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**Testing the Predictive and Incremental Validity of Callous-Unemotional traits versus
the Multidimensional Psychopathy Construct in Preschool Children**

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Abstract

This study aimed to test the predictive and incremental value of psychopathic trait dimensions in early childhood. To this end, a callous-unemotional (CU)-based approach was compared to the multidimensional psychopathic personality approach in predicting future and stable conduct problems (CP) and aggression, whilst controlling for well-established risk factors for child CP. Prospective longitudinal data were collected from a community sample of 2,247 children (48.6% girls) aged three to six ($M_{age} = 4.25$; $SD = 0.91$) at the initial assessment. Participants were followed annually for two years, with information provided by parents. Children were assigned to six mutually exclusive groups based on their baseline levels of psychopathic traits and conduct problems. Results showed that, after accounting for sociodemographic variables, temperamental features (e.g., fearlessness), and ADHD symptoms, children scoring high in all psychopathic traits and high in CP were at increased risk to display future and stable CP, reactive and proactive aggression, followed by the group of children high in CU traits and CP. Future research on child psychopathy may benefit from considering the constellation of co-occurring interpersonal, affective and behavioral psychopathic traits, and could inform developmental models aiming to explain heterogeneity in child CP.

Keywords: psychopathy, callous-unemotional traits, conduct problems, reactive and proactive aggression, predictive incremental value, early childhood

Introduction

Child conduct problems (CP) involves a heterogeneous pattern of deviant behaviors, including aggressive, oppositional or destructive behavior, that hamper general functioning and involvement in developmentally appropriate activities, even at an early age (Frick & Matlasz, 2018; Keenan & Wakshlag, 2000; Odgers et al., 2008). Because conduct problems are highly heterogeneous (Lindhiem et al., 2015), there have been many attempts to define distinctive and meaningful subgroups of problematic children, focusing on those at risk for more severe and persistent CP (e.g., Loeber et al., 1993; Moffitt, 1993; Patterson, 1996).

During the past decade, psychopathic personality, which is probably rooted in early childhood (Raine, 2013), has emerged as an increasingly important construct in understanding child CP (Salekin & Lynam, 2010). Through a burgeoning line of research, psychopathic traits have been linked with a large set of problematic behaviors and negative outcomes, including conduct problems, different forms of aggression, and low prosocial behavior, with several studies evidencing their usefulness in identifying a specific group of more severe and aggressive children (e.g., Frogner, Gibson, et al., 2018; Lochman et al., 2010; Lynam et al., 2007). Although psychopathic personality has been consistently defined as a constellation of co-occurring interpersonal (e.g., grandiosity, deceitfulness, manipulation), affective (e.g., lack of empathy, callousness, shallow affect) and behavioral (e.g., impulsivity, sensation seeking, irresponsibility) traits (Andershed et al., 2002; Colins et al., 2014; Cooke & Michie, 2001; Salekin, 2016), research conducted in childhood has mainly focused on the role of the affective or callous-unemotional (CU) dimension. In this regard, an extensive line of research supported CU traits as predictors of serious and persistent forms of conduct problems and aggressive behavior, as well as potential identifiers of an etiological and clinically distinctive subgroup of antisocial children (see Frick et al., 2014, for a detailed review on this topic). Accordingly, CU traits have become increasingly included in theoretical models and

empirical studies aiming to understand CP (e.g., Kahn et al., 2012). As a result, a CU-based specifier was recently added for the diagnosis of conduct disorder (CD) in diagnostic classification systems, namely the DSM-5 (APA; 2013) and the ICD-11 (WHO; 2018) (see Colins et al., 2020, for a recent review on the specifier).

Regardless of the advances achieved in the study of CP from the CU-based approach, a critical question in the field is whether including additional psychopathic dimensions in developmental and predictive models of child CP might provide a better approach in predicting and further subtyping CP (Lilienfield, 2018; Colins & Andershed, 2019; Salekin et al., 2018). Some recent studies have provided support for considering the entire psychopathy construct, as well as recognizing all its dimensions, showing that the combination of high levels of all three psychopathy dimensions was most strongly related to child and youth CP measured both concurrently and prospectively (e.g., Colins et al., 2012; Fanti et al., 2018; López-Romero et al., 2012; Ribeiro da Silva et al., 2019).

A recent line of research has compared the CU subtyping approach with the multidimensional psychopathy approach in order to examine their predictive value in several different samples of preschoolers, school-aged children, and adolescents in several different countries (Andershed et al., 2018; Colins et al., 2018; Frogner, Andershed et al., 2018; Fanti et al., 2018; Frogner, Gibson et al., 2018). In the majority of these studies, children were classified into six mutually exclusive groups based on their initial levels of psychopathic dimensions (i.e., interpersonal, affective and behavioral) as well as CP: (1) low in CP and all three dimensions (*Control*); (2) high in CP and low on all three dimensions (*CP Only*); (3) low on CP and high in the affective (*CU traits*) dimension (*CU Only*); (4) low in CP and high in all three psychopathic traits (*Psychopathic Personality Only*); (5) high in CP and the CU traits dimensions (*CU + CP*); and (6) high in CP and all three psychopathic traits (*Psychopathic Personality + CP*). Overall, results were clear and showed that *Psychopathic*

personality + CP children displayed the most robust and highest risk for future and stable CP, fearlessness, attention deficit hyperactivity disorder (ADHD), aggression and substance use. Also predictive, but to a lesser extent, was the combination of *CU + CP* and *CP Only* groups. In line with previous work, psychopathic traits that do not co-occur with baseline CP (*Psychopathic Personality Only*) showed some prognostic utility for later CP and aggression, particularly in older samples (Andershed et al., 2018) when behavioral problems are shown to later occur.

Based on the foregoing, there is evidence to suggest that the multidimensional psychopathic personality construct is more informative to predict future and stable behavioral maladjustment than CU traits alone. Nevertheless, it is still largely unknown to what extent psychopathic personality dimensions identify a high risk profile of problematic children over and above other well-established risk factors (see, for some notable exceptions, López-Romero et al., 2015; McMahon et al., 2010; Lynam et al., 2007). In this regard, research in the field has consistently shown that child CP is a complex construct, partially influenced by temperamental dispositions that, usually in combination with other environmental variables, may impact the development of CP and later maladjustment (Moffitt, 1993).

