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The psychometric properties of the Trauma Symptom Checklist for Young Children in a sample of Swedish children

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Objective: To evaluate the psychometric properties of the Swedish version of Trauma Symptom Checklist for Young Children (TSCYC).

Method: The study was composed of a total of 629 children—296 girls and 333 boys—aged 3–11, from a non-clinical population who were rated by their caretakers (26 of whom performed a re-test after 2 weeks) in addition to 59 children from a clinical population with known experience of sexual and/or physical abuse. The caretakers from the normal population completed the TSCYC and Lifetime Incidence of Traumatic Events Scale-parent scale (LITE-P) and the clinical-sample caretakers completed TSCYC. The psychometric properties of the TSCYC were examined, including reliability and validity.

Results: The reliability (Cronbach's alpha) of the TSCYC, total scale, was $\alpha = 0.93$ (normative group) and $\alpha = 0.96$ (clinical group). For the clinical scales, this ranged between $\alpha = 0.55$ – 0.88 and 0.77 – 0.93 , respectively. Test-retest for the total scale was $r = 0.77$. Regarding criterion-related validity, the clinical groups scored significantly higher than the normative group, and within the normative group significant relationships were found between exposure to traumatic events and TSCYC scores. Confirmatory factor analysis testing of the construction of the TSCYC indicated significant loadings on the original scales.

Conclusion: The Swedish version of TSCYC appears to be a screening instrument with satisfactory psychometric qualities for identifying symptoms after trauma in young children. The instrument can also be recommended to clinicians for screening purposes in a European context.

Keywords: *post-traumatic stress; young children; assessment; trauma; TSCYC*

For the abstract or full text in other languages, please see Supplementary files under Reading Tools online

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Research in recent years has shown that while growing up, children encounter various amounts and different kinds of potentially traumatic experiences (Finkelhor, Ormond, & Turner, 2007a; Gilbert et al., 2009; Gustafsson, Nilsson, & Svedin, 2009; MacKenzie, Kotch, & Lee, 2011; Nilsson, Gustafsson, & Svedin, 2010; Nilsson, Gustafsson, Larsson, & Svedin, 2010). Some children grow up in maltreating environments, others are exposed to bullying, still others witness violence in their homes and others are abused themselves,

both physically and sexually. Symptoms after experiencing trauma can be very diverse (Alisic, Jongmans, van Wesel, & Kleber, 2011; Osofsky, 1995), with depression, anger, dissociation and different aspects of post-traumatic stress, with intrusion, avoidance and hyper-arousal, being the most frequent. It is also known that it is important to get help as early as possible to those who need it (Kramer & Lanholt, 2011; Roos et al., 2011; Scheeringa, Weems, Cohen, Amaya-Jackson, & Guthrie, 2011; Kassam-Addams & Fein, 2003). Many studies have also

demonstrated that the cumulative exposure to traumatic exposures, polytraumatization/polyvictimization (Finkelhor et al., 2007a; Gustafsson, Nilsson, & Svedin 2009; Nilsson et al., 2010; Schilling, Aseltin, & Gore, 2008; Turner, Finkelhor, & Ormond, 2010), is associated with more symptoms of stress and mental health problems in cross-sectional studies but also in longitudinal studies such as the adverse childhood experiences studies (ACE-study; www.acestudy.org) and others (Koenen, Moffitt, Poulton, Martin, & Caspi, 2007; Widom, Czaja, & Dutton, 2008). Few have studied the impact frequency of a single type of trauma but to weight the estimated severity of the various traumas does not much improve prediction (Finkelhor, Ormon, Turner, & Hamby, 2005). It is therefore of great importance to be able to identify early signs of symptoms following traumatic exposures. To accomplish this task for young children, the clinician often has to rely on either the parent's, or caregiver's report, as young children (<7 years) do not yet possess the developmental capacity for accurate self-report of psychiatric symptomatology (Cohen et al., 2010). To achieve this we need reliable and valid instruments for parent's reports which have been evaluated in both normative groups of young children and clinical groups of children with known experience of traumatization. Unfortunately, there is a lack of instruments which identify the psychiatric symptoms of preschool children—including post-traumatic stress and other symptoms in the aftermath of potentially traumatic life events (Cohen & Scheeringa, 2009; Hawkins & Radcliffe, 2006; Scheeringa & Haslett, 2010; Scheeringa, Zeanah, & Cohen, 2011).

Instruments and studies that investigate and attempt to identify symptoms of trauma in small children are rare compared to studies and instruments that cover the adolescent years (Giola, Schneider, Vaugh, & Isquith, 2009). The Child Behavior Checklist (CBCL; Achenbach, 2001) is a widely used parent report concerning the child's symptoms and wellbeing. However, the CBCL is a generic instrument and does not specifically aim to identify symptoms connected to potential traumas and consequently there is a risk that these symptoms go unnoticed and untreated. Children's Impact of Traumatic Events Scale – Revised (CITES; Wolfe, Gentile, Michienzi, Sas, & Wolfe, 1991) also addresses younger children but has not been evaluated in normative groups. It is important to have data distribution also from normative groups in the general population in order to be able to interpret the actual clinical implication of a given score. Thus, despite the importance of identifying symptoms of traumatic exposures in small children, there are few available screening instruments focussed on the various particular symptoms that younger children might display as a consequence of trauma.

