreatment Review (PMR; Briere, Godbout, & Runtz, 2012). The PMR is a 30-item scale that evaluates noncontact maltreatment (emotional abuse, emotional neglect, lack of psychological support) by each parent or parental figure prior to age 18, which can be summed to yield a total score across caretakers. Participants are asked, "When you were 17 or younger, how often did the following things happen to you in the average year?" They responded on a scale ranging from 0 (never) to 6 (over 20 times a year). As in other studies (e.g., Briere, Runtz, Eadie, Bigras, & Godbout, 2019), scores were summed across mothers and fathers when there were scores for both parents, whereas when there was only one parent/caretaker in the participant's life, that one parent/caretaker's score was doubled to match the metric of the two-parent score. Cronbach's *alphas* for total psychological abuse and total psychological neglect ranged from .92 to .95 in the current study.

Physical abuse in childhood was assessed by a brief screening tool based on a measure developed by Leserman, Drossman, and Li (1995). Participants indicated whether each parent had either "hit, kicked, or beaten" them or "seriously threatened" them in an average year prior to age 18, on a scale ranging from 0 (never) to 6 (over 20 times a year). Physical abuse was considered present if participants indicated at least one of the above behaviors at a non-zero level for either parent.

CSA prior to age 14 was assessed using a modification of the screening measure developed by Leserman et al. (1995). Items addressed specific "unwanted" sexual behaviors ranging from genital exposure to intercourse. Responses to these items were used to create a single CSA score, coded as present (1) or absent (0).

2.3.2. Sexual assault

Because most women in this sample were relatively young, and thus only recently emergent from adolescence, a measure of adult (i.e., 18 years or older) sexual assault would likely underestimate participants' experiences of later-onset sexual victimization. In response, we categorized adolescent/adult sexual assault as occurring at age 14 or older, based on participants' responses to Leserman et al.'s (1995) items inquiring about having experienced: (a) unwanted, direct sexual contact that did not involve oral, vaginal, or anal intercourse; and/or (b) unwanted oral, vaginal, or anal intercourse. The resultant sexual assault variable was coded 0 for negative responses to both questions, and 1 for unwanted sexual contact, including unwanted oral, vaginal, or anal sexual intercourse. In this way, two non-overlapping sexual victimization variables were created: one assessing sexual maltreatment up to age 14 (CSA) and one measuring sexual trauma at 14 or older (adolescent/adult sexual assault).

2.3.3. Psychological symptoms

Psychological symptomatology was measured by the Trauma Symptom Inventory-2 (TSI-2, Briere, 2011), a standardized, self-report measure that assesses posttraumatic stress symptoms and other psychological sequelae experienced over the last six months. Each symptom-item is rated from 0 (*never*) to 3 (*often*) to form 12 scales, which are summarized by four factor scales (Godbout, Hodges, Briere, & Runtz, 2016): *Self* (consisting of TSI-2 scales and/or subscales measuring impaired self-reference, insecure attachment, and depression), *Posttraumatic Stress* (scales and/or subscales measuring intrusive experiences, defensive avoidance, hyperarousal, and dissociation), *Externalization* (scales and/or subscales measuring tension reduction behavior, dysfunctional sexual activities or problems, suicidality, and anger), and *Somatization* (subscales measuring general and pain-specific somatic preoccupation).

An advantage of using four summary factor scores in the present study, as opposed to all 12 individual TSI-2 scales, is that the central dimensions of trauma-related symptomatology can be evaluated, but the experiment-wise error rate and potentially overlapping content associated with a separate examination of each scale is minimized (Godbout et al., 2016). Because the TSI-2 evaluates a range of posttraumatic symptomatology, ranging from posttraumatic stress to externalization, self-disturbance, and somatization, various researchers have used it as a proxy for complex PTSD (e.g., Krammer, Grosse, Soyka, & Liebreinz, 2019) or, more generally, posttraumatic symptom complexity (e.g., Briere et al., 2008).

