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**Disentangling the role of psychopathic traits and externalizing behaviour in predicting
conduct problems from childhood to adolescence**

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Disentangling the Role of Psychopathic Traits and Externalizing Behavior in Predicting
Conduct Problems from Childhood to Adolescence

Abstract

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3 Child and youth conduct problems are known to be a heterogeneous category that
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5 implies different factors and processes. The current study aims to analyze whether the
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7 early manifestation of psychopathic traits designates a group of children with severe,
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9 pervasive and persistent conduct problems. To this end, cluster analysis was conducted
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11 in a sample of 138 children (27.6% female), aged 6-11 at the first wave of the study
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13 (T1) and 12-17 in a follow-up carried out six years later (T2). Results allowed the
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15 identification of four distinctive clusters: Primarily externalizing, Externalizing-
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17 psychopathic, Primarily psychopathic and Non-problematic. As was expected, the
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19 Externalizing-psychopathic cluster showed the most severe and persistent pattern of
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21 behavioral, temperamental and social disruptions across the six years of the study. Early
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23 psychopathic traits seemed also to be relevant in predicting higher levels of conduct
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25 problems in T2, even when conduct disorders had not manifested in T1. These results
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27 highlight the role of psychopathic traits in predicting adolescent psychosocial disorders
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29 and the relevance to analyze them at early developmental stages.
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38 *Keywords:* conduct problems, psychopathic-like traits, childhood, adolescence, cluster
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Conduct disorders constitute one of the most common and analyzed problems in adolescence (Thomas, 2010), causing severe functional and psychosocial impairment (Fergusson, Horwood & Ridder, 2005). Given their long-term important consequences (Vaughn et al., 2011), and the relevance of psychosocial functioning for the healthy development of teens (Mason, Hitchings, McMahon & Spoth, 2007), several attempts have emerged to examine and understand all the factors and processes underlying adolescent conduct problems. These attempts have led to the establishment of different subgroups of youth with conduct disorders, considering early-onset conduct problems as one of the best indicators for a high-risk antisocial pattern (Burt, Donellan, Iacono & McGue, 2011; Moffitt, 2007). In order to reduce the heterogeneity that in terms of etiology, developmental trajectories and prognosis still characterizes this phenomenon (White & Frick, 2010), psychopathic-like traits have been proposed as a relevant factor in subtyping and better understand early onset conduct problems, given their close relationship with long-lasting psychosocial disorders (McLoughlin, Rucklidge, Grace et al., 2010; Rowe et al., 2010).

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Previous research has shown that the presence of affective (e.g., lack of empathy), interpersonal (e.g., manipulation), and behavioral (e.g., impulsivity) personality traits in childhood and adolescence, has been related concurrently and prospectively with higher conduct problems (e.g., López-Romero, Romero & Luengo, 2011; Rowe et al., 2010), Attention Deficit/Hyperactivity Disorder symptoms (AD/HD; see Svecke & Kosson, 2010), aggressive behaviors (e.g., Marsee & Frick, 2010), adolescent antisocial behavior and delinquency (e.g., Lynam, Miller, Vachon, Loeber & Stouthamer-Loeber, 2009; McMahon, Witkiewitz & Kotler, 2010), and lower levels of prosocial behavior and social competence skills (e.g., Viding, Simmonds, Petrides & Frederickson, 2009). Thereby, Callous and Unemotional traits (CU), considered for

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some authors as the core features of psychopathic like-personality (White & Frick, 2010), have been proposed as a classification criterion for child and youth conduct disorders in the latest version of the Diagnostic and Statistical Manual of Mental Disorders (DMS-5; Frick & Moffitt, 2010).

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Studies conducted so far largely have focused on specific characteristics of children with conduct problems based on the joint presence of psychopathic-like traits (Frick, Cornell, Barry, Bodin & Dane, 2003; White & Frick, 2010). These studies have shown the predictive power of early manifested psychopathic-like traits (see Forth and Book, 2010), even above and beyond other well-known factors (e.g., Lynam et al., 2009; McMahon et al., 2010). Those results also have supported the study of the psychopathic-like personality in childhood and adolescence as a specific way to better understand and prevent the most severe and persistent patterns of adolescent psychosocial disorders, as well as the early developmental course of psychopathic-like personality (Andershed, 2010).

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From a person-oriented perspective, the few studies carried out have shown that high levels of early manifested psychopathic-like traits and conduct problems could designate a specific group of children both in clinic referred (Christian, Frick, Hill, Tyler & Frazer, 1997) and normal populations (Frick et al., 2003; Frick, Stickle, Dandreaux, Farrell & Kimonis, 2005). This specific group of children differed substantially from other groups, showing a greater number and variety of conduct problems and psychosocial problems (e.g., McLoughlin et al., 2010), higher levels of aggression, and higher self-reported delinquency or police contacts (e.g., Christian et al., 1997), even one to four years later (Frick et al., 2003; Frick et al., 2005). Some studies also have shown that the second highest rate of conduct disorders was manifested by the group of children high on CU traits who did not initially show

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conduct problems (Frick et al., 2003), but no specific differences with other groups have been clarified (Frick et al., 2005). Therefore, youths with high levels of psychopathic-like traits, even when conduct problems have not manifested yet (Rowe et al., 2010), have been related with a high-risk pattern to develop severe behavioral, temperamental and psychosocial disruptions (Salekin, Rosenbaum, Lee & Lester, 2009).

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However, beyond the findings previously obtained, some limitations in this body of research can be identified. Firstly, studies conducted in children and adolescents largely have focused on the role of psychopathic-like traits in relation to conduct problems (Forth & Book, 2010), especially from a variable-oriented perspective, whereas just a few studies particularly have analyzed the existence of different subgroups of children and their specific characteristics, based on their levels of conduct problems and psychopathic-like traits (e.g., Frick et al., 2003). Secondly, most of the studies have relied on the analysis of CU traits as the core features of psychopathic-like personality, but some classical and recent proposals have suggested that psychopathic-like personality should be considered as a constellation of affective, interpersonal and behavioral traits (Andershed, 2010; Cooke & Michie, 2001). Thus, more research is needed to clarify whether the joint presence of this constellation of personality traits and conduct problems is useful in identifying a specific subgroup of youth with a severe and persistent pattern of behavioral and psychosocial problems. Thirdly, research has suggested a specific etiological process underlying conduct problems in the subgroup of children with high levels of psychopathic traits, which have shown particular emotional, cognitive, behavioral and familial correlates (Salekin et al., 2009; White & Frick, 2010). In order to better understand this specific group, it is necessary to analyze it in comparison with other meaningful subgroups. Fourthly, most of the studies have used cross-sectional rather than longitudinal designs (Frick et al., 2005). Therefore, it would

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be necessary to examine the role of this specific group of children in predicting future conduct problems over longer periods of time (Lee, Salekin & Iselin, 2010). Finally, to our knowledge, all the studies in this area have been conducted in the Anglo-American context, which limits the generalization of their main conclusions. To carry out similar studies in different contexts would provide an international scope on the topic (Frick & Dickens, 2006).

