

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*, 41(3), 366–374. <https://doi.org/10.1007/s10862-019-09735-0>

RUNNING HEAD: Multi-informant CPTI in preschoolers

## **Psychopathic Traits in Early Childhood: Further Multi-informant Validation of The Child Problematic Traits Inventory (CPTI)**

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Acknowledgements. This study was funded by FEDER/Ministerio de Ciencia, Innovación y Universidades – Agencia Estatal de Investigación – (PSI2015-65766-R), and the Programa de Axudas á Etapa Posdoutoral da Xunta de Galicia (Consellería de Cultura, Educación e Ordenación Universitaria).

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Conflict of interests: The authors declare that they have no conflicts of interest.

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## **Abstract**

The present study aimed to further test the teacher- and parent-versions of the Child Problematic Traits Inventory (CPTI) in Spain, with a special focus on gender differences. Data were collected in a sample of 2,467 preschool children (48.1% girls) aged three to six (mean age = 4.25; SD = 0.91). Results supported the proposed three-factor structure of the CPTI (Grandiose-deceitful, GD; Callous-unemotional, CU; and Impulsive-need of stimulation, INS), being invariant across gender, and with good-to-excellent internal consistency values. CPTI scores showed the expected associations with fearlessness, conduct problems, reactive and proactive aggression, hyperactivity and prosocial behavior, thereby supporting the external validity of the CPTI scores. This pattern of associations also held when cross-informant correlations were explored, although correlation values were lower in magnitude. Some different patterns of correlations were also found across gender groups. Overall, the CPTI reveals as a promising, psychometrically sound measure for assessing psychopathic traits in very young children using both parents' and teachers' reports.

*Keywords:* CPTI; psychopathic traits; conduct problems; early childhood; assessment

Psychopathic personality is usually defined as a multi-faceted construct that includes a combination of interpersonal (e.g., grandiosity, deceitfulness), affective (e.g., callousness, lack of guilt and empathy), and behavioral/lifestyle (e.g., impulsivity, irresponsibility) traits (Cooke & Michie, 2001; Hare & Neumann, 2008). During the past decades, the interest for assessing the psychopathy construct at early developmental stages has received increasing attention, especially due to its strong association with a wide range of behavioral and psychosocial problems (see Salekin & Lynam, 2010). Nevertheless, there is still a need to further address its assessment at early developmental stages (Colins et al., 2014; Salekin, 2017) and, more specifically, in young children.

To this end, the Child Problematic Traits Inventory (CPTI; Colins et al., 2014) was recently developed in order to provide a reliable measure of the interpersonal, affective and behavioral dimensions of psychopathic personality from early childhood onwards. The CPTI (Colins et al., 2014) is a 28-item research instrument specifically developed to assess psychopathic traits in 3- to 12-year old children in a way that closely resembles how it is often conceptualized in the three-factor model of psychopathy in adolescence and adulthood (Andershed, Kerr, Stattin, & Levander, 2002; Cooke & Michie, 2001).

The psychometric properties of the teacher-version of the CPTI have been previously tested in different samples, countries and languages (Colins et al., 2014; Colins, Fanti, Larsson, & Andershed, 2017; Colins, Veen, Veenstra, Frogner, & Andershed, 2016; López-Romero et al., 2018; Somma, Andershed, Borroni, & Fossati, 2016; Wang, Colins, Deng, Deng, Huang, & Andershed, 2018). These studies have overall supported the CPTI as a psychometrically sound measure, with the 28 items loading distinctively on the three theoretical proposed factors, namely Grandiose-

Deceitful (GD), Callous-Unemotional (CU) and Impulsive-Need of stimulation (INS). Acceptable to good model fit indices were observed across samples, as well as excellent internal consistency values, and a large set of significant associations with external criteria including another measures of both CU and psychopathic traits, conduct problems, reactive and proactive aggression, ADHD and oppositional defiant disorder (ODD) symptoms, low social competence and prosocial behavior, and different measures of child temperament (Colins et al., 2016, 2017; López-Romero et al., 2018; Somma et al., 2016; Wang et al., 2018).

Although the CPTI was primarily developed to be a teacher-reported measure (Colins et al., 2014), to date two studies have tested its psychometric properties when reported by parents (Somma et al., 2016; Wang et al., 2018). Both studies overall supported the CPTI's proposed three-factor structure. Further, the CPTI total and factor scores were internally consistent for both informants, and supported the external validity of the CPTI, although with some differences in the relationships across informants, and a relatively poor agreement when rating the CPTI (Somma et al., 2016; Wang et al., 2018).