Three theoretically and empirically relevant risk factors for severe and stable forms of child CP are fearlessness, emotional reactivity and emotional regulation. Children characterized by a fearless temperament often seek out novel situations to test limits, and usually do not fear consequences of misbehavior, which place them at greater risk to exhibit severe and stable forms of CP (e.g., Calkins et al., 2007; Moffitt, 1993; Shaw et al., 2005). Emotional reactivity, defined as an intense and excessive emotional response to negative emotional stimuli (Leibenluft & Stoddard, 2013), has been consistently associated with serious and stable forms of CP, including oppositional defiant disorder (ODD), ADHD or reactive forms of aggression (e.g., Ezpeleta et al., 2016; Lugo-Candelas et al., 2017; Tonacci

et al., 2019). Finally, deficits in emotional regulation, defined as the set of process through which emotional experience and expression are shaped in favor of adaptive behavior (Thompson, 1990), have been linked to serious CP observed in early childhood, being one of the best predictors of later maladjustment (Beauchaine, 2015; Lugo-Candelas et al., 2017; Rydell et al., 2003).

Beyond these relevant factors, the comorbidity of child CP with other psychopathologies should also be considered. ADHD symptoms commonly appear in early childhood, persist over time, and are often comorbid with other forms of child CP (Biederman, 2005; Hudec & Mikami, 2017). Yet, prior research not only supported the comorbidity between ADHD and CP, but also consistently linked ADHD in childhood with future and stable forms of CP and more serious problematic behavior (e.g., Lee & Hinshaw, 2006; Shawn et al., 2005; Sibley et al., 2014).

This Study

The present study was designed to test in a large sample of preschool children, followed longitudinally, the CU-based versus the multidimensional psychopathic personality construct in predicting future and stable CP and aggression. To this end, we used the same analytical approach described in the aforementioned research (e.g., Andershed et al., 2018; Colins et al., 2018; Frogner, Andershed et al., 2018), aiming to replicate and extend previous results in various ways. First, this study relied on parent-reports, which have been used in childhood (Colins et al., 2018), but not in previous studies conducted with preschoolers, which were based on teacher-reported information (Frogner, Andershed et al., 2018; Frogner, Gibson et al., 2018). Second, because CP are quite heterogeneous in kind, and aggressive behaviors are one of the most prevalent forms in early childhood (Frick & Matlasz, 2018; Keenan & Wakshlag, 2000), we intended to expand previous research in early childhood by including not only CP, but also future and stable measures of aggression. Since prior research

has supported the association between psychopathic traits and different functions of aggression (e.g., Fanti et al., 2009; Frick et al., 2014; Kerig & Stellwagen, 2010), future and stable measures of both reactive and proactive aggression were included. Finally, because research testing the incremental validity of psychopathic traits over other well-known factors has been scarce, particularly in early childhood, we aimed to test not only the predictive value but also the incremental validity of psychopathic traits, while accounting for relevant risk factors in the field of child CP, namely fearlessness, emotional reactivity, emotional regulation, and ADHD symptoms. Therefore, the current study is expected to have several important implications.

According to the expectation that children with CP who manifest psychopathic traits constitute a severe CP group (Frick et al., 2014; APA, 2013), we first hypothesized that children exhibiting a combination of *Psychopathic Personality + CP* or *CU + CP* will show the highest levels of CP at baseline, with higher levels for children within the *Psychopathic Personality + CP group* (Frogner, Andershed et al., 2018; Frogner, Gibson et al., 2018). Second, it was also expected that *Psychopathic Personality + CP* and *CU + CP* children will be at higher risk for future and stable CP and aggression as compared to children in the remaining groups. Children identified in the *Psychopathic Personality + CP* group were expected to be at higher risk than children in the *CU + CP* group. Third, as observed in some previous research (e.g., Colins et al., 2018; López-Romero et al., 2012; McMahon et al., 2010), we expected that children with psychopathic traits without concurrent CP (i.e., *Psychopathic Personality Only* and *CU Only*) to be at risk for future CP and aggression. Finally, it was expected that the *Psychopathic Personality + CP* and the *CU + CP* groups will show incremental predictive value even after accounting for temperamental variables and ADHD symptoms, with stronger results for the *Psychopathic Personality + CP* group as compared to the *CU + CP*.

Method

Participants

Data for the present study were collected in waves 1 to 3 of the *Estudio Longitudinal para una Infancia Saludable* (Longitudinal Study for a Healthy Childhood; [ELISA]), 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. Parents' reports (87.2% mothers) provided the information for the present study in an initial sample of 2,266 children (48.5% girls), aged three to six¹ ($M_{age} = 4.25$; $SD = 0.91$) from 72 public (79.2%), charter (18.1%), and private (2.8%) schools. The schools were located in predominantly working-class communities, with no diverse in terms of ethnicity (93.9% of children were Spanish). 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. At the time of data collection, 77.2% of the mothers and 92.4% of fathers were working outside home.

Two follow-up studies were conducted one (T2) and two years later (T3). The level of attrition between T1-T2 and T1-T3 participants was 11.43% and 20.3% respectively. Comparisons among participating children, children who missed one follow-up and those who only participated in T1 revealed no significant differences in terms of age $F(2, 2248) = 2.51$, $p = .082$, and the initial (T1) levels of conduct problems $F(2, 2227) = 0.30$, $p = .741$. There were differences based on gender $\chi^2(2) = 11.88$, $p < .01$, with higher proportion of boys in families who missed one of the follow-up studies; and according to SES $F(2, 2249) = 16.27$, $p < .001$, with higher levels of SES in families who participated in all three waves of the study. For the

¹ Children who were born in 2011-2013. The 6-years-old (8.2% of the sample) were children attending preschool who were born before July of 2011.

purpose of the current study, children were selected for whom complete baseline data were available for the main study variables, being psychopathic traits and conduct problems, resulting in a sample of 2,247 children (48.6% girls; Mage = 4.25; SD = 0.91).

Measures

Baseline variables (T1)

Psychopathic traits. Parents rated the 28 items of the *Child Problematic Traits Inventory* (CPTI; Colins et al., 2014). Eight items intend to measure the interpersonal or Grandiose-deceitful (GD) psychopathy component (e.g., “Thinks that he or she is better than everyone on almost everything”), 10 items intend to measure the affective or Callous-unemotional (CU) psychopathy component (e.g., “Never seems to have bad conscience for things that he or she has done”), and 10 items intend to measure the behavioral or Impulsive-need of stimulation (INS) psychopathy component (e.g., “Provides himself or herself with different things very fast and eagerly”). Parents rated the CPTI items on the basis of how the child usually behaves rather than how he/she behaves at the moment, in a response scale ranging from 1 (*does not apply at all*) to 4 (*applies very well*). Albeit the CPTI was initially developed to be completed by teachers (Colins et al., 2014), previous research has shown the expected factor structure, internal consistency, and validity of the parent version of the CPTI to be supported in various samples, settings, and countries (e.g., Colins, Roetman, López-Romero, & Andershed, 2019; Wang et al., 2018) including the ELISA study (López-Romero et al., 2019). In the current sample, Cronbach’s alpha (α) for the three CPTI component scores were 0.80 (GD), 0.84 (CU) and 0.81 (INS).

