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Italian International Trauma Questionnaire for Children and Adolescents: Factor structure, measurement invariance, and validity in community and high-risk samples

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Abstract

Complex posttraumatic stress disorder (CPTSD) is recognized as a distinct diagnosis in the *ICD-11*. The International Trauma Questionnaire for Children and Adolescents (ITQ-CA) assesses CPTSD symptoms in youth aged 7–17 years; however, no validated Italian version is currently available. This study evaluated the psychometric properties of the Italian ITQ-CA in 488 children and adolescents from community ($n = 432$) and high-risk residential-care ($n = 56$) samples. Confirmatory factor analyses compared competing models, and measurement invariance was tested across sex assigned at birth, age, and risk status. The correlated second-order posttraumatic stress disorder (PTSD) and disturbances in self-organization (DSO) model was the best-fitting admissible hierarchical solution, CFI = .990, TLI = .986, RMSEA = .045. Reliability was good, $\omega = .866–.900$; $\omega H = .800–.823$; OHC = .947–.952. Approximate or partial measurement invariance supported latent-mean comparisons: Girls and adolescents had higher PTSD and DSO means than boys and younger participants, $\Delta M = .554–.879$, whereas risk groups did not differ, $\Delta M = -.055–.006$. Concurrent and convergent associations were moderate to large, and regression models identified partially differentiated external correlates, $R^2 = .563–.618$. The findings support the factorial validity and reliability of Italian ITQ-CA symptom scores and their use in Italian youth, and future research should examine functional impairment, longitudinal validity, and clinical replication.

Trauma exposure during childhood and adolescence constitutes a major public health concern, with substantial implications for psychological development and mental health (Asmundson & Afifi, 2019; Landolt et al., 2024). Although posttraumatic stress disorder (PTSD) has been extensively studied as a primary outcome of trauma exposure, growing evidence indicates the presence of more complex trauma-related outcomes that extend beyond the

traditional PTSD framework (Cook et al., 2005). These outcomes are associated with prolonged exposure to adverse interpersonal experiences during critical developmental periods, often within attachment relationships in which the caregiver either perpetrates harm or fails to protect the child from abuse, neglect, domestic violence, or other dysfunctional experiences (e.g., parental substance use, violent death, or detention). These experiences exert cumulative and pervasive effects across multiple domains of functioning, including emotion regulation, self-concept, interpersonal relationships, and meaning-making processes, resulting in symptom profiles that are broader and more pervasive than those typically associated with PTSD (Cloitre et al., 2013; D'Andrea et al., 2012). These symptoms may persist into adulthood, contributing to enduring maladaptive coping strategies and widespread impairments in overall functioning, including academic difficulties, occupational challenges, and unhealthy lifestyle patterns (Asmundson & Afifi, 2019; Ford, 2021).

In light of this clinical and developmental significance, scientist-practitioners proposed a diagnosis of *complex PTSD* (CPTSD) several decades ago, nearly concurrently with the initial description of PTSD. However, it was not until the publication of the 11th revision of the *International Statistical Classification of Diseases and Related Health Problems* (*ICD-11*; World Health Organization [WHO], 2019) that CPTSD received formal recognition as a distinct clinical entity. According to the *ICD-11*, CPTSD encompasses all traditional PTSD symptoms, including reexperiencing the trauma in the here and now, the avoidance of trauma reminders, and a persistent sense of current threat manifested by arousal and hypervigilance. In addition, CPTSD includes core symptom clusters reflecting *disturbances in self-organization* (DSO), which are commonly associated with repeated multiple forms of trauma exposure and include affective dysregulation, negative self-concept, and disturbances in relationships. Both PTSD and CPTSD diagnoses require exposure to trauma and evidence of functional impairment.

The formal recognition of CPTSD as a distinct diagnostic entity has highlighted the need for reliable and valid assessment tools capable of differentiating traditional PTSD from CPTSD in both adult and pediatric populations, consistent with *ICD-11* guidelines. Focusing on the pediatric population, the International Trauma Questionnaire for Children and Adolescents (ITQ-CA) was developed by Cloitre, Roberts, et al. (2018) as an adaptation of the adult version (Cloitre, Shevlin, et al., 2018), using developmentally appropriate language and concise items to enhance accessibility for younger respondents. The ITQ-CA evaluates *ICD-11* PTSD and CPTSD symptoms across six clusters—three for PTSD and three for DSO—alongside items assessing functional impairment.

The instrument has undergone adaptation in samples from several countries, including Austria, Lithuania, China, Denmark, Iran, and Afghanistan (Afsharzada et al., 2025; Bruckmann et al., 2020; Daniunaite et al., 2021; Haselgruber et al., 2020; Ho et al., 2022; Kazlauskas et al., 2020; Løkkegaard et al., 2023; Parhoon et al., 2024; Sigurðardóttir et al., 2025). Empirical evidence from high-risk samples of children and adolescents consistently supports a model with two correlated second-order factors: PTSD and DSO (Afsharzada et al., 2025; Haselgruber et al., 2020; Ho et al., 2022; Løkkegaard et al., 2023; Parhoon et al., 2024). Alternative models, including six correlated factors corresponding to the three PTSD and three DSO symptom clusters (e.g., Kazlauskas et al., 2020) or a single-factor model (Afsharzada et al., 2025), have also received some empirical support. In sum, although most studies indicate that ITQ-CA data best reflect the *ICD-11* operationalization of CPTSD, the presence of alternative, equally acceptable models in children and adolescents may be related to developmental stage. Specifically, developmental differences may influence the expression and organization of symptoms, resulting in different patterns of association between DSO symptoms and core PTSD symptoms (e.g., Kazlauskas et al., 2020).