The Current Study

Based on the foregoing, the present study has been proposed with the aim of going beyond some of the limitations identified in this field. Therefore, our main purpose has been to analyze, from a person-oriented perspective and in a Spanish population, the role of early manifested psychopathic-like traits in predicting behavioral and psychosocial problems in childhood and adolescence. To this end, this study was structured around two specific objectives. The first one aimed to examine whether a sample of Spanish children can be classified into meaningfully and homogeneous groups based on their initial levels of conduct problems and psychopathic-like traits. Given the results obtained on previous studies in this field (e.g., McLoughlin et al., 2010), we expected at least one problematic group, with high levels of conduct problems and psychopathic traits, and one control group, with low levels in both of them. Ideally, due to previous findings on this topic (e.g., Christian et al., 1997) we might also expect one externalizing group, characterized by high levels of conduct problems and low of psychopathic-like traits, as well a “psychopathic” group, with high levels of psychopathic-like traits but low in conduct problems. This group would be the key cluster in the analysis of the role of psychopathic-like traits in predicting future conduct problems (Rowe et al., 2010). After distinguishing specific subgroups of children, the second objective was to examine the meaningfulness of those groups,

analyzing their external validity. To this end, differences between the obtained groups in a set of external concurrent and prospective variables, measured over a six-year interval and traditionally related with psychopathic-like personality (Frick & McMahon, 2008), were checked. It was expected that the problematic group, high in both conduct problems and psychopathic traits, showed a severe and persistent pattern of behavioral and psychosocial disturbances from childhood to adolescence. Given the predictive power of psychopathic-like traits (e.g., López-Romero et al., 2011; Lynam et al., 2009), it also was expected that the psychopathic group, which has not developed conduct problems in the first assessment, also manifested high rates of psychosocial problems, especially during adolescence (McMahon et al., 2010).

Method

Participants

Data was collected from an initial sample (T1) of 192 Spanish boys (72.4%) and girls (27.6%) aged 6–11 years ($\bar{X} = 8.05$, $S_x = 1.49$). The family structure was generally composed of a nuclear family (81.15%), with two children in most cases (60%). They came from both urban and rural areas, and were studying in 34 elementary public schools in Galicia (NW Spain). The schools were located in a predominantly working-class community, and the academic level of participants' principal caregiver was basically elementary (61.2%). Under Spanish criteria, a large proportion of the sample would fit in lower or lower-middle SES (87.9%). In order to ensure that the sample would be representative of conduct problems at various levels, teacher-reported information was used, as is described in the Procedure section. The information was supplied by 173 parents and 113 teachers.

A follow-up study was conducted six years later (T2) on 138 of the 192 initial participants (68.8% boys) aged 12–17 years ($\bar{X} = 13.93$, $S_x = 13.95$). Therefore, there

was 28% attrition between the two data collections. The comparisons between those participants who completed both assessments and those who only completed the first assessment showed that there were no statistically significant differences in terms of age, $t(176) = 0.40, p > .05$, gender, $\chi^2(1) = 2.16, p > .05$, and initial levels of conduct problems, both reported by parents (CBCL), $t(170) = 1.12, p > .05$, and teachers (TRF), $t(107) = 1.30, p > .05$. The information was provided by 138 parents, 102 teachers and 131 children.

Assessment and Measures

Conduct problems-Externalizing behavior (T1-T2)

Child Behavioral Checklist (CBCL; Achenbach, 1991a). With the aim of assessing parent-reported Externalizing conduct problems, the CBCL categories belonging to the externalizing dimension were used: *Aggression* ($\alpha = .90$ and $.92$, in T1 and T2 respectively), which comprises 20 items (e.g. “Cruelty, bullying or meanness to others”); *Delinquency* ($\alpha = .65$ and $.76$), consisting of 13 items (e.g., “Sets fires”), and *Externalizing* ($\alpha = .91$ in both T1 and T2), which provides a global score of externalizing conduct problems from the Aggression and Delinquency scales. All of the items were scored on a scale 0 (*Not true*) to 2 (*Very true or often true*).

Teacher’s Report Form (TRF; Achenbach, 1991b). In order to assess behavioral problems in the academic field, we used the TRF externalizing scales of *Aggression* ($\alpha = .97$ and $.96$ in T1 and T2 respectively), which consists of 26 items (e.g., “Defiant, talks back to staff”), and *Delinquency* ($\alpha = .97$ and $.76$), which comprises 11 (e.g., “Steals”). Both of them were scored on a scale from 0 (*Not true*) to 2 (*Very true or often true*).

Psychopathic-like traits (T1–T2)

Modified Child Psychopathy Scale (mCPS; Lynam, 1997; Lynam & Gudonis, 2005; T1-T2). The parent version, consisting of 55 items in the form of *Yes* (1)–*No* (0) questions, was used. The items were classified into 14 dimensions that, in turn, were grouped into two global factors similar to those used in adult psychopathy studies (see Lynam et al., 2005). *Factor 1* (F1; $\alpha = .80$ and $.81$, in T1 and T2 respectively) encompassed the affective and interpersonal traits of Glibness, Untruthfulness, Manipulation, Lack of guilt, Poverty of affect, Callousness, Unreliability and Grandiosity (e.g., “Is he able to see how other people see?”). *Factor 2* (F2; $\alpha = .81$ and $.84$) encompassed traits from the behavioral dimensions of Boredom susceptibility, Parasitic lifestyle, Behavioral dyscontrol, Lack of planning, Impulsiveness and Failure to accept responsibility (e.g., “Does he take a lot and not give much in return?”). Finally, a *Global score* ($\alpha = .87$ and $.88$) was used as a general measure of child and youth psychopathic personality.