Conduct problems. Parents rated 10 conduct problem items ($\alpha = .86$) that were closely based on DSM-IV (APA, 1994) criteria of ODD and CD, and were relevant to preschool children as well as older children and adolescents (Colins et al., 2014). Examples of items are: “Has been very angry”, and “Has beaten, torn, shoved, kicked, or thrown

something on others without a reason”. Items were scored using a 5-point response scale (1 = *never* to 5 = *very often*). This scale has been used in previous studies, displaying good reliability and external validity (e.g., Colins et al., 2014; Klingzell et al., 2016; López-Romero et al., 2019).

Fearlessness. A scale consisting of six items ($\alpha = .85$; e.g., “He/she does not seem to be afraid of anything”) was used to assess fearlessness (Colins et al., 2014). Parents score each item on a four-point scale, ranging from 1 (*does not apply at all*) to 4 (*applies very well*).

Emotional reactivity. The Emotionality scale from the *EAS Temperament Survey* for children (Buss & Plomin, 1984) was used. It consists of five items ($\alpha = .71$; e.g., “Reacts intensely when upset”), rated by parents on a five-point scale ranging from 1 (*my child’s behavior is never like this*) to 5 (*my child’s behavior is always like this*).

Emotional regulation. A six-item scale from the *Fast Track Social Competence Scale-Parent Version* (Conduct Problems Prevention Research Group, 1995) was used to assess emotional regulation. Parents rated the six items ($\alpha = .80$; e.g., “Can accept things not going his/her way”) on a scale ranging from 0 (*not at all*) to 4 (*very well*).

Attention Deficit Hyperactivity Disorder (ADHD). The *Achenbach System of Empirically Based Assessment, Preschool Form* (ASEBA; Achenbach & Rescorla, 2000) was used to assess ADHD symptoms. The version of the ASEBA used in the current study is based on DSM-reference scales. The parent-reported ADHD scale consisted of six items ($\alpha = .78$; e.g., “Inattentive”, “Can’t wait”) rated on a three-point scale ranging from 0 (*not true*) to 2 (*very true or often true*).

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 ($\alpha = .66$).

Longitudinal outcomes (T2 and T3)

Conduct Problems. Conduct problems at follow-ups were assessed in the same way as described at baseline. Cronbach's alpha values in T2 and T3 were .87 and .88 respectively.

Reactive and proactive aggression. The *Parents' and Teachers' Report of Reactive and Proactive Behaviors* (Dodge & Coie, 1987) were used for assessing reactive aggression (3 items; e.g., "Yells at others when they have annoyed him/her") and proactive aggression (3 items; e.g., "Threatens and bullies someone"). Items were scored on a scale ranging from 1 (*never true*) to 5 (*almost always true*). Cronbach's alpha in T2 and T3 were .71 and .77 for reactive aggression, and .78 and .76 for proactive aggression.

Stable Conduct Problems and Stable Reactive and Proactive Aggression. For this purpose, we decided to use a more stringent cut-off than observed in previous studies (i.e., +/- 0.5 SD; Andershed et al., 2018; Colins et al., 2018; Frogner, Gibson et al., 2018) in order to test not only for stable but also for more serious forms of CP and aggression. Children were classified in the stable CP group if they presented 1.00 SD above mean in CP at wave 2 (T2) and wave 3 (T3). All other children were classified in the no-stable conduct problem category. The same strategy was used to calculate stable reactive and proactive aggression.

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. 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.

An active consent form was filled out by the families who agreed to participate in the study (rate around 25-50% per school), and collected by the preschool teachers, who handed out the information to the parents. Only one of the parents (i.e., mother, father, or principal caregiver) completed the questionnaire. In all the three waves, participants had one month to complete and return the questionnaire. For those who were late, reminders were submitted, first by the preschool teacher and then directly by the ELISA staff via email. Parents did not receive any compensation for their participation. Instead, all the participating schools received at the end of the first wave data collection (T1) a set of educational games for pre-schoolers as a reward for study participation.

Statistical Analyses

First, Pearson product moment correlations were calculated to display the bivariate relationship among the study variables. Second, in line with previous studies (e.g., Andershed et al., 2018; Colins et al., 2018; Frogner et al., 2018ab), a cut-off of 0.5 SD above/below the mean was used to classify participants into high (above cut-off) and low levels (below cut-off) of baseline psychopathic traits (i.e., GD, CU and INS) and CP. This cut-off enabled comparisons with prior work that used distribution based cut-offs to classify children into high CU or high psychopathic groups (e.g., Pasalich et al., 2012; Van Baardewijk et al., 2009), and ensured that enough children were assigned to the groups of interest. Based on being above and below the cut-off, children were assigned to six mutually exclusive groups: *Control* (69.4% of the sample), with children scoring below the 0.5 cut-off in both psychopathic traits and CP; *CU Only* (8.9%), with children scoring above the cut-off in CU traits and below in GD, INS and CP; *Psychopathic Personality Only* (3.4%), including

children with scores above the cut-off in all psychopathy dimensions (GD, CU, INS) and below in CP; *CP Only* (6.5%), with children scoring below the cut-off in all psychopathy dimensions and above in CP; *CU + CP* (3.5%), including children scoring above the cut-off in CU traits and CP, and below in GD and INS traits; and, finally, *Psychopathic Personality + CP* (8.2%), with children scoring above the cut-off in all psychopathy dimensions and CP. Children who were not assigned to one of these groups (e.g., children scoring high in GD and CP, and low in CU and INS traits) were not included in the analyses. In line with the study conducted by Colins et al. (2018), all analyses were replicated using a more stringent cut-off (i.e., 0.75 SD). Main results consistently replicate those presented in the current study, although there were some restrictions in group size, particularly when examining stable outcomes. In order to ensure that enough children are represented within each group, current results are presented with groups created using the 0.5 cut-off. Further details are available upon request.