Tests of the ITQ-CA's convergent validity—that is, the extent to which a measure is associated with others that, on theoretical grounds, should assess the same or closely related constructs (Nunnally & Bernstein, 1994)—indicate positive associations with lifetime trauma exposure. Previous findings in community and high-risk samples have shown associations between total ITQ-CA scores, indexing complex PTSD symptomatology, and more childhood traumatic experiences (Kazlauskas et al., 2020), as well as the two ITQ-CA subscales when used separately (Haselgruber et al., 2020; Sigurðardóttir et al., 2025). Convergent validity has also been tested with a range of psychopathological symptoms, including dissociation, anxiety, depression, stress, aggression, and emotional–behavioral difficulties (Bruckmann et al., 2020; Daniunaite et al., 2021; Haselgruber et al., 2020; Ho et al., 2022; Kazlauskas et al., 2020; Løkkegaard et al., 2023; Sigurðardóttir et al., 2025). Discriminant validity refers to the extent to which a measure shows low or clearly distinguishable associations with measures of theoretically distinct constructs (Nunnally & Bernstein, 1994), thereby supporting the distinctiveness of the construct under assessment. A limited number of studies have examined the discriminant validity of the ITQ-CA by testing whether its two proposed dimensions are differentially associated with theoretically relevant predictors. Nevertheless, the findings have been mixed: Studies examining distinct predictors for CPTSD and PTSD, or the two ITQ-CA factors (PTSD and DSO), generally support differential predictors, but the patterns are

not always consistent across investigations (Bruckmann et al., 2020; Daniunaite et al., 2021; Haselgruber et al., 2020; Ho et al., 2022; Løkkegaard et al., 2023).

Although the adult version of the ITQ has been validated in older Italian adolescents (Rossi et al., 2022), to date, there is no Italian version of the ITQ-CA. The first aim of the present study was to fill this gap by translating the ITQ-CA into Italian and testing its factorial validity and reliability by comparing theoretically plausible models of the *ICD-11* PTSD/CPTSD symptom structure. Based on the previously discussed findings, as well as the *ICD-11* conceptualization of CPTSD symptoms, we expected a second-order two-factor solution to yield the best fit.

The second aim of the study was to test measurement invariance of the Italian version of the ITQ-CA across sex assigned at birth, age, and risk classification to verify whether the factorial structure held for different groups of participants. No clear predictions were made, given the exploratory nature of this aim. When a sufficient level of invariance was supported, higher-order latent means were compared across groups.

The third aim was to test concurrent, convergent, and discriminant validity (Nunnally & Bernstein, 1994). More specifically, we tested concurrent validity by examining associations between the ITQ-CA total scale and subscales and PTSD symptoms assessed by an independent and validated PTSD measure widely used for pediatric populations in Italy, the Trauma Symptom Checklist for Children (Briere, 1996; Di Blasio et al., 2011). Convergent validity was tested by examining associations between both ITQ-CA dimensions (PTSD and DSO) and criterion variables, such as cumulative trauma exposure, emotional–behavioral problems, dysregulation, and dissociation. Based on the previously discussed findings, we expected to observe positive associations between both ITQ-CA dimensions and the criterion variables, particularly cumulative trauma exposure, anxiety, and depression. Lastly, discriminant validity was examined by assessing the distinct contributions of predictors commonly associated with PTSD and DSO within the broader CPTSD symptom structure. No detailed predictor pattern was hypothesized because the relevant literature does not indicate a consistent pattern of predictors differentially associated with each CPTSD dimension. The only exception concerns the expected stronger association between the DSO dimension, compared with the PTSD dimension, with adaptive difficulties and dissociation. This expectation was based on evidence indicating that these outcomes are among the most frequently reported consequences in individuals with a history of adverse childhood experiences. Previous research has shown that adverse childhood experiences represent a key developmental precursor of CPTSD rather than PTSD alone (Cloitre et al., 2009, 2013; Rafiq et al., 2018), with impairments in adaptive functioning and dissociative symptoms frequently emerging as prominent clinical manifestations of DSO processes.

METHOD

Participants

A total of 488 children and adolescents (n = 227 boys, n = 260 girls, n = 1 missing sex data) aged 8–17 years (M = 12.93 years, SD = 2.50) took part in the study. The sample included two groups: a community sample and a high-risk sample. The community sample comprised 432 participants (n = 204 boys, n = 227 girls, n = 1 missing sex data) aged 8–17 years (M = 13.04 years, SD = 2.42), recruited from five primary or secondary schools in an urban area of Apulia, in southeastern Italy. The high-risk sample comprised 56 children and adolescents (n = 23 boys, n = 33 girls) aged 8–17 years (M = 12.14 years, SD = 2.97) who were in residential institutional care following judicial decisions related to adverse family conditions. Of these participants, 17 were institutionalized with their mothers, whereas 39 were cared for by professional educators. School and institutional records indicated no developmental disorders among participants.

