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This is the **accepted version** of the journal article:

Barrau Alonso, Víctor; López Romero, Laura; Bosch, Rosa; [et al.]. «Further Validation of the Spanish Parent-Reported Child Problematic Traits Inventory : Discriminant Validity for Distinguishing Children Vulnerable to Externalizing and Other Psychopathology Conditions». *Journal of psychopathology and behavioral assessment*, Vol. 44 Núm. 1 (march 2022), p. 245-260. DOI 10.1007/s10862-021-09921-z

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**Further Validation of the Spanish Parent-Reported Child Problematic Traits Inventory:  
Discriminant Validity for Distinguishing Children Vulnerable to Externalizing and Other  
Psychopathology Conditions**

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**Declarations:**

**Funding:** This work was funded by la Caixa “Banking Foundation”, Diputació de Barcelona, Diputació de Lleida, and Department of Health of Generalitat de Catalunya. Laura López-Romero’s contribution was funded by Xunta de Galicia, under the Programa de Axudas á Etapa Posdoutoral 2017 (Consellería de Cultura, Educación e Ordenación Universitaria).

**Conflict of Interest/Competing interests:** The funding sources had no role in the study design, collection, analysis or interpretation of data, the writing of the article or decision to submit the article for publication. Miguel Casas has received fees to give talks for Janssen- Cilag, Ferrer-Brainfarma, Pfizer, Lundbeck, Otsuka, Lilly, Shire, Rovi and Adamed. He has received financial compensation for his participation as a member of the Janssen- Cilag, Lilly, Shire, Lundbeck, Otsuka, Ferrer and Rovi board. The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

**Availability of data and material:** The data that support the findings of this study are available from the corresponding author, BM, upon reasonable request.

**Code availability:** not applicable

**Acknowledgements:**

The authors thank the schools, the teachers and the families for their participation.

### Abstract

The Child Problematic Traits Inventory (CPTI) is a relatively new tool for measuring psychopathic traits in early development mainly applied in community samples. The main purpose of the present study was to provide further validation of the parents' version of the CPTI in the Spanish context. In a first phase, the study examined (a) the factor structure and the invariance across gender, (b) the internal consistency, and (c) the convergent and divergent validity of the CPTI in a community sample of 1,387 children (48.1% girls) aged 5-12 years ( $M=8.27$ ;  $SD=2.17$ ). In a second phase, the study tested the capacity of the CPTI to discriminate between normal and two clinical conditions (i.e., externalizing versus other psychopathological problems) in a subsample of 678 at-risk children (46.2 % girls), aged 5-12 years ( $M = 8.38$ ;  $SD = 2.25$ ), preselected according to psychiatric measures and clinical judgment. The Spanish parent version of the CPTI confirmed a three-factor structure, being invariant across gender, with an adequate internal consistency, and a consistent relationship with delinquent and aggressive behavior. The associations with external variables differed according to each CPTI dimension. In addition, the CPTI discriminated children at risk for externalizing disorders from children with other psychopathology conditions (internalizing and learning disorders) and from healthy children. In sum, the CPTI holds up as a promising measure to assess psychopathic traits in childhood from a multidimensional perspective and, therefore, would open new ways to study diverse etiological pathways leading to the development of psychopathy in children.

*Keywords:* Psychopathy, CPTI, conduct problems, externalizing problems, assessment, children.

### Introduction

Psychopathy is usually described as a syndrome comprising a constellation of concurrent personality traits being captured under at least three dimensions: interpersonal (e.g., grandiosity, deceitfulness), affective (e.g., callousness, lack of empathy), and behavioral/lifestyle (e.g., impulsivity, need for stimulation) (Cooke & Michie, 2001; Hare & Neumann, 2008). Previous research has consistently shown that psychopathic traits are associated with severe and lasting conduct problems, delinquency, psychosocial problems and various forms of aggressive behavior (Colins et al., 2014; Frick et al., 2014; Lynam et al., 2009; Salekin & Lochman, 2008). It has been proposed that psychopathic traits do not emerge suddenly in early adulthood but have roots in childhood and adolescence (DeLisi, 2016; Frick et al., 2014). In this regard, twin studies have shown that these traits are moderately to strongly heritable (Viding et al., 2005; Moore et al., 2019). In addition, it is also possible that specific genetic variants may interact with some environmental factors (in particular early adversity) in order to explain the development of psychopathic traits (Blair, 2013). Hence, the construct of psychopathy has been extended downwards to youth populations with a burgeoning line of research that has made great progress over the past two decades and confirm the presence of temperamental traits early in development that can be precursors of adult psychopathy (Colins et al., 2014; Ezpeleta et al., 2013).

Much of the advances in the conceptualization of child psychopathy come from previous studies focusing on the construct callous unemotional (CU) traits, the affective dimension of psychopathy, which has been considered as the core component of psychopathy (Frick et al., 2014). Recently, there have been calls to expand knowledge on psychopathy in childhood considering it as a multifaceted construct, with the same dimensions as in adulthood (see Colins et al., 2014; Salekin, 2017). As was preliminarily suggested, the facets could be rooted in distinct underlying etiologic-dispositional factors with differentiated developmental pathways and different psychosocial correlates (Herpers et al., 2014; Molinuevo et al., 2014; Salekin 2017). Unraveling dimensions and concerning externalizing problems, research on the interpersonal dimension (e.g., deceitfulness, grandiosity, manipulation) have shown associations with proactive aggression, bullying and cyberbullying (Muñoz et al., 2013; Orue & Calvete, 2019). The relationship between the CU dimension (e.g., lack of empathy, shallow affect, failure to accept responsibility for one's own actions, and lack of guilt or remorse) and more severe and stable conduct problems and antisocial behavior has been widely studied (see Frick et al., 2014). Traits within the behavioral dimension (e.g., impulsivity; need for stimulation, sensation seeking, proneness to

boredom) have been shown to be related to reactive aggression, and also provide an explanation for the onset of conduct problems in children (Salekin, 2016).

Evidence about the relationship between psychopathic traits and other forms of psychopathology in children is scarce and less consistent compared to externalizing ones. Recent research suggests that psychopathy can co-occur with elevated levels of anxiety (Humayun et al., 2014). In adults and youth, there appear to be two distinct groups of persons with a high level of psychopathy traits but with differing levels of anxiety, also referred to as variants (i.e., primary and secondary; Craig et al., 2021; Frick, Lilienfeld, et al., 1999; Goulter et al., 2021; Huang et al., 2020; Humayun et al., 2014; Kahn et al., 2013; Mahendran et al., 2021). However, the heterogeneity among children with psychopathic tendencies remains largely unknown.

### **The Child Problematic Traits Inventory**

With the aim of providing a multidimensional psychometric assessment of psychopathic traits from early childhood onward, the Child Problematic Traits Inventory (Colins et al., 2014) was designed to be used in 3-to 12-year-old children in a way that closely resembles how it is often conceptualized in adolescence and adulthood (Andershed et al., 2012; Colins et al., 2014; Cooke & Michie, 2001). It is composed of 28 items that load on three theoretically proposed factors, namely Grandiose-Deceitful (GD), Callous-Unemotional (CU) and Impulsive-Need of stimulation (INS). In addition, these three factors load onto an overarching latent factor (i.e., Psychopathic Personality).

Nine previous studies (Colins et al., 2016; Colins et al., 2018; Colins, Roetman, et al., 2020; Colins et al., 2014; López-Romero, Maneiro, et al., 2019; López-Romero, Molinuevo, et al., 2019; Luo et al., 2019; Somma et al., 2016; Wang et al., 2018) have supported the CPTI as a psychometrically sound measure, with the 28 items loading distinctively on the three theoretical proposed factors. All of them also confirmed acceptable to good model fit as well as excellent internal consistency values, and exhibited the expected correlations with external criteria, including ratings of conduct problems, ADHD symptoms, low social competence and prosocial behavior, different measures of child temperament (e.g., fearlessness), reactive and proactive aggression, and alternative measures of psychopathic traits. The model fit seemed to be less optimal in girls than in boys when parents' reports are examined (Wang et al., 2018), and the average ratings were, overall, higher in boys (e.g., López-Romero, Molinuevo, et al., 2019; Wang et al., 2018).

Notwithstanding all the advances prompted by previous research, it should be noted that all prior CPTI studies but one (i.e., Colins, Roetman, et al., 2020) tested the CPTI in community-based samples, raising the need for further analysis of its properties when used in clinical settings. This is an important milestone since CU traits, which represent the affective dimension of the psychopathy construct, are already considered important to identify a severe subgroup of problematic children (Frick et al., 2014), and have been incorporated in diagnostic classifications systems as the specifier “with limited prosocial emotions” (LPE) for conduct disorder (CD) or/and oppositional defiant disorders (ODD; American Psychiatric Association [APA], 2013; World Health Organization [WHO], 2018).