Antisocial Process Screening Device (APSD; Frick & Hare, 2001; T1-T2). The teachers’ version of the instrument, which assesses psychopathic traits via 20 items scored from 0 (*Not at all true*) to 2 (*Definitely true*), was used. In order to facilitate comparison with the mCPS, the two-factor structure found initially (Frick, O’Brien, Wootton & McBurnett, 1994) was selected. The *Callous/Unemotional* factor (CU; $\alpha = .76$ and $.69$ in T1 and T2 respectively) assesses the most salient affective and interpersonal traits (e.g., “Emotions seem shallow”), and the *Impulsivity/Conduct Problems* factor (I/CP; $\alpha = .83$ and $.81$) evaluates behavioral psychopathic traits (e.g., “Acts without thinking”).

Attention Deficit/Hyperactivity Disorder (AD/HD; T2)

Conners’ Parent Rating Scales-Revised (Conners, 1997; translated by Villegas). As a global measure of AD/HD symptoms, the *Attention-*

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Deficit/Hyperactivity Disorder scale (AD/HD; $\alpha = .95$) was used. It encompasses 12 parent-rated items (e.g., “He/she gets out of control, loses his/her patience, gets annoyed”), scored from 0 (*Never or rarely*) to 3 (*Always*).

Reactive and proactive aggression (T2)

Parent/Teacher Report of Reactive and Proactive Behaviors (Dodge & Coie, 1987). Aggressive behaviors were assessed through six items, three of which assess reactive aggression (*Reactive*; $\alpha = .81$ and $.87$ for parents’ and teachers’ versions respectively; e.g., “Yells at others when they have annoyed him/her”), and the remainder measures proactive aggression (*Proactive*; $\alpha = .86$ and $.83$; e.g., “Threatens and bullies someone”). Parents and teachers were asked to report their frequency on a scale from 1 (*Never true*) to 5 (*Almost always true*).

School adjustment (T2)

School adjustment scale. First, *School involvement* was assessed through six items (e.g., “In the morning I dislike having to go to the school”) self-rated in a four-point scale from 0 (*Completely disagree*) to 4 (*Completely agree*). The level of school *Absenteeism* was assessed with the question “Did you miss some classes without justified reason last month?” which should be answered on a five-point scale from 0 (*No, never*) to 4 (*Yes, 5 or more times*). Finally, *School performance* was assessed through the number of failed subjects, in a six-point scale from 0 (*None*) to (*More than four*). All the items were adapted from Berry, Phinney, Sam and Vedder (2006).

Social competence (T2)

Fast Track Social Competence Scale–Parent Version (Conduct Problems Prevention Research Group, 1991). This scale comprises 12 parent-rated items, scored on a scale from 0 (*Not at all*) to 4 (*Very well*). Six items measure *Prosocial/Communication Skills* ($\alpha = .87$; e.g., “Listens to other points of view”) and

1 the remaining six assess *Emotional Regulation Skills* ($\alpha = .86$; e.g., “Copes well with
2 failure”).

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5 Questionnaires without a previous Spanish version were adapted and translated
6 according to guidelines widely accepted for successful translation (Brislin, 1970).

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9 Therefore, one bilingual translator, who was culturally informed, individually blindly
10 translated the questionnaires from the original language (English) to the second
11 language (Spanish). Another bilingual person translated it back to the original language
12 (Spanish to English). Differences in the original and the back-translated versions were
13 discussed and solved by joint agreement of both translators.
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22 All the measures were used in previous studies that have evidenced their validity
23 in assessing the intended constructs (e.g., López-Romero et al., 2012; López-Romero,
24 Romero & González-Iglesias, 2011).

25 26 27 **Procedure**

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29 All procedures, assents/consents, and instruments were approved by the
30 Bioethics Committee at the University of Santiago de Compostela, the Regional
31 Government (Xunta de Galicia), and the Ministry of Science and Technology of the
32 Spanish Government.
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41 The initial study (T1) started by contact with the schools. At the beginning 54
42 schools from Galicia were invited to participate. They were contacted by mail and
43 phone and the objectives of the study were clearly explained. From these 54 schools, 34
44 agreed to participate. The participating schools were located in different cities and
45 villages of Galicia and were geographically representative. After obtaining parental
46 consent, case selection was facilitated by a teacher-reported questionnaire adapted from
47 the Teacher’s Report Form (Achenbach, 1991b) and expanded with a listing of various
48 behaviors established in accordance with the DSM-IV-TR criteria (APA, 2000) for
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Attention-Deficit/Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder and Conduct Disorder. This initial assessment was used as a screening procedure to select a convenience sample of children with significantly high and low levels of conduct problems, using the 50th percentile as a cut-off. It was completely confidential and selected children for the study were identified by their classroom class number. Finally, 87% of families and 63% of teachers from the initial selected sample agreed to participate in the study. The questionnaires were administered by qualified and trained psychologists, and completed by parents and teachers at the participants' schools. As regards parents' reports, questionnaires were completed individually by the person who attended the assessment meeting (generally children's mothers). When both parents were present, they completed one questionnaire together.

The follow-up study (T2) started by telephone contacts with the families and schools to inform them of the objectives of the second assessment. Once permission was obtained, qualified staff were again sent to the schools to have the parents, teachers and children complete the corresponding questionnaires.

Data Analyses

In order to classify the sample of children into distinctive and meaningfully groups, Hierarchical Cluster Analysis was conducted, using Complete Linkage as the clustering method and Squared Euclidean Distance as the measure to define the distance between clusters. With the aim of checking the differences between clusters and their external validity, they were compared on T1 and T2 external variables via Multivariate analysis of variance (MANOVA) and Analysis of variance (ANOVA). All the analyses were conducted in IBM SPSS Statistics 18.