Most prior CPTI studies also showed an acceptable model fit for the three-factor model in boys and girls (Colins et al., 2014; Colins et al., 2016; Colins et al., 2017). Nevertheless, the model fit seemed to be less optimal in girls than in boys when parent' reports are examined (Wang et al., 2018), and there were some problems with invariance tests at the scalar level (López-Romero et al., 2018). In addition, CPTI studies showed that boys scored higher in all the CPTI dimensions, although effect sizes (Cohen's *d*) were usually small (Colins et al., 2016, 2017; Somma et al., 2016). Some exceptions also revealed similar CPTI scores among preschool boys and girls, particularly in the GD scale (e.g., Colins et al., 2014; López-Romero et al., 2018). This

pattern of mixed results converges with prior research on the prevalence rates of psychopathic traits, with some studies showing overall higher scores on boys (e.g., Andershed et al., 2002; Frick, Bodin, & Barry, 2000; Hillege, Das, & de Ruiter, 2010), and other studies reporting no gender differences for some psychopathic traits, (see Verona, Sadeh, & Javdani, 2010). To our knowledge, no studies to date have examined the external correlates of the CPTI scores in boys and girls. In this regard, prior evidence with alternative measures of psychopathic traits has also shown relatively consistent relations of psychopathic traits to external criterion measures across gender (e.g., Colins & Andershed, 2016). Therefore, there is still a need to clarify the role of gender in the structure and utility of psychopathic traits measured with the CPTI in children. This will shed new light not only to disentangle differences across gender groups but also to elucidate how psychopathic traits look like in boys and girls (Verona et al., 2010).

### **The current study**

The main purpose of the current study is to provide further validation of the CPTI in the Spanish context when both parents and teachers administer the CPTI. Although some previous CPTI studies have used a multi-informant perspective (Colins et al., 2017; Somma et al., 2016; Wang et al., 2018), to our knowledge this is the first attempt to capture the psychopathic personality construct by both parent- and teacher-reported CPTI in a preschool sample of children aged 3 to 6, with main analyses conducted within and across informants. In addition, this study intends to go a step further in analyzing gender differences, not only in terms of factor structure and mean scores, but also by assessing potential differences across gender groups when the association between psychopathic traits and external criteria is examined.

We overall expected that, when parents and teachers completed the CPTI (1) the CPTI would show acceptable to good model fit for the original three-factor structure, being invariant across gender; (2) internal consistencies for the CPTI total and factor scores would be good to excellent; and (3) the CPTI scores would significantly correlate with empirically supported external criteria relevant within the theoretical framework of child psychopathy (i.e., fearlessness, conduct problems, reactive and proactive aggression, hyperactivity, and prosocial behavior; see Salekin & Lynam, 2010). Notwithstanding that we, overall, expected a similar pattern of results for across informants (parents and teachers) and across gender (girls and boys) groups, we did expect some differences to emerge as regards how interpersonal and affective traits relates to conduct problems and aggression in boys and girls, particularly when cross-informant associations are examined.

## **Method**

### **Participants**

Data for the present study were collected in the first wave of the ELISA study, a prospective longitudinal study conducted in Galicia (NW Spain) with the aim of better understanding the behavioral, emotional, personality, and psychosocial development from early childhood to adolescence. The sample was composed of 2,467 children (48.1% girls), aged three to six<sup>1</sup> (Mean = 4.25; SD = 0.91) from 72 public (79.2%), charter (18.1%), and private (2.8%) schools. Information was collected through 2,266 parents' reports (91.85% of the sample), and 2,420 reports (98.09%) from preschool teachers (n = 275). The majority of the sample (93.9%) was Spanish. Parents' academic level was basically middle-to-high (76.4% and 60.1% for mothers and fathers – or the

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<sup>1</sup> Participants were kids who had born in 2011-2013. The 6-years-old (8.2% of the sample) were children attending preschool who had born before July of 2011.

corresponding caregivers – respectively), and the 92.4% of the fathers and the 77.2 % of mothers were working at the time of data collection.

## Measures

All the measures were included in the study on the basis of the theoretical framework on child psychopathy. Thus, different empirically well-supported correlates such as fearlessness, conduct problems, reactive and proactive aggression, hyperactivity, and prosocial behavior, were considered as external criteria. The internal consistency values for all the measures regarding Cronbach's alpha and mean inter-item correlations (MIC) were specifically estimated for the current study.