Previous research has consistently shown that CU traits are usually more prevalent in clinical or forensic samples (10-40%; Christian et al., 1997; Hyde et al., 2015; Kahn et al., 2012; Kolko & Pardini, 2010; Pechorro et al., 2015; Van Damme et al., 2016; Vanwoerden et al., 2016) than in the general population (2-10%; Humayun et al., 2014; Kahn et al., 2012; Oshukova et al., 2017; Pardini et al., 2006). The few studies on the LPE specifier also point to higher prevalence in clinical and forensic samples, as well as differences according to the source of information or the assessment tool used (Colins, Van Damme, et al., 2020; Molinuevo et al., 2020). Furthermore, recent proposals also recommend exploring the potential of interpersonal and behavioral psychopathic traits for subtyping children with externalizing conduct problems (Lilienfeld, 2018; Salekin, 2017). As observed in previous research, the CPTI may serve as an adequate assessment tool to examine all psychopathic trait dimensions in childhood, but it is still unknown how useful it could be when clinical samples are examined (Colins, Roetman, et al., 2020). Further research in this regard is particularly needed, which may enable comparisons between normative and clinical samples and, even more interestingly, between different clinical conditions (e.g., externalizing versus internalizing problems).

### **The present study**

The main purpose of the current study is to provide further validation of the parents' version of the CPTI in the Spanish context. To this end, the study was structured in two different phases, with four objectives. In the first phase, we examined its psychometric properties, including (1) factor structure, (2) internal consistency, and (3) its convergent/divergent associations with relevant external criteria, in a large sample of community children. In a second phase, we aimed to test (4) to what extent the CPTI dimensions discriminate between healthy community children and children at risk for psychopathology, allowing us to particularly identify children within the externalizing pole as compared to children with

other psychopathology conditions (e.g., internalizing) and controls. We hypothesized that the three-factor model of the CPTI would show acceptable to good model fit indices and would be invariant across gender; internal consistency values would be good to excellent for all the CPTI dimensions; the CPTI total would positively correlate with variables such as ADHD symptoms and conduct problems, and negatively with prosocial behavior. At the dimensional level, we expected that all CPTI dimensions would be positively related to behavioral problems. Yet, based on previous CPTI studies, once the effect of the other two dimensions was controlled for, it was expected that GD traits would be more related to aggressive behavior, CU traits would be inversely related to prosocial behavior, and INS traits would show a close association with inattentive and hyperactive behaviors (e.g., López-Romero, Maneiro et al., 2019; López-Romero, Molinuevo et al., 2018); due to the scarcity of research on other forms of non-externalizing psychopathology in children, no specific predictions regarding the associations with psychopathy dimensions were made. Finally, we expected that the CPTI, with all its dimensions, would discriminate between children at risk for psychopathology and healthy children, and in particular that it would discriminate externalizing problems from the rest of the conditions.

## Method

### Participants and Procedure

The present study is part of a larger, ongoing research project called *INSchool*, aiming to identify children and adolescents' mental health problems in a school setting (for more information see Español-Martín et al., 2020). Prior to the start of data collection in 2011, the project was accepted and approved by the Department of Education and the Department of Health of the Generalitat de Catalunya (Catalonia, Spain) and was approved by the Clinical Research Ethics Committee of the [blinded for review] in Barcelona. The data of the current study were collected during the 2016-2017 academic year, using a two-step procedure. Figure 1 describes the data collection process.

### *Study Phase 1: Community-Based Data Collection (objectives 1 to 3)*

The data were collected in 15 schools (8 state and 7 private state-subsidized schools) located in different rural and urban areas of Catalonia (NE Spain), which resulted in 1,928 eligible subjects. The school head and the teachers were informed about the purposes of the study. Meetings were held in schools to explain the purposes of the study to the interested parents, who were given information and consent letters as well as questionnaires wrapped in envelopes. In the case of families who did not attend

the meeting, envelopes with consents and detailed information about the study were taken home by their children. The parents were instructed to return them in a sealed envelope to their teacher within two weeks. Children were only rated if the parents provided informed consent. Children who were 11 and 12 years old were also required to give written informed consent. The documents were monitored by a professional from the Psychiatric Service of the participant hospital, ensuring the quality of the information collected. These documents were coded to preserve the anonymity of the participants. The final sample was composed of 1,387 children (48.1% girls) aged 5-12 years ( $M=8.27$ ;  $SD=2.17$ ), who completed at least the *Child Behavior Checklist, Teacher's Report Form*, and *Youth Self-Report* (CBCL/TRF/YSR; i.e.,  $\leq 8$  missing items) or the *Conners' Parent and Teacher Rating Scale- Short Form* (CPRS-R:S/CTRS-R:S; i.e.,  $\leq 5$  missing items). Parents were most commonly university/college graduates (65.0% mothers; 57.7% fathers) or high school graduates (22.0% mothers; 22.6% fathers). Ninety-five per cent of the fathers and 85.6% of mothers were working, and 53.4% of parents perceived their socioeconomic status (SES) as middling at the time of data collection.

***Study Phase 2: At-risk for Psychopathology Sample Selection and Data Collection (objective 4)***

Owing to the study's funding constraints, only 9 (8 state and 1 private state-subsidized) of the 15 schools mentioned above were offered a free psychiatric diagnostic process. In the rest of the schools, this process was only available if it was paid for. Therefore, to avoid possible bias, only data from these 9 schools was used to test the discriminant validity of the CPTI between healthy community and at-risk for psychopathology participants in a final sample of 678 children (46.2% girls). In this sample, the educational level of the parents was as follows: university/college graduates (48.0% mothers; 37.9% fathers); high school graduates (29.7% mothers; 29.0% fathers). At the time of data collection, 93.3% of the fathers and 82.6% of mothers were working, and 61.2% of parents perceived their socioeconomic status as middling. Statistically significant differences were found with respect to the schools not included in this phase in terms of lower educational level of mothers ( $\chi^2= 222.99$ ;  $p< .001$ ) and fathers ( $\chi^2= 264.15$ ;  $p< .001$ ), lower employment rates [mothers ( $\chi^2= 20.55$ ;  $p< .001$ ), fathers ( $\chi^2= 18.92$ ;  $p< .001$ )], or lower SES ( $\chi^2= 212.09$ ;  $p< .001$ ) in participating schools. These differences were partly explained by the lower presence of private schools in the selected sample.

Positive screening was considered in children who met the following criteria: a) a T score  $\geq 70$  on any of the syndrome scales from the CBCL, TRF, or YSR; b) a T score  $\geq 70$  on any of the subscales from the CPRS-R:S or CTRS-R:S; c) five or more high-risk indicators on the Detection and Action Protocol in

Dyslexia (PRODISCAT); or d) a previous diagnosis of neurodevelopmental disorder from a medical professional. The instruments are described in the Measures section.

All families from phase 1 received a written, individualized report informing them of what had been assessed in this screening phase, the scores obtained, and the recommendation, or not, to participate in a diagnostic process. In the 9 centers where the diagnostic process was offered for free, participants with a positive screening score (n=319) were invited to participate in this second phase. After parents had given their consent, they and their children were separately interviewed by trained psychiatrists to confirm or discard a clinical diagnosis using the *Present and Lifetime version of the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS/PL)*; Kaufman et al., 19-97). In order to avoid possible biases, we first removed 18 subjects, eight with diagnoses of autism spectrum disorder, eight with borderline intellectual functioning and two affected by parental relationship distress. Afterwards, based on the diagnosis provided, the following groups were formed: (1) Externalizing disorders (ED; n = 89), which include attention deficit hyperactivity disorder (ADHD; 94%) and ODD (6%) (CD were not identified in the current sample); (2) Other psychopathology (OP; n = 102), which includes internalizing disorders (12,7%) and learning disorders (87.3%)<sup>1</sup>, and (3) Control (CG; n = 487), including both children with a negative screening in the first phase (n = 377) and children without a clinical diagnosis in the second phase (n = 110). No family was financially compensated for their participation.

## Measures

For the purpose of the current study, only information provided by parents was considered in this research, except for screening reasons.

### *Study Phase 1: Community-Based Data Collection*

*The Child Problematic Traits Inventory* (Colins et al., 2014) is a 28-item questionnaire aimed at assessing psychopathic personality traits in children. It consists of 28 items rated on a response scale ranging from 1 (*Does not apply at all*) to 4 (*Applies very well*), and on the basis of how the child usually behaves rather than how the child is behaving at the moment. It is composed of three scales: Grandiose-Deceitful (GD; 8 items; e.g., “Thinks that he/she is better than everyone on almost everything”); Callous-

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<sup>1</sup> To support their inclusion within the same group (i.e., OP), the discriminant ability between ID and learning disorders was also analyzed, finding only marginal significant differences on CPTI Total score (data available upon request).