Trauma Symptom Checklist for Young Children (TSCYC) is a caretaker report developed by John Briere (Briere et al., 2001; Briere, 2005). TSCYC was developed to represent similar areas as assessed by the Trauma Symptom Checklist for Children (TSCC; Briere, 1996), which is a widely used, broad spectrum self-report questionnaire for adolescents of 10–17 years that identifies symptoms after potentially traumatic experiences. (Elhai, Gray, Kashdan, & Franklin, 2005). TSCYC is also broad-spectrum measure that identifies many of the supposed symptoms a small child can show in the aftermath of an experienced potential trauma, such as post-traumatic stress, anxiety, depression, anger, dissociation and sexual concerns.

The TSCYC has been used in four published studies (Briere et al., 2001; Lanktree et al., 2008; Milot, Éthier, St-Laurent, & Provost, 2010; Wherry, Graves, & Rhodes King, 2008) as well as in studies carried out in order to standardize the instrument. The psychometrics of the instrument have been found to be satisfactory regarding reliability and validity. The TSCYC seems to be able to identify symptoms in the aftermath of different kinds of potential traumas, such as interpersonal and non-interpersonal and to distinguish between children who report trauma and those who do not.

Wherry et al. (2008) reported good convergent validity between the PTSD subscales of the TSCYC and the University of California at Los Angeles' Post-traumatic Stress Disorder Reaction Index (Parent version). They (Wherry et al., 2008) also found correlations between some of the subscales on CBCL, such as between delinquency and anger $r=0.544$, aggression $r=0.841$, sexual concerns $r=0.702$, anxious/depressed, $r=0.702/0.777$.

But the studies are few and conducted only in the US. In the absence of broad trauma symptom questionnaires in Sweden, the natural choice was to translate and validate the TSCYC. The aim of this study was consequently to expand the evaluation of the TSCYC scale by examining the psychometrics, such as the reliability and validity of the scale, in clinical and normative samples of Swedish children.

Method

Participants

Normative group

The normative group came from two parts of Sweden. The older participants were school children aged 6.5–11 years old from the south of Sweden and the younger participants were children in day care aged 3–6 years old from the middle of Sweden. A total of 995 envelopes with questionnaires were given out to parents, 617 to the older school group and 378 to younger, day care group.

Questionnaires were completed by 403 parents (65%) in the older school group and by 226 parents (60%) in the younger group. In all there were 296 girls and 333 boys aged 3–11 years ($M (SD)=6.7 (2.2)$ years). In the younger, day care group, 89% lived with both parents and in the older group, school children, 81% lived with both parents. It was mostly mothers/women who filled in the questionnaires ($n=472$).

Research procedure

A letter was sent out to the headmaster of the different schools covering different socioeconomic areas in the south of Sweden asking if the school wanted to participate in the study. After approval was granted from the headmaster of each school, letters were sent to the parents asking whether they were willing to participate in the study. After informed consent was received, an envelope with the questionnaires was sent out to the caretakers.

In order to come in contact with parents of smaller children, contact was established with the director of day care centres, selected with the intention of covering different socioeconomic areas in a city in the middle of Sweden. After approval, the researcher went to the day care center and gave to the staff members the letters for parents with information about the research and envelopes with the questionnaires for the participating parents. All questionnaires were anonymous. To ensure a representative spread of socioeconomic background and ethnicity we asked administrative personal in each community to give an indication of which schools and day care centres to turn to.

The test-retest group

The test-retest group consisted of 30 parents/caretakers who were randomly drawn from the normative group and asked if they would fill in the questionnaire a second time. The parents who said yes had their code number duplicated and retained by the personal at the day care centre so that the anonymity could be kept. Of these 30 parents, 26 completed the questionnaires twice, with two to three weeks between the occasions. Half of the rated group was girls and the other half boys; seventeen children were 3–4 years old and nine were 5–6 years old. We considered 30 parents to be sufficient for this test-retest procedure and compared with Briere (2005), who had 33 in his test-retest group.

Clinical group

The clinical group ($N=59$, 37 girls and 22 boys, aged 3–11 years [$M (SD)=7.2 (2.25)$ years] came from the two clinical special units in Sweden, both outpatient units meeting children with a history of abuse, and a third unit

called “Children’s House”, equivalent to Child Advocacy Centers in the US.

The children had experienced sexual abuse and/or physical abuse, while some had also witnessed violence in their home. The abuse history was corroborated with the social authorities and police.

Questionnaires

Trauma Symptom Checklist for Young Children (TSCYC)

TSCYC is a caretaker instrument report with 90 items and is designed for the assessment of trauma symptoms in children aged 3–12 years. It was developed by John Briere (2001) and a complete manual was published 2005. The questionnaire was translated into Swedish by three researchers from the field of Child and Adolescent Psychiatry, each working independently. After a consensus procedure the questionnaire was sent to a translator for back-translation. The back-translation was then compared with the original and final versions, showing minor differences, and was sent for acceptance by the designer of the original scale.