Results¹

Clustering Children on the Basis of T1 Conduct Problems and Psychopathic-like Traits

As regards the first objective of the study, a person-centered approach was adopted to ascertain the number and characteristics of children who could be classified into meaningfully and homogeneous groups from their initial levels of conduct problems and psychopathic traits. To this end, hierarchical cluster analysis was conducted using as clustering variables the Global score of psychopathic-like traits (mCPS) and Externalizing conduct problems (CBCL), both reported by parents. Just parents' reports were used given that they provided the most readily comparable scores since the informants (parents) were the same on T1 and T2 (Obradović, Pardini, Long & Loeber, 2007); on the contrary, most of the teachers changed between two assessments and the number of missing were significantly higher. Two to six cluster solutions were explored, and the theoretically expected four cluster solution emerged as the most interpretable. As displayed in Figure 1, the first cluster, named "Primarily externalizing cluster" comprised 18.8% of the sample and was characterized by high levels of externalizing conduct problems (Mean-Z score = 0.47) and levels under the mean of psychopathic-like traits (-0.24). The second cluster, which comprised 19.6% of the sample, was named "Externalizing-psychopathic cluster" given its specific combination of high levels of conduct problems (1.61) and psychopathic traits (1.37). The third cluster was characterized by relatively low levels of conduct problems (0.18) and higher levels of psychopathic-like traits (0.66); it comprised 18.8% of the total sample and was named "Primarily psychopathic cluster". Finally, the fourth cluster represented 42.8% of the sample and was characterized as the "Non-problematic cluster" given its low

¹ Descriptive statistics and correlations among variables are available upon request to the corresponding author

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levels of conduct problems (-0.90) and psychopathic-like traits (-0.76). Clusters were not different in terms of age, neither in T1, $F(3, 134) = 0.72, p = .543$, nor T2, $F(3, 132) = 1.32, p = .271$.

[Insert Figure 1 around here]

Resulting clusters were compared on clustering variables through MANOVA. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices and multicollinearity, with no serious violation noted. Results of comparisons showed a statistically significant difference between clusters on the combined dependent variable: Wilks' Lambda (Λ) = .101, $F(6, 266) = 95.37, p < .001, \eta^2 = .68$. When results for dependent variables were considered separately, using a Bonferroni adjusted alpha level of .025, differences between clusters remained significant both in externalizing conduct problems, $F(3, 134) = 230.08, p < .001, \eta^2 = .84$, and psychopathic-like traits, $F(3, 134) = 118.24, p < .001, \eta^2 = .73$. Pairwise comparisons using the Tukey's *LSD* post hoc test confirmed significant differences between the four clusters on both clustering variables.

Validation of Clusters with External Criteria

With the aim of endowing the four identified clusters with external validity and examining their meaningfulness as distinctive groups, they were compared on T1 and T2 external variables traditionally related with conduct problems and psychopathic-like personality (Frick & McMahon, 2008). Variables used in the analyses were grouped by both content (e.g., conduct problems, aggression, or social competence) and informant (parents, teachers and self reported).

Comparisons on concurrent external validity correlates

[Insert Table 1 around here]

Differences between clusters on specific T1 conduct problems and psychopathic traits variables were explored, using both parents' and teachers' reports. As Table 1

1 displays, there were significant differences in T1 combined variables of conduct
2 problems and psychopathic-like traits. When results of dependent variables were
3 examined separately, differences between clusters remained significant, even after
4 including a Bonferroni adjusted alpha level ($p = .025$). Post hoc pairwise comparisons
5 clearly showed that the highest levels of aggression and delinquency reported by parents
6 were manifested by the Externalizing psychopathic cluster, with no significant
7 differences in delinquency between the Primarily externalizing and the Primarily
8 psychopathic cluster. There were no significant differences between the problematic
9 clusters (Primarily externalizing, Externalizing-psychopathic and Primarily
10 psychopathic) in aggression and delinquency reported by teachers. As regards
11 psychopathic-like traits reported by parents, the highest levels of both F1 and F2 were
12 clearly observed in the Externalizing psychopathic cluster, followed by the Primarily
13 psychopathic group. Those clusters also showed the highest levels of CU traits reported
14 by teachers, while there were no differences between the problematic clusters on I/CP.

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34 In sum, comparisons between clusters in T1 measures evidenced that the most
35 severe problematic pattern were manifested by the Externalizing-psychopathic cluster,
36 followed by the Primarily externalizing in conduct problems, and the Primarily
37 psychopathic cluster in psychopathic-like traits. Therefore, as we expected, the highest
38 levels of conduct problems and psychopathic-like traits were related with the
39 problematic profile during childhood and early adolescence.

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Comparisons on prospective external validity correlates

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In order to check whether the clusters maintain their differences in T2, they were first compared on clustering variables measured in T2 (Global scores of conduct problems-CBCL- and psychopathic traits-mCPS- both reported by parents). Results of those comparisons showed that the differences between clusters still remained

1 statistically significant: Wilks' Lambda (Λ) = .622, $F(6, 190) = 8.47, p < .001, \eta^2 = .21,$
 2 even when results for dependent variables were considered independently: $F(3, 96) =$
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 5 14.10, $p < .001, \eta^2 = .31$ for externalizing conduct problems, and $F(3, 97) = 17.76, p <$
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 7 .001, $\eta^2 = .36,$ for the global score of psychopathic-like traits. The highest levels of
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 11 conduct problems and psychopathic traits were again observed in the Externalizing
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 13 psychopathic cluster, followed by the Primarily psychopathic group. However, post hoc
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 15 pairwise comparisons between clusters did not show clear differences between all the
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 17 clusters on both variables.