In the community sample, 221 parents agreed to participate themselves. Of these, 156 were mothers, and 39 were fathers, whereas the remaining 26 did not report their parental role. On average, mothers were 45.55 years old (SD = 5.56; n = 46 missing) and fathers were 50.07 years old (SD = 3.83; n = 11 missing). Mothers reported completing an average of 14.10 years of education (SD = 4.01; n = 21 missing), and fathers reported completing 14.88 years (SD = 2.76; n = 7 missing). In the high-risk sample, all 17 mothers and 39 educators completed the caregiver component. Mothers and educators were, on average, 43.35 years old (SD = 8.80) and 40.00 years old (SD = 11.26), respectively; caregivers reported completing an average of 8.25 years of education (SD = 3.53).

Procedure

For the community sample, the study's purpose was explained to school principals and teachers; for the high-risk sample, the study's purpose was explained to institutional directors and educators, who authorized data collection at their sites. Parents or legally responsible caregivers provided written consent for each child's participation and could separately choose whether to complete the caregiver-report component themselves. Children and adolescents were informed that participation was voluntary and that they could decline or discontinue

without consequences. The study was conducted according to the guidelines of the Declaration of Helsinki. Participants received no compensation and were treated in accordance with the ethical standards outlined by the American Psychological Association and the Italian Association of Academic Psychologists. The protocol for the data collection and treatment was approved by the Ethics Committee of the Department of Education, Psychology, and Communication at the University of Bari Aldo Moro (Bari, Italy), within a larger study of the impact of adverse childhood experiences on physical and psychological well-being (ethics reference code: ET-21-18).

The child and parent/educator data collections were conducted independently. Community parents who agreed to participate were sent a link through which they were asked to specify whether they were fathers or mothers and were instructed to create an identifying code by combining the first three letters of the name and surname with the year of birth of their participating child, solely for the purpose of matching parent and child questionnaires. They then completed two sociodemographic questions (age and years of education) and a questionnaire describing their child's sociobehavioral functioning. Data collection among community children and adolescents was completed in a single session at school. Research assistants visited the classes and provided students whose parents had consented to participate with a package containing a battery of self-report questionnaires assessing the measures of interest. General information about the study aims and the confidentiality of the data was provided. To protect confidentiality, student participants were asked to provide an identifying code following the same criteria used with parents, and then to complete the questionnaires. Teachers were not present in the classroom to reduce the likelihood that children would experience their research participation as a school task. Children and adolescents were assured that their participation was voluntary and that they could decline to participate at any time. No child whose parent had consented refused to complete the questionnaires.

In the high-risk sample, children and adolescents, mothers, and educators were visited at the institution and completed paper-and-pencil surveys. The same procedures used in the community sample to provide information, protect confidentiality, and support comfortable survey completion were adopted.

Measures

Child-reported measures

ICD-11 PTSD and CPTSD

The ITQ-CA (Cloitre, Roberts, et al., 2018) is a 21-item, self-report measure organized into six symptom clusters consistent with the *ICD-11* conceptualization of CPTSD. The PTSD component includes items related to reexperiencing (two items), avoidance (two items), and sense of current threat (two items). The DSO component comprises items related to affective dysregulation (two items), negative self-concept (two items), and disturbances in relationships (two items). Each item assesses symptom severity over the past month, rated on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). As no Italian version was available, the third author, a native English speaker, translated the original instrument into Italian, and the first author independently back-translated it into English; discrepancies were discussed among the coauthors until agreement was reached.

In addition to symptom items, the ITQ-CA includes functional impairment items assessing the extent to which symptoms interfere with life domains (e.g., family and friends, school). Although these items are essential for diagnostic determination in clinical settings, they were not included in the psychometric test of the present study.

Trauma-related symptoms

The TSCC (Briere, 1996; Italian version: Di Blasio et al., 2011) is a self-report questionnaire used to evaluate trauma-related symptomatology in pediatric populations aged 8–16 years. The 44-item form includes five clinical scales: Anxiety, Depression, Anger, Posttraumatic Stress, and Dissociation. When the assessment of sexual concerns is clinically or contextually appropriate, an additional 10-item Sexual Concerns scale is also available. The 44-item form was administered in the community sample, and the 54-item form was used in the high-risk sample. In both the community and high-risk samples, internal consistency was satisfactory-to-good for the Anxiety, Depression, Anger, Posttraumatic Stress, and Dissociation subscales, Cronbach's αs = .80–.91. The Sexual Concerns subscale demonstrated good internal consistency in the high-risk sample, Cronbach's α = .80; this scale was not administered in the community sample.

Trauma exposure

The Child and Adolescent Trauma Screen (CATS; Sachser et al., 2017) is a screening instrument that assesses potentially traumatic events and posttraumatic stress symptoms in pediatric populations aged 7–17 years. The present study used only its trauma exposure checklist, which comprises 14 dichotomous ("yes" or "no") items and one open-ended question for unlisted experiences. The checklist assesses lifetime exposure to potentially traumatic events, such as physical and sexual violence, death or injury, sudden or violent death of close persons, natural disasters, and war. Cumulative lifetime traumatization was assessed by summing exposure across all traumatic events, yielding scores from 0 to 15. Because no Italian version

was available at the time of data collection, the third author translated the checklist into Italian and the first author independently back-translated it into English; no substantive discrepancies emerged. In the community and high-risk groups, respectively, 23.1% ($n = 100$) and 10.7% ($n = 6$) of participants reported no trauma exposure.