The TSCYC has been found to have good psychometric characteristics for reliability and validity, in samples of US children (Briere, 2001, 2005; Lanktree et al., 2008). TSCYC contains eight clinical scales with the goal of identifying symptoms of experienced traumatic events. The eight clinical scales are Anxiety, (*ANX*), Depression, (*DEP*), Anger, (*ANG*), Post-traumatic Stress-Intrusion (*PTS-I*), Post-traumatic Stress-Avoidance (*PTS-AV*), Post-traumatic Stress-Arousal (*PTS-AR*), Dissociation (*DIS*), Sexual Concern (*SC*) and a summary Post-traumatic stress scale (*PTS-TOT*). These scales provide detailed information about different symptoms of post-traumatic stress and give a cautious diagnosis of PTSD as well as giving information on other symptoms that may arise from trauma, such as depression, anxiety, aggression and abnormal sexual behavior. TSCYC also contains two validity scales of the caretaker report such as a scale to identify potential over-report, Atypical Response (*ATR*), and under-report, Response Level (*RL*) of the child’s symptoms.

The caretaker rates each symptom on a 4-point scale from 1, “not at all”, to 4, “very often”, according to whether the symptom has occurred in the last month. The caretaker is also asked to evaluate how many hours they have spent with their child each week, which is information that has not been used in this study.

Data on the TSCYC have previously been collected from two normative samples ($N=750$, $N=433$) in the US (Briere, 2005) and one clinical sample ($N=219$) collected from six child advocacy centers, child abuse programs or child trauma centres, based on regular intake process (Briere, 2001, 2005). Briere found high

internal consistency in the normative sample ranging between $\alpha = 0.78$ (ANX) and 0.92 (PTS-TOT), on the clinical scales and the two validation scales, ATR, $\alpha = 0.93$, RL, $\alpha = 0.80$. In the clinical sample α varied between $\alpha = 0.81$ (SC) and 0.93 (PTS-TOT), and for the two validation scales was, ATR, $\alpha = 0.33$, RL, $\alpha = 0.73$

Test-retest reliability ($N = 33$) was examined in a group selected from the standardization sample with 13 days between the two test occasions. Test-retest reliability was found to range between *PTS-I*, $r = 0.37$, and *ANG*, $r = 0.96$, and the two validation scales, *ATR*, $r = -$, *RL*, $r = 0.80$.

To validate the scale (Briere et al., 2001, 2005) the correlations between the TSCYC scales were examined, with acceptable correlations ranging from 0.45 (for *SC* scale with the *DIS* scale) to 0.90 (*PTS-AV* with *PTS-TOT*). It was also found that TSCYC scores discriminated between the children that the caretaker said had experienced something very upsetting or traumatic and those that had not. According to Briere (2005), five studies were able to demonstrate the relationship between TSCYC score and caretaker-reported trauma exposure.

Lifetime Incidence of Traumatic Events Scale-parent scale (LITE-P)

The Swedish translation of the Lifetime Incidence of Traumatic Events for Parents (LITE-P) (1–3) was used and completed by the parents of the normative group only. LITE-P is a self-report questionnaire about experienced interpersonal and non-interpersonal, potentially traumatic events. LITE-P tries to address criterion 1 (the trauma itself) and criterion 2 (subjective reaction to the event) on Axis A from the DSM-IV. LITE-P consists of 15 fixed items and one optional item. Eight items ask about non-interpersonal potential traumas such as whether the child has experienced *a fire, a car accident, a friend being ill, injured or dying*, and interpersonal potential traumas like *witnessed violence, been physically abused, been sexually abused or been threatened*. Each item enquires whether the event has occurred, how many times, age at occurrence (the first time), and how much it upset the child then, and how much it bothers him/her now. Only the occurrence of the events was considered in our analysis. The total number of different traumatic events was used as a continuous score of polytraumatization (PT) (Gustafsson, Nilsson, et al., 2009; Nilsson et al., 2010).

We decided to include lifetime-occurrence traumas since traumatic events may have a persistent effect which continues for many years and into adulthood (4–7), and for power reasons due to sample size and the low frequencies of many of the events. The total number of traumatic events (polytraumatization) in the sample ranged between 0 and 8, with a mean (SD) of 1.21 (1.37),

with 60.3% reporting exposure to at least one and 32.6% reporting exposure to two or more of the listed events. To our knowledge there is no psychometric data reported on LITE-P, but it has been used in several studies reporting significant associations to mental health symptoms (Gustafsson, Larsson, et al., 2009; Gustafsson, Nilsson, et al., 2009).

Statistical analysis

Due to item non-response, N differs slightly between analyses. Differences in TSCYC scores between age- and sex groups were examined using ANOVA. Internal consistency was estimated by *Cronbach's α* . Test-retest reliability was examined by the correlation coefficient (Pearson's r) between test and retest scores. Construct validity was examined by zero-order correlations (Pearson's r) between TSCYC scales and by confirmatory factor analysis (CFA) where structural equation modeling (SEM) was used. The program AMOS version 20.0 was used for the CFA. Criterion validity was examined by comparing differences in TSCYC scores between reference and clinical groups, using ANCOVA with age and sex as covariates to adjust for potential confounding influence of these factors and using type III sums of squares for unbalanced designs. Criterion validity was also evaluated by examining whether the reported number of different traumatic life events ("Polytraumatization" from the LITE checklist) predicted TSCYC scales, using multiple regressions adjusted for age and sex. We refrained from using Bonferroni correction of the p values as the strong correlations between the dependent variables, the TSCYC scales, would lead to overly conservative corrections of error rate.

Ethical considerations

The study was approved by the Regional Ethical Review Board in Linköping (registration number 2011/151-31).

Results

Descriptive statistics

Descriptive statistics of the TSCYC scales by sex and age group, and summary of 2×2 ANOVAs, are reported in Table 1a for the reference group and in Table 1b for the clinical group.