Third, ANOVA analyses were performed to test for potential covariates, including gender, age and SES, between the six groups. Univariate Analyses of Variance (UNIANOVA) were then performed to test for differences between groups in baseline levels of psychopathic traits and CP, controlling for covariates and using partial eta square (η^2) as an indicator of effect size. Prevalence rates of stable CP, reactive and proactive aggression within each analyzed group was examined with crosstabs and chi-square test of differences, with Cramer's V as the indicator of effect size. Fourth, five dummy coded variables (0 = not fulfilling criteria for group membership; 1 = fulfilling criteria for group membership) were created representing the *CU Only*, *Psychopathic personality Only*, *CP Only*, *CU + CP* and *Psychopathic Personality + CP groups*. These five variables were entered as independent variables in linear regression analyses to test their predictive value for of future CP, reactive and proactive aggression, and in logistic regression analyses to estimate their effect on the binary measures of stable CP,

reactive and proactive aggression. Finally, in order to test the incremental value of psychopathic traits and conduct problems, sociodemographic variables (i.e., gender, age and SES; Step 1), temperamental variables (i.e., fearlessness, emotional reactivity, and emotional regulation; Step 2), ADHD (Step 3), and the five grouping dummy variables (Step 4) were entered in hierarchical linear and logistic regression analyses to predict future and stable CP, reactive and proactive aggression. All the analyses were performed by means of IBM SPSS Statistics 20.

Results

Descriptive information

Table 1 presents correlations between main study variables and shows that all baseline variables, including the three psychopathic dimensions, correlated with conduct problems and reactive/proactive aggression at each follow-up assessment.

Psychopathic traits and conduct problems groups: Baseline differences

In order to test for potential covariates, the groups were first compared in sociodemographic variables, including gender ($\chi^2 = 32.95 [5], p < .001$)², age ($F = 4.54 [5, 1476], p < .001$), and SES ($F = 5.69 [5, 1468], p < .001$). Given the significant differences, all three variables were included as covariates in the subsequent analyses.

Comparisons on baseline levels of psychopathic traits and conduct problems are presented in Table 2. Results reveal that the *Psychopathic Personality + CP* group showed the highest levels of GD traits and CP, as compared to all the remaining groups. There were no significant differences between the *Psychopathic Personality + CP* group and the

² Because gender is an important variable to consider when studying CP and psychopathic traits (e.g., Frogner, Gibson et al., 2018), group assignments were also performed separately for boys and girls. Unfortunately, this strategy resulted in groups that were too small in number, particularly when assessing stable outcomes, leading to empty cells for some groups. Gender was, therefore, included as covariate (details available upon request).

Psychopathic Personality Only group in CU traits and INS. Table 2 also shows that there were no significant differences between the *CU Only*, *CP Only* and *CU + CP* groups in GD and INS traits. Differences were not significant for the *CU Only* and the *CU + CP* in CU traits, and between the *CP Only* and *CU + CP* in baseline levels of CP.

Finally, Table 2 shows distribution and prevalence rates of children within each group who displayed stable CP, reactive and proactive aggression. Results overall showed that *Psychopathic Personality + CP* grouped children with significantly higher and stable levels of CP and reactive aggression. There were no differences in proactive aggression between the *Psychopathic Personality + CP* and the *CU + CP* groups. For all comparisons presented in Table 2, large effect sizes were observed.

Predicting future and stable conduct problems and aggression

Conduct problems. Table 3 shows that *Psychopathic Personality + CP* was the strongest predictor for future and stable CP, followed by *CU + CP* and *CP Only*. Neither *Psychopathic Personality Only* nor *CU Only* were predictive of prospective CP.

Reactive aggression. Table 3 also shows that *Psychopathic Personality + CP* was the best predictor for future and stable reactive aggression, followed by *CU + CP*. The *CP Only* predicted future but not stable reactive aggression. Children within the *Psychopathic Personality + CP* group doubled the probability of displaying stable reactive aggression than their *CU + CP* counterparts. *Psychopathic Personality Only* was marginal predictive of reactive aggression at T3 (2-year follow-up).

Proactive aggression. Table 3 finally shows that *Psychopathic Personality + CP* was the best predictor for future proactive aggression, followed by *CU + CP*. The probability of displaying stable proactive aggression was similar for *Psychopathic Personality + CP* and *CU + CP*, although slightly higher for the former. *CP Only* predicted proactive aggression at T2

(1-year follow-up), whilst *Psychopathic Personality Only* marginally predicted proactive aggression at T3 (2-year follow-up).

Incremental value of psychopathic traits and conduct problems in predicting future and stable conduct problems and aggression.

Conduct problems. Table 4 shows that *Psychopathic Personality + CP* was the strongest predictor of future and stable CP, above and beyond gender, fearlessness, emotional reactivity, emotional regulation and ADHD, which were all significant predictors. *CU + CP* and *CP Only* groups were also, albeit to a lesser extent, predictive of future CP, whilst only the *CU + CP* group predicted, to a lesser extent, stable CP.

Reactive aggression. Both *Psychopathic Personality + CP* and *CU + CP* groups predicted future and stable reactive aggression, beyond gender, fearlessness, emotional reactivity, and emotional regulation. ADHD was not predictive of future nor stable reactive aggression. The *CP Only* group predicted future but not stable reactive aggression.

Proactive aggression. *Psychopathic Personality + CP* and *CU + CP* significantly predicted future and stable proactive aggression. These results held after accounting for gender and fearlessness, which predicted future proactive aggression, and emotional regulation, which predicted both future and stable proactive aggression. More specifically, *Psychopathic Personality + CP* was a stronger predictor for future proactive aggression whilst *CU + CP* was at increased risk for stable proactive aggression. *CP only* marginally predicted proactive aggression at T2.

Discussion

The present study tested the predictive and incremental value of psychopathic trait dimensions to predict future and stable CP and aggression in early childhood. To this end, we compared a CU-based versus a multidimensional psychopathic personality-based approach in

their ability to predict later maladjustment, including tests for incremental predictive value over well-established risk factors for child CP.

According to expectations, children who displayed high levels of all interpersonal (i.e., grandiose-deceitful), affective (i.e., CU traits), and behavioral (i.e. impulsive-need of stimulation) traits along with high levels of CP (*Psychopathic personality + CP*) showed significantly higher levels of CP at baseline (Frogner, Gibson et al., 2018), than children in the other groups. Interestingly, both the *Psychopathic Personality + CP* and the *Psychopathic Personality Only* groups had the highest levels of CU traits at baseline, showing significant differences with the *CU Only* and *CU + CP* children. As observed in previous research, the combination of high psychopathic traits and CP would better account for CP variability than CU traits alone (e.g., Fanti et al., 2018), an assumption also supported in the present study. Hence, also in line with prior expectations, children within the *Psychopathic personality + CP* group were at increased risk to prospectively show CP, reactive and proactive aggression.

