

Article

Gender Differences in Children's Conduct Problems: A Multigroup Analysis of Latent Profiles Based on Temperament and Psychopathic Traits

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ABSTRACT

Background: Despite the high prevalence of conduct problems in children, and their social and health impact, little is known about gender differences in their characteristics, determinants and implications. This three-year longitudinal study explored the diversity of individual trait configurations in children with conduct problems, assessing whether 1) the same profiles can be identified in boys and girls and, 2) the predictors and outcomes of these profiles are invariant across genders. **Method:** A multigroup analysis of latent profiles based on temperamental and psychopathic traits was performed on a sample of 401 young children (50.87% girls) with high scores in conduct problems. **Results:** Both the number of profiles and the means and variances of compositional variables were similar across genders, but the distributions were different. Four profiles were identified, and girls belonged to the least problematic group more frequently. While the predictors were invariant across genders, outcomes were not. **Conclusions:** This study contributes to the literature on heterogeneity in conduct problems by identifying specific constellations of traits in both boys and girls and shows the importance of considering gender in understanding the progression of conduct problems.

Diferencias de Género en Problemas de Conducta en la Niñez: un Análisis Multigrupo de Perfiles Latentes Basados en Rasgos Temperamentales y Psicopáticos

RESUMEN

Antecedentes: Pese a la alta prevalencia de los problemas de conducta en niños y de su relevancia sociosanitaria, se sabe poco sobre las diferencias de género en sus características, determinantes e implicaciones. Este estudio longitudinal de tres años explora la diversidad de configuraciones de rasgos individuales en niños con problemas de conducta, evaluando 1) si pueden identificarse los mismos perfiles en niños y niñas y, 2) si los predictores y consecuencias de estos perfiles permanecen invariantes entre géneros. **Método:** Se realizó un análisis multigrupo de perfiles latentes basados en rasgos temperamentales y psicopáticos en 401 participantes (50,87% niñas) con altos problemas de conducta. **Resultados:** El número de perfiles y las medias y varianzas de las variables composicionales fueron similares entre géneros, pero las distribuciones fueron diferentes. Se identificaron cuatro perfiles, y las niñas pertenecían con mayor frecuencia al grupo menos problemático. Mientras que los predictores permanecieron invariantes entre géneros, las consecuencias de dichos perfiles no. **Conclusiones:** Este estudio contribuye a la literatura sobre la heterogeneidad en los problemas de conducta mediante la identificación de constelaciones específicas de rasgos en niños y en niñas, y muestra la relevancia de atender al género para entender el desarrollo de los problemas de conducta.

Palabras clave:

Problemas de conducta
Perfiles
Temperamento
Rasgos psicopáticos
Género

Conduct Problems [CP] refer to a pattern of behaviors that include aggression, destruction, defiance, temper tantrums, violation of the rights of others and of age-appropriate rules (American Psychiatric Association, 2013). CP usually appear in childhood or adolescence and when they become clinically relevant as in the case of oppositional defiant disorder [ODD] or conduct disorder [CD] the prevalence is estimated to be 5-14% in school-aged children (Fairchild et al., 2019; Ghandour et al., 2019; Merikangas et al., 2009). Therefore, CP have a negative impact on the school context and represent one of the main reasons for seeking clinical assistance (Lau et al., 2023; Navarro-Pardo et al., 2012).

Previous research has shown that the prevalence of CP is higher in boys, but gender differences in manifestations and determinants of CP have received little attention (Gutman et al., 2018), particularly at early childhood. However, it has been suggested that CP in girls are associated with greater comorbidities and global impairment, thus reflecting the so-called "gender paradox" (Konrad et al., 2021).

Also, a wide body of research has linked a variety of factors to CP, including family variables such as low Socioeconomic Status [SES] (Piotrowska et al., 2015), parenting stress (Barroso et al., 2018) or parenting practices (Pinquart, 2017), and extra-familial variables like community violence or association with deviant peers (Jennings et al., 2018). But, among the diversity of factors involved, temperament and/or personality traits constitute a major research field (Waller et al., 2017).

In this sense, two primary branches of work can be identified: One of these, centred on the variables of Rothbart's temperament model (Rothbart & Derryberry, 1981), has repeatedly found that negative affect and low effortful control are linked to CP (King et al., 2013). The other main area of interest stems from research on adult antisocial personality and focuses on so-called psychopathic traits: Callous-Unemotional [CU], Grandiose-Deceitful [GD], and Impulsive-Need for Stimulation [INS], which have all been shown to be predictors of greater severity and persistence of CP (Salekin, 2017). Nevertheless, there is a notable lack of understanding as to whether individual factors associated with CP differ in boys and girls (Brennan & Shaw, 2013). Additionally, previous studies have typically been variable-centred, trying to depict the characteristics that are associated to the presence, frequency, intensity, or severity of CP (eg., Abulizi et al., 2017; Johnson et al., 2017). However, data-driven, person-centred studies, are now attracting interest, since they allow the study of heterogeneity in children with CP and, at the same time, they improve the ecological validity of child classifications (Smaragdi et al., 2020).