In the reference group (see Table 1a for a summary of ANOVAs), although girls tended to score higher on the total TSCYC score ($p = 0.063$), the total scale did not differ significantly by either age or sex. However, both sex and particularly age differences emerged for specific scales. Older children scored higher on Depression, Post-traumatic stress-avoidance and Sexual Concern and slightly higher on Post-traumatic stress-intrusion and Post-traumatic stress-total, but lower on Anger, when compared to younger children. Girls scored higher than

Table 1a. TSCYC subscales in the reference group ($n = 613-629$); descriptive statistics of raw scores in younger (age 3 to 6 years) and older (age 6.5 to 11 years) boys and girls, and age and sex differences (2×2 ANOVA with separate analyses for each TSCYC subscale; effect size for age and sex main effects indicated by partial η^2). See footnote^a for the sample range of each subscale

Dependent variable	Descriptive TSCYC scores by gender and age group, <i>M (SD)</i>				Age and sex differences (2×2 ANOVA)				
	Girls 3–6 years ($n = 158$)	Boys 3–6 years ($n = 146-147$)	Girls 6.5–11 years ($n = 132-138$)	Boys 6.5–11 years ($n = 183-186$)	Model <i>F(df)</i>	Age main effect, η^2	Age main effect, p	Sex main effect, η^2	Sex main effect, p
ANX ^a	11.8 (2.6)	11.1 (2.2)	12.2 (3.3)	11.1 (2.5)	9.414 (2,624)	0.001	0.472	0.029	<0.001
DEP ^a	10.5 (1.4)	10.2 (1.1)	11.1 (2.5)	10.6 (2)	8.673 (2,620)	0.019	<0.001	0.011	0.008
ANG ^a	11.4 (2.8)	11.8 (2.8)	10.6 (2.2)	10.6 (2.2)	12.637 (2,626)	0.038	<0.001	0.002	0.271
PTS-int ^a	10.0 (1.5)	10.0 (1.3)	10.7 (2.2)	10.2 (2.2)	18.046 (2,623)	0.013	0.005	0.005	0.076
PTS-av ^a	9.5 (1.3)	9.4 (0.8)	10.1 (2.1)	11.1 (2.5)	9.301 (2,620)	0.026	<0.001	0.005	0.073
PTS-ar ^a	11.1 (2.3)	11.1 (2.1)	11.4 (2.8)	11.1 (2.5)	0.619 (2,623)	0.001	.357	.001	.478
PTS-tot ^a	30.6 (4.4)	30.4 (3.4)	32.2 (6.3)	31.1 (5.7)	4.398 (2,616)	0.012	0.008	0.004	0.124
DIS ^a	10.8 (2.2)	10.5 (2.1)	10.4 (2.2)	10.7 (2.2)	0.191 (2,620)	0.001	0.551	0.001	0.826
SC ^a	9.1 (0.6)	9.1 (0.4)	9.5 (1.3)	9.3 (0.8)	8.919 (2,623)	0.024	<0.001	0.007	0.043
Total ^a	84.2 (10.8)	83.0 (8.9)	85.6 (14.4)	83.2 (12.4)	1.928 (2,610)	0.001	0.422	0.006	0.063
RL ^a	3.4 (2.3)	3.5 (2.4)	4.1 (2.6)	4.4 (2.4)	9.613 (2,620)	0.027	<0.001	0.001	0.357
ATR ^a	9.1 (0.2)	9.0 (0.2)	9.3 (0.8)	9.1 (0.4)	13.338 (2,624)	0.033	<0.001	0.012	0.005

^aANX = Anxiety (range 9–23), DEP = Depression (range 9–27), ANG = Anger (range 9–26), PTS-int = Post-traumatic stress -intrusion (range 9–26), PTS-av = Post-traumatic stress- avoidance (range 9–22), PTS-ar = Post -traumatic stress-arousal (range 9–26), PTS-tot = Post -traumatic stress-total score (range 27–74), DIS = dissociation (range 9–20), SC = Sexual concern (range 9–18), Total = Total TSCYC score (range 72–177), RL = Response Level (validity scale) (range 0–9), ATR = Atypical Response(validity scale) (range 9–13).

Table 1b. TSCYC subscales in the clinical group ($n = 58$ – 59): descriptive statistics of raw scores in younger (age 3–6 years) and older (age 6.5–11 years) boys and girls, and age and sex differences (2×2 ANOVA with separate analyses for each TSCYC subscale; effect size for age and sex main effects indicated by partial η^2). See footnote^a for the sample range of each subscale

