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Semantic adaptation of the Global Psychotrauma Screen for children and adolescents in the United States

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ABSTRACT

Background: The review of trauma screening tools for children and adolescents indicates a need for developmentally and linguistically appropriate, globally applicable, free, and easily accessible trauma screening instruments.

Objective: The aim of this study is to adapt the Global Psychotrauma Screen (GPS) for children and adolescents in the United States.

Method: Using the modified Delphi method, this study included the GPS Expert Consensus (GPS-EC) and the GPS Stakeholder Consensus (GPS-SC) substudies. In the GPS-EC, ten reviewers who specialize in trauma services independently revised the GPS child and adolescent versions in four rounds. In the GPS-SC, a stratified minimum sample of children and adolescents ($n = 24$) and their parents ($n = 24$) were interviewed to collect feedback on the revised GPS versions.

Results: In the GPS-EC Round 1, a low level of consensus was observed on the anxiety (restlessness) and depression (loss of interest) items. In Round 2, a high level of consensus was achieved on all but PTSD hypervigilance and detachment, and CPTSD self-concept items. Round 3 indicated a low level of consensus on the exposure and functioning items. Full consensus was achieved in Round 4 on all items. In the GPS-SC, children had more difficulties than adolescents with the exposure, dissociation, and risk-protection items.

Conclusions: Based on the results of this study, the semantic adaptation process concluded with implementation of six decisions on the final GPS versions for children and adolescents: adding a non-binary gender choice for adolescents; removing the exposure section; using a full-sentence structure for children and a phrase structure for adolescents; retaining the two-part items on PTSD intrusion and avoidance, retaining self-blame but removing other-blame in the PTSD-blame item; providing specific descriptions of depersonalization and derealization in the dissociation items; and removing risk-protection and functioning items for children.

Adaptación semántica del Mapeo Global de Psicotrauma para niños y adolescentes en los Estados Unidos

Antecedentes: La revisión de las herramientas de detección de trauma en niños y adolescentes indica la necesidad de instrumentos de detección de trauma que sean aplicables a nivel mundial, gratuitos y de fácil acceso, apropiados para el desarrollo y lingüísticamente.

Objetivo: El objetivo de este estudio es adaptar el Mapeo Global de Psicotrauma (GPS) para niños y adolescentes en Estados Unidos.

Método: Utilizando el método Delphi modificado, este estudio incluyó los subestudios GPS de Consenso de Expertos (GPS-EC) y GPS de Consenso de Partes Interesadas (GPS-SC). En el GPS-EC, diez revisores que se especializan en servicios de trauma revisaron de forma independiente las versiones del GPS para niños y adolescentes en cuatro rondas. En el GPS-SC, se entrevistó a una muestra mínima estratificada de niños y adolescentes ($n = 24$) y sus padres ($n = 24$) para recopilar retroalimentación sobre las versiones revisadas del GPS.

Resultados: En la Ronda 1 del GPS-EC, se observó un bajo nivel de consenso en los ítems de ansiedad (inquietud) y depresión (pérdida de interés). En la Ronda 2, se logró un alto nivel de consenso en todos los ítems excepto los de hipervigilancia y desapego del TEPT y de auto-concepto del TEPT-C. La Ronda 3 indicó un bajo nivel de consenso sobre los ítems de exposición y funcionamiento. En la Ronda 4 se logró un consenso total sobre todos los elementos. En el GPS-SC, los niños tenían más dificultades que los adolescentes con los ítems de exposición, disociación y protección contra riesgos.

Conclusiones: Basados en los resultados de este estudio, el proceso de adaptación semántica concluyó con la implementación de seis decisiones sobre las versiones finales del GPS para niños y adolescentes: agregar una opción de género no binaria para adolescentes; eliminar la sección de exposición; usar una estructura de oración completa para niños y una estructura de

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PALABRAS CLAVE

Mapeo Global de Psicotrauma; niño; adolescente; adaptación semántica; Método Delphi

关键词

全球心理创伤筛查; 儿童; 青少年; 语义改编; 德尔菲法

HIGHLIGHTS

- Global Psychotrauma Screen (GPS) is adapted for children and adolescents.
- GPS-Child (GPS-C) for children aged 6-10 years includes 16 items, after removing risk-protection and functioning questions.
- GPS-Teen (GPS-T) for adolescents aged 11-17 years retains 22 items as in the original GPS.
- All items are revised based on the four-round expert and one-round stakeholder reviews and consensus.

frase para adolescentes; retener los ítems de dos partes sobre la intrusión y evitación del TEPT, retener la auto-culpa pero eliminar la culpa del otro en el ítem de culpa del TEPT; proporcionar descripciones específicas de despersonalización y des-realización en los elementos de disociación; y la eliminación de ítems de protección contra riesgos y funcionamiento para los niños.

美国儿童和青少年全球心理创伤筛查的语义改编

背景: 对儿童和青少年创伤筛查工具的综述表明, 需要发展和语言上适应, 全球适用, 免费且易得的创伤筛查工具。

目的: 本研究旨在为美国儿童和青少年改编全球心理创伤筛查 (GPS)。

方法: 本研究使用改进的德尔菲法, 纳入了GPS专家共识 (GPS-EC) 和GPS利益相关者共识 (GPS-SC) 子研究。在GPS-EC中, 十位专门从事创伤服务的评审者在四轮中独立修订了儿童和青少年版GPS。在GPS-SC中, 对一个儿童和青少年 ($n = 24$) 及其父母 ($n = 24$) 的分层最小样本进行了访谈, 以收集修订版GPS的反馈。

结果: 在第1轮GPS-EC中, 人们对焦虑 (躁动) 和抑郁 (丧失兴趣) 条目的共识水平很低。在第2轮中, 除PTSD的高警觉和分离以及CPTSD的自我概念条目外, 其他均达成了高度共识。第三轮表明对暴露和功能性条目的共识程度很低。在第4轮中就所有条目达成了完全共识。在GPS-SC中, 与青少年相比, 儿童在暴露, 分离和风险保护方面的困难更大。

