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This is a preliminary, unedited version of a manuscript that has been accepted for publication in the Brazilian Journal of Psychiatry. As a service to our readers, we are providing this early version of the manuscript. The manuscript will still undergo copyediting, typesetting, and review of the resulting proof before it is published in final form. The final version may present slight differences in relation to the present version.

# Differences in behavioral and emotional problems among children aged 1-4 years from two independent cohorts in Montevideo, Uruguay: the 2013 and 2018 ENDIS studies

**Short running title:** Differences in behavioral and emotional problems in Montevideo cohorts

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## Abstract

**Objective:** To examine differences in behavioral and emotional problems among children aged 1–4 years using baseline data from two independent Uruguayan cohort studies (2013 and 2018), and to investigate whether differences were explained by socioeconomic, maternal, and child characteristics.

**Methods:** Data from two independent Montevideo cohorts (2013: n=790; 2018: n=743) were analyzed. Behavioral and emotional problems were assessed through

maternal report using the Child Behavior Checklist for Ages 1½–5 (CBCL 1½–5). Between-cohort differences were examined using ANCOVA with sequential adjustment for socioeconomic, maternal, and child characteristics.

**Results:** The 2018 cohort showed higher CBCL scores for total problems (mean difference=1.87, Cohen's d=0.10, 95%CI:0.00–0.20, p=0.049) and internalizing problems (mean difference=1.01, d=0.17, 95%CI:0.07–0.27, p=0.001). Externalizing scores showed a non-significant trend (mean difference=0.57, d=0.07, 95%CI:−0.02–0.17, p=0.140). After adjustment, emotionally reactive, anxious/depressed, withdrawn, and aggressive behavior scores remained significantly higher in 2018. Differences were largest among low-income families (CBCL total: adjusted mean difference=5.94, p=0.001; internalizing=2.63, p<0.001), with virtually no difference in the highest income tercile.

**Conclusions:** Effect sizes were small overall, yet higher scores in the 2018 cohort were concentrated in lower-income families, suggesting socioeconomic patterning of behavioral and emotional problems across cohorts.

**Keywords:** Mental health; behavior and emotional problems; child behavior check list; socioeconomic factors; cohort study.

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## Introduction

Emotional and behavioral problems emerge early in life and represent an important public health issue[1–3]. Global burden of disease analyses estimate that mental disorders are a leading cause of disability among children and adolescents worldwide, with stable age-standardized rates between 1990 and 2019 despite increases in absolute burden.[4] Worldwide prevalence estimates indicate that approximately one in five individuals under 18 years meets criteria for a mental disorder, with considerable variation across regions and age groups [5] These conditions often originate in childhood and adolescence, run throughout the life cycle, are associated with a wide range of adverse outcomes in adult life [6,7].

Time trend analyses have suggested increases in mental health problems among children and adolescents from high-income countries in recent decades [8–12]. In the United States, mental health surveillance data confirm that anxiety and attention-deficit/hyperactivity disorder each affected approximately one in eleven children during 2013–2019[9], and diagnoses of both conditions have risen since 2000[8]. It should be noted, however, that increases in diagnosis rates do not

necessarily reflect true rises in community prevalence: a systematic review and meta-regression analysis found no evidence of an increase in the number of children meeting criteria for ADHD over three decades when standardized diagnostic procedures were applied, with variability in prevalence estimates largely explained by methodological differences rather than by year of study[13]

Few epidemiological studies have examined time trends in child behavioral problems outside North America and Europe, and data from Latin America remain scarce[14]. A study in Sudan reported that older boys tripled their rate of behavioral symptoms from 1965 to 1980[15], while cohort studies from Brazil showed significant increases in CBCL total, internalizing and externalizing scores among 4-years-olds between 1993 and 2004, particularly aggressive behavior[16]. In Singapore, increases in the thought problems and somatic complaints were observed between 2003 and 2017 [17].

Given cross-country variability in child psychopathology [3,16,17], further research in upper-income Latin American settings is needed. In Uruguay, early childhood development has been monitored through population-based surveys since the 1990s. [18,19]A 2008 CBCL-based study in Montevideo reported a prevalence of emotional and behavioral problems of 20.1% in children aged 6–11 years, higher than international estimates[20].

The aim of this study was to examine differences in behavioral and emotional problems among children aged 1-4 years, using data from the baseline of two independent Uruguayan cohort studies started in 2013 and 2018. Furthermore, we aimed to examine whether changes in emotional and behavioral problems could be accounted for by differences in socioeconomic, maternal and child characteristics between cohorts.

## Methods

*Research setting and study design*

We used baseline data from two cohorts carried out in Uruguay, South America. Uruguay has a human development index (HDI) of 0.817, occupying the 55$^{th}$ position in the world ranking and the 3$^{rd}$ position in the South American continent [21]. According to the 2023 census, its capital city, Montevideo has a population of 1.302.954 (about a third of the Uruguay's total population)[22]. Montevideo ranks first in Latin America in terms of quality of life [23].

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The '*Encuesta de Nutrición, Desarrollo Infantil y Salud* (Survey of Nutrition, Child Development and Health of Uruguay, Endis)' is a panel survey designed to measure well-being and developmental indicators in a national and representative sample of Uruguayan children. To date, the ENDIS project is composed of two cohorts and the data presented in this study refers to the baseline of the 2013 cohort (carried out in 2012 and 2013) and the baseline of the 2018 cohort (carried out in 2018). Data is available for 3077 and 2598 children from ENDIS 2013 and 2018, respectively. These samples are representative of the Uruguayan early childhood population (from 0 to 4 years and 11 months of age) living in private homes, located in urban localities with more than 5,000 inhabitants [1]. More technical details about survey sampling procedures can be found on the National Institute of Statistics (INE) website [24].

In the baseline of the 2013 ENDIS, the Child Behavior Checklist (CBCL) was applied only among children residing in Montevideo. Thus, for comparative purposes in the present analyses, only children residing in Montevideo in the 2013 and 2018 studies with complete information on the CBCL were included (790 and 743 children of ENDIS 2013 and 2018, respectively).The age range of the children was 14 to 47 months in ENDIS 2013 (M = 29.7; SD = 7.7) and 18 to 59 months in ENDIS 2018 (M = 38.3; SD = 11.9) ($p < 0.001$). Questionnaires were applied to mothers. The interviews were performed at home by trained university students.

*Assessment of behavior problems at 2-3 years of age*

Child behavioral/emotional problems were assessed at baseline in ENDIS 2013 and 2018 using the CBCL for children 1.5 to 5 years old (CBCL 1½–5) [25–28]. The CBCL 1½–5 is a screening instrument designed to assess the behavioral, emotional and social problems of children aged from one and a half to five years old. It is composed of seven subscales or domains: (1) emotionally reactive, (2) anxious/depressed, (3) somatic complaints, (4) withdrawn, (5) sleep problems, (6) attention problems and (7) aggressive behaviours. This structure of seven correlated factors was determined in the original study by exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and reliability analysis in a sample from the United States.