Dependent variable	Descriptive TSCYC scores by gender and age group, <i>M</i> (<i>SD</i>)				Age and sex differences (2×2 ANOVA)				
	Girls 3–6 years ($n = 17$ – 18)	Boys 3–6 years ($n = 11$)	Girls 6.5–11 years ($n = 19$)	Boys 6.5–11 years ($n = 11$)	Model <i>F</i> (<i>df</i>)	Age main effect, η^2	Age main effect, <i>p</i>	Sex main effect, η^2	Sex main effect, <i>p</i>
ANX ^a	14.4 (5.3)	16.1 (4.4)	16.4 (5.0)	14.5 (4.7)	0.310 (2,55)	0.009	0.472	0.002	0.772
DEP ^a	13.3 (4.2)	12.6 (2.6)	15.6 (3.9)	17.7 (4.1)	2.436 (2,56)	0.076	0.036	0.004	0.623
ANG ^a	14 (5.1)	16.7 (5.8)	15.9 (6.4)	17.7 (4.1)	1.748 (2,56)	0.038	0.144	0.023	0.251
PTS-int ^a	14.4 (5.9)	14.7 (4.3)	16 (5.7)	12.9 (2.6)	0.549 (2,56)	0.001	0.790	0.018	0.317
PTS-av ^a	13.9 (5.7)	15.6 (5)	16 (4.5)	13.9 (3.9)	0.083 (2,56)	0.003	0.693	0.000	0.933
PTS-ar ^a	15.2 (5.7)	16.1 (5.2)	16.8 (4.5)	17.7 (4.5)	1.244 (2,56)	0.039	0.138	0.004	0.623
PTS-tot ^a	43.5 (16.2)	46.5 (12.7)	48.8 (12.5)	44.5 (8.6)	0.369 (2,56)	0.012	0.415	0.001	0.809
DIS ^a	13.4 (4.4)	14.3 (5.8)	13.7 (4.4)	12 (2.9)	0.654 (2,56)	0.023	0.258	0.000	0.972
SC ^a	11 (3.6)	9.9 (1.3)	11 (2.8)	11.1 (3)	0.092 (2,56)	0.001	0.817	0.002	0.722
Total ^a	110.2 (35.4)	116.1 (23.6)	121.3 (28.4)	114.8 (22.5)	0.393 (2,55)	0.014	0.383	0.000	0.932
RL ^a	3.7 (3.0)	2.4 (2.4)	2.8 (1.9)	2.5 (2.3)	0.966 (2,56)	0.007	0.519	0.027	0.221
ATR ^a	9.7 (1.9)	9.4 (0.8)	9.7 (1.1)	9.6 (0.9)	0.067 (2,56)	0.000	0.893	0.002	0.736

^aANX = Anxiety (range 9–28), DEP = Depression (range 9–28), ANG = Anger (range 9–35), PTS-int = Post-traumatic stress -intrusion (range 9–33), PTS-av, = Post-traumatic stress- avoidance (range 9–27), PTS-ar = Post-traumatic stress- arousal (range 9–29), PTS-tot = Post -traumatic stress-total score (range 27–82), Dis = dissociation (range 9–30), SC = Sexual concern (range 9–24), Total = Total TSCYC score (range 74–202), RL = Response Level (validity scale) (range 0–9), ATR = Atypical Response.(validity scale) (range 9–17).

boys on Anxiety and Depression and also slightly higher on Sexual Concern. In corresponding analyses in the much smaller clinical group (see Table 1b for a summary of ANOVAs) few significant age or sex differences emerged, although older children scored significantly higher on Depression.

Reliability

Internal consistency

See Table 2 for estimates of internal consistency (Cronbach's α) for the clinical TSCYC scales. Whereas the total scale displayed excellent consistency ($\alpha > 0.90$) in both the reference and the clinical group, consistency varied between individual scales and between the groups. In the reference group, individual subscales varied between acceptable ($\alpha > 0.70$; Anxiety, Depression, all Post-traumatic stress subscales, and Dissociation), good ($\alpha > 0.80$; Anger and Post traumatic stress-total) and poor (Sexual Concern, $\alpha = 0.55$) consistency. In the clinical group all individual subscales had at least good consistency ($\alpha > 0.80$), with the exception of Sexual Concerns ($\alpha = 0.77$). Thus, consistency was generally higher in the clinical group than in the reference group.

Internal consistency for the validity scales was $\alpha = 0.77$ (reference group) and $\alpha = 0.83$ (clinical group) for Response Level, and $\alpha = 0.36$ (reference group; item no 79, "forgets his or her own name", removed from analysis as it had zero variance) and $\alpha = 0.12$ (clinical group) for Atypical response.

Table 2. Internal consistency (Cronbach's α) for TSCYC subscales in reference group and clinical group

Subscale	No. of items	Reference group		Clinical group	
		N	α	N	α
ANX ^a	9	620	0.75	54	0.85
DEP ^a	9	616	0.72	59	0.84
ANG ^a	9	616	0.81	60	0.92
PTS-int ^a	9	623	0.75	56	0.90
PTS-av ^a	9	606	0.75	55	0.81
PTS-ar ^a	9	613	0.75	58	0.81
PTS-tot ^a	27	590	0.88	52	0.93
DIS ^a	9	595	0.78	57	0.91
SC ^a	9	613	0.55	57	0.77
Total ^a	72	552	0.93	45	0.96

^aANX = Anxiety, DEP = Depression, ANG = Anger, PTS-int = Post-traumatic stress-intrusion, PTS-av = Post-traumatic stress-avoidance, PTS-ar = Post -traumatic stress- arousal, PTS-tot = Post -traumatic stress-total score Dis = dissociation, SC = Sexual concern, Total = Total TSCYC score.

Test-retest reliability

The test-retest correlation coefficient (Pearson's r) in the reference test-retest subsample ($n = 26$) ranged between excellent [Anger ($r = 0.90$), Post-traumatic stress-avoidance ($r = 0.95$)], good [Post-traumatic stress-arousal ($r = 0.81$), Post-traumatic stress-total ($r = 0.82$)], acceptable [Anxiety ($r = 0.71$), Total scale ($r = 0.77$)], questionable [Depression ($r = 0.68$) and poor Post-traumatic-intrusion ($r = 0.59$)], Dissociation ($r = 0.56$) test-retest estimates, with all respondents scoring zero Sexual Concerns problems on both occasions. Thus, test-retest varied considerably depending on subscale.

