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The Child PTSD Symptom Scale: Psychometric Properties in Female Adolescent Sexual Assault Survivors

Seth J. Gillihan,
Department of Psychiatry, University of Pennsylvania

Idan M. Aderka,
Department of Psychology, Boston University

Phoebe H. Conklin,
Department of Psychiatry, University of Pennsylvania

Sandra Capaldi, and
Department of Psychiatry, University of Pennsylvania

Edna B. Foa
Department of Psychiatry, University of Pennsylvania

Abstract

Traumatic experiences are common among youths and can lead to posttraumatic stress disorder (PTSD). In order to identify traumatized children who need PTSD treatment, instruments that can accurately and efficiently evaluate pediatric PTSD are needed. One such measure is the Child PTSD Symptom Scale (CPSS), which has been found to be a reliable and valid measure of PTSD symptom severity in school-age children exposed to natural disasters (Foa, Johnson, Feeny & Treadwell, 2001). However, the psychometric properties of the CPSS are not known in youths who have experienced other types of trauma. The current study aims to fill this gap by examining the psychometric properties of the interview (CPSS-I) and self-report (CPSS-SR) administrations of the CPSS in a sample of 91 female youths with sexual abuse-related PTSD, a population that is targeted in many treatment studies. Scores on both the CPSS-I and CPSS-SR demonstrated good to excellent internal consistency. One week test-retest reliability assessed for CPSS-SR scores was excellent (r = .86); inter-rater reliability of CPSS-I scores was also excellent (r = .87). Symptom-based diagnostic agreement between the CPSS-SR and CPSS-I was excellent at 85.5%; scores on both the CPSS-SR and CPSS-I also demonstrated good convergent validity (74.5–76.5% agreement) with the PTSD module of The Schedule of Affective Disorders and Schizophrenia for School-Age Children–Revised for DSM-IV (K-SADS; Kaufman, Birmaher, Brent, & Rao, 1997). The strong psychometric properties of the CPSS render it a valuable instrument for PTSD screening as well as for assessing symptom severity.

Keywords

Assessment; posttraumatic stress disorder; adolescent; trauma; measurement

Traumatic experiences such as domestic and school violence, accidents, and sexual assault are common among youths and lead to posttraumatic stress disorder (PTSD) in some

Correspondence concerning this article should be addressed to Edna B. Foa, Center for the Treatment and Study of Anxiety, Department of Psychiatry, University of Pennsylvania, Philadelphia, PA 19104. foa@mail.med.upenn.edu.
Seth J. Gillihan is now at Department of Psychology, Haverford College.Idan M. Aderka is now at Department of Psychology, University of Haifa, Israel.Phoebe H. Conklin is now at Department of Psychology, Rutgers University

individuals. In order to identify PTSD among children and adolescents who may require treatment for their problems, the need is paramount for instruments that can accurately and efficiently evaluate pediatric PTSD. Clinician-administered structured diagnostic interviews represent the gold standard for PTSD treatment outcome studies in which accuracy of PTSD diagnosis and severity are crucially important. When there is a need to assess a large number of youths who have been exposed to a mass traumatic event, the time and expense associated with structured diagnostic interviews may be prohibitive. For these situations, brief self-report instruments can effectively and efficiently assess trauma-exposed youths and identify those that are most likely to have PTSD; such identification allows clinicians to focus their resources on individuals most in need of clinical care.

There are a variety of measures that assess PTSD symptoms in children (for a review see Strand, Sarmiento, & Pasquale, 2005); self-report instruments include the Child and Adolescent Trauma Survey (CATS; March & Amaya-Jackson, 1997), the Child Post-Traumatic Stress Disorder Reaction Index (CPTSD-RI; Frederick, 1985; Pynoos et al., 1987), the Child PTSD Symptom Scale (CPSS; Foa, Johnson, Feeny, & Treadwell, 2001), the Child Report of Post-traumatic Symptoms (CROPS; Greenwald & Rubin, 1999), the Children's Reactions to Traumatic Events Scale (CRTES; Jones, 1994), and the Impact of Events Scale for Children (IES; Horowitz, Wilner & Alvarez, 1979). Interview-based assessments of PTSD in children and adolescents include the Posttraumatic Stress Module of the Child and Adolescent Psychiatric Assessment (CAPA-C; Angold et al., 1995), the CPSS (Foa et al., 2001) when administered as an interview, the Children's Impact of Traumatic Events Scale Revised (CITES-R; Wolfe, Gentile, Michienzi, Sas, & Wolfe, 1991), the Clinician-Administered PTSD Scale for Children and Adolescents (CAPS-CA; Nader et al., 2002), and the Los Angeles Symptom Checklist (LASC; King, King, Lesking, & Foy, 1995).

Only a small subset of the measures listed above assess all symptoms in the three clusters (reexperiencing, avoidance, and arousal) of PTSD symptoms from the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (*DSM-IV-TR*; American Psychiatric Association, 2000), thereby providing diagnostic information. These measures include the CAPA-C, the CPSS, the CROPS, the CAPS-CA, and the CITES-R. Advantages of the CPSS include the relative brevity of the scale (24 items; cf. 78 items for the CITES-R; Wolfe et al., 1991) and short administration time (approx. 15 minutes; cf. 60 minutes for the CAPA-C, and 30–120 minutes for the CAPS-CA; Strand et al., 2005), the availability at no cost (both the CAPA-C and the CROPS are available for a fee), and the inclusion of a functional impairment scale.

