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Exploratory Factor Analysis of the Trauma Symptom Checklist for Children: A Comparison of Two Factor Extraction Methods

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Abstract

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By

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Abstract:
INTRODUCTION: Assessment tools that demonstrate adequate construct validity are needed to identify youth at risk of developing posttraumatic stress symptoms (PTSS) so these at risk youth can be referred to appropriate resources such as counseling. Research on the construct validity of instruments designed to measure PTSS have not shown a consistent factor structure of PTSS. Furthermore, the factor structure of PTSS measured using the Trauma Symptom Checklist for Children (TSCC), a widely used instrument, have only been studied using principal component analysis (PCA), a data reduction technique, rather than exploratory factor analysis (EFA), a factor analytic technique.

AIM: The present study aims to 1) evaluate the construct validity of the TSCC using EFA, and 2) demonstrate differences in factor solutions extracted using EFA and PCA.

METHODS: A secondary data analysis was conducted on a sample of 121 adolescents exposed to community violence in a mid-sized southern city. Two factor analyses were conducted on the sample using EFA and PCA.

RESULTS: Using EFA, PTSS measured by the TSCC demonstrated a three factor structure. The factors were named the Posttraumatic Stress factor, Fear factor, and Sexual Concerns factor. Using PCA, five less interpretable components were extracted.

DISCUSSION: The factor structure of PTSS measured by the TSCC differed from currently proposed factor solutions in the PTSS literature, lending evidence that more EFA work is necessary to determine the factor structure of PTSS. As expected, there were also differences between the factor solutions produced using the two different analytic techniques. Future research is needed to confirm this factor solution in larger, more diverse samples.

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A comparison of two factor extraction methods

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APPROVAL PAGE

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Author's Statement Page

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Rayleen Lewis
Signature of Author

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Introduction

Millions of adolescents in the U.S. experience a potentially traumatic event, such as sexual assault, physical assault, or witnessing violence, during their childhood (Kilpatrick et al., 2000). In a nationally representative sample of children and adolescents ages 0 to 17 years old, nearly 61% of participants reported experiencing such an event during their youth (Finkelhor, Turner, Ormrod, & Hamby, 2009). Approximately 5% of U.S. adolescents have met the diagnostic criteria for posttraumatic stress disorder, a disorder defined by the presence of posttraumatic stress symptoms (PTSS), during their childhood (Merikangas et al., 2010). PTSS have also been associated with other disorders such as agoraphobia, depression, and anxiety, causing further distress in affected youth (Fan, Zhang, Yang, Mo, & Liu, 2011; Hoven et al., 2005; Lai, Kelley, Harrison, Thompson, & Self-Brown, 2015). With so many children at risk for developing PTSS and comorbid disorders, it is crucial to have assessment tools that have adequate construct validity to efficiently identify and refer at-risk youth to appropriate resources such as counseling.

Literature Review

The factor structure of PTSS is ill defined, making the construct validity of instruments difficult to compare. More research is needed to discern the most consistent factor structure of PTSS to improve the comparability of construct validity across instruments. One analytic technique for determining the factor structure of PTSS is factor analysis. Factor analytic studies have identified conflicting factor structures of PTSS. Two predominant factor structures that have been presented are the Numbing Model (King, Leskin, King, & Weathers, 1998) and the Dysphoria Model (Simms, Watson, & Doebbelling, 2002). Each model presents PTSS as a construct composed of four unique factors. The models are very similar, but they differ based on the placement of items measuring difficulties with sleep, irritability, and concentration (Elhai et al., 2013; Elhai & Palmieri, 2011). Additionally, a five-factor model has recently been presented that assigns the three mentioned items to a fifth factor (Elhai et al., 2013).

Currently, statistical methods for evaluating construct validity are not standardized, which may explain why many factor structures for PTSS have been proposed. Two strategies commonly reported when evaluating the construct validity of a construct with an unknown factor structure are 1) exploratory factor analysis (EFA) and 2) principal components analysis (PCA). EFA is more appropriate for evaluating construct validity. The purpose of EFA is to determine the number of factors represented by the construct by combining similar items into factors. Items are combined based on shared variance ensuring items measuring similar concepts are grouped together. EFA is a factor analytic technique, which is useful for evaluating the construct validity of instruments (Kline, 2016). The purpose of PCA is to reduce the number of items in a model to a smaller number of components. Items are combined based on total variance, rather than shared variance. PCA is a data reduction technique, which is useful for simplifying models with a large number of variables. Similar items are not necessarily grouped into the same component like they are in EFA (Di lorio, 2005). The fundamental differences in the item grouping methodology can lead to differences in the number of factors extracted and distribution of items across factors, affecting construct validity assertions.