The coefficient for the validity scales was $r = 0.79$ for Response Level and not calculable for Atypical response (as all respondents scored "9" on the second occasion).

Validity

Construct validity

Correlations between TSCYC subscales. See Table 3 for zero-order correlations between the TSCYC scales in the reference group and the clinical group.

The correlations between the clinical scales and the total scale varied between 0.48 (Sexual Concern) and 0.93 (Post-traumatic stress-total) in the normative group and in the clinical group between 0.52 (Sexual Concern) and 0.97 (Post-traumatic stress-total). As expected, the Response Level scale was negatively correlated with all scales, ranging from -0.09 with the Atypical Response scale, to -0.49 with the Anger subscale. In the clinical group the Response Level scale was -0.33 with the SC scale and -0.52 with the Post-traumatic stress-arousal scale. The Atypical Response scale was most strongly associated with the Post-traumatic stress-total scale in both the normative group and clinical group; $r = 0.45$ respectively $r = 0.73$.

Confirmatory factor analysis (CFA). The confirmatory factor analysis on the total population, normative and clinical ($N = 694$), was conducted to investigate the construct of the TSCYC (see Table 4). In this CFA analysis to test the Goodness of fit (GOF) of the TSCYC and the subscales, Chi-square was found to be 14244.97 and *degrees of freedom* (df) = 248, ($\chi^2/df = 5.7$). All items except one item on the sexual concern subscale loaded significantly ($p < 0.001$). Root mean square of approximation (RMSEA) was = 0.082 (*interval* 0.081–0.083) and Comparative fit index (CFI) = 0.55. Most of the items loaded over 0.50 and 23 items loaded 0.70 or higher and those that loaded less than 0.50 loaded very close to 0.50. The subscale Sexual Concern was clearly the subscale that showed the poorest fit with the construct and with one non-significant item (no. 59).

Criterion validity

Difference between the normative group and the clinical group. The clinical group scored significantly higher

Table 3. Zero-order correlations (Pearson's r) between TSCYC subscales in the reference group (above the diagonal, $n = 618-633$) and the clinical group (below the diagonal, $n = 59-60$). All correlation coefficients are statistically significant ($p < 0.05$) if not otherwise indicated

Subscale	ANX	DEP	ANG	PTS-int	PTS-av	PTS-ar	PTS-tot	DIS	SC	Total	RL	ATR
ANX ^a	–	0.51	0.29	0.62	0.48	0.65	0.69	0.40	0.32	0.76	–0.33	0.28
DEP ^a	0.74	–	0.40	0.56	0.59	0.55	0.65	0.41	0.31	0.74	–0.35	0.26
ANG ^a	0.58	0.52	–	0.31	0.35	0.50	0.47	0.46	0.13	0.65	–0.49	0.20
PTS-int ^a	0.82	0.64	0.48	–	0.67	0.62	0.87	0.45	0.41	0.79	–0.25	0.39
PTS-av ^a	0.70	0.58	0.60	0.63	–	0.57	0.83	0.40	0.44	0.74	–0.20	0.43
PTS-ar ^a	0.74	0.69	0.66	0.62	0.61	–	0.88	0.59	0.33	0.86	–0.44	0.38
PTS-tot ^a	0.87	0.73	0.67	0.87	0.86	0.86	–	0.57	0.48	0.93	–0.37	0.45
DIS ^a	0.34	0.30	0.22 ^b	0.26	0.34	0.60	0.46	–	0.23	0.71	–0.44	0.27
SC ^a	0.41	0.42	0.26	0.40	0.25 ^b	0.41	0.41	0.22 ^b	–	0.48	–0.14	0.42
Total ^a	0.89	0.80	0.74	0.81	0.80	0.89	0.97	0.57	0.50	–	–0.49	0.44
RL ^a	–0.40	–0.46	–0.48	–0.35	–0.38	–0.53	–0.48	–0.38	–0.32	–0.54	–	–0.09
ATR ^a	0.62	0.62	0.58	0.60	0.55	0.71	0.72	0.41	0.42	0.75	–0.34	–

^aANX = Anxiety, DEP = Depression, ANG = Anger, PTS-int = Post traumatic stress -intrusion, PTS-av = Post-traumatic stress-avoidance, PTS-ar = Post -traumatic stress-arousal, PTS-tot = Post -traumatic stress-total score, DIS = dissociation, SC = Sexual concern, Total = Total TSCYC score, RL = Response Level (validity scale), ATR = Atypical Response (validity scale).

^bNot significant; $p > 0.05$.

than the normative group on all clinical TSCYC subscales, see Table 5 for a summary of the analyses including effect size measures of explained variance (partial η^2), and Table 1 for descriptive statistics by group, sex and age. The difference was however more pronounced for some specific scales, particularly Post-traumatic stress-avoidance, Post-traumatic stress-total and for the total TSCYC score (explained variance around 30%), whereas the difference was more modest for the subscales Dissociation, Sexual Concern and Anxiety (explained variance <13%), with a magnitude of difference in between (explained variance around 20%) for Anger, Depression, Post-traumatic stress-intrusion, and Post-traumatic stress-arousal. There were highly significant differences between the groups for all subscales, but also large variations in the magnitude of difference depending on subscale.