One of the main contributions of the current study was to test the incremental predictive value of psychopathic traits dimensions and CP beyond classic risk factors, including three temperamental variables and ADHD symptoms. Emotional regulation was the best predictor of future and stable CP, reactive and proactive aggression (Beauchaine, 2015; Lugo-Candelas et al., 2017). Fearlessness and emotional reactivity were also predictive of later maladjustment, including future and stable CP, and future but not stable forms of aggression (Calkins et al., 2007; Ezpeleta et al., 2016; Moffitt, 1993). After controlling for these temperamental factors, ADHD symptoms showed incremental value to predict future and stable CP, but not any form of aggression. The link between CP and ADHD symptoms has been consistently informed in previous research (e.g., Lee & Hinshaw, 2006; Sibley et al., 2014), with studies showing 30%-50% of comorbidity between the two conditions (see Gnanavel et al., 2019). What is even more interesting is that, above and beyond the effect of

all these risk factors, the combination of psychopathic traits and CP remained as a significant predictor of future maladjustment, reinforcing their value to identify a specific group of problematic children. Such findings may add important information to developmental models and further subtyping approaches of child conduct problems (Salekin, 2016; Salekin et al., 2018). Of note, early-onset CP, with no psychopathic traits (*CP Only*), only predicted future CP and reactive aggression, whilst *Psychopathic Personality + CP* was more likely to display all forms of future and stable CP and aggression. These results overall suggest that, beyond early-onset CP, and other risk factors, psychopathic traits add a unique effect to predict more serious forms of later maladjustment (Colins et al., 2018; Frogner, Gibson et al., 2018; López-Romero et al., 2012). Children high in CU traits and baseline levels of CP (*CU + CP*) were also at risk for negative outcomes. In this regard, it should be noted that after accounting for gender, temperamental variables and ADHD symptoms, *Psychopathic personality + CP* children were at increased risk for CP, whereas both *Psychopathic personality + CP* and *CU + CP* were at similar risk for later aggression.

Interestingly, current results expand and replicate previous research that used the same analytical approach and relied on different informants (i.e., parent's, teachers', and self-reports; Andershed et al., 2018; Colins et al., 2018; Frogner, Gibson et al., 2018). These multisource findings contribute to, and further support, the generalizability of current findings irrespective of the informant. Nevertheless, there were some minor exceptions. Of note, the specific link between *CU + CP* children and aggression was not observed in a previous study in a sample of young adolescents (e.g., Andershed et al., 2018). The association between CU traits, CP and aggression, however, has been reported in previous research (e.g., Fanti et al., 2009; Frick et al., 2003; Kahn et al., 2012). In this regard, children and adolescents with CP and CU traits would be less concerned about the consequences of aggression (Pardini & Byrd, 2012), viewing aggressive behavior as an acceptable way for obtaining goals, blaming others,

and emphasizing the importance of dominance and revenge in social conflicts (Frick et al., 2014). Current results show a specific link between *CU + CP* children and stable levels of proactive aggression, which is defined as a goal-directed behavior, motivated by the perceived benefits of aggression and, therefore, not particularly impulsive in nature (Walters, 2005). Children in the *CU + CP group* displayed significantly lower levels of INS traits than their *Psychopathic Personality + CP* counterparts, which may partially explain this specific association. It should be noted that interpersonal (GD) psychopathic traits have also shown a unique association with proactive forms of aggression, even beyond CU traits (Kerig & Stellwagen, 2010), and this remains an important area of inquiry. Unfortunately, the purpose of the current study did not allow examining the specific association between GD traits, CP and aggression. Yet, higher levels of GD traits were displayed by children in the *Psychopathic Personality + CP* group, which overall showed the worst pattern of later maladjustment, including both forms of aggressive behavior. Because most of previous studies examining CU traits did not control for other psychopathic traits, there is a need to further analyze the existence of unique effects between CU traits, aggression and other negative outcomes, particularly after controlling for other psychopathy dimensions.

Surprisingly, scoring high in psychopathic traits at baseline, but without concurrent CP (*Psychopathic Personality Only*), was not predictive of future nor stable CP and aggression, with remarkably low prevalence rates for stable outcomes. This result converges with previous studies conducted in preschool children (Frogner, Gibson et al., 2018). Yet, studies conducted with older samples of children and adolescents has provided evidence about the predictive role of psychopathic traits even in the absence of concurrent CP (e.g., Andershed et al., 2018; Colins et al., 2018; López-Romero et al., 2012; McMahon et al., 2010), suggesting that psychopathic traits may have more predictive value later in development. Expecting an increased risk for the *Psychopathic Personality Only* group could seem reasonable at an early

age, when CP are not necessarily developed yet, and since some previous results raised the possibility that overall psychopathic traits, and more specifically CU traits, might be considered to bear clinical significance in the absence of CP (Rowe, 2014; Viding & McCrory, 2012). It is worthy to note that some traits within the psychopathic construct are frequent (e.g., lying, shallow affect, impulsive behavior) and, to some extent, seen as normative in early childhood (Colins et al., 2014). In this regard, the distinction between early-stage normative and more serious psychopathic traits has been considered as a dimensional matter of grade (Salekin et al., 2009). However, it is also noteworthy that current results revealed no significant differences between the *Psychopathic Personality Only* and the *Psychopathic Personality + CP* groups in both CU and INS traits, with both groups displaying the highest levels of psychopathic traits at baseline. The current approach also allowed testing the usefulness of CU traits without concurrent CP (*CU Only*). In line with previous studies, children in this group were less likely to display high CP at baseline, as well as future and stable negative outcomes (Frogner, Gibson et al., 2018; Fanti, 2013).