The CPSS has been widely used to assess PTSD symptom severity among school-aged children (e.g., Nevo & Manassis, 2011; Smith et al., 2007) and adolescents (e.g., Gilboa-Schechtman et al., 2010) of various ethnic and cultural backgrounds including Israel (e.g., Aderka, Foa, Applebaum, Shafran, & Gilboa-Schechtman, 2011), Nepal (Kohrt et al., 2008), the Nova Scotian Mi'Kmaq community (Zahradnik et al., 2010), Chile (Bustos, Rincón, & Aedo, 2009), Latino youths in the US (Kataoka et al., 2003), American Indian youth (Goodkind, LaNoue, & Milford, 2010) and children who recently immigrated to the US (Jaycox et al., 2002). The scale also has been translated into many languages, including Armenian, Chinese, German, Hebrew, Korean, Norwegian, Polish, Russian, Spanish, and Swedish. To our knowledge, Foa et al. (2001) provided the only comprehensive report on the psychometric properties of the English version of the CPSS among a sample of 75 school-aged children (ages 8–15) who experienced an earthquake in Northridge, CA. Children completed the CPSS at an initial assessment, and 65 of the original 75 children completed the CPSS a second time 1–2 weeks later. In this sample, scale internal consistency was high: coefficients alpha were .89 for total score, .80 for reexperiencing, .73

for avoidance, and .70 for arousal. Other groups have reported similarly high internal consistency for the CPSS total score (e.g., Mullet-Hume, Anshel, Guevara & Cloitre, 2008; Kataoka et al., 2003; Jaycox et al., 2002). Foa and colleagues also reported moderate to high test-retest reliability—.84 for total score, .85 for reexperiencing, .63 for avoidance, and .76 for arousal—and good convergent and divergent validity.

Given the widespread use of the CPSS in the US and abroad, it is problematic that such limited psychometric data are available. Furthermore there are serious limitations of the study by Foa et al. (2001). First, the sample was limited to survivors of an earthquake; thus the properties of the CPSS in youths exposed to other types of trauma, and in survivors of repeated versus single-incident traumas, remain unknown. According to the Standards for Educational and Psychological Testing, the psychometric properties associated with a measure's use in one population cannot be assumed to generalize to new populations (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999); it follows that conclusions based on test scores in a new population may not be valid. Likewise, it cannot be assumed that the psychometric properties of the test scores will generalize to samples drawn from different populations (e.g., Vacha-Haase, Kogan, & Thompson, 2000). Consequently it is imperative to conduct further research on the psychometric properties of the scale in different populations of trauma survivors, with respect to both demographic characteristics and type of trauma experienced (Balaban, 2006; Ohan, Myers, & Collett, 2002). Second, the sample recruited by Foa et al. was relatively homogenous with respect to ethnicity, socioeconomic status, and religion, again raising questions about the generalizability of their findings. Third, the Foa et al. study used a self-report administered criterion measure (CPTSD-RI) to evaluate convergent validity of scores on the CPSS, rather than a clinician-administered measure. Finally, the previous study used only the self-report version of the CPSS.

The current study addresses the limitations of the psychometrics study by Foa et al. (2001). First, it extends the examination of the psychometric properties of the CPSS to a demographically diverse sample of adolescent girls with sexual abuse-related PTSD (both single-incident and repeated traumas) who were enrolled in a randomized controlled trial of treatment for PTSD. The current study also compares diagnoses derived from the CPSS to diagnoses based on the Schedule of Affective Disorders and Schizophrenia for School-Age Children–Revised for *DSM-IV* (K-SADS; Kaufman, Birmaher, Brent, & Rao, 1997), a widely used semi-structured clinical interview that allows for a more precise assessment of the diagnostic accuracy of the CPSS compared to the self-report administration of the CPTSD-RI used in the Foa et al. (2001) study. An additional advantage of the current study is that unlike previous studies which have administered the CPSS only as a self-report measure (CPSS-SR), we administered the CPSS in both a self-report and an interview (CPSS-I) format. Examining the correlation between these two forms of CPSS administration provides important information about the reliability and the validity of CPSS scores based on self-report administration. This information is particularly important because the CPSS has been used as a self-report screening measure.

We chose to examine the psychometric properties of the CPSS among survivors of sexual assault because of the high rates of PTSD following sexual abuse (e.g., Gillespie et al., 2009; Kessler et al., 1995). Furthermore, a recent meta-analysis of cognitive-behavioral therapy studies of PTSD among children and adolescents revealed that the majority of these studies targeted sexual assault survivors (Kowalik, Weller, Venter, & Drachman, 2011). Thus it is crucial to determine the psychometric performance of the CPSS among a sample drawn from this population.

Method

This research study received approval from the institutional review board at the university from which the study was conducted.

