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# Dynamics of the parenting and child development

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## Abstract

This paper analyzes the link between parenting and child development. It seeks to identify feedback mechanisms between these two dimensions by considering mothers' personality traits and education as moderators. We found a strong link between externalizing problems in children and authoritarian parenting styles and did not find inertia for authoritarian parenting. It was also found that the link between personality traits and parenting often cited in the literature may have some biases if the child's problems are not taken into account, mainly due to the role of neuroticism and conscientiousness. Finally, it was found that externalizing problems affects parenting style differently depending on the mothers' personality traits and education. The effect is more profound among mothers with low levels of education, agreeableness and conscientiousness, and greater levels of neuroticism.

*Keywords:* Child development, parenting, personality traits, early childhood

JEL Classification: J13, D91, I15

## Resumen

Este artículo analiza el vínculo entre parentalidad y desarrollo infantil. Se busca identificar los mecanismos de retroalimentación de estas dos dimensiones, considerando la personalidad y educación de la madre como moderadores. Encontramos un fuerte vínculo entre los problemas externalizados del niño y el estilo de crianza autoritario. También encontramos que el vínculo habitualmente reportado en la literatura, entre los rasgos de personalidad de la madre y la parentalidad, puede presentar algunos sesgos si no se consideran los problemas del niño, principalmente por el papel del neuroticismo y la perseverancia. Por último, se encuentra que los problemas externalizados afectan los estilos de crianza de forma diferencial, dependiendo de la educación y rasgos de personalidad de la madre. El efecto más importante se encuentra entre las madres con bajo nivel educativo, baja amabilidad y perseverancia, y altos niveles de neuroticismo.

*Palabras clave:* Desarrollo infantil, parentalidad, rasgos de personalidad, primera infancia

Clasificación JEL: J13, D91, I15

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## **1. Introduction**

Recent studies have explored how early childhood development affects adulthood performance (Heckman et al., 2006; Heckman et al., 2013; Conti and Heckman, 2013) and shown that gaps in skills take root in early childhood (Cunha et al., 2010; Schady et al., 2015). During this stage of life, development is affected by several factors, with parenting and family environment exerting remarkable influence (Del Bono et al., 2016; Mustard et al., 2003; Todd and Wolpin, 2003; Becker, 1965). A broad consensus exists regarding corporal punishment's negative impact on child development (Lansford et al., 2005), and the evidence notes that affective and nurturing parenting impacts a child's brain development by developing neuronal connections (Cunha et al., 2006; Heckman, 2008). Kim et al. (2018) found that good discipline and positive engagement during childhood reduces externalizing behaviors in adolescence.

While it is known that the quality of children's interactions with referential adults affects early social behavior and attachment relationships (Oates, 2007), only a few very recent economic papers incorporate parenting environments or the time mothers dedicate to their children in certain activities as determinant factors of child performance (Del Bono et al., 2016). Moreover, given that the quality and quantity of the time mothers spend with a child and the child's performance interact and change over time, the nature of this relationship remains unclear (Todd and Wolpin, 2003; Cunha and Heckman, 2008). While some works find more evidence in favor of compensation mechanisms between the two, others find the existence of reinforcement mechanisms (Attanasio et al., 2020; Fiorini and Keane, 2014; Nicoletti and Tonei, 2020). At the same time, it has been shown that factors such as education level (Restrepo, 2016) and the types of expenditures made in the home (Yi et al., 2015) could influence the link between parenting and a child's development.

According to Cuervo (2010), a parent's choices will generate profound and lasting effects on development and social and learning opportunities. For instance, prolonged and gravely negligent situations during childhood, and non-stimulating experiences, could be related to lower skills, physical and motor problems, and externalizing behavioral problems. According to Baumrind (1968, 1971), an 'enabling' parental style is characterized by a strong affective involvement with children, active control of their activities, and receptivity to their demands, combined with nonviolent discipline strategies. Another style, authoritarian, is based on obedience and the frequent use of punishment to regulate behavior. Finally, the permissive style is characterized basing parenting on information, but setting few limits. Doepke and Zilibotti (2017) develop a model in which these parenting styles are chosen rationally, based on parental preferences and socioeconomic environment.

Belsky (1984) outlines one of the theoretical frameworks most used to analyze parenting determinants. According to this author, these determinants can be grouped into three sources of influence: child characteristics, contextual factors of stress and support, and the parents' personality traits. In this paper, we seek to delve into some of these traits.

A central characteristic of children is the way they express social-emotional problems. Pinquart (2017) provides a framework for analysis of these characteristics by performing a meta-analysis of the associations between parenting and the externalization of problems in children and adolescents. The study provides support for bidirectional associations, and the author point out that externalizing problems is more closely linked to parenting styles than to parenting practice. Rothenberg et al. (2020) study the relationship between parental control and warmth and the externalization and internalization of problems among children ages 8 to 13; they find that the bond's bidirectionality exists and is independent of the culture considered. Given these findings, this paper's main objective is to provide evidence on how child development and parenting practices are related, considering the possibility that this relation could be bidirectional, an aspect rarely considered for developing countries. For instance, Campbell (1979) shows that a child's behavior is associated with parental attention, i.e., those children with the worst behavior receive less attention. This idea is explored in Heckman and Mosso (2014) model, where they propose an investment function that includes parents' parenting and has child skills as an argument. Herein lies the idea of self-productivity of investment postulated by Heckman in several works, which suggests that the higher the previous investments, the higher the yields generated by subsequent ones.