Unemotional (CU; 10 items; e.g., “Does not become upset when others are being hurt”); and Impulsive-Need for stimulation (INS; 10 items; e.g., “Often does things without thinking ahead”). The total score of each scale, as well as the composite total score were computed as the mean of the responses to the items. A higher score is indicative of higher levels in psychopathic traits, either in their total score or in the different dimensions. In this study, we used the official authorized Spanish translation (López-Romero, Molinuevo, et al., 2019) and we considered the parents’ responses.

*The Strengths and Difficulties Questionnaire (SDQ;* Goodman, 1997) for parents is a screening instrument intended to measure psychosocial functioning of children and adolescents. It is a 25-item questionnaire, scored on a 3-point response scale that ranges from 0 (*Not true*) to 2 (*Certainly true*), and divided into five scales: Emotional symptoms (5 items; Cronbach’s alpha [ $\alpha$ ]=.71; Mean inter-item correlation [MIC]=.33); Conduct problems (5 items;  $\alpha$ =.61; MIC=.24); Hyperactivity/inattention (5 items;  $\alpha$ =.80; MIC=.44); Peer relationship problems (5 items;  $\alpha$ =.62; MIC=.25); and Prosocial behavior (5 items;  $\alpha$ =.68; MIC=.30). The scores for the first four scales were added up to generate a total difficulties score ( $\alpha$ =.82; MIC=.31). A higher score is indicative of more problems, excepting the Prosocial behavior scale. In the present study, we used the Spanish version of the SDQ for parents, which is available as a free download from the [www.sdqinfo.com](http://www.sdqinfo.com).

*The Conners’ Parent Rating Scale- Short Form (CPRS-R:S;* Conners, 1997), and its Spanish version (Amador-Campos et al., 2002), includes 27 items scored on a 4-point scale, ranging from 0 (*Not true*) to 3 (*Very true*). It was developed to assess attention-deficit/hyperactivity disorder (ADHD) and its most common comorbid problems, over the previous month, through four scales: Oppositional problems ( $\alpha$ =.87; MIC=.53), Attention deficit problems ( $\alpha$ =.89; MIC=.58), Hyperactivity/Impulsivity ( $\alpha$ =.82; MIC=.44), and ADHD index ( $\alpha$ =.92; MIC=.48). *The Conners’ Teacher Rating Scale- Short Form (CTRS-R:S;* Conners, 1997) was also used for the screening process for phase 2.

*The Child Behavior Checklist/ 4-18 de Achenbach (CBCL;* Achenbach, 1991a) is a checklist that parents complete to detect emotional and behavioral problems in children and adolescents occurring over the previous 6 months. *The Teacher’s Report Form (TRF;* Achenbach, 1991b), and the *Youth Self- Report (YSR;* Achenbach, 1991c) were also used for the screening process for phase 2. The CBCL consists of 113 items, scored on a 3-point response scale ranging from 0 (*Not true*) to 2 (*Very true or often true*). The CBCL is made up of eight syndrome scales: Withdrawn ( $\alpha$ =.70; MIC=.22); Somatic complaints ( $\alpha$ =.55; MIC=.15); Anxious/depressed ( $\alpha$ =.82; MIC=.25); Social problems ( $\alpha$ =.65; MIC=.20); Thought problems

( $\alpha=.49$ ; MIC=.17); Attention problems ( $\alpha=.78$ ; MIC=.24); Delinquent behavior ( $\alpha=.57$ ; MIC=.25); and Aggressive behavior ( $\alpha=.87$ ; MIC=.26). These items can be used to calculate scores on three broadband scales: Internalizing, Externalizing, and Total Problems. The CBCL has been translated and adapted to Spanish, with good psychometric properties (Rubio-Stipec et al., 1990).

In this study, prior to the main statistical analyses, 10 items were eliminated because of their low frequency when referring to primary school children. These were item 40 (“Hears sounds or voices that aren’t there”) from the Thought problems scale, and the following nine items from delinquent behavior: item 39 (“Hangs with others who get in trouble”), item 67 (“Runs away from home”), item 72 (“Sets fires”), item 81 (“Steals at home”), item 82 (“Steals outside the home”), item 96 (“Thinks about sex too much”), item 101 (“Truancy, skips school”), item 105 (“Uses drugs for nonmedical purposes”) and item 106 (“Vandalism”). Cronbach’s  $\alpha$  and MIC values were calculated following this assumption.

*Sociodemographic characteristics* was assessed with items developed ad hoc for the present study. To this end, parents provided information on variables such as the child’s age, gender and health (general anamnesis and medical record), and the family’s socioeconomic level. Children’s academic data were provided by teachers.

### ***Study Phase 2: At-risk for Psychopathology Sample Selection and Data Collection***

The instruments used in the screening process for phase 2 were: CPRS-R:S, CTRS-R:S, CBCL, TRF, YSR, and the PRODISCAT.

PRODISCAT (Col·legi de Logopedes de Catalunya, 2011) is a protocol developed by the Speech Therapists Association of Catalonia and aimed at teachers of preschool, elementary and secondary education, and vocational training with the objective to detect possible cases of dyslexia at an early stage. It consists of 18-44 items, depending on the educational stage, some of which represent high-risk indicators that require intervention. The remaining items indicate associated difficulties that may worsen the symptomatology and that will need to be considered in the intervention plan. This tool was only used for screening purposes.

*The Kiddie Schedule for Affective Disorders and Schizophrenia Present and Lifetime Version* (Kaufman et al., 1997b). *The K-SADS/PL* is a semi-structured interview aimed at early diagnosis of psychiatric disorders in school-aged children 6-18, according to the Diagnostic and Statistical Manual of Mental Disorders–Fourth edition–Text revision (DSM-IV-TR; APA, 2000). This interview was administered to parents and students separately. Items are scored using a 0- to 3-point scale from 0 (*No*

*information is available*) to 3 (*Threshold level of symptomatology*). This tool includes an 82-symptom screen interview and five diagnostic supplements: Affective disorders, Psychotic disorders, Anxiety disorders, Behavioral disorders, and Substance abuse, eating, and tic disorders. Diagnostic supplements are only applied if at least a threshold score is received on any of the symptoms studied in that area of the screening interview. Only scores with a threshold level of symptomatology were considered for diagnosis. The Spanish version of the K-SADS/PL has shown an excellent interrater reliability for the evaluation of psychopathology in children and adolescents (any affective disorder, Cohen's kappa coefficient ( $\kappa$ ) = .84; any anxiety disorder,  $\kappa$  = .84; any externalized disorder,  $\kappa$  = .87) (Ulloa et al., 2006).

### **Statistical Analyses**

In order to examine the factor structure of the CPTI, a set of Confirmatory Factor Analyses (CFA) were conducted, with robust weighted least squares used as estimator (WLSMV). Model fit was assessed using root mean square error of approximation (RMSEA; study criterion  $\leq .08$ ), comparative fit index (CFI;  $\geq .90$ ), and Tucker–Lewis index (TLI;  $\geq .90$ ) (Hu & Bentler, 1999). Three levels of measurement invariance (MI; i.e., configural, metric, and scalar) were tested across gender groups using the sequential strategy suggested by Meredith and Teresi (2006). Change in CFI ( $\Delta$ CFI) was used as an indicator for testing MI, given its independence of model parameters and sample size ( $\Delta$ CFI  $\leq 0.01$  supports the presence of MI across groups) (Cheung & Rensvold, 2002). The internal consistency was computed with Cronbach's alpha and interpreted as poor ( $\leq .60$ ), marginal (.60 to .69), acceptable (.70 to .79), good (.80 to .89), and excellent ( $\geq .90$ ) (Barker et al., 2002). As Cronbach's alpha is dependent on the length of the scale, MIC was computed as a more straightforward indicator of the internal consistency, with values ranging from .15 to .50, at minimum, being considered adequate (Clark & Watson, 1995).

The study of convergent and discriminant validity was performed through zero-order correlations, and a series of structural equation models (SEM), which make it possible to test the latent contribution of each CPTI dimension while overcoming the limitations of partialing redux (Sleep et al., 2017). Specifically, eleven models were analyzed; two for the SDQ: one including all the problematic scales (i.e., Emotional symptoms, Conduct problems, Hyperactivity/inattention problems, Peer relationship problems), and one for the Prosocial behavior scale; one model for the CPRS-R:S subscales (i.e., Hyperactivity/impulsivity problems, Attention deficit problems, Oppositional problems); and eight models for each independent facet of the CBCL (i.e., Withdrawn, Somatic complaints, Anxious/depressed, Social problems, Thought problems, Attention problems, Delinquent behavior and

Aggressive behavior). Finally, in order to evaluate if the CPTI can discriminate between community and clinical children, the aforementioned groups (i.e., externalizing problems, internalizing problems, and the control group) were compared in the CPTI subscales and total scores by means of a GML Univariate Analysis of Variance. To further test the differences between groups, multiple comparisons post-hoc analysis was carried out, with Cohen's *d* estimation as the effect size of mean comparisons. CFAs and SEM analyses were conducted in Mplus 7.4 (Muthén & Muthén, 2011). All other analyses were conducted in SPSS 21.0.