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 19 With the aim of reinforce the external validity of the clusters, they were
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 21 compared on a wide range of external relevant variables measured in T2. Those results
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 23 are presented in Table 2.
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 26 [Insert Table 2 around here]
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 29 Results showed that there were statistically significant differences in all of the
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 31 combined variables. Regarding conduct problems reported by parents, differences
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 33 between clusters were significant, with the highest levels of aggression and delinquency
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 35 in the Externalizing-psychopathic and the Primarily psychopathic cluster. According to
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 37 teachers' reports, there were significant differences in aggression between the three
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 39 problematic clusters and the non problematic cluster, while there were no differences in
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 41 delinquency. The Externalizing psychopathic and the Primarily psychopathic clusters
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 43 showed the highest levels of psychopathic-like traits reported by parents six years later.
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 45 As regards psychopathic-like traits reported by teachers, the Non-problematic cluster
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 47 was significantly different from the three problematic clusters in CU traits and, from the
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 49 Externalizing-psychopathic and the Primarily psychopathic clusters in I/CP.
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 53 Comparisons on the global score of AD/HD symptoms also showed significant
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 55 differences, with the highest score in both the Primarily psychopathic and the
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1 Externalizing-psychopathic cluster. In spite of the results displayed in Table 2, which
2 shows significant differences in combined variables of aggressive behavior reported by
3 parents and teachers, only reactive aggressive behavior was significantly different when
4 results for dependent variables were considered independently. The highest levels of
5 reactive aggression were manifested by the Externalizing-psychopathic and the
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7 Primarily psychopathic, when it was reported by parents, while there were no
8 differences among the problematic clusters when reactive aggression was reported by
9 teachers. Similarly, there was a significant difference in the combined variable of
10 School adjustment, but considering results for dependent variables independently, the
11 only variable to reach statistical significance was the number of failed subjects,
12 showing a significant difference between the three problematic clusters and the Non-
13 problematic cluster. Finally, as regards social competence skills, the lowest scores of
14 social communication skills were observed in the Externalizing-psychopathic and the
15 Primarily psychopathic cluster. In terms of emotional regulation skills, the lowest levels
16 were manifested by the Externalizing-psychopathic cluster followed by the Primarily
17 psychopathic, showing a statistically significant difference with the Non-problematic
18 cluster, which manifested the highest levels.

19 To sum up, as was initially expected, early manifested conduct problems and
20 psychopathic-like traits were related with the most severe pattern of behavioral and
21 psychosocial disorders six years later. Similarly, early developed psychopathic-like
22 traits seemed to be predictive of future behavioral and psychosocial disturbances, even
23 when conduct problems had not manifested in T1.

24 Discussion

25 The inclusion of psychopathic-like traits in the study of early onset conduct
26 problems has been relevant in identifying a subgroup of youth with a specific high-risk

1 pattern for conduct problems and antisocial behavior (Forth & Book, 2010; Vaughn et
2 al., 2011). Previous research largely has focused on different characteristics of children
3 and adolescents with conduct problems who also manifested psychopathic-like traits,
4 but the analysis of their distinctive characteristics in comparison with other relevant
5 groups has been scarce (Frick et al., 2003). Therefore, the main purpose of the present
6 study was to examine, from a person-oriented perspective and in a Spanish population,
7 the role of psychopathic-like traits in predicting the most severe and persistent pattern of
8 behavioral and psychosocial problems. To this end, we analyzed whether early
9 manifested conduct problems and psychopathic-like traits allow the identification of
10 meaningfully and homogeneous groups of children. It was expected that these groups of
11 children differed in a wide range of concurrent and prospective external variables,
12 measured in a six-year period, and traditionally related with the psychopathic-like
13 personality (Frick & McMahon, 2008; White & Frick, 2010).

14 Results of cluster analysis conducted with global scores of externalizing conduct
15 problems and psychopathic-like traits, both reported by parents, clearly showed the four
16 theoretically expected clusters (e.g., Christian et al., 1997). The first one was Primarily
17 externalizing cluster, characterized by high levels of conduct problems and low levels of
18 psychopathic-like traits. It constitutes a well-known and consistently analyzed group of
19 children, extensively investigated in childhood and adolescence due to the long-lasting
20 implications related with child and youth conduct problems (Burt et al., 2011; Thomas,
21 2010). The second group was the Externalizing-psychopathic cluster, which grouped
22 children with high levels of conduct problems and psychopathic-like traits. Previous
23 research considered this group as a specific subgroup into the children with early-onset
24 conduct problems (Dandreaux & Frick, 2009), showing a particular pattern of severe
25 and persistent problematic behaviors, underlying factors and developmental trajectories

(Frick, 2009). They have also shown specific emotional, cognitive, personality and familial correlates similar to those that define adult psychopathy (Salekin et al., 2009; White & Frick, 2010). The third cluster was the Primarily psychopathic cluster, with children characterized by higher levels of psychopathic-like traits. This specific group of children has been less analyzed, despite its relevance in examining the predictive power of psychopathic-like traits in children that have not developed conduct disorders yet (Rowe et al., 2010). Finally, the fourth cluster grouped children with low levels of both conduct problems and psychopathic-like traits, which represented the Non-problematic or control cluster. All the groups were significantly different on clustering variables, both on T1 and T2, with the highest levels of aggression, delinquency and psychopathic-like traits on the Externalizing-psychopathic cluster. These results evidence the existence of distinctive groups of children in terms of conduct problems and psychopathic traits, providing relevant knowledge around specific patterns of youth's conduct disorders (Dandreaux & Frick, 2009).

In order to check the meaningfulness of these clusters as distinctive groups of children, endowing them with external validity, and examining the role of conduct problems and psychopathic traits in predicting future psychosocial disturbances, differences in a wide set of variables were tested. Comparisons between clusters on external variables measured in T1 showed that the four clusters were significantly different in aggression, delinquency and psychopathic-like traits reported by parents. As we expected, children with the highest levels of both conduct problems and psychopathic-like traits showed the most severe pattern of behavioral disturbances (López-Romero et al., 2011; Salekin et al., 2009). Clusters were also different on external variables reported by teachers, reinforcing the results obtained with parents' reports. However, differences in teacher reported variables were not significant between

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all the clusters, but the observed tendencies showed that the highest levels of aggression and CU were manifested by the Externalizing-psychopathic cluster, while the highest of Delinquency and I/CP were observed in the Primarily externalizing.

Comparisons conducted on T2 measures also showed that there were significant differences in all of the combined variables, even when they were considered separately. Although post hoc comparisons did not show specific significant differences between all the clusters, the general pattern showed that the Externalizing-psychopathic was the most problematic and high-risk group (Christian et al., 1997; Rowe et al., 2010). As was observed in previous literature, this group showed the highest levels of adolescent externalizing behavior, psychopathic-like traits, AD/HD symptoms, aggression and the lowest of academic achievement and social competence (Marsee & Frick, 2010; McMahon et al., 2010; Svecke & Kosson, 2010; Viding et al., 2009). As we expected, the second highest rate of psychosocial disturbances was observed on the Primarily psychopathic cluster. This represents a relevant change from the pattern observed in T1 comparisons, where the second highest rate of conduct problems and psychopathic-like traits were observed in the Primarily externalizing group. This new tendency reinforces the relevance of psychopathic like traits as a key factor in identifying high-risk problematic children even when conduct problems have not developed in early childhood (Rowe et al., 2010). However, more research is needed on children with psychopathic-like traits who do not manifest significant conduct problems, to more clearly determine the risk level for adolescent behavioral and psychosocial disturbances (Frick et al., 2005).