结论: 基于本研究的结果, 语义改编过程以对最终儿童和青少年版GPS施行了六个决定而告终: 为青少年增加了非二元性别选择; 删去暴露部分; 对儿童使用全句结构, 对青少年使用短语结构; 保留PTSD的闯入和回避两部分条目, 保留自责, 但删去PTSD责备条目中的其他责备; 提供解离条目中去人格化和去现实化的具体描述; 并删除儿童的风险保护和功能性条目。

1. Introduction

The reports on childhood violence indicate that 1.7 billion children, nearly 3 out of 4, are victims of abuse each year worldwide (Global Report, 2017). The lifetime prevalence of child emotional abuse is 36.3% and physical abuse is 22.6% globally (World Health Organization [WHO], 2014). The COVID-19 pandemic and the subsequent school closures may have exacerbated a risk of domestic violence against children (Appleton & Sidebotham, 2020; Ertan, El-Hage, Thierrée, Javelot, & Hingray, 2020; Øverlien, 2020). Yet, children and adolescents have been underserved in trauma assessment and treatment (Lang & Connell, 2018; Sachser et al., 2017).

Following the PRISMA-P guidelines (Moher et al., 2015), a review of trauma screening tools was conducted (see Figure 1). Nine screening instruments for traumatic stress in children and adolescents were selected for comparative analysis based on the following criteria: self-report, non-specific (e.g. response to any type of traumatic events), validation, and recency. These instruments were compared qualitatively to identify the areas for consideration when adapting the GPS (Olf, Bakker, & Global Collaboration on Traumatic Stress, 2020a) for children and adolescents (see Table 1).

The review of the selected instruments shows that most of them do not differentiate between the child and adolescent age groups. The various starting and ending age points from 6, 7, or 8 years to 16, 17, or 18 years and a wide age range in these instruments (Dyregrov & Yule, 1995; Foa, Asnaani, Zang, Capaldi, & Yeh, 2018; Kassam-Adams, 2006; Kenardy, Spence, & Macleod, 2006; Lang & Connell, 2017; Sachser et al.,

2017; Tyler et al., 2019) do not account enough for differences in comprehension between children and adolescents. Although the authors of the instruments sought providers' feedback when developing or adapting the instruments, they did not report collecting data from children and adolescents on how to better articulate the screening items for them.

Some of the reviewed instruments were newly developed for children and adolescents (Grasso, Felton, & Reid-Quinones, 2015; Kassam-Adams, 2006; Lang & Connell, 2017; Sachser et al., 2017) and then adapted for adults (Grasso, Ford, & Greene, 2019), whereas others were adapted from the adult to child and adolescent versions (Dyregrov & Yule, 1995; Foa et al., 2018; Kenardy et al., 2006; Tyler et al., 2019). Developing a new screening instrument requires more time and resources, whereas, adapting an adult version for children involves careful consideration of not only developmentally appropriate language, but also, an item and response structure (Yes-No versus Likert-type) and a form of expression (first or second person), among other details. Most of the reviewed instruments were designed as Likert-type scales, although it may be difficult for younger children to choose between the scale points while trying to match them with the verbal meaning of items. For example, it may be challenging for a child to recollect whether they had 'trouble feeling happy' 1–2 times or 3+ times per week in the last 30 days in the Child Trauma Screen (CTS; Lang & Connell, 2017). It may be particularly difficult when a Likert-type quantitative value is contradictory to the qualitative meaning of an item, for example, expecting a child to remember whether they experienced 'not being able to remember part of what happened' 'once in a while' or 'half a time' in the last two weeks in the