The *Child Problematic Traits Inventory* (Colins et al., 2014). Both parents and teachers rated the 28 items of the CPTI on the basis of how the child usually behaves rather than how he/she behaves at the moment. The 28 items were assigned to three scales: Grandiose-Deceitful scale (GD; eight items; e.g., “Thinks that he/she is better than everyone on almost everything”); Callous-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”). Informants rated the CPTI items in a response scale ranging from 1 (*does not apply at all*) to 4 (*applies very well*). A composite total score was also computed as the mean score of the CPTI items

The *Child Fearlessness Scale* (Colins et al., 2014) was used to assess fearlessness. This scale consists of six items (e.g., “He/she does not seem to be afraid of anything”;  $\alpha = .85$  and  $.92$ ; MIC =  $.64$  and  $.78$  for parents and teachers, respectively). They were scored on a four-point response scale, ranging from 1 (*does not apply at all*) to 4 (*applies very well*).

The *Conduct Problems Scale* (Colins et al., 2014). Conduct problems were assessed through a 10-item questionnaire ( $\alpha = .86$  and  $.93$ ; MIC =  $.57$  and  $.74$ , for

parents and teachers) that correspond with DSM-IV symptoms of ODD and CD (American Psychiatric Association [APA], 1994). Each item (e.g., “Has violated important rules in school”) was rated on a five-point response scale, ranging from 1 (*never*) to 5 (*very often*).

The *Parents’ and Teachers’ Report of Reactive and Proactive Behaviors* (Dodge & Coie, 1987) were used for assessing both reactive and proactive aggression. This tool consists of six items, three assessing reactive aggression ( $\alpha = .77$  and  $.89$ ; MIC =  $.60$  and  $.79$ ; e.g., “Yells at others when they have annoyed him/her”), and three measuring proactive aggression ( $\alpha = .73$  and  $.82$ ; MIC =  $.56$  and  $.68$ ; e.g., “Threatens and bullies someone”). Items were scored on a scale ranging from 1 (*never true*) to 5 (*almost always true*).

The *Strengths and Difficulties Questionnaire* -Parents’ and Teachers’ versions (SDQ; Goodman, 1997) were used to measure Hyperactivity (e.g., “Restless, overactive, cannot stay still for long”;  $\alpha = .78$  and  $.85$ ; MIC =  $.55$  and  $.66$ ) and Prosocial behavior (e.g., “Helpful if someone is hurt, upset or feeling ill”;  $\alpha = .66$  and  $.79$ ; MIC =  $.42$  and  $.57$ ). Both scales consist of five items rated on a three-point response scale ranging from 0 (“*not true*”) to 2 (“*certainly true*”). Of note, higher scores are indicative of fewer problems (i.e., high prosocial behavior).

*Parents’ SES.* Parents’ socioeconomic status (SES) was assessed through a set of questions reported by parents about their level of education and the economic level of the family. It was operationalized as the mean level of the z-mean scores of the response values.

## **Procedure**

Compliance of ethical standards was taking into account throughout the study procedure, with data collection being approved by the Bioethics Committee at the

Universidade de Santiago de Compostela, and the Spanish Ministry of Economy and Competitiveness. The heads of 126 schools were initially contacted in order to get the school collaboration in the study. Once the school agreed to be part of the study, families were then contacted and invited to participate in the study. An active consent form was filled out by the families who agreed to participate in the study (mean rate around 25-50% per school) and collected by the preschool teachers, who were then authorized to complete the questionnaires concerning the participating children from their classroom. One teacher could answer the questionnaire for as many children as they had signed consents. Neither preschool teachers nor parents/caregivers received any compensation for their participation. Instead, all the participating schools received a set of educational games for preschoolers as a reward of participation in the study.

## **Results**

### **Factor Structure and Measurement Invariance**

Confirmatory Factor Analyses (CFA) was conducted in Mplus 7.4 (Muthén & Muthén, 2011), with robust weighted least squares used as estimator (WLSMV). The three-factor model was specified with the 28 items of the CPTI as observed variables, and the three factors as latent and correlated constructs. Each item was specified to load on only one factor. In addition, the model was specified to include an overarching latent psychopathic personality construct joining the three latent factors. The three-factor model of the CPTI showed an acceptable fit for parents-reports (RMSEA = .07; CFI = .90; TLI = .89), although the value for TLI did not reach the .90 cut-off for acceptable model fit. For teacher-reported CPTI items, model fit values ranged from acceptable (RMSEA = .08) to good (CFI = .96; TLI = .95). All 28 items loaded significantly on the expected CPTI factor and on the latent construct, with all factor loadings above .50 and .70 for parents' and teachers' reports respectively (specific factor loadings results are

available upon request). The only exception was item 1 parent-reported (.20). Removing that item from the model resulted in a slightly improvement in terms of TLI (RMSEA = .07; CFI = .91; TLI = .90). Nevertheless, to enable comparisons with the teachers' version of the CPTI, as well as with prior studies using the parents' version (Somma et al., 2016; Wang et al., 2018), item 1 was not removed from the following analyses.