The 1½–5-year-old version, adapted and translated into Spanish, as authorized by the instrument developers, was used. It is composed of 99 items with



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three response options (0 = not true; 1 = in some ways, sometimes; 2 = very true or often true). The original authors reported adequate fit indices for both the seven-correlated-factor model (syndromes) and for the second-order model. Narrowband syndromes showed adequate reliabilities with α > 0.70, except anxiety/depression (α = 0.60) and attention problems (α = 0.68). Very good internal consistency values were reported for the internalizing (α = 0.89), externalizing (α = 0.92) and total problems (α = 0.95) scales [28].

The 99 behavioral and emotional items of the CBCL were completed by the mothers. Data from these scales were summed to provide an overall score (total problems) and were also grouped in two broad dimensions (internalizing and externalizing problems). Several studies have supported the CBCL's psychometric properties, showing good reliability and validity in both clinical and nonclinical populations [25–27].

*Maternal and child information*

All variables were collected in the baseline of ENDIS 2013 and 2018 studies. Family income in the month prior to the interview was collected as a continuous variable. Per capita income was calculated by dividing the household income equally by the total number of residents. For the analyses, this variable was categorized in terciles (tercile 3: highest income tercile). The number of rooms in the house in which the child lived was categorized as: <4 rooms and ≥4 rooms. Maternal skin color was self-reported and categorized as white, black and Asian/indigenous. Information on maternal schooling was collected using the following question: '*What was the highest educational level reached?*', and categorized as: primary, secondary and tertiary. Maternal age was collected in complete years and categorized as <20, 20–34, and ≥35 years.

The following information was obtained retrospectively to the time of the child´s gestation. Information on maternal prenatal care was obtained using the following question '*Did you attend prenatal care when you were pregnant?*' and the responses were categorized as yes or no. Unwanted pregnancy was assessed using the question: '*In the weeks before getting pregnant, did you want to get pregnant?*', with options of response categorized as yes or no. Multiple births were recorded (yes or no). Type of delivery was categorized as vaginal or cesarean. Parity was defined as the number of previous viable pregnancies and categorized as 1, 2, and ≥3.

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Maternal smoking and alcohol intake during pregnancy were assessed based on mother's report. The questions used were '*Did you smoke (tobacco) cigarettes during pregnancy*?' and '*During your pregnancy, did you drink any alcoholic beverages such as wine, beer, whiskey, spirits, white drinks, etc.?*', respectively. Depression during pregnancy was assessed using the following question: '*During your pregnancy, were you diagnosed with depression?*'. The answer was categorized as yes or no.

Child variables were sex, preterm birth (<37 weeks of gestation, yes or no), low birthweight (<2,500 g, yes or no), duration of exclusive breastfeeding (<6 months or ≥6 months). It was investigated whether the child lived with the father using the following question *'Does the biological/adoptive father live in the home?*', with answers categorized as yes or no. Information regarding school attendance was obtained using the question '*Does the child attend an educational center?*', with options of response categorized as yes or no.

*Statistical analyses*

CBCL scores were analyzed in original score unit, as the main objective was to compare the two cohorts within each CBCL scale, rather than to compare absolute effect magnitudes across domains. To aid interpretation, standardized mean differences (Cohen's d) with 95% confidence intervals were also calculated for crude between-cohort differences.

Differences in the distribution of maternal and child variables between cohorts were assessed using Pearson chi-square tests. Differences in CBCL scores between cohorts were assessed using ANOVA, with age in months included as a covariate in all analyses to account for the mean age difference between ENDIS 2013 (M = 29.7; SD = 7.7) and 2018 (M = 38.3; SD = 11.9).

To examine associations between maternal and child characteristics and CBCL scores across both cohorts, multivariable ANOVAs were conducted for each CBCL outcome. Post hoc analyses used univariable ANOVAs with Bonferroni adjustments. Cohort interaction effects (confounder×cohort) were tested to evaluate whether associations differed between cohorts.

To assess whether cohort differences in CBCL scores could be attributed to changes in sample composition, successive ANCOVA models were estimated with sequential adjustment for conceptually defined blocks of covariates: (1) age at CBCL assessment; (2) family socioeconomic status; (3) maternal characteristics; (4) child

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characteristics; (5) maternal depression during pregnancy. Each model retained all adjustments from previous steps. Variables were included if they had a significant effect on CBCL scores, differed significantly between cohorts, or showed a significant cohort×covariate interaction. Significant interaction terms were incorporated into the adjusted models. Covariates included: family income, number of rooms, maternal skin color, schooling and age, prenatal care, desired pregnancy, delivery type, parity, smoking and alcohol intake during pregnancy, multiple pregnancy, preterm birth, low birthweight, exclusive breastfeeding duration, father's presence in the home, school attendance, and maternal depression during pregnancy.

For outcomes showing a significant cohort×income interaction, age-adjusted predicted marginal means by cohort and family income tertile with 95% confidence intervals were estimated from linear regression models including cohort, income tertile, their interaction, and age in months.

All analyses were performed using Stata version 15.0 (College Station, TX).

*Ethics*

Both cohort studies were approved by the institutional review board of the Faculty of Medicine of the Universidad de la República (UDELAR), Uruguay. Parents or legal guardians signed an informed consent form.

## Results

*Characteristics of the cohorts*

Differences in maternal and child characteristics between the 2013 and 2018 cohorts are presented in **Table 1**. The 2013 cohort had higher frequency of women living in smaller houses (<4 rooms), more black women and those with more years of schooling than the 2018 cohort. In addition, the 2013 cohort had more frequency of women ≥35 years, women who did not want to be pregnant, and more frequency of mothers who smoked and consumed alcohol during pregnancy. No difference was observed between the two cohorts regarding maternal prenatal care, type of delivery, parity, multiple birth and depression during the pregnancy. The proportion of preterm birth was higher in the 2013 cohort than the 2018 cohort; however, the frequency of exclusive breastfeeding and school attendance was higher in the 2018 study than in the 2013 one. No difference was observed regarding child’s sex, low birthweight and father´s presence in the home.