Certain studies have been carried out with a Latent Class Analysis [LCA] (in the case of discrete variables) or Latent Profile Analysis [LPA] (with continuous variables) approach to CP in children and adolescents. Some of them have focused their classifications on the context where CP are produced (e.g., Bulotsky-Shearer et al., 2012; Fergusson et al., 2009; McDermott et al., 2022). Other studies have investigated on the characteristics of CP like aggression, irritability, or oppositional behaviour (Bolhuis et al., 2017). Finally, other researchers have focused on the severity of the behaviour (e.g., Smaragdi et al., 2020; Toupin et al., 2016). It should be noted that gender differences have not

been comprehensively examined in most of them. Only a few of them indicate that girls are less likely to belong to the most problematic profiles (Bulotsky-Shearer et al., 2012; McDermott et al., 2022; Toupin et al., 2016). Nevertheless, Smaragdi et al. (2020) have tried to identify different profiles across genders in the same study, finding two profiles in girls (i.e., mild, and severe) and four in boys (i.e., rule breaking, aggressive, mild, and severe). While there are studies that have classified adolescents with CP according to their temperamental variables (e.g., Wilson et al., 2019), to our knowledge no data-driven research has been conducted that has classified young children with CP according to their temperamental and psychopathic profiles. It is on these lines that the present article will address the variety of profiles that can be found in children with CP when temperamental variables and psychopathic traits are considered. Also, it will focus on possible gender similarities, following Morin et al. (2016) approach. Longitudinal data collected over three years is used to examine the gender-based similarity of trait profiles, plus the role of traditionally relevant predictors in the CP domain, such as family characteristics (i.e., SES, parental stress) and child characteristics (i.e., fearlessness, Limited Prosocial Emotions [LPE], emotional regulation). Finally, the relations of the different profiles with outcomes such as later CP, emotional symptoms, and prosocial behaviour will be considered.

In general, this research seeks to shed light on the diversity of individual trait configurations in young children with CP, analysing whether the same profiles can be identified in boys and girls and whether the predictors and outcomes of such profiles are invariant across genders.

Given the previous research on psychopathic traits, one might expect to identify a psychopathic profile more prevalent in boys that might be linked to fearlessness and lower levels of prosocial behavior later in life (Lykken, 1995; Viding & McCrory, 2019). However, the lack of previous research prevents us from anticipating the differences that might be found across genders in the predictors and outcomes of the different profiles.

Method

Participants

The present study uses data from 401 young children with CP who are participants in the long-term ELISA Project (*Estudio Longitudinal para una Infancia Saludable*). The initial ELISA sample consisted of 2,467 children, who were followed between 2016 and 2019. For this study, the participants were 204 girls (50.87%) and 197 boys (49.13%), all of whom scored one standard deviation above the mean of their reference group (girls or boys) on the Conduct Problem Scale based on DSM-IV (Colins et al., 2014), as reported by parents at T2 (2017-2018). Data from T1 (2016-2017) were considered for the study of predictors, and from T3 (2018-2019) for the examination of outcomes. The level of attrition of this subsample between T2-T3 was 15.46%. Comparisons between children who participated in all waves and children who missed one follow-up revealed no statistically significant differences in terms of age $t(397) = -0.33, p = .746$ or gender $\chi^2(1) = 0.16, p = .687$. In terms of SES, statistically significant differences were found $t(334) = -3.21, p < .001$ and

children who participated in all waves showed higher levels, a result consistently found in previous longitudinal research (Young et al., 2006). Children's ages ranged from 3-6 at T1 ($M = 4.16$, $SD = 0.93$), 3-7 at T2 ($M = 4.94$, $SD = 1.01$), and 4-8 at T3 ($M = 5.89$, $SD = 1.11$). For details see López-Romero et al. (2022).

Instruments

For Selection of Children with High CP Scores (T2)

CP were measured using the Conduct Problem Scale based on DSM-IV criteria for ODD and CD (Colins et al., 2014). This scale consists of 10 items (e.g., "Threatens others"; $\alpha = .86$) with a 5-point Likert response scale ranging from 1 (*never*) to 5 (*very often*).