On the whole, results of the present study showed that the combination of high levels of conduct problems and psychopathic-like traits could help to delimit a problematic subgroup of children, with a specific pattern of behavioral and psychosocial

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disturbances during adolescence (e.g., McLoughlin et al., 2010). This specific and distinctive cluster showed a number of relevant differences from the other clusters, providing evidence of external validation (Lee et al., 2010), which is relevant in order to consider the distinctiveness and meaningfulness of the outlined groups. In general terms, psychopathic-like traits have shown their relevance as a key risk factor, which have facilitated the understanding of conduct disorders and antisocial behavior, and have reduced the heterogeneity characteristic on child and adolescent disturbances (Dandreaux & Frick, 2009; Salekin et al., 2009).

Strengths and limitations

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The current study intended to analyze the role of conduct problems and psychopathic-like traits in predicting behavioral and psychosocial disturbances from a person-oriented perspective. That is, we tried to classify a sample of children into distinctive, meaningfully and homogeneous subgroups from their initial levels of conduct problems and psychopathic traits, analyzing differences between groups, and not just examining the role of psychopathic-like traits in relation to conduct problems (Forth & Book, 2010). Secondly, and following some classical and recent proposals, psychopathic-like personality has been treated as a whole, considering it as a constellation of affective, interpersonal and behavioral traits (e.g., Cooke and Michie, 2001; Andershed, 2010), and not just focusing on one of its dimensions (i.e., CU traits; e.g., Frick et al., 2003). Thirdly, and as long as we know, this is the first study that has analyzed the external validity of distinctive groups of children, with different levels of conduct problems and psychopathic-like traits, in a six year period. Thereby, some relevant connections between early manifested conduct problems and psychopathic-like traits and severe disturbances during adolescence can be established. Fourthly, in order to examine the external validity of the identified groups, a wide range of variables

1 traditionally related with psychosocial adjustment in childhood and adolescence were
2 analyzed (e.g., Frick & McMahon, 2008), some not even analyzed in previous studies
3 on this specific topic, like social competence skills or school involvement measures,
4 two aspects extremely relevant to adolescents' psychosocial well-being (e.g.,
5 Holopainen, Lappalainen, Juntilla & Savolainen, 2012; Wentzel, 2003). Finally, to our
6 knowledge, this is the first study with its specific characteristics (e.g., objectives,
7 person-oriented perspective, external criteria) conducted in a Spanish population. It
8 provides an international dimension on the topic beyond the US-based research, and
9 supports the contention that psychopathic-like traits are relevant for understanding the
10 development of severe conduct problems across cultures (Frick & Dickens, 2006). This
11 will help to generalize some of the conclusions outlined in previous studies (e.g., Frick
12 et al., 2003; McLoughlin et al., 2010).

28 Beyond the contributions of the current study, there are a number of limitations
29 that should be noted and considered in future research. Firstly, the study of
30 psychopathic-like personality in childhood and adolescence entails some controversies,
31 especially given the negative connotations related with psychopathic traits (e.g.,
32 callousness, manipulation, treatment resistance; Edens, Skeen, Cruise & Cauffman,
33 2001). However, there is an extensive body of research that has evidenced that
34 psychopathic traits can be manifested at early developmental stages (Salekin et al.,
35 2009), showing a strong relationship with concurrent and future behavioral and
36 psychosocial problems (Forth & Book, 2010; Svecke & Kosson, 2010). Although some
37 authors have noted that many of those traits are to some extent normative and temporary
38 in childhood and adolescence (Edens et al., 2001), differences between normative and
39 psychopathic traits have been considered a matter of grade (Salekin et al., 2009),
40 evidencing their stability over the different developmental stages (see Andershed,
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2010). Moreover, given that personality traits are less stable in childhood and adolescence than in adulthood (McCrae et al., 2002), the study of psychopathic-like traits at early stages allows the identification of developmental periods where psychopathic traits are more prone to change (Pardini, Lochman & Powell, 2007). Secondly, clusters were created using just parent-reported measures of conduct problems and psychopathic-like traits, increasing the observed and expected informant discrepancies. Just parental reports were used since the informants were the same in the two assessment points, while most of the teachers changed between T1 and T2 (Obradović et al., 2007), increasing the number of missing data. However, clusters created from parental reports were different even on measures reported by teachers, which provide them more distinctiveness and external validity. Future research should consider the use of combined measures for teachers and parents' reports in order to provide the most accurate assessment of children's personality traits and behaviors (e.g., Frick et al., 2005). Similarly, it would be necessary to include methods to measure informant discrepancies, reducing their negative implications on the assessment, classification, and childhood treatment (De los Reyes & Kazdin, 2005). Thirdly, cluster size and the low rates of conduct problems and psychopathic-like traits in the whole sample may have reduced further the power to detect important differences across groups (Frick et al., 2005), especially between the Primarily externalizing and the Primarily psychopathic clusters. More research is needed to examine the observed tendencies on differences among those clusters, which would give us more information about the specific role of early psychopathic-like traits in predicting future conduct problems. Fourthly, previous studies have focused on CU traits (e.g., Frick et al., 2003), but it is not clear which dimension or dimensions of the construct might be the most important in predicting the most severe and persistent patterns of future conduct

1 disorders (Andershed, 2010; Cooke & Michie, 2001). Furthermore, although the mCPS
2 has been developed with the aim of analyze just the personality traits of psychopathic-
3 like personality, ignoring behaviors overlapping with conduct problems (Lynam &
4 Gudonis, 2005), future research should consider the controversies around the overlap
5 between conduct problems and behavioral aspects of psychopathy, as well as the study
6 of the core dimensions of psychopathic-like personality (e.g., Skeem & Cooke, 2010).
7 Finally, results of the present study reported some evidence about the predictive power
8 of psychopathic-like traits for future conduct disorders, but it would be necessary to
9 analyze the specific developmental trajectories of each cluster to better understand the
10 early development of conduct problems and psychopathic-like personality across
11 childhood and adolescence as well as the etiological process underling (White & Frick,
12 2010).

