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**Proposed Specifiers for Conduct Disorder (PSCD): Preliminary
Validation of the Parent Version in a Spanish Sample of Preschoolers**

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Abstract

The Proposed Specifiers for Conduct Disorder scale (PSCD; Salekin & Hare, 2016) was developed as a measure of the broader construct of psychopathy in childhood and adolescence. In addition to Conduct Disorder symptoms (CD), the PSCD addresses the interpersonal (Grandiose-Manipulative; GM), affective (Callous-Unemotional; CU), and lifestyle (Daring-Impulsive; DI) traits of psychopathic personality. The PSCD can be scored by parents/caregivers and/or teachers. The present study is a preliminary test of the psychometric properties of the PSCD-Parent Version in a sample of 2,229 children aged three-to-six. Confirmatory Factor Analyses supported both a three- and a four-factor structure, being invariant across gender groups. The validity of the PSCD was also supported by convergent-divergent associations with an alternative measure of psychopathic traits as well as by the expected relations with fearlessness, conduct problems, reactive and proactive aggression, ADHD and ODD symptoms, and social competence skills. Overall, the PSCD is a promising alternative measure for assessing early manifestation of the broader construct of psychopathy in children. Its use should facilitate discussion of the conceptualization, assessment, predictive value, and clinical usefulness of the psychopathic construct as it relates to conduct disorder (CD) at early developmental stages.

Keywords: psychopathic traits; grandiose-manipulative; callous-unemotional; daring-impulsive; conduct disorder (CD); proposed specifiers for conduct disorder

Public significance statement:

This study was the first to test the psychometric properties of the Proposed Specifiers for Conduct Disorder scale (PSCD). The PSCD offers an alternative and potentially psychometrically sound assessment of the full array of child/adolescent psychopathic traits and dimensions in addition to Conduct Disorder symptoms. Research with the PSCD could help better understand the potential for additional CD specifiers.

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From its first contemporary conceptualizations (Cleckley, 1941; see Lilienfeld, Watts, Smith, Patrick, & Hare, 2018), adult psychopathy has been defined as a global constellation of co-occurring traits and behaviors, including deceitfulness, grandiosity, callousness, lack of remorse, impulsivity, irresponsibility, and antisociality (Hare & Neumann, 2008). However, in an early analysis of the 22-item Psychopathy Checklist (PCL), the precursor to the *Psychopathy Checklist-Revised* (PCL-R; Hare, 2003), Hare (1980) reported that the scale was multidimensional. In a later analysis of a large sample of offenders, Harpur, Hakstian, and Hare (1988) obtained a correlated two-factor solution for the PCL. Factor 1 comprised personality traits, including superficiality, habitual lying and manipulation, callousness, and lack of affect, guilt, remorse, and empathy. Factor 2 comprised items reflecting a chronic and unstable lifestyle. Harpur, Hare, and Hakstian (1989) replicated the two-factor structure and showed that the factors had differing external correlates. Hare and colleagues (1990) obtained the same two-factor structure for the PCL-R.

Cooke and Michie (2001) later offered a truncated, 13-item three-factor model of the PCL-R in which they dropped items they considered to reflect antisocial behavior and therefore not part of the psychopathy construct. Despite this contention, there has been extensive empirical evidence that antisociality is an integral part of the psychopathic construct (e.g., DeLisi, 2016; Hare & Neuman, 2010; Miller & Lynam, 2015; Neumann, Hare, & Pardini, 2015), with many of its defining features across dimensions (e.g., manipulation, deception, callousness, irresponsibility, impulsivity) being themselves antisocial or dissocial in nature. In the second edition of the PCL-R Manual, Hare (2003) provided evidence for a four-factor model labeled Interpersonal, Affective, Lifestyle, and Antisocial. Neumann, Hare, and Newman (2007) showed that the correlations among these first-order factors (dimensions) are indicative of a single higher-order psychopathy factor. In addition, Hare and Neumann (2008; also see Hare, Neumann, & Mokros, 2018) have

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shown that the four factors can be viewed in terms of facets of the original two-factor model described above: Factor 1, Interpersonal and Affective; and Factor 2, Lifestyle and Antisocial.

During the past two decades, this multidimensional construct has been extended downward in age and widely studied in childhood and adolescence. In line with adult literature, two-, three-, and four-factor solutions were explored. Studies of adolescents (13-18 years of age), using the Psychopathy Checklist: Youth Version (PCL: YV; Forth, Kosson, & Hare, 2003), have supported the three- and four-factor solutions obtained with adults (Ellingwood et al., 2017; Frick, O'Brien, Wootton, & McBurnett, 1994; Jones, Cauffman, Miller, & Mulvey, 2006; Kosson et al., 2013; Neumann, Kosson, Forth, & Hare, 2006; Salekin, Brannen, Zalot, Leitisco, & Neumann, 2006).

Research with self-report and parent/teacher rating instruments, with diverse samples of children and adolescents, support a three-factor model (e.g., Andershed, Kerr, Stattin, & Levander, 2002; Frick, Bodin, & Barry, 2000; Frick & Hare, 2001), as do studies of preschool children (e.g., Colins et al., 2014; Colins, Fanti, Larsson, & Andershed, 2017; López-Romero et al., 2018; López-Romero, Maneiro, Colins, Andershed, & Romero, 2019). For example, the Antisocial Process Screening Device (ASPD; Frick & Hare, 2001), based on the PCL-R, described a three-factor solution consisting of Narcissism (NAR), Callous/Unemotional (CU), and Impulsivity (IMP) dimensions. Salekin (2016a, 2017) and Salekin and Hare (2016) referred to the three sets of traits as Grandiose-manipulative (GM), Callous-unemotional (CU), and Daring-impulsive (DI), designations used in recent research (e.g., Bergstrøm & Farrington, 2018). All three dimensions are associated with a large set of psychosocial and behavioral problems (e.g., antisocial behavior, aggression, low prosocial behavior; Salekin & Lynam, 2010), and are relevant factors in subtyping child

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conduct problems (e.g., Andershed et al., 2002; Frogner, Gibson, Andershed, & Andershed, 2016; Colins et al., 2014; Salekin, 2016a).

Notwithstanding the advances achieved in the study of child psychopathic personality, recent research has increasingly focused on the CU traits alone, and workgroups for the DSM-5 and ICD-11 decided to incorporate a “with Limited Prosocial Emotions” specifier for conduct disorder (CD), indicating that the broader construct of child psychopathy still remains underrepresented in both research and clinical diagnosis (Salekin, 2016b; Salekin, Andershed, & Clark, 2018). Nevertheless, prior research has repeatedly shown child psychopathy to be a multifaceted construct that comprises all three or four psychopathy dimensions. This construct, with all its dimensions, is observable at an early age, is relatively stable across time, and has specifically meaningful correlations with cognitive and emotional correlates, as well as with predictive outcomes (see Colins et al., 2014; Salekin, 2017).