For Profiling According to Temperamental and Psychopathic Variables (T2)

Temperamental and psychopathic variables at T2 were used to classify subjects into different latent profiles. The Behaviour Questionnaire Very Short Form [CBQ-VSF] (Putnam & Rothbart, 2006) was used to measure three temperamental traits (i.e., surgency/extraversion, negative affect, and effortful control). The CBQ-VS consists of 36 items (12 for each dimension) with a 7-point Likert scale ranging from 0 (*totally false*) to 7 (*totally true*). Some examples of their items are: "Seems to be comfortable with almost everyone" (surgency/extraversion; $\alpha = .70$), "It is difficult to calm down when upset" (negative affect; $\alpha = .68$) and "Prefers quiet activities over active games" (effortful control; $\alpha = .66$). The Child Problematic Traits Inventory [CPTI] (Colins et al., 2014) was used to measure psychopathic traits by means of 28 items with a 4-point Likert scale ranging from 1 (*does not apply at all*) to 4 (*applies very well*). Eight items intend to measure GD (e.g., "Seems to lie more than other children in the same age"; $\alpha = .84$), 10 items intend to measure CU (e.g., "Does not become upset when others are being hurt"; $\alpha = .89$) and 10 items intend to measure INS (e.g., "Seems to get bored quickly"; $\alpha = .76$).

For Predicting Membership to the Different Profiles (T1)

Family and child characteristics at T1 were used as predictors. SES was assessed using *ad hoc* items regarding family studies, family income and family financial solvency (e.g., "What is your perception of the household's monthly income level?"). Thus, a mean of each of the Z-transformed variables was computed to represent an SES composite. Parental stress was measured through a 9-item *ad hoc* scale based on the Parental Stress Scale [PSS] (Berry & Jones, 1995) (e.g., "Taking care of my child exhausts me a lot"; $\alpha = .76$) with a 5-point Likert ranging from 1 (*never*) to 5 (*always*). The level of child's fearlessness was assessed by means of the Fearlessness Scale (Colins et al., 2014). This scale consists of six items (e.g., "Does not seem to be afraid of anything"; $\alpha = .87$) with a 4-point Likert response scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Four items corresponding to the LPE specifier were used on a 4-point Likert scale ranging from 0 (*totally disagree*) to 3 (*totally agree*) (Colins et al., 2021) (e.g., "Seems not to feel bad or guilty when doing something bad or wrong"; $\alpha = .64$). Emotion regulation was examined through the emotional regulation subscale of the Fast Track Social

Competence Scale (Conduct Problems Prevention Research Group, 1992). This subscale consists of six items (e.g., "Cope well with rejection"; $\alpha = .73$) with a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*completely*).

For Measurement of Outcomes (T3)

The characteristics of children at T3 were used as outcomes. CP were measured using the Conduct Problem Scale (Colins et al., 2014) ($\alpha = .85$). For details see the section "*For Selection of Children with High CP Scores (T2)*". Emotional symptoms and prosocial behaviour were measured using the Strengths and Difficulties Questionnaire [SDQ] (Goodman, 1997). The emotional symptoms subscale consists of five items ($\alpha = .67$) as well as the subscale of prosocial behaviour ($\alpha = .72$). The SDQ has a 3-point Likert response scale ranging from 0 (*not true*) to 2 (*certainly true*).

All measures were parent-reported. See Table S1 of the supplementary material for details.

Procedure

The study was approved by the Bioethics Committee of the University of Santiago de Compostela and the Spanish Ministry of Economy and Competitiveness. Initially, 126 public, charter and private schools were approached to collaborate in this study. Of these, 72 schools agreed to participate. Subsequently, families were invited to participate in the study and approximately 25-50% families per school agreed to participate (2,467 children). The teachers oversaw delivering and collecting the questionnaires from the families. The data collection was conducted under conditions of confidentiality, after written parental consent and assent of the participants had been obtained. Parents were given one month to complete each questionnaire. Reminders were sent via email. Families did not receive any compensation for their participation. Despite the wide variety of schools, the system for administering the questionnaires was standardized as far as possible, from the order of presentation of the scales to the place and time of the academic year in which they were administered. See <http://www.personalitydevelopmentcollaborative.org/project-page-elisa/> for details.

Data Analysis

Analyses were carried out using MPlus 7 and IBM SPSS Statistics 25.

To create profiles and analyse similarities across genders, LPA and multi-group similarity analyses were performed with MPlus following the six-step process proposed by Morin et al. (2016): configural, structural, dispersion, distributional, predictive, and explanatory similarity. First, two separate LPAs were conducted: one for girls and one for boys, to test whether the same number of profiles were obtained for the two genders. In both cases the optimal solution was four, and thus we proceeded to estimate a configuration similarity model to be used as a baseline for the following steps. The structural, dispersion and distribution similarity models were then estimated, and each model (fit indices) was compared to its predecessor. To estimate these models, equality constraints were imposed across genders on 1)

within-profile means of the variables for the structural similarity model; 2) within-profile means and variances for the dispersion similarity model; and 3) within the profile means and variances of the variables and on the relative profile size to estimate the distributional similarity model. Finally, predictors and outcomes were added and studied to see whether they behaved in similar ways in both genders. This was done using the start values of the best-fit model (i.e., dispersion similarity model). Thus, two models were run for each set of predictors and outcomes: one in which the effects of the predictors/outcomes were constrained for both genders and another in which these effects were estimated freely across genders.

