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Measuring Abuse Sequelae: Validating and Extending the Trauma Symptom Checklist-40

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Abstract

The current study used the *Trauma Symptom Checklist-40* (TSC-40) to index both childhood sexual abuse (CSA) and childhood physical abuse (CPA) in a college student sample of both men and women ($N = 441$). Although the TSC-40 was designed as a measure of CSA trauma, this study concludes the measure is appropriately reliable for indexing the traumatic sequelae of CPA as well as CSA in nonclinical samples. The current study also explored the effects of gender and abuse severity on resulting symptomatology, finding that women and severely abused individuals report the most negative sequelae. Both CSA and CPA emerged as significant explanatory variables in TSC-40 scale scores beyond gender, supporting its validity for indexing traumatic sequelae in nonclinical samples.

Keywords: Sexual Abuse, Physical Abuse, Child Abuse, Trauma Symptom Checklist

Measuring Abuse Sequelae: Validating and Extending the Trauma Symptom Checklist-40

Traumatic childhood experiences often lead to long-term psychological difficulties in adulthood (Briere & Elliot, 1994; Briere & Runtz, 1989; Elliot & Briere, 1992; Gold, Milan, Mayall, & Johnson, 1994; Higgins & McCabe, 1994; Whiffen, Benazon, & Bradshaw, 1997; Zlotnick, Shea, Begin, Pearlstein, Simpson, & Costello, 1996). Two commonly investigated traumatic childhood experiences are childhood sexual abuse (CSA) and childhood physical abuse (CPA). Child abuse is defined by minimum federal standards according to the Child Abuse Prevention and Treatment Act (CAPTA; U.S. Department of Health and Human Services, 2003) and is further refined by individual state law. CSA is minimally defined as the forced engagement of children in sexual activities or in a sexually explicit manner (USDHHS, 2003). CPA is minimally defined as intentional physical injury to children which includes striking, kicking, burning, biting, or any other action resulting in physical impairment (USDHHS, 2003).

The negative sequelae associated with CSA and CPA cause significant impairments in life functioning across age groups (Molnar, Buka, & Kessler, 2001). Following abuse, children and adolescents display a variety of dysfunction in cognitive, affect, interpersonal, and psychophysiological domains (Gold et al., 1994). At times, symptoms of dysfunction in these domains extend to the long-term effects of abuse seen in adulthood. Adult survivors of CSA and CPA frequently experience negative psychological effects such as depression, dissociation, anxiety, post-traumatic stress, sexual problems, and somatization (Briere & Elliot, 1994; Browne & Finkelhor, 1986; Gold et al., 1994; Griffin & Amodeo, 2010; Zlotnick et al., 1996). The current study examines the performance of a measure of trauma-related symptoms (e.g., the Trauma Symptom Checklist-40; TCS-40) when used as a research instrument with nonclinical

samples to measure both childhood physical and childhood sexual abuse trauma in adult men and women.

Incidence of CSA and CPA

Two sources report on the incidence of CSA and CPA in the United States. The Fourth National Incidence Study of Child Abuse and Neglect (NIS-4) Report to Congress (2010) was designed to estimate rates of child abuse perpetrated by parents or caretakers by examining abuse cases seen by over 5,600 community professionals (Sedlak et al., 2010). The NIS-4 estimated that 25.7% of children were physically abused and 10.8% of children were sexually abused by parents or caretakers in 2005-2006 (Sedlak et al., 2010). Another survey, the National Child Abuse and Neglect Data System (NCANDS), accounts for other perpetrators of abuse such as relatives of the victim, unmarried partners of parents, friends or neighbors (USDHHS, 2010). Based on abuse cases reported to Child Protective Services, the NCANDS found that 17.8% of children were physically abused and 9.5% were sexually abused in 2009 (USDHHS, 2010).