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29 In the light of those limitations, the present study supports the potential utility of
30 conduct problems and psychopathic-like traits in identifying distinctive and meaningful
31 groups of children, reducing the heterogeneity of youth conduct problems (Burt et al.,
32 2011; Dandreaux & Frick, 2009). Given the importance of conduct problems as one of
33 the most common adolescent disturbances, their long-lasting consequences (Vaughn et
34 al., 2011), and the associated functional and psychosocial impairment (Fergusson et al.,
35 2005), examining in detail all the factors related with conduct disorders, and ultimately
36 with adolescent psychosocial well-being, gains extreme relevance (Mason et al., 2007;
37 Thomas, 2010). In this case, high levels of psychopathic-like traits, manifested with
38 early-onset conduct problems or even without them, seem to be a good predictor in
39 identifying the highest risk adolescent group, which manifested more externalizing
40 conduct problems, aggression, AD/HD symptoms, as well as lower levels of social
41 competence or school adjustment (e.g., López-Romero et al., 2011; Marsee & Frick,
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2010; McLoughlin et al., 2011). Future research will help to better understand differences between identified groups, going deeper into their specific characteristics, underlying factors and developmental trajectories (White & Frick, 2010). These advances will improve our knowledge on youths' conduct problems and antisocial behavior, and will help in developing and promoting new advances in terms of prevention and treatment (Salekin et al., 2009).

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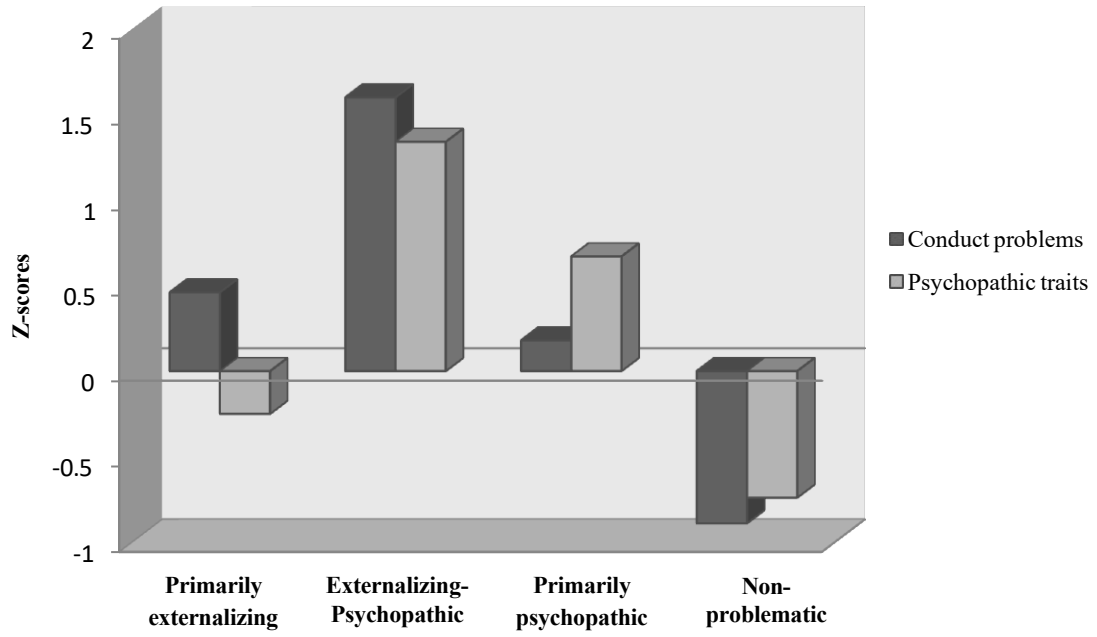


Figure 1. Z-score profiles in conduct problems and psychopathic traits for the four-cluster solution

Table 1

Comparisons between clusters on TI measures

	Primarily externalizing cluster (n = 26)	Externalizing- Psychopathic cluster (n = 27)	Primarily psychopathic cluster (n = 26)	Non-problematic cluster (n = 59)	Λ	$F(df)$	p	η^2
	<i>Mean-Z (SD)</i>	<i>Mean-Z (SD)</i>	<i>Mean-Z (SD)</i>	<i>Mean-Z (SD)</i>				
Conduct problems								
CBCL (PR)					.157	67.22 (6, 264)	.000	.60
Delinquency	0.32 (0.89) _b	1.33 (1.14) _c	0.04 (0.59) _b	-0.68 (0.37) _a		49.51 (3, 133)	.000	.53
Aggression	0.48 (0.37) _c	1.57 (0.51) _d	0.22 (0.42) _b	-0.90 (1.04) _a		215.52 (3, 133)	.000	.83
TRF (TR)					.612	6.95 (6, 150)	.000	.22
Delinquency	0.62 (0.98) _c	0.31 (1.08) _c	0.03 (0.93) _b	-0.71 (0.39) _a		8.73 (3, 76)	.000	.26
Aggression	0.39 (0.98) _b	0.56 (0.77) _b	0.26 (0.97) _b	-0.79 (0.60) _a		12.03 (3, 76)	.000	.32
Psychopathic traits								
mCPS (PR)					.304	36.10 (6, 266)	.000	.45
F1	-0.24 (0.65) _b	1.31 (0.85) _d	0.56 (0.53) _c	-0.69 (0.50) _a		73.79 (3, 134)	.000	.62
F2	-0.13 (0.59) _b	1.16 (0.52) _d	0.68 (0.51) _c	-0.72 (0.75) _a		64.92 (3, 134)	.000	.59
APSD (TR)					.671	5.08 (6, 138)	.000	.18
CU	-0.14 (0.74) _{ab}	0.49 (1.02) _b	0.31 (0.88) _b	-0.40 (0.99) _a		3.77 (3, 70)	.015	.14
I/CP	0.45 (1.10) _b	0.34 (0.82) _b	0.11 (0.91) _b	-0.76 (0.62) _a		8.30 (3, 70)	.000	.26

Note. PR = Parent reported; TR = Teacher reported; CBCL = Child Behavioral Checklist; TRF = Teacher's Report Form; mCPS = Modified Child Psychopathy Scale; F1 = Factor 1: emotional/interpersonal traits ; F2 = Factor 2 = Behavioral traits; APSD = Antisocial Process Screening Device; CU = Callous and Unemotional traits; I/CP =

Impulsivity/Conduct problems; n = Number of cases on each group; $Mean-Z$ = Mean standardized score; SD = Standard deviation; Λ = Wilks's Lambda distribution; F = F distribution; df = Degrees of freedom; p = Probability value; η^2 = Eta squared.