The intergenerational transmission of parenting styles is another key consideration. Belsky (2010) indicates that the parenting style that an individual experienced during childhood affects their parenting style during adulthood. The literature has identified three mechanisms by which beliefs about these styles are transmitted and incorporated: kinesthetic-primary learning, which refers to the enduring impact of the parenting experienced during the first years of life that could attenuate or be reinforced depending on later experiences; imitation learning, which is obtained during the second childhood by observing and imitating how adults care for small children, interact, and play with them; and, finally, learning incorporated in adulthood, which includes information, orientations, and advice received by different communications routes (Sigel and McGillicuddy-De Lisi, 2002). Regarding the first two factors, lived parenting experiences have a strong effect. The presence of punishment constitutes a risk factor, while a relationship of affection and support is beneficial for an individual's future bond with their children (O'Connor and Scott, 2007; Cuervo, 2010).

Finally, the parents' noncognitive skills are important. Anger and Shnitzlein (2017) provide evidence that the correlation between siblings' abilities is higher than 0.5, indicating the

importance of an intergenerational transmission of abilities. The literature has shown that personality traits are linked to a broad set of performances (Ozer and Benet-Martinez, 2006; Caprara and Cervone, 2000). Among these are the parents' role in terms of parenting (Belsky, 1984). Many empirical studies have used the Big Five Inventory (BFI) to determine the role of a care-taker's personality traits in parenting (Metsäpelto and Pulkkinen, 2003; Prinzie et al., 2005). The evidence indicates that personality traits affect the parents' behavior by impacting how they feel, think, and act (Prienze et al., 2009). A typical result is that higher conscientiousness, agreeableness, extraversion, and openness to experiences are related to more desirable parenting, while neuroticism goes in the opposite direction.

Attempts to capture the interactions between parenting and child performance over time run into at least two challenges. First, one must measure all the inputs relevant to a child's development, particularly the quality of the home environment. Second, one must discern a correlation between inputs and outputs from a causal effect—a more complex task (Del Bono et al., 2016; Fiorini and Keane, 2014). We exploit the change in child performance and parenting among individuals and over time. Similar to what has been suggested by Todd and Wolpin (2003, 2007), and then applied in Del Bono et al. (2016) and Fiorini and Keane (2014), we use an accumulative model with added value and instrumental variables in which we associate parenting and child performance with contemporaneous and lagged variables, including lags for dependent variables in children.

This paper contributes to the specialized literature in the area of economic development by providing novel empirical evidence about one of the leading social mobility basics, early childhood performance. The specific contributions are threefold. First, we will illustrate the interaction between parenting and externalizing problems in children, allowing a bidirectional link. As most of the literature pertains to high-income countries, it is notable that the context of these findings is a country with an intermediate level of development. Second, the studies that use accumulative models with added value use child development indicators as dependent variables. In this paper, we chose to consider parenting because it allows us to explore whether the link changes when we consider different development problems.

The model developed in Cobb-Clark et al. (2019) predicts how socioeconomic disadvantages affect parents' decisions of investment via limitations imposed by the endowment for care at home (cognitive capacity). In this framework, one of the contributions of this article arises from its consideration of the mother's personality traits as moderators of the bond in parenting and child development. Although the role that the mother's personality traits play in explaining parenting is known (Bornstein et al. 2007; de Haan et al. 2012), only Di Giunta et al. (2020) have analyzed how a personality trait (the self-efficacy of parents in anger regulation) affects harsh parenting, and how this, in turn, affects externalization and

internalization of problems in children. However, in this case the personality traits analyzed are limited. We consider the BFI and add maternal education as additional moderators.

This paper finds that externalizing problems have stronger links with parenting based on punishment and authoritarian style. From the estimations, we find there to be reinforcement between this parenting and externalizing problems in children, although there is also evidence of a weaker reinforcement with internalizing problems. We try to establish whether there are heterogeneities in the link between parenting and child development associated with the mother's education and personality traits. The most consistent result indicates that the link between authoritarian style and externalizing problems is influenced by the mother's degree of emotional instability, conscientiousness, and agreeableness.

The paper is organized as follows. In Section 2, we describe the data and comment on the main variables. The empirical strategy is presented in Section 3, indicating the different specifications that will be used later. Then, in Section 4, we include the main results derived from these estimations. We close the paper with the conclusions derived from this work.

## **2. Data**

### **2.1 Survey on Nutrition, Child Development and Health**

This paper uses the Survey on Nutrition, Child Development and Health (ENDIS by its acronym in Spanish) of Uruguay as a longitudinal source of information. This survey is rich in that it presents not only substantial information on the child but also, for instance, retrospective information on the mother's home environment during childhood as well as her current circumstances, including information about her personality traits. This makes it possible to approach the main objective of this paper from different perspectives and in a novel way.

We worked with two waves of the ENDIS, the first from 2013 and the second from 2015. The National Institute of Statistics carries out this survey. It represents the whole country, the sampling frame being the same as for the main national survey source (the Continuous Household Survey). In 2013, data was collected from all households with a child less than 48 months old; in the second wave, these children were between 24 and 72 months old. In the first wave, 2665 households were visited; in the second wave, 2306 homes, 2091 of which were in the original sampling frame. Of these households, 14% report information on more than one child (siblings).