## Results

### Descriptive Information

Descriptive statistics between the main study variables are presented in Table 1. As expected, participants scored relatively low in all CPTI factors and Total score, as well as all the analyzed variables, except Prosocial behavior, which showed high mean scores.

### Factor Structure and Measurement Invariance

The three-factor model of the parent-reported CPTI showed an adequate (RMSEA = .07; CFI = .91; TLI = .91) model fit, and better fit the data as compared to the CPTI unidimensional solution (RMSEA = .10; CFI = .82; TLI = .90). All items loaded well and with statistical significance ( $p < .001$ ) on the expected CPTI factor (see Figure S1, available online). Item 1 "Likes change and that things happen all the time"; the factor loading = .38 was low but greater than .30, being considered acceptable when factor loads are interpreted (Brown, 2014). Rerunning the CFA without Item 1 improved the model fit indices, although not in a meaningful way (RMSEA = .06; CFI = .93; TLI = .93).

MI tests were performed across gender groups. The three-factor model of the CPTI was firstly tested for boys and girls separately, resulting in an acceptable model fit for boys and girls (RMSEA = .07/.07; CFI = .92/.92; TLI = .91/.91 respectively). Model fit indices for configural invariance were RMSEA = .07, CFI = .92, and TLI = .91; for metric invariance: RMSEA = .07, CFI = .92, and TLI = .92; and for scalar invariance: RMSEA = .06, CFI = .93, and TLI = .93. Results from MI suggest that the parent-reported CPTI scores were invariant across gender ( $\Delta$ CFIs < .01) (Cheung & Rensvold, 2002).

### Internal Consistency of the CPTI Scores and Correlations between CPTI Scores.

Overall, the Cronbach's  $\alpha$  and MIC values were indicative of good to excellent internal consistency for both the CPTI total score ( $\alpha = .91$ ; MIC = .28), and the three CPTI factors: GD ( $\alpha = .85$ ;

MIC=.43), CU ( $\alpha=.85$ ; MIC=.38), and INS ( $\alpha = .85$ ; MIC = .36). Significant zero-order correlations were found between CPTI factor scores and CPTI total score ( $r_s$  ranging from .79 to .87), and between the three CPTI factor scores ( $r_s$  ranging from .47 to .54). All correlations were significant at  $p < .001$  (see Table 1).

### **Convergent and Divergent Validity of the CPTI**

The Table 1 shows the results of the zero-order bivariate correlations between the CPTI and the SDQ, the CPRS-R:S and the CBCL. As observed, the CPTI factors and Total score were significantly correlated with all the external criteria ( $r_s$  ranging from .23 to .65 for the SDQ; from .32 to .64 for the CPRS-R:S; and from .10 to .63 for the CBCL). These correlations were positive for all analyzed variables except for the SDQ prosocial behavior scale, which was negatively related with CPTI factors and Total score.

The unique associations between each of the three CPTI factors (e.g., GD) and external variables, while controlling for the other two factors (e.g., CU and INS), were examined through a set of SEM analyses. The goodness of fit indices for all the analyzed models are presented in Table 2, with acceptable model fit for all of them. As displayed in Table 3, the CPTI scores showed a different pattern of associations with the analyzed measures. The GD factor was associated with high levels of conduct problems and delinquent behavior and, to a lesser extent, with oppositionism and aggressive behavior. The CU factor was clearly associated with peer relationship problems, withdrawn and thought problems, but above all, with low levels of prosocial behavior. Finally, the INS factor was related in a significant way to all scales (especially inattention and hyperactivity) except for peer relationship problems and prosocial behavior.

### **Discriminant Validity of the CPTI across Different Clinical Conditions**

As observed in Table 4, result from comparisons showed statistically significant differences across the analyzed groups in the three CPTI factors and CPTI total score: GD ( $F = 24.18$ ;  $p < .001$ ); CU ( $15.59$ ;  $p < .001$ ); INS ( $F = 69.29$ ;  $p < .001$ ); CPTI<sub>Total</sub> ( $F = 59.41$ ;  $p < .001$ ).

Multiple comparisons post-hoc analysis showed that the GD factor discriminated between externalizing and other psychopathological conditions, and between externalizing disorders and the control group, with medium effect sizes ( $d = 0.51$  and  $0.68$ ). The CU factor discriminated between externalizing disorders and the other psychopathological conditions with a small effect size ( $d = 0.42$ ), and between externalizing and control group with a medium effect size ( $d = 0.59$ ). The INS factor discriminated between externalizing and other psychopathological conditions, and between externalizing

disorders and the control group, in both cases with large effect sizes ( $d = 1.02$  and  $1.35$ ). Finally, CPTI<sub>Total</sub> discriminated between externalizing and other psychopathological conditions, and between externalizing disorders and the control group, with large effect sizes ( $d = 0.87$  and  $1.15$ ). No CPTI factors and Total score discriminated between the other psychopathological conditions and the control group.

### **Discussion**

The current study aimed to provide further validation of the psychometric properties of the parent-reported CPTI in a large sample of school-aged children. This study shows that the parent-reported CPTI confirms the original structure of three interrelated factors (GD, CU, and INS), being invariant across gender, and with good to excellent internal consistency. Relations between CPTI scores and external correlates replicated and extended previous research (Colins et al., 2016; Colins et al., 2018; Colins, Roetman, et al., 2020; Colins et al., 2014; López-Romero, Maneiro, et al., 2019; López-Romero, Molinuevo, et al., 2019; Luo et al., 2019; Somma et al., 2016; Wang et al., 2018). Overall, we provide additional support for the utility of the CPTI for assessing psychopathic traits in childhood through parents' reports. Of particular note is that our findings provide new evidence supporting the utility of the CPTI to establish comparisons between normative and at-risk for psychopathology samples, particularly those in the externalizing pole.

### **Psychometric Properties**

The model fit for the three-factor structure of parent-reported CPTI was adequate, replicating the results obtained in previous CPTI studies, including both parents' and teachers' reports. In this regard, it is noteworthy that our results largely converge with those obtained in a previous multi-study conducted with the teacher-reported version of the CPTI in our country (López-Romero, Molinuevo, et al., 2019). The three-factor structure was invariant across gender, in line with all prior parent-reported CPTI studies (Colins, Roetman, et al., 2020; López-Romero, Maneiro, et al., 2019; Luo et al., 2019; Somma et al., 2016) except for one (Wang et al., 2018). Moreover, the factor loadings were mostly high (almost all well over .40) on their corresponding factor, showing a good result in the assessment literature on parent-rated psychopathic traits in childhood (Dadds et al., 2005; Frick et al., 2000). Although it was initially an instrument designed to be reported by teachers, the internal consistency values of the CPTI scores obtained in this sample indicate that it can be used by parents, being a tool with the ability to unravel the

roots of psychopathic personality and antisocial behavior early in development (Farrington et al., 2010; Waller et al., 2013).

### **Convergent and Divergent Validity of the CPTI**

According to our predictions, clear positive correlations were obtained in the CPTI variables, particularly with externalizing problems such as ADHD symptoms, aggressive and delinquent behavior, and conduct problems, as well as a negative correlation with prosocial behavior, which confirms the convergent and divergent validity of the CPTI. Nevertheless, zero order bivariate correlations showed how the CPTI factors and Total score related with all external criteria correlates, including internalizing problems. As reflected in previous studies, the combination of certain psychopathic traits together with the presence of anxiety traits is related to different psychopathological outcomes (Craig et al., 2021; Humayun et al., 2014). Even considering that individuals with psychopathic traits have been traditionally defined as low anxious, research conducted at early developmental stages has shown some mixed results when examining emotional problems (e.g., Kubak & Salekin, 2009). In addition, anxiety and other related emotional problems have been examined as potential indicators of the primary (i.e., low anxious) and secondary variants (i.e., high anxious) of psychopathy (Kimonis et al., 2012), a result that should be further explored in the context of CPTI research.

When testing the unique contribution of each CPTI factor (e.g., GD), after accounting for the shared variance with the others (e.g., CU and INS), different and unique associations were obtained for these variables. As expected, GD traits correlate with conduct problems, oppositional problems, delinquent behavior and aggressive behavior. Our results are in line with all previous studies that relate GD traits with greater transgression, unprovoked aggression and lower neuroticism (Salekin, 2017). As has already been observed, this highlights the unique association between GD traits and aggressive or delinquent behavior, where GD traits have shown a stronger relationship than CU traits (Lau et al., 2011; Lau & Marsee, 2013)

Only CU traits remain significantly and negatively correlated with prosocial behavior, and positively correlated with peer relationship problems, probably because the development of consciousness, often defined by guilt and empathy (Thompson & Newton, 2010), plays a clear role in both promoting prosocial behavior and inhibiting problematic behavior (Waller et al., 2020). Supporting previous studies (e.g., Dadds et al., 2005), the CU factor is not found to be related to SDQ conduct problems, unlike the GD factor, where the association is notorious. This is possibly due to the fact that

this scale reflects a proactive aggression and interpersonal manipulation style. To a lesser extent, this is also observable in the aggressive behavior scale of the CBCL, and even in terms of criminal behavior, since GD traits seem to modulate more severe antisocial pathways (Lau & Marsee, 2013). Nevertheless, it should be noted that CU traits remained significantly correlated with both oppositional behavior from the CPRS-R:S, and both delinquent and aggressive behavior from the CBCL, supporting the predictive value of CU traits at early developmental stages (Frick et al., 2014).