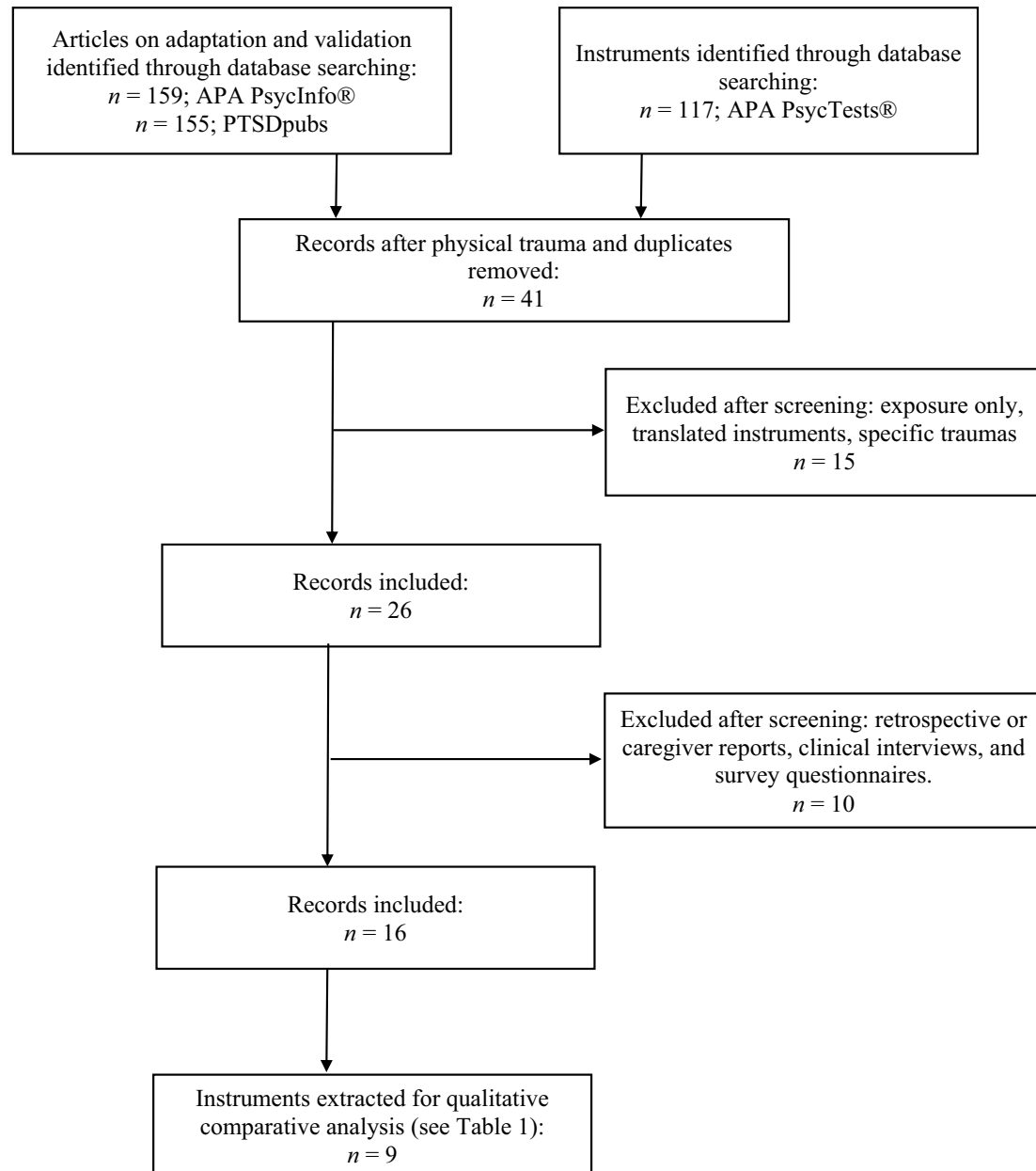


Figure 1. Modified PRISMA-P flow diagram for review of trauma screening instruments.

Child and Adolescent Trauma Screen (CATS; Sachser et al., 2017).

The timeframe for reporting symptoms varies across the reviewed instruments. The shorter timeframes were from seven days in the Children's Revised Impact of Event Scale (CRIES; Dyregrov & Yule, 1995) to 14 days in the CATS (Sachser et al., 2017). The longest period for symptoms was six months in the Brief Trauma Symptom Screen for Youth (BTSSY; Tyler et al., 2019). The open and perhaps more accurate timeframe was 'since the accident' in the Child Trauma Screening Questionnaire (CTSQ-10; Kenardy et al., 2006). Five instruments followed the one-month timeframe for reporting traumatic symptoms (Kassam-Adams, 2006; Grasso et al., 2015; Foa et al., 2018; Lang & Connell, 2017; Rolon-Arroyo et al., 2020), as in the DSM-5 (American Psychiatric Association [APA], 2013). Similarly, the

GPS adult version (Olff et al., 2020a) follows the one-month timeframe.

A child self-report is considered a more accurate measure of traumatic stress symptoms than a parental or caregiver report (Kassam-Adams et al., 2013; Sachser et al., 2017). However, the use of first-person statements, as in the UCLA Child/Adolescent PTSD Reaction Index for DSM-5 (Rolon-Arroyo et al., 2020) or the BTSSY (Tyler et al., 2019), may appear suggestive and inadvertently lead children and adolescents to 'agree' with such statements. Formulating second-person questions as in the CRIES (Dyregrov & Yule, 1995), the CTSQ-10 (Kenardy et al., 2006), or the Structured Trauma-Related Experiences and Symptoms Screener (STRESS; Grasso et al., 2015) allows a more direct self-appraisal of child's symptoms.

The reviewed instruments have mostly been developed and validated with clinical samples (Foa et al., 2018;

Table 1. Comparison of selected trauma screening instruments for children and adolescents.

	Acute Stress Checklist for Children (ASC-Kids -29, Kassam-Adams, 2006; ASC-6 & ASC-3, Kassam-Adams & Marsac, 2016)	Children's Revised Impact of Event Scale (CRIES; Dyregrov & Yule, 1995; Children and War Foundation, n.d.)	Child PTSD Symptom Scale Self-Report for DSM-5 (CPSS-5-SR; Foa et al., 2018)	Child and Adolescent Trauma Screen (CATS; Sachser et al., 2017)	Child Trauma Screen (CTS; Lang & Connell, 2017)	Child Trauma Screening Questionnaire (CTSQ-10; Kenardy et al., 2006)	Structured Trauma-Related Experiences and Symptoms Screener (STRESS; Grasso et al., 2015)	UCLA Child/Adolescent PTSD Reaction Index for DSM-5 (UCLA PTSD-RI5; Rolon-Arroyo et al., 2020)	GPS (Oliff et al., 2020a)
Adult version	No	PC-PTSD (Prins et al., 2003)	PDS-5 (Foa et al., 2016)	No	No	TSQ (Brewin et al., 2002)	STRESS-A (Grasso et al., 2019)	No	GPS
Age range	8–17 years. No child-adolescent differentiation	10–18 years, adolescents only.	8–18 years. No child-adolescent differentiation.	7–17 years. No child-adolescent differentiation	6–17 years. No child-adolescent differentiation	7–16 years. No child-adolescent differentiation	7–18 years. No child-adolescent differentiation	7–18 years No child-adolescent differentiation	GPS-C: 6–10 years; GPS-T: 11–17 years.
Item structure	3–point Likert scale (0–2). First-person statements. Full sentences.	3–point Likert scale (0–2). First-person statements. Full sentences.	4–point Likert scale (0, 1, 3, & 5). Second-person questions.	Yes-No items for events and functioning; 4-point Likert scale (0–3) for Phrases.	4-point Likert scale. Questions for events & second-person phrases for symptoms.	Yes-No, second-person questions.	Yes-No items for events; 4-point Likert scale for symptoms. Second-person full questions.	4-point Likert scale for symptoms. First-person full questions.	Yes-No second-person questions. Full questions for children and phrases for adolescents.
Total items	Full version – 29 items; brief screeners – 6 & 3 items	6 items	Two versions: 8 & 13 items	40 items: 15 events, 20 symptoms, & 5 functioning items.	10 items: 4 event and 6 symptom items.	10 items	55 items	31 symptom items	GPS-C: 16 items, GPS-T: 23 items.
Event items	No	No	No	15 items	4 items	No	25 items	22 items for caregivers	GPS-T 3 items
Timeframe	1 month	6 months	7 days	14 days	30 days	Since the accident	Specific age for events; 7 days for severity and 1 month for presence of symptoms	Specific age for events; 7 days for severity and 1 month for presence of symptoms	1 month
Wording	Same for children and adolescents.	For adolescents.	Same for children and adolescents.	Same for children and adolescents.	Same for children and adolescents.	Same for children and adolescents.	Same for children and adolescents.	Same for children and adolescents.	Different for children and adolescents.
Symptoms	Immediate responses to the event, ASD symptoms, family responses.	Intrusion, avoidance, negative mood/cognition, hyperarousal.	CRIES-8: Intrusion & avoidance. CRIES-13: Intrusion, avoidance, hyperarousal.	Intrusion, avoidance, negative mood/cognition, hyperarousal.	Intrusion, avoidance, negative mood/cognition, hyperarousal.	Intrusion, avoidance, negative mood/cognition, hyperarousal.	Intrusion, avoidance, negative mood/cognition, hyperarousal, dissociation.	Intrusion, avoidance, negative mood/cognition, hyperarousal, dissociation.	Intrusion, avoidance, negative mood/cognition, hyperarousal, anxiety, depression, harm, substance use.