Cumulative traumatic events and TSCYC subscales in the normative group. In a series of multiple regression analyses (see Table 6), the number of lifetime traumatic events (polytraumatization) was related to all TSCYC subscales as well as to the total TSCYC score. On average, exposure to one additional traumatic event corresponded to a higher score of between 0.2–0.4 on most individual 9-item subscales, with a steeper regression slope for Anger ($b = 0.51$) and a substantially less steep slope for Sexual Concern ($b = 0.07$), with the coefficient for the other subscales ranging between 0.2 and 0.4. For the total scale, each additional event corresponded to a 2.6 point higher score on average.

Thus, in addition to the group differences in symptom scores between the reference groups described above, the TSCYC also displayed capability to significantly differentiate heterogeneity in past traumatic experiences in the reference sample.

Discussion

The objective of this study was to investigate the psychometric properties of the TSCYC in a Swedish population with the purpose of aiding the identification of symptoms following traumatic experiences, in pre-school and minor schoolchildren. The main results from this study can be summarized in five main findings.

First, the Swedish version of the TSCYC translation generally showed satisfactory psychometrics in this study. Internal consistency was found to be acceptable to good for all the subscales, except for the sexual concern subscale in the reference group, for which consistency could be considered poor. However, in the clinical group the sexual concern scale displayed acceptable consistency. The reasons for the relative inconsistency of the Sexual Concern scale for the reference group are unknown.

Test-retest reliability varied from good to poor on several scales; the scales measuring more internalizing symptoms such as depression, post-traumatic stress-intrusion, and dissociation showed the lowest reliability. The quality of the symptoms could be the reason for the poor result. Moreover, we only had test-retest scores from caretakers of pre-school children. Briere (2005) also reported low test-retest value on post-traumatic stress-intrusion. On the other subscales we found slightly lower

Table 4. Confirmatory factor analysis (CFA) with all the clinical scales item number and factor loadings (*n* = 694)

ANX item number	Factor loading	DEP item number	Factor loading	Anger item number	Factor loading	PTS-i item number	Factor loading	PTS-av item number	Factor loading	PTS-ar item number	Factor loading	DIS item number	Factor loading	Sexc item number	Factor loading	Factor p value
7	0.69	2	0.37	1	0.64	4	0.45	8	0.71	10	0.54	5	0.39	6	0.35	
21	0.57	18	0.45	15	0.65	11	0.75	13	0.58	17	0.59	25	0.59	12	0.80	
31	0.70	41	0.53	23	0.53	19	0.83	29	0.56	26	0.43	28	0.72	16	0.35	
32	0.71	54	0.52	34	0.70	24	0.46	39	0.78	45	0.45	33	0.62	20	0.23	
42	0.48	61	0.68	43	0.70	27	0.54	49	0.48	47	0.69	38	0.61	35	0.27	
44	0.47	68	0.71	58	0.69	36	0.54	55	0.64	48	0.56	46	0.72	50	0.73	
57	0.64	71	0.62	62	0.73	63	0.69	70	0.50	56	0.78	52	0.70	59	0.00 ns	
67	0.48	84	0.63	87	0.75	69	0.70	72	0.66	74	0.54	78	0.45	65	0.80	
76	0.66	88	0.66	90	0.70	80	0.80	81	0.76	82	0.76	85	0.64	75	0.85	

Note: Values over 0.50 in bold and according to Hair, Black, Babin, & Andreson (2010) what it should be and ideally 0.70.

ANX = Anxiety, DEP = Depression, PTS-int = Post-traumatic stress -intrusion, PTS-av = Post-traumatic stress-avoidance, PTS-ar = Post-traumatic stress-arousal, DIS = Dissociation, SC-Sexual concern.

test-retest coefficients than Briere (*N* = 33), except for post-traumatic stress- avoidance and post-traumatic stress- total where we found these to be somewhat higher.

The construct validity of the TSCYC scale was investigated in two ways; by the inter-correlations between the subscales and by a confirmatory factor analysis (CFA). The inter-correlations between the subscales were acceptable, were in line with what Briere had found and support a valid construct, as was also reported in Briere's study (2005). The inter-correlations between the subscales were sufficiently satisfactory (Hair, Black, Babin, & Anderson, 2010) to be able go further with a CFA.

There are several indexes that can be chosen to present the Goodness of fit (GOF) when a CFA has been conducted and in this study we chose the most common. Concerning the items loadings on the subscales, the majority of the loadings were not ideal (Hair et al., 2010) but two thirds had acceptable loadings and 25% had ideal loadings. With regard to the other GOF indexes found in this study for the subscales of the TSCYC, such as χ^2/df , *RSEMA* and *CFI*, there are some doubts that can be raised as none of the indexes showed to be optimal. One of the reasons for this could be the result of the sexual concern scale that showed the lowest loadings in the analysis. It can also be speculated that with a population with known traumatization, GOF indexes could have been different. To our knowledge, this is the first CFA examination of the TSCYC, and the results must be regarded with cautiousness concerning the underlying construction of the scale TSCYC and maybe another model of the subscales could have given better GOF indexes.

Furthermore, it was clearly shown that TSCYC could discriminate significantly between the clinical group and the normative group on all the subscales. The TSCYC could also discriminate well according to reported traumas (polytraumatization) in the normative group. In conclusion, criterion validity was sound in this study.