Several studies found that the combination of high levels of the GM, CU, and DI dimensions was more strongly related to child conduct problems, measured both concurrently and prospectively, than was the CU dimension alone (e.g., Bergstrøm & Farrington, 2018; Colins, Andershed, Salekin, & Fanti, 2018; Fanti, Kyranides, Lordos, Colins, & Andershed, 2018; Frogner et al., 2016; Frogner, Andershed, & Andershed, 2018). The authors of these studies concluded that the multidimensional model for child psychopathy, *in combination with concurrent conduct problems*, is more effective for predicting child behavioral problems than are CU traits alone, and that the model might offer increased utility to researchers and clinicians for both prediction and specification of CD (Salekin, Andershed, Batky, & Bontemps, 2018).

Altogether, there seems to be enough support for considering the broader concept of psychopathy and all of its component dimensions at early developmental stages. Although

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behavioral problems can be considered “normative” during preschool years (e.g., tantrums, noncompliance), it is important to keep in mind that researchers such as Keenan and Wakshlag (2000) have shown that preschool children can engage in excessive and serious conduct problems with a level of impairment consistent with DSM’s Oppositional Defiant Disorder (ODD) and CD. These authors also noted that high degrees of behavioral problems hamper general functioning and involvement in developmentally appropriate activities (Keenan & Wakshlag, 2000). Moreover, DeLisi (2016) highlighted the relevance of psychopathy to identify a high-risk profile, as well as its ability to establish the relationships of antisociality over the life-span (see also Corrado, DeLisi, Hart, & McCuish, 2015). The early identification of psychopathology and its implications for mental health suggest that conduct problems and perhaps the construct of psychopathy need to be properly applied and assessed at early developmental stages.

Although several instruments specifically designed to assess psychopathic traits in children are already available (see Colins et al., 2014; Kotler & McMahon, 2010), we still need new efforts for accurately examining the psychopathic construct, and its component parts, in both childhood and adolescence (Salekin, 2016a; Salekin & Lynam, 2010). The approach described here will allow for a better understanding of this personality construct in childhood especially as it pertains to CD symptoms, and will provide specific information regarding the correlates of each dimension, as well as the identification of potential instances in which an elevation in one facet or dimension may amplify or mask features specifically linked to another dimension (Patrick, 2006; Salekin, 2017).

If the goal is to further establish a well-validated CD diagnosis, it will be imperative to capture the whole range of interpersonal, affective, and behavioral psychopathic traits. To this end, Salekin and Hare (2016) developed the Proposed Specifiers for Conduct Disorder (PSCD) as a measure of the broader psychopathy construct from childhood to late

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adolescence. It addresses four dimensions, including the GM, CU, and DI dimensions of psychopathic personality, in addition to CD, which was designed to assess the four categories of CD symptoms (aggression to people and animals, destruction of property, deceitfulness or theft, serious violation of rules) as well as one category of ODD symptoms (argumentative and defiant). Item selection was performed using both rational and empirical criteria and according to three main premises: 1) to provide a measure of the three-factor model of psychopathic personality plus conduct disorder (CD) in a way that closely resembles how it is often conceptualized in adolescence and adulthood (Hare & Neumann, 2006, 2008; Forth et al., 2003); 2) to include only those traits with an empirical and/or theoretical support for being identifiable at early developmental stages (see Colins et al., 2014, Salekin, 2016a); and 3) to increase the homogeneity within scales with item selection focused on content representativeness and item harmonization (Salekin, 2017). In sum, the PSCD is intended to allow for an examination of psychopathy in conjunction with CD, improve synergy among the dimensions of child psychopathy, and provide a brief assessment tool to aid in descriptive, etiology, and treatment research studies on CD (see Salekin, 2017).

The Present Study

The present study is designed to provide preliminary validation of the PSCD-Parent Version in a preschool sample of Spanish children. To our knowledge, this is the first study to evaluate the psychometric properties of the PSCD, and one of the few intended to examine the broader psychopathic construct, with all its dimensions and CD, in a sample of very young children (i.e., pre-schoolers; e.g., Colins et al., 2014; Colins et al., 2017; López-Romero et al., 2018). To this end, we first test the factor structure of the PSCD. Based on prior conceptualizations of psychopathy, we test a series of competing models, including

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the two-, three-, and four-factor model in addition to a one-factor solution. According to the original proposal of the PSCD (Salekin, 2017), and in line with previous studies (e.g., Jones et al., 2006; Salekin et al., 2006), we hypothesized an acceptable model fit for both the three- and four-factor solutions. We also expected acceptable internal consistency for the PSCD factors. Furthermore, we tested external, construct validity of the PSCD. In this regard, we expected positive and strong correlations with an alternative measure of psychopathic traits in children (i.e., the Child Problematic Traits Inventory [CPTI]; Colins et al., 2014), with the strongest correlations being with the corresponding interpersonal, affective, and behavioral CPTI factors. Finally, we expected to find moderate-to-strong associations with a set of external criteria traditionally and theoretically related to the psychopathy construct in childhood, including fearlessness, conduct problems, aggression, attention deficit hyperactivity disorder (ADHD) symptoms, ODD, and social competence skills (e.g., López-Romero et al., 2018; Wang et al., 2018).

Method

Participants

Data for the present study were collected in the first wave of the ELISA Project (Estudio Longitudinal para una Infancia Saludable; Longitudinal Study for a Healthy Childhood), a prospective longitudinal study conducted in Galicia (an autonomous region in northwest Spain) with the aim of better understanding behavioral, emotional, personality, and psychosocial development from early childhood. The final sample consisted of 2,229 children (51.4% boys and 48.6% girls) from 72 public (79.2%), charter (18.1%), and private (2.8%) schools located in 28 urban, sub-urban and rural areas of Galicia.

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Participants ranged in age from three to six¹, with a mean age of 4.25 ($SD = 0.91$). The majority of the sample (93.9%) was Spanish, with only a 1% of participants reporting a different nationality, and with no information for the remaining 5.1% of the sample. According to parents' academic level, 23.7% of mothers and 39.8% of fathers, respectively, completed compulsory education, 47.4% and 31.2% completed higher education, and 28.9% and 29% completed vocational training studies. 77.2% of the mothers and 92.4% of fathers were working at the time of data collection. Parents' reports provided the information for the present study.

Measures and Study Variables

The Proposed Specifiers for Conduct Disorder (PSCD). The PSCD-Parent Version (Salekin & Hare, 2016) consists of 24 items rated by parents on a response scale of 0 (*not true*), 1 (*somewhat true*) and 2 (*true*). Parents rated the item based on how well it described their child. Salekin (2016a, 2017) and Salekin and Hare (2016) initially proposed a four-factor structure for the PSCD, with six items for each factor: Grandiose-Manipulative (GM; e.g., "Your child can turn on the charm in any situation"); Callous-Unemotional (CU; e.g., "Rarely feels guilty or remorseful"); Daring-Impulsive (DI; e.g., "Your child is daring"); and Conduct Disorder (CD; e.g., "Some people say your child breaks a lot of rules"). After reviewing the content of the items, Item 23 ("Your child started breaking rules before the age of 10") was not included for further analyses since it was not considered age-appropriate for the current study. In addition, considering the age-range of participants (i.e., 3 to 6) clarifications of intentionality were added to item 19 ("Your child has [deliberately] stolen things"), and item 21 ("Your child has [intentionally] destroyed property"). A

¹ Participants were children born in 2011-2013. The 6-years-olds (8.2% of the sample) were children attending preschool and were born before July of 2011.