(Continued)

Table 1. (Continued).

	Acute Stress Checklist for Children (ASC-Kids -29, Kassam-Adams, 2006; ASC-6 & ASC-3, Kassam-Adams & Marsac, 2016)	Children's Revised Impact of Event Scale (CRIES; Dyregrov & Yule, 1995; Children and War Foundation, n.d.)	Child PTSD Symptom Scale Self-Report for DSM-5 (CPSS-5-SR; Foa et al., 2018)	Child and Adolescent Trauma Screen (CATS; Sachser et al., 2017)	Child Trauma Screen (CTS; Lang & Connell, 2017)	Child Trauma Screening Questionnaire (CTSQ-10; Kenardy et al., 2006)	Structured Trauma-Related Experiences and Symptoms Screener (STRESS; Grasso et al., 2015)	UCLA Child/Adolescent PTSD Reaction Index for DSM-5 (UCLA PTSD-RI5; Rolon-Arroyo et al., 2020)	Global Psychotrauma Screen for Children (GPS-C) and Adolescents (GPS-T)
Risk and protective factors	Social support, coping, resilience.	No	No	No	No	No	No	No	GPS-T: Other stressful events, social support, childhood trauma, history of mental illness, resilience.
Functioning	1 item	No	7 items	5 items	No	No	6 items	21 items for caregivers	GPS-T: 1 item
Validation	Kassam-Adams et al., 2013, Kassam-Adams & Marsac, 2016	Tyler et al., 2019	Foa et al., 2018	Sachser et al., 2017, 2018	Lang & Connell, 2017, 2018	Kenardy et al., 2006	Grasso et al., 2015	Doric et al., 2019; Kaplow et al., 2020	Planned.
Languages	English & Spanish	English	English	German, English, Norwegian, & Swedish.	English & Spanish	English	English	English, German, Spanish	Arabic, Chinese, Dutch, English, Hungarian, Norwegian, Russian, & Spanish. <i>In translation:</i> French, German, Hebrew, & Portuguese.

Kassam-Adams, 2006; Kassam-Adams et al., 2013; Kaplow et al., 2020; Kenardy et al., 2006; Lang & Connell, 2017, 2018; Sachser et al., 2017; Tyler et al., 2019). Five instruments (Foa et al., 2018; Grasso et al., 2015; Lang & Connell, 2017, 2018; Rolon-Arroyo et al., 2020; Sachser et al., 2017) include the exposure questions, and although asking such questions in clinical settings where treatments are available may be appropriate, they still appear unnecessarily retraumatizing or extensive. Asking such questions for screening purposes without knowing whether a child and their guardian can afford or will accept a treatment, even if it is available, particularly in nonclinical settings (for example, schools) where no treatment is immediately accessible, may be harmful. Some items in the reviewed instruments appear to over-pathologize the defensive or adaptive responses that can be observed in children and adolescents who live in dangerous environments. For example, the hypervigilance items in the CATS (Sachser et al., 2017) and CPSS-5-SR (Foa et al., 2018) describe behaviours that are typical in children and adolescents who face real threats in their daily life.

To address the limitations of the reviewed instruments and to provide more options for practitioners and researchers for selecting an appropriate screening tool from a variety of instruments, this study aimed to adapt the GPS (Olf et al., 2020a) by creating two separate, developmentally appropriate versions for children and adolescents. The United Nations Children's Fund (2011) defines childhood as the first decade (under 10 years), and adolescence as the second decade of life (10–19 years). In this study, we chose 6 years of age as a starting point because children usually go to elementary school at this age and have a basic reading comprehension that they gained in preschool. We defined 10 years as an ending point, assuming that the child version will be easier to understand for 10-year-olds than the adolescent version that we adapted for 11–17 years.