The TSI-2 has demonstrated acceptable psychometric properties in various contexts (e.g., Briere, 2011; Krammer et al., 2019; Nilsson, Dahlstrom, Wadsby, & Johannesson, 2018), although most items do not specifically reference trauma or adversity. Cronbach's alpha for the total TSI-2 factor scales in this study ranged from .75 to .87, and the alpha for the total TSI-2 score was .93. TSI-2 factor score means ranged from $M = 7.41$ ($SD = 4.70$) for Somatization to $M = 35.02$ ($SD = 18.68$) for Self.

2.4. Statistical analyses

2.4.1. Missing data management

Missing values for the variables examined in this study were 0.3 % for age, 0.8 % for CSA, 1.2 % for sexual assault, 7.5 % for psychological abuse and psychological neglect, 7.7 % for physical abuse, and 8.1 % for TSI-2 scores, yielding a total missing value rate of 13.9 %, which is at the lower end of missing values reported in published educational and psychological studies (McKnight, McKnight, Sidani, & Figueredo, 2007; Peng, Harwell, Liou, & Ehman, 2007). We conservatively coded missing dichotomous maltreatment variables in the present study as "no" responses (i.e., zero), whereas missing values for continuous variable were replaced in SPSS 23 with linear interpolated values, as suggested by Little and Rubin (2002).

2.4.2. Analytic strategy

We first conducted simple correlation and logistic regression analyses to determine which types of child maltreatment were significantly related to adolescent/adult sexual assault in this sample. Following multicollinearity analysis, which indicated an acceptable value of IVF < 4 (Hair, Black, Babin, & Anderson, 2010), we then conducted hierarchical multiple regression analyses, in which maltreatment variables found to be significant in the logistic regression analyses were entered, along with the adolescent/adult sexual assault variable, into the equation at Step 1, in order to determine their unique association with each of the TSI-2 factor scales and the TSI-2 total score. Age was also included at Step 1 as a control variable, given its typical correlation with TSI-2 scores (e.g., Briere, 2011) and the fact that older women have had more years in which they might be sexually assaulted, thereby increasing their overall risk. At Step 2, the interactions between child maltreatment variables and adolescent/adult sexual assault were added to the equation, in order to determine whether childhood maltreatment moderated the relationship between sexual assault and symptomatology.

Because the child maltreatment variables and TSI-2 scores were unlikely to be normally distributed, bootstrapping (Efron & Tibshirani, 1993) was applied in the multiple regression analyses, with the recommended 1000 random re-samples with replacement. This methodology corrects for bias associated with non-normal predictor and dependent variable distributions, and generates confidence limits and p values for the true value of coefficients (Chernick, 2007; Erceg-Hurn & Mirosevich, 2008). The resultant bootstrap statistics are asymptotically more accurate than those obtained through classic parametric testing (DiGiacco & Efron, 1996). In the present study, both regression (β) weights and bootstrap-corrected p values are reported. Finally, in order to control for the potential experiment-wise error rate inflation associated with the number of analyses conducted in this study, we constrained statistical significance to $\alpha < .01$ for all analyses.

3. Results

Participants reported high lifetime levels of sexual victimization (57.8 %; $n = 230$ out of 398). Specifically, 126 women (31.7 %) reported adolescent/adult sexual assault, while 142 (35.7 %) reported CSA, and 97 (24.4 %) reported having experienced both. Of those reporting any type of sexual victimization, 97 out of 230 (42.2 %) indicated victimization both before and after age 14. On scales potentially ranging from 0 to 60, participants endorsed a mean score of 40.59 ($SD = 27.15$) on the psychological abuse scale and 39.34 ($SD = 31.61$) on the psychological neglect scale. Of all women, 39.4 % ($n = 157$) reported childhood physical abuse; of those with a history of physical abuse, 44.6 % ($n = 70$) also reported CSA, and 56.7 % ($n = 89$) also reported adolescent/adult sexual assault. Simple correlation analyses indicated significant relationships between all types of childhood maltreatment, and with CSA and childhood physical abuse (but not psychological abuse and neglect) and adolescent/adult sexual assault (see Table 1).