Participants

The sample included 91 adolescent girls from a community-based rape crisis center in a large city in the northeastern US who sought treatment for PTSD following sexual trauma. All participants provided written informed assent or consent (as applicable) to participate in this research study; parents provided consent for individuals under the age of 18. Participants received either client-centered therapy or prolonged exposure therapy weekly for a total of 14 weeks. The mean age was 15.3 years (SD = 1.5), and ages ranged from 13 to 18. Of the 86 participants who provided information about their race, the majority were of African-American (55 participants, 64.0%), European (18, 20.9%), and Hispanic (9, 10.5%) descent. All participants were diagnosed with PTSD according to DSM-IV criteria, using the K-SADS, which was administered by a doctoral-level clinician. Most participants (68.8%) had comorbid disorders in addition to PTSD (see Table 1), with the most common diagnosis being major depressive disorder (47.3%). The average number of comorbid diagnoses was 0.99 (SD = 1.05, range = 0 to 4).

Measures

Child PTSD Symptom Scale (**CPSS**; Foa et al., 2001). The CPSS is designed to assess PTSD diagnosis and symptom severity in children ages 8–18 who have experienced a traumatic event. It has 24-items, 17 of which correspond to the DSM-IV symptoms. Each of the 17 items is rated on a scale from 0 to 3 with total score ranging from 0 to 51. An additional seven items that inquire about daily functioning (e.g. relationships with friends, schoolwork) are rated as either absent (0) or present (1) and yield a total impairment severity score ranging from 0 to 7. The total impairment score does not contribute to the overall score. The CPSS has shown good internal consistency (α =.89 for total score, .80 for reexperiencing, .73 for avoidance, and .70 for arousal), and scores on the measure have shown good test-retest reliability (.84 for total score, .85 for reexperiencing, .63 for avoidance, and .76 for arousal), and convergent validity (Foa et al., 2001; see Introduction section of the current report).

The Schedule of Affective Disorders and Schizophrenia for School-Age Children–Revised for DSM-IV (**K-SADS**; Kaufman et al., 1997) is a semi-structured interview administered by trained clinical interviewers. The K-SADS assesses the presence of previous and current psychiatric disorders based on information provided by both the patient and the patient's guardian. Diagnoses based on the K-SADS have shown excellent reliability and validity among clinical samples (Kaufman et al., 1997).

The Beck Depression Inventory (**BDI;** Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961) is a 21-item measure of depressive severity that is widely used in a variety of populations and has been normed for adolescents. Each item is rated on a 4-point scale (0–3) with total scores ranging from 0 to 63. This measure was chosen to examine the concurrent validity of CPSS scores, as depression is a construct that tends to show strong overlap with PTSD. Split-half reliability of BDI scores is .93, and correlations with clinician ratings of depression range from .62 to .65 (Beck et al.).

Spielberger State-Trait Anger Expression Inventory-2 (**STAXI-2**; Spielberger, Sydeman, Owen, & Marsh, 1999) is a 57-item self-report inventory assessing the experience, expression and control of anger. The inventory is divided into three parts. State and trait

anger are assessed by asking the respondent to rate the intensity and frequency of angry feelings and reactions using a 4-point Likert-type scale. Anger control is assessed by presenting descriptions of reactions and asking the respondent to rate how often he or she behaves in the manner described when angry or furious, again using a 4-point Likert-type scale. Internal consistency of the STAXI-2 scales and subscales ranged from alpha = .73 to .95 (Mdn. α = .88). High scores on the STAXI-2 scales (≥75th percentile) suggest anger experience and expression that interferes with normal functioning (Spielberger et al.).

Trauma History Interview. In order to precisely assess the presence of trauma exposure that meets PTSD Criterion A (*Diagnostic and Statistical Manual of Mental Disorders* 4th ed., text rev.; *DSM–IV–TR*; American Psychiatric Association, 2000), the Trauma History Interview (THI) was administered. This clinician-administered interview includes questions about the nature of the trauma and the individual's response to it (e.g., helplessness, terror). The THI is a revised version of the Standardized Assault Interview (SAI) that has been administered in studies of adult trauma survivors (e.g. Foa, Hearst-Ikeda, & Perry, 1995; Foa, Rothbaum, Riggs, & Murdock, 1991). The SAI has shown satisfactory inter-rater reliability (K = .81; Foa et al., 1991).

Procedure

Initial evaluation. A doctoral-level clinician administered the CPSS-I to determine PTSD symptom severity, the K-SADS to assess current and lifetime psychiatric diagnoses, and the Trauma History Interview. Participants completed the CPSS-SR, BDI, and STAXI-2, as well as other measures not relevant to the current report.

Weekly self-reports. Participants completed the CPSS-SR and BDI at every weekly treatment session (sessions 1–14) for a total of 14 weeks in order to track symptom change during the course of treatment.

Periodic evaluations. Evaluations of PTSD symptom severity were completed at the mid- and end-points of the 14-week treatment period , and at 3-, 6- and 12-month follow-up. At each of these five evaluations, a clinician administered the CPSS-I and the PTSD module of the K-SADS, and participants completed the CPSS-SR, BDI, and STAXI-2. These evaluations provided measures of symptom change during and at the end of treatment and at follow-up.

Results

Missing Data

The complete pre-treatment CPSS data included 3094 values, of which 210 were missing (6.78%). To examine if missing data influenced our results we conducted Little's Missing-Completely-At-Random (MCAR) test (Little & Rubin, 1987). This test examines if patterns of actual missing data significantly differ from a random distribution of missing data; thus, a non-significant result indicates that data are missing completely at random (Little & Rubin, 1987). We found that missing data in our sample were missing completely at random (Little's MCAR $\chi^2(164) = 169.9$, $p = .36$); thus no systematic bias existed in the current dataset as a result of missing data. We did not replace missing values in the dataset. Importantly, we used all available data on an analysis-by-analysis basis; in other words, we did not limit analyses to individuals with complete data, but rather used all available data for each analysis. Scores on the CPSS-SR and CPSS-I were normally distributed (Shapiro-Wilk statistic = .99, df = 81, p = .65; Shapiro-Wilk statistic = .98, df = 81, p = .12 for the CPSS-SR and CPSS-I, respectively) and thus did not require transformation.