Prevalence of CSA and CPA in College Samples

Research on childhood maltreatment using college recruitment sources has increased over the past several decades. These studies often employ self-report measures. For samples of college men and women combined, self-reports of CSA range from 8.2% to 34% (Boudewyn & Liem, 1995; Brandyberry & MacNair-Semands, 1998; Clemmons Walsh, DiLillo, & Messman-Moore, 2007; Cruise, 1998; Finkelhor, 1979; Witchel, 1989), self-reports of CPA range from 9.1% to 20% (Clemmons, 2004), and self-reports of both CSA and CPA range from 1.3% to 3.8% (Clemmons, 2004; Clemmons et al., 2007). For college men, self-reports of CSA range from 10% to 16% (Boudewyn & Liem, 1995; Clemmons, 2004; Clemmons et al., 2007). For college women, self-reports of CSA range from 6.3% to 28% and self-reports of CPA ranged

from 14.7% to 32.4% (Boudewyn & Liem, 1995; Cruise, 1998; Fox & Gilbert, 1994; Fromuth, 1986; Gagnon, 1965; Gold et al., 1994; Messman-Moore, Walsh, & DiLillo, 2010).

Severity of Abuse and Long-Term Effects

The severity of abuse may predict the likelihood of long-term effects in adult survivors of childhood abuse. Wright, Master, and Hubbard (1997) suggested that severity of abuse be defined by exposure to traumatic events, as they found that greater exposure to traumatic events is related to an elevated likelihood of symptoms. Severity of abuse may thus be explored by examining the frequency with which abuse was experienced. Frequency of abuse has been demonstrated to be significantly correlated to four TSC-40 subscales and the overall TSC-40 scale (Elliot & Briere, 1992). Several studies have measured frequency of abuse to contribute to the construct of severity (Clemmons, 2004; Clemmons et al., 2007; Elliot & Briere, 1992). A few studies have demonstrated that more frequent abuse is related to greater adjustment difficulties and more symptomatology later in life (Clemmons, 2004; Elliot & Briere, 1992). Thus for the purposes of our study reported here, frequency of abuse will be used as an indicator of abuse severity.

Trauma Symptom Checklist-40 (TSC-40)

Despite the widespread prevalence of childhood abuse and knowledge of long-term negative effects, there have been relatively few measures developed that index the effects of childhood victimization. Among the measures used to assess the specific symptomatology of CSA is the Trauma Symptom Checklist-40 (TSC-40, Elliot & Briere, 1992). The TSC-40 has demonstrated adequate levels of reliability and validity in assessing adult adjustment in CSA survivors (Elliot & Briere, 1992; Higgins & McCabe, 1994). A number of research studies support the ability of the TSC-40 to discriminate between abused and non-abused respondents

(Elliot & Briere, 1992; Higgins & McCabe, 1994; Warner, 1997). In addition, it has been found to display predictive validity in regard to CSA in clinical and nonclinical samples, though only a small proportion of studies using the TSC-40 have utilized college samples as nonclinical recruitment sources (see e.g., Brandyberry & MacNair-Semands, 1998; Clemmons, 2004; Cruise, 1998; Elliot & Briere, 1992; Follette, Polusny, Bechtle & Naugle, 1996; Gold et al., 1994; Warner, 1997).

Though the TSC was designed to measure the long-term effects of CSA, Briere and Runtz (1989) indicated the measure may encompass other traumatic life experiences and encouraged the investigation of other childhood stressors like CPA. Several studies have used the TSC-40 for measuring the effects of CPA (see e.g., Brandyberry & MacNair-Semands, 1998; Clemmons, 2004; Clemmons et al., 2007; Dunn, Ryan, & Dunn, 1994; Elliot & Guy, 1993; Follette et al., 1994) but only a few have done so in a college sample (e.g., Brandyberry & MacNair-Semands, 1998; Clemmons, 2004). Using the TSC-40 to measure the long-term effects of both CSA and CPA offers an evaluation of how victim typology influences subsequent dysfunction. The co-occurrence of CSA and CPA may indicate heightened long-term effects, which is important to understand as both of these types of abuse may be experienced concurrently in childhood abuse.

The Current Study

This research was motivated by our desire to identify a measure that could briefly index trauma-related symptoms people experience in adulthood secondary to childhood physical and/or sexual abuse. If one measure could be used to examine the trauma related to both types of abuse, researchers could then substitute one measure for two, particularly for studies in which traumatic symptoms are not necessarily the primary research question. For example, we often research

juror decision-making in court cases. We recently conducted a study in which we presented evidence of a defendant's childhood abuse history and we wanted to index the jurors' own abuse histories to see if their personal experiences and traumatic symptomatology moderated their perceptions of the defendant's mitigation arguments. At a minimum we wanted to be able to control for the jurors' personal trauma symptoms as a result of abuse.