Table 1
Correlations between Childhood Sexual and Physical Abuse and Adolescent/Adult Sexual Assault.

	CSA	CPA	PSY	NEG	SA
CSA	.	.15**	.20***	.27***	.33***
CPA		.	.45***	.44***	.17***
PSY			.	.71***	.11
NEG				.	.12
SA					.

Note. CSA = Childhood sexual abuse; CPA = Childhood physical abuse; PSY = Childhood psychological abuse; NEG = Child psychological neglect. N = 398.

** $p \leq .005$.
*** $p \leq .001$.

3.1. Multivariate associations with sexual assault risk

Logistic regression analysis revealed that participants who reported CSA were significantly more likely to report sexual assault in adolescence or adulthood, whereas participant age, psychological abuse, physical abuse, and psychological neglect were not associated with sexual assault status, $\chi^2(5, N = 398) = 52.98, p < .001$. See Table 2 for logistic regression results.

Because sexual abuse was significantly related to sexual assault, we performed χ^2 analyses to delineate the risk relationships between these variables. Cross-tabulation indicated that participants who reported sexual abuse in childhood had a 68 % chance of reporting sexual assault later in life, as compared to 34 % for those without a CSA history ($\chi^2[1, N = 398] = 42.28, p < .001$). These results indicated that the risk of sexual assault was twice as high (1.99) for those with CSA histories as compared to those without CSA.

3.2. Multivariate associations with symptomatology

As presented in Table 3, bootstrapped hierarchical multiple regression analyses, in which age, CSA, and adolescent/adult sexual assault were entered simultaneously to evaluate their relationship to TSI-2 factor scores, indicated that both CSA and adolescent/adult sexual assault were associated with all TSI-2 factors and the total TSI-2 score, with the exception of Somatization, which was not associated with CSA. The addition of the CSA x adolescent/adult sexual assault interaction at Step 2 did not increase prediction of symptoms: R^2 change = .00, $F(1,393) = 0.75, ns$.

4. Discussion

The current study reveals high rates of sexual victimization of girls and women, with 36 % of the sample reporting CSA at or before age 13, and 32 % reporting sexual assault at age 14 or older. CSA emerged as the sole antecedent to later sexual assault, doubling the risk of adolescent or adult sexual victimization. These results are consistent with previous studies identifying CSA as the strongest predictor of sexual revictimization (e.g., Desai et al., 2003; Nishith et al., 2000). As hypothesized, CSA and sexual assault were independently related to TSI-2 factor scores and the total TSI-2 score. Contrary to expectations, CSA did not interact with later sexual assault to produce higher levels of symptomatology.

Although the CSA and sexual assault rates were high, it is difficult to compare them to much of the existing literature. Because we wanted to evaluate adolescent and adult sexual assault within a reasonable time frame, given the average age of women in the sample, we used Leserman et al.'s (1995) definition of sexual abuse as sexual acts involving physical contact before age 14, and sexual assault as victimization occurring at age 14 or older. These age cut-offs are consistent with those used in several other related studies (e.g., Hequembourg et al., 2013; Humphrey & White, 2000; Van Bruggen et al., 2006). Had we delineated between sexual assault and CSA by using a different (e.g., older) age point (Briere & Elliott, 2003), relatively fewer women in the sample would have been

Table 2
Logistic Regression Predicting Sexual Assault Based on Age and Child Maltreatment History.

Variable	95 % CI				Wald (1)
	B	Exp(B)	lower	upper	
Age	.02	1.02	1.00	1.04	3.61
CSA	1.30	3.67	2.31	5.82	30.28***
CPA	0.59	1.80	1.11	2.94	5.57
PSY	0.00	1.00	0.99	1.01	0.02
NEG	0.00	1.00	0.99	1.01	0.28

Note. CSA = Childhood sexual abuse; CPA = Childhood physical abuse; PSY = Childhood psychological abuse; NEG = Child psychological neglect. N = 398.