Measurement invariance (MI) tests were performed across gender groups using the sequential strategy suggested by Meredith and Teresi (2006). The three-factor model of the CPTI was firstly tested for boys and girls separately, leading to an acceptable model fit for boys/girls in parents' reports (RMSEA = .07/.07; CFI = .91/.90; TLI = .90/.90), and ranging from acceptable (RMSEA = .08/.07) to good (CFI = .96/.95; TLI = .95/.96) according to teachers' reports. Configural, metric and scalar invariance were then examined in sequence for gender groups, showing an acceptable model fit<sup>2</sup> and a change in CFI lower than .01, which suggests that both the parent- and teacher-reported CPTI scores were invariant across gender (Cheung & Rensvold, 2002).

### **Descriptive Statistics and Internal Consistency**

Descriptive information and gender comparisons for the CPTI parent- and teacher-reported scores are presented in Table 1. Overall, the CPTI factor scores showed low mean values, with boys scoring higher than girls (small to medium effect sizes), except for GD parent-reported. Additional analyses revealed that the age of the child was not significantly related with any of the CPTI factors and total scores, both reported

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<sup>2</sup> For the CPTI parents-reported, model fit indices for configural invariance were RMSEA = .07, CFI = .91, and TLI = .90; for metric invariance: RMSEA = .07, CFI = .91, and TLI = .90; and for scalar invariance: RMSEA = .06, CFI = .91, and TLI = .92. For the CPTI teachers-reported, the values for configural invariance were RMSEA = .08, CFI = .96, and TLI = .95; for metric invariance = RMSEA = .07, CFI = .96, and TLI = .95; and for scalar invariance: RMSEA = .07, CFI = .96, and TLI = .96.

by parents and teachers, with the exception of GD teachers-reported ( $r = .12$ ;  $p = < .001$ ). Family SES was positively related to all the CPTI factors and total scores reported by parents and teachers ( $p < .05$ ). Based on the foregoing, gender, SES and age (only when corresponding) were included as sociodemographic covariates for subsequent analyses.

Cronbach's alpha and MIC values were indicative of a good internal consistency for CPTI parent-reported scores and showed an excellent internal consistency for the CPTI teachers-reported scores (Table 1). Significant correlations were observed between CPTI total score and the three CPTI factors for parents/teachers' reports:  $r$ 's =  $.76/.81^{\text{Total-GD}}$ ;  $.79/.87^{\text{Total-CU}}$ ;  $.83/.88^{\text{Total-INS}}$ ; as well as between the three CPTI factors:  $r$ 's =  $.50/.66^{\text{GD-CU}}$ ;  $.45/.56^{\text{GD-INS}}$ ;  $.43/.58^{\text{CU-INS}}$ . Smaller in magnitude, but still significant cross-informant correlations were also observed among parents- and teachers-reported CPTI total and factor scores ( $r$ 's =  $.14-.27$ ;  $p < .001$ ). These values revealed a quite low agreement between informants as was also observed for Intraclass correlation coefficients (ICC =  $.27-.36$ ).

### **External Validity of the CPTI: Within and Across Informants**

Zero-order correlations between the CPTI scores and the external correlates were computed within and across-informants. Partial correlations controlling for age, gender and SES were computed for the CPTI total score; for each CPTI factor (e.g., GD), we also controlled for the other two CPTI factors (e.g., CU and INS). To counteract the issue of multiple testing, Bonferroni's correction was applied and the threshold levels of significance were settled at  $.004$  (12 variables).

### **Parent-reported CPTI scores in relation to parent- and teacher-reported external criteria**

At the zero-order level, the parent-reported CPTI total and factor scores showed significant associations with all the parent-informed correlates in the expected direction, with correlation coefficients ranging from .23 to .59<sup>3</sup> (INS-proactive aggression and INS-hyperactivity, respectively). Partial correlations exhibited a similar pattern of results although the strength of the associations was reduced. GD remained significantly associated with all the external criteria except with fearlessness, hyperactivity, and prosocial behavior; CU was significantly related to all the variables but hyperactivity; and INS was associated with all but two (i.e., proactive aggression and prosocial behavior). Significant correlation coefficients ranged from weak (i.e., .10 for CU-proactive aggression) to strong (i.e., .52 for INS-hyperactivity).