Dissociative experiences

The Adolescent Dissociative Experiences Scale (A-DES; Armstrong et al., 1997; Italian version: Schimmenti, 2016) is a 30-item, self-report measure designed to assess normal and pathological dissociative experiences in adolescents aged 11–18 years. Items are rated on an 11-point scale ranging from 0 (*never*) to 10 (*always*), with respondents indicating how frequently they experience each symptom. These rates are averaged to obtain a final score of the dissociative experiences. In the present sample, the A-DES demonstrated excellent internal consistency, Cronbach's $\alpha = .96$. Given the scale's age limit, it was administered only to older participants ($n = 328$, 67.2%).

Caregiver-reported measures

Children's socioemotional functioning and behavioral difficulties

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997; Italian version: Tobia & Marzocchi, 2018) is a widely used, 25-item screening tool that is used to assess socioemotional functioning and behavioral difficulties in children and adolescents aged 2–17 years. Items are rated on a 3-point Likert scale ranging from 0 (*not true*) to 2 (*certainly true*), with respondents indicating the degree to which each statement applies to the child's behavior over the past 6 months. The SDQ comprises the following five subscales: Emotional Symptoms, Conduct Problems, Hyperactivity/Inattention, Peer Relationship Problems, and Prosocial Behavior. The caregiver completing the measure was a parent in the community group and either a parent, when available, or a professional educator in the high-risk group. In the present sample, internal consistency ranged from poor to acceptable across subscales, Emotional Symptoms: Cronbach's $\alpha = .78$; Conduct Problems: Cronbach's $\alpha = .63$; Hyperactivity/Inattention: Cronbach's $\alpha = .77$; Peer Relationship Problems: Cronbach's $\alpha = .58$; Prosocial Behavior: Cronbach's $\alpha = .77$.

Data analysis

Primary ITQ-CA PTSD and DSO scores were calculated as unit-weighted sums of their six symptom items and required complete data on all six items; the CPTSD symptom total score required complete data on all 12 items. The resulting valid sample sizes were 469 for PTSD, 467 for DSO, and 463 for CPTSD. Item endorsement was defined as a rating of 2 or higher; a symptom cluster was considered endorsed when at least one of its two items was endorsed. PTSD symptom criteria required the endorsement of all three PTSD clusters, DSO symptom criteria required the endorsement of all three DSO clusters, and combined CPTSD symptom criteria required both. Because complete functional impairment data were unavailable, these profiles were not interpreted as diagnoses.

Distributional characteristics were evaluated using bias-corrected skewness, excess kurtosis, Lilliefors-corrected Kolmogorov–Smirnov tests, and Shapiro–Wilk tests. All variables used in observed-score inferential analyses were transformed using Van der Waerden normal scores. Raw score means and standard deviations were retained for descriptive interpretation. Caregiver participation, sex assigned at birth, and risk condition comparisons used pooled-variance independent-samples t tests on transformed scores, with Cohen's d effect sizes reported.

Factorial validity was evaluated in *Mplus* (Version 7) using the weighted least squares mean- and variance-adjusted estimator (WLSMV) with THETA parameterization for the 12 ordered-categorical symptom items. Five models were compared: a single CPTSD factor, correlated PTSD and DSO factors, six correlated symptom-cluster factors, a single second-order CPTSD factor, and correlated second-order PTSD and DSO factors. Model fit was evaluated using the chi-square statistic; comparative fit index (CFI); Tucker–Lewis index (TLI); root mean square error of approximation (RMSEA), with 90% confidence intervals (CI); and weighted root mean square residual (WRMR), interpreted jointly (Chen, 2007; Kline, 2016). Missing item values were coded as 999 and treated as missing in *Mplus*.

The reliability of PTSD and DSO sum scores was estimated using omega total, omega hierarchical, and omega–hierarchical correlation (OHC; Raykov et al., 2026) in the retained hierarchical model (Dunn et al., 2014; Zinbarg et al., 2005). For the two-item symptom clusters, pairwise polychoric correlations and Spearman–Brown coefficients were calculated (Eisinga et al., 2013).

Measurement invariance was tested sequentially across sex assigned at birth (boys vs. girls), age (12 and younger vs. 13 years and older), and risk condition (community vs. high risk) using the following metrics through the following sequence of increasingly restrictive models: configural form, equality of first-order loadings, equality of ordinal thresholds, equality of second-order loadings, estimation of higher-order latent means, and equality of higher-order means. Changes in fit were evaluated using a CFI change of −.010 or more and an RMSEA change of .015 or less, together with the WLSMV DIFFTEST. The residual vari-

ance of affective dysregulation was fixed to .01 throughout. To maintain admissible nested solutions, the threat residual was also fixed to .01 in boys, and the reexperiencing and threat residuals were fixed to .01 in the high-risk group. Age analyses used partial threshold invariance by freeing three thresholds in adolescents: Threshold 4 of Item 5 and Thresholds 3 and 4 of Item 7.