Relatedly, the current findings also converge with the classic debate about the role of CP and antisocial behavior in the definition of the psychopathy construct (Skeem et al., 2011). Thereby, some scholars have argued that CP, and more extensive deviant and antisocial behaviors, represent a correlate of psychopathic personality rather than a core feature (Cooke & Michie, 2001), with interpersonal, affective and behavioral psychopathic traits having prognostic utility by themselves. Yet, classic definitions of adult psychopathy, and their downward extensions to childhood and adolescents, assume deviant behavior as an integral part of the construct (Hare & Neuman, 2010), an endorsement also supported by current results. Hence, as observed in previous studies, it is the combination of high levels of co-occurring psychopathic traits plus CP what identifies a more serious and stable group of problematic children, even after controlling for relevant predictors of child CP. New

longitudinal studies are required to investigate how many children display high and stable levels of psychopathic traits over various developmental periods, their prognostic value across development with and without concurrent CP, and which proportion of *CU Only* and *Psychopathic Personality Only* children may develop into other trait configurations, being even potentially classified as *Psychopathic Personality + CP* later in development.

Implications

Current findings contribute to improve our understanding of two influential constructs for well-being in childhood, namely conduct problems and psychopathic traits. Because psychopathic personality is considered to be a developmental disorder with roots in early childhood (Raine, 2013), and the study of psychopathy components is relevant for targeting and improving prevention and intervention (Caldwell et al., 2012; Somech & Elizur, 2012), exploring the viability of early childhood psychopathic personality from a research perspective is justified. However, we would like to emphasize first that the labels “psychopathy” or “psychopathic traits” are pejorative and stigmatizing, and should not be used for applied purposes, or addressed with extremely caution, when dealing with very young children.

Current findings helped to support the value of psychopathic traits to predict more serious and stable CP, reactive and proactive aggression, accounting for heterogeneity in child conduct problems. One of the main contributions of this study is evidence that psychopathic traits has incremental validity above and beyond other risk factors, suggesting that psychopathic trait dimensions have unique predictive value to be included in comprehensive developmental models of child CP and aggression. It is important to note that developmental models to child CP are based on dynamic processes with multiple interacting factors delineating multiple pathways to child CP and aggression (Loeber et al., 1993; Moffitt, 1993; Patterson, 1996). Hence, temperamental variables like fearlessness or emotional regulation are

also key factors for understanding psychopathic traits (e.g., Dadds et al., 2016; Fanti et al., 2016). These interrelations, and many others including environmental risk factors (e.g., parenting practices) (Waller et al., 2017) should be also accounted for in future comprehensive models of child CP.

In terms of implications for diagnostic classification, prevention and intervention strategies, the present study supports the need for subtyping children with CP/CD. Alternative subtyping approaches (e.g., early- versus adolescent-onset; Moffitt, 1993), although potentially useful, might not be enough to cover the developmental heterogeneity of child CP. As was previously outlined, children with *CP Only* (i.e., without concurrent psychopathic traits) showed lower risk for later maladjustment than the group of children with CP and co-occurring psychopathic traits. In the most recent versions of the DSM and the ICD, only CU traits are used as a specifier for CD (APA, 2013). The current study showed that although children in the *CU + CP* group were at risk for future and stable CP, reactive and proactive aggression, this group was not as much as children in the *Psychopathic Personality + CP* group, particularly in terms of CP. The current findings, and their consistency with prior work, should encourage researchers to increase the representation of the psychopathic personality construct by using all its components, as well as its different combinations and interactions (e.g., Fanti et al., 2018; Somma et al., 2018), to build an adequate knowledge base for further revisions of the DSM and the ICD (Salekin, 2016, 2017). From these results, different profiles of psychopathic personality could be expected. Although this study did not allow to examine other combinations of traits (e.g., GD + CP), future research should further examine how different combinations of traits are linked to specific behavioral and emotional outcomes and, even more interesting, if they are based on different etiological mechanisms. Dealing with heterogeneity in psychopathic personality will also help to further understand heterogeneity in child conduct problems. Building up this knowledge will also help to prompt

new prevention and intervention proposals, particularly tailored to the specific needs of children showing psychopathic traits early in development.

Strengths and limitations

The strengths of the present study include the longitudinal design, the use of various negative outcomes beyond CP, and the inclusion of temperamental variables and ADHD symptoms to test the incremental predictive value of psychopathic traits and CP. Also, we used a more stringent cut-off (1.00 SD) to identify children displaying stable CP, reactive and proactive aggression, allowing to examine more serious stable outcomes. Nevertheless, relying in the mean cut-off (0.5 SD) to assign participants to mutually exclusive groups should be assumed as a limitation of the current study, since it might not be completely representative of high psychopathic traits and conduct problems in community samples. Previous research using higher cut-offs to classify children (e.g., Colins et al., 2018; Frogner, Gibson et al., 2016) showed that the pattern of results remained substantially similar, as observed with our sample. To ascertain for generalizability of current results, new studies with larger samples and based on more stringent criteria, are particularly encouraged. In this regard, although these results are in line with previous research also conducted in preschool children (e.g., Frogner, Gibson et al., 2018), replication studies, preferably conducted in clinic-referred samples, are warranted to test the prognostic value of both CU and psychopathic traits in children meeting criteria for ODD/CD. To this end, using standardized measures to assess CP is further recommended. Other limitations of the study relate to reliance on parents' reports for all measures, which could raise the possibility that prospective relations were partially explained by shared method variance. Also, we were not able to further account for gender differences in CP and psychopathic traits, an issue that should be addressed in future studies.

Conclusions

The findings of the present study suggest that the entire psychopathic personality construct outperforms the CU traits alone approach in identifying children with CP at increased risk for future and stable CP, as well as future aggression. Importantly, psychopathic personality traits add incremental predictive value over and above CP, reactive and proactive aggression, even after accounting for additional risk factors. In addition to providing evidence for the importance of the multidimensional psychopathy construct, the current study reinforces the value of developmental models that account for heterogeneity in CP. By doing so, we might more effectively be able to inform prevention and intervention efforts starting early in life, enabling at risk children to follow an adaptive developmental trajectory. In conclusion, with the aim to better subtype child CP, future research would benefit from considering the entire psychopathy syndrome, with co-occurring interpersonal, affective and behavioral traits, as well as their potential interactive effects and combinations in different profiles (Salekin, 2016).