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composite Total score was created including all 23 items. All PSCD factors and Total score were computed by averaging scores across items. This score could vary from 0 to 2.

The Child Problematic Traits Inventory (CPTI). We used the CPTI (Colins et al., 2014) as an alternative measure for assessing psychopathic traits with the three-factor model. Although the CPTI was originally developed to be a teacher report tool, the psychometric properties of the parent's version were also supported (e.g., Wang et al., 2018). Parents rated the 28 items in a response scale ranging from 1 (*does not apply at all*) to 4 (*applies very well*). The 28 items were assigned to three scales intended to assess the corresponding psychopathic traits dimensions; specifically, eight items were used to measure the Grandiose-Deceitful scale (GD; e.g., "Thinks that he/she is better than everyone on almost everything"; $\alpha = .80$; $MIC = .53$); 10 items for the Callous-Unemotional (CU; e.g., "Does not become upset when others are being hurt"; $\alpha = .84$; $MIC = .55$); and 10 items for the Impulsive-Need for Stimulation (INS; e.g., "Often does things without thinking ahead"; $\alpha = .81$; $MIC = .49$). Additionally, we computed a Total score by averaging scores across the 28 items ($\alpha = .89$; $MIC = .45$).

The Child Fearlessness Scale (CFS). We used the CFS (Colins et al., 2014) to assess fearlessness. This scale consists of six items (e.g., "He/she does not seem to be afraid of anything"; $\alpha = .85$; $MIC = .64$). Parents score each item on a four-point scale, ranging from 1 (*does not apply at all*) to 4 (*applies very well*).

The Conduct Problems Scale. We assessed conduct problems with a 10-item questionnaire (Colins et al., 2014; $\alpha = .86$; $MIC = .57$) that corresponds with DSM-IV symptoms of ODD and CD (American Psychiatric Association, 1994). Parents rated each item (e.g., "Has violated important rules in school") on a five-point scale, ranging from 1 (*never*) to 5 (*very often*).

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The Parents' Report of Reactive and Proactive Behaviors. We measured aggressive behaviors with a six-item scale (Dodge & Coie, 1987) that assesses both reactive (three items; $\alpha = .77$; $MIC = .60$; e.g., “Yells at others when they have annoyed him/her”) and proactive aggression (three items; $\alpha = .73$; $MIC = .56$; e.g., “Threatens and bullies someone”). Parents scored each item on a scale ranging from 1 (*never true*) to 5 (*almost always true*).

Achenbach System of Empirically Based Assessment, Preschool Form (ASEBA). The ASEBA (Achenbach & Rescorla, 2000) is a standardized assessment that indexes children's behavioral and emotional problems. The current version of the ASEBA is based on DSM-reference scales, which comprise items that experienced psychiatrists and psychologists from ten cultures rated as being very consistent with DSM diagnostic categories. Specifically, for this study we used 12 items in order to evaluate the dimensionality of disruptive behavior, with six items drawn from the DSM-IV referenced oppositional defiant disorder (ODD; e.g., “Defiant”, “Disobedient”; $\alpha = .75$; $MIC = .48$), and six from the attention deficit hyperactivity disorder (ADHD; e.g., “Can't concentrate”; $\alpha = .70$; $MIC = .36$). Parents rated each item on a three-point scale ranging from 0 (*not true*) to 2 (*very true or often true*).

Fast Track Social Competence Scale-Parent Version. We assessed social competence skills with a 12-item scale (Conduct Problems Prevention Research Group, 1995). It includes six items that measure emotional regulation skills ($\alpha = .80$; $MIC = .56$; e.g., “Can accept things not going his/her way”), and six items that measure prosocial/communication skills ($\alpha = .82$; $MIC = .59$; e.g., “Shares things with others”). Parents rated the extent to which each statement was true of their child on a scale from 0 (*not at all*) to 4 (*very well*).

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Socioeconomic Status (SES) of Parents. SES was indexed through a set of questions about 1) parental level of education, 2) family economic level and 3) the family financial solvency to face daily overheads. Level of education was based on the average of the father's and mother's educational level rated on a six-point scale ranging from 1 (*without basic studies*) to 6 (*postgraduate; e.g., PhD.*). Family economic level was based on parents' reports of family income rated on a four-point scale from 1 (*serious problems to make ends meet*) to 4 (*well off*). Family financial solvency to face daily overhead was rated on a five-point scale ranging from 1 (*never worried*) to 5 (*worried basically every day*). A composite SES was computed by first transforming all three aforementioned variables into z-scores. The mean of three z-scored variables was then computed as the total SES composite ($\alpha = .66$; $MIC = .43$). A similar procedure was also observed in other large-scale community-based studies (e.g. Colins et al., 2014).

Procedure

The study was approved by the Bioethics Committee at the Universidade de Santiago de Compostela, and the Spanish Ministry of Economy and Competitiveness. Firstly, we contacted the heads of 126 public, charter and private schools in order to obtain school collaboration for the study. The main objectives and procedures of the study were first explained by phone, with more information regarding the background, purpose, and procedure of the ELISA study submitted by mail. Once the school accepted the conditions and agreed to be part of the study, families were then contacted and invited to participate in the study.

Each family received a letter with all the information regarding the study. In addition, personal meetings with school staff, preschool teachers and/or parents were scheduled by school request. An active consent form was filled out by the families who agreed to

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participate in the study (rate around 25-50% per school), and collected by the preschool teachers, who handed out the information to the parents. Parents had the opportunity to choose if they preferred to fill out the questionnaire by paper (47%) or via a secured web-platform (53%). In both cases, they received the questionnaire and/or the instructions from the preschool teachers. Participants had one month to complete and return the questionnaire. Only those who chose the paper form had to return the questionnaire to the school, from where they were collected by the ELISA staff. For those who were late, reminders were submitted, first by the preschool teacher and then directly by the ELISA staff via email. The parents did not receive any compensation for their participation. Instead, all the participating schools received a set of educational games for pre-schoolers as a reward for study participation.