In deciding which model was the best fit in each case, previously-established fit criteria were considered (Hickendorff et al., 2018; McDermott et al., 2022): (a) lower values of Akaike Information Criterion [AIC], Bayesian Information Criterion [BIC], and Sample-Size Adjusted BIC [SSABIC], (b) higher values of entropy, (c) statistically significant values of Lo-Mendell-Rubin [LMR], Lo-Mendell-Rubin adjusted [LMRt], and Bootstrapped Likelihood Ratio Test [BLRT], and (d) theoretically significant profiles representing at least $\geq 5\%$ of the full sample.

Multinomial Logistic Regressions [MLR] were conducted to examine the predictive relations between demographic, family, and child characteristics (at T1) and membership of each profile. ANOVA analyses and *post-hoc* comparisons were performed to fully describe the differences between profiles (at T2) and to examine differences in outcomes between profiles and across genders (at T3).

As for management of missing cases, the profiling analyses used the full information maximum likelihood estimator and listwise deletion was used in the other analyses.

Results

For details of the sample descriptives see Table S2 of the supplementary material.

Cross-Gender Similarity (Structural, Dispersion, and Distributional) of the Profiles

The first step proposed by Morin et al. (2016) is to assess the configural similarity of profiles. In the girls' subsample, most indices decreased as profiles were added (AIC, BIC, SSABIC). The BLRT was not helpful, and the LMRt suggested

that increasing profiles should stop at the three-profile solution. However, as the SSABIC value decreased, the four-profile solution was chosen, in that it also had an acceptable degree of entropy. In the boys' subsample, most of the indices also decreased as profiles were added (AIC, BIC, SSABIC). In this case, the best solution was also four profiles, because the SSABIC value decreased, the LMRt indicated that the model was better than the previous one, and entropy increased. These results meant that the four-profile solution for the two samples could be retained in support of the configural similarity across genders. The fit indices of the LPA separated by gender performed in this study can be seen in Table 1.

A multi-group four-profile model was then estimated for both genders. With this first configural similarity model, the structural, dispersion and distribution similarity models were estimated and compared to the previous ones. The dispersion similarity model was retained for the following steps, since it was the one that obtained the best fit indices (lower BIC than the configurational model and lower AIC, BIC and SABBIC than the other models). This model obtained a reasonable entropy of .79, indicating a good level of classification accuracy across the profiles. The mean posterior probabilities of membership of each class in the dominant profile ranged from .72 to .85 for boys and .77 to .85 for girls. The distributional similarity model was rejected (AIC, BIC and SSABIC higher than the previous one) so that the relative size of the profiles was allowed to vary across genders. The fit indices of the multi-group analysis performed in this study are shown in Table 2.

Description of the Profiles

The Z-Means in the classifying variables of the four profiles of the dispersion similarity solution are presented in Figure 1. Profile 1 is the least numerous of all ($n = 24$; 5.98%) and is characterised by very low effortful control and high CU and was thus named Callous-Undercontrolled. Profile 2 (Introverted; $n = 88$; 21.95%) is characterised by low surgency, relatively high negative affect, moderately high effortful control, and medium scores on psychopathic traits; it thus appears to be a more behaviourally inhibited profile. Profile 3 (High Psychopathic; $n = 114$; 28.43%) is characterised by very high scores on psychopathic traits. Finally, Profile 4 is the most prevalent (Extraverted; $n = 175$; 43.64%) and is characterised by high scores on surgency/extraversion and INS with moderate scores on all other variables. No statistically significant differences in age were found across the different profiles ($F(3, 395) = 0.1, p = .962$).

Table 1
Fit Results from LPA

	k	AIC	BIC	SSABIC	Entropy	LMR p value	LMRt p value	BLRT p value	Smallest profile
Girls	1	3569.74	3609.56	3571.54					
	2	3460.90	3523.98	3463.78	.78	<.001	<.001	<.001	24.51%
	3	3436.41	3522.68	3440.31	.70	.390	.400	<.001	21.08%
	4	3418.98	3528.48	3423.93	.70	.321	.327	<.001	12.25%
Boys	1	3366.56	3405.95	3367.94					
	2	3294.25	3356.63	3292.44	.70	.008	.009	<.001	42.64%
	3	3269.26	3354.62	3272.25	.70	.061	.066	<.001	23.86%
	4	3250.65	3358.99	3254.45	.75	.027	.030	<.001	12.69%