When cross-informant correlations were examined, the parent-reported CPTI total and factor scores were weakly but significantly correlated with all the teacher-reported external correlates at the zero-order level ( $r$ 's between .10 and .31). After controlling for sociodemographics and the other two CPTI factors, a different pattern of associations emerged as compared with that observed among CPTI factors and external criteria reported both by parents. In this case, significant correlations coefficients ranged from .08 (e.g., GD-reactive and proactive aggression) to .23 (i.e., INS-hyperactivity). Non-significant relationships between GD-conduct problems, CU-fearlessness, and CU-reactive and proactive aggression were found; whereas a significant association emerged between INS and proactive aggression.

### **Teacher-reported CPTI scores in relation to teacher- and parent-reported external correlates**

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<sup>3</sup> Zero-order and partial correlation values in total sample were largely similar to those observed across gender groups, which are displayed in Table 2 and Table 3. Further results in Total sample are available upon request.

The teacher-reported CPTI total and factor scores were moderate to strongly correlated with all the teacher-rated external criteria at the zero-order level in the expected direction, with correlation coefficients ranging from  $-.42$  (i.e., CU-prosocial behavior) to  $.79$  (i.e., CPTI Total score-conduct problems). Partial correlations were notably lower than the zero-order correlations, with  $v$  significant correlations coefficients ranging from  $.10$  (CU-proactive aggression) to  $.60$  (INS-hyperactivity). Notwithstanding, the correlation between CU and prosocial behavior increased after controlling for gender, SES, and the other two CPTI factors. GD remained significantly associated with all the external criteria except with fearlessness and prosocial behavior; CU was significantly correlated with all the variables; whereas INS was associated with all but one (i.e., prosocial behavior).

A similar pattern of associations was found when linking a teacher-reported CPTI total and factor scores with parent-reported external correlates. Both zero-order and partial correlations were weak in magnitude although the latter were smaller (significant correlations coefficients ranged from  $-.07$  to  $.30$  and  $.08$  to  $.28$ , respectively). At the partial correlation level, non-significant associations of GD with conduct problems and hyperactivity were found. Likewise, CU only remained significantly associated with conduct problems and prosocial behavior. Finally, non-significant correlations emerged between INS and reactive and proactive aggression.

### **Validity of the CPTI: Analyses by Gender**

When correlations were analyzed by gender, we observe a similar pattern of associations across groups, particularly within informants (see Table 2 and Table 3). The unique exceptions were the associations between parent-reported CU traits and reactive aggression, which remains significant only for girls, and proactive aggression, which remains significant only for boys. Similarly, the association between teacher-

reported INS and proactive aggression held only for boys. More variability was observed for partial correlations across informants. Therefore, regarding the CPTI parent-reported, weak but significant associations were observed only for boys between GD and teacher-reported variables of reactive and proactive aggression; as well as between INS and proactive aggression and prosocial behavior. Correlations were significant only for girls for parent-reported CU and all the teacher-reported variables, except fearlessness and hyperactivity (see Table 2). According to cross-informant associations of the CPTI teachers-reported, marginal but significant associations were observed only for boys between GD and reactive aggression, and between INS and conduct problems. The association observed for GD with hyperactivity and prosocial behavior was significant only for girls (see Table 3).

### **Discussion**

The current study aimed to assess the psychometric properties of the Spanish version of the CPTI through a multi-informant perspective with an emphasis on gender differences. The results provided further support for the utility of the CPTI in the assessment of psychopathic traits in early childhood through parent's and teacher's reports. Current findings also yielded new evidence for the presence of gender differences not only in the mean level of psychopathic traits but also when correlations between CPTI scores and external correlates are examined.

According to the predictions established, all the CPTI global and factor scores reported both by parents and teachers showed the expected relations with the external criteria, with positive correlations of the CPTI scores with fearlessness, conduct problems, reactive and proactive aggression, and hyperactivity, as well as a negative association with hyperactivity (e.g., Colins et al., 2014; Colins et al., 2016; Wang et al., 2018). These findings converge with an extended line of research that established a

connection between child psychopathic traits and a more serious pattern of behavioral and psychosocial problems, including conduct problems, different forms of aggression, hyperactivity, and a lack of prosocial behaviors and social competence skills (see Salekin & Lynam, 2010).

Overall, these results also support the consideration of psychopathy as a multidimensional construct which might exert influence on behavior problems through the combination of all the three factors (Colins et al., 2014). Even considering the increasing interest on the study of the psychopathic personality in the early developmental stages raised throughout the last years, the focus was mainly on the study of one dimension (i.e. CU traits), leading even to the inclusion of a CU-based specifier for conduct disorder (i.e., with limited prosocial emotions) in the last version of the DSM (*DSM-5*; APA, 2013). However, the inclusion of this single dimension might not be enough when subtyping conduct disorder and, as observed in some recent studies (e.g., Colins, Andershed, Salekin, & Fanti, 2018; Andershed et al., 2018), a multidimensional perspective of psychopathic personality should be enabled in order to warrant a better understanding and prediction of conduct problems (Salekin, 2016, 2017).