Statistical Analyses

First, in order to test the proposed four-factor structure (Salekin, 2017; Salekin & Hare, 2016) we conducted confirmatory factor analyses (CFAs) of the PSCD items using Mplus 7.4 (Muthén & Muthén, 2011), with robust weighted least squares used as estimator (WLSMV). This procedure is considered less biased and more accurate than other procedures in every condition (Li, 2016), especially with ordinal data (Flora & Curran, 2004). We specified a four-factor model, with the 23 items of the PSCD as observed variables, and the four factors as latent and correlated constructs, with each item specified to load on only one factor (i.e., Four-factor interrelated model). In addition, since we assumed that the factors were affected by a common general factor, an alternative model was specified to include an overarching latent psychopathic personality construct joining the four latent factors (i.e., Four-factor superordinate model). For comparative reasons, we also tested several competing models traditionally examined in prior CFA work with

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psychopathy measures. These included: a unidimensional or one-factor model (Colins et al., 2014), with the 23 PSCD items computed as a single factor; a two-factor model, with Factor 1 (items from both GM and CU scales), and Factor 2 (items from DI and CD scales; Salekin & Hare, 2016; Hare, 2003); and a three-factor model, with GM, CU, and DI scales (i.e., 18 items) as three independent and correlated factors (e.g., Andershed et al., 2002; Colins et al., 2014; Cooke & Michie, 2001). We assessed model fit using the root-mean-square error of approximation (RMSEA), the comparative fit index (CFI), and the Tucker-Lewis index (TLI). According to suggestions by Hu and Bentler (1999), RMSEA values lower or equal to .06, and TLI and CFI values of .95 or higher are considered indicators of good model fit, whereas a RMSEA smaller than .08, and TLI and CFI larger than .90 indicated adequate model fit. Measurement invariance (MI) tests were performed across gender groups using the sequential strategy suggested by Meredith and Teresi (2006). Since the model should initially fit both groups, the proposed four-factor model was tested separately for boys and girls as a first step of the procedure. Three levels of MI (i.e., configural, metric, and scalar) were tested to examine whether the factor structure, factor loadings and item intercepts, respectively, were invariant across groups. Change in CFI (Δ CFI) was used as an indicator for testing MI given its independence of model parameters and sample size. According to Cheung and Rensvold (2002), a value of Δ CFI smaller than or equal to 0.01 supports the presence of MI across groups.

Second, we computed descriptive statistics and internal consistency for all study variables. Specifically, we calculated descriptive information of the PSCD, with additional tests for differences due to gender, age and SES: Student's *t* and zero-order correlations. We also calculated the internal consistency of the PSCD with Cronbach's alpha (α), interpreted as low-to-marginal ($\leq .59$), marginal (.60 to .69), acceptable (.70 to .79), good

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(.80 to .89), and excellent ($\geq .90$; Barker, Pristang, & Elliott, 2002). Given the dependence of α on the number of items in a scale, we also computed mean inter-item correlation (*MIC*) as an additional indicator of the internal consistency, with values ranging .15 to .50 being considered adequate (Clark & Watson, 1995).

Finally, we examined the external validity of the PSCD scores by computing zero-order correlations between the PSCD mean item scores and an alternative measure of psychopathic traits, and between a set of external criteria measuring temperamental, behavioural and psychosocial criteria.

Correlation coefficients were interpreted as $\leq .30$ = small; .30-.50 = medium; and $\geq .50$ = strong effect sizes (Cohen, 1988), although Hemphill (2003) has noted that these parameters may be stringent in psychological research. We conducted descriptive statistics, internal consistency, and zero-order correlations with SPSS 21.

Results

Distribution of PSCD Mean Total Scores

The mean total scores varied from 0 to 1.43 (*Mean* = 0.46; *SD* = 0.22). The distribution of these scores had a positive skew (0.90; *SE* = 0.05), with 1.8% of the sample having a mean item score of 1.0 or higher (see Appendix 1). Measures of internal consistency were adequate (α = .79; *MIC* = .34).

Factor Structure

The theorized/expected four-factor model of the PSCD showed a good model fit according to RMSEA, but not in terms of CFI and TLI (see Table 1). Modification indices clearly suggested that item 11 (“Some people consider him/her to be a mean person”) best loaded in the CD factor instead of the proposed CU one. Therefore, an alternative four-factor model, including item 11 in the CD factor, was also tested showing an acceptable-to-

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good model fit according to RMSEA (.05) and CFI (.90), although the value for TLI (.89) did not reach the .90 cut-off for acceptable model fit. Modification indices also substantiated a residual covariance between items 3 and 2 as representing an acutely misspecified parameter in the model. After including this new parameter, an acceptable model fit was observed according to all the indices. Equal model fit indices were obtained for the two alternative four-factor interrelated and four-factor superordinate models.

As displayed in Table 1, the four-factor model fit better than the one-factor model and the two-factor model, and was essentially the same as the three-factor model. Considering that modification indices for the four-factor model suggested that the item 11 should best loaded in the CD factor, and a residual covariance between item 3 and item 2, an alternative three-factor model excluding item 11 from the CU factor (i.e., including 17 items in the final model) and specifying a residual correlation between items 3 and 2, was also tested; it showed an acceptable model fit according to all fit indices $\chi^2 = 729.65$ (116), RMSEA = .05, CFI = .94, TLI = .93. Although both the three- and the four-factor model adequately fit the data, the subsequent analyses were focused on the four-factor model in order to provide a preliminary validation of the PSCD as originally developed (Salekin, 2017). Further validation results for the three-factor model have been included as Supplementary material, and can be observed in Appendix 2. These results showed the expected convergent correlations among the PSCD scales (i.e., GM, CU, and DI) and an alternative measure of psychopathic traits (i.e., the CPTI), as well as with a set of external criteria behavioral and psychosocial correlates traditionally associated with psychopathic personality in childhood. In this regard, higher levels of GM, CU, and DI are related with higher levels of conduct problems, reactive and proactive aggression, and ODD.

Preliminary results from the four-factor interrelated model showed moderate to strong correlations between the PSCD latent factors, all of them significant at $p < .001$ (see

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Appendix 3). For the four-factor superordinate model, CFA results showed that the four PSCD factors were affected by a common general psychopathy factor, which accounts for 34%, 41%, 57%, and 71% of the variance, respectively, for the GM, CU, DI, and CD dimensions (see Figure 1). Table 2 shows that all 23 items loaded significantly on the expected PSCD factor and on the latent global construct, with the exception of item 11 which best loaded on the CD factor instead of the CU. Accordingly, item 11 was ultimately included in the CD factor for all subsequent analyses. All item loadings were above .30, which is considered as a salient cut-off for factor loadings (Brown, 2006). The only exception was item 1 (.24). Removing this item from the model resulted in a slightly improvement in terms of model fit $\chi^2 = 1036.10$ (204), RMSEA = .04, CFI = .94, TLI = .93. Nevertheless, as a preliminary validation study and since the item loading was statistically significant at $p < .001$, we decided to keep it in the analysis in order to further test the original proposal for the PSCD (Salekin, 2017).

MI tests were performed across gender groups. The final four-factor model of the PSCD was firstly tested for boys and girls separately, leading an acceptable model fit for boys/girls respectively (see Table 1). Configural, metric and scalar invariance were then examined in sequence for gender groups. Model fit indices ranged from acceptable to good for configural $\chi^2 = 1770.80$ (446), RMSEA = .05, CFI = .92, TLI = .91; metric $\chi^2 = 1702.48$ (465); RMSEA = .05; CFI = .93; TLI = .92; and scalar invariance $\chi^2 = 1683.07$ (484); RMSEA = .05, CFI = .93, TLI = .93. These results suggest that the final four-factor model of the PSCD was invariant across gender groups ($\Delta\text{CFIs} \leq .01$; Cheung & Rensvold, 2002).