Concurrent and convergent validity were examined using partial correlations among van der Waerden–transformed scores, controlling for age and sex assigned at birth and using pairwise available cases. Stepwise linear regressions predicted PTSD and DSO scores from TSCC Anxiety, Depression, Anger, and Dissociation subscales; cumulative trauma exposure; the five SDQ subscales and dysregulation profile; sex assigned at birth; and age. Entry was set at a p value of less than .05, and removal was set at a p value of .10 or higher, using one listwise-complete candidate set for each outcome. TSCC Posttraumatic Stress was reserved as the concurrent validity criterion, and the A-DES was excluded from predictor selection because it was administered only to older participants.

RESULTS

Preliminary data features and symptom endorsement

Item-level missingness was low (i.e., less than 3.9%; Supplementary Table S1). Consistent with the previously described scoring approach, an item was considered endorsed when given a rating of 2 or higher. Across the 12 symptom items, endorsement rates ranged from 31.6% to 65.6%. Complete counts and sample-specific cluster endorsement rates are reported in Supplementary Table S2.

Factorial validity

As shown in Table 1, the single-factor model fit poorly, and the correlated PTSD–DSO model improved fit but remained suboptimal. The six-cluster model showed excellent approximate fit but was inadmissible because its latent covariance matrix was not positive definite. The second-order one-factor model fit well but less well than the admissible two-factor hierarchical representation and did not preserve the *ICD-11* distinction between PTSD and DSO.

The second-order two-factor model (Model 5) was retained as the best-fitting admissible hierarchical solution because it provided a parsimonious representation that preserved the clinically meaningful separation between PTSD and DSO while maintaining excellent fit. The initial unconstrained estimation produced a small negative residual variance for the affective dysregulation first-order factor (−.018). An admissible solution was obtained by fixing this residual variance to a small positive value (.01), resulting in excellent fit (Table 1).

In the retained model (Figure 1), all standardized item loadings on their intended first-order symptom clusters were statistically significant and ranged from .528 to .881. Standardized second-order loadings were strong for PTSD (.844–.958) and DSO (.796–.996), supporting the coherence of the higher-order dimensions. The correlation between PTSD and DSO was high, $r = .918$, indicating substantial shared variance while the dimensions remained conceptually distinguishable. Standardized parameter estimates are reported in Supplementary Table S3. The high correlations among first-order clusters in the six-factor model, reported in Supplementary Table S4, further supported a hierarchical PTSD–DSO representation. Additional item-level polychoric correlations, item thresholds, observed Pearson correlations, and reproducibility materials are reported in the Supplementary Materials and Supplementary Tables S5–S7.

Reliability

Both higher-order dimensions showed good reliability. For the PTSD symptom sum, omega was .866, hierarchical omega was .800, and the OHC was .952, SE = .009, 95% CI [.935, .969]. For the DSO symptom sum, the corresponding estimates were .900, .823, and .947 ($SE = .007$), 95% CI [.933, .960]. At the cluster level, pairwise polychoric interitem correlations ranged from .425 to .764, corresponding to Spearman–Brown coefficients of .596–.866 (Supplementary Table S8).

Measurement invariance (sex assigned at birth, age, risk)

Measurement-invariance results are presented in Supplementary Table S9, and the estimated higher-order latent mean differences are shown in Supplementary Table S10. Decisions were based primarily on changes in CFI and RMSEA, interpreted together with the WLSMV DIFFTEST package results. Across sex assigned at birth (boys: $n = 227$, girls: $n = 260$), the equality constraint on first-order loadings produced small changes in approximate fit, ΔCFI = −.002, ΔRMSEA = .003, although the DIFFTEST was significant, $p = .022$. Threshold equality also remained within the incremental fit criteria, ΔCFI = −.007, ΔRMSEA = .002, despite a significant DIFFTEST, $p < .001$. A test of the equality of second-order

TABLE 1 Fit indices for competing confirmatory factor analysis models of the International Trauma Questionnaire for Children and Adolescents (ITQ-CA) symptom structure.

Model	Specification	χ^2	*df*	CFI	TLI	RMSEA	[90% CI]	WRMR
1	1F (CPTSD)	391.668	54	.930	.914	.113	[.103, .124]	1.495
2	2F (PTSD, DSO)	288.883	53	.951	.939	.095	[.085, .106]	1.265
3	6F clusters[a]	70.934	39	.993	.989	.041	[.025, .056]	0.551
4	SO-1F	115.731	48	.986	.981	.054	[.041, .066]	0.772
5	SO-2F (*ICD-11*)[b,c]	95.318	48	.990	.986	.045	[.032, .058]	0.688

Note: $N = 488$. Models were estimated in *Mplus* (Version 7) with THETA parameterization for ordered-categorical indicators. 1F = single-factor model; 2F = correlated two-factor model; 6F = correlated six-factor model; SO-1F = single second-order factor model; SO-2F = correlated second-order factor model; AD = affective dysregulation; CFI = comparative fit index; CI = confidence interval; CPTSD = complex posttraumatic stress disorder; DSO = disturbances in self-organization; *ICD-11* = *International International Statistical Classification of Diseases and Related Health Problems* (11th rev.); ITQ-CA = International Trauma Questionnaire for Children and Adolescents; PTSD = posttraumatic stress disorder; RMSEA = root mean square error of approximation; TLI = Tucker-Lewis index; WLSMV = weighted least squares mean- and variance-adjusted estimator; WRMR = weighted root mean square residual.