### **Cross-informant Agreement**

Following the recommendation to use multiple sources of information in the assessment of psychopathic traits at early developmental stages, the current study constitutes one of the few cross-informant studies that reported the correlations among parent's and teacher's ratings of the psychopathic facets in young children. The results evidenced weak cross-informant correlations. This modest convergence between parent's and teacher's reports is consistent with a number of previous findings regarding psychopathic traits in children (Barhight, Hubbard, Swift, & Konold, 2017; Kahn, Frick,

Youngstrom, Findling, & Youngstrom, 2012; Klyce, Conger, Conger, & Dumas, 2011). The family context (i.e., with parents observing the child across a variety of situations) and the academic context (i.e., with teachers assessing the child in the normative environment of the classroom) may explain to some extent their lack of agreement. Moreover, parents and external observers (e.g., teachers) tend to easily converge when rating positive traits but tend to diverge on the negative temperamental traits dimension (Stitfer, Willoughby, & Towe-Goodman, 2008). Nevertheless, the lack of agreement observed in the current and prior CPTI studies should not be interpreted as a deficiency in the validity of the scale, which was proven useful for assessing psychopathic traits by different sources, but as a way to better understand when and how the information from different sources should be used and combined (Alexander, McKnight, Disabato, & Kashdan, 2017).

### **Gender Differences**

The current study also addresses an important gap by examining the psychometric properties and the external validity of the CPTI across gender. These results showed that the three-factor model of the CPTI was invariant across gender, although at the mean level the CPTI total and factor scores evidenced significant differences among girls and boys for both parent's and teacher's reports, with the exception of GD factor reported by parents (Colins et al., 2014). In all cases the average ratings were higher in boys, a result that is in line with prior studies (e.g. Colins et al., 2016; López-Romero et al., 2018; Wang et al., 2018). These new findings also provide insight into gender differences in how psychopathic personality relates to behavior. Interestingly, as regards conduct problems, the relation with GD was stronger in girls whereas the relation with CU and INS was higher in boys, either reported by parents or teachers. These results might reflect to some extent a different behavioral pattern in

which girls are more susceptible towards covert behaviors characterized by interpersonal manipulation or indirect aggression (Marsee, Silverthorn, & Frick, 2005), while boys would be more influenced by instrumental goals triggered by impulsive behaviors without considering the damage towards the others (Card, Stucky, Sawalani, & Little, 2008). Of note, generally girls tend to be less involved in aggression than boys (e.g., Loeber, Capaldi, & Costello, 2013); however, the current results evidenced an increase in both reactive and proactive aggression as long as girls scored higher on CU traits (Marsee et al., 2005). Overall, these results highlight the need to take into account the assessment of psychopathic traits from a gender perspective in order to better understand potential differences in traits manifestation and related outcomes, as well as to adapt specific prevention strategies for problematic developmental trajectories which might differentially influence boys and girls.

### **Strengths and Limitations**

The availability of a large sample of children, the use of multiple informants and well-validated external criteria measures, as well as the specific consideration regarding the role of gender contribute to the strengths of the study. Nevertheless, this study is not exempt from some limitations which should be taken into account when interpreting the results. The use of a cross-sectional design does not allow establishing predictions between psychopathic personality and future conduct problems. Similarly, the inclusion of a community-based sample hampers any conclusions as regards the clinical usefulness of the CPTI. In addition, the current sample was composed of children aged 3 to 6, which limits the possibility to test the psychometric properties of the parent-reported CPTI in older children specifically in Spanish contexts. Further, the current study did not include other specific measures of psychopathic traits that might be useful to test the convergence with CPTI in preschool samples. Finally, although large sample

size is a substantial strength, due to the high statistical power small coefficients were sometimes significant, even after considering the Bonferroni correction.

### **Conclusions**

The CPTI holds as a promising instrument for assessing psychopathic traits in very young children through a multi-informant perspective, with additional support for both the parents and teachers versions. Further understanding in terms of gender was also provided, with some differential associations among the CPTI dimensions and external criteria across gender groups. Nevertheless, new research is needed for elucidating potential differences in terms of construct conceptualization and predictive value, as well as its role when subtyping conduct problems on the basis of psychopathic traits (Salekin, 2017). Until then, it is important to note that although the CPTI will enable a better understanding of the psychopathic construct in childhood, it was developed as a research tool and should not be used for clinical purposes.