We questioned whether the TSC-40 could function as such a measure. We wanted to know whether the TSC-40 would be useful to include in research with nonclinical samples (e.g., not people seeking treatment for trauma or sexual abuse – the typical sample TSC-40 studies have used). Though research using college students as nonclinical samples is increasing, there is still substantial work that may be done to validate the TSC-40 in this population. Furthermore, most of the literature on the TSC-40 includes women evaluatees. We thought it would be useful to measure the traumatic symptoms of both women and men. Therefore, we decided to examine how the measure would perform with a college student sample (both men and women) for the purpose of measuring both physical and sexual abuse trauma.

We chose to use the TSC-40 for this study for several reasons. Primary among them was that the TSC-40 is one of the few instruments developed for measuring the traumatic sequelae of childhood abuse. Other reasons include that the psychometric data already available regarding the instrument is strong, it is relatively short and easy to use, it is in the public domain and available for use at no charge to researchers, and it was designed and validated for research purposes. We used the TSC-40 despite the existence of a more recent measure, the Trauma Symptom Inventory (TSI; Briere, 1995) because the TSI is a clinical instrument (Briere, 1996). Briere (1996) suggested the TSI be used in cases requiring a validated psychological test of

posttraumatic response, which was not a factor in the current study. Therefore, we determined that the TSC-40 would be an adequate measure for the purposes of this study.

- Hypothesis 1: Experiencing both sexual and physical abuse will be associated with experiencing a greater number of trauma-related symptoms in adulthood compared to no abuse and sexual or physical abuse in isolation.
- Hypothesis 2: Severity of childhood physical and sexual abuse will be positively related to experiencing trauma-related symptoms in adulthood.

Method

Participants

Undergraduate students ($N = 441$) at a large, southeastern university in the United States who were at least 18 years of age served as participants in this study. The mean age of the students was 18.98 years ($SD = 3.03$). The sample was 67% female and 33% male, 82% percent of whom were Caucasian, 10% African American, 4% from a Latino/a background, and 4% from a different racial background. They were recruited from Introductory Psychology courses as partial completion of research requirements.

Procedure

Participants were greeted upon arrival and given a copy of a participant information sheet to read and keep. We then asked participants to complete a questionnaire packet which included basic demographic questions, items inquiring about participants' prior experience with and attitudes toward childhood abuse and punishment, and questions regarding the types of symptoms they had been experiencing in the two months prior to the survey. All participants were given a debriefing document before they left, which briefly described the variables being

investigated and invited participants to contact the researchers if they were interested in obtaining the results of the study.

Measures

Abuse history questionnaire. We developed this questionnaire to inquire about the participants' experiences with child physical and sexual abuse. Questions included the frequency with which participants experienced physical and sexual abuse, when they experienced the abuse, and whether they sought help. Some of these questions were designed based on Higgins and McCabe's Family and Sexual History Questionnaire (1994), and others were based on Fricker, Smith, Davis, and Hanson's (2003) findings that behaviorally-specific questions (e.g., "have you ever been made to touch someone's genitals when you didn't want to?") are superior to label-based questions (e.g., "have you ever been sexually abused?") for eliciting accurate endorsement.

Specifically, the questions we included regarding physical abuse were "Before the age of 18, did any authority figure (e.g., parent, teacher, etc.), male or female, ever, 1) hit you really hard – harder than you deserved?; 2) hit you with an object or instrument (e.g., a belt, a spoon, a switch, etc.) harder than you deserved?; 3) punch or kick you?; or 4) physically injure you in any other way that was undeserved? This might include burning or cutting you, and etc.; 5) If you answered yes to any of the above questions, please try to remember approximately how many times these events occurred (total); and 6) If you answered yes to any of these questions, at what age were you first treated this way?"