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Table 1
Descriptive Statistics and Associations between Main Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	M (SD) [Range]
1. GD (T1)	-																1.41 (0.45) [1-4]
2. CU (T1)	.50***	-															1.42 (0.45) [1-4]
3. INS (T1)	.45***	.43***	-														2.34 (0.56) [1-4]
4. CP (T1)	.48***	.44***	.49***	-													1.76 (0.52) [1-5]
5. Fearlessness (T1)	.31***	.37***	.48***	.39***	-												1.79 (0.66) [1-4]
6. Emotional reactivity (T1)	.28***	.19***	.40***	.40***	.15***	-											3.03 (0.82) [1-5]
7. Emotional regulation (T1)	-.32***	-.37***	-.50***	-.53***	-.30***	-.46***	-										1.70 (0.64) [0-4]
8. ADHD (T1)	.32***	.32***	.68***	.44***	.44***	.39***	-.49***	-									0.73 (0.47) [0-2]
9. CP (T2)	.38***	.37***	.43***	.73***	.33***	.32***	-.47***	.38***	-								1.75 (0.51) [1-5]
10. CP (T3)	.34***	.34***	.37***	.69***	.29***	.34***	-.44***	.36***	.73***	-							1.60 (0.50) [1-5]
11. Stable CP [n (%)]	.29***	.27***	.26***	.53***	.23***	.21***	-.27***	.28***	.60***	.64***	-						163 (9.8%)
12. Reactive (T2)	.34***	.30***	.31***	.53***	.21***	.26***	-.35***	.23***	.68***	.57***	.43***	-					1.95 (0.74) [1-5]
13. Reactive (T3)	.34***	.31***	.32***	.55***	.22***	.30***	-.37***	.28***	.58***	.72***	.47***	.67***	-				1.81 (0.73) [1-5]
14. Stable Reactive [n (%)]	.27***	.25***	.19***	.40***	.16***	.16***	-.23***	.18***	.45***	.48***	.46***	.57***	.57***	-			129 (7.8%)
15. Proactive (T2)	.28***	.24***	.22***	.42***	.19***	.12***	-.24***	.18***	.54***	.42***	.40***	.49***	.42***	.38***	-		1.20 (0.41) [1-5]
16. Proactive (T3)	.31***	.24***	.20***	.42***	.18***	.14***	-.24***	.18***	.42***	.54***	.45***	.39***	.53***	.43***	.49***		1.15 (0.36) [1-5]
17. Stable Proactive [n (%)]	.19***	.15***	.15***	.31***	.11***	.11***	-.16***	.12***	.34***	.37***	.39***	.32***	.36***	.31***	.61***	.66***	103 (6.2%)

Note: T1 = Wave 1; T2 = Wave 2 (1 year follow-up); T3 = Wave 3 (2-years follow-up); GD = Grandiose-deceitful; CU = Callous-unemotional; INS = Impulsive-need of stimulation; CP = Conduct problems; ADHD = Attention Deficit Hyperactivity Disorder symptoms

*** $p < .001$

Table 2

Group Comparisons of Baseline Levels of Psychopathic Traits and Conduct Problems (n = 1,482), and Group Distribution in Stable CP, Reactive and Proactive Aggression Groups.

	Control (n = 1,028; 69.4%)	CU Only (n = 132; 8.9%)	PP Only (n = 51; 3.4%)	CP Only (n = 97; 6.5%)	CU + CP (n = 52; 3.5%)	PP + CP (n = 122; 8.2%)		
	<i>M</i> (SE)	<i>M</i> (SE)	<i>M</i> (SE)	<i>M</i> (SE)	<i>M</i> (SE)	<i>M</i> (SE)	<i>F</i> / χ^2 (df)	η^2 / Cramer's <i>V</i>
GD	1.16 (0.01) _a	1.27 (0.02) _b	2.15 (0.03) _c	1.24 (0.02) _b	1.32 (0.03) _b	2.31 (0.02) _d	659.88 (5, 1465)***	.69
CU	1.16 (0.01) _a	1.90 (0.02) _c	2.18 (0.03) _d	1.26 (0.03) _b	1.97 (0.03) _c	2.16 (0.02) _d	704.52 (5, 1465)***	.71
INS	1.96 (0.01) _a	2.21 (0.03) _b	2.98 (0.05) _c	2.16 (0.04) _b	2.26 (0.05) _b	3.07 (0.02) _c	256.48 (5, 1465)***	.47
CP	1.46 (0.01) _a	1.57 (0.03) _b	1.73 (0.04) _c	2.29 (0.03) _d	2.33 (0.04) _d	2.66 (0.03) _c	515.64(5, 1465)***	.64
Stable CP [n (%) ¹]	7 (0.9%) _a	4 (4.3%) _{ab}	1 (3.0%) _a	10 (14.5%) _b	8 (19.5%) _b	44 (53.7%) _c	338.19 (5)***	.56
Stable Reactive [n (%) ¹]	9 (1.2%) _a	4 (4.3%) _{ab}	2 (6.1%) _{ab}	8 (11.6%) _{bc}	9 (22.0%) _c	29 (35.4%) _d	187.14 (5)***	.42
Stable Proactive [n (%) ¹]	8 (1.1%) _a	5 (5.4%) _b	3 (9.1%) _{bc}	3 (4.3%) _{ab}	8 (19.5%) _{bc}	17 (20.7%) _c	102.22 (5)***	.31

Note: GD = Grandiose-deceitful; CU = Callous-unemotional; INS = Impulsive-need of stimulation; PP = Psychopathic personality; CP = Conduct problems; η^2 = Partial eta square.

Estimated means, adjusted for covariates (gender, age, and SES) are presented. Means with different subscripts (a, b, c) were significantly different ($p < .05$) in Bonferroni post hoc pairwise comparisons.

¹ (%) represents the prevalence rate of children displaying stable CP, Reactive and Proactive aggression within each analyzed group.

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

Table 3

Predicting Future and Stable Conduct Problems, Reactive and Proactive Aggression, after Controlling for Covariates (Gender, Age and SES)

Baseline groups (3-6 year-olds)	Conduct problems			Reactive aggression			Proactive aggression		
	T2 (4-7 year olds)	T3 (5-8 year olds)	Stable	T2 (4-7 year olds)	T3 (5-8 year olds)	Stable	T2 (4-7 year olds)	T3 (5-8 year olds)	Stable
	<i>B</i> (SE)	β (SE)	OR ¹	β (SE)	β (SE)	OR	β (SE)	β (SE)	OR
CU Only	-.02 (.05)	.01 (.05)	.61	-.01 (.07)	.02 (.07)	.72	.02 (.04)	.01 (.04)	1.11
^a PP Only	.04 (.08)	.03 (.08)	-	.04 (.11)	.07** (.12)	.98	.03 (.06)	.05* (.06)	1.87
CP Only	.13*** (.05)	.15*** (.05)	2.04*	.11*** (.08)	.12*** (.08)	2.08	.06** (.05)	.03 (.04)	.84
CU + CP	.15*** (.07)	.12*** (.07)	2.62*	.14*** (.10)	.14*** (.11)	4.11***	.08*** (.06)	.07** (.06)	4.36***
PP + CP	.33*** (.05)	.30*** (.05)	14.95***	.24*** (.07)	.25*** (.08)	8.19***	.21*** (.04)	.23*** (.04)	4.80***
Adjusted R ² / Nagelkerke R ²	.17	.16	.15	.11	.12	.10	.05	.06	.05

Note: T2 = Wave 2 (1 year follow-up); T3 = Wave 3 (2-years follow-up); β = Standardized regression coefficient; ER = Standard error; OR = Odd ratio; CU = Callous-unemotional; PP = Psychopathic personality; CP = Conduct problems. Confidence intervals for unstandardized betas and OR are presented in the Supplemental Material (available online).