Ultimately, factor structure, including both the number of factors and the distribution of items across factors, can be used to determine if instruments are indeed measuring the same construct. This makes research on the factor structure of PTSS essential because of the wide applicability of instrument use in both research and clinical settings (Elhai, Gray, Kashdan, &

Franklin, 2005). Information on the factor structure of PTSS may improve the comparability of results across studies and aid in the development and revision of new and existing instruments.

The construct validity of many PTSS instruments has been explored using EFA, but this literature does not extend to every instrument. Although developed in 1996, no EFA specific studies have been performed on the Traumatic Symptom Checklist for Children (TSCC; Briere, 1996). Historically, the TSCC has been reported as the most commonly used instrument to evaluate PTSS (Elhai et al., 2005). It is often used as a comparison to determine the convergent validity of other instruments designed to measure PTSS (Crouch, Smith, Ezzell, & Saunders, 1999; Elhai et al., 2013; Nelson-Gardeli, 1997). Two studies have claimed to have performed an EFA but actually conducted a PCA (Sadowski & Friedrich, 2000; Wherry, Huffhines, & Walisky, 2016). It is unknown if the use of PCA resulted in differences in the number of factors or combinations of items forming factors than would have been seen using EFA. Research is needed to directly compare PCA results to EFA results to determine if differences in the methods effect the evaluation of construct validity of the TSCC.

The present study aims to address two gap in the literature regarding the construct validity of the TSCC. First, the present study aimed to evaluate the construct validity of the TSCC using EFA. Second, this study aimed to demonstrate differences in factor solutions extracted using EFA and PCA.

Method

Participants

The present study conducted secondary data analyses using a convenience sample originally recruited to study the effects of community violence exposure on adolescents (Self-Brown et al., 2006). The sample consisted of 121 adolescents attending one of three public schools in high crime neighborhoods located in a mid-sized southern city. Neighborhoods of the included schools were selected based on crime rates compared to the national average for murders, robberies, aggravated assaults, burglaries, and theft. All neighborhoods selected had crime rates higher than the national averages for these particular crimes.

Procedure

Students in grades 7 to 11 were recruited from the pre-selected schools through advertisements during the morning announcements. During lunchtime, interested students had the opportunity to approach a student recruiter. The student received an information packet, oral and written instructions discussing both the study procedures and time commitment required for participation, and IRB-approved assent/consent forms for the adolescent and their parent/guardian from the recruiter. The student and adult dyads who returned signed assent/consent forms were included in the study, and a time to complete questionnaires was scheduled. Adolescents completed the TSCC and one additional questionnaire not included in the present analysis. Parents/guardians were asked to complete a demographics questionnaire along with two other questionnaires not included in the present study. Responses were anonymous and dyad packets were coded to match in order to keep anonymity of responses while keeping dyads linked. The response rate for the study was 46% (i.e., 138/300 packets were returned). Following the completion of the questionnaires, all participants received a debriefing discussing the purpose of the study and were given an opportunity to ask any questions. At this time, all adolescents received $5 compensation for their participation.

Measures

Demographics Questionnaire. Adolescents' guardians were asked to complete a demographic questionnaire assessing the age, grade, gender, race/ethnicity, and socioeconomic status of the adolescent.

Trauma Symptom Checklist for Children (TSCC). The TSCC is a 54-item adolescent self-report questionnaire used to measure PTSS and related symptoms in children and adolescents ages 8 to 16 years old developed by John Briere. The measure consists of two validity scales (i.e., underresponse and hyperresponse) as well as six clinical scales, anxiety (9 items), anger (9 items), depression (9 items), posttraumatic stress (10 items), dissociation (10 items), and sexual concerns (10 items; Briere, 1996). Of the 54 items in the instrument, 3 items belonged to 2 scales. Two items were not included in the questionnaire administered to the present sample of adolescents due to IRB concerns. TSCC items are scored using a 4-point response option ranging from 0 (never) to 3 (almost all of the time) to determine the frequency of the symptom. The TSCC has demonstrated high internal consistency (Briere, 1996). In the present sample, the internal consistencies for the anxiety, anger, depression, posttraumatic stress, dissociation, and sexual concerns clinical subscales were .86, .89, .85, .87, .87, and .82, respectively. The TSCC has demonstrated adequate convergent and divergent validities (Briere, 1996; Sadowski & Friedrich, 2000).