The questions we included regarding sexual abuse were "Before the age of 18, 1) did anyone, male or female, ever make you touch their genitals or (for women) breasts when you didn't want to?; 2) did anyone, male or female, ever touch your genitals or (for women) breasts

when you didn't want to?; 3) did anyone, male or female, ever put their mouth on your genitals or (for women) breasts when you didn't want to?; 4) did anyone, male or female, ever put their fingers or objects inside your anus or (for women) vagina when you didn't want to?; 5) did a man or boy ever put his penis inside any part of your body (mouth, anus, or [for women] vagina) when you didn't want him to?; 6) If you answered yes to any of the above questions, please try to remember approximately how many times these events occurred; and 7) If you answered yes to any of these questions, at what age did this first happen to you?"

Trauma Symptom Checklist-40 (TSC-40). Briere and Runtz (1989) developed the TSC-40 as a brief instrument to be used in research on the traumatic impact of childhood sexual abuse. The measure yields a total score as well as six subscale scores: Dissociation, Anxiety, Depression, Post-Sexual Abuse Trauma, Sleep Disturbance, and Sexual Problems. The measure consists of 40 items of adult symptoms of psychological adjustment associated with childhood maltreatment. Respondents indicate on a four-point scale (0, *never* to 3, *often*) the frequency with which s/he experienced each item in the previous two months (e.g., insomnia, crying, guilt, etc.). The TSC-40 has been shown to discriminate effectively between nonabused and abused individuals, with higher scores for those who had been abused (Elliot & Briere, 1992; Higgins & McCabe, 1994; Warner, 1997).

In this sample, alpha coefficients were acceptable for the Total Score (0.92), Sexual Problems (0.83), Anxiety (0.77), Sleep Disturbance (0.76), Dissociation (0.74), and Depression (0.70) scales; however, the alpha coefficient for the Post-Sexual Abuse Trauma scale was less acceptable (0.60; Cronbach, 1951). These values are consistent with those reported by Briere and Runtz (1989; $\alpha = 0.66-0.89$) and Elliott and Briere (1992; $\alpha = 0.62-0.90$). Alpha coefficients have been criticized as imperfect indicators of internal consistency because of their reliance on

intercorrelations among items and number of items (see e.g., Cortina, 1993). Another method of internal consistency reliability estimation, calculating average inter-item correlations, is not dependent upon number of items (Clark & Watson, 1995; Cortina, 1993). We examined the average inter-item correlations for the total scale and the subscales in this same as a secondary method of internal reliability estimation. Recommended benchmarks for average inter-item correlations are values between 0.15 and 0.50 (Clark & Watson, 1995). The values for the total score (0.22) and each of the subscale scores fall within the recommended benchmarks (Dissociation = 0.33, Anxiety = 0.26, Depression = 0.21, PSAT-h = 0.21, Sleep Disturbance = 0.34, Sexual Problems = 0.45). We conclude on the basis of both methods of reliability estimation that these scales are appropriately reliable for use in this population.

Demographics. Participants completed a demographic questionnaire, inquiring about such items as age, gender, ethnicity, socioeconomic status, and religious orientation.

Results

The parametric assumptions were checked prior to data analysis. The independence assumption was not violated and the dependent variables had approximately normal distributions and equal variances. We conducted two omnibus multivariate tests to assess the effect of history of childhood physical and sexual abuse on the TSC-40. Each model included seven dependent variables (TSC-40 total score and six subscales) and gender as a control variable. The predictors were what differed between the two models: the first was a MANOVA with one independent fixed factor (type of abuse [no abuse, physical abuse only, sexual abuse only, physical and sexual abuse]). The second was a MANCOVA with two continuous predictors entered as covariates (severity of childhood physical and sexual abuse). Although we could have built a single model with all the predictors, we decided against that because of the multicollinearity between the

categorical and continuous predictors. We chose to use these conservative multivariate tests to reduce alpha inflation, as we intended to conduct several univariate tests. We examined whether the demographic variables other than gender accounted for significant variance. They did not, so they were not included in the final models.

For these analyses, the assumption of equal group sizes for the independent variables was violated. The “no abuse” condition had many more people compared to the abuse conditions. To the extent that group sizes are unequal, statistical power diminishes (Sheskin, 2004). However, we decided to move forward with the analysis for three reasons. First, the statistical program used (i.e., SPSS) automatically adjusts for unequal group sizes. Second, using a nonparametric test for this analysis would have further sacrificed statistical power and did not seem warranted given that the dependent variables met the parametric assumptions. Third, our results were compelling despite the degradation of statistical power due to unequal sample size.