### **2.2 Parenting and child development**

To approximate parenting we use the distinction established in Darling and Steinberg (1993) between parenting practices and parenting styles. In this framework, 'parenting practices'

seek to have a direct effect on specific outcomes of child development while 'parenting styles' constitute a constellation of attitudes towards the child that describe the interactions with their children in a wide range of situations based on the parents' socialization objectives. We use a set of beliefs about what parenting "should be like" to approximate parenting styles. In this case, we construct an authoritative style index for both waves of the ENDIS, using Principal Component Analysis (PCA). For parenting practices, we use the Home Observation Measurement Environment (HOME) scale to measure the home environment's warmth and positivity.<sup>1</sup> This scale is available exclusively in the second wave of the ENDIS.<sup>2</sup>

For a measurement of parenting styles, we start by using the categories proposed by Baumrind (1971). In the PCA, the relevant variables in the first factor are related to an authoritarian style, for instance, the survey questions, "Often, a child's whims can 'drive you up the wall' and you end up hitting or yelling at them" or "'A good beating' from time to time is good for a child" are used to build this index. In Table A.1 in the Appendix, we present the factors from PCA, which were used to construct the index.

The HOME is composed of 45 items, divided into six subscales. However, the ENDIS has 11 items on the responsivity and acceptance subscales. The first six items correspond to the responsivity subscale (the care-taker responsible for the child is physically affectionate, praises him). The last five items correspond to the acceptance subscale, which measures how parents manage the child's behavior. For HOME's acceptance subscale, a higher score indicates punitive or severe parents (the care-taker yells at or hits the child during the interview) and is related to a more hostile environment for the child. In the responsivity subscale, the higher score indicates a colder or less sensitive relationship with the parents. Both subscales are standardized by non-parametric regressions that take into consideration the child's age and the different interviewers. The Pearson coefficient between both subscales is high (0.265), but they present a low correlation with the authoritarian style (0.066 in responsivity and 0.013 in acceptance).

For the child's development measure, we use the Child Behavior Checklist (CBCL) questionnaire, which is part of the ASEBA system, developed by Achenbach (1991). This psychometric test allows for the identification of socio-emotional problems that could be related, for instance, to a lack of attention and aggressive behavior (externalizing), and with those associated with anxiety, withdrawal, or isolation (internalizing). For this scale, we use

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<sup>1</sup> According to Berlinski et al. (2015) there is substantial evidence for the correlation between HOME and child development in several environments, and this correlation has been used in several studies that examine how the quality of time that a mother spends with her children affects a child's development (Rosales-Rueda, 2014; Todd and Wolpin, 2007).

<sup>2</sup> While parenting styles moderate the link between parenting practices and child development, they also directly influence a child's openness to parenting processes. The authoritarian style is not considered a HOME moderator since this last scale is only available in the second wave.



the same standardization procedure as for HOME. The correlation between both types of problems is very high, 0.550 for the first wave, and 0.654 for the second wave.

### 2.3 Sample selection

Since the first wave collected the CBCL only for the capital city of Montevideo, our study only covers this city. As the psychometrics instrument is applied from 18 months of age, the first wave was reduced to 813 cases. However, in the second wave, as the children grew up, the number of cases increased to 990. We ultimately collected 517 observations that permitted us to consider a balanced panel, and at the same time, discard those observations with a missing value for any of the variables used. In Table 1, descriptive statistics of the parenting and child development variables are presented. Information on these variables is shown according to the sex and age of the children.

**Table 1 Average HOME score, parenting style index and CBCL by sex and age of the child. 1st and 2nd wave**

		HOME (Only 2nd wave)		Authoritarian parenting style		CBCL			
		Responsivity	Acceptance	1st wave	2nd wave	Internal.		External.	
						1st wave	2nd wave	1st wave	2nd wave
Total score	Mean	-0.034	0.011	-0.064	0.133	-0.021	-0.050	-0.010	-0.030
	St. Dev.	1.005	1.043	1.254	0.858	0.987	0.912	0.934	0.995
<b>Child characteristics</b>									
(a) Sex									
Boy (47%)	Mean	0.106	0.181	0.015	0.212	0.073	0.049	0.116	0.203
	St. Dev.	1.079	1.155	1.120	0.716	0.991	0.980	0.941	1.080
Girl (53%)	Mean	-0.190	-0.176	-0.116	0.049	-0.096	-0.191	-0.124	-0.268
	St. Dev.	0.916	0.898	1.341	0.991	0.973	0.809	0.909	0.844
(b) Age (months) in 1st wave									
<=30 (42%)	Mean	-0.022	-0.005	-0.017	0.156	-0.025	0.014	-0.009	-0.011
	St. Dev.	0.995	1.116	1.322	0.809	1.021	0.995	0.924	1.047
>30 (58%)	Mean	-0.042	0.022	-0.097	0.116	-0.018	-0.097	-0.011	-0.043
	St. Dev.	1.013	0.989	1.204	0.891	0.963	0.844	0.942	0.958

Note: The tests' scores are standardized in each wave through non-parametric regressions, taking into account the child's months and identifying the interviewer who applied the test. Source: ENDIS.

When we consider the average score for an authoritarian parenting style, we can observe that it increases between periods. We observed that this increase occurs both for the youngest children (less than 30 months in the first wave) and for the oldest (more than 30 months in the first wave). Also, the authoritarian style is more frequently associated with boys in both waves. This result is consistent with both subscales of HOME, which is also higher for boys.