*** $p \leq .001$ (bootstrap corrected).

Table 3

Bootstrapped Multiple Regression Analysis of TSI-2 Factor and Total Scores as a Function of Age, Child Sexual Abuse, and Adolescent/Adult Sexual Assault.

TSI-2 Scales	Age	CSA	SA	Multiple Regression Analysis		
	β	β	β	Adj. R^2	$F(3,394)$	p
SELF	.10	.16*	.14*	.05	7.61	< .001
PTS	-.07	.18***	.16**	.06	9.90	< .001
EXT	-.14**	.18**	.15**	.07	10.44	< .001
SOMA	-.00	.03	.26***	.07	10.63	< .001
Total score	-.11	.18**	.18**	.07	11.42	< .001

Note. Adj. R^2 = Adjusted R^2 ; SELF = TSI-2 Self factor; PTS = TSI-2 Posttraumatic Stress factor; EXT = TSI-2 Externalization factor; SOMA = TSI-2 Somatization factor; CSA = Childhood sexual abuse; SA = Adolescent or adult sexual assault.

$N = 398$.

* $p \leq .01$.

** $p \leq .005$.

*** $p \leq .001$ (bootstrap corrected).

categorized as having experienced sexual assault. As a result, it is likely that a smaller number of women were defined as having experienced CSA (i.e., at age 13 or younger) in the current study compared to studies that define sexual abuse as occurring up to age 17, and more women may have been categorized as having undergone sexual assault (i.e., at age 14 or higher) in our study than in studies where the minimum age of victimization was age 18.

Despite these age constraints, the sample reported high rates of CSA by age 13 (35.7 %) and sexual assault at age 14 or older (31.7 %) as well as a significant number of women who experienced both CSA and later sexual assault (24.4 %). The exact reason for these elevated rates in the current sample is unknown, but may be related to unmeasured characteristics of the sample and/or self-selection bias. Regarding the latter, although the initial description of the study made no reference to abuse or sexual assault, it did refer to the effects of “childhood experiences,” and the consent form noted that topics included “experiences of childhood maltreatment and other forms of victimization” – information that may have affected participation in unknown ways. It may be that provision of even this small amount of information influenced potential online respondents with a history of maltreatment and victimization to participate in greater numbers or dissuaded some people without a history of child maltreatment from participating. Alternatively, these rates may be representative of the internet population from which this sample was drawn. Further research is needed to evaluate: (a) the effects of study descriptions on participant recruitment, (b) the epidemiologic and mental health implications of age at the time of first sexual victimization, and (c) the best cut-off point for defining CSA versus adolescent or adult sexual assault. For example, future researchers might consider splitting participants into different age-of-onset groups (e.g., under age 14, ages 14–17, and 18 and beyond) when delineating sexual victimization and its effects.

Notably, the present study indicates that a history of adolescent/adult sexual assault is associated with individuals’ current symptomatology, above-and-beyond any effects of CSA, even though CSA was a risk factor for subsequent sexual assault. Although perhaps an expected finding (see [Dworkin et al., 2017](#)), this result is antithetic to suggestions sometimes raised in court that a given adolescent or adult sexual assault has had few psychological effects, or that symptoms of a sexual assault survivor are actually due to antecedent abuse experiences. At the same time, however, CSA was found to have independent long-term effects, meaning that individuals who have experienced both CSA and adolescent/adult sexual assault may suffer from the effects of both types of victimization simultaneously.

Contrary to our hypothesis, the present study did not find any evidence of interaction effects. Although CSA was associated with later sexual assault, and has been shown to have additive long-term impacts, it does not appear to exacerbate the effects of later sexual assault, nor does it serve as a precondition for later sexual assault effects. In other words, even though earlier CSA may contribute to an adult sexual assault survivor’s current symptomatology, the present study suggests that such abuse is unlikely to substantially increase the effects of her current sexual assault trauma.