The MANOVA yielded a significant multivariate effect for type of abuse above and beyond the effects of gender, *Wilks' Lambda* = 0.85, $F(21, 1184) = 3.26$, $p < 0.001$, $\eta_p^2 = 0.05$. We further explored the MANOVA findings by examining separate univariate ANOVAs on each dependent variable with examination of LSD post-hoc comparisons for significant effects. We found significant univariate effects for type of abuse while controlling for gender on the TSC-40 total score ($F(3, 418) = 13.93$, $p < 0.001$, $\eta_p^2 = 0.09$) and all six TSC-40 subscales ($F_s(3, 418) \geq 5.35$, $p_s \leq 0.001$, $\eta_p^2 \geq 0.04$; see Table 1).

[INSERT TABLE 1 HERE]

LSD pairwise comparisons revealed that each of the three abuse conditions (physical only, sexual only, and both physical and sexual) was associated with significantly higher TSC-40 total scores than no abuse at all ($p_s \leq 0.006$; see Table 1). This indicates the measure does

indeed tap into the sequelae of abuse more broadly defined than just sexual abuse. Our first hypothesis, that experiencing both physical and sexual abuse would be associated with higher trauma symptom scores compared to either type of abuse in isolation or no abuse, was partially supported. Experiencing both types of abuse was associated with significantly higher scores compared to no abuse on the TSC-40 total scale and 4 subscales (Dissociation, Anxiety, Depression, and Post-Sexual Abuse Trauma; $ps \leq 0.01$; see Table 1). However, no difference was found between both types of abuse and no abuse for the Sleep Problems ($p = 0.20$) or Sexual Problems ($p = 0.14$) subscales. Victimization from both types of abuse was associated with significantly higher scores on the Anxiety subscale compared to physical abuse in isolation ($p = 0.04$). However, higher scores were not found for both types of abuse trauma compared to physical abuse for the total score ($p = 0.24$) nor the other five subscales ($p \geq 0.09$). Experiencing both types of abuse was not associated with higher scores on the total scale or any subscales compared to sexual abuse in isolation ($p \geq 0.19$).

The MANCOVA also yielded significant multivariate effects for severity of physical abuse, *Wilks' Lambda* = 0.90, $F(7, 411) = 6.77$, $p < 0.001$, $\eta_p^2 = 0.10$ and severity of sexual abuse, *Wilks' Lambda* = 0.94, $F(7, 411) = 3.78$, $p = 0.001$, $\eta_p^2 = 0.06$ while controlling for gender. We further explored the MANCOVA findings by using separate univariate ANCOVAs on each dependent variable with follow-up examination of parameter estimates (see Table 2 for detailed results). We found significant univariate effects on all six TSC-40 subscales and the total score for both severity of childhood physical abuse ($\beta_s \geq 0.43$, $t_s \geq 4.14$, $ps < 0.001$, $\eta_p^2 \geq 0.04$) and severity of sexual abuse ($\beta_s \geq 0.96$, $t_s \geq 2.12$, $ps \leq 0.034$, $\eta_p^2 \geq 0.01$). The positive relations indicate that our second hypothesis is supported. Severity of childhood physical and sexual abuse is significantly related to experiencing more trauma-related symptoms in adulthood.

For each unit increase participants endorsed on the childhood abuse severity items, trauma symptom ratings on each scale increased (see Table 2 for specific values).

[INSERT TABLE 2 HERE]

We then conducted a stepwise regression to explore the degree to which severity of physical and sexual abuse contributed to the variance in TSC-40 total scores. Results indicated that the full $R^2 = 0.105$, which indicated the model (i.e., regressing severity of physical and sexual abuse on total TSC-40 scores) predicted 10.5% of the variability in total TSC-40 scores. Physical and sexual abuse severity could thus explain a statistically significant amount of variability in the dependent variable (TSC-40 scores), $F(2, 431) = 25.32, p < 0.001$. To explore the unique ability of each predictor, we examined the stepwise results in which sexual abuse severity was entered in the first step and was joined by physical abuse severity in the second step. The R^2 value for sexual abuse severity alone was 0.031 (3.1%), a significant portion of variance, $F(1, 432) = 13.58, p < 0.001$. When physical abuse severity was added in, the R^2 change (0.075; 7.5%) was significant, $F\Delta(1, 431) = 35.97, p < 0.001$. These results demonstrate that physical abuse severity actually accounted for most of the variability in TSC-40 scores for this nonclinical community sample, and that sexual abuse severity added a relatively small but unique ability to explain the variance in TSC-40 scores in this sample.