Descriptive Statistics and Internal Consistency

Descriptive information for the PSCD scores is presented in Table 3. Overall, the PSCD factors scores had low mean values. Additional analyses revealed that, with the exception

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of GM, there were statistically significant gender differences for all the PSCD factors, with boys scoring significantly higher than girls, although with small effect sizes ($d = .14-.23$). There were also significant differences in terms of SES ($p < .01$), except for CD, with lower SES level in children scoring higher on the PSCD factors. No differences were observed with regard to age for any of the PSCD factors or Total score.

The values for alpha and the *MIC*, respectively, were as follows: GM (.58 and .32), CU (.60 and .37), DI (.77 and .52), CD (.70 and .45), and Total score (.79 and .34). All *MIC* values were indicative of an adequate internal consistency for all the PSCD factors and Total score.

Convergent and Discriminant Validity: Associations with the CPTI

Convergent and discriminant associations with the CPTI are presented in Table 4. The zero-order correlations between the PSCD factors and the CPTI factors were weak-to-strong. Steiger's Z indicated that the PSCD GM, CU, and DI subscales were significantly more highly correlated with the corresponding CPTI GD, CU and INS subscales ($p < .001$) than with the other subscales. The correlations between the PSCD Total score and all the CPTI factors and Total score were moderate-to-strong.

Criterion Validity: Associations with External Criteria

Table 4 also presents zero-order correlations between the PSCD Total/factors and a set of external criteria from the psychopathic personality framework. There were significant and positive zero-order correlations between the PSCD Total/factor scores and fearlessness, conduct problems, reactive and proactive aggression, and ADHD and ODD symptoms. The zero-order correlations were negative between the PSCD Total/factor scores and social competence skills, including emotional regulation and social/communication. These

correlations were stronger for the PSCD CD scale and Total score than for the other PSCD factors.

Discussion

This is the first study to test the psychometric properties, factor structure, and external correlates of the PSCD-Parent Version in a large sample of three- to six-year old children. The results are encouraging, and indicate that the PSCD is a promising instrument for the early assessment of interpersonal (GM), affective (CU), and behavioral/lifestyle traits (DI) in the study of child conduct problems. Importantly, prior research revealed that these traits are identifiable in preschool years (Colins et al., 2014; Keenan, & Wakschlag, 2000; López-Romero et al., 2018, 2019), show reasonable stability (Andershed, 2010), have meaningful relations with cognitive and emotional correlates, have differential underlying processes and mechanisms, and differentially predict several outcomes (Salekin, 2016a, 2017). Based on the need to provide ongoing attention to the assessment of this personality profile at early developmental stages (Salekin & Lynam, 2010), while addressing all its dimensions (Lee, 2018; Lilienfeld, 2018), the PSCD provides a measure of the broader psychopathic construct in childhood and adolescence.

Factor Structure

According to the original proposal (Salekin, 2016a, 2017), the four-factor structure of the PSCD was preliminary supported, representing the three psychopathy dimensions (GM, CU, and DI) plus CD. In line with some previous studies (e.g., Jones et al., 2006; Salekin et al., 2006), the three-factor solution could be also justifiable in terms of model fit, providing a more parsimonious solution. Given these results, the decision to use the three- or four-factor model will probably rely on researchers' particular preferences, underlying conception of psychopathy, or the objectives and hypothesis under a given research

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investigation. Since the main aim of this study was to test the psychometric properties of the PSCD as originally developed, most of the analyses were focused on the original four-factor structure, which provides a more accurate content coverage of the construct conceptualization underlying the development of the PSCD (i.e., the four-factor model; Salekin, 2017), and connects the psychopathy dimensions more specifically to CD, a notion that Herbert Quay (1986, 1987) believed was important in order to better understand CD. We also note that the three-factor model eliminates an important component of psychopathy, namely antisocial conduct (Hare, 2003; Hare & Neumann, 2008). However, as noted, at the child level, this component is CD (Salekin & Hare, 2016).

Admittedly, modification indices suggested that Item 11 (“Some people consider your child to be a mean person”), best loaded in the CD factor instead of the CU proposed one. Waiting for new research that sheds new light on item distribution for the PSCD, we hypothesized that translation issues may explain this modification since the Spanish language does not provide a word that easily defines and properly addresses the specific connotations around being a *mean* person. Instead, parents seemed to rate this item as a behavioral trait, with the child being described by others as bad (probably for doing wrong things), which is more in line with the CD item content. Since there are no prior studies that allow for comparisons and further interpretation, this issue should be clarified in future studies conducted in different contexts and languages. Also based on modification indices, a correlation between item 3 and item 2 error terms was also added to the model, which improved model fit according to all the indices. The inclusion of modification indices has been extensively accepted when personality traits inventories are examined since they have often shown difficulties to adequately fit the data, particularly given the inherent complexity of personality, and the difficulties related with measurement and the application and interpretation of CFA models (Byrne, 2012; Hopwood & Donnellan, 2010).

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Considering model fit indices in tandem (Brown, 2006), as well as the purposes of this study, we adopted the four-factor structure of the PSCD proposed by Salekin (2017; Salekin & Hare, 2016), with an overarching latent psychopathy factor. This model was invariant across boys and girls groups. The standardized factor loadings were overall higher than .60, with only one factor loading below .30, and two in the range of .30-.40, being also supportive of the PSCD as a four-factor measure that distinctively assesses four different but interrelated dimensions of the psychopathic construct (Hare & Neumann, 2008; Salekin, 2017).

Descriptive information

The mean item scores presented in in this study provide a useful basis for comparisons with those that will be obtained in future studies of the PSCD in other countries, and in diverse ethnic and cultural populations. In this study, the lowest scores were for the CU and CD dimensions, suggesting that these PSCD measured traits are less prominent at a very early age than are the GM and DI traits, or that cultural influences might be at play (López-Romero et al., 2018). Follow-up research with this sample will determine if CU and CD traits increase with age, while research currently underway in several other countries will provide a basis for cross-cultural comparisons of the PSCD and its factors.

The reliability indices indicate that the PSCD and its factors have an adequate internal validity. Cronbach's alpha values were modest, particularly for GM and CU, and with the highest values for DI, CD and the PSCD Total scores (α s around .70). Although Cronbach's alpha is a common measure for internal consistency, several concerns about its reliance have been raised, such as its dependence on the number of the items, or the problems stemming from unrealistic assumptions (e.g., the lack of adherence to tau equivalence, or the normal distribution of the items; McNeish, 2017). In addition, in the community-based

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sample used in this study range restriction may have affected the values. Given the very few items per scale, Cronbach's alphas were assumed as adequate. Nevertheless, and in order to overcome these limitations, the MIC was used as a more informative index of internal consistency than is alpha, with all values being indicative that the PSCD and its factors have good internal consistency.

Validity of the PSCD factors

Significant convergent associations were observed with the CPTI scales, with the GM, CU and DI PSCD factors being more strongly correlated with their corresponding interpersonal (i.e., GD), affective (i.e., CU) and behavioral (i.e., INS) CPTI factors. Both the CD factor and the PSCD Total score were significantly related to all CPTI factors. The magnitude of these correlations is in line with what are considered reasonable convergent validity coefficients and thus would support the content validity of the four psychopathic dimensions of the PSCD (Fiske et al., 1993, Hemphill, 2003). Certainly, independent measures of psychopathy are not always highly correlated and, therefore, further research is needed on this topic (Kotler & McMahon, 2010).