4.1. Limitations

Interpretation of the present findings should take into account certain limitations. First, the use of a cross-sectional design does not allow causal inference. The research design was grounded in theory which acknowledges the temporal sequence of experienced trauma, but further studies are needed to confirm and clarify the revictimization trajectory of survivors. Moreover, this study was based on retrospective self-reports that may have introduced biases in participants’ recall of child abuse and sexual assault, as well as the potential for under- or over-reporting of psychological symptoms. However, previous studies that examined the validity of trauma disclosures in the course of research have shown self-reported data to be reliable (e.g., [McKinney, Harris, & Caetano, 2009](#)) and indicate that assessing sexual victimization experiences through behaviorally specific questions, as is the case in the current study, increases the accuracy of self-report ([Fricker, Smith, Davis, & Hanson, 2003](#); [Wilson & Miller, 2016](#)). The use of anonymously-acquired data from participants may have reduced bias or self-report effects, but this cannot be ruled out entirely. Further studies should consider using a longitudinal design where participants’ traumatic experiences, and the evolution of their symptomatology, could be monitored and disentangled. As well, future research might include a measure of physical (not just psychological) neglect,

and a more comprehensive multi-item assessment of childhood physical abuse.

Because the current study categorized nonsexual childhood maltreatment in terms of behaviors occurring up to age 17, we cannot rule out that some such maltreatment experiences actually occurred after the onset of adolescent/adult sexual assault, which was operationalized as occurring at age 14 or older. Future research that uses the 14-or-older requirement for sexual assault may choose to constrain the offset of physical and psychological child abuse and neglect to age 13 or younger, as was done in the present study for CSA.

The different thresholds, across different measures, for defining child abuse and adolescent/adult sexual victimization to some extent constrain the conclusions that can be made about the correlates of victimization in this study. For example, the child sexual abuse variable includes noncontact exposure of sexual body parts, whereas the adolescent/adult sexual assault variable is limited to actual sexual contact. In addition, as noted, the age range for childhood sexual abuse was constrained to acts before age 14, whereas the measures of physical and psychological abuse include victimization up to age 17. Finally, several victimization variables were dichotomized (e.g., child sexual and physical abuse) whereas childhood psychological abuse and neglect were treated as continuous variables. Although these differences reflect, among other things, the use of established measures and procedures in the maltreatment literature, they may have introduced unmonitored variation in the current findings. Future research should strive to make all child and adolescent/adult trauma measures more equivalent in terms of contact/noncontact (for sexual victimization), age range, and level of measurement (e.g., dichotomous versus continuous variables).

The predominantly Caucasian, heterosexual, and college-educated composition of the sample may alter the generalizability of the findings as women of different ethnicities, sexual orientations, and education levels may have different risks of revictimization and symptomatic responses. Similarly, the fact that this study was conducted on women may or may not limit its usefulness in understanding revictimization in males.

Importantly, further studies are needed to identify phenomena in addition to child maltreatment that might influence survivor's revictimization trajectories. For example, emotional dysregulation (Charak, DiLillo, Messman-Moore, & Gratz, 2018), substance abuse (Messman-Moore & Long, 2002), dysfunctional sexual behaviors (Van Bruggen et al., 2006), and insecure attachment (Brenner & Ben-Amity, 2015) have been linked to sexual revictimization, and should be further studied and examined within integrated models as they potentially mediate, moderate, or combine with child maltreatment to increase the likelihood of sexual assault. Studies might also take into account the specific characteristics of childhood abuse and later sexual assault (e.g., age at onset, frequency, duration, severity, relational proximity with the perpetrator[s]), to determine their differential effects on symptomatology severity and complexity.