It is worth noting the relationship between CU traits and withdrawn, but especially with thought problems. Although we do not have a fully satisfactory explanation, we must bear in mind that children are in a continuous process of neurodevelopmental change. It is possible that internalizing symptoms in these children, when expressed behaviorally, appear callous or unemotional. For example, a sensitive and withdrawn child may present as indifferent to the social and emotional needs of peers; however, this apparent indifference may be reflecting underlying anxiety and social introversion. On the other hand, the presence of obsessions, intrusive thoughts or self-absorption, which are symptoms that could belong to the anxious or psychotic sphere, could be interpreted by parents as CU traits. All of this could be framed within the historical terminological confusion faced by this area of study (Torrubia & Cuquerella, 2008; Skeem, Polaschek, Patrick, & Lilienfeld, 2011). Further studies to analyze the relationship of this dimension with the variables described, as well as the study of neurobiological correlates, are needed.

As regards INS traits, beyond the expected associations with external behavioral problems (e.g., conduct problems, oppositional behavior, or aggressive behavior), positive correlations were observed with withdrawn, somatic complaints or anxious/depressed symptomatology, perhaps because of the close relationship between impulsivity and other psychiatric symptoms (Vidal et al., 2014), as well as the potential co-occurrence between conduct problems, largely linked with INS traits, and emotional problems (Bubier & Drabick, 2009). Another feasible explanation is the fact that co-occurring elevated INS/CU traits and internalizing disorders in some children could be a consequence of the behavior problems they experience (Frick, Lilienfeld, et al., 1999).

### **Discriminant validity of the CPTI**

To the best of our knowledge, this is the first study to analyze comparisons between a normative sample and an at-risk for psychopathology sample, using the CPTI as a comparative framework. In addition, only one study has tested the psychometric properties of CPTI in a clinical referred sample (Colins, Roetman, et al., 2020). Although statistically significant differences between the groups were

found in all dimensions, they were especially high for INS and for CPTI <sub>Total score</sub>. The results showed that children in the ED group scored higher than children in the other two groups (OP/CG) on all three CPTI dimensions and on the total score. In more detail post-hoc analyses, the INS and CPTI <sub>Total score</sub> demonstrated a high ability to discriminate between ED-OP and ED-CG; GD and CU showed acceptable discriminant ability in the same groups particularly to discriminate between ED-CG.

The ability of the INS dimension to discriminate children with externalizing disorders from healthy children is in line with previous results at the dimensional level (Salekin, 2016), but is also consistent with the diagnoses in our sample, where the main diagnosis was ADHD. Additional research with samples containing a higher prevalence of ODD or CD will therefore be necessary. Also, the failure to discriminate between the children with another psychopathology than externalizing from healthy children may also be due to the scarcity of internalizing disorders in our sample and the composition of this group, mainly composed by children with learning disorders. However, we would like to note that data were also analyzed considering only internalizing disorders (ID; n=13), and it was observed that there was no discrimination between ED and ID, but there was discrimination between these two conditions and CG (data available upon request); although the sample size is small and could be interpreted as a power of effect problem, it could also show the importance of carrying out further works with homogeneous groups of internalizing pathology to see if differences are found. In order to better interpret these results, it should be also noted that psychopathy has been associated with poorer academic achievement, being independent of CD or SES (Allen et al., 2018; Bird et al., 2019). Specifically, CU traits were potent predictors of reading comprehension over and above ADHD and even IQ (Vaughn et al., 2011). At the same time, learning disorders have been associated with the appearance of anxiety (Haft et al., 2019), which may justify why both internalizing problems and learning disorders covariate within the OP group. That said, it is important to highlight that this is a cross-sectional study and therefore we can only objectify the concurrence of psychopathology and psychopathic traits, without establishing causality.

The different dimensions that make up the CPTI and the general construct of psychopathy have the capacity to discriminate between the mentioned populations and identify a group of children with ED. These results are again in line with the requirement to study the potential of interpersonal and behavioral traits for subtyping children with externalizing conduct problems (Lilienfeld, 2018; Salekin, 2017).

Future studies on clinical samples should be conducted in other countries to elucidate whether this ability

to discriminate between different cultures is maintained. If confirmed, it could lead to the inclusion of the CPTI in evaluation protocols, for example to establish different treatment lines.

### **Theoretical and Practical Implications**

Overall, the results obtained in this study support the consideration of psychopathy as a multidimensional construct that could influence behavioral problems by combining the three factors (Colins et al., 2014). Also, these findings converge with previous research that establishes a close relationship among psychopathic traits in children and a wide range of behavioral and psychosocial problems (Salekin & Lynam, 2010). Finally, the present results would be in line with current proposals that claim for the inclusion of all psychopathy dimensions, and not only CU traits, as potential identifiers of CD and other relevant problems in developmental models and diagnostic classification systems (Lilienfeld, 2018; Salekin, 2017).

Even considering that these results support the main findings obtained in an ever-increasing line of research, they also open new ways of discussion and analysis that should be addressed in future research. Hence, in line with previous CPTI validation studies, CU traits is not the only dimension predicting serious conduct problems in children (e.g., Colins et al., 2016; Colins et al., 2018; Colins, Roetman, et al., 2020; Colins et al., 2014; López-Romero, Maneiro, et al., 2019; López-Romero, Molinuevo, et al., 2019; Luo et al., 2019; Somma et al., 2016b; Wang et al., 2018). Although it does not invalidate all the contributions made in previous literature, it should be noted that most studies that have focused on CU traits have not controlled for other psychopathy dimensions, which seem to be relevant as well in their associations with behavioral maladjustment, as is the case of GD traits (Salekin, 2017). In addition, it would be interesting to study interaction effects between the dimensions since previous studies have shown that both concurrent and prospective behavioral maladjustment can be driven by interaction effects between all three psychopathy dimensions (e.g., Fanti et al., 2018), a result that should be further explored in future research.

Even though we already know that the three-factor model of psychopathy, as delineated in the CPTI, seems to work in childhood, there is much that we need to know about this construct in general, and all its dimensions in particular, when trying to understand serious conduct problems in childhood and later antisocial behavior/delinquency in adolescence, as well as other forms of psychopathology. To this end, future studies should keep focusing on studying psychopathic traits from a multidimensional perspective, considering the potential role of the psychopathic construct (i.e., with high levels in all three

dimensions), as well as the contribution of each specific dimension or other potential trait interactions and configurations (Salekin, 2016). Finally, there is a need to clarify whether previous results obtained in the CU literature (e.g., etiological processes, cognitive, emotional and environmental correlates...) are comparable when all dimensions are taken into account or, in contrast, if there are specific deficits for each dimension that contribute to a unique etiological pattern underlying psychopathic personality. Answering these questions will clarify the role of the psychopathic construct, and will have potential practical implications relevant to assessment, diagnostic classification and tailored interventions.

### **Strengths and Limitations**

The strengths of this study include the availability of a large sample of children and within this a considerable at-risk for psychopathology, and the use of well-validated and commonly used questionnaires and a diagnostic interview to measure external correlates. However, this study has some limitations to be considered. First, only parents were used as a source of information. Nevertheless, this could be also considered a strength, since the present study shows, as have previous ones (Colins, Roetman et al., 2020; López-Romero, Maneiro, et al., 2019; Luo et al., 2019; Somma et al., 2016; Wang et al., 2018), that CPTI can be answered by parents as well as by teachers, giving us the possibility of evaluating psychopathic traits from early ages with multiple informants, as recommended (Frick et al., 2000). Second, this study does not include preschool children so we cannot know what is happening in 3-4-year-olds. Third, the non-inclusion of alternative measures to assess psychopathic traits. Fourth, the use of a cross-sectional design does not allow us to establish predictions between psychopathic personality and future conduct problems and treatment outcomes. Fifth, the results are not representative of the general population, and more studies are needed taking this into account, and also considering sociodemographic information, particularly parents' educational level, employment situation, and SES as potential differential variables when assessing psychopathic traits (Zxaanswijk et al., 2018). Sixth, internalizing diagnoses were scarce in our sample with an elevated presence of learning disorders; nevertheless, it provides preliminary information on the relationship of this instrument with another psychopathology also present in children. And, externalizing diagnoses were mainly made up of ADHD, with a high prevalence (17%), although within the range indicated by some reviews (Polanczyk et al., 2007). Seventh, because it was beyond of the purpose of the current study, the differences between the ADHD subtypes have not been analyzed, an issue that should be addressed in future research. Finally,

future studies should also account for potential gender differences, particularly as regards the predictive and discriminant value of psychopathic traits.