The last four columns in Table 1 list the average CBCL test scores for internalizing and externalizing problems, with the same variables used to describe the parenting style and practices. We observe little variation between waves. However, the differences are more notable when we look at these problems according to the sex of the child. While externalizing problems increased between waves for boys (almost double), both problems decreased for

girls, also by relevant magnitudes. Note that in both waves, the externalizing and internalizing problems are greater for boys than girls.

#### 2.4 Moderator variables: BFI and education mother's

One of this paper's contributions is related to the heterogeneities of links between parenting and children's development. The analysis will focus on the education and the personality traits of mothers. For this last modulator, we use the BFI, which is included only in the second wave of ENDIS. Having information for only one wave is not a limitation because the literature points out that personality traits tend to be stable in adulthood (Roberts and Del Vecchio, 2000; Costa and McCrae, 1992). However, to control for potential changes for older interviewees, we estimate each dimension of the BFI using the interviewee's age as a covariable and employ the residual of that estimation to approximate personality traits (Groves, 2005; Heineck and Anger, 2010).

In Table 2, we show the correlations of each of the modulators with parenting and child development. In general, except for neuroticism, we expect negative correlations (a higher score on the BFI and a higher educational level associated with better parenting and fewer social-emotional problems). The association is low between all modulators and the authoritarian parenting style. When considering HOME, no association with neuroticism is found. Additionally, the expected sign is found in all modulators in the responsivity subscale. The same happens with acceptance except in extraversion and agreeableness, where the association is close to zero. Moreover, it is observed that association levels are higher for responsivity than acceptance.

**Table 2 Correlation of moderating variables with parenting and child development**

	HOME		Authoritarian parenting style	CBCL	
	Responsivity	Acceptance		Internal.	External.
Years of education	-0.246	-0.154	-0.002	-0.331	-0.283
BFI					
Extraversion	-0.135	0.013	0.020	-0.123	-0.152
Agreeableness	-0.108	0.043	0.041	-0.100	-0.069
Conscientiousness	-0.179	-0.091	-0.020	-0.040	-0.119
Neuroticism	0.005	0.003	-0.047	0.193	0.137
Openness	-0.143	-0.021	-0.023	-0.096	-0.058

Note: For the different dimensions of the BFI, the residual from the estimation of each dimension's score is used, including the age of the interviewee as a covariate. The mother's years of education's maximum value is 22, and her average value is 11.02. Source: ENDIS.

When considering externalizing and internalizing problems in children, we find the expected signs in all cases. In particular, a relatively high and positive association is found with neuroticism. The highest correlation of both problems is found with years of education, with

values close to -0.3. Negative correlations are found in the rest of the BFI dimensions, with values around -0.1.

## 2.5 Additional variables

ENDIS allows for controls with a rich set of variables. Among the most relevant are the absence of the father, postpartum depression, problematic consumption during pregnancy, low birth weight, support in parenting and presence of younger siblings.

## 3. Empirical strategy

To analyze the link between parenting and children's development, we take advantage of the longitudinal nature of the data source. For the estimation, we use an accumulative model, with added value and instrumental variables (Todd and Wolpin, 2003, 2007; Del Bono et al., 2016; Fiorini and Keane, 2014). Therefore, most estimations are done using OLS, except when it is specifically mentioned that we are using IV.

We start with the estimation of a basic contemporary model, which will serve as a reference point. This model presupposes that only contemporaneous regressors that approximate child development matter in explaining parenting and that control variables are a good proxy of unobservable innate skills and possible omitted variables.

$$Y_{i,2}^j = \alpha \cdot Z_{i,2}^w + \epsilon_i$$

The variable  $Y_{i,2}^j$  reflects the parenting in the second wave; the superscript  $j$  refers to whether the parenting is measured with the standardized score of each HOME subscale or the parent's authoritarian style.  $Z_{i,2}^w$  is the CBCL standardized score, where  $w$  refers to whether externalizing or internalizing problems are considered.

Second, lagged observables that vary over time ( $Z_{i,1}^w$ ) are added to the contemporary estimation, thereby relaxing the first assumption. This model allows us to capture, at least in part, the problems caused by simultaneity or reverse casualty between parenting and children's development. The analysis of changes in sign and significance of regressors when their lag is incorporated allows us to hypothesize about the medium-run relationship between regressors and parenting (Del Bono et al., 2016).

$$Y_{i,2}^j = \alpha^1 \cdot Z_{i,1}^w + \alpha^2 \cdot Z_{i,2}^w + \beta \cdot X_{i,1} + \epsilon_i$$

We carry out estimations with and without controls ( $X_{i,1}$ ). The controls used are: mother's level of education; age and age squared of the mother; the age of the child in days; sex of the child; absence of the father; postpartum depression; problematic consumption during pregnancy; low birth weight; BFI; support in the upbringing; and presence of younger siblings.

When we include these controls, we use the variables present in the first wave in the vast majority of cases. The exception is the BFI, which was available only for the second wave. Although, as mentioned above, it is relatively invariant over time, we nevertheless consider the residual of the estimated score controlling for the respondent's age. Finally, we use controls that we assume do not present exogeneity problems. In some specifications, we include controls that could give endogeneity problems (hours worked by the mother; enrollment of the child at a daycare center; and per capita income) to verify that the main results do not change.