[a]Model 3 produced a non–positive-definite latent covariance matrix.

[b]The unconstrained SO-2F model produced a small negative residual variance for AD.

[c]The reported Model 5 fit is for the admissible solution with that residual fixed to .01.

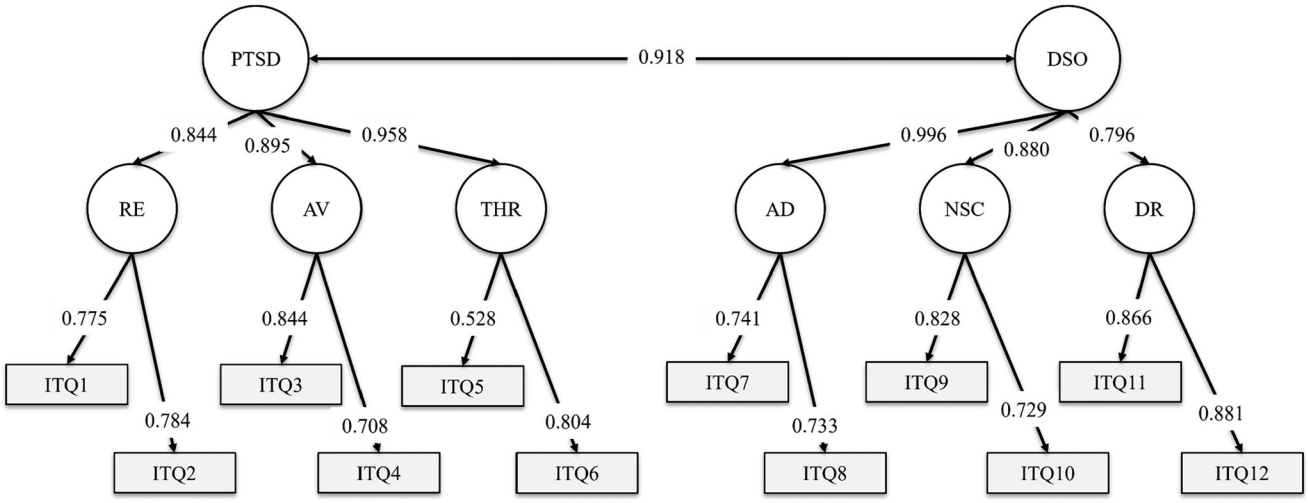

FIGURE 1 Standardized solution for the retained International Trauma Questionnaire for Children and Adolescents (ITQ-CA) second-order two-factor model (Model 5).

Note: $N = 488$. Circles represent latent factors, and rectangles represent observed ITQ-CA items (ITQ1–ITQ12). Standardized factor loadings and the correlation between the second-order factors (posttraumatic stress disorder [PTSD] and disturbances in self-organization [DSO]) are shown. Estimates are from a confirmatory factor analysis using the weighted least squares mean- and variance-adjusted estimation estimator with THETA parameterization for ordered-categorical responses (0–4). The residual variance of affective dysregulation (AD) was fixed to .01 to obtain the retained admissible solution. RE = reexperiencing; AV = avoidance; THR = sense of threat; NSC = negative self-concept; DR = disturbances in relationships.

loadings and estimation of higher-order latent means produced negligible fit changes. Girls had higher latent means for PTSD ($\Delta M = .628$, $SE = .103$), $p < .001$, and DSO ($\Delta M = .879$, $SE = .119$), $p < .001$, than boys, and constraining these means to equality substantially worsened fit. The overall pattern, therefore, supported approximate rather than strict invariance across sex assigned at birth.

Across age (children: $n = 204$, adolescents: $n = 284$), the equality of first-order loadings was supported, ΔCFI = .000, ΔRMSEA = −.003. Partial threshold invariance was obtained after freeing three thresholds in adolescents; the change in CFI was at the −.010 boundary, ΔRMSEA = .008, and the DIFFTEST was significant, $p < .001$. The equality of second-order loadings was supported, and the higher-order latent-mean model showed only small changes in approximate fit despite a significant DIFFTEST, $p = .027$. Adolescents had higher latent means for PTSD ($\Delta M = .554$, $SE = .108$), $p < .001$, and DSO ($\Delta M = .727$, $SE = .125$), $p < .001$, than younger participants, and equality constraints on these means

markedly worsened fit. These results supported cautious mean comparisons under partial age invariance.

Across risk condition (community: $n = 432$, high-risk: $n = 56$), first-order loadings, thresholds, and second-order loadings met the incremental fit criteria for invariance. Although the DIFFTEST for the higher-order latent-mean step was significant, $p < .001$, the changes in CFI and RMSEA remained within the prespecified criteria, ΔCFI = −.005, ΔRMSEA = .008. High-risk participants did not differ from community participants in PTSD ($\Delta M = -.055$, $SE = .198$), $p = .781$, or DSO scores ($\Delta M = .006$, $SE = .133$), $p = .964$, and constraining the two higher-order means to equality did not worsen fit, $p = .718$.

Known-groups validity (sex assigned at birth/age/risk)

Girls and adolescents showed higher mean PTSD and DSO scores than boys and younger participants, whereas community and high-risk participants did not differ. Observed score comparisons by sex assigned at birth and risk condition are reported in Supplementary Tables S11–S12.