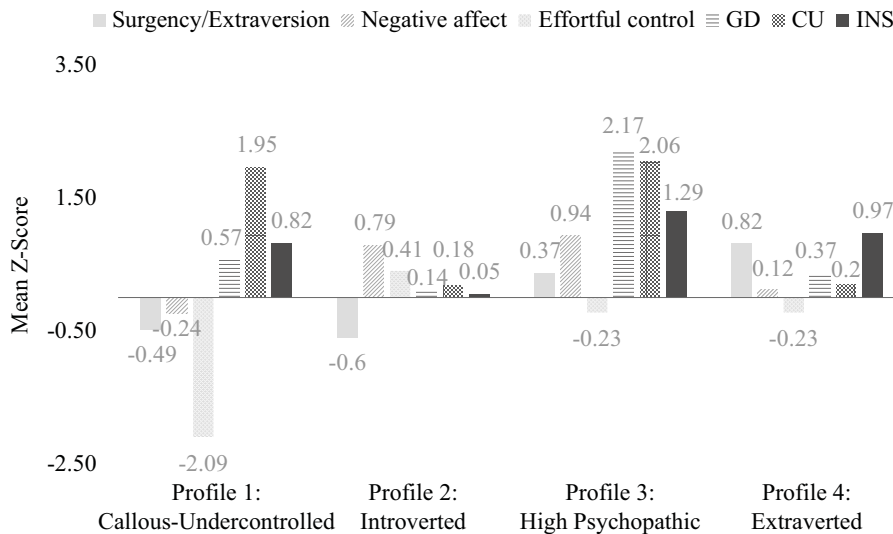
Note. k = number of profiles; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SSABIC = Sample-size adjusted BIC; LMR = Lo, Mendell and Rubin likelihood ratio test; LMRt = LMR adjusted; BLRT = Bootstrap Likelihood Ratio Test.

Table 2
Multigroup Analysis of Similarity

	<i>k</i>	AIC	BIC	SSABIC	Entropy	SP
Cross-gender similarity						
Configural	4	7177.79	7445.39	7232.79	.82	22.94%
Structural (means)	4	7213.42	7385.16	7248.71	.80	6.73%
Dispersion (means and variances)	4	7210.15	7357.93	7240.53	.79	5.98%
Distributional (means, variances, and probabilities)	4	7231.17	7366.97	7259.08	.79	12.72%
Predictive similarity: Family characteristics						
Freely estimated across genders	4	5378.19	5470.70	5391.42	.86	
Equality estimated across genders	4	5372.32	5442.63	5382.37	.86	
Predictive similarity: Child characteristics						
Freely estimated across genders	4	5302.84	5417.45	5319.14	.89	
Equality estimated across genders	4	5302.74	5384.07	5314.30	.86	
Explanatory similarity: Outcomes						
Freely estimated across genders	4	37105.99	37469.44	37180.69	.99	
Equality estimated across genders	4	37173.09	37440.69	37228.09	.99	

Note. *k* = number of profiles; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SSABIC = Sample-size adjusted BIC; SP = Smallest Profile.

Figure 1
Descriptions of the LPA Based on the Cross-Gender Model



Note. Z-scores were calculated on the whole ELISA sample.

The differences between the four profiles in terms of the variables used were confirmed with ANOVA tests and the effect sizes found were large: surgency/extraversion ($F(3, 393) = 61.92, p < .001; \eta^2_p = .32$), negative affect ($F(3, 392) = 30.12, p < .001; \eta^2_p = .19$), effortful control ($F(3, 392) = 55.28, p < .001; \eta^2_p = .30$), GD ($F(3, 395) = 111.56, p < .001; \eta^2_p = .46$), CU ($F(3, 395) = 152.71, p < .001; \eta^2_p = .54$) and INS ($F(3, 395) = 58.02, p < .001; \eta^2_p = .31$). *Post-hoc* analyses are shown in Table S3 of the supplementary material.

As noted above, the distributional similarity model was not supported. Two profiles were more frequent in boys than in girls: Callous-Undercontrolled (10.15% vs 1.96%; $\chi^2(1) = 11.95, p = .001; V = .17$) and Extraverted (51.78% vs 35.78%; $\chi^2(1) = 10.42, p = .001; V = .16$). The Introverted profile was more frequent in girls (5.58% vs 37.75%; $\chi^2(1) = 60.52, p < .001; V = .39$). There were no statistically significant differences in the High Psychopathic profile (32.49% vs 24.51%; $\chi^2(1) = 3.14, p = .08$). The profiles have

different levels of CP at T2 with a large effect size ($F(3, 397) = 21.81, p < .001; \eta^2_p = .14$). The Introverted profile had significantly lower scores than the rest. In addition, the High Psychopathic profile has significantly higher scores than the Extraverted profile.