The third estimations add the lagged dependent variable,  $Y_{i,1}^j$ , which reflects the effects of persistence or self-productivity (understood as motivation or propensity to develop certain parenting in various situations), but presupposes that the effects of unobservable abilities decrease at a fixed rate ( $\rho$ ) between waves, while at least partly capturing innate unobservable abilities, such as intelligence (Todd and Wolpin, 2003; Fiorini and Keane, 2014; Del Bono et al., 2016). This estimation can be performed for the authoritarian style when HOME is not available for the first wave. This model is the one that previous studies have called an accumulative model with added value.

$$Y_{i,2}^j = \rho \cdot Y_{i,1}^j + \alpha^1 \cdot Z_{i,1}^w + \alpha^2 \cdot Z_{i,2}^w + \beta \cdot X_{i,1} + \epsilon_i$$

Finally, introducing the lagged endogenous variable could bias the coefficients of the inputs. A standard instrument consists of using the endogenous variable lagged two (or more) periods (Del Bono et al., 2016). This is because these lags correlate with the t-1 lags of the output, but not with the errors in t (Del Bono et al., 2016). For the case of ENDIS, although we do not have previous observations, we do have information on the mother's perceptions of her own childhood, such as the presence of conflict, punishment, and a happy environment. As mentioned in the introduction, there is evidence that parenting is transmitted intergenerationally. We use two instruments for lagged parenting: (i) if the mother reports that, when she was a child the frequency with which she was beaten as a form of discipline was high (19.2% of the population), and (ii) if there was conflict or tension in the home while growing up (67.1% of the population).<sup>3</sup>

It should be noted that this strategy does not allow us to completely control for other variables that may have previously affected our variables of interest, and therefore made an impact the parents' behavior and the child's development as observed in the first wave of ENDIS. For example, if variables lagged for more than one period. However, we are not aware of any

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<sup>3</sup> The question about beatings is collected in wave 1, while the question about conflict is collected in wave 2. We believe it is relevant to collect the instruments in different waves, as it allows us to control for possible changes in the interviewees' perceptions about their childhood associated with their context.

previous study that explains parenting dynamics and including in the estimation the lagged dependent variable by more than one period.

#### **4. Main results**

In this section, we present the main results of the paper. First, we discuss the links between parenting and child development. We estimate the same models, trying to understand how other determinants, namely BFI and mother's education, operate in parenting. Finally, we include a section dedicated to studying the existence of heterogenous links between both performances.

##### **4.1 The bond between parenting and children's development**

We present the estimation results of models that may help understand how internalizing and externalizing problems in children affect parenting. As mentioned above, in theoretical terms, the sign of the effect of a child's problems on their parents' actions is ambiguous. Problems in a child's development could produce changes in the parent's behavior, mitigating the adverse effects or reinforcing them (Nicoletti and Tonei, 2020).

In the next estimations, the first column shows the contemporaneous specification of parenting, taking into account the socio-emotional problems of the child. In Columns 2 and 3, the lagged problems are included with several controls. Then, in Column 4, other regressors that could present endogeneity problems are included to see if the model results are not altered. The last two columns are only shown for the authoritarian parenting style estimates since HOME is not available for the first wave. In Column 5, the lagged dependent variable is included. Finally, in Column 6, this variable is instrumented with the mother's background.

The first estimation includes authoritarian parenting style as the dependent variable (Table 3). When this variable is related to the externalizing problems variable (Panel a), we find that, for each point of increase in such problems, authoritarian parenting style increases by 0.534 standard deviations (sd). When the previous externalizing problems of the child are included (Column 2), as well as a range of relevant controls (Column 3), in particular the mother's characteristics, the coefficients of the contemporary effects of the socio-emotional problems drop considerably (to 0.3 sd). Notably, historical information on a child's development, which is positive and statistically significant in explaining the authoritarian parenting style, indicates that omitting this information leads to overestimating the impact of the contemporary problems. Since both present and past values of this performance are positive and statistically significant, this result could be indicating that there is feedback over time between a child's externalization of problems and the belief in an authoritarian parenting style, as shown by a medium-term effect of between 0.3 and 0.2 sd.

Column 5 incorporates the lag of an authoritarian parenting style to capture the persistence in such beliefs. Although such an effect's persistence is relevant, the child's externalizing problems, both present and past, continue to be statistically significant, although slightly less so than in the previous estimation. However, the persistent effects cease to be substantial when the mother environment is used to instrument the lag of authoritarian style (Column 6). In this last estimation, the coefficients for externalizing problems are similar to the estimation without the lag of an authoritarian style. This result may well be because the lagging authoritarian style coefficient, when included without instrumentation, captures the effects of the child's lagging externalizing problems or beliefs on parenting styles acquired from her early childhood experiences. There is pervasive evidence, especially from psychology, that links coercive parenting practices and children's behavioral problems. In the case of the children and mothers analyzed here, the evidence is in line with previous literature.

When we consider the internalizing problems (Panel b), a mothers' authoritarian style has effects. But they are weaker and less robust. When we incorporate the lagged authoritarian parenting, the coefficient's magnitude is lower, and the lagged variable is not significant. Once again, when implementing the lagged parenting style, it is no longer significant, and the magnitude of the lagged internalizing problems coefficient increases. That is to say, the inter-temporal dynamics are not affected when one type of problem or the other is considered.

Panel c incorporates both internalizing and externalizing problems simultaneously. Let us remember that the correlation of both was very high, so it is important to determine whether the effects found are specific to the different problems or whether they are different indicators that capture the same phenomenon. In these estimates, the externalizing problems in  $t$  remain significant, the robustness of this lagged problem is relativized, and the internalizing problems are no longer significant. This result gives us indications that the type of relevant problems affecting upbringing are externalizing rather than internalizing.