PTSD Diagnosis and Severity

All results were based on baseline administration of the CPSS unless otherwise specified. To correct for multiple comparisons, only differences at the $p < .01$ level were considered significant. The mean CPSS-SR score was 29.98 ($SD = 9.05$, $n = 83$), and the mean CPSS-I score was 26.86 ($SD = 9.21$, $n = 88$). For the CPSS-SR, the mean re-experiencing, avoidance and arousal subscales were 8.27 ($SD = 3.47$, $n = 83$), 11.40 ($SD = 4.51$, $n = 83$), and 10.31 ($SD = 3.05$, $n = 81$) respectively. For the CPSS-I, the mean re-experiencing, avoidance and arousal subscales were 6.83 ($SD = 3.45$, $n = 88$), 10.40 ($SD = 4.50$, $n = 88$), and 9.64 ($SD = 3.29$, $n = 88$) respectively.

Age was not significantly correlated with the total CPSS-SR and CPSS-I scores ($r = .05$, $p = .64$, $n = 80$; $r = .09$, $p = .42$, $n = 85$, respectively) or their subscales (all ps $> .39$, $n = 80$–87). Similarly, race was unrelated to CPSS-SR, CPSS-I and their respective subscales (all ps $> .20$, $n = 80$–87). Thus the CPSS-SR and CPSS-I do not seem to be influenced by these demographic variables.

Internal Consistency

The total CPSS-SR score demonstrated high internal consistency (Cronbach's α = .83). Cronbach's α for the subscales was .74, .71, and .58, for re-experiencing, avoidance and arousal, respectively. Correlations between the subscales and the total score were high: .82, .86, and .77 for the respective subscales (Table 2). The total CPSS-I score demonstrated high internal consistency as well (Cronbach's α = .81). Cronbach's α for the subscales was .74, .67, and .50, respectively. Correlations between the subscales and the total score were high: .80, .84, and .80 (Table 2), respectively.

Test-retest Reliability

To establish the test-retest reliability of scores on the CPSS-SR we compared assessments from the first two treatment sessions (sessions 1 and 2) which took place one week apart. The test-retest coefficients for the total score and the subscales were high: .86 ($p < .001$, $n = 40$) for the total score, .83 ($p < .001$, $n = 40$) for re-experiencing, .81 ($p < .001$, $n = 40$) for avoidance, and .77 ($p < .001$, $n = 40$) for arousal. Consecutive assessments using the CPSS-I were over 6 weeks apart during the course of treatment in which participants were expected to improve. Therefore, we were unable to examine test-retest reliability for scores on this measure. To approximate this test-retest coefficient we examined correlations between CPSS-SR at session 7 and CPSS-I one week later. The justification for this comparison was the high correlation between the self-report and interview administrations at baseline ($r = .80$, $p < .001$, $n = 81$), suggesting that both means of administering the instrument measure the same construct. The correlation between CPSS-SR at session 7 and CPSS-I one week later was good at .77 ($p < .001$, $n = 33$) for the total score, .67 ($p < .001$, $n = 33$) for re-experiencing, .70 ($p < .001$, $n = 33$) for avoidance, and .75 ($p < .001$, $n = 33$) for arousal. The correlations between CPSS-SR at session 7 and CPSS-I at session 8 occurred midway through treatment; as some individuals dropped-out by mid-treatment and others did not attend both sessions, the sample size was reduced to 33.

Inter-rater Reliability

In order to determine inter-rater reliability of scores on the CPSS-I, master's level clinicians trained in administering the CPSS-I reviewed 25 (27.5%) of the audio recorded CPSS interviews selected at random and scored the CPSS-I accordingly. Cohen's κ was .87 for the total score, .91 for re-experiencing, .80 for avoidance, and .93 for arousal. Cohen's κ for the single items ranged from .61 to 1.00. Thus, CPSS-I scores demonstrated high inter-rater reliability.

Concurrent Validity

In order to determine the concurrent validity of CPSS scores we assessed the relation between the two administrations of this measure and another measure of psychological distress, the BDI, which is commonly used to assess depression symptoms. The total BDI scores were moderately correlated with the total CPSS-SR ($r = .65$), as well as with the reexperiencing ($r = .44$), avoidance ($r = .64$), and arousal ($r = .43$) subscales (all ps < .001, $n = 75$). Similarly, BDI scores were moderately correlated with the total CPSS-I ($r = .55$), as well as with its reexperiencing ($r = .42$,), avoidance ($r = .42$), and arousal ($r = .42$) subscales (all ps < .001, $n = 74$). Thus both administrations of the CPSS were correlated significantly with another measure of psychological distress.