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**Table 1.** Comparison of maternal and child characteristics between 2013 Endis (n= 790) and 2018 Endis[#] (n= 743) cohorts.

| Variable | 2013 Endis n (%) | 2018 Endis[#] n (%) | *p** |
|---|---|---|---|
| **Number of rooms** | | | |
| < 4 rooms | 494 (63.9) | 160 (56.3) | **0.025** |
| ≥ 4 rooms | 279 (36.1) | 124 (43.7) | |
| **Maternal skin colour** | | | |
| White | 697 (90.5) | 490 (97.8) | |
| Black | 53 (6.9) | 9 (1.8) | **<0.001** |
| Asian/indigenous | 20 (2.6) | 2 (0.4) | |
| **Maternal schooling** | | | |
| Primary | 90 (15.3) | 101 (19.3) | |
| Secondary | 305 (51.8) | 302 (57.9) | **0.001** |
| Tertiary | 194 (32.9) | 119 (22.8) | |
| **Maternal age** (years) | | | |
| < 20 | 38 (5.5) | 70 (9.4) | |
| 20-34 | 367 (53.3) | 484 (65.1) | **<0.001** |
| ≥ 35 | 283 (41.2) | 189 (25.5) | |
| **Prenatal care** | | | |
| No | 9 (1.2) | 7 (0.9) | 0.672 |
| Yes | 764 (98.8) | 736 (99.1) | |
| **Desired pregnancy** | | | |
| No | 433 (56.0) | 240 (32.4) | **<0.001** |
| Yes | 340 (44.0) | 501 (67.6) | |
| **Delivery type** | | | |
| Vaginal | 420 (54.6) | 390 (52.5) | 0.407 |
| Cesarean | 349 (45.4) | 353 (47.5) | |
| **Parity** | | | |
| 1 | 272 (35.3) | 237 (37.0) | 0.245 |

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| | | | |
|---|---|---|---|
| 2 | 284 (36.9) | 251 (39.2) | |
| ≥ 3 | 214 (27.8) | 153 (23.8) | |
| **Multiple birth** | | | |
| No | 769 (97.3) | 723 (97.3) | 0.968 |
| Yes | 21 (2.7) | 20 (2.7) | |
| **Smoking[§]** | | | |
| No | 637 (82.3) | 654 (88.0) | **0.002** |
| Yes | 137 (17.7) | 89 (12.0) | |
| **Alcohol intake[§]** | | | |
| No | 697 (90.4) | 694 (93.8) | **0.015** |
| Yes | 74 (9.6) | 46 (6.2) | |
| **Depression[§]** | | | |
| No | 753 (97.5) | 719 (97.3) | 0.764 |
| Yes | 19 (2.5) | 20 (2.7) | |
| **Child's sex** | | | |
| Male | 398 (504) | 389 (52.4) | 0.439 |
| Female | 392 (49.6) | 354 (47.6) | |
| **Preterm birth** | | | |
| No (≥ 37 weeks) | 680 (88.5) | 687 (92.5) | **0.009** |
| Yes (< 37 weeks) | 88 (11.5) | 56 (7.5) | |
| **Low birthweight** | | | |
| No (≥ 2500g) | 695 (91.3) | 684 (92.1) | 0.607 |
| Yes (< 2500g) | 66 (8.7) | 59 (7.9) | |
| **Exclusive breastfeeding** | | | |
| < 6 months | 367 (48.7) | 284 (40.7) | **0.002** |
| ≥ 6 months | 387 (51.3) | 414 (59.3) | |
| **Lives with father** | | | |
| No | 212 (27.1) | 160 (23.0) | 0.064 |
| Yes | 569 (72.9) | 537 (77.0) | |
| **Attends educational center** | | | |

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| | | | |
|---|---|---|---|
| No | 373 (47.2) | 177 (23.8) | **<0.001** |
| Yes | 417 (52.8) | 566 (76.2) | |

[#]Only children from Montevideo. *Chi-square. [§]Variables related to the gestational period (e.g. smoking during pregnancy).

*Differences in behavioral/emotional problems between the 2013 and 2018 cohorts*

Differences in CBCL scores between the 2013 and 2018 cohorts are presented in **Figure 1**. In the crude analyses, for the 2013 and 2018 cohorts, respectively, CBCL mean values (SD) total problems scores were 24.1 (17.9) and 26.0 (19.4); for internalizing scores 5.1 (5.2) and 6.2 (6.7) and for externalizing scores 10.0 (7.5) and 10.5 (7.6). Higher scores in 2018 were also identified for emotionally reactive, withdrawn, and attention problems. No significant differences were observed in the anxious/ depressed, somatic complaints, sleep problems, and aggressive behavior in crude analyses. Standardized mean differences (Cohen's d) with 95% confidence intervals for all crude between-cohort comparisons are presented in **Supplementary Table 1.** Effect sizes were consistently small (d range: 0.07–0.17), suggesting that, while statistically significant differences were identified for several outcomes, the clinical magnitude of these differences is modest.

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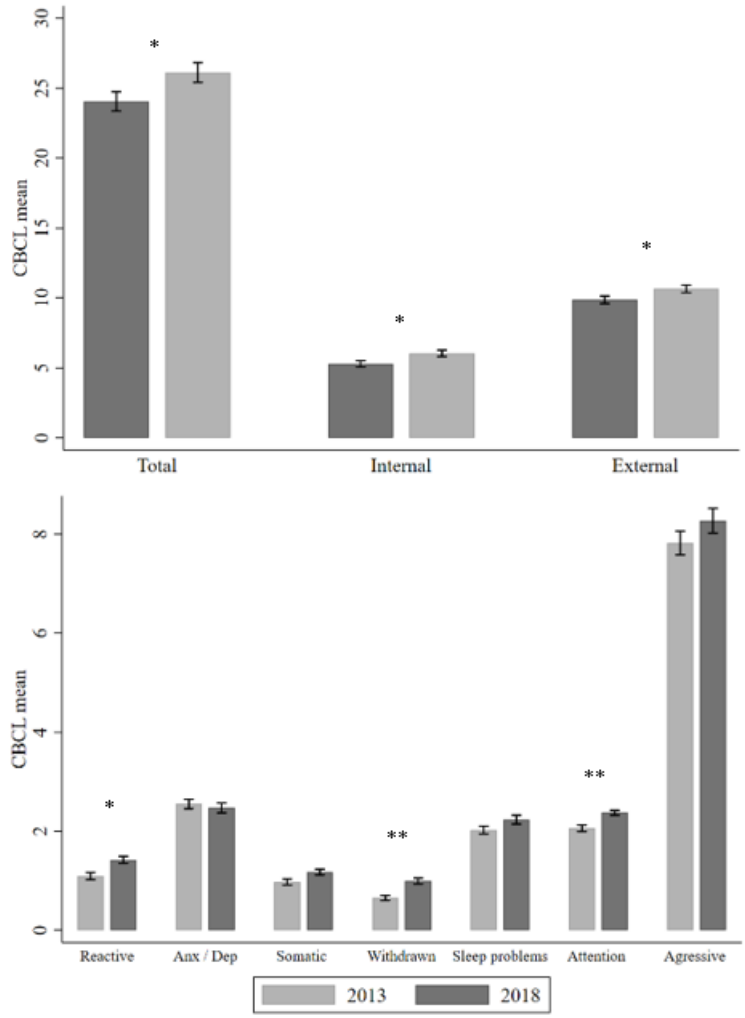



**Figure 1.** Mean CBCL scores and standard error of the mean in children in the 2013 and 2018 ENDIS cohort studies adjusted for age (months) at the time of testing. Note. *p < .05, **p < .001.

*Association of socioeconomic, maternal and child characteristics with behavioral/emotional problems*

Multivariable ANOVAs revealed associations between maternal and child characteristics and CBCL scores across both cohorts, varying by syndrome (**Supplementary Table 2)**. CBCL total score was identified to be significantly associated with familiar income, number of rooms in the house, maternal skin colour, schooling and age, prenatal care, type of delivery, maternal smoking and depression during pregnancy, and with the father´s presence in the home. The internalizing problem score was additionally associated with child school attendance, and the externalizing problem score was also associated with maternal alcohol intake during pregnancy.