In this case, the HOME acceptance component (Table 4), which measures the presence of hostility and punishment in the home, is consistent with the results obtained for the authoritarian parenting style; we find a positive correlation with children externalizing problems (panel a). An increase in contemporary problems in children results in a 0.35 sd increase in the HOME acceptance component. However, past problems do not seem to explain the current home environment. They are not statistically significant. Current socio-emotional problems are not affected, indicating that there is no feedback process between these parenting practices and the child's development, which is consistent with the results presented in Nicoletti and Tonei (2020) concerning the low temporal variability of HOME compared to other parenting indicators. We should also recall that parenting styles frame and condition parents'

practices. In this sense, it is expected that the feedback dynamic would occur between the beliefs of the parents and the behavior of their children, while the link with concrete practices would take place within a specific time frame.

**Table 3 Authoritarian parenting style estimation. Effects of externalizing and internalizing problems**

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) IV
<b>(a) Externalizing problems</b>						
Externalizing problems (t)	0.534*** [0.081]	0.415*** [0.080]	0.321*** [0.081]	0.327*** [0.081]	0.293*** [0.079]	0.302*** [0.079]
Externalizing problems (t-1)		0.342*** [0.090]	0.262*** [0.098]	0.256** [0.099]	0.178* [0.093]	0.207* [0.109]
Authoritarian style (t-1)					0.382*** [0.079]	0.252 [0.223]
Observations	517	517	517	517	517	517
R-squared	0.086	0.113	0.200	0.206	0.301	0.290
F (endogenous regressors)						14.51
P-value						0.00
Chi2 (overidentifying)						2.200
P-value						0.138
<b>(b) Internalizing problems</b>						
Internalizing problems (t)	0.426*** [0.100]	0.366*** [0.096]	0.205* [0.111]	0.215* [0.111]	0.209** [0.101]	0.208** [0.099]
Internalizing problems (t-1)		0.246*** [0.082]	0.172** [0.080]	0.164** [0.080]	0.124 [0.078]	0.137* [0.083]
Authoritarian style (t-1)					0.404*** [0.077]	0.299 [0.223]
Observations	517	517	517	517	517	517
R-squared	0.046	0.063	0.165	0.171	0.280	0.272
F (endogenous regressors)						15.12
P-value						0.00
Chi2 (overidentifying)						1.985
P-value						0.159
<b>(c) Externalizing and internalizing problems</b>						
Externalizing problems (t)	0.488*** [0.115]	0.385*** [0.125]	0.362*** [0.122]	0.363*** [0.120]	0.304** [0.124]	0.325*** [0.125]
Internalizing problems (t)	0.077 [0.131]	0.057 [0.133]	-0.061 [0.149]	-0.054 [0.147]	-0.011 [0.144]	-0.029 [0.144]
Externalizing problems (t-1)		0.283** [0.115]	0.215* [0.098]	0.214* [0.121]	0.141 [0.117]	0.167 [0.1250]
Internalizing problems (t-1)		0.098 [0.104]	0.080 [0.098]	0.073 [0.096]	0.067 [0.099]	0.071 [0.096]
Authoritarian style (t-1)					0.381*** [0.079]	0.246 [0.226]
Observations	517	517	517	517	517	517
R-squared	0.087	0.116	0.202	0.207	0.302	0.290
F (endogenous regressors)						14.24
P-value						0.00
Chi2 (overidentifying)						2.199
P-value						0.138
Exogenous controls	No	No	Yes	Yes	Yes	Yes
Endogenous controls	No	No	No	Yes	No	No

Note: Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Exogenous controls include: the education of the mother, age and age squared of the mother, age of the child in days, sex of the child, absence of the father, postpartum depression, problematic consumption during pregnancy, low birth weight, BFI, support in the upbringing, and presence of younger siblings. Endogenous controls are: hours worked by the mother, enrolment of the child at a day care center, and per capita income. All variables included as controls, except the BFI, corresponding to t-1. The instrumental variables used are two: (i) the mother was frequently beaten in childhood, and (ii) conflict in the home was high during childhood. Source: ENDIS.

Nevertheless, as we have no previous measurement of HOME, it is not possible to conclude the persistence of effects in this case. On the other hand, when considering internalizing problems as a co-variable (panel b), the contemporary variables continue to be the only significant ones, although with smaller coefficients than for externalizing problems. Once again, there is no evidence of feedback between these parenting practices and the child's internalizing problems. When we incorporate both problems simultaneously (panel c), only the externalizing problems in t are significant.

**Table 4 Acceptance HOME score estimation. Effects of externalizing and internalizing problems. OLS**

	(1)	(2)	(3)	(4)
<b>(a) Externalizing problems</b>				
Externalizing problems (t)	0.347*** [0.052]	0.330*** [0.057]	0.322*** [0.057]	0.329*** [0.058]
Externalizing problems (t-1)		0.048 [0.059]	0.001 [0.054]	-0.005 [0.054]
Observations	517	517	517	517
R-squared	0.109	0.111	0.165	0.172
<b>(b) Internalizing problems</b>				
Internalizing problems (t)	0.219*** [0.057]	0.215*** [0.061]	0.202*** [0.063]	0.204*** [0.063]
Internalizing problems (t-1)		0.016 [0.056]	-0.031 [0.050]	-0.034 [0.049]
Observations	517	517	517	517
R-squared	0.036	0.037	0.110	0.115
<b>(c) Externalizing and internalizing problems</b>				
Externalizing problems (t)	0.377*** [0.071]	0.356*** [0.073]	0.333*** [0.072]	0.344*** [0.072]
Internalizing problems (t)	-0.051 [0.080]	-0.046 [0.084]	-0.026 [0.081]	-0.032 [0.079]
Externalizing problems (t-1)		0.061 [0.060]	0.021 [0.059]	0.014 [0.059]
Internalizing problems (t-1)		-0.021 [0.060]	-0.038 [0.056]	-0.037 [0.055]
Observations	517	517	517	517
R-squared	0.111	0.112	0.167	0.174
Exogenous controls	No	No	Yes	Yes
Endogenous controls	No	No	No	Yes