4.2. Clinical implications

The prevalence of sexual victimization found in the current study and elsewhere, the strong association between childhood sexual abuse and later sexual assault, and the contributions of multiple types of victimization to current symptoms have significant practical implications for prevention, assessment, and intervention. As noted by others (e.g., Van der Put, Assink, Gubbels, & Boekhout van Solinge, 2018), it appears that preventing child maltreatment would not only have humanitarian benefits in terms of eliminating a widely prevalent source of suffering in society, it would also likely decrease the incidence of later, "downstream" victimization, including adolescent and adult sexual assault. These data suggest that not only should modern sexual assault-prevention programs (e.g., Senn et al., 2015) be widely employed, there also should be readily-available interventions for child maltreatment survivors that have been shown to reduce the likelihood of revictimization later in life (e.g., DePrince, Chu, Labus, Shirk, & Potter, 2015). Such programs might increase the abuse survivor's ability to detect risky situations, apply effective problem-solving and communication skills, regulate abuse-related emotional states, and engage in self-protection behaviors that may reduce the risk of revictimization (see also Marx, Calhoun, Wilson, & Meyerson, 2001). Psychoeducation may also be important, perhaps especially in terms of increasing the individual's understanding of the consequences of childhood maltreatment (e.g., substance abuse, involvement in risky behaviors) that, although not the client's fault, increase danger by interfering with risk-detection and self-protection (Briere, 2019; DePrince et al., 2015; Noll & Grych, 2011).

Treatment implications of the current study pertain primarily to the finding that childhood and adolescent/adult sexual victimization experiences can each contribute to current symptomatology, often leading to more complex symptom outcomes. The current study suggests that a range of adversities are associated with a range of symptoms, thereby supporting research linking multiple types of trauma exposure to more complex outcomes, including Complex PTSD. However, the TSI-2 was not developed to specifically evaluate the currently proposed criteria for this symptom pattern, as presented in the 11th edition of the International Statistical Classification of Diseases and Related Health Problems (ICD-11; Karatzias et al., 2017). Future researchers might seek to replicate the current findings with measures that directly evaluate Complex PTSD, such as the International Trauma Questionnaire (ITQ; Cloitre et al., 2018; Hyland, Shevlin, Fyvie, & Karatzias, 2018).

Notably, in the present study CSA and adolescent/adult sexual assault were independently associated with current symptomatology. Especially since these forms of victimization appear to be intercorrelated, it may be insufficient to treat the effects of a single event in an individual who has experienced other forms of victimization, each of which can produce separate psychological symptoms (Briere & Scott, 2014; Courtois & Ford, 2015; Messman-Moore & Kaplinska, 2016). For example, a client presenting with symptoms associated with a recent rape may also benefit from treatment of her prior CSA experiences, since each of these adversities may be contributing to current psychological difficulties. Similarly, those seeking treatment of child abuse effects are relatively likely to have experienced later forms of victimization that are also part of the symptom picture. Attending to the full range of client victimization experiences may be especially important when using therapeutic exposure to treat trauma symptoms (e.g., Foa & Rothbaum, 2001),

as this may require processing of specific memories associated with different forms of maltreatment at different times of life (Briere et al., 2016; Briere, Dias, Semple, Godbout, & Scott, 2017).

4.3. Forensic implications

The current findings are relevant to legal determinations of psychological injury in court. As noted by Smith (2010), the extent of psychological harm attributed to a sexual assault may vary according to whether the current symptoms are linked primarily to the most recent trauma or whether the earlier trauma exacerbated the effects of the later trauma. Thus, it might be argued that the symptoms experienced by a sexual assault survivor with a history of CSA reflect the effects of the earlier experience rather than the most recent one, and therefore the current assailant would not be liable for psychological damages. The current data tend to argue against this formulation, suggesting that childhood abuse sequelae and those of adolescent/adult sexual assault are functionally independent; the presence of the former does not increase the impacts of the latter, and sexual assault appears to have long-term effects, regardless of prior CSA. On the other hand, although exacerbation effects were not found in the present study, these findings do not entirely resolve legal problems associated with apportioning the damages associated with current sexual assault. For example, it could be argued that symptoms in a recent sexual assault survivor might be due to the cumulative (albeit non-interactive) effects of both the recent event and earlier childhood traumas. Thus, the exact proportion of symptoms uniquely attributable to the sexual assault would be difficult to determine. In summary, the present study suggests that although sexual assault is more likely among those exposed to CSA, symptomatology following sexual assault is not primarily a function of prior CSA. At the same time, however, antecedent CSA may add to the suffering associated with sexual assault. These results have forensic and clinical implications, primarily as they relate to the individual and cumulative effects of multiple traumas.

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