Post hoc comparisons using univariable ANOVAs (**Supplementary Table 3**) identified a higher score in at least one CBCL syndrome scale in children of poor mothers, mothers who lived in smaller houses, had black/Asian/indigenous skin color, mothers who had less schooling and who were adolescent at the time of birth, women who did not attend the prenatal care, smoked, ingested alcoholic beverages and had depression during pregnancy. Preterm birth children, those who did not live with their father and those who did not attend an educational center had higher scores in at least one CBCL syndrome scale.

*Cohort interaction effects of socioeconomic, maternal and child characteristics on behavioral/emotional problems*

The presence of significant cohort interactions revealed differences in the effect of some maternal and child characteristics on CBCL scores between cohorts (**Supplementary Table 4**). Interaction effects were most consistently identified between cohort and family income (**Figure 2**). For CBCL total and internalizing scores, higher scores in 2018 were observed only in the lowest income tertile, with virtually no difference between cohorts in the highest income tertile. Higher scores in anxious/depressed, withdrawn, and sleep problems in 2018 were similarly concentrated among lower-income families.

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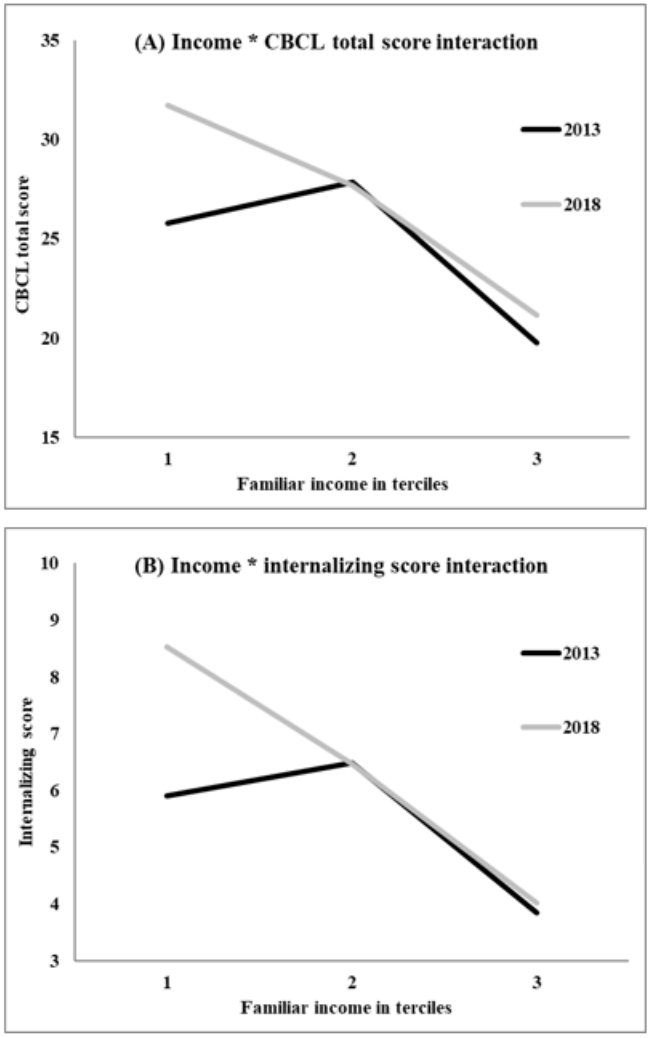



**Figure 2.** Plot of income*CBCL total score (A) and income*internalizing score (B) interactions in the 2013 and 2018 Endis cohort studies.

Age-adjusted predicted marginal means by cohort and income tertile are presented in **Supplementary Table 5.** For the remaining outcomes, the interaction pattern was more heterogeneous across income strata.

*Contribution of socioeconomic, maternal and child characteristics to between-cohort differences in behavioral/emotional problems.*

Successive ANCOVA models are presented in **Table 2**. Adjustment for family socioeconomic status (Model 2) did not explain the differences in CBCL total, internalizing, externalizing, emotionally reactive and withdrawn syndrome scores. After SES adjustment, aggressive behavior became significantly higher in 2018, while attention problems were no longer significant. Further adjustment for maternal

characteristics (Model 3) revealed a significant cohort difference in anxious/depressed scores. Adjustment for child characteristics (Model 4) and maternal depression during pregnancy (Model 5) did not attenuate the remaining cohort differences, suggesting that observed differences in CBCL scores are independent of changes in sample composition between cohorts. Across all adjusted models, higher scores in 2018 remained evident for CBCL total, internalizing, externalizing, emotionally reactive, withdrawn, anxious/depressed, and aggressive behavior outcome whereas somatic complaints, sleep problems, and attention problems were not significant in the fully adjusted model.

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**Table 2.** ANCOVA analyses of differences in CBCL scores between the 2013 and 2018 Endis[#] cohorts.

| CBCL Scales | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | F | *p* | F | *p* | F | *p* | F | *p* | F | *p* |
| **CBCL total** | 5.07 | 0.024 | 10.59 | 0.001 | 10.80 | 0.001 | 14.47 | <0.001 | 15.21 | <0.001 |
| **Internalizing** | 6.92 | 0.008 | 7.14 | 0.008 | 7.91 | 0.005 | 16.73 | <0.001 | 17.79 | <0.001 |
| **Externalizing** | 5.07 | 0.024 | 7.92 | 0.005 | 7.32 | 0.007 | 5.64 | 0.018 | 5.60 | 0.018 |
| **Emotionally reactive** | 10.77 | 0.001 | 13.10 | <0.001 | 11.17 | <0.001 | 19.97 | <0.001 | 6.31 | 0.012 |
| **Anxious/ depressed** | 0.00 | 0.977 | 2.28 | 0.131 | 4.10 | 0.043 | 8.15 | 0.004 | 9.26 | 0.002 |
| **Somatic complaints** | 2.80 | 0.094 | 0.08 | 0.772 | 0.21 | 0.649 | 0.08 | 0.781 | 0.10 | 0.755 |
| **Withdrawn** | 20.49 | <0.001 | 14.98 | <0.001 | 18.12 | <0.001 | 26.50 | <0.001 | 26.30 | <0.001 |
| **Sleep problems** | 1.58 | 0.209 | 3.84 | 0.050 | 3.27 | 0.071 | 2.11 | 0.147 | 2.06 | 0.151 |
| **Attention problems** | 12.03 | <0.001 | 3.08 | 0.080 | 2.27 | 0.133 | 1.52 | 0.218 | 1.53 | 0.216 |
| **Aggressive behavior** | 3.00 | 0.083 | 7.94 | 0.005 | 7.54 | 0.006 | 13.64 | <0.001 | 13.91 | <0.001 |

[#]Only children from Montevideo.
Model 1. Adjusted for age at time of CBCL assessment.