Because cumulative childhood trauma is a high-risk factor for CPTSD (Cloitre et al., 2019), adapting the GPS (Olf et al., 2020a) for children and adolescents would address the need for a comprehensive and accessible screening instrument that can be used longitudinally or across generations in trauma research and practice. By adapting the GPS (Olf et al., 2020a), as opposed to creating new instruments, we aimed to provide a tool for longitudinal screening of the symptom dynamics and treatment outcomes as children grow, and cross-sectional screening of symptoms of intergenerational trauma in families who live in chronically traumatic contexts. The GPS has a potential for a more comprehensive screening of trauma because in addition to PTSD, it includes Disturbances in Self-Organization (DSO) as part of Complex PTSD, the symptoms of anxiety, depression,

sleep problems, self-harm, dissociation, other physical, emotional, and social problems, substance abuse, the risk and protective factors, and functioning (Frewen, McPhail, Schnyder, Oe, & Olf, 2021; Oe et al., 2020; Olf et al., 2020b; Rossi et al., 2021).

2. Method

This study utilized the Delphi method which allows an iterative, four-round review process while preventing groupthink and balancing power dynamics (RAND Corp., 2020). The Delphi method considers the diversity of academic and professional backgrounds of experts, can involve stakeholders' feedback, and has been validated and utilized in healthcare (Khodyakov et al., 2020; RAND Corp., 2020; Rubenstein et al., 2020). In the Delphi data analysis, a 9-point scale is used to rate responses at each round which are categorized as low (1–3), uncertain (4–6), and high (7–9) levels of consensus; the median (*Me*) indicates a group consensus, and the interquartile range (*IQR*) represents a consensus data distribution (Khodyakov et al., 2020).

This project included two substudies: the GPS Expert Consensus (GPS-EC) and the GPS-Stakeholder Consensus (GPS-SC). The purpose of the *GPS-EC* was to revise the GPS adult version (Olf et al., 2020a) making it developmentally appropriate for children and adolescents, while retaining its authenticity. The GPS-EC took place in February–April 2020. The primary author served as a Project Leader (PL) for a research team of ten volunteer reviewers all of whom were affiliated with the Trauma Services concentration of the International Psychology Ph.D. Program at The Chicago School of Professional Psychology (TCSPP), Washington, DC Campus. The reviewers had up to 15 years of professional experience with the assigned age groups: GPS child group (GPS-C; $M = 8$, $Me = 5$); GPS adolescent (i.e. teenager) group (GPS-T; $M = 9$, $Me = 10$).

To ensure the objectivity and integrity in reaching a valid consensus, the reviewers were informed that they could not see any individual member's revisions but would work on a consolidated version. The reviewers were not permitted to use any other screening or assessment instruments as models in the process of revision. To preserve the authorship and authenticity of the original GPS (Olf et al., 2020a), the reviewers were instructed not to create any new items, but rather revise the existing items for children and adolescents. The PL rated the level of consensus on each member's revisions of each item using a 9-point scale (0 – no consensus, revisions are made; 9 – full consensus, no revisions made). The medians on each GPS item were calculated in each round, indicating the middle point in the distribution of revisions, and the group medians of the GPS-C and

GPS-T were compared using the Median Test in SPSS.25. The IQRs indicating the interval subsuming the middle 50% of revisions were calculated on each GPS item.

In Round 1, the reviewers revised the adult GPS for children and adolescents. Round 2 involved revising the consolidated GPS-C and GPS-T. At this time, the GPS authors added a structured event section, including the COVID-19 pandemic as one of the potentially traumatic events, and a functioning item in the adult GPS (Olf et al., 2020a). The reviewers revised these new items in Round 3. After the Round 4 revisions, the quantitative and qualitative data analyses were completed.

The purpose of the *GPS-SC* was to test the revised GPS-C and GPS-T for comprehension by children and adolescents and obtain their feedback for semantic improvement of these instruments. The GPS-SC data collection took place in July 2020–January 2021. After obtaining TCSP Institutional Review Board (IRB) approval, three Research Assistants (RAs; Sotilleo, Rogers, and Doe) conducted the recruitment, screening, informed consent and assent procedures, and data collection. Given the anticipated impact of the COVID-19 pandemic and the civil unrest in the US on the recruitment of participants for the GPS-SC, a stratified minimum sampling strategy was employed to recruit a minimum one participant for each gender and year of age from 6 to 17 years along with one parent for each child or adolescent. Thus, the projected sample size was 24 children and adolescents, and 24 parents.

The RAs conducted oral interviews via videoconferencing. The RAs asked a parent to answer demographic questions about their child's or adolescent's age, gender, educational level, ethnicity or race, and the current state of residence in the US. The RAs then displayed the GPS-C or GPS-T on their computer screen and asked a child or adolescent to read each item and indicate if the items were clear to them and if they, or children of their age, would understand the items easily. If a child or an adolescent had difficulty with understanding the item, the RAs would explain it and ask if they had any suggestions for making the item easier to understand for children of their age. The PL rated the responses using the 9-point scale and incorporated the participants' suggestions into the GPS-C and GPS-T. Olf, who has been supervising the project, conducted revisions of the final GPS-C and GPS-T.

3. Results

3.1. Child and adolescent participant characteristics

The GPS-SC sample included children ($n = 10$), adolescents ($n = 14$), and their parents ($n = 24$). The response rate among prospective participants was 50%. Because of the stratified minimum sampling,

equal numbers of girls and boys participated in the study with one girl and one boy for each year of age. Most participants were enrolled in the grades aligned with their age. However, some children and adolescents were in the grades above or below their age, indicating that they began attending a school either a year earlier or later. The sample was racially diverse, and the participants resided in seven states across the US. Detailed characteristics of the GPS-SC sample are provided in the Supplemental Material.