Results

Preliminary Analyses

All analyses were performed using SPSS version 23. Prior to the analysis, missing data were imputed using mean imputation. As preliminary analyses, descriptives on sample demographics were performed. The present sample included adolescents ranging in age from 13 to 16 years old ($M = 15.25$, $SD = 0.90$). Half of the participants were female ($n = 61$, 50%). The sample was predominantly African American ($n = 117$, 97%) and of low socioeconomic status (i.e., 71% indicated an annual income of less than $20,000).

Prior to factor analysis, the correlations between items were reviewed, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was calculated, and Bartlett's Test of Sphericity was performed. A majority of items showed inter-item correlations greater than 0.3, suggesting there may be underlying factors causing shared variance among items. The calculated KMO value (.86) was greater than the suggested cut-off of .70 indicating the sample size was adequate for subsequent factor analytic techniques (Pett, Lackey, & Sullivan, 2003). Finally, based on Bartlett's Test of Sphericity, there is evidence factor analysis is appropriate ($\chi^2(1326)=4859.09$, $p<.001$).

Aim 1: Evaluate the construct validity of the TSCC using EFA.

An EFA using principal axis factoring with an oblimin rotation was performed to determine the underlying factors of PTSS measured by the TSCC. Factors were extracted based on Kaiser Guttman's eigenvalues greater than one rule, examination of the scree plot, and factor interpretability. Factor loadings of .35 were considered significant (Stevens, 1992). Principal axis factoring was utilized for factor extraction followed by an oblique rotation using the Oblimin with Kaiser Normalization method. Three factors were extracted using Kaiser-Guttman's eigenvalues greater than one criteria and interpretability of the factors explaining 49% of the total variance. Cattell's scree plot confirmed the three factor solution. Factor loadings were considered significant if the loading was >.35 following rotation. Three items did not significantly load on any factor. Four items showed evidence of cross-loading.

The EFA factor solution using principal axis factoring produced three factors, the PTS factor, the Fear factor, and the Sexual Concerns factor. The PTS factor had an initial eigenvalue of 19.17 and explained 37% of the total variance prior to rotation. A total of 35 items loaded on this factor. These items encompassed a variety of PTSS and represented each of the original six subscales. Each of these items represented a symptom outlined in the diagnostic criteria of posttraumatic stress disorder according to the DSM-5. The Cronbach alpha value for the PTS factor was .96.

The Fear factor had an initial eigenvalue of 3.23 and explained 6% of the variance prior to rotation. Eleven items significantly loaded on the Fear factor. All 11 items related to fear and anxiety. The Fear factor had a Cronbach alpha of .88.

Finally, the Sexual Concerns factor had an initial eigenvalue of 2.98 and prior to rotation explained 6% of the variance. This final factor was composed of seven items focused on sexual concerns. The Cronbach alpha for the Sexual Concerns factor was .86. For eigenvalues, explained variance, and item loadings, see Table 1.

Among the factors, a moderate correlation was seen between the PTSS factor and the Fear factor ($r = .45$). The Sexual Concerns factor showed weak correlation with the PTSS factor ($r = .35$) and very weak correlation with the Fear factor ($r = .19$). Since there is some evidence of correlation among factors, an oblique rotation, compared to an orthogonal rotation, was appropriate (see Table 2).

Aim 2: Demonstrate differences in factor solutions extracted using EFA and PCA.

Principal components analysis (PCA) with a varimax rotation was performed to evaluate differences between EFA and PCA. As in EFA, components were extracted based on Kaiser Guttman's eigenvalues greater than one rule, examination of the scree plot, and component interpretability. Loadings of .35 were considered significant (Stevens, 1992). The rotation did not result in a simplified structure. Based on interpretability of components, percent variance explained, and Kaiser-Guttman's eigenvalues greater than one criteria, five components were extracted explaining 57% of the total variance. All items loaded significantly on at least one factor. There was evidence of cross loading for 23 items. Solutions extracting two, three, four, and six components were also compared. These solutions either resulted in more cross loading items, worse interpretability of components, less variance explained, or a combination of all three concerns. Consequently, the five component solution was chosen. The components were named the PTS, Anger/Alterations in Cognition, Fear, Sexual Concerns, and Dissociation/Sexual Concerns components.