Convergent Validity

We used diagnoses established by the K-SADS for 51 participants at post-treatment, 3-, 6-, or 12-month follow-up to examine the convergent validity of CPSS scores. We used the follow-up assessments to ensure that variability in diagnosis existed (PTSD diagnosis was required for entry into the treatment study). For the purpose of assessing convergent validity, participants who endorsed at least one reexperiencing item, at least three avoidance items, and at least two arousal items on the CPSS were categorized as having PTSD, whereas participants who did not meet these criteria were categorized as not having PTSD. According to the K-SADS, 20 of 51 individuals (39.2%) were categorized as having PTSD at follow-up. According to the CPSS-SR and the CPSS-I, 21 (41.2%) and 20 (39.2%) individuals, respectively, were categorized as having PTSD at follow-up. Agreement between the K-SADS and the CPSS-SR diagnoses was 74.5% and agreement between the K-SADS and the CPSS-I diagnoses was 76.5%. The CPSS-SR and CPSS-I diagnoses had an agreement rate of 94.1%.

Divergent Validity

In order to assess the divergent validity of scores on the CPSS we examined the correlations between the STAXI-2 and both administrations of the CPSS. State anger as measured by the STAXI-2 was not significantly correlated with the total CPSS-SR ($r = .19$, $p = .12$) or with the reexperiencing ($r = .14$, $p = .24$), and avoidance ($r = .09$, $p = .44$) subscales; it was marginally associated with the arousal subscale with alpha set at .01 ($r = .25$, $p = .04$; all Ns = 71). STAXI-2-measured trait anger showed similarly low and nonsignificant correlations with the CPSS-SR total score ($r = .20$, $p = .09$) and the reexperiencing ($r = .14$, $p = .25$), avoidance ($r = .22$, $p = .07$), and arousal ($r = .11$, $p = .37$; Ns = 70) subscales. Scores on the CPSS-I and its subscales were not significantly correlated with state anger (rs = –.02 – .06, ps > .63, $N = 75$) or with trait anger (rs = –.01 – .10, ps > .38, $N = 74$). Anger expression as measured by the STAXI-2 also was not significantly associated with scores on the CPSS-SR and its subscales (rs = –.01 – .14, ps > .27, $N = 68$) or with scores on the CPSS-I and its subscales (rs = –.05 – .09, ps > .47, $N = 71$). Thus scores on the CPSS demonstrated good divergent validity in relation to the STAXI-2.

Sensitivity to Treatment

Post-treatment scores on the CPSS were significantly lower than pre-treatment scores ($F_{(1, 39)} = 182.40$, $p < .001$, partial $\eta^2 = 0.82$; $F_{(1, 39)} = 102.49$, $p < .001$, partial $\eta^2 = 0.72$; for CPSS-SR and CPSS-I respectively). This finding suggests that scores on the CPSS are sensitive to change following treatment.

We also examined sensitivity to treatment for CPSS-SR scores by computing the correlation between session number during treatment and the average CPSS-SR score in each session. Since the effects of PE have been shown to be quite large (Powers, Halpern, Ferenschak,

Gillihan, & Foa, 2010), even measures that are not very sensitive may capture this change. Moreover, examining pre-post changes does not provide an estimation of effect size for sensitivity. Therefore we chose to examine correlations in order to both conduct a more stringent test for sensitivity to treatment, and to better capture session by session sensitivity and its size. The correlation between session numbers and average CPSS-SR scores was –.98 ($p < .001$), indicating that as session number increases, CPSS-SR scores decreases. We also conducted an individual-level analysis and computed the correlation between session number and CPSS-SR scores for each individual separately. The average individual-level correlation was –.66 ($p < .001$, $n = 40$). These results suggest that the CPSS-SR is highly sensitive to treatment effects.

PTSD-related Functional Impairment

The mean functional impairment score was 4.17 ($SD = 1.94$) for the CPSS-SR, and 4.29 ($SD = 1.89$) for the CPSS-I; see Table 3 for the percentage of participants who endorsed individual items. Internal consistency for the functional impairment items was moderate for both the CPSS-SR (Cronbach's $\alpha = .73$) and the CPSS-I (Cronbach's $\alpha = .69$). To test the association between PTSD symptom severity and functional impairment we calculated the correlation between these measures at baseline. Posttraumatic symptom severity (as measured by items 1–17 of the CPSS) was significantly correlated with functional impairment for the CPSS-SR ($r = .60$, $p < .001$, $n = 83$), and the CPSS-I ($r = .55$, $p < .001$, $n = 75$). Thus greater PTSD symptom severity was significantly positively associated with greater functional impairment.

Comparison of the CPSS-SR and CPSS-I

Diagnostic agreement. For the purpose of assessing diagnostic agreement, participants who endorsed at least one reexperiencing item, at least three avoidance items, and at least two arousal items were categorized as having PTSD, whereas participants who did not meet these criteria were categorized as not having PTSD. We then examined the agreement between both the CPSS-SR and the CPSS-I in assigning PTSD diagnosis. According to the criteria above, 89.2% of participants were categorized as having PTSD according to the CPSS-SR, and 94.0% of participants were categorized as having PTSD according to the CPSS-I. The agreement between the CPSS-SR and CPSS-I was high at 85.5%. Of the individuals who met PTSD criteria based on the CPSS-SR, 94.6% also met criteria on the CPSS-I; 89.7% of individuals who met PTSD criteria on the CPSS-I also met criteria on the CPSS-SR.