Test of concurrent, convergent and discriminant validity

Before the validity analyses, the distributions of the external variables were inspected. As reported in Supplementary Table S13, seven measures had skewness, and six had kurtosis values outside the range of -1.0 to 1.0. The more restrictive Kolmogorov–Smirnov and Shapiro–Wilk tests were significant for all measures, supporting use of the van der Waerden rank-based normal score transformation. In addition, because only 221 of 432 parents in the community sample completed the caregiver component, potential nonresponse bias was examined by comparing children whose parents participated and those whose parents did not for all child-report measures. As reported in Supplementary Table S14, children of participating parents reported lower scores on every measure, ps $\leq .001$, ds = 0.32–.66, indicating systematic self-selection in caregiver participation.

Concurrent and convergent validity results are reported in Supplementary Table S15. Across the total sample, ITQ-CA PTSD and DSO scores showed moderate-to-large positive associations with TSCC posttraumatic stress scores and other trauma-related symptom domains, including anxiety, depression, anger, and dissociation. Associations were also positive with cumulative lifetime trauma exposure, as assessed using the CATS. Associations with caregiver-rated socioemotional and behavioral functioning (SDQ) were smaller and less consistent. The broad pattern of child-report associations was comparable across community and high-risk participants; indeed, several coefficients were particularly large in the high-risk group, including those for the associations between ITQ-CA PTSD and both TSCC Posttraumatic Stress and Anxiety and the association between DSO and TSCC Depression. Estimates involving caregiver-rated SDQ scales were weaker and less precise and should be interpreted cautiously because the high-risk subgroup was small, and caregiver informants differed across settings.

The regression findings are reported in Supplementary Table S16. The PTSD model explained 56.3% of score variance, $R = .750$, $F(5, 257) = 66.17$, $p < .001$. Retained predictors were anxiety, dissociation, cumulative trauma exposure, sex assigned at birth, and age. The DSO model explained 61.8% of score variance, $R = .786$, $F(7, 257) = 59.40$, $p < .001$. Retained predictors were depression, dissociation, anxiety, anger, sex assigned at birth, peer relationship problems, and age. Thus, anxiety, dissociation, sex assigned at birth, and age were shared predictors, whereas cumulative trauma exposure was retained only for PTSD, and depression, anger, and peer relationship problems were retained only for DSO. These findings were interpreted as evidence of partially differentiated external correlates rather than definitive discriminant validity.

DISCUSSION

This study evaluated the factorial validity; reliability; measurement invariance across sex assigned at birth, age, and risk status; and concurrent, convergent, and discriminant validity of the Italian ITQ-CA symptom items. Across the competing confirmatory factor analysis (CFA) models, the second-order two-factor solution was retained as the best-fitting admissible hierarchical model after the small negative residual variance for the affective dysregulation cluster was fixed to .01. In this model, PTSD was represented by reexperiencing, avoidance, and sense of threat, whereas DSO was represented by affective dysregulation, negative self-concept, and disturbances in relationships. This pattern is consistent with the hierarchical structure most frequently supported in studies of the ITQ-CA among children and adolescents across diverse cultural contexts (Afsharzada et al., 2025; Haselgruber et al., 2020; Ho et al., 2022; Løkkegaard et al., 2023; Parhoon et al., 2024) and aligns with the *ICD-11* conceptualization of CPTSD symptoms (WHO, 2019). Furthermore, the strong association between the PTSD and DSO factors reflects their interrelated nature and substantial shared variance while retaining their conceptual distinction.

With respect to our second study aim, the findings support approximate measurement invariance across sex assigned at birth and risk status and partial invariance across age, permitting cautious comparison of higher-order latent means. Invariance across risk status is noteworthy because it suggests that the same higher-order structure can be applied in community and high-risk samples, although the small, imbalanced high-risk subgroup limits precision. Previous research focusing specifically on the ITQ-CA has not consistently identified the same factorial structure across samples; although the second-order two-factor model has been shown to provide the best fit in several high-risk samples (e.g., Ho et al., 2022; Løkkegaard et al., 2023; Parhoon et al., 2024), an alternative correlated six-factor solution demonstrated superior fit in a community sample (Kazlauskas et al., 2020). The present findings, therefore, extend evidence for the applicability of the hierarchical model across community and high-risk youth without implying strict invariance in every comparison.

Within the approximately or partially invariant models, girls and adolescents showed higher latent means for both PTSD and DSO than boys and younger participants, whereas latent means did not differ between the community and high-risk groups. Higher symptom levels among girls have been consistently documented in the broader trauma literature (Garza & Jovanovic, 2017; Haag et al., 2020), as well as in studies employing the ITQ-CA (Haselgruber et al., 2020; Løkkegaard et al., 2023; Sigurðardóttir et al., 2025) and may reflect differences in exposure patterns and sex-related vulnerability to trauma. The age-related findings are also consistent with prior research indicating increased trauma-related symptom severity from late childhood through adolescence (Bailey et al., 2025; Haselgruber et al., 2020; Løkkegaard et al., 2023). The absence of PTSD and DSO latent-mean differences across risk groups should not be interpreted as evidence that the groups were equivalent in trauma exposure or broader adjustment because the high-risk participants reported higher cumulative trauma exposure and showed substantially greater caregiver-rated difficulties in several domains.