Discussion

The TSC-40 is a reliable and internally consistent measure appropriate for measuring the traumatic impact of childhood abuse in a nonclinical sample with both men and women. The measure taps into not only sexual abuse trauma – what the TSC-40 was originally designed to measure – but also physical abuse trauma. Of note, we found a significant effect of gender on the TSC-40, in which women score significantly higher on almost all of the scales – even with no

abuse history. Therefore, we controlled for the effect of gender in our models. Physical and sexual abuse each accounted for a significant amount of variance in TSC-40 scale scores above and beyond the effects of gender. The finding that traumatic effects of each type of abuse emerged as significant while controlling for the effects of gender lends support to the validity of this measure. These findings may be particularly useful for researchers whose primary research questions are not about abuse sequelae, but who wish to index abuse sequelae as just one piece of their project. For instance, our research lab often conducts research on jury decision-making. In a recent study, we presented evidence about a defendant's history of childhood abuse and we needed to control for the participants' personal histories of abuse to interpret our results. Based on the results of this study, the TSC-40 is an appropriate measure to use in situations like this.

Although we expected victims experiencing both physical and sexual abuse would evidence a greater number of trauma-related symptoms on the TSC-40 total score compared to victims experiencing only one type of abuse or no abuse at all, the pattern of results did not fully support this hypothesis. On the TSC-40 total score, participants reporting both types of abuse evidenced higher scores than participants with no abuse history. However, no difference in total scores emerged between participants experiencing both types of abuse compared to participants experiencing only one type of abuse (either physical or sexual abuse in isolation). Based on these results, it appears the traumatic legacy of experiencing either physical or sexual abuse may be just as strong as experiencing both types of abuse, and further, that the traumatic symptoms of either type of abuse may present similarly.

To explore the issue of traumatic presentation in more depth, we examined the pattern of TSC-40 subscale scores for each of the abuse groups. Participants who experienced both physical and sexual abuse had significantly higher subscale scores compared to those who experienced no

abuse on four of the six subscales (Dissociation, Anxiety, Depression, and Post-Sexual Abuse Trauma). Both types of abuse were associated with higher scores on the Anxiety Subscale compared to physical abuse in isolation, but no other subscales were significantly different between both types of abuse and physical abuse only. Thus, sexual abuse itself may contribute to anxiety, or perhaps a greater severity of abuse (e.g., both physical and sexual abuse) leads to anxiety symptomatology. Future studies might be able to answer this question. No differences in the six subscale scores emerged between participants experiencing both types of abuse compared to those experiencing only sexual abuse. Therefore, this measure may be more sensitive to the trauma of sexual abuse history, consistent with the purpose for which it was designed.

Our second hypothesis, that severity of childhood physical and sexual abuse would predict higher trauma-related symptoms, was supported. The TSC-40 total score and each of the six subscales evidenced the same pattern of relations – greater physical and sexual abuse severity predicted higher trauma symptoms each scale. The finding that physical abuse trauma registers significant relations on each of these TSC-40 scales compared to sexual abuse trauma is important and relevant for a variety of future research questions. Perhaps of most interest in this regard are the stepwise regression results presented below.

To explore how much variability in trauma scores could be explained by physical abuse compared to sexual abuse, we conducted a stepwise regression. Results indicated that physical abuse accounted for more of the variance than sexual abuse did in this sample. However, examination of the standardized beta weights in Table 2 indicates that sexual abuse is more strongly related to trauma symptoms on this scale than physical abuse. These data can be best understood by taking into account the characteristics of this sample – this was a nonclinical

community (college student) sample. Most of the people in this sample did not report abuse, and of those that did, most of the abuse reported was physical abuse. Therefore, the statistical power in the tests involving physical abuse history was greater than those involving sexual abuse history. It is likely that a sample with equal numbers of people who had experienced physical and sexual abuse would yield results indicating that sexual abuse accounts for a greater percentage of unique variability than physical abuse.