The PTS component had an initial eigenvalue of 19.17 and explained 37% of the total variance prior to rotation. A total of 23 items loaded on this factor. These items represented each of the original six subscales and the four symptom clusters outlined in the DSM-5. Items covered a variety of PTSS. The Cronbach alpha of the PTS component was .95.

The Anger/Alterations in Cognition component had an eigenvalue of 3.23 and explained 6% of the variance and included 24 items. These items also included items from each subscale and diagnostic symptom cluster, but the items were predominantly focused on anger and symptoms related to negative alterations in cognition. The Cronbach alpha of the Anger/Alterations in Cognition component was .94.

The Fear component had an eigenvalue of 2.98 and explained 6% of the total variance. This component included 14 items focused mainly on feelings of fear. This component had a Cronbach alpha value of .90.

The Sexual Concerns component had an eigenvalue of 2.04 and explained 4% of the total variance. With the exception of one item, all six items loading on component 4 were related to sexual concerns. The Cronbach alpha for this component was .84.

The Dissociation/Sexual Concerns component was a compilation of 10 items, primarily sexual concerns items, and items associated with dissociation. This component had an eigenvalue of 1.98 and explained 4% of the total variance. The Cronbach alpha for this factor was .86. For eigenvalues, explained variance, item loadings, rotation sum of squared loadings, and percent variance explain after rotation, see Table 3.

Discussion

Because the TSCC is used as a screening instrument by both clinicians and researchers to identify children presenting with PTSS, construct validity of the TSCC is crucial. The present study is the first study to evaluate the construct validity of the TSCC using EFA. Thus far, construct validity assessed using exploratory procedures have used PCA rather than EFA. By performing an EFA, this study fills a significant gap in the literature on the construct validity of the TSCC. The present study examined differences in factor structure results using PCA, a data reduction technique, and EFA, a factor analysis technique. The differences between the EFA and PCA results seen in the present study demonstrate analytic choices ultimately can affect conclusions related to construct validity.

Several studies have assessed the construct validity of the TSCC using confirmatory factor analysis (CFA; Chung, 2014; Matulis et al., 2015; Wherry et al., 2016). A CFA requires the specification of an a priori factor structure, including a hypothesized number of factors and relationships between items and the specified factors. Current literature has used the clinical subscales of the TSCC as the basis for performing a CFA (Chung, 2014; Matulis et al., 2015;

Wherry et al., 2016). This six factor model has demonstrated adequate fit, but it is unclear if there is a better fitting factor structure. CFA is an important step in evaluating the construct validity of an instrument, but it should be conducted after exploratory analyses have determined the underlying factor structure of a construct (Osborne & Costello, 2009). Since there is not consensus on the factor structure of PTSS, more exploratory research, such as the present study, is needed to provide an a priori factor structure for conducting a CFA.

The factor structure of PTSS measured by the TSCC differed from the factor structures of PTSS most commonly reported using other instruments (i.e., the Numbing model and Dysphoria model). In the present study, PTSS as measured by the TSCC was composed of three factors, a PTS factor, Fear factor, and Sexual Concerns factor. Because the present factor structure differed from the current literature, there is a need for more EFA research. These differences may have been a result of aspects of the item content of the TSCC. First, other instruments measuring PTSS do not include questions specifically on sexual concerns. This makes the TSCC unique, and while still appropriate for other types of traumatic events, it may be better suited for measuring PTSS in populations who have been exposed to traumatic events related to sexual abuse. Second, the TSCC includes an entire subscale on anger. Outbursts of anger is a diagnostic criterion of PTSD in the DSM-5, but it is not typically directly measured using an entire subscale of items in instruments measuring PTSS (*Diagnostic and statistical manual of mental disorders: DSM-5*, 2013). Because the TSCC includes these subscales, EFA studies on the TSCC may provide a unique perspective on the factor structure of PTSS that is not captured using other instruments.