Note: Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Exogenous controls include: the education of the mother, age and age squared of the mother, age of the child in days, sex of the child, absence of the father, postpartum depression, problematic consumption during pregnancy, low birth weight, BFI, support in the upbringing and presence of younger siblings. Endogenous controls are: hours worked by the mother, enrollment of the child at a day care center, and per capita income. All variables included as controls, except the BFI, corresponding to t-1. Source: ENDIS.

Finally, we showed the estimations for the responsivity HOME subscale, which measures the absence of warmth in parent-child interactions (Table 5). Higher values of this subscale indicate a colder or less sensitive relationship between parents and their children. In this case, similar results to the HOME acceptance subscale are found, particularly for externalizing problems. More problems of this kind are related to a less receptive environment, although mothers' behaviors do not appear to be affected by the previous existence of a child's externalizing problems. A relevant difference between the two subscales is that with the



responsivity subscale, the externalizing problem coefficients fall sharply as new variables are included (from 0.21 sd to 0.13 sd). This implies that the mother's characteristics, such as education and personality traits, are relevant in explaining a receptive environment regarding the child's externalizing problems, which does not happen with acceptance, as will be shown in the next section. When the internalizing problems are considered, this occurs more markedly only when the contemporaneous variable remains significant, and no controls are included. Once we control for several of the mother's, child's, and home characteristics, we find that internalizing problems do not affect the presence of a receptive environment.

**Table 5 Responsivity HOME score estimation. Effects of externalizing and internalizing problems. OLS**

	(1)	(2)	(3)	(4)
<b>(a) Externalizing problems</b>				
Externalizing problems (t)	0.211*** [0.062]	0.189*** [0.060]	0.129** [0.058]	0.132** [0.059]
Externalizing problems (t-1)		0.063 [0.056]	0.016 [0.052]	0.011 [0.052]
Observations	517	517	517	517
R-squared	0.044	0.047	0.133	0.138
<b>(b) Internalizing problems</b>				
Internalizing problems (t)	0.161*** [0.051]	0.147*** [0.056]	0.069 [0.056]	0.074 [0.056]
Internalizing problems (t-1)		0.056 [0.050]	0.016 [0.045]	0.011 [0.045]
Observations	517	517	517	517
R-squared	0.021	0.024	0.121	0.127
<b>(c) Externalizing and internalizing problems</b>				
Externalizing problems (t)	0.201** [0.101]	0.184* [0.095]	0.148* [0.078]	0.149* [0.079]
Internalizing problems (t)	0.017 [0.095]	0.011 [0.098]	-0.032 [0.080]	-0.028 [0.079]
Externalizing problems (t-1)		0.044 [0.063]	0.007 [0.057]	0.004 [0.057]
Internalizing problems (t-1)		0.031 [0.058]	0.014 [0.050]	0.011 [0.050]
Observations	517	517	517	517
R-squared	0.044	0.047	0.133	0.139
Exogenous controls	No	No	Yes	Yes
Endogenous controls	No	No	No	Yes

Note: Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Exogenous controls include: the education of the mother, age and age squared of the mother, age of the child in days, sex of the child, absence of the father, postpartum depression, problematic consumption during pregnancy, low birth weight, BFI, support in the upbringing and presence of younger siblings. Endogenous controls are: hours worked by the mother, enrolment of the child at a daycare center, and per capita income. All variables included as controls, except the BFI, corresponding to t-1. Source: ENDIS.

In sum, the evidence indicates that a mother's authoritarian parenting tends to result in her child's externalizing problems, functioning as a kind of feedback. The mother's authoritarian parenting persistence is irrelevant, indicating that these beliefs change over time and according to circumstances. Nicoletti and Tonei (2020) find that parents react by investing more time in their children when their socio-emotional problems improve. In other words,

there is a reinforcement behavior in the face of changes in these kinds of problems in children. They explain that this is due to the physical costs for parents when interacting with children with behavioral problems in tandem with time constraints. In HOME's case, the results indicate that, although the parenting environment is negatively reinforced by the presence of a child who externalizes problems, this link should be expected to be contemporaneous. In other words, parents adapt their behavior to present circumstances.

That results differ between the two parenting indicators. It is not surprising that the first is self-reported by mothers regarding what they consider the best parenting. The second is based on the pollster's observation of the interaction between mother and child. It is reasonable to assume that the first has a higher bias produced by the parents' wishes to obtain good reported results that they consider acceptable behavior. However, the HOME is not entirely exempt from this.