With respect to concurrent validity, the Italian ITQ-CA showed strong associations with the TSCC Posttraumatic Stress subscale, which is an established Italian-language measure of trauma-related symptoms in pediatric populations, although the measure was not specifically developed to assess CPTSD. Regarding convergence with external criteria, ITQ-CA scores were associated in the expected directions with cumulative lifetime trauma exposure, internalizing and dissociative symptoms, and selected indicators of socioemotional functioning. Associations with caregiver-rated functioning were smaller and less consistent, a pattern that may partly reflect differences in informants and the caregiver participation bias identified in the community sample. Overall, these findings support the convergence of ITQ-CA dimensions with related indicators of trauma and psychological difficulties.

With regard to discriminant validity, the regression models showed both overlap and partial differentiation between PTSD and DSO. Anxiety, dissociation, sex assigned at birth, and age contributed to both outcomes; cumulative trauma exposure was retained only for PTSD, whereas depression, anger, and peer relationship problems were retained only for DSO. The broader affective and interpersonal correlates in the DSO model were consistent with the conceptual scope of DSO. However, dissociation was shared rather than uniquely associated with DSO; thus, the specific expectation of a stronger, distinctive DSO association was only partially supported. The regression findings, therefore, provide qualified evidence of partially differentiated external correlates rather than a definitive demonstration of discriminant validity.

Several limitations should be considered when interpreting these results. First, functional impairment items were not considered, which prevents the use of the full *ICD-11* diagnostic algorithm and limits conclusions regarding the symptom component of PTSD and DSO. Future studies should include impairment to enable diagnostic classification, evaluate optimal impairment scoring strategies in younger age groups, and examine the incremental validity of impairment over symptoms. Second, the study design was cross-sectional and relied on self-report symptom ratings, which constrains inferences about developmental processes, introduces shared method variance and prevents testing validity against a gold-standard clinical interview assessment of PTSD and DSO symptoms. Longitudinal research is needed to test temporal stability, prospective validity, and sensitivity to change, including in treatment settings.

Third, two sample-related limitations should be acknowledged. First, preliminary analyses suggest that parents of children who reported more pronounced difficulties may have been less likely to participate, suggesting a nonresponse bias. This is a well-documented issue in survey-based studies of child mental health, in which parents may be reluctant to report on their children's psychological difficulties (e.g., Stormark et al., 2008). In the present study, this bias may have led to an underestimation of children's overall socioemotional difficulties, potentially limiting the test of the concurrent validity of the ITQ-CA measures against parent-reported criteria. Second, although the sample included a high-risk subgroup, group sizes were imbalanced. This reduces precision for risk-group comparisons within latent variable models. Replication in larger and more diverse clinical and high-adversity samples, ideally with clinician-rated

outcomes and structured diagnostic interviews, will be crucial to evaluate clinical utility, diagnostic agreement, and cutoff performance.

Lastly, although the CFA results support the *ICD-11* structure, the especially strong association between PTSD and DSO in this sample underscores the need for careful interpretation at the individual level. In practice, profiles characterized by prominent DSO symptoms may be most informative for case formulation and treatment planning, particularly when relational and self-concept difficulties are central to the presentation.

The findings provide support for the factorial structure, reliability, and construct validity of Italian ITQ-CA symptom scores and suggest that the Italian ITQ-CA symptom set is suitable for research and symptom-screening contexts targeting *ICD-11* PTSD and CPTSD symptom dimensions in youth. Its brevity and close alignment with *ICD-11* domains make it particularly appropriate for epidemiological studies, service evaluation, and settings in which a rapid yet theoretically grounded assessment is required. Further research should include functional impairment, longitudinal validation, and replication in larger clinical and high-adversity samples.

AUTHOR CONTRIBUTIONS

Michele Simeone: conceptualization, supervision, writing–review and editing. **Marvita Goffredo**: conceptualization, investigation, writing–original draft, methodology, validation, visualization, writing–review and editing, data curation, supervision. **Alessandro Costantini**: conceptualization, investigation, writing–original draft, writing–review and editing, data curation, resources. **Maria Grazia Foschino Barbaro**: conceptualization, investigation, writing–original draft, writing–review and editing, methodology, supervision. **Jonathan I Bisson**: conceptualization, supervision, writing–original draft, writing–review and editing. **Gabrielle Coppola**: conceptualization, investigation, writing–original draft, methodology, validation, visualization, writing–review and editing, formal analysis, project administration, data curation, supervision, resources. **Pasquale Musso**: conceptualization, investigation, writing–original draft, writing–review and editing, methodology, formal analysis, project administration, data curation, supervision. **Marylene Cloitre**: conceptualization, supervision, writing–review and editing, writing–original draft. **Francesco Mancini**: conceptualization, writing–original draft, writing–review and editing, supervision.

AUTHOR NOTE

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OPEN PRACTICES STATEMENT

The study reported in this article was not formally preregistered. The data have been made publicly available on Figshare at https://figshare.com/articles/dataset/Matrix_ITQ-CA/32023221 (https://doi.org/10.6084/m9.figshare.32023221). Mplus input files and additional analytic results are provided in the online supplementary materials.

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