3.2. Demographic items

The quantitative data analysis showed that most participants understood the revised GPS versions indicating the high level of consensus between the GPS-EC reviewers and GPS-SC participants (see Table 2). Based on the results of both substudies, we have made several decisions for semantic adaptation of the GPS. Our *first* decision was regarding the two demographic items in the GPS: age and gender. We retained the 'Age (years)' item for adolescents, but we changed it to a question 'How old are you?' for children. Based on the reviewers' responses, we added a non-binary gender choice 'Other' and 'Prefer Not Answer' to the 'Female' and 'Male' options for adolescents. We decided not to use the 'Other' gender option in the GPS-C to prevent a risk of children coming out prematurely and being punished, if their parents opposed a non-binary gender orientation. All children and adolescents in this study understood the age and gender items. Only a 6-year-old participant who understood the question, did not know the word 'gender' preceding it. We removed the word 'gender' and retained the question 'Are you a [girl, boy, prefer not to answer]?' in the GPS-C.

3.3. Traumatic exposure items

The traumatic exposure section of the adult GPS consists of an open-ended item asking participants to briefly describe the event or experience that affects them the most, and three structured items: time, quantity, and type of the event or events. In the GPS-SC, two participants aged 6 and 8 years did not understand the word 'traumatic' in the GPS instruction, thus supporting the GPS-EC reviewers' earlier concerns. We removed the word 'traumatic' but retained 'frightening or horrible' that all participants understood. The GPS-EC reviewers requested to remove the open-ended exposure question to avoid a risk of retraumatization, and we did so before testing the GPS with children and adolescents. In the event type item, the reviewers stated that children would not understand the labels such as physical, sexual, and emotional abuse; whereas for adolescents, recalling the types of events would be retraumatizing. At least one child and

Table 2. The Expert Consensus ($n = 10$) and Stakeholder Consensus ($n = 24$) results.

GPS Domain	GPS Items	GPS Child Version										GPS Adolescent Version									
		EC Rounds										EC Rounds									
		1		2		3		4		SC		1		2		3		4		SC	
Me	IQR	Me	IQR	Me	IQR	Me	IQR	Me	IQR	Me	IQR	Me	IQR	Me	IQR	Me	IQR	Me	IQR	Me	IQR
Demographics	Gender	9	5	9	0	9	0	9	0	9	0	9	9	9	0	9	1	9	0	9	0
	Age	9	0	9	0	9	1	9	0	9	0	9	0	9	0	9	0	9	0	9	0
Traumatic Event	Event instruction	4	8	9	0	9	1	9	0	9	3	9	2	9	0	9	3	9	0	9	0
	Description of the event					9	3	9	0							0	8	9	0		
	Event Time					9	3	9	0	9	1					7	5	9	0	9	0
	Single or multiple events					9	2	9	0	9	3					3	7	9	0	9	0
	Event Type					9	4	9	0	9	0					8	3	9	1	9	0
	Symptom instruction					9	0	9	0	9	0					9	2	9	1	9	0
PTSD	1. Intrusion	1	8	9	1	9	1	9	1	9	0	1	5	9	3	9	2	9	0	9	0
	2. Avoidance	1	5	9	0	9	2	9	0	9	0	4	7	9	2	9	1	9	2	9	0
	3. Hypervigilance	2	8	9	3	9	2	9	0	9	1	4	5	8	4	9	0	9	0	9	0
	4. Detachment	9	8	7	4	9	1	9	1	9	0	5	6	3	4	9	2	9	0	9	0
	5. Blame	4	6	9	0	9	2	9	0	9	1	8	7	8	2	9	0	9	0	9	0
DSO (CPTSD)	6. Negative self-concept	4	8	9	6	9	1	9	0	9	2	7	6	8	5	9	2	9	1	9	0
	7. Affective dysregulation	7	5	9	1	9	0	9	0	9	0	9	3	7	2	9	1	9	0	9	0
Anxiety	8. Restlessness	2	2	9	1	9	0	9	0	9	1	9	1	8	1	9	0	9	4	9	0
	9. Worrying	2	7	9	2	9	0	9	0	9	0	9	6	9	1	9	1	9	0	9	0
Depression	10. Depressed mood	2	5	9	1	9	1	9	0	9	0	9	1	9	1	9	0	9	4	9	0
	11. Loss of interest	2	4	9	1	9	0	9	0	9	0	7	3	8	2	9	0	9	0	9	0
Sleep	12. Sleep problems	9	2	9	1	9	0	9	1	9	0	9	6	9	2	9	0	9	1	9	0
Self-harm	13. Self-harm	7	6	9	0	9	0	9	0	9	0	7	5	7	6	9	2	9	0	9	0
Dissociation	14. Derealization	2	3	9	1	9	0	9	0	9	9	4	1	9	2	9	0	9	2	9	0
	15. Depersonalization	9	5	9	0	9	0	9	0	9	0	9	3	9	2	9	0	9	4	9	0
Other Problems	16. Physical, emotional, social	1	7	9	0	9	1	9	0	9	2	9	4	9	2	9	1	9	1	9	0
Other Events	17. Other stressful events	6	6	9	1	9	0	9	0	9	1	5	3	9	2	9	1	9	1	9	0
Substance Abuse	18. Substance abuse	9	8	9	0	9	0	9	0	9	0	4	2	8	2	9	1	9	1	9	0
Social Support	19. Supportive people	9	8	9	0	9	0	9	0	9	0	4	2	8	2	9	1	9	1	9	0
Childhood Trauma	20. Before the age of 18	1	3	9	1	9	0	9	1	9	0	5	5	9	1	9	1	9	0	9	0
History of Mental Illness	21. Diagnosis or treatment	1	3	9	1	9	0	9	0	9	0	3	2	7	4	9	1	9	1	9	0
Resilience	22. Resilience	2	2	9	1	9	1	9	0	9	0	2	1	9	2	9	1	9	0	9	0
Functioning	F. Functioning					9	7	9	1	9	0					7	9	9	0	9	0

Note: 9-point scale with 0 – no consensus, revisions are made and 9 – full consensus, no revisions made. Scores 1–3 are categorized as low consensus, 4–6 uncertain, and 7–9 high levels of consensus. *Me* – median; *IQR* – Inter-Quartile Range. Medians indicated the middle point in the distribution of revisions and were calculated on each GPS item in each round, and the group medians of the GPS-C and GPS-A were compared using the Median Test. The IQRs indicated the interval subsuming the middle 50% of revisions and were calculated on each GPS item.

one adolescent had difficulties with understanding the event types.