As anticipated, several major differences can be seen between the results from the EFA and the PCA methods. First, three factors were extracted in EFA whereas five components were extracted in the PCA. Second, the factors and components extracted had very different levels of interpretability. As expected, the EFA grouped items assessing similar concepts into a common factor. For example, nearly all sexual concerns items were grouped together into the Sexual Concerns factor. In the PCA, sexual concerns items were spread across all five components. Items measuring similar concepts were not guaranteed to load on the same component, making interpretability much more difficult in the PCA. Third, item loadings on the factors and components were very different between the two analyses. These differences contributed to the difficulties in interpretability. Because PCA combines items based on explaining the most total variance rather than shared variance amongst items, these differences in item groupings were expected (Kline, 2016). The item loading differences were also very apparent in the number of items cross loading in each analysis. The EFA resulted in cross loadings of only four items. In the PCA, almost half (23/54) of the items in the TSCC showed evidence of cross loading. This suggests under-factoring may be occurring (Hancock & Mueller, 2010). Models extracting two, three, four, and six components were also compared to the presented PCA solution, but all models showed a similar degree of cross loading and lack of interpretability. No alternative factor solution resulted in a loading matrix with a simple structure.

These differences demonstrate the importance of using EFA for factor analysis. When developing an analytic plan for factor analytic studies, it is critical to consider the implications analytic decisions may have on the results. Because the aim of EFA is to determine the number of factors underlying a construct, factor solutions extracted using PCA will not be comparable to the existing literature. The literature will not converge on a factor solution if solutions vary based on analytic decisions. Construct validity is evaluated by reviewing the factor structure of a construct. As seen in the present study, different analytic techniques can lead to differences in factor solutions. When inappropriate techniques are used, biased conclusions concerning construct validity can result.

Limitations

There are limitations of the present study that should be noted. First, the sample size is smaller than recommended for an EFA study (Di lorio, 2005). However, when communalities are at least .70 in a 3 factor model, a sample size of 100 may be adequate for achieving stable estimates depending on the number of items (Hancock & Mueller, 2010). In the present study, nearly all communalities were above .70, indicating the present sample may be adequately sized for achieving stable estimates. More research is needed to determine if a larger sample is necessary for stable parameter estimates. Second, because community violence was the primary type of trauma evaluated, the sexual concerns questions may not have been relevant for a majority of this sample. The administered instruments did not include items assessing sexual abuse or assault, so it is not possible to determine the relevance of these items in the present sample. However, unless there is evidence administering the sexual concerns questions will be harmful to participants, the use of the full TSCC rather than the TSCC-A, which excludes the sexual concerns questions, is advised (Briere, 1996). Finally, self-report is always a concern for bias, but adolescents have been found to be reliable reporters of PTSS (Scheeringa, Wright, Hunt, & Zeanah, 2006).

Future Research

Findings from this study may be used to guide future research. Construct validity research of the TSCC should be extended to samples of adolescents exposed to other types of traumatic events (e.g., sexual abuse). The primary purpose of establishing construct validity of an instrument is to determine if a construct is presenting the same way in various populations.

PTSS may develop after a variety of traumatic events beyond community violence, such as sexual or physical assault. Evaluating the construct validity of the TSCC in other populations is a valuable next step in research.

The factors found using EFA can serve as the foundation for research using CFA to evaluate the construct validity of the TSCC. CFA requires an a priori factor structure. Prior to the present work, all hypothesized a priori factor structures of PTSS measured using the TSCC have been based on the clinical subscales of the instrument. No EFA studies have been performed to justify this hypothesized model. While this six factor structure may be supported by CFA, this factor structure may not be applicable to PTSS as measured by other instruments. The three factor structure identified in the present study can serve as the a priori model in future CFAs.

Evaluating the construct validity of the TSCC in other populations may help the overall literature on the factor structure of PTSS converge to a factor solution. A converged factor solution will guide future psychometric research on instruments developed to measure PTSS by providing a gold standard for comparison during evaluation of construct validity. These directions of future research will not only add to the construct validity literature of the TSCC, they will add to the overall literature concerning the factor structure of PTSS as measured by all instruments.

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Tables

Table 1: Item descriptives and loadings for the three factor solution of PTSS measured by the TSCC using EFA.