Predictive Similarity of the Profiles

Based on the dispersion similarity model, family and child characteristics were added as predictors to assess predictive similarity. Two models were created: one with predictors freely estimated across genders, and this was contrasted with the model in which each predictor was constrained to be equal across genders. Table 2 shows that both family predictors and child characteristics fit the gender-equal model better (lower AIC, BIC, SSABIC indices). A series of MLRs were performed to enrich the description of the profiles (see Table 3).

Table 3
MLRs Assessing the Effects of Each Predictor on Latent Profile Membership

Predictor	Profile 1 vs Profile 4			Profile 2 vs Profile 4			Profile 3 vs Profile 4		
	Coef.(SE)	OR	95% CI [LL, UL]	Coef.(SE)	OR	95% CI [LL, UL]	Coef.(SE)	OR	95% CI [LL, UL]
<i>Family characteristics</i>									
SES	-0.50(0.34)	1.64	[0.84, 3.23]	-0.06(0.19)	0.95	[0.65, 1.37]	-0.14(0.18)	0.87	[0.62, 1.23]
Parental stress	1.58(0.47)***	4.83	[1.91, 12.23]	-0.15(0.29)	0.86	[0.49, 1.5]	0.33(0.26)	1.39	[0.83, 2.33]
<i>Child characteristics</i>									
Fearlessness	-0.95(0.40)*	0.39	[0.18, 0.84]	-1.30(0.26)***	0.27	[0.17, 0.45]	-0.10(0.2)	0.90	[0.61, 1.33]
Emotional regulation	-1.31(0.56)*	0.27	[0.09, 0.81]	0.26(0.30)	1.29	[0.72, 2.32]	-0.39(0.29)	0.68	[0.38, 1.2]
LPE	1.95(0.46)***	7.03	[2.88, 17.14]	-0.51(0.33)	0.60	[0.31, 1.15]	1.19(0.28)***	3.30	[1.91, 5.7]
Predictor	Profile 1 vs Profile 3			Profile 2 vs Profile 3			Profile 1 vs Profile 2		
	Coef.(SE)	OR	95% CI [LL, UL]	Coef.(SE)	OR	95% CI [LL, UL]	Coef.(SE)	OR	95% CI [LL, UL]
<i>Family characteristics</i>									
SES	0.63(0.36)	1.88	[0.94, 3.77]	0.08(0.21)	1.08	[0.72, 1.62]	-0.55(0.36)	1.74	[0.86, 3.52]
Parental stress	1.25(0.48)**	3.48	[1.35, 8.98]	-0.48(0.31)	0.62	[0.33, 1.14]	1.73(0.51)***	5.64	[2.09, 15.2]
<i>Child characteristics</i>									
Fearlessness	-0.84(0.41)*	0.43	[0.19, 0.95]	-0.19(0.27)***	0.30	[0.18, 0.52]	0.35(0.42)	1.41	[0.62, 3.25]
Emotional regulation	-0.91(0.57)	0.40	[0.13, 1.23]	0.65(0.34)	1.91	[0.98, 3.72]	-1.56(0.59)**	0.21	[0.07, 0.66]
LPE	0.76(0.43)	2.13	[0.91, 5]	-1.70(0.36)***	0.18	[0.09, 0.37]	2.46(0.51)***	11.72	[4.29, 32]

Note. IC = Confidence interval; LL = Lower limit; UL = Upper limit; * $p < .05$; ** $p < .01$; *** $p < .001$.

Regarding family characteristics, the logistic model created for SES was not statistically significant. Nevertheless, parental stress was statistically significant ($R^2 = .04$ (Cox & Snell), $.05$ (Nagelkerke); $\chi^2(3) = 217.03$, $p = .003$) and predicted a higher probability of belonging to Profile 1 than the other profiles. For child characteristics, fearlessness was statistically significant ($R^2 = .11$ (Cox & Snell), $.12$ (Nagelkerke); $\chi^2(3) = 162.33$, $p < .001$), and predicted a higher probability of belonging to Profile 3 and 4 relative to 1 and 2. Emotional regulation was significant ($R^2 = .03$ (Cox & Snell), $.04$ (Nagelkerke); $\chi^2(3) = 156.19$, $p = .02$) and predicted a lower probability of belonging to Profile 1 relative to 2 and 4. Finally, LPE was also significant ($R^2 = .14$ (Cox & Snell), $.15$ (Nagelkerke); $\chi^2(3) = 105.51$, $p < .001$) and predicted a higher probability of belonging to Profile 1 than the others. It also predicted a higher probability of belonging to Profile 3 than Profiles 2 and 4.