### **Conclusions**

In sum, this study replicated and extended prior work on the psychometric properties of the parent-reported CPTI and went some way to answering prior calls to develop a psychometrically sound and comprehensive assessment tool of psychopathic traits in children (Hawes et al., 2014; Waller et al., 2015). Our results appear to provide robust evidence of the usefulness of CPTI for subtyping children with behavioral disorders, since it proved to be capable of discriminating between normative and at-risk for psychopathology samples. This underlines the need for more studies that compare different populations, ideally, from a multi-informant perspective. We may broadly conclude that it is necessary to keep studying psychopathy from a multidimensional perspective, which would enable us to extend our knowledge on the general construct while accounting for each specific dimension.

### References

- Achenbach, T. (1991a). Child Behavior Checklist for Ages 4-18. In *Manual for the child behavior checklist/4-18 and 1991 profile*. University of Vernon, Department of Psychiatry.
- Achenbach, T. (1991b). *Manual for the Teacher's Report Form and 1991 profile*. University of Vernon, Department of Psychiatry.
- Achenbach, T. (1991c). *Manual for the Youth Self-Report and 1991 profile*. University of Vernon, Department of Psychiatry.
- Allen, J. L., Bird, E., & Chhoa, C. Y. (2018). Bad Boys and Mean Girls: Callous-Unemotional Traits, Management of Disruptive Behavior in School, the Teacher-Student Relationship and Academic Motivation. *Frontiers in Education*, 3(December). <https://doi.org/10.3389/educ.2018.00108>
- Amador- Campos, J.A., Idiázabal, M.C, Sangorrin, J., Espadaler, J., & Forns, M. (2002). Utilidad De Las Escalas De Connors Para Discriminar Entre Sujetos Con Y Sin Trastorno Por Déficit De Atención Con Hiperactividad. *Psicothema*, 14, 350–356.
- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., T). American Psychiatric Publishing Association.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Association.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2012). Psychopathic traits in non-referred youths: A new assessment tool. In *Psychopaths: Current International Perspectives* (eds) (pp. 131–158). Elsevier.
- Barker, C., Pistrang, N., & Elliott, R. R. (2002). Research Methods in Clinical Psychology: An Introduction for Students and Practitioners: Second Edition. In *Research Methods in Clinical Psychology: An Introduction for Students and Practitioners. The marketing review* (2nd ed.). Wiley. <https://doi.org/10.1002/0470013435>
- Bird, E., Chhoa, C. Y., Midouhas, E., & Allen, J. L. (2019). Callous-Unemotional Traits and Academic Performance in Secondary School Students: Examining the Moderating Effect of Gender. *Journal of Abnormal Child Psychology*, 47(10), 1639–1650. <https://doi.org/10.1007/s10802-019-00545-2>
- Blair, R. J. R. (2013). The neurobiology of psychopathic traits in youths. *Nature Reviews Neuroscience*, 14(11), 786–799. <https://doi.org/10.1038/nrn3577>
- Brown, T. A. (2014). *Confirmatory factor analysis for applied research*. The Guildford Press.

- Bubier J.L., Drabick D.A.G. Co-occurring anxiety and disruptive behavior disorders: The roles of anxious symptoms, reactive aggression, and shared risk processes. *Clinical Psychology Review*. 2009; 29:658–669.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 233–255.  
[https://doi.org/10.1207/S15328007SEM0902\\_5](https://doi.org/10.1207/S15328007SEM0902_5)
- Christian, R. E., Frick, P. J., Hill, N. L., Tyler, L., & Frazer, D. R. (1997). Psychopathy and Conduct Problems in Children: II. Implications for Subtyping Children With Conduct Problems. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(2), 233–241.  
<https://doi.org/10.1097/00004583-199702000-00014>
- Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7(3), 309–319. <https://doi.org/10.1037/1040-3590.7.3.309>
- Colins, O. F., Fanti, K., Larsson, H., & Andershed, H. (2016). Psychopathic Traits in Early Childhood: Further Validation of the Child Problematic Traits Inventory. *Assessment*.  
<https://doi.org/10.1177/1073191115624544>
- Colins, O. F., Roetman, P. J., Lopez-Romero, L., & Andershed, H. (2020). Assessing Psychopathic Traits Among Children: The First Validation Study of the Child Problematic Traits Inventory in a Clinical Sample. *Assessment*, 27(6), 1242–1257. <https://doi.org/10.1177/1073191119832654>
- Colins, O. F., Van Damme, L., Hendriks, A. M., & Georgiou, G. (2020). The DSM-5 with Limited Prosocial Emotions Specifier for Conduct Disorder: a Systematic Literature Review. *Journal of Psychopathology and Behavioral Assessment*, 42(2), 248–258. <https://doi.org/10.1007/s10862-020-09799-3>
- Colins, O. F., Veen, V., Veenstra, M., Frogner, L., & Andershed, H. (2018). The Child Problematic Traits Inventory in a Dutch General Population Sample of 3- to 7-Year-Old Children. *European Journal of Psychological Assessment*, 34(5), 336–343. <https://doi.org/10.1027/1015-5759/a000347>
- Colins, O. F., Andershed, H., Frogner, L., Lopez-Romero, L., Veen, V., & Andershed, A.-K. (2014). A New Measure to Assess Psychopathic Personality in Children: The Child Problematic Traits Inventory. *Journal of Psychopathology and Behavioral Assessment*, 36(1), 4–21.  
<https://doi.org/10.1007/s10862-013-9385-y>
- Col·legi de Logopedes de Catalunya (2011). *PRODISCAT: Protocolo de Detección y Actuación en la*

- Dislexia*. <https://www.clc.cat/es/publicacions/eines-d-avaluacio>. Accessed 21 Desember 2020.
- Conners, C. K. (1997). *The Conners' Rating Scales-Revised: Technical manual*.
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: towards a hierarchical model. *Psychological Assessment, 13*(2), 171–188.
- Craig, S. G., Goulter, N., & Moretti, M. M. (2021). A Systematic Review of Primary and Secondary Callous-Unemotional Traits and Psychopathy Variants in Youth. *Clinical Child and Family Psychology Review, 24*(1), 65–91. <https://doi.org/10.1007/s10567-020-00329-x>
- Dadds, M. R., Fraser, J., Frost, A., & Hawes, D. J. (2005). Disentangling the underlying dimensions of psychopathy and conduct problems in childhood: A community study. *Journal of Consulting and Clinical Psychology, 73*(3), 400–410. <https://doi.org/10.1037/0022-006X.73.3.400>
- DeLisi, M. (2016). *Psychopathy as unified theory of crime*. Palgrave Macmillan.
- Eisenbarth, H., Demetriou, C. A., Kyranides, M. N., & Fanti, K. A. (2016). Stability Subtypes of Callous-Unemotional Traits and Conduct Disorder Symptoms and Their Correlates. *Journal of Youth and Adolescence, 45*(9), 1889–1901. <https://doi.org/10.1007/s10964-016-0520-4>
- Español-Martín, G., Pagerols, M., Prat, R., Rivas, C., Sixto, L., Valero, S., Artigas, M. S., Ribasés, M., Ramos-quiroga, J. A., Casas, M., & Bosch, R. (2020). *Strengths and Difficulties Questionnaire : Psychometric Properties and Normative Data for Spanish 5- to 17-Year-Olds*, <https://doi.org/10.1177/1073191120918929>
- Ezpeleta, L., de la Osa, N., Granero, R., Penelo, E., & Domènech, J. M. (2013). Inventory of callous-unemotional traits in a community sample of preschoolers. *Journal of Clinical Child and Adolescent Psychology, 42*(1), 91–105. <https://doi.org/10.1080/15374416.2012.734221>
- Fanti, K. A., Kyranides, M. N., Lordos, A., Colins, O. F., & Andershed, H. (2018). Unique and interactive associations of callous-unemotional traits, impulsivity and grandiosity with child and adolescent conduct disorder symptoms. *Journal of Psychopathology and Behavioral Assessment, 40*(1), 40–49. <https://doi.org/10.1007/s10862-018-9655-9>
- Farrington, D. P., Ullrich, S., & Salekin, R. T. (2010). Environmental influences on child and adolescent psychopathy. In R. T. Salekn & D. R. Lynam (Eds.), *Handbook of child and adolescent psychopathy* (pp. 202–230). The Guildford Press.
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic-referred samples of children: Further development of the Psychopathy Screening Device.