Probability values (p) in bold are statistically significantly different after apply the Bonferroni adjustment. Means with different subscripts (a, b, c) were significantly different ($p \leq .05$) in pairwise comparisons using Tukey *LSD* post-hoc test.

Table 2

Comparisons between clusters on T2 measures

	Primarily externalizing cluster	Externalizing- Psychopathic cluster	Primarily psychopathic cluster	Non-problematic cluster	<i>A</i>	<i>F(df)</i>	<i>p</i>	η^2
	<i>Mean-Z (SD)</i>	<i>Mean-Z (SD)</i>	<i>Mean-Z (SD)</i>	<i>Mean-Z (SD)</i>				
Conduct problems								
CBCL (PR)					.645	7.85 (6, 192)	.000	.20
Delinquency	0.17 (1.06) _b	0.74 (0.90) _b	0.40 (1.37) _b	-0.43 (0.63) _a		8.21 (3, 97)	.000	.20
Aggression	0.18 (0.91) _b	0.99 (1.06) _c	0.70 (1.12) _c	-0.51 (0.59) _a		17.40 (3, 97)	.000	.35
TRF (TR)					.685	3.74 (6, 108)	.002	.17
Delinquency	0.45 (1.19) _b	0.62 (1.16) _b	0.19 (0.91) _{ab}	-0.34 (0.91) _a		3.06 (3, 55)	.036	.14
Aggression	0.61 (1.20) _b	0.72 (0.89) _b	0.68 (1.19) _b	-0.42 (0.64) _a		7.15 (3, 55)	.001	.28
Psychopathic traits								
mCPS (PR)					.619	8.78 (6, 194)	.000	.21
F1	-0.06 (1.07) _a	0.79 (1.07) _b	0.54 (1.14) _b	-0.49 (0.61) _a		11.48 (3, 98)	.000	.26
F2	0.01 (0.94) _b	0.91 (0.89) _c	0.71 (0.75) _c	-0.52 (0.72) _a		19.76 (3, 98)	.000	.38
APSD (TR)					.703	3.53 (6, 110)	.003	.16
CU	0.70 (1.09) _b	0.63 (1.09) _b	0.51 (0.70) _b	-0.49 (0.80) _a		7.53 (3, 56)	.000	.29
I/CP	0.53 (0.99) _b	0.63 (1.09) _b	0.50 (0.70) _b	-0.49 (0.80) _a		3.74 (3, 56)	.000	.19
AD/HD Symptoms								

	Primarily externalizing cluster	Externalizing- Psychopathic cluster	Primarily psychopathic cluster	Non-problematic cluster				
	<i>Mean-Z (SD)</i>	<i>Mean-Z (SD)</i>	<i>Mean-Z (SD)</i>	<i>Mean-Z (SD)</i>	<i>Λ</i>	<i>F(df)</i>	<i>p</i>	<i>η²</i>
Conners-Global score (PR)	0.17 (0.21) _b	0.72 (0.22) _{bc}	0.77 (0.19) _c	-0.53 (0.13) _a		14.64 (3, 96)	.000	.31
Aggressive behavior (PR)					.778	4.33 (6, 194)	.000	.12
Reactive	0.09 (0.81) _{ab}	0.77 (1.28) _c	0.46 (1.11) _{bc}	-0.40 (0.65) _a		8.94 (3, 98)	.000	.22
Proactive	0.07 (0.70) _{ab}	0.23 (1.13) _b	0.24 (1.45) _b	-0.29 (0.32) _a		2.55 (3, 98)	.060	.07
Aggressive behavior (TR)					.763	3.19 (6, 132)	.006	.13
Reactive	0.55 (0.97) _b	0.50 (0.94) _b	0.82 (1.24) _b	-0.39 (0.89) _a		6.48 (3, 67)	.001	.23
Proactive	0.23 (1.14) _a	0.25 (1.22) _a	0.24 (0.99) _a	-0.19 (0.92) _a		1.03 (3, 67)	.386	.04
School adjustment (SR)					.764	2.69 (9, 207.18)	.006	.09
School involvement	-0.09 (1.25) _a	-0.36 (0.89) _a	0.03 (1.05) _a	0.17 (0.99) _a		0.98 (3, 87)	.405	.03
Absenteeism	0.18 (1.35) _b	0.13 (0.47) _{ab}	-0.15 (0.42) _a	-0.22 (0.26) _a		2.19 (3, 87)	.219	.05
N° fails	0.33 (1.10) _b	0.69 (0.94) _b	0.36 (0.98) _b	-0.41 (0.80) _a		7.16 (3, 87)	.000	.20
Social competence (PR)					.806	3.67 (6, 194)	.002	.10
Social/Commun.	0.06 (0.73) _{bc}	-0.73 (0.92) _a	-0.30 (1.23) _{ab}	0.36 (0.83) _c		6.86 (3, 98)	.000	.17
Emotional Reg.	-0.09 (1.04) _b	-0.70 (1.05) _a	-0.26 (0.92) _{ab}	0.34 (0.81) _b		6.08 (3, 98)	.001	.16

Note. PR = Parent reported; TR = Teacher reported; SR= Self-reported; CBCL = Child Behavioral Checklist; TRF = Teacher's Report Form; mCPS = Modified Child Psychopathy Scale; F1 = Factor 1: emotional/interpersonal traits ; F2 = Factor 2 = Behavioral traits; APSD = Antisocial Process Screening Device; CU = Callous and

Unemotional traits; I/CP = Impulsivity/Conduct problems; n = Number of cases on each group; $Mean-Z$ = Mean standardized score; SD = Standard deviation; Λ = Wilks's Lambda distribution; F = F distribution; df = Degrees of freedom; p = Probability value; η^2 = Eta squared.

Probability values (p) in bold are significantly different after apply the Bonferroni adjustment. Means with different subscripts (a, b, c) were significantly different ($p \leq .05$) in pairwise comparisons using Tukey *LSD* post-hoc test.

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Conflict of interest

The authors declare that they have no conflict of interest.