Further associations with external criteria also supported the validity of the PSCD as a measure of the multidimensional psychopathy construct. In this regard, the PSCD factors showed the expected positive associations with conceptually and clinically important outcomes, including fearlessness, conduct problems, reactive and proactive aggression, ADHD and ODD symptoms, and the expected negative associations with social competence skills (see Salekin & Lynam, 2010).

Although the PSCD is intended to be used in childhood, some items were not purposely developed for exclusive use in very early childhood, which may affect the results to some extent. In addition, future studies may clarify the role of some GM traits in early childhood,

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as well as item distribution. Future research should also work toward better understanding whether CD should be fully met before assessing the dimensions of psychopathy or whether the dimensions themselves provide pertinent information (Andershed et al., 2018; Colins, et al., 2018); in this regard, replication analyses with clinic-referred samples are particularly encouraged. Until then, current findings should be interpreted with caution since some of them could be sample dependent, and/or based on language- or age-related issues. Multi-informant approaches are also needed in future research. Finally, although a large sample size is a substantial strength, due to the high statistical power even small coefficients were sometimes significant. Nonetheless, the magnitudes of the effects were generally moderate lending further support to the reported relations.

Conclusion

Based on the foregoing, the PSCD is a potentially useful measure of psychopathic personality in childhood. It provides an opportunity for a deeper study of the conceptualization, predictive value, and clinical usefulness of early psychopathic traits. It may also allow analyzing stability, and identifying etiological mechanisms underlying psychopathic traits, providing an empirically test of the notion that psychopathic personality is already rooted in early childhood (Raine, 2013). It may enhance the understanding of the heterogeneity of CD as well as how to specify CD. Finally and relatedly, the PSCD will allow for researchers to examine the different configurations of psychopathic traits in conjunction with CD which may inform future versions of the DSM and ICD. The PSCD was developed to be an instrument for addressing all psychopathy dimensions as potential specifiers of CD in both research and clinical practice (Salekin, 2017; Salekin & Hare, 2016). To this end, much more research is needed, including replication analyses in different samples, contexts and languages, and with other versions of

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the PSCD (i.e., self-report; teacher-report). We hope that working with the PSCD will open new means of discussion and analysis in terms of construct conceptualization, predictive value, and clinical usefulness, ultimately leading to a better understanding of psychopathic personality traits and their relation to CD.

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Table 1

Model Fit Results Based on Confirmatory Factor Analyses for One-, Two-, Three, and Four-Factor Models for the PSCD

	<i>N</i>	χ^2 (<i>df</i>)	RMSEA	CFI	TLI
PSCD					
One-factor model	2229	2844.26 (230)	.07	.79	.77
Two-factor model	2229	2603.09 (229)	.07	.83	.82
Three-factor model	2229	1108.75 (132)	.06	.91	.89
Four-factor model ^a	2229	1845.31 (226)	.06	.89	.88
Four-factor model (with MI) ^a	2229	1574.63 (225)	.05	.92	.91
Boys	1145	947.61 (225)	.05	.92	.91
Girls	1084	812.63 (225)	.05	.92	.91

Note. PSCD = Proposed Specifiers for Conduct Disorder; MI = Modification indices

^a Model fit indices were identical for the two alternative four-factor models: Four-factor interrelated and Four-factor superordinate models.

Table 2

Item Loadings for the Four-factor Solution (CFA) of the PSCD

	GM	CU	DI	CD
Item				
1. Your child can turn on the charm in any situation	.24			
2. Your child thinks (s)he is a very important person	.43			
3. Your child thinks (s)he is very good at most things (s)he does	.36			
4. Lying is easy for your child	.74			
5. Your child takes advantage of others	.78			
6. Your child is a good storyteller	.73			
7. Your child doesn't waste time thinking about how others feel		.69		
8. Your child can turn and walk away from someone who is hurt		.64		
9. When people are happy or upset your child doesn't seem to care		.84		
10. Your child likes it when others are afraid of them		.63		
12. Your child rarely feels guilt or remorse		.72		
13. Your child is daring			.87	
14. Your child likes a lot of change or adventure			.79	
15. Your child gets a thrill out of doing risky things			.93	
16. Your child feels like they need a lot of stimulation			.63	
17. Your child likes to live in the moment			.34	
18. Some people say your child is reckless			.91	
11. Some people consider your child to be a mean person				.66
19. Your child has (deliberated) stolen things				.69
20. (S)He has engaged in physical aggression against animals or people				.74
21. Your child has (intentionally) destroyed property				.75
22. Some people say your child breaks a lot of rules				.84
23. Your child can be argumentative and defiant				.79
Factor loadings on Total score	.74	.66	.74	.90

Note. PSCD = Proposed Specifiers for Conduct Disorders; CFA = confirmatory factor analysis; GM = Grandiose/deceitful; CU = Callous-unemotional; DI = Daring/Impulsive; CD = Conduct Disorder. All factor loadings were statistically significant at $p < .001$.

Table 3

Descriptive Statistics of the PSCD Subscales and Total score, With Gender Comparisons

	Range		Total sample (<i>n</i> = 2,229)	Boys (<i>n</i> = 1,145)	Girls (<i>n</i> = 1,084)	<i>t</i>	<i>p</i>	<i>d</i>
	Min.	Max.	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>			
PSCD								
GM	0.00	2.00	0.66 (0.34)	0.66 (0.34)	0.67 (0.35)	-0.34	.753	-
CU	0.00	1.60	0.16 (0.24)	0.18 (0.26)	0.13 (0.21)	4.76	<.001	.21
DI	0.00	2.00	0.75 (0.43)	0.79 (0.44)	0.72 (0.41)	3.46	<.001	.14
CD	0.00	2.00	0.23 (0.27)	0.26 (0.29)	0.20 (0.24)	4.62	<.001	.23
Total score	0.00	1.43	0.46 (0.22)	0.48 (0.23)	0.44 (0.21)	4.19	<.001	.18

Note. PSCD = Proposed Specifiers for Conduct Disorder; GM = Grandiose-Manipulative; CU = Callous-Unemotional; DI = Daring-Impulsive; CD = Conduct Disorder.