- Psychological Assessment*, 12(4), 382–393. <https://doi.org/10.1037/1040-3590.12.4.382>
- Frick, P. J., Lilienfeld, S. O., Ellis, M., Loney, B., & Silverthorn, P. (1999). The association between anxiety and psychopathy dimensions in children. *Journal of Abnormal Child Psychology*, 27(5), 383–392. <https://doi.org/10.1023/A:1021928018403>
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous-unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents? A comprehensive review. *Psychological Bulletin*, 140(1), 1–57. <https://doi.org/10.1037/a0033076>
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 38(5), 581–586. <https://doi.org/10.1111/j.1469-7610.1997.tb01545.x>
- Goulter, N., Craig, S. G., & McMahon, R. J. (2021). Primary and secondary callous-unemotional traits in adolescence are associated with distinct maladaptive and adaptive outcomes in adulthood. *Development and Psychopathology*, May, 1–16. <https://doi.org/10.1017/S0954579421000481>
- Haft, S. L., Duong, P. H., Ho, T. C., Hendren, R. L., & Hoefft, F. (2019). Anxiety and Attentional Bias in Children with Specific Learning Disorders. *Journal of Abnormal Child Psychology*, 47(3), 487–497. <https://doi.org/10.1007/s10802-018-0458-y>
- Hare, R. D., & Neumann, C. S. (2008). Psychopathy as a Clinical and Empirical Construct. *Annual Review of Clinical Psychology*, 4(1), 217–246. <https://doi.org/10.1146/annurev.clinpsy.3.022806.091452>
- Hawes, S. W., Byrd, A. L., Henderson, C. E., Gazda, R. L., Burke, J. D., Loeber, R., & Pardini, D. A. (2014). Refining the parent-reported inventory of callous-unemotional traits in boys with conduct problems. *Psychological Assessment*, 26(1), 256–266. <https://doi.org/10.1037/a0034718>
- Herpers, P. C. M., Scheepers, F. E., Bons, D. M. A., Buitelaar, J. K., & Rommelse, N. N. J. (2014). The cognitive and neural correlates of psychopathy and especially callous–unemotional traits in youths: A systematic review of the evidence. *Development and Psychopathology*, 26(1), 245–273. <https://doi.org/10.1017/S0954579413000527>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Huang, J., Fan, L., Lin, K., & Wang, Y. (2020). Variants of Children with Psychopathic Tendencies in a

- Community Sample. *Child Psychiatry and Human Development*, 51(4), 563–571.  
<https://doi.org/10.1007/s10578-019-00939-9>
- Humayun, S., Kahn, R. E., Frick, P. J., & Viding, E. (2014). Callous-Unemotional Traits and Anxiety in a Community Sample of 7-Year-Olds. *Journal of Clinical Child & Adolescent Psychology*, 43(1), 36–42. <https://doi.org/10.1080/15374416.2013.814539>
- Hyde, L. W., Burt, S. A., Shaw, D. S., Donnellan, M. B., & Forbes, E. E. (2015). Early starting, aggressive, and/or callous–unemotional? Examining the overlap and predictive utility of antisocial behavior subtypes. *Journal of Abnormal Psychology*, 124(2), 329–342.  
<https://doi.org/10.1037/abn0000029>
- Kahn, R. E., Frick, P. J., Youngstrom, E. A., Kogos Youngstrom, J., Feeny, N. C., & Findling, R. L. (2013). Distinguishing primary and secondary variants of callous-unemotional traits among adolescents in a clinic-referred sample. *Psychological Assessment*, 25(3), 966–978.  
<https://doi.org/10.1037/a0032880>
- Kahn, R. E., Frick, P. J., Youngstrom, E., Findling, R. L., & Youngstrom, J. K. (2012). The effects of including a callous-unemotional specifier for the diagnosis of conduct disorder. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 53(3), 271–282. <https://doi.org/10.1111/j.1469-7610.2011.02463.x>
- Kaufman, J., Birmaher, B., Brent, D., Rao, U., Flynn, C., Moreci, P., Williamson, D., & Ryan, N. (1997). Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL): initial reliability and validity data. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36(7), 980–988. <https://doi.org/10.1097/00004583-199707000-00021>
- Kimonis, E. R., Frick, P. J., Cauffman, E., Goldweber, A., & Skeem, J. (2012). Primary and secondary variants of juvenile psychopathy differ in emotional processing. *Development and Psychopathology*, 24, 1091–1103. <https://doi.org/10.1017/S0954579412000557>
- Kolko, D. J., & Pardini, D. A. (2010). ODD dimensions, ADHD, and callous-unemotional traits as predictors of treatment response in children with disruptive behavior disorders. *Journal of Abnormal Psychology*, 119(4), 713–725. <https://doi.org/10.1037/a0020910>
- Kubak, F.A., & Salekin, R.T. (2009). Psychopathy and Anxiety in Children and Adolescents: New Insights on Developmental Pathways to Offending. *Journal of Psychopathology and Behavioral*

- Assessment*, 31, 271–284. <https://doi.org/10.1007/s10862-009-9144-2>
- Lau, K. S. L., & Marsee, M. A. (2013). Exploring Narcissism, Psychopathy, and Machiavellianism in Youth: Examination of Associations with Antisocial Behavior and Aggression. *Journal of Child and Family Studies*, 22(3), 355–367. <https://doi.org/10.1007/s10826-012-9586-0>
- Lau, K. S. L., Marsee, M. A., Kunimatsu, M. M., & Fassnacht, G. M. (2011). Examining Associations Between Narcissism, Behavior Problems, and Anxiety in Non-Referred Adolescents. *Child & Youth Care Forum*, 40(3), 163–176. <https://doi.org/10.1007/s10566-010-9135-1>
- Lilienfeld, S. O. (2018). The Multidimensional Nature of Psychopathy: Five Recommendations for Research. *Journal of Psychopathology and Behavioral Assessment*, 40(1), 79–85. <https://doi.org/10.1007/s10862-018-9657-7>
- López-Romero, L., Maneiro, L., Colins, O. F., Andershed, H., & Romero, E. (2019). Psychopathic Traits in Early Childhood: Further Multi-informant Validation of the Child Problematic Traits Inventory (CPTI). *Journal of Psychopathology and Behavioral Assessment*, 366–374. <https://doi.org/10.1007/s10862-019-09735-0>
- López-Romero, L., Molinuevo, B., Bonillo, A., Andershed, H., Colins, O. F., Torrubia, R., & Romero, E. (2019). Psychometric Properties of the Spanish Version of the Child Problematic Traits Inventory in 3- to 12-Year-Old Spanish Children. *European Journal of Psychological Assessment*, 35(6), 842–854. <https://doi.org/10.1027/1015-5759/a000458>
- Luo, J., Wang, X., Wang, M.-C., Zhang, X., Deng, J., Zhong, C., Gao, Y., & Qi, S. (2019). Longitudinal measurement invariance of the Child Problematic Trait Inventory in older Chinese children. *Plos One*, 14(7), e0219136. <https://doi.org/10.1371/journal.pone.0219136>
- Lynam, D. R., Miller, D. J., Vachon, D., Loeber, R., & Stouthamer-Loeber, M. (2009). Psychopathy in Adolescence Predicts Official Reports of Offending in Adulthood. *Youth Violence and Juvenile Justice*, 7(3), 189–207. <https://doi.org/10.1177/1541204009333797>
- Mahendran, N., Aitken, M., & Andrade, B. F. (2021). Comorbid Internalizing Symptoms in Children with Disruptive Behavior Disorders: Buffering Effects or Multiple Problem Effects? *Journal of Child and Family Studies*, 30(2), 474–482. <https://doi.org/10.1007/s10826-020-01893-0>
- Meredith, W., & Teresi, J. A. (2006). An essay on measurement and factorial invariance. In *Medical Care* (Vol. 44, Issue 11 SUPPL. 3). <https://doi.org/10.1097/01.mlr.0000245438.73837.89>
- Molinuevo, B., Martínez-Membrives, E., Pera-Guardiola, V., Requena, A., Torrent, N., Bonillo, A.,