	M	*SD*	Factor			Communality
			PTS	Fear	Sexual Concerns	
1.	0.71	0.82	***0.48***	***0.41***	-0.27	0.79
2.	0.80	0.81	***0.71***	0.11	-0.21	0.77
3.	0.62	0.85	***0.39***	0.25	0.02	0.69
4.	1.10	1.05	***0.64***	-0.26	0.10	0.74
5.	0.42	0.75	***0.53***	0.07	0.10	0.73
6.	0.89	1.01	***0.60***	0.00	-0.06	0.70
7.	0.70	1.00	***0.59***	0.21	0.06	0.86
8.	0.24	0.66	0.02	0.34	***0.41***	0.80
9.	0.72	0.88	***0.69***	0.08	-0.03	0.85
10.	0.99	0.90	***0.67***	0.01	-0.01	0.73
11.	0.55	0.84	***0.56***	0.12	0.03	0.73
12.	0.64	0.91	***0.69***	0.19	-0.05	0.85
13.	0.72	0.98	***0.72***	-0.13	0.06	0.74
14.	0.82	0.92	***0.72***	0.02	-0.27	0.74
15.	0.39	0.81	***0.40***	0.25	0.20	0.79
16.	0.60	0.92	***0.58***	0.04	0.23	0.78
17.	0.89	0.95	0.28	-0.16	***0.39***	0.60
18.	0.48	0.74	***0.41***	0.34	0.01	0.77
19.	0.80	0.84	***0.80***	-0.27	0.13	0.80
21.	0.62	0.87	***0.66***	-0.25	0.23	0.80
22.	0.36	0.75	-0.10	0.09	***0.78***	0.73
23.	0.39	0.77	0.18	0.10	***0.67***	0.79
24.	0.28	0.67	0.16	***0.59***	0.05	0.83
25.	0.23	0.66	0.17	0.33	0.29	0.71
26.	0.42	0.83	0.21	0.28	0.22	0.77
27.	0.45	0.79	***0.38***	***0.39***	-0.07	0.78
28.	0.69	0.74	***0.66***	0.20	-0.03	0.81
29.	0.59	0.85	***0.52***	0.28	0.05	0.78
30.	0.75	0.84	***0.60***	0.11	0.04	0.70
31.	0.23	0.56	0.10	***0.46***	0.21	0.78
32.	0.63	0.82	***0.52***	***0.38***	-0.12	0.81
33.	0.53	0.83	0.34	***0.52***	-0.03	0.82
34.	0.45	0.80	0.13	***0.52***	-0.03	0.79

35.	0.46	0.74	***0.43***	0.26	0.00	0.72
36.	0.65	0.88	***0.43***	0.13	0.12	0.65
37.	0.74	0.89	***0.64***	0.05	0.11	0.76
38.	0.44	0.76	***0.41***	0.27	0.07	0.73
39.	0.27	0.68	-0.03	***0.67***	0.03	0.79
40.	0.24	0.62	-0.04	***0.73***	0.15	0.84
41.	0.70	0.83	***0.65***	0.15	-0.12	0.76
42.	0.63	0.96	***0.46***	0.34	0.01	0.75
43.	0.66	0.89	***0.60***	-0.03	0.24	0.80
44.	0.56	0.84	0.12	0.20	***0.63***	0.85
45.	0.55	0.84	***0.47***	0.11	***0.40***	0.86
46.	0.59	0.92	***0.51***	0.00	0.30	0.85
47.	0.55	0.85	-0.04	0.26	***0.72***	0.87
48.	0.46	0.80	0.19	0.29	0.30	0.74
49.	0.82	0.90	***0.69***	-0.16	0.25	0.84
50.	0.41	0.79	0.14	***0.52***	0.14	0.80
51.	1.10	1.11	***0.60***	-0.06	0.17	0.72
53.	1.27	0.99	***0.69***	0.08	-0.14	0.73
54.	0.25	0.60	-0.09	***0.58***	0.13	0.75
Initial Eigenvalue			19.17	3.23	2.98	
Percent Variance Explained Before Rotation			36.86	6.21	5.73	
Rotation Sum of Squared Loadings			16.89	9.84	6.71	
Cronbach's Alpha			0.96	0.88	0.86	

Note: PTSS = posttraumatic stress symptoms, TSCC = Trauma Symptom Checklist for Children, EFA = exploratory factor analysis, *M* = mean, *SD* = standard deviation, PTS = posttraumatic stress, significant item loadings are in bold and italics

Table 2: Correlations amongst factors extracted using EFA.

Subscale	PTS	Fear	Sexual Concerns
PTS	-		
Fear	0.446	-	
Sexual Concerns	0.352	0.194	-

Note: PTS = posttraumatic stress, EFA = exploratory factor analysis

Table 3: Item loadings for the five factor solution of PTSS measured by the TSCC using PCA.