Table 4

Zero-order Correlations between the PSCD Subscales and Total Score and the CPTI and External Criteria

	PSCD				Total score
	GM	CU	DI	CD	
CPTI-GD	.38***	.28***	.27***	.41***	.48***
CPTI-CU	.15***	.53***	.22***	.38***	.42***
CPTI-INS	.24***	.21***	.49***	.43***	.53***
CPTI-Total score	.31***	.42***	.43***	.51***	.60***
Fearlessness	.17***	.22***	.69***	.34***	.58***
Conduct problems	.22***	.33***	.39***	.73***	.59***
Reactive aggression	.20***	.29***	.27***	.53***	.45***
Proactive aggression	.19***	.25***	.21***	.42***	.37***
ADHD	.17***	.22***	.45***	.41***	.47***
ODD	.17***	.26***	.36***	.60***	.50***
Emotional regulation	-.05*	-.23***	-.23***	-.44***	-.33***
Social communication	-.01	-.33***	-.05*	-.31***	-.21***

Note. PSCD = Proposed Specifiers for Conduct Disorder; GM = Grandiose-Manipulative; CU = Callous-Unemotional; DI = Daring-Impulsive; CPTI = Child Problematic Traits Inventory; GD = Grandiose-Deceitful; CU = Callous-Unemotional; INS = Impulsive-Need of stimulation; CD = Conduct Disorder; ADHD = Attention Deficit Hyperactivity Disorder; ODD = Oppositional Defiant Disorder.

* $p < .05$ ** $p < .01$ *** $p < .001$

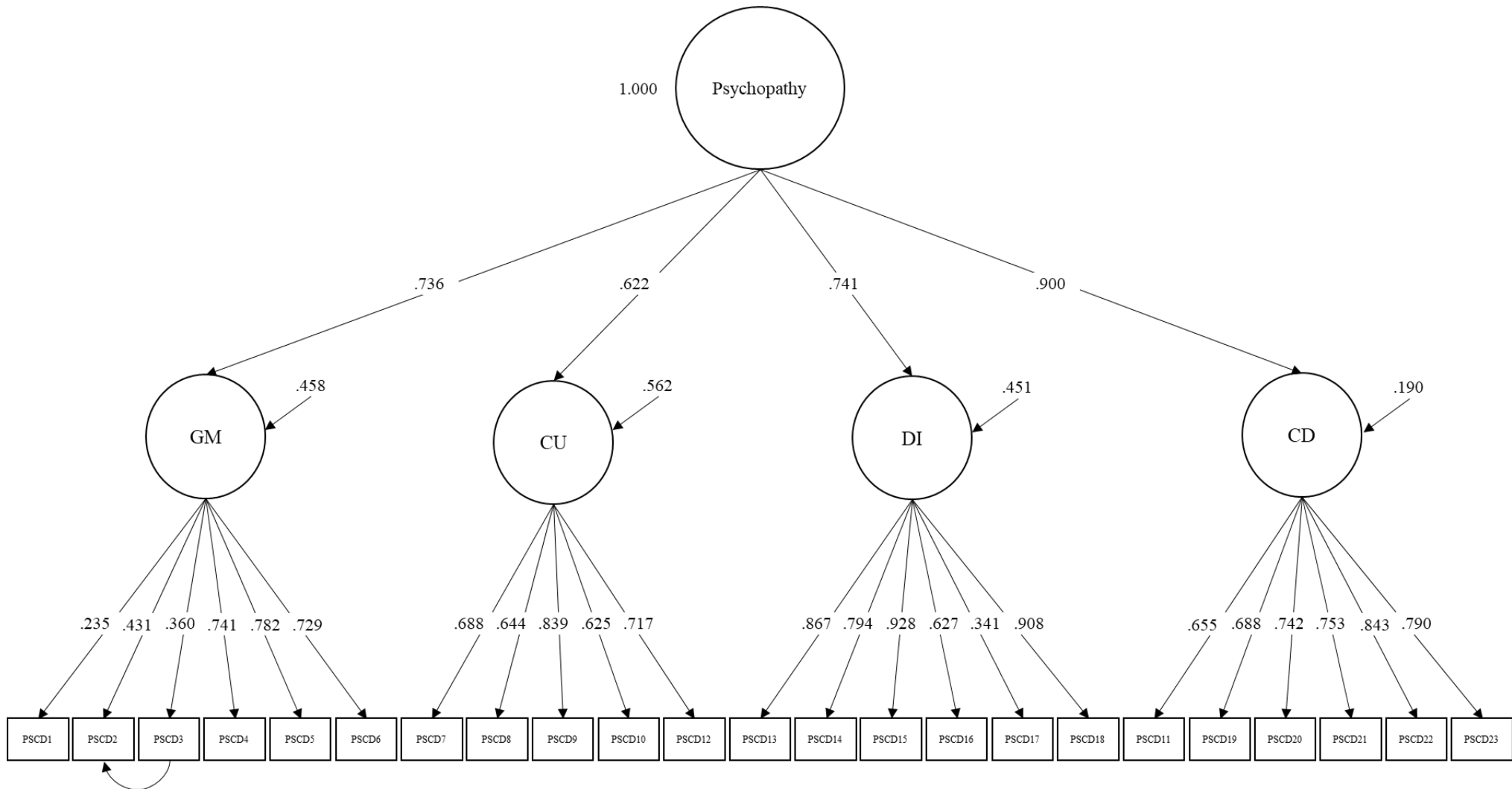
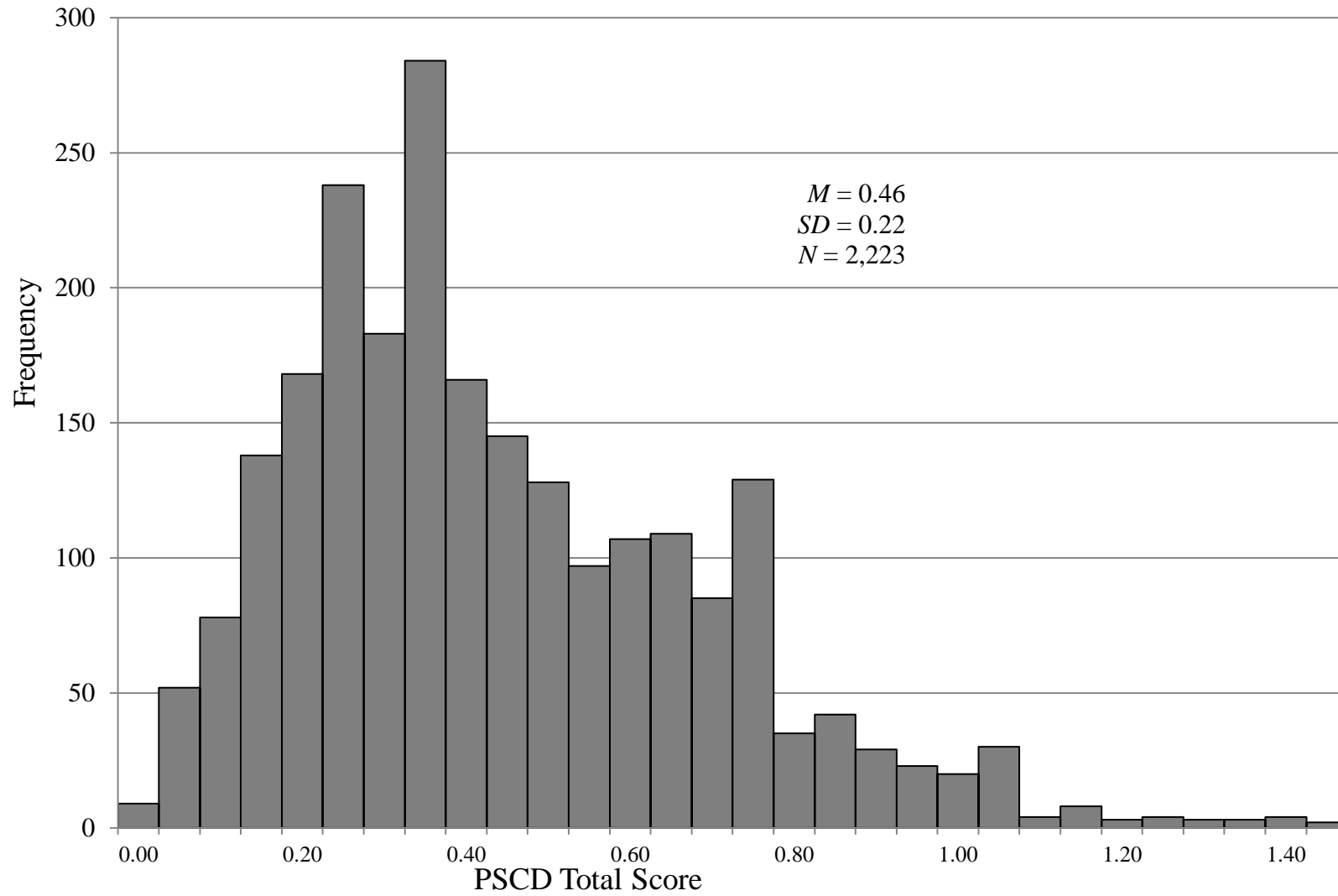