Second, the division by gender showed little significant difference except concerning anxiety and depressive symptoms, a finding which is in line with several other studies in which girls report more symptoms than boys. However the observed differences may indicate the development-related emergence of sex differences in symptomatology that have been shown in many other studies (Nolen-Hoeksema & Girgus, 1994; Hyde, Mezulis, & Abramson, 2008). In this research it is shown that the differences appear with age and possibly after the passage of ten to eleven years, at an age when the young girl and boy approach adolescence. This has also been indicated in another normative study in Sweden, in which Trauma Symptom Checklist for Children (TSCC) was used (Nilsson, Wadsby, & Svedin, 2008), reporting that girls reported more symptoms than boys on all the clinical scales.

Table 5. Summary of ANCOVA models testing differences in TSCYC scores between reference and clinical samples, with Group (reference: $n = 613-629$, clinical: $n = 58-59$) main effect (estimates shown below), adjusted for age and sex (estimates not shown)

Independent variable	Model estimates			Main effect (group)		
	F (df)	p value	Partial η^2	F	p value	
ANX ^a	39.198 (3,681)	<0.001	0.12	91.140	<0.001	
DEP ^a	60.701 (3,678)	<0.001	0.18	145.107	<0.001	
ANG ^a	59.665 (3,684)	<0.001	0.20	170.234	<0.001	
PTS-int ^a	70.236 (3,681)	<0.001	0.22	188.424	<0.001	
PTS-av ^a	115.969 (3,678)	<0.001	0.32	313.124	<0.001	
PTS-ar ^a	67.761 (3,681)	<0.001	0.22	196.271	<0.001	
PTS-tot ^a	108.549 (3,674)	<0.001	0.31	301.262	<0.001	
DIS ^a	20.697 (3,678)	<0.001	0.08	60.172	<0.001	
SC ^a	32.027 (3,681)	<0.001	0.10	77.186	<0.001	
Total ^a	94.449 (3,667)	<0.001	0.29	268.717	<0.001	

^aANX = Anxiety, DEP = Depression, ANG = Anger, PTS-int = Post- traumatic stress -intrusion, PTS-av = Post-traumatic stress-avoidance, PTS-ar = Post -traumatic stress-arousal, PTS-tot = Post-traumatic stress-total score, Dis = dissociation, SC = Sexual concern, Total = Total TSCYC score.

Third, there were clear differences between the normal group and the clinical group concerning total score and all of the subscales. This underscores the ability of the TSCYC to differentiate a clinical sample from the normal population which is an essential feature for usefulness as

Table 6. Summary of multiple regression models: TSCYC subscales regressed on cumulative traumatic events ('Polytraumatization', estimates displayed below), age and sex (estimates not shown) in the reference group ($N = 613-629$), in separate analyses for each TSCYC scale

Dependent variable	Model estimates		Coefficient estimates (polytraumatization)		
	R ²	p value	b	t value	p value
ANX ^a	0.056	<0.001	0.33	4.104	<0.001
DEP ^a	0.082	<0.001	0.31	5.853	<0.001
ANG ^a	0.118	<0.001	0.51	7.087	<0.001
PTS-int ^a	0.082	<0.001	0.36	6.546	<0.001
PTS-av ^a	0.073	<0.001	0.22	4.633	<0.001
PTS-ar ^a	0.026	<0.001	0.29	4.013	<0.001
PTS-tot ^a	0.066	<0.001	0.87	5.793	<0.001
DIS ^a	0.043	<0.001	0.33	5.071	<0.001
SC ^a	0.044	<0.001	0.07	2.852	0.004
Total ^a	0.089	<0.001	2.55	7.420	<0.001

ANX = Anxiety, DEP = Depression, ANG = Anger, PTS-int = Post-traumatic stress -intrusion, PTS-av = Post-traumatic stress-avoidance, PTS-ar = Post -traumatic stress- arousal, PTS-tot = Post-traumatic stress-total score, Dis = dissociation, SC = Sexual concern, Total = Total TSCYC score.

a screening tool in clinical practice, such as at Child Advocacy Centers.

Fourth, similar to the report by Briere (2005), the majority of informants in the present study were female. Whether the responses differ by sex of informant is a scarcely studied topic, but could be an interesting issue for future research.

Briere has made divisions with ages 3-4, 5-9 and 10-12. In our samples we have only five 11-year-olds and this age group probably better belongs to an age where self-reporting is used, e.g., using the TSCC which is suitable for ages 10-17 years old. Even if the TSCYC has many items compared to some other scales, it is convenient as the clinician can use only one scale instead of several when screening for possible symptoms a child could show in the aftermath of an experienced trauma.

A limitation of this study arises from the fact that TSCYC is a caretaker report, with no multi-informant information. The relatively small clinical sample lead to insufficient power in some analyses (e.g., age, gender differences). The lack of information on the number of traumatic events (e.g., LITE) or nature of trauma in the clinical group is also considered to be a limitation.

Conclusions

Our conclusions are that overall the TSCYC is a reliable and valid caretaker instrument, which can be recommended to clinicians for use in screening for symptoms after potentially traumatic life events experienced by preschool children and school children up to 10 years of age. Certain subscales do not display quite as good psychometrics and should therefore be used with

some caution. However, the TSCYC can be a valuable instrument for identifying symptoms in preschool and younger school children.

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