Limitations and Future Directions

Using a college student sample necessarily limited the generalizability of these results in regards to a “community” sample. This sample only provides an estimate of the rate and impact of childhood physical and sexual abuse for a subsample of the population: students choosing to attend university, most of whom were Caucasian. The usefulness of identifying an instrument that can measure the prevalence of childhood physical and sexual abuse in college samples is a first step toward validating the measure for a broader section of the population. Given that many researchers include college students as participants, this first step is meaningful; however, more research is needed with this instrument before it can be used with a community sample. For example, perhaps the college student population has a lower base rate of abuse victimization than an average community member. If this is the case, it is possible that these findings would be stronger in a sample of individuals with a higher base rate of physical and/or sexual abuse.

Of note, although the rate of physical abuse in our sample is consistent with other studies with similar samples, the sexual abuse reported by our sample was low (3.9%) – even lower than what might be expected based on other studies with college student samples. For instance, Fromuth (1986) found a CSA base rate of 22% in a college student sample consisting of all women. Clemmons and colleagues (2007) reported a CSA base rate of 8.2% in a male and

female college student sample. Messman-Moore et al. (2010) reported that 6.6% of the college women in their sample endorsed a history of CSA. The much higher base rate reported in Fromuth's (1986) study may have been as a result of a self-selection effect. In Fromuth's (1986) recruitment materials, participants were informed that the experience would "explore the effects of childhood sexual experiences on current psychological and sexual adjustment" (p. 6). In contrast, Messman-Moore and colleagues (2010) did not indicate that childhood abuse would be part of the study. Their online recruitment titled the study "Beliefs about interpersonal relationships" (p. 971). Similar to Messman-Moore and colleagues' (2010) method, our study's recruitment materials did not reveal to participants that abuse experiences would be inquired about (although our informed consent statement did). Our online recruitment materials were vaguer, indicating "participants [would] be asked to answer a questionnaire about themselves."

Another potential limitation of the research is that it is based upon self-report data on a topic about which people may not want to accurately report. Research has strongly suggested that CSA and CPA are often undisclosed and underreported (Bagley, 1992; Browne & Finkelhor, 1986; Goodman-Brown, Edelstein, Goodman, Johnes, & Gordon, 2003; McKinney, Harris, & Caetano, 2009; Tsai & Wagner, 1978). Several reasons exist for this phenomenon, including a lack of opportunity to report, discomfort reporting to a stranger, fearfulness of retaliation by the perpetrator, shame and embarrassment about the abuse, or fear that people not believe them (Bagley, 1992; Goodman-Brown et al., 2003; McKinney et al., 2009; Tsai & Wagner, 1978). It is possible that more people in this sample experienced than reported CSA. Although this problem may affect our study, it is also a problem that affects any self-report study on this topic. Research findings to complement these findings should find other ways of incorporating data

about CSA and CPA (e.g., accessing medical records or department of children/family records with appropriate permission).

As discussed in the results section, our sample sizes for the categories of abuse (i.e., none, physical only, sexual only, both physical and sexual) were unequal. This violation of the equal sample sizes assumption for parametric analysis poses a problem for analyzing this data and interpreting results. To address this limitation of the present study, additional data needs to be collected from people who have experienced CSA, CPA, and both CSA/CPA. A randomly selected equal number of non-abused people could then be sampled to include in comparative analyses to meet the assumption of equal sample size.

While many reports use abuse frequency as a proxy indicator for severity, as we did, abuse frequency is at best an incomplete marker of severity. Other factors that clearly contribute to abuse severity include the intensity of abuse, the invasiveness of the abuse, the relationship of the victim to the perpetrator, the number of perpetrators involved, the duration of the abuse incident(s), implicit or explicit threats of violence prior to, during, or after the abuse incident(s), and so forth. Future studies must take into account some of these complicating factors when indexing the severity of abuse.

We were able to demonstrate adequate reliability of the TSC-40 for use in research with nonclinical samples; however, the contributions of this study regarding the validity of the TSC-40 for this purpose are limited. We did not include other measures of abuse sequelae with which to demonstrate convergent or discriminant validity. Although we were able to demonstrate some criterion-related validity with regard to the fact that increased traumatic symptomatology was associated with increased severity of abuse, future studies should add to the psychometric data

about the validity of the measure by including additional measures of abuse sequelae in a sample like ours.