Figure 1. Standardized model parameters for the Confirmatory Factor Analysis: Four-Factor Superordinate Model



Appendix 1. Distribution of PSCD Mean Item Total Scores (0, 1, 2)

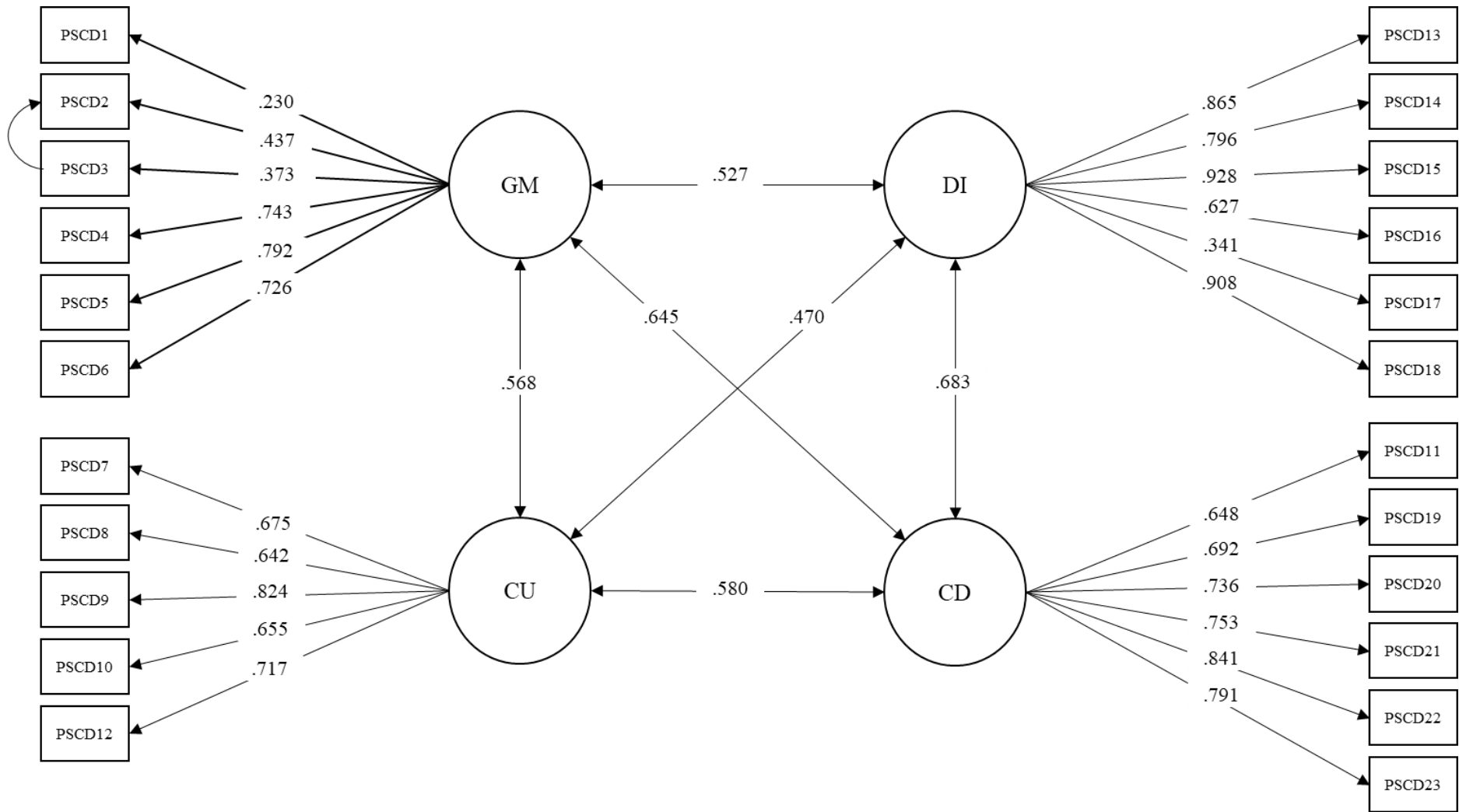
Appendix 2

Zero-order Correlations between the PSCD Subscales and Total Score from the Three-Factor Model and the CPTI and External Criteria

	PSCD			
	GM	CU	DI	Total score
CPTI-GD	.38***	.28***	.27***	.43***
CPTI-CU	.14***	.53***	.22***	.36***
CPTI-INS	.24***	.21***	.49***	.48***
CPTI-Total score	.31***	.42***	.43***	.54***
Fearlessness	.18***	.22***	.69***	.58***
Conduct problems	.22***	.33***	.39***	.44***
Reactive aggression	.20***	.29***	.27***	.35***
Proactive aggression	.19***	.25***	.21***	.29***
ADHD	.17***	.22***	.45***	.42***
ODD	.17***	.26***	.36***	.38***
Emotional regulation	-.05*	-.23***	-.23***	-.23***
Social communication	-.01	-.33***	-.05*	-.13***

Note. PSCD = Proposed Specifiers for Conduct Disorder; GM = Grandiose-Manipulative; CU = Callous-Unemotional; DI = Daring-Impulsive; CPTI = Child Problematic Traits Inventory; GD = Grandiose-Deceitful; CU = Callous-Unemotional; INS = Impulsive-Need of stimulation; CD = Conduct Disorder; ADHD = Attention Deficit Hyperactivity Disorder; ODD = Oppositional Defiant Disorder.

* $p < .05$ ** $p < .01$ *** $p < .001$



Appendix 3. Standardized model parameters and covariance between latent factors for the Confirmatory Factor Analysis: Four-Factor Interrelated Model.