The reviewers noted that asking about the event time can be confusing for children and adolescents. Some reviewers recommended placing the event type before the event time for a better memory recall. The reviewers stated that children and adolescents in the US experience multiple traumatic events simultaneously, thus, remembering and reporting the age for each event can be difficult for them. At least one child noted that the event time item was confusing.

Based on these results, our *second* decision was to remove the structured event section in both GPS-C and GPS-T due to the risk of retraumatization when it is uncertain whether children, adolescents, and their parents would immediately access or accept treatment, or when treatment is not available. We retained the instruction briefly describing traumatic exposure, then asking children and adolescents to answer the questions only if the exposure happened and to check the symptoms only if they occurred within a month after the exposure. We aimed to adapt these instruments for use not only in clinical but non-clinical settings as well (e.g. education, humanitarian work, legal system, research). These

instruments will be freely accessible online, and our decision is intended to ensure the user safety. We prioritized screening for traumatic symptoms over identifying the details of exposure, to refer children and adolescents to available services as soon as possible. If the priority is to screen for the type of traumatic event, other instruments can be administered such as CATS (Sachser et al., 2017), CTS (Lang & Connell, 2017), CPSS-5-SR (Foa et al., 2018), STRESS (Grasso et al., 2015), and UCLA PTSD-RI-5 (Rolon-Arroyo et al., 2020).

3.4. Symptom items

The results of both GPS-EC and GPS-SC indicated that brevity of items, which is considered a desirable criterion in the screening instruments for adults, is not beneficial to children who need a more detailed description of items. Therefore, our *third* decision was to use a full-sentence structure in the symptom items for children, while retaining a phrase structure for adolescents similar to the adult GPS. Although reading full-sentence questions takes longer, they are necessary in the self-report instruments for children to reduce the risk of misunderstanding.

There are 17 symptom items in the GPS (Olf et al., 2020a). The Median Test results in Round 1 showed that the GPS-C reviewers had a lower level of consensus and made significantly more revisions than the GPS-T reviewers on items #8 (anxiety-restlessness; $p = .008$) and #11 (depression-loss of interest; $p = .008$). The levels of consensus on all other symptom items showed no statistically significant differences indicating that both versions of the GPS underwent a similar number of revisions.

The expert consensus was low on items #1 (PTSD-intrusion) and #2 (PTSD-avoidance) in both GPS-C and GPS-T mostly because of the two-part structure of these items. At least one participant aged 10 years had difficulty understanding the two-part items, specifically, the second half of item #1 (PTSD-intrusive thoughts) and item #5 (PTSD-blame). Thus, our *fourth* decision was regarding the two-part items. We decided not to split items #1 (PTSD-intrusive thoughts *and* nightmares) and #2 (PTSD-avoidance of thoughts *and* actions) because answering 'Yes' to either one of the two parts is enough for screening purposes. Other instruments can be used if there is a need to ask separately about each of these symptoms (e.g. ASC-Kids-29, Kassam-Adams, 2006; CATS, Sachser et al., 2017; CPSS-5-SR, STRESS, Grasso et al., 2015; Foa et al., 2018; CTSQ-10; Kenardy et al., 2006; and UCLA PTSD-RI-5; Rolon-Arroyo et al., 2020). We decided to take out the second part of item #5 (PTSD-blame) about other-blame to avoid pathologizing a legitimate blame that a traumatized person may feel towards a perpetrator, and due to the controversial conflation of the blame criterion in DSM-5 (Greene, 2018). Four of the reviewed instruments contain a PTSD-blame item: CPSS-5-SR (Foa et al., 2018) and STRESS (Grasso et al., 2015) include self-blame but not other-blame; CATS (Sachser et al., 2017) has a conflated self-blame and other-blame item; and the UCLA PTSD-RI-5 (Rolon-Arroyo et al., 2020) asks separately about self-blame and other-blame.

In item #3 (PTSD-hypervigilance), one GPS-T reviewer noted that hypervigilance may be an adaptive response in adolescents who live in violent neighbourhoods. We added an emphasis on the involuntary nature of hypervigilance as a PTSD symptom to avoid confusion with a deliberate vigilant adaptive behaviour. Another problem with this item was that three reviewers replaced 'startled' with 'jumpy' to simplify the wording, but we had to remove it because some children did not understand 'jumpy' in the context of this item. For example, a 6-year-old participant did not understand the word 'jumpy' in items #3 (PTSD-hypervigilance) and #8 (anxiety-restlessness) and suggested using the word 'scared' instead. This participant also did not like the word 'jittery' in item #8 (anxiety-restlessness) but supported the word 'nervous.' We

changed 'jumpy' back to 'nervous' as in the adult GPS, even though other validated screening instruments for children use 'jumpy' for example, CATS (Sachser et al., 2017), CPSS-5-SR (Foa et al., 2018), and UCLA PTSD-RI-5 (Rolon-Arroyo et al., 2020).

The most challenging were dissociation items #14 (derealization) and #15 (depersonalization) which required multiple revisions. Some reviewers perceived item #4 (PTSD-detachment) as similar to item #15 (depersonalization), therefore, we clarified language for these two conceptually different items. In the GPS-C, two participants aged 6 and 10 years had difficulties with item #14 (derealization), and a 9-year-old participant did not understand item #15 (depersonalization). In the GPS-T, a 13-year-old participant understood items #14 and #15 but stated that the symptoms 'make no sense.' It became apparent that participants who were not familiar with dissociative experiences would not understand the items. Thus, our *fifth* decision was to revise items #14 and #15 by using specific descriptions of dissociative experiences provided for children in DSM-5 (APA, 2013). Only two other instruments contain dissociation items (STRESS, Grasso et al., 2015; UCLA PTSD-RI-5; Rolon-Arroyo et al., 2020).