Explanatory Similarity of the Profiles

Considering the dispersion similarity model, outcomes were added to assess explanatory similarity. CP, emotional symptoms, and prosocial behaviour at T3 were included as outcomes. The level of attrition of this subsample between T2-T3 was 16.71% for CP and 16.21% for emotional symptoms and prosocial behaviour. Two models were tested: one with outcomes freely estimated across genders, and the other with outcomes constrained to be equal across genders. Table 2 shows that the outcomes fit the freely estimated cross-gender model (lower values of AIC and SSABIC). This underlines the differences between the relationship profiles-outcomes across genders. To see which variables exhibited differences, ANOVA analyses were carried out. Since the profile-outcome relations were not the same across genders, each profile was divided into two: one for girls and one for boys, to examine

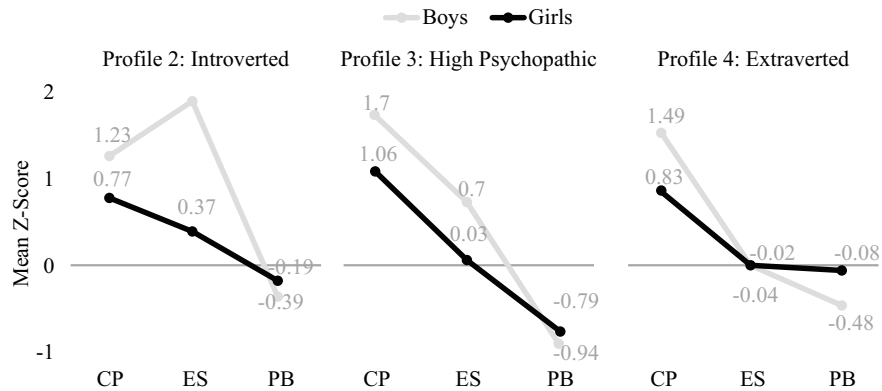
differences in more detail. It should be noted that Profile 1 could not be compared in girls, since only one girl remained in the group by T3. Statistically significant differences were found with medium effect size between the gender-differentiated profiles in CP ($F(6, 326) = 6.68$, $p < .001$; $\eta_p^2 = .11$), emotional symptoms ($F(6, 327) = 8.21$, $p < .001$; $\eta_p^2 = .13$), and prosocial behaviour ($F(6, 327) = 5.94$, $p < .001$; $\eta_p^2 = .10$). Figure 2 provides a graphical description of within-profile gender differences.

Regarding CP and gender, within-profile analyses showed statistically significant differences by gender in Profile 3 and Profile 4: Profile 3 boys scored higher than Profile 3 girls ($p = .025$), and Profile 4 boys scored higher than Profile 4 girls ($p = .005$). There were no statistically significant differences across profiles within the subsamples of either girls or boys.

In relation to emotional symptoms and gender, within-profile analyses showed statistically significant differences by gender in Profile 2 and Profile 3: boys in Profile 2 scored significantly higher than girls in Profile 2 ($p = .001$), and boys in Profile 3 scored significantly higher than girls in Profile 3 ($p = .017$). There were no significant differences within the girls' subsample. However, within boys there were statistically significant differences between Profile 2 boys and Profile 1 ($p = .015$) and 4 ($p < .001$). Also, Profile 3 boys scored significantly higher than Profile 4 boys ($p < .001$). This seems to indicate that for boys, the Introverted profile is the one that is most related to emotional symptoms.

Regarding prosocial behaviour, within-profile analyses showed statistically significant differences by gender in Profile 4: boys in Profile 4 scored significantly lower than girls in Profile 4. No statistically significant differences were found in the boys' subsample. However, differences were found for girls: Profile 3 girls scored lower than the others. In other words, the High Psychopathic profile in girls is associated with less prosocial behaviour compared to the rest of the profiles for girls.

Figure 2
Description of Outcomes Considering Within-Profiles Gender Differences



Note. Z-scores were calculated on the whole ELISA sample. ES = Emotional symptoms; PB = Prosocial behaviour.

Discussion

The aim of the present study was to examine the diversity of individual trait configurations (i.e., temperament and psychopathic variables) in young children with CP, assessing whether the same profiles can be identified in boys and girls and whether the predictors and outcomes of these profiles remain invariant across genders.

The profiles were similar across genders, and the same number of profiles were found, with similar means and variances in the compositional variables. Thus, four profiles were identified: Callous-Undercontrolled, Introverted, High Psychopathic and Extraverted. However, girls and boys were not equally distributed in each profile. Predictors were found to be similar across genders, but outcomes were not.

Regarding distributional differences, the findings are consistent with previous studies indicating that girls are more likely to belong to less problematic profiles (e.g., McDermott et al., 2022; Toupin et al., 2016). In the present study, girls belonged most numerously to the Introverted profile, which is also the group with the highest effortful control and the lowest surgency/extraversion. This is also consistent with the literature indicating that girls present less surgency/extraversion (Else-Quest et al., 2006) and display more effortful control (Smith & Day, 2018). However, no statistically significant differences were found across genders in the distribution of the High Psychopathic profile, typically found in boys. This result should be interpreted with caution; the absence of differences may be due to the power of the analysis as there is an eight-percentage point difference between genders. Nevertheless, further research is needed on female psychopathy, and continued examination of the theoretical and practical relevance of this construct, especially in girls (Nicholls et al., 2020).