¹ For logistic regression results Nagelkerke's R² value is provided

^a *Psychopathic Personality Only* was not entered in logistic regression to predict Stable CP because there was only one child from the PP Only group in the stable CP.

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

Table 4

Incremental Value of Psychopathic Traits and CP Groups in the Prediction of Future and Stable Conduct Problems, Reactive and Proactive Aggression, after Controlling for Covariates, Temperamental Variables and ADHD

Baseline variables (3-6 year-olds)	Conduct problems			Reactive aggression			Proactive aggression		
	T2 (4-7 year olds)	T3 (5-8 year olds)	Stable	T2 (4-7 year olds)	T3 (5-8 year olds)	Stable	T2 (4-7 year olds)	T3 (5-8 year olds)	Stable
	<i>B</i> (SE)	<i>B</i> (SE)	OR ¹	<i>B</i> (SE)	<i>B</i> (SE)	OR	<i>B</i> (SE)	<i>B</i> (SE)	OR
Step 1	$\Delta R^2 = .03^{***}$	$\Delta R^2 = .05^{***}$	$R^2 = .05^{***}$	$\Delta R^2 = .03^{***}$	$\Delta R^2 = .03^{***}$	$R^2 = .03^{***}$	$\Delta R^2 = .01^{**}$	$\Delta R^2 = .01^{**}$	$R^2 = .01$
Gender	-.10 ^{***} (.02)	-.14 ^{***} (.02)	2.05 ^{***}	-.13 ^{***} (.03)	-.14 ^{***} (.03)	1.78 ^{**}	-.05* (.02)	-.05* (.02)	1.48
Age	-.03 (.01)	-.01 (.01)	.96	.05* (.02)	.03 (.02)	1.21	.02 (.01)	.02 (.01)	1.10
SES	.02 (.01)	.01 (.02)	.87	.02 (.02)	.01 (.02)	0.93	.03 (.01)	-.01 (.01)	1.23
Step 2	$\Delta R^2 = .26^{***}$	$\Delta R^2 = .23^{***}$	$R^2 = .26^{***}$	$\Delta R^2 = .14^{***}$	$\Delta R^2 = .16^{***}$	$R^2 = .18^{***}$	$\Delta R^2 = .07^{***}$	$\Delta R^2 = .07^{***}$	$R^2 = .10^{***}$
Fearlessness	.14 ^{***} (.02)	.11 ^{***} (.02)	1.45*	.09 ^{***} (.03)	.07 ^{**} (.03)	1.32	.10 ^{***} (.02)	.08 ^{**} (.01)	1.31
Emotional reactivity	.11 ^{***} (.01)	.15 ^{***} (.01)	1.41*	.13 ^{***} (.02)	.15 ^{***} (.02)	1.22	.01 (.01)	.02 (.01)	1.19
Emotional regulation	-.26 ^{***} (.02)	-.23 ^{***} (.02)	.37 ^{***}	-.22 ^{***} (.03)	-.20 ^{***} (.03)	.31 ^{***}	-.14 ^{***} (.02)	-.15 ^{***} (.02)	.40 ^{***}
Step 3	$\Delta R^2 = .01^{**}$	$\Delta R^2 = .01^{**}$	$R^2 = .27^{**}$	$\Delta R^2 = .00$	$\Delta R^2 = .00$	$R^2 = .18$	$\Delta R^2 = .00$	$\Delta R^2 = .00$	$R^2 = .10$
ADHD	.11 ^{***} (.03)	.08 ^{***} (.03)	2.09 ^{**}	-.01 (.04)	.04 (.04)	1.14	.03 (.03)	.01 (.02)	1.01
Step 4	$\Delta R^2 = .05^{***}$	$\Delta R^2 = .05^{***}$	$R^2 = .32^{***}$	$\Delta R^2 = .03^{***}$	$\Delta R^2 = .04^{***}$	$R^2 = .21^{***}$	$\Delta R^2 = .02^{***}$	$\Delta R^2 = .03^{***}$	$R^2 = .12^*$
CU Only	-.02 (.04)	-.01 (.04)	.81	.01 (.07)	.01 (.07)	.76	.02 (.04)	-.01 (.04)	1.12
^a PP Only	-.02 (.07)	-.01 (.07)	-	.01 (.11)	.04 (.11)	.58	.01 (.06)	.02 (.06)	1.24
CP Only	.10 ^{***} (.05)	.12 ^{***} (.05)	2.07	.08 ^{***} (.08)	.09 ^{***} (.08)	1.83	.05* (.05)	.02 (.04)	.73

CU + CP	.12*** (.06)	.10*** (.07)	2.46*	.11*** (.10)	.12*** (.10)	3.42**	.06* (.06)	.05* (.05)	3.56**
PP + CP	.18*** (.05)	.18*** (.05)	5.13***	.14*** (.07)	.15*** (.08)	3.36***	.14*** (.04)	.18*** (.04)	2.25*
Adjusted R ² / Nagelkerke R ²	.35	.32	.32	.20	.23	.21	.09	.10	.12

Note: T2 = Wave 2 (1 year follow-up); T3 = Wave 3 (2-years follow-up); β = Standardized regression coefficient; SE = Standard error; OR = Odd ratio; ADHD = Attention Deficit Hyperactivity Disorder; CU = Callous-unemotional; PP = Psychopathic traits; CP = Conduct problems. Confidence intervals for unstandardized betas and OR are presented in the Supplemental Material (available online).

¹ For logistic regression results Nagelkerke's R² value is provided

^a *Psychopathic Personality Only* was not entered in logistic regression to predict Stable CP because there was only one child from the PP Only group in the stable CP.

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