Other items with lower consensus were related to self-concept, self-harm, and substance abuse. A 6-year-old participant did not understand the meaning of self-worth (e.g. 'as if you have no worth') in item #6 (CPTSD negative self-concept) and suggested replacing it with 'as if you are not important;' we implemented this change. For item #13 (self-harm), one reviewer suggested adding suicidal attempts, however, we did not accept this change to retain the authenticity of the original GPS. The other instruments that asked about self-harm (e.g. CATS; Sachser et al., 2017; CPSS-5-SR, Foa et al., 2018; UCLA PTSD-RI-5; Rolon-Arroyo et al., 2020), similarly did not include suicide. We had substantially revised item #18 (substance abuse) and both children and adolescents understood it; however, we decided to remove this item from the GPS-C because it may be uncommon or inappropriate to ask about in other countries.

3.5. Risk-protection and functioning items

There are five risk and protection items and one functioning item in the adult GPS: other stressful events, social support, childhood trauma, history of mental illness, resilience, and functioning (Olf et al., 2020a). Our *sixth* decision was to remove these items from the GPS-C but revise and retain them in the GPS-T, based on the following results. Although most participants understood the items for other stressful events and social support, some reviewers noted that many children and adolescents routinely experience other stressful events or may lack social support, regardless of whether they

have trauma. Due to this nonspecificity that would inflate the GPS total score, we removed items #17 (other stressful events) and #19 (social support) from GPS-C but retained them in GPS-T. For comparison, only one of the reviewed instruments has a social support item (ASC-Kids-29; Kassam-Adams, 2006).

The reviewers had lower levels of consensus on item #21 (history of mental illness) and two of them suggested removing this item from GPS-C stating that children may not know their mental disorder diagnosis. One reviewer proposed adding ADHD to the examples of disorders in the GPS-T item #21 because traumatized adolescents from marginalized communities in the US are often (mis)diagnosed with ADHD. We implemented both changes.

Two GPS-C reviewers considered item #22 (resilience) difficult for children and suggested removing it. This concern was supported by a 10-year-old child and a 17-year-old adolescent who did not understand item #22 (resilience). We removed this item from GPS-C, but retained it after revisions in GPS-T. For comparison, only one of the reviewed instruments has a resilience item (ASC-Kids-29; Kassam-Adams, 2006).

The reviewers proposed splitting the functioning item into two, one for school and one for home, stating that children and adolescents may function differently in these settings. However, we did not accept this change because the GPS aims to screen for global functioning in all areas. Additionally, home has become the main setting for children and adolescents during the COVID-19 pandemic when schools transitioned to the online or hybrid teaching modalities making it difficult to differentiate their functioning in each setting. Although all participants understood the meaning of the functioning item, it would be difficult for children to self-evaluate their functioning on the 1–10 continuous scale. Therefore, we removed this item from the GPS-C but retained in the GPS-T. Three other instruments (CATS; Sachser et al., 2017; CPSS-5-SR, Foa et al., 2018; & STRESS, Grasso et al., 2015) include separate functioning items for major areas of impairment.

4. Discussion

Traumatic stress can occur from early childhood and the risk of overlooking or misdiagnosing it in children and adolescents is high, if the assessment criteria are not developmentally appropriate (APA, 2013; Sachser et al., 2018). This study built on the strengths of previously established and validated assessment instruments for traumatic stress in children and adolescents, while at the same time addressing some of the issues identified throughout their review. Overall, the

results of this study showed that the revised GPS-C and GPS-T were well understood by most children and adolescents.

Strengths of this study include rigorous semantic adaptation of the GPS through a complementary expert-stakeholder revision process, separate and developmentally appropriate versions of the GPS for children and adolescents, the use of a sampling strategy stratified by gender and year within the designated age range in the GPS-SC, and the decision-making process with immediate implementation of the results in the continuous revision of the GPS-C and GPS-T. One of the limitations was the possible impact of the COVID-19 pandemic related stress and fatigue on the performance of the GPS-EC reviewers and the GPS-SC participants. A small sample size in the GPS-SC was another limitation, which was mitigated by using the stratified sampling strategy. Even if one participant in the GPS-SC had difficulty with understanding the GPS item, the item was revised. It is possible that with a larger GPS-SC sample size, more revisions could have been performed. Additionally, the GPS-T may be difficult for younger adolescents (e.g. 11-year-old); therefore, we will provide an online instruction referring users to the GPS-C in such instances. Although we removed the substance use item, children in the families with addicted adult members may be exposed to violence, have easy access to drugs, and may use them to cope with traumatic stress; thus, more research is needed on its screening. Additional semantic adaptation may be needed not only for translations to other languages for use in countries outside the US but also for bilingual and multilingual groups in the US in which English is spoken but there are cultural differences in the linguistic expressions familiar to children and adolescents.

One of the implications of this study is that its design can be replicated by researchers in other countries when adapting the GPS-C and GPS-T in local languages and contexts. Both the expert and stakeholder consensus are needed to ensure that the screening items will be understood by intended users. Another implication is that the GPS-C and GPS-T, along with the adult version, can serve as tools for cross-sectional and longitudinal screening of traumatic stress across major age groups. Our future research will focus on conducting validation studies of the GPS-C and GPS-T.

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Data availability statement

The data from this study cannot be made publicly available to protect participants' information. Inquiries about the data can be referred to the corresponding author, Emma Grace, egrace@thechicagoschool.edu

Disclosure statement

No potential conflict of interest was reported by the author(s).

Ethics statement

The study was approved by TCSPP IRB (#IRB-20-04-0048). The oral informed consent of parents and assent of children and adolescents were obtained.

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