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Model 2. Adjusted for model 1 plus family socioeconomic status (familiar income, number of rooms, maternal skin colour and schooling).
Model 3. Adjusted for model 2 plus maternal characteristics (maternal age, prenatal care, desired pregnancy, delivery type, parity, smoking and alcohol intake during pregnancy).
Model 4. Adjusted for model 3 plus child characteristics (multiple pregnancy, preterm birth, low birthweight, exclusive breastfeeding, lives with father and attends educational center).
Model 5. Adjusted for model 4 plus maternal depression during pregnancy.
The significant cohort interaction effects (variable*cohort) of familial, maternal and child characteristics on CBCL scales were inserted in the models.

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## Discussion

Our study analyzed 5-year changes in maternal-reported behavioral and emotional problems among 1-4-year-old children residing in Montevideo, Uruguay. Differences in maternal and child´s characteristics between the 2013 and 2018 Endis cohorts were identified. After fully accounting for these characteristics, higher CBCL scores in the 2018 cohort remained evident for total problems, internalizing, externalizing, emotionally reactive, anxious/depressed, withdrawn and aggressive behavior. Differences in CBCL total and internalizing problems, anxious/depressed, withdrawn and sleep problems scores were largest among children from low-income families, with virtually no difference observed in the highest income tertile. We identified higher scores across several types of behavioral and emotional domains in the 2018 cohort. These results are in consonance with findings from high-income countries where an increase in child behavioral problems has also been observed [10,11], especially in the recent years [12,29]. It should be noted, however, that not all studies in high-income countries have found a rise in childhood emotional and behavioral problems, with several investigators reporting stability or small decreases in parent-reported offspring psychological problems [30–32].Despite increases or stability, there has been a rise in the diagnosis and treatment of child mental disorders in many countries in recent years [33,34]. While the increasing number of cases may suggest a real increase in the prevalence of symptoms of mental disorders, other possible explanations for the rising trend include an increase in help-seeking behavior, changes in diagnostic criteria, improved screening in schools and primary health settings, and changes in clinical practices [32]. Therefore, it is possible that the apparent increase in the rates of mental disorders is merely a reflection of the shrinking gap between actual and reported mental health problems. Hence, studies are needed to assess the prevalence of mental health symptoms in repeated cross-cohort community samples or successive accompaniments of children in cohorts from multiple settings [35].

Few epidemiological studies have been conducted to assess time changes in child behavior problems outside high-income countries[14]. As far as we know, only three studies have investigated this wide range of child behaviors using the CBCL in low-and middle-income populations, and none of them

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accessed data from very young children. First, Rahim and Cederblad investigating children from Sudan, reported that boys and girls 3-6-year-old did not change their rate of behavioral symptoms from 1965 to 1980 [15]. Second, in Brazil, also located in Latin America, Matijasevich et al. investigated behavioral/emotional problems through maternal report in children 4-year-olds and noted a significant increase in CBCL total problems, internalizing, externalizing, aggressive, anxious/depressed, and thought problems mean scores between 1997 and 2008 [16]. Finally, Lee et al. assessed the CBCL in two cohorts of children aged 6 to 8 living in Singapore. They reported an increase in the thought problems and somatic complaints scores between 2003 and 2017 [17]. Our study advances in literature, showing results from a population-based urban sample from an upper-income Latin American setting, which has not been studied previously.

According to the results found in our study, the differences in behavioral/ emotional problems was more pronounced among children from lower socioeconomic status. In Brazil, it was verified that CBCL total score increased in a 11-year-period and these differences were more observable in children from families from low socioeconomic status (compared with the highest status). Additionally, children from families in the highest socioeconomic level showed almost no increase in behavioral problems in the studied period [16]. Previous studies have indicated that children's behavior is primarily influenced by their family environment [17,36–38]. Household income and parents' economic status are considered major influencing factors for the family stability [39], and family economic status is considered to be strongly related to children's problem behavior. A possible explanation for the association between socioeconomic status and behavioral problems in children is the level of parental involvement [37] and a less satisfactory relationship between children and their parents [40]. Hill and Taylor suggested that lower income parents tend to be less involved in their children's education [41]. Additionally, parents from lower socioeconomic level may not have the time, resources, or information to facilitate greater involvement and may be hesitant in their interactions with their children because of a perceived lack of competence [37].

Family life and socioeconomic conditions have changed across different countries in recent years, and differences in maternal and child characteristics



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between the 2013 and 2018 Endis cohorts indicate that Uruguay is not an exception. The observed differences in child CBCL externalizing scores found in our study were not accounted for by changes in familial, maternal, and child characteristics between 2013 and 2018. This suggests that variables other than those included in our analyses could be responsible for these differences. It is plausible that changes in behavioral problems among children, especially among the poorest groups, could reflect broader changes in the local environment in terms of insecurity and violence. There is evidence that indirect exposures to neighborhood-based violence, including witnessing physical assault, shootings, and murder, are associated with externalizing behaviors in youth [42]. Violence exposure within the neighborhood context is a predictor of externalizing behaviors among children, poorer academic achievement, and cognitive difficulties [42,43]. Additionally, it is important to highlight that exposure to violence in any context (in the neighborhood, at school, or at home) is an established risk factor associated with elevated externalizing behavior problems [44]. Despite including detailed data on a wide range of relevant sociodemographic covariates, violence was not measured in our study. In Uruguay, between 2013 and 2018, there was evidence of an increase in violence. Homicides went from 7.6 to 11.8 per 100,000 inhabitants and robberies and thefts increased by 53.8% and 25.6%, respectively [45]. In the same period, although there was improvement in records of intrafamily violence, cases of serious violence against children and adolescents augmented from 1,319 to 4,131 [46].

The strengths of these analyses include the possibility to compare the baseline of two population-based cohort studies of the same location starting 5 years apart. The comparisons rely on uniform modes of data collection combined with the use of similar questionnaires and standardized instrument for children behavioral/emotional problems performed by highly trained fieldworkers at both time points. A further strength is that we were able to adjust for a range of socio-economic markers, unlike other studies where fewer indicators are available.

Several limitations should be acknowledged. First, the use of maternal report may introduce reporting bias, although evidence supports that parents can accurately rate their children's behavior across diverse backgrounds [47] The

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possibility that increased social acceptability of behavioral problems may have contributed to higher 2018 scores cannot be ruled out; however, the fact that some scales increased while others did not argues against a broad societal shift in reporting sensitivity. Second, the analyses are restricted to Montevideo, given that the CBCL was administered only in this city during the 2013 ENDIS baseline. Although Montevideo represents approximately one-third of Uruguay's total population and ranks first in Latin America in quality of life indicators, findings should not be extrapolated to rural populations or interpreted as national-level trends. Third, formal measurement invariance of the CBCL 1½–5 across cohorts was not tested. This is a limitation shared across the existing literature comparing CBCL scores across time points or populations; to our knowledge, no published cohort comparison study using the CBCL 1½–5 has conducted formal invariance testing. The use of the same standardized instrument, administered by trained fieldworkers following identical protocols in both cohorts, reduces the likelihood of major comparability issues. Nonetheless, findings should be interpreted as differences in observed scores rather than definitive evidence of change in underlying latent constructs, and future studies should incorporate invariance testing when feasible. Fourth, raw scores were used rather than standardized metrics; while appropriate for within-scale cohort comparisons, this limits direct comparison of effect magnitude across CBCL domains with different score ranges. Finally, although multivariable linear regression could have been used to estimate adjusted cohort effects, we adopted a successive ANCOVA strategy to transparently show how between-cohort differences changed after sequential adjustment for conceptually defined blocks of covariates.