Symptom endorsement. In order to compare the frequency of endorsement of the component symptoms of PTSD we calculated the percentage of participants at baseline who endorsed each symptom (i.e., scored a 1, 2, or 3) on both the CPSS-I and the CPSS-SR at baseline, as well as the mean for each item. These values, as well as the subscale, overall severity, and impairment totals are shown in Table 3. Participants reported more reexperiencing symptoms in the self-report administration of the CPSS compared to the CPSS-I ($t = 2.75$, $df = 80$, $p < .01$); additionally, participants reported higher scores in the self-report administration on the Loss of Interest item (item 9; $t = 3.15$, $p < .01$). No additional differences were found between the CPSS-SR and CPSS-I in the total severity scores, the subscales, and the impairment scores.

Discussion

We presented data on the psychometric properties of the self-report and interview administrations of the CPSS (Foa et al., 2001), an instrument that provides PTSD diagnostic information, severity scores for PTSD and its component clusters (reexperiencing,

avoidance, and arousal), and a measure of degree of functional impairment. The results of this study confirm the strong psychometric properties of the CPSS and its utility for assessing PTSD severity and related functional impairment in female survivors of childhood sexual assault. Thus the CPSS may be a good instrument to use both for screening (in its self-report administration) and as a rigorous measure of PTSD severity, for example, in clinical outcome studies.

The mean CPSS scores were higher than those reported in the original psychometrics paper for the CPSS (Foa et al., 2001); the mean total scale score for individuals with at least "moderate" PTSD in the report by Foa et al. (2001) was 19.1 (*SD* = 7.1), compared to a mean in the current sample of 29.98 (*SD* = 9.05). While it cannot be determined what accounts for this severity discrepancy, it is reasonable to assume that childhood sexual assault generally represents a more severe trauma compared to a natural disaster like a relatively mild earthquake; this difference in trauma severity is reflected in the greater likelihood of PTSD among females following rape (45.9%) than natural disaster (5.4%; Kessler et al., 1995). Another possible explanation lies in the difference in which participants were recruited in the Foa et al. study (2001) and the current study. Participants in the study by Foa and colleagues were recruited through letters sent to all students in grades 3–8 of a parochial school, whereas participants in the current study elected to take part in a treatment study; treatment seekers are likely to present with more severe symptoms.

The percentage of participants who endorsed functional impairment items was higher in the current sample than in the sample of earthquake survivors in Foa et al. (2001). Among youths with PTSD in the Foa et al. sample, functional impairment items were endorsed on average by 30.3% of participants versus 60.6% in the current sample. For example, 81% of participants in the current sample versus 56% of the sample in Foa et al. (2001) endorsed impairment in their general happiness, and 72% versus 28% of the samples, respectively, endorsed impairment with schoolwork. The higher functional impairment in the current sample is consistent with the higher mean CPSS scores in the current sample compared to the Foa et al. (2001) sample.

The subscales and total symptom severity scores demonstrated good to excellent internal consistency, and the test-retest reliability of scores on the CPSS was excellent. Age and race were not significantly associated with CPSS scores, suggesting that the instrument is appropriate for use across the range of adolescence and with individuals of various racial backgrounds. Symptom-based diagnostic agreement between the CPSS-SR and CPSS-I was excellent at 85.5%. Scores on the CPSS also demonstrated good convergent validity with the PTSD module of the K-SADS. It is important to consider that the same interviewers administered the CPSS-I and the K-SADS, which could artificially inflate the agreement between the measures. However, the strong correspondence between diagnosis based on self-reported trauma symptoms on the CPSS-SR and interviewer-rated trauma symptoms on the K-SADS supports the convergent validity of CPSS scores and reduces concerns that correlations between the CPSS and K-SADS may have been spuriously high.

Although there was strong correspondence between ratings on the CPSS-I and the CPSS-SR, some significant differences emerged for specific items between the two ways of administering the measure. On all items on which there were significantly different ratings between the two administrations, the self-report administration had the higher rating. On average, participants rated their reexperiencing symptoms higher than did the interviewers, including nightmares and flashbacks. The higher ratings for the self-report version may have been the result of a lack of differentiation by the participants between a flashback and distressing memories of the traumatic event. Similarly, in contrast to the interviewers, participants may not have made the distinction between a loss of interest driven by

anhedonia (Loss of Interest, item 9) and the avoidance of trauma-related activities, which may account for the higher self-report ratings on this item. Alternatively, some participants may have been more willing to endorse items on a self-report form than share it with the clinician. The cause of these differences awaits further research. For now, it should be noted that self report of reexperiencing symptoms on the CPSS may be higher than those obtained in a clinical interview.

The moderate to strong correlations between depression symptoms as measured by the BDI and both the CPSS-I and CPSS-SR (*r*s = .42 – .65) demonstrate the concurrent validity of CPSS scores. These correlations are of similar magnitude as ones reported previously for similar measures of PTSD and depression (e.g., Foa et al., 1993, $r = .72$; Rachamim, Helpman, Foa, Aderka, & Gilboa-Schechtman, 2011, $r = .69$) and likely reflect the overlap between PTSD and depression; indeed, PTSD symptoms overlap considerably with those of depression (e.g., anhedonia, lack of concentration, difficulty sleeping; APA, 2000). Earlier investigations have confirmed that PTSD and depression both may follow traumatic experiences and yet these two reactions represent distinct disorders (e.g., Blanchard, Buckley, Hickling, & Taylor, 1998; Shalev et al., 1998; see also Foa et al., 1997). In contrast to the relatively strong correlations between the CPSS and the BDI, the CPSS showed nonsignificant correlations with the STAXI-2, a psychometrically sound measure of anger. These results demonstrate the divergent validity of CPSS scores and show that it is measuring a construct that is more specific than general psychological distress.