	Factor				
	PTS	Anger/ Alterations in Cognition	Fear	Sexual Concerns	Dissociation/ Sexual Concerns
1.	***0.59***	0.14	***0.44***	-0.06	0.03
2.	***0.78***	0.21	0.12	0.09	0.02
3.	***0.39***	0.22	***0.39***	0.22	-0.04
4.	***0.36***	***0.48***	-0.04	0.30	-0.20
5.	***0.41***	***0.39***	0.04	0.09	***0.39***
6.	***0.46***	***0.38***	0.10	0.07	0.03
7.	***0.65***	0.26	0.17	0.24	0.27
8.	0.10	0.10	0.14	0.25	***0.71***
9.	***0.71***	0.28	0.03	0.17	0.23
10.	***0.43***	***0.50***	0.27	0.18	-0.18
11.	0.32	***0.51***	0.24	-0.01	0.25
12.	***0.63***	***0.37***	0.23	0.11	0.20
13.	***0.50***	***0.48***	0.00	0.20	0.06
14.	***0.66***	0.30	0.10	-0.04	-0.07
15.	***0.45***	0.22	0.29	***0.38***	0.16
16.	0.22	***0.64***	0.22	0.15	0.26
17.	0.15	0.27	0.01	***0.64***	-0.21
18.	***0.54***	0.14	0.27	0.13	0.30
19.	0.29	***0.76***	-0.01	0.09	0.14
21.	0.25	***0.64***	-0.05	0.24	0.09
22.	-0.08	0.12	0.08	***0.78***	0.25
23.	0.11	0.31	0.20	***0.74***	0.15
24.	0.11	0.28	***0.70***	-0.03	0.25
25.	0.19	0.20	0.19	0.16	***0.64***
26.	0.04	***0.37***	***0.41***	0.13	0.26
27.	***0.58***	0.06	0.27	0.06	0.32
28.	***0.66***	0.31	0.14	0.08	***0.35***
29.	***0.64***	0.18	0.18	0.21	0.34
30.	***0.42***	***0.45***	0.17	0.04	0.28
31.	0.20	0.11	0.29	0.06	***0.67***
32.	***0.58***	0.22	***0.44***	0.10	0.06
33.	***0.47***	0.14	***0.60***	0.19	0.02
34.	0.22	0.09	***0.63***	0.05	0.03
35.	0.22	***0.45***	***0.48***	0.01	0.03
36.	0.15	***0.51***	0.34	0.08	0.10
37.	0.25	***0.66***	0.32	0.10	0.08

38.	0.34	0.32	0.26	0.02	***0.39***
39.	0.32	-0.18	***0.64***	0.23	0.06
40.	0.25	-0.06	***0.61***	0.19	***0.36***
41.	***0.46***	***0.47***	0.31	-0.05	0.07
42.	***0.36***	***0.38***	***0.45***	0.05	0.20
43.	0.27	***0.60***	0.20	0.29	0.06
44.	0.18	0.17	0.21	***0.74***	0.24
45.	0.26	***0.51***	0.12	0.28	***0.53***
46.	0.17	***0.61***	0.12	0.18	***0.37***
47.	0.13	0.05	0.16	***0.77***	***0.37***
48.	-0.05	***0.44***	***0.49***	0.21	0.19
49.	0.24	***0.72***	0.05	0.17	0.23
50.	0.20	0.15	***0.64***	0.24	0.07
51.	0.34	***0.51***	0.18	0.33	-0.10
53.	***0.55***	***0.40***	0.15	-0.04	0.13
54.	-0.05	0.10	***0.63***	0.01	0.30
Initial Eigenvalue	19.17	3.23	2.98	2.04	1.98
Percent Variance Explained Before Rotation	36.86	6.21	5.73	3.93	3.81
Rotation Sums of Squared Loadings	8.16	7.69	5.59	4.06	3.90
Percent Variance Explained After Rotation	15.70	14.78	10.76	7.81	7.50
Cronbach's Alpha	0.95	0.94	0.90	0.84	0.86

Note: PTSS = posttraumatic stress symptoms, TSCC = Trauma Checklist for Children, PCA = principal components analysis, PTS = posttraumatic stress, significant item loadings are in bold and italics