Child psychological problems have a long-lasting impact on life outcomes, including psychiatric disorders, poor educational achievement, and contact with the criminal justice system.[48] These findings provide evidence of higher behavioral and emotional problems in the 2018 cohort compared to 2013, particularly among low-income families. Effect sizes were small overall (d range: 0.07–0.17), and the clinical significance of these differences at the individual level is modest. However, even small shifts in population-level scores, when concentrated in socially disadvantaged groups, may have meaningful implications for early childhood services planning. Replication in other settings

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and time points is needed before these results are translated into public health recommendations.

## Declarations

### Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

### Competing interests

The authors declare no conflicts of interest. The funders were not involved in the design or interpretation of the findings.

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### Author Contributions

Conceptualization: AM, CZ, FB, GAGL, DDS, MRR; Methodology and Data analysis: AM, DDs;

Writing—Original Draft Preparation: AM, DDS, JM, CZ; Writing—Review and Editing: all authors;

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All authors have read and approved the final version of the manuscript submitted and take public responsibility for all aspects of the work.

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**Supplementary Table 1.** Mean differences and standardized effect sizes (Cohen's d) for CBCL scores in the 2013 (n= 790) and 2018[#] (n= 743) Endis cohorts.

| CBCL scales | 2013 Endis mean (SD) | 2018 Endis[#] mean (SD) | *Mean difference** | *p value* | *Cohen's d (95%CI)* |
|---|---|---|---|---|---|
| **CBCL total** | 24.15 (17.89) | 26.02 (19.39) | 1.87 | 0.049 | -0.10 (-0.20; 0.00) |
| **Internalizing** | 5.16 (5.21) | 6.17 (6.75) | 1.01 | 0.001 | -0.17 (-0.27; -0.07) |
| **Externalizing** | 9.98 (7.53) | 10.55 (7.61) | 0.57 | 0.140 | -0.07 (-0.17; 0.02) |
| **Emotionally reactive** | 1.07 (1.66) | 1.43 (2.11) | 0.35 | <0.001 | -0.18 (-0.28; -0.08) |
| **Anxious/ depressed** | 2.51 (2.43) | 2.52 (2.66) | 0.01 | 0.941 | -0.01 (-0.10; 0.10) |
| **Somatic complaints** | 0.93 (1.60) | 1.22 (1.91) | 0.28 | 0.002 | -0.16 (-0.26; -0.06) |
| **Withdrawn** | 0.63 (1.15) | 1.00 (1.77) | 0.37 | <0.001 | -0.25 (-0.35; -0.15) |
| **Sleep problems** | 2.07 (2.28) | 2.17 (2.38) | 0.10 | 0.412 | -0.04 (-0.14; 0.06) |
| **Attention problems** | 2.08 (1.64) | 2.35 (1.72) | 0.27 | 0.002 | -0.16 (-0.26; -0.06) |
| **Aggressive behaviour** | 7.89 (6.44) | 8.20 (6.51) | 0.31 | 0.358 | -0.05 (-0.15; 0.05) |

[#]Only children from Montevideo. *2018 minus 2013. *p* value: Student's t-test for independent samples.

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**Supplementary Table 2.** Multivariable ANOVA main effects (*F* statistic) of familial, maternal, and child characteristics on CBCL scores across both cohorts.

| Variables | CBCL total | Internal | External | Emotionally reactive | Anxious/ depressed | Somatic complaints | Withdrawn | Sleep problems | Attention problems | Aggressive behavior |
|---|---|---|---|---|---|---|---|---|---|---|
| **Family income** | 30.01** | 41.76** | 14.16** | 19.98** | 62.18** | 8.23* | 17.04** | 2.12 | 7.44** | 13.64** |
| **Number of rooms** | 8.14* | 7.50* | 5.70* | 1.63 | 14.56** | 0.02 | 6.73* | 0.14 | 7.91* | 4.28* |
| **Maternal skin colour** | 3.72* | 4.40* | 2.70 | 0.11 | 9.19** | 2.89 | 4.21* | 0.83 | 0.88 | 2.86 |
| **Maternal schooling** | 30.90** | 29.64** | 21.78** | 13.92** | 40.98** | 5.25* | 17.02** | 0.91 | 15.26** | 19.68** |
| **Maternal age** (years) | 10.45** | 18.79** | 4.88* | 9.81** | 17.31** | 7.66** | 10.76** | 0.11 | 8.64** | 3.32* |
| **Prenatal care** | 5.92* | 1.39 | 7.88* | 0.13 | 4.48* | 0.57 | 2.53 | 0.16 | 8.45* | 6.38* |
| **Desired pregnancy** | 0.09 | 2.17 | 0.02 | 0.27 | 3.37 | 0.91 | 1.06 | 3.09 | 0.01 | 0.04 |
| **Delivery type** | 4.05* | 2.91 | 1.43 | 1.17 | 8.80* | 0.02 | 0.42 | 1.17 | 0.27 | 1.60 |
| **Parity** | 1.05 | 0.80 | 1.47 | 0.63 | 1.87 | 0.02 | 1.21 | 1.77 | 6.42* | 0.66 |
| **Multiple birth** | 0.05 | 1.70 | 0.06 | 4.55* | 0.44 | 1.72 | 4.53* | 1.72 | 0.31 | 0.02 |
| **Smoking**[§] | 23.80** | 11.38** | 27.08** | 6.20* | 23.06** | 0.00 | 5.53* | 2.80 | 4.94* | 30.41** |
| **Alcohol intake**[§] | 3.65 | 0.49 | 4.47* | 0.06 | 0.06 | 0.76 | 1.09 | 3.14 | 1.32 | 4.73* |
| **Depression**[§] | 15.79** | 31.13** | 7.15* | 21.30** | 27.31** | 20.91** | 4.92* | 1.29 | 1.89 | 7.67* |
| **Child's sex** | 1.11 | 0.05 | 3.45 | 0.02 | 0.01 | 1.84 | 0.11 | 0.88 | 3.56 | 2.84 |
| **Preterm birth** | 0.06 | 0.92 | 0.47 | 0.03 | 0.39 | 4.06* | 0.45 | 0.00 | 0.44 | 0.39 |
| **Low birthweight** | 0.35 | 0.80 | 0.05 | 0.05 | 0.60 | 2.15 | 0.68 | 0.12 | 0.32 | 0.02 |
| **Exclusive breastfeeding** | 0.33 | 1.35 | 0.04 | 0.40 | 1.51 | 2.67 | 0.03 | 1.02 | 0.54 | 0.00 |
| **Lives with father** | 25.28** | 24.59** | 19.21** | 14.01** | 21.04** | 7.62* | 17.34** | 0.00 | 2.58 | 22.28** |
| **Attends educational center** | 2.21 | 8.54* | 0.37 | 1.03 | 15.40** | 1.27 | 6.18* | 0.65 | 0.00 | 0.53 |

[§]Variables related to the gestational period (e.g., smoking during pregnancy). Controlling for age (months) at follow-up. *p < .05; **p < .001.