One potential concern with the current report is that it is based on a measure of PTSD criteria as defined in the current version of the *DSM*, the *DSM-IV-TR* (APA, 2000); at this writing, some of the symptoms for PTSD are slated to be changed in the *DSM-5*, scheduled for publication in 2013. Thus the current version of the CPSS will need to be revised, possibly rendering the current report irrelevant. However, several factors mitigate this concern. First, it will take some time to develop and validate *DSM-5*-based PTSD measures for youths; in the meantime, sound measures of PTSD severity and diagnosis are needed. For example, several ongoing treatment studies likely will continue to use the current version of the CPSS, perhaps in conjunction with a supplement of the few additional PTSD symptoms from *DSM-5*. Given the use of the symptom criteria of *DSM-III-R* (1987) well beyond the publication of the *DSM-IV* (1994), it is likely that the current version of the CPSS will continue to be used until the validation of the revised CPSS is available. Importantly, there is considerable overlap between the current and proposed PTSD symptoms. Of the existing 17 criteria, 16 will be retained in *DSM-5*, most without substantive modification, and three new symptoms will be added that describe alterations in cognitions and mood (e.g., persistent negative emotional state; American Psychiatric Association, 2012). Although avoidance symptoms will form their own cluster in the proposed criteria making a total of four symptom clusters instead of three, several factor analyses of *DSM-IV* criteria have yielded similar four-factor structures (e.g., Cox, Mota, Clara, & Asmundson, 2008; King, Leskin, King, & Weathers, 1998). Thus it is reasonable to expect that there will be a very high correspondence between PTSD assessment results based on the current CPSS and a version revised for *DSM-5*. Quantification of these similarities awaits future research.

Strengths, Limitations, and Future Directions

Strengths of the current study include the administration of the CPSS both as a self-report and an interview measure, the use of another validated structured interview (K-SADS) for comparative diagnostic information, and the demographically diverse sample. Some limitations of the current study warrant comment. First, the sample was limited to females; thus future work should address the extent to which similar psychometric properties of the CPSS are found in samples of males. Similarly, all participants in the current study were

survivors of sexual assault; additional work needs to be done to determine the CPSS properties among survivors of diverse traumas.

It also should be noted that test-retest reliability for CPSS-I scores was based on the correlation between CPSS-SR at week 7 and CPSS-I at week 8, and should thus be interpreted with caution. This analysis was chosen because consecutive assessments of the CPSS-I were several weeks apart during the course of treatment, which was done to limit the burden on the participants in having to both self-report their trauma symptoms and undergo an interview at the same study visit. Future investigations may compare two scores based on the CPSS-I, which may more precisely estimate the reliability of scores on the measure. The strong correlation between these two assessments ($r = .77$) is striking given the multiple sources of variability (i.e., method, time) that distinguish the two scores. The strong psychometric properties reported here, along with the other advantages of the CPSS, support modifying the instrument for *DSM-5*; it will be important to assess the correspondence between the current CPSS and a revised version. Finally it will be important to determine the factor structure of the CPSS in future studies that are adequately powered for these analyses.

Conclusions

A comparison with other measures of PTSD symptoms and severity in children and adolescents suggests that the CPSS has several advantages over other self-report and interview measures. The CPSS is one of a small number of instruments that maps directly onto the 17 PTSD symptoms from *DSM-IV-TR*. It also includes seven items that assess functional impairment, thereby providing additional information about a person's posttrauma reactions. As discussed above, the availability of the CPSS at no cost represents an advantage over other measures that are available for a fee, and may be especially beneficial for organizations and practitioners with limited financial resources. This advantage appears to carry no tradeoffs as the psychometric properties of the CPSS compare very favorably with those of instruments available for a fee. For example, the internal consistency of the CROPS ranges from .80 to .92 (Greenwald et al., 2002), which is similar to that of the CPSS-SR (.83); similarities also emerge for the test-retest reliability of scores on the CROPS ($r = .70$; Greenwald et al.) and scores on the CPSS-SR in the current study ($r = .86$). Additional advantages of the CPSS include its brevity (24 items) and quick administration time (approximately 15 minutes). Taken together these data suggest that the CPSS is a good choice for assessing PTSD in children and adolescents.

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Table 1

Comorbid diagnoses

Diagnosis	***n*** **(%)**
Major Depressive Disorder	43 (47.3)
Obsessive Compulsive Disorder	10 (11.0)
Generalized Anxiety Disorder	11 (12.1)
Specific Phobia	9 (9.9)
Social Anxiety Disorder	6 (6.6)
Oppositional Defiant Disorder	5 (5.5)
Attention Deficit Hyperactivity Disorder	5 (5.5)
Panic Disorder	1 (1.1)

Table 2

Correlations between CPSS-SR, CPSS-I, and their subscales

	1	2	3	4	5	6	7
CPSS-SR							
1.Total	–						
2. Re-exp	.82	–					
3. Avoid	.86	.52	–				
4. Arous	.77	.52	.47	–			
CPSS-I							
5. Total	.80	.63	.70	.63	–		
6. Re-exp	.69	.76	.48	.48	.80	–	
7. Avoid	.62	.38	.74	.30*	.84	.48	–
8. Arous	.59	.38	.36*	.77	.80	.54	.50

Note. CPSS-SR = Child Posttraumatic Symptom Scale – Self Report; CPSS-I = Child Posttraumatic Symptom Scale – Interview; Re-exp = re-experiencing subscale; Avoid = avoidance subscale; Arous = arousal subscale. All correlations are significant at $p < .001$ unless otherwise noted.