**Compliance with Ethical Standards**

**Funding:** This study was funded by The Ministerio de Economía y Competitividad, Spanish Government (MINECO/FEDER, UE; PSI2015-65766-R), and the Programa de Axudas á Etapa Posdoutoral da Xunta de Galicia (Consellería de Cultura, Educación e Ordenación Universitaria).

**Conflict of Interests:** The authors declare that they have no conflict of interests

**Ethical Approval:** The Spanish Ministry of Economy and Competitiveness, and the Bioethics Committee at the Universidade de Santiago de Compostela. All procedures performed in studies including human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed consent:** Informed consent was obtained from all individual participants included in the study.

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Table 1

Descriptive Statistics, Internal Consistency (Cronbach's Alpha and Mean Inter-item Correlation – MIC), and Gender Comparisons for Parents' and Teachers' Reported CPTI Factors and Total Scores

	Range		Total sample		Boys		Girls		Gender comparisons	
	Min.	Max.	M (SD)	$\alpha$ /MIC	M (SD)	$\alpha$ /MIC	M (SD)	$\alpha$ /MIC	<i>t</i>	<i>d</i>
CPTI_PR			n = 2,248		n = 1,156		n = 1,092			
GD	1.00	3.63	1.41 (0.45)	.80/.53	1.42 (0.46)	.81/.53	1.39 (0.43)	.80/.52	1.54	-
CU	1.00	4.00	1.42 (0.45)	.84/.55	1.47 (0.47)	.85/.57	1.38 (0.42)	.82/.51	4.78***	.20
INS	1.00	4.00	2.34 (0.56)	.81/.49	2.38 (0.56)	.81/.48	2.29 (0.55)	.81/.48	3.90***	.16
Total score	1.00	3.50	1.75 (0.39)	.89/.45	2.29 (0.55)	.89/.46	1.71 (0.38)	.88/.44	4.47***	.18
CPTI_TR			n = 2,418		n = 1,260		n = 1,158			
GD	1.00	4.00	1.26 (0.46)	.90/.71	1.30 (0.49)	.91/.71	1.21 (0.42)	.90/.69	4.43***	.20
CU	1.00	4.00	1.32 (0.53)	.94/.75	1.41 (0.59)	.94/.77	1.23 (0.43)	.92/.72	8.60***	.35
INS	1.00	4.00	1.71 (0.65)	.91/.67	1.83 (0.71)	.91/.69	1.58 (0.56)	.89/.63	9.60***	.39
Total score	1.00	4.00	1.44 (0.48)	.95/.63	1.53 (0.52)	.95/.64	1.35 (0.40)	.94/.60	9.45***	.38

*Note.* CPTI = Child Problematic Traits Inventory; PR = Parents-reported; TR = Teachers-reported; GD = Grandiose-Deceitful; CU = Callous-Unemotional; INS = Impulsivity-Need of Stimulation;  $\alpha$  = Cronbach's alpha; MIC = Mean inter-item correlation.

Table 2

Zero-Order and Partial Correlations by Gender (Boys/Girls) between the CPTI Total and Factor Scores, Parents-Reported, and External Criteria Reported by Parents and Teachers.

	CPTI-PR Total score		GD_PR		CU_PR		INS_PR	
	Z-O	Partial <sup>a</sup>	Z-O	Partial <sup>b</sup>	Z-O	Partial <sup>b</sup>	Z-O	Partial <sup>b</sup>
<b>Parents-reported variables</b>								
Fearlessness	.49*/.49*	.48*/.48*	.30*/.31*	.04/.05	.37*/.36*	.17*/.17*	.48*/.47*	.35*/.35*
Conduct problems	.61*/.56*	.60*/.56*	.46*/.50*	.20*/.31*	.47*/.38*	.23*/.11*	.52*/.45*	.33*/.28*
Reactive aggression	.47*/.42*	.47*/.43*	.43*/.40*	.26*/.24*	.36*/.31*	.14*/.11*	.36*/.31*	.16*/.15*
Proactive aggression	.34*/.36*	.35*/.37*	.37*/.38*	.28*/.24*	.25*/.32*	.06/.16*	.23*/.21*	.06/.03
Hyperactivity	.52*/.49*	.52*/.48*	.26*/.28*	-.05/.02	.33*/.25*	.09*/.01	.61*/.57*	.53*/.50*
Prosocial behavior	-.38*/-.32*	-.37*/-.31*	-.22*/-.23*	.02/-.04	-.48*/-.39*	-.43*/-.33*	-.20*/-.15*	.02/.02
<b>Teachers-reported variables</b>								
Fearlessness	.26*/.17*	.26*/.17*	.18*/.11*	.06/.02	.19*/.10*	.07/.02	.24*/.17*	.15*/.14*
Conduct problems	.32*/.37*	.32*/.26*	.22*/.18*	.07/.03	.22*/.23*	.06/.13*	.32*/.22*	.22*/.13*
Reactive aggression	.25*/.19*	.25*/.18*	.22*/.13*	.13*/.03	.13*/.16*	-.02/.09*	.25*/.16*	.16*/.09
Proactive aggression	.23*/.14*	.23*/.14*	.22*/.09*	.14*/.04	.14*/.14*	.01/.10*	.19*/.10*	.10*/.05
Hyperactivity	.24*/.22*	.24*/.20*	.09*/.11*	-.05/-.03	.15*/.15*	.03/.06	.30*/.24*	.26*/.19*
Prosocial behavior	-.17*/-.16*	-.17*/-.15*	-.10*/-.13*	-.01/-.05	-.15*/-.17*	-.09*/-.11*	-.14*/-.09*	-.09/-.01