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**Supplementary Table 3.** Marginal means (SE) of significant main effects of familial, maternal and child characteristics on CBCL scores, across both cohorts, adjusted for age at time of testing.

| Variables | CBCL total | Internal | External | Emotionally reactive | Anxious/ depressed | Somatic complaints | Withdrawn | Sleep problems | Attention problems | Aggressive behavior |
|---|---|---|---|---|---|---|---|---|---|---|
| **Familiar income** | | | | | | | | | | |
| 1st tercile | | | 10.8 (0.4) | 1.5 (0.1) | | 1.1 (0.1) | | | 2.3 (0.1) | 8.5 (0.3) |
| 2nd tercile | | | 11.3 (0.3) | 1.5 (0.1) | | 1.3 (0.1) | | | 2.4 (0.1) | 8.9 (0.3) |
| 3rd tercile | | | 9.0 (0.3)* | 0.9 (0.1)* | | 0.8 (0.1)* | | | 2.0 (0.1)* | 7.0 (0.3)* |
| **Number of rooms** | | | | | | | | | | |
| < 4 rooms | 26.2 (0.7) | 5.9 (0.2) | 10.6 (0.3) | | 2.8 (0.1) | | 0.8 (0.0) | | 2.3 (0.1) | 8.4 (0.3) |
| ≥ 4 rooms | 22.9 (0.9)* | 5.0 (0.3)* | 9.4 (0.4)* | | 2.2 (0.1)* | | 0.6 (0.1)* | | 2.0 (0.1)* | 7.5 (0.3)* |
| **Maternal skin colour** | | | | | | | | | | |
| White | 24.3 (0.5) | 5.4 (0.2) | | | 2.4 (0.1) | | 0.7 (0.0) | | | |
| Black | 28.3 (2.3) | 6.7 (0.7) | | | 3.5 (0.3)* | | 1.1 (0.2) | | | |
| Asian/indigenous | 32.7 (3.9) | 8.4 (1.2)* | | | 3.8 (0.5)* | | 1.5 (0.3) | | | |
| **Maternal schooling** | | | | | | | | | | |
| Primary | 32.0 (1.3) | 8.1 (0.4) | 11.9 (0.5) | 1.7 (0.1) | 3.6 (0.2) | 1.3 (0.1) | 1.4 (0.1) | | 2.6 (1.2) | 9.3 (0.5) |
| Secondary | 28.9 (0.8) | 6.9 (0.2) | 11.7 (0.3) | 1.6 (0.1) | 3.1 (2.9)* | 1.3 (0.1) | 1.0 (0.1)* | | 2.5 (0.1) | 9.2 (0.3) |
| Tertiary | 19.9 (1.0)* | 4.0 (0.3)* | 8.4 (0.4)* | 0.9 (0.1)* | 1.7 (0.1)* | 0.9 (0.1)* | 0.5 (0.1)* | | 1.9 (0.1)* | 6.5 (0.4)* |
| **Maternal age** (years) | | | | | | | | | | |
| < 20 | | | 12.1 (0.7) | | | 1.7 (0.2) | 1.3 (0.1) | | 2.7 (0.2) | 9.4 (0.6) |
| 20-34 | | | 10.4 (0.3) | | | 1.0 (0.1)# | 0.8 (0.1)* | | 2.2 (0.1)# | 8.1 (0.2) |
| ≥ 35 | | | 9.7 (0.3)# | | | 1.0 (0.1)# | 0.6 (0.1)* | | 2.0 (0.1)# | 7.6 (0.3)# |
| **Prenatal care** | | | | | | | | | | |
| No | 36.3 (4.7) | | 15.4 (1.9) | | 3.8 (0.6) | | | | 3.4 (0.4) | 11.9 (1.6) |
| Yes | 25.0 (0.5)* | | 10.2 (0.2)* | | 2.5 (0.1)* | | | | 2.2 (0.0)* | 8.0 (0.2)* |
| **Delivery type** | | | | | | | | | | |
| Vaginal | 26.0 (0.6) | | | | 2.7 (0.1) | | | | | |
| Cesarean | 24.2 (0.7) | | | | 2.3 (0.1)* | | | | | |
| **Parity** | | | | | | | | | | |
| 1 | | | | | | | | | 2.4 (0.1) | |
| 2 | | | | | | | | | 2.2 (0.1) | |
| ≥ 3 | | | | | | | | | 2.0 (0.1)# | |
| **Smoking**§ | | | | | | | | | | |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No | 24.1 (0.5) | 5.4 (0.2) | 9.9 (0.2) | 1.2 (0.5) | 2.4 (0.1) | 0.8 (0.1) | 2.2 (0.0) | 7.7 (0.2) |
| Yes | 31.0 (1.2)* | 7.0 (0.4)* | 12.8 (0.5)* | 1.6 (0.1)* | 3.3 (0.2)* | 1.0 (0.1)* | 2.5 (0.1)* | 10.3 (0.4)* |
| **Alcohol intake[§]** | | | | | | | | |
| No | | | 10.2 (0.2) | | | | | 8.0 (0.2) |
| Yes | | | 11.7 (0.7)* | | | | | 9.3 (0.6)* |
| **Depression[§]** | | | | | | | | |
| No | 24.8 (0.5) | 5.5 (0.1) | 10.2 (0.2) | | 2.4 (0.1) | 1.0 (0.0) | 0.8 (0.0) | 8.0 (0.2) |
| Yes | 36.4 (3.0)* | 10.7 (0.9)* | 13.4 (1.2)* | | 4.5 (0.4)* | 2.3 (0.3)* | 1.3 (0.2)* | 10.9 (1.0)* |
| **Preterm birth** | | | | | | | | |
| No | | | | | | 1.0 (0.0) | | |
| Yes | | | | | | 1.4 (0.1)* | | |
| **Lives with father** | | | | | | | | |
| No | 29.3 (1.0) | 7.1 (0.3) | 11.7 (0.4) | | | 1.6 (0.1) | | 9.4 (0.3) |
| Yes | 23.9 (0.6)* | 5.2 (0.2)* | 9.8 (0.2)* | | | 1.1 (0.1)* | | 7.6 (0.2)* |
| **Attends educational center** | | | | | | | | |
| No | | 6.3 (0.3) | | | 2.9 (0.1) | 0.9 (0.1) | | |
| Yes | | 5.3 (0.2)* | | | 2.3 (0.1)* | 0.7 (0.0)* | | |

Note. Marginal means presented for main effects that were not involved in a significant interaction.
*Indicates significantly different to above category, adjusted for multiple comparisons using Bonferroni test.
#Indicates significantly different to first category, adjusted for multiple comparisons using Bonferroni test.