* $p < .01$

Table 3

Endorsement of individual PTSD symptoms and functional impairment items at baseline

	Interview		Self-Report		Difference in Endorsing	Difference in Item Mean
Symptom	**% Endorsing**	**Mean (SD)**	**% Endorsing**	**Mean (SD)**		
Reexperiencing						
1. Upsetting thoughts	84.1	1.85 (1.08)	92.8	1.98 (0.84)	$t_{(80)}$= 1.40	$t_{(80)}$= 0.53
2. Nightmares	58.0	1.03 (1.03)	68.7	1.35 (1.13)	$t_{(80)}$= 2.04	$t_{(80)}$= 2.65 *
3. Flashbacks	31.8	0.48 (0.80)	65.9	1.13 (1.06)	$t_{(79)}$= 4.48 **	$t_{(79)}$= 4.30 *
4. Upset by reminders	94.3	2.00 (0.92)	95.2	2.30 (0.88)	$t_{(80)}$= 0.33	$t_{(80)}$= 2.01
5. Feelings in body	75.0	1.47 (1.09)	77.1	1.52 (1.04)	$t_{(80)}$= 0.22	$t_{(80)}$= 0.24
Subscale Total (*SD*)		6.83 (3.45)		8.27 (3.47)		$t_{(80)}$= 2.75 *
Avoidance						
6. Trying not to talk	93.2	2.37 (0.94)	97.6	2.52 (0.76)	$t_{(80)}$= 1.14	$t_{(80)}$= 1.18
7. Avoid activities	89.8	2.01 (0.99)	84.3	1.86 (1.04)	$t_{(80)}$= –1.62	$t_{(80)}$= –1.53
8. Cannot remember	35.2	0.66 (1.03)	49.4	0.99 (1.17)	$t_{(80)}$= 1.83	$t_{(80)}$= 1.89
9. Loss of interest	64.8	1.49 (1.24)	82.9	1.61 (1.06)	$t_{(79)}$= 3.15 *	$t_{(79)}$= 0.46
10. Emotional distance	70.5	1.40 (1.09)	82.9	1.62 (1.01)	$t_{(79)}$= 1.54	$t_{(79)}$= 0.97
11. Restricted affect	60.2	1.30 (1.18)	69.1	1.57 (1.20)	$t_{(78)}$= 0.96	$t_{(78)}$= 1.21
12. Future plans	51.1	1.17 (1.26)	61.4	1.31 (1.24)	$t_{(80)}$= 1.35	$t_{(80)}$= 0.71
Subscale Total (*SD*)		10.40 (4.50)		11.40 (4.51)		$t_{(80)}$= 1.06
Hyperarousal						
13. Trouble sleeping	78.4	1.92 (1.20)	83.1	2.08 (1.11)	$t_{(80)}$= 0.83	$t_{(80)}$= 0.67
14. Irritable	92.0	2.17 (0.96)	95.1	2.21 (0.78)	$t_{(79)}$= 0.82	$t_{(79)}$= 0.21
15. Concentration	73.9	1.83 (1.26)	85.5	2.01 (1.05)	$t_{(80)}$= 1.75	$t_{(80)}$= 0.69
16. Overly careful	81.8	2.15 (1.15)	89.2	2.12 (1.05)	$t_{(80)}$= 1.16	$t_{(80)}$= –0.76
17. Jumpy	78.4	1.57 (1.12)	89.2	1.92 (0.98)	$t_{(80)}$= 2.04	$t_{(80)}$= 2.51
Subscale Total (*SD*)		9.64 (3.29)		10.31 (3.05)		$t_{(80)}$= 1.09
Severity Total (*SD*)		26.86 (9.21)		29.98 (9.05)		$t_{(80)}$= 2.01

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Symptom	Interview		Self-Report		Difference in Endorsing	Difference in Item Mean
	% Endorsing	Mean (SD)	% Endorsing	Mean (SD)		
	% Endorsing				Difference in Endorsing	
Impairment	Interview		Self-Report			
18. Doing prayers	32.9		31.6		$t_{(68)} = 0.00$	
19. Chores and duties	43.5		46.3		$t_{(79)} = 1.00$	
20. Relationships with friends	69.8		63.4		$t_{(79)} = -1.98$	
21. Fun and hobbies	70.9		66.3		$t_{(80)} = -1.75$	
22. Schoolwork	66.7		71.6		$t_{(77)} = 0.63$	
23. Relationships with family	70.9		63.9		$t_{(80)} = -1.83$	
24. General happiness	83.7		80.5		$t_{(79)} = -1.62$	
Impairment Items Endorsed (*SD*)	4.29 (1.89)		4.17 (1.94)		$t_{(80)} = -2.31$	

Note. *N*s range from 77 to 81. Alpha was set at .01 to lower Type I error as a result of multiple tests.

* $p < .01$,

** $p < .001$.