These limitations are balanced by several strengths. First, we had a large sample size with adequate statistical power to conduct these tests. Second, we used omnibus tests to reduce the alpha inflation and chances of making a Type II error. Third, we added to the psychometric literature about the TSC-40, and concluded that the measure is appropriate for measuring the traumatic sequelae of both physical and sexual abuse in a nonclinical sample. These findings support the use of the TSC-40 in studies in which researchers are interested in briefly indexing abuse sequelae, particularly for studies in which traumatic symptoms are not the primary research question. Future researchers may be able to build on existing literature by using the TSC-40 in a broader way than it has typically been used.

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Table 1.

Multivariate, Univariate, and Post-Hoc test results and associated Means and Standard Deviations of TSC-40 Scales by Type of Abuse.

	Univariate Tests*	Physical Abuse <i>n</i> =162	Sexual Abuse <i>n</i> =7	Physical & Sex <i>n</i> =10	No Abuse <i>n</i> =262
<i>Scale</i>	<i>F</i> (3, 418)= <i>eta</i> _{<i>p</i>} ² =	<i>M</i> (<i>SD</i>)			
Dissociation	7.47 0.05	4.45 (3.81) ^a	4.86 (3.93)	5.90 (4.36) ^b	3.14 (2.77) ^{a,b}
Anxiety	10.40 0.07	3.95 (5.07) ^{a,c}	4.86 (4.98)	7.20 (5.05) ^{c,d}	3.22 (2.94) ^{a,d}
Depression	8.99 0.06	5.90 (4.19) ^a	8.14 (2.80) ^e	7.50 (2.80) ^f	4.51 (3.34) ^{a,e,f}
P-SAT	7.04 0.05	3.01 (2.66) ^d	4.00 (3.00) ^g	4.30 (3.77) ^h	2.19 (2.13) ^{d,g,h}
Sleep Disturbance	5.35 0.04	6.89 (3.51) ⁱ	8.86 (4.88) ^j	7.30 (3.13)	5.83 (3.64) ^{i,j}
Sexual Problems	8.96 0.06	2.39 (3.23) ^{a,k}	5.39 (5.63) ^{a,k,l}	2.63 (3.10) ^l	1.28 (2.43) ^a
TSC-40 Total Score	13.93 0.09	25.36 (16.23)^a	32.39 (18.42)^h	30.63 (13.35)^m	17.87 (12.18)^{a,h,m}

Note: P-SAT = Post-Sexual Abuse Trauma. *All univariate tests are statistically significant at the $p \leq 0.001$ level or below. Significantly different means within each subscale in *post-hoc* tests depicted by superscript: ^a = significantly different means at $p < 0.001$, ^b $p = 0.009$, ^c $p = 0.048$, ^d $p = 0.001$, ^e $p = 0.008$, ^f $p = 0.01$, ^g $p = 0.047$, ^h $p = 0.006$, ⁱ $p = 0.003$, ^j $p = 0.025$, ^k $p = 0.007$, ^l $p = 0.049$, ^m $p = 0.004$.

Table 2.

Severity of Childhood Abuse on TCS-40 Scales.

<u>Scale</u>	<u>Physical Abuse</u>				<u>Sexual Abuse</u>			
	β	<i>t</i>	<i>p</i> *	η_p^2	β	<i>t</i>	<i>p</i> *	η_p^2
Dissociation	0.68	4.89	<0.001	0.05	1.36	2.76	0.006	0.02
Anxiety	0.82	5.21	<0.001	0.06	1.53	2.73	0.007	0.02
Depression	0.74	4.83	<0.001	0.05	1.54	2.82	0.005	0.02
P-SAT	0.43	4.27	<0.001	0.04	0.96	2.65	0.008	0.02
Sleep Disturbance	0.62	4.14	<0.001	0.04	1.34	2.12	0.034	0.01
Sexual Problems	0.58	4.84	<0.001	0.05	1.98	4.63	<0.001	0.05
TSC-40 Total Score	3.73	6.40	<0.001	0.09	7.54	3.62	<0.001	0.03

Note. P-SAT = Post-Sexual Abuse Trauma. *All relations are statistically significant at the .05 level or below (two tailed).