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**Supplementary table 4.** *F* statistics of multivariable ANOVA cohort interaction effects (variable*cohort) of familial, maternal and child characteristics on CBCL scores.

| Variables | CBCL total | Internal | External | Emotionally reactive | Anxious/ depressed | Somatic complaints | Withdrawn | Sleep problems | Attention problems | Aggressive behavior |
|---|---|---|---|---|---|---|---|---|---|---|
| **Familiar income** | 3.29* | 6.75* | 0.56 | 1.94 | 7.78** | 2.93 | 5.14* | 3.14* | 1.06 | 0.37 |
| **Number of rooms** | 0.37 | 0.02 | 1.60 | 1.06 | 0.06 | 0.00 | 0.16 | 0.00 | 0.04 | 2.33 |
| **Maternal skin colour** | 0.71 | 0.11 | 0.74 | 0.08 | 1.36 | 0.30 | 0.10 | 0.79 | 0.49 | 0.77 |
| **Maternal schooling** | 0.03 | 1.19 | 1.80 | 1.24 | 0.27 | 1.00 | 0.97 | 0.22 | 0.29 | 2.08 |
| **Maternal age** (years) | 4.96* | 8.15* | 0.62 | 3.47* | 11.90** | 2.14 | 2.62 | 0.86 | 2.69 | 0.46 |
| **Prenatal care** | 0.19 | 0.14 | 0.22 | 0.02 | 0.11 | 0.59 | 0.02 | 0.21 | 1.77 | 0.80 |
| **Desired pregnancy** | 17.58** | 20.29** | 9.23* | 14.13** | 20.53** | 1.47 | 17.76** | 0.37 | 6.14* | 8.46* |
| **Delivery type** | 0.17 | 0.01 | 0.31 | 0.00 | 0.62 | 0.28 | 1.16 | 1.44 | 1.24 | 0.88 |
| **Parity** | 1.22 | 1.44 | 0.48 | 1.14 | 0.53 | 0.38 | 2.37 | 0.10 | 0.21 | 0.67 |
| **Multiple birth** | 4.96* | 10.14* | 3.66 | 7.93* | 9.35* | 0.75 | 9.11* | 0.47 | 0.25 | 4.46* |
| **Smoking**[§] | 0.87 | 1.96 | 0.35 | 2.66 | 1.85 | 0.12 | 0.73 | 0.21 | 1.23 | 0.16 |
| **Alcohol intake**[§] | 1.11 | 0.06 | 1.81 | 0.05 | 0.07 | 0.31 | 0.80 | 1.61 | 0.33 | 2.02 |
| **Depression**[§] | 0.39 | 1.15 | 0.01 | 4.62* | 0.24 | 0.40 | 2.20 | 0.08 | 1.32 | 0.03 |
| **Child's sex** | 0.07 | 0.33 | 0.03 | 0.02 | 0.29 | 0.21 | 0.43 | 0.81 | 0.06 | 0.06 |
| **Preterm birth** | 0.01 | 0.01 | 0.27 | 0.39 | 0.94 | 1.46 | 0.01 | 0.89 | 0.01 | 0.34 |
| **Low birthweight** | 1.41 | 1.11 | 2.75 | 0.19 | 6.99* | 2.20 | 0.87 | 1.11 | 3.46 | 2.13 |
| **Exclusive breastfeeding** | 0.41 | 0.56 | 0.14 | 0.00 | 0.30 | 2.28 | 0.05 | 0.54 | 0.24 | 0.10 |
| **Lives with father** | 0.09 | 2.94 | 0.59 | 0.06 | 5.75* | 0.99 | 3.96* | 0.89 | 0.05 | 0.92 |
| **Attends educational center** | 0.19 | 0.20 | 2.24 | 0.09 | 0.36 | 0.27 | 0.04 | 0.01 | 0.20 | 2.68 |

[§]Variables related to the gestational period (e.g., smoking during pregnancy). Controlling for age (months) at follow-up. *p < .05; **p < .001.

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**Supplemental table 5.** Adjusted predicted marginal means of CBCL scores by cohort and family income tertile in the 2013 (n= 790) and 2018[#] (n= 743) Endis cohorts.

| CBCL scales | Income tertile | 2013 Endis adjusted mean (95% CI) | 2018 Endis[#] adjusted mean (95% CI) | *Mean difference** | *p value* |
|---|---|---|---|---|---|
| **CBCL total** | 1st | 25.78 (23.45; 28.12) | 31.72 (29.13; 34.31) | 5.94 | 0.001 |
| | 2nd | 27.85 (25.54; 30.16) | 27.66 (25.28; 30.04) | -0.19 | 0.912 |
| | 3rd | 19.77 (17.71; 21.83) | 21.16 (19.10; 23.21) | 1.38 | 0.359 |
| **Internalizing** | 1st | 5.91 (5.17; 6.65) | 8.53 (7.71; 9.35) | 2.63 | <0.001 |
| | 2nd | 6.49 (5.76; 7.22) | 6.47 (5.71; 7.22) | -0.02 | 0.965 |
| | 3rd | 3.85 (3.19; 4.50) | 4.02 (3.36; 4.67) | 0.17 | 0.726 |
| **Anxious/ depressed** | 1st | 2.99 (2.68; 3.30) | 3.71 (3.37; 4.06) | 0.73 | 0.002 |
| | 2nd | 3.10 (2.79; 3.41) | 2.62 (2.30; 2.93) | -0.48 | 0.035 |
| | 3rd | 1.83 (1.55; 2.10) | 1.52 (1.25; 1.80) | -0.30 | 0.134 |
| **Withdrawn** | 1st | 0.82 (0.63; 1.00) | 1.50 (1.30; 1.71) | 0.69 | <0.001 |
| | 2nd | 0.68 (0.49; 0.86) | 1.02 (0.83; 1.21) | 0.34 | 0.012 |
| | 3rd | 0.49 (0.33; 0.66) | 0.63 (0.46; 0.79) | 0.13 | 0.268 |
| **Sleep problems** | 1st | 1.76 (1.46; 2.06) | 2.28 (1.95; 2.61) | 0.52 | 0.024 |
| | 2nd | 2.39 (2.10; 2.69) | 2.18 (1.87; 2.48) | -0.22 | 0.320 |
| | 3rd | 1.95 (1.68; 2.21) | 2.24 (1.98; 2.50) | 0.29 | 0.128 |

Adjusted predicted marginal means were estimated from linear regression models including cohort, family income tertile, the cohort × income interaction, and child age in months. [#]Only children from Montevideo. *2018 minus 2013. Income tertile: 1st: lowest income; 3rd: highest income. *p* values refer to pairwise comparisons between cohorts within each income tertile, based on adjusted predicted marginal means estimated from linear regression models.

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