Note. CPTI = Child Problematic Traits Inventory; PR = Parents' reported; GD = Grandiose-Deceitful; CU = Callous-Unemotional; INS = Impulsivity-Need of Stimulation. Z-O = Zero-order correlations.

<sup>a</sup>Partial correlations controlling for SES (results for the three CPTI factors are available upon request).

<sup>b</sup>Partial correlations controlling for gender, SES, and the other two CPTI factors.

\*Significant p value after applying the Bonferroni correction ( $p < .008$ ).

Table 3

Zero-Order and Partial Correlations by Gender (Boys/Girls) between the CPTI Total and Factor Scores, Teachers-Reported, and External Criteria Reported by Teachers and Parents.

	CPTI-TR Total score		GD_TR		CU_TR		INS_TR	
	Z-O	Partial <sup>a</sup>	Z-O	Partial <sup>b</sup>	Z-O	Partial <sup>b</sup>	Z-O	Partial <sup>b</sup>
<b>Teachers-reported variables</b>								
Fearlessness	.68*/.63*	.68*/.63*	.50*/.43*	.05/-.03	.60*/.57*	.32*/.34*	.62*/.57*	.40*/.35*
Conduct problems	.80*/.74*	.81*/.74*	.65*/.66*	.26*/.36*	.70*/.62*	.39*/.21*	.71*/.62*	.45*/.36*
Reactive aggression	.69*/.67*	.69*/.67*	.62*/.63*	.32*/.39*	.57*/.54*	.18*/.10*	.60*/.56*	.31*/.30*
Proactive aggression	.51*/.61*	.61*/.61*	.68*/.66*	.47*/.47*	.51*/.53*	.09*/.11*	.47*/.43*	.08/.07
Hyperactivity	.66*/.59*	.65*/.56*	.38*/.33*	-.14*/-.11*	.50*/.43*	.19*/.14*	.73*/.66*	.63*/.55*
Prosocial behavior	-.59*/-.53*	-.59*/-.53*	-.42*/-.42*	-.01/-.04	-.69*/-.59*	-.56*/-.43*	-.41*/-.37*	-.03/-.04
<b>Parents-reported variables</b>								
Fearlessness	.15*/.25*	.15*/.24*	.09*/.18*	-.01/.01	.13*/.21*	.04/.06	.15*/.24*	.10*/.15*
Conduct problems	.33*/.20*	.33*/.20*	.25*/.17*	.07/.06	.29*/.20*	.13*/.09*	.29*/.15*	.13*/.04
Reactive aggression	.20*/.15*	.20*/.16*	.21*/.16*	.12*/.08	.18*/.15*	.05/.06	.14*/.10*	.04/.01
Proactive aggression	.22*/.18*	.23*/.18*	.20*/.17*	.08/.09	.20*/.15*	.07/.04	.18*/.14*	.04/.04
Hyperactivity	.27*/.22*	.27*/.20*	.15*/.11*	-.05/-.07	.21*/.18*	.07/.05	.30*/.16*	.23*/.21*
Prosocial behavior	-.10*/-.10*	-.10*/-.10*	-.07/-.04	.01/.06	-.14*/-.15*	-.14*/-.16*	-.05/-.06	.03/-.01

*Note.* CPTI = Child Problematic Traits Inventory; TR = Teachers-reported; GD = Grandiose-Deceitful; CU = Callous-Unemotional; INS = Impulsivity-Need of Stimulation. Z-O = Zero-order correlations.

<sup>a</sup>Partial correlations controlling for SES (results for the three CPTI factors are available upon request).

<sup>b</sup>Partial correlations controlling for SES, and the other two CPTI factors.

\*Significant p value after applying the Bonferroni correction ( $p < .008$ ).