- Batalla, I., Torrubia, R., & Frick, P. J. (2020). Psychometric Properties of the Clinical Assessment of Prosocial Emotions: Version 1.1 (CAPE 1.1) in Young Males Who Were Incarcerated. *Criminal Justice and Behavior, 47*(5), 547–563. <https://doi.org/10.1177/0093854819892931>
- Molinuevo, B., Pardo, Y., González, L., & Torrubia, R. (2014). Memories of parenting practices are associated with psychopathy in juvenile male offenders. *The Journal of Forensic Psychiatry & Psychology, 25*(4), 495–500. <https://doi.org/10.1080/14789949.2014.920901>
- Moore, A. A., Blair, R. J., Hettema, J. M., & Roberson-Nay, R. (2019). The genetic underpinnings of callous-unemotional traits: A systematic research review. *Neuroscience and Biobehavioral Reviews, 100*, 85–97. <https://doi.org/10.1016/j.neubiorev.2019.02.018>
- Muñoz Centifanti, L. C., Kimonis, E. R., Frick, P. J., & Aucoin, K. J. (2013). Emotional reactivity and the association between psychopathy-linked narcissism and aggression in detained adolescent boys. *Development and Psychopathology, 25*(2), 473–485. <https://doi.org/10.1017/S0954579412001186>
- Muthén, L. K. & Muthén, B. O. (2011). *Mplus user's guide* (7th ed.). Muthén & Muthén.
- Orue, I., & Calvete, E. (2019). Psychopathic Traits and Moral Disengagement Interact to Predict Bullying and Cyberbullying Among Adolescents. *Journal of Interpersonal Violence, 34*(11), 2313–2332. <https://doi.org/10.1177/0886260516660302>
- Oshukova, S., Kaltiala-Heino, R., Kaivosoja, M., & Lindberg, N. (2017). Self-assessed limited prosocial emotions do not distinguish community youth with psychosocial problems from those without them. *Nordic Journal of Psychiatry, 71*(2), 126–130. <https://doi.org/10.1080/08039488.2016.1241825>
- Pardini, D., Obradovic, J., & Loeber, R. (2006). Interpersonal Callousness, Hyperactivity/Impulsivity, Inattention, and Conduct Problems as Precursors to Delinquency Persistence in Boys: A Comparison of Three Grade-Based Cohorts. *Journal of Clinical Child & Adolescent Psychology, 35*(1), 46–59. [https://doi.org/10.1207/s15374424jccp3501\\_5](https://doi.org/10.1207/s15374424jccp3501_5)
- Pechorro, P., Jiménez, L., Hidalgo, V., & Nunes, C. (2015). The DSM-5 Limited Prosocial Emotions subtype of Conduct Disorder in incarcerated male and female juvenile delinquents. *International Journal of Law and Psychiatry, 39*, 77–82. <https://doi.org/10.1016/j.ijlp.2015.01.024>
- Polanczyk, G., de Lima, M. S., Horta, B. L., Biederman, J., & Rohde, L. A. (2007). The worldwide prevalence of ADHD: a systematic review and metaregression analysis. *The American Journal of Psychiatry, 164*(6), 942–948. <https://doi.org/10.1176/ajp.2007.164.6.942>

- Rowe, R., Maughan, B., Moran, P., Ford, T., Briskman, J., & Goodman, R. (2010). The role of callous and unemotional traits in the diagnosis of conduct disorder. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *51*(6), 688–695. <https://doi.org/10.1111/j.1469-7610.2009.02199.x>
- Rubio-Stipec, M., Bird, H., Canino, G., & Gould, M. (1990). The internal consistency and concurrent validity of a Spanish translation of the Child Behavior Checklist. *Journal of Abnormal Child Psychology*, *18*(4), 393–406. <https://doi.org/10.1007/BF00917642>
- Salekin, R. T., & Lynam, D. R. (2010). *Handbook of child and adolescent psychopathy*. Guilford Press.
- Salekin, R. T., & Lochman, J. E. (2008). Child and Adolescent Psychopathy: The Search for Protective Factors. *Criminal Justice and Behavior*, *35*(2), 159–172. <https://doi.org/10.1177/0093854807311330>
- Salekin, R. T. (2016). Psychopathy in childhood: why should we care about grandiose-manipulative and daring-impulsive traits? *The British Journal of Psychiatry*, *209*(3), 189–191. <https://doi.org/10.1192/bjp.bp.115.179051>
- Salekin, R. T. (2017). Research Review: What do we know about psychopathic traits in children? *Journal of Child Psychology and Psychiatry*, *11*, 1180–1200. <https://doi.org/10.1111/jcpp.12738>
- Skeem, J. L., Polaschek, D. L. L., Patrick, C. J., & Lilienfeld, S. O. (2011). Psychopathic personality: Bridging the gap between scientific evidence and public policy. *Psychological Science in the Public Interest*, *12*(3), 95–162. <https://doi.org/10.1177/1529100611426706>
- Sleep, C. E., Lynam, D. R., Hyatt, C. S., & Miller, J. D. (2017). Perils of partialing redux: The case of the Dark Triad. *Journal of Abnormal Psychology*, *126*(7), 939–950. <https://doi.org/10.1037/abn0000278>
- Somma, A., Andershed, H., Borroni, S., & Fossati, A. (2016). The Validity of the Child Problematic Trait Inventory in 6–12 Year Old Italian Children: Further Support and Issues of Consistency Across Different Sources of Information and Different Samples. *Journal of Psychopathology and Behavioral Assessment*, *38*(3), 350–372. <https://doi.org/10.1007/s10862-015-9528-4>
- Thompson, R. A., & Newton, E. K. (2010). Emotion in early conscience. In W. F. Arsenio & E. A. Lemerise (Eds.), *Emotions, aggression, and morality in children: Bridging development and psychopathology* (pp. 13–31). American Psychological Association.
- Torrubia, R., & Cuquerella, À. (2008). Psicopatía: una entidad clínica controvertida pero necesaria en

- psiquiatría forense. *Revista Española de Medicina Legal*, 34(1), 25–35.  
[https://doi.org/10.1016/S0377-4732\(08\)70023-3](https://doi.org/10.1016/S0377-4732(08)70023-3)
- Ulloa, R. E., Ortiz, S., Higuera, F., Nogales, I., Fresán, A., Apiquian, R., Cortés, J., Arechavaleta, B., Foullieux, C., Martínez, P., Hernández, L., Domínguez, E., & de la Peña, F. (2006). Interrater reliability of the Spanish version of Schedule for Affective Disorders and Schizophrenia for School-Age Children--Present and Lifetime version (K-SADS-PL). *Actas Espanolas de Psiquiatria*, 34(1), 36–40.
- Van Damme, L., Colins, O. F., & Vanderplassen, W. (2016). The Limited Prosocial Emotions Specifier for Conduct Disorder Among Detained Girls: A Multi-Informant Approach. *Criminal Justice and Behavior*, 43(6), 778–792. <https://doi.org/10.1177/0093854815613104>
- Vanwoerden, S., Reuter, T., & Sharp, C. (2016). Exploring the clinical utility of the DSM-5 conduct disorder specifier of ‘with limited prosocial emotions’ in an adolescent inpatient sample. *Comprehensive Psychiatry*, 69, 116–131. <https://doi.org/10.1016/j.comppsy.2016.05.012>
- Vaughn, M. G., Delisi, M., Beaver, K. M., Wexler, J., Barth, A., & Fletcher, J. (2011). Juvenile psychopathic personality traits are associated with poor reading achievement. *Psychiatric Quarterly*, 82(3), 177–190. <https://doi.org/10.1007/s11126-010-9162-y>
- Vidal, R., Barrau, V., Casas, M., Caballero-Correa, M., Martínez-Jiménez, P., & Ramos-Quiroga, J. A. (2014). Prevalence of attention deficit/hyperactivity disorder symptoms in outpatient adolescents and young adults with other psychiatric disorders refractory to previous treatments. *Revista de Psiquiatria y Salud Mental*, 7(3), 104–112. <https://doi.org/10.1016/j.rpsm.2014.03.003>
- Viding, E., Blair, R. J. R., Moffitt, T. E., & Plomin, R. (2005). Evidence for substantial genetic risk for psychopathy in 7-years-olds. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 46(6), 592–597. <https://doi.org/10.1111/j.1469-7610.2004.00393.x>
- Waller, R., Gardner, F., & Hyde, L. W. (2013). What are the associations between parenting, callous-unemotional traits, and antisocial behavior in youth? A systematic review of evidence. *Clinical Psychology Review*, 33(4), 593–608. <https://doi.org/10.1016/j.cpr.2013.03.001>
- Waller, R., Wagner, N., Barstead, M. G., Subar, A., Petersen, J. L., Hyde, J. S., & Hyde, L. W. (2020). A meta-analysis of the associations between callous-unemotional traits and empathy, prosociality and guilt. *Clinical Psychology Review*, 75, 101809. <https://doi.org/10.1016/j.cpr.2019.101809>
- Waller, R., Wright, A. G. C., Shaw, D. S., Gardner, F., Dishion, T. J., Wilson, M. N., & Hyde, L. W.

(2015). Factor Structure and Construct Validity of the Parent-Reported Inventory of Callous-Unemotional Traits Among High-Risk 9-Year-Olds. *Assessment*, 22(5), 561–580.

<https://doi.org/10.1177/1073191114556101>

Wang, M. C., Colins, O. F., Deng, Q., Deng, J., Huang, Y., & Andershed, H. (2018). The child problematic traits inventory in China: A multiple informant-based validation study. *Psychological Assessment*, 30(7), 956–966. <https://doi.org/10.1037/pas0000545>

World Health Organization. (2018). *International classification of diseases for mortality and morbidity statistics (11th Revision)*. <https://icd.who.int/browse11/l-m/en>. Accessed 21 Desember 2020.

Zwaanswijk, W., van Geel, M., & Vedder, P. (2018). Socioeconomic Status and Psychopathic Traits in a Community Sample of Youth. *Journal of abnormal child psychology*, 46(8), 1643–1649.

<https://doi.org/10.1007/s10802-018-0411-0>