In terms of predictors, no differences were found across genders. SES was not related to any profile, which differs from previous studies, where it has been related to CU traits (Piotrowska et al., 2015). Callous-Undercontrolled profile was related to parental stress, which is consistent with previous studies and points to relationships between CU traits and parental stress (Fanti & Centifanti, 2014). However, whereas it might have been expected that parental stress would also be related to the High Psychopathic

profile, which also has high levels of CU traits, this was not found to be the case; this result reinforces the need to consider the full combination of psychopathic traits as a specific profile, which may differ from the usually studied CU profile (López-Romero et al., 2021). The highest LPE indices were related to the most problematic profiles (i.e., Callous-Undercontrolled and High Psychopathic), an expected finding and one which is in line with previous studies, since LPE measures the affective dimension of psychopathic traits to a substantial degree (i.e., CU) (Kimonis et al., 2015). Finally, fearlessness was related to the High Psychopathic profile, in line with previous research linking fearlessness with the psychopathic personality (Lykken, 1995); it could also have been expected that fearlessness would predict membership of the group Callous-Undercontrolled (e.g., Domínguez-Álvarez et al., 2021), but this was not the case. Again, these results suggest the further need to disentangle the nature and correlates of CU traits as against the full constellation of psychopathic traits.

Profiles were related differently to outcomes according to gender. In the boys' subsample, the Introverted profile showed higher levels of emotional symptoms than the other profiles, which was not the case for the girls. This may indicate that the specific trait combinations of this profile (i.e., low surgency/extraversion and high negative affect) may be especially critical for boys in terms of emotional symptoms. This might be in line with the gender paradox: children belong less to this profile, but when they do, they have more dysfunctional symptoms (Konrad et al., 2021). In the girls' subsample, the High Psychopathic profile was related to lower levels of prosocial behaviour than in the other profiles. For boys, such a relationship was not found. In this sense, it could be that the psychopathic constellation in girls is more socially dysfunctional. This is consistent with previous studies suggesting that the expression of psychopathic traits may have more negative consequences for girls in terms of adaptation (Charles et al., 2012). This also lends some support to the gender paradox even though in this case, no differences in gender distribution were found in this profile (Konrad et al., 2021).

This study shows specific strengths to go deeper into the heterogeneity of CP in children. Variables drawn from the main traditions in the study of individual differences and children's

References

CP (e.g., temperamental models and psychopathic traits) were included, and specific statistical techniques suited for the study of gender invariances were implemented. Early childhood, a developmental stage scarcely considered in the study of CP profiling was studied and, remarkably, longitudinal data was used to investigate predictors and outcomes of membership to different profiles. Nevertheless, certain limitations in the study reported here must be considered for future work. First, only parent-reported measures were considered, and thus the magnitude and significance of the relationships may have been overestimated by shared-method variance. Parents, though, are often considered as optimal informants of a child's behaviour (Frick et al., 2010). Nevertheless, the use of multi-informant measures might serve to improve future research. Future lines of research could also examine CP in children by incorporating ICT, for example through gamification or ecological assessment (Elosua et al., 2023). Second, in a longitudinal study the loss of participants is inevitable, and in this case, it meant that only one girl remained in the Callous-Undercontrolled profile in T3. This made it impossible to examine the differences in outcomes of this profile. A third limitation has to do with the suboptimal internal consistency of certain instruments which means that results here should be interpreted with a degree of caution. However, no instrument shows an internal consistency of less than $\alpha = .60$, which Huh et al. (2006) considers to be the acceptable threshold in exploratory research.

In conclusion, when considering temperamental and psychopathic traits, four profiles can be identified in young children with CP. Across genders, the profile distribution is different, with girls pertaining more to the least problematic group. However, there are no differences in gender distribution for the High Psychopathic profile, traditionally associated with boys. Predictors behaved similarly across genders, but outcomes did not. Boys belonging to the Introverted profile seemed to be more prone to emotional difficulties, and girls in the High Psychopathic profile showed more impairments in the domain of prosocial behaviour. Overall, person-centred analyses in this study have made it possible to explore in greater depth the heterogeneity of CP, showing that children with high levels of CP are diverse in their dispositional profiles, and that gender should not be neglected in this area of research. On a practical level, this may improve prevention and identification of these problems in girls so that they have the possibility of benefiting from psychological interventions for CP that have demonstrated a high level of evidence (Fonseca-Pedrero et al., 2021; Valero-Aguayo et al., 2021).

Supplementary Material

Supplementary Material can be found at <https://osf.io/8e46p/>

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