#### **4.2 Other links of interest with parenting: the role of BFI and mother's education**

This section presents coefficients of covariables included in the estimations mentioned in the previous section. These include exogenous controls that will be subsequently used to examine the heterogeneity of links between parenting and child development. The variables examined here are the mother's BFI and her level of education. These coefficients are presented in the odd columns of Table 6 and correspond to Column 3 of previous estimations. We include those specifications where the child's externalization of problems is used as an independent variable. When other specifications are considered (Columns 4 - 5), or when internalizing problems is included, there are no changes in the magnitude or significance of the coefficients.

Although, as previously noted, the parent's characteristics and parenting have been found in multiple studies to be factors that affect a child's behavior and their development, both elements are rarely analyzed together. Previous findings indicate that negative parenting and some personality traits have a major impact on externalizing problems in children. A mother's education is also expected to play a role in various behaviors in children. Given this, it is worth examining if mothers with specific personality or educational characteristics are more prone to certain types of parenting. To take a closer look at this evidence, we presented similar estimations without including externalizing problems; these are illustrated in even columns of Table 6. Thus, we can provide evidence about whether the link between parenting and mothers' personality traits are altered when 'externalizing problems' is included as a control.

We find that a higher score for neuroticism (less emotional stability) positively affects authoritarian parenting. Persons with less emotional stability tend to be more anxious and tense, limiting their capacity to maintain effective relationships and respond appropriately to a child's demands; they may more frequently attribute bad intentions to their child, and

respond with physical and verbal punishments (Prinz et al., 2009). When we exclude the estimation for externalizing problems, this coefficient rises by 30%. Hence, omitting such problems could lead to attributing part of the link to this characteristic in mothers.

The positive result is less clear when we consider agreeableness. Although this personality trait has received less attention in the literature (Huver et al., 2010), it is indicative of a predisposition to empathy. Agreeableness is associated with unassuming and kind people, who may then a priori be expected to have more capacity to give affection and protection. However, the link between this personality trait and parenting is ambiguous (Oliver et al., 2009). At least one previous study finds that a greater degree of agreeableness is related to a higher degree of coercion and positively associated with school-aged children's externalizing problems (Prinz et al., 2004). On other hand, there is evidence that as the mother's age and child's age increase, there the link between agreeableness and warmth in interactions tends to decrease (Prinz et al., 2009).

**Table 6 Parenting estimation. Link with BFI and mother's education**

	Authoritarian style		HOME			
			Responsivity		Acceptance	
	(1)	(2)	(3)	(4)	(5)	(6)
Mother's education	-0.120*** [0.028]	-0.147*** [0.063]	-0.042*** [0.015]	-0.050*** [0.015]	-0.010 [0.015]	-0.029** [0.015]
<i>BFI</i>						
Extraversion	0.006 [0.072]	-0.055 [0.077]	-0.063 [0.049]	-0.084 [0.053]	0.062 [0.053]	0.011 [0.057]
Agreeableness	0.177** [0.090]	0.186* [0.095]	-0.073 [0.052]	-0.071 [0.054]	0.076 [0.051]	0.081 [0.057]
Conscientiousness	0.124* [0.072]	0.092 [0.086]	-0.121** [0.057]	-0.129** [0.064]	-0.060 [0.045]	-0.079 [0.056]
Neuroticism	0.228** [0.091]	0.301*** [0.100]	-0.098* [0.050]	-0.081 [0.051]	-0.050 [0.052]	-0.015 [0.059]
Openness	-0.052 [0.079]	-0.008 [0.084]	-0.039 [0.052]	-0.024 [0.053]	-0.023 [0.054]	0.012 [0.057]
Control						
externalizing	Yes	No	Yes	No	Yes	No
problems						

Note: Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Exogenous controls include: age and age squared of the mother, age of the child in days, sex of the child, absence of the father, postpartum depression, problematic consumption during pregnancy, low birth weight, support in the upbringing, and presence of younger siblings. All variables included as controls correspond to t-1. Source: ENDIS.

Conscientiousness appears to generate better outcomes as it is a measure that captures parents' higher propensity to be responsible and set boundaries for their children (Olvidier et al., 2009). Still, it does not clearly link with parenting styles (Huver et al., 2010). It could be that this positive link between a higher propensity to set boundaries and authoritarian parenting is produced by some stress factor(s) in the home, such as the externalization of problems, which is usually not taken into account in the literature. When we omit these problems, the conscientiousness dimension is no longer significant. This result is not surprising. In fact, most studies tend to focus on a component of the BFI at a particular

moment in time rather than interactions between potentially cumulative components (Prinz et al., 2009). Also, the links are analyzed without taking into account the potential socio-emotional challenges that the child may be facing.

We do not find any relationship between the BFI and the acceptance subscale of HOME, which captures the presence of punitive environments. This result is consistent with the findings previously mentioned, in which mother's beliefs and actual parenting practices do not necessarily match, at least simultaneously. We do find a link between the responsivity of HOME, and the neuroticism and conscientiousness dimensions. HOME's responsivity subscale reflects whether the care-giver responds verbally to the child, praises him, and is physically affectionate. Higher values indicate a colder or less sensitive relationship. Therefore, the link between conscientiousness and a less receptive environment is expected, and this does not change if we choose to include the response regarding externalizing problems. However, in neuroticism, we find a weak negative coefficient that runs against our expected results. When we exclude the externalizing problem variable, the link is no longer significant, potentially indicating that this variable's effect is captured in the neuroticism dimension, at least partly compensating for its relationship with the receptivity subscale.

Regarding the mother's education, which, together with the degree of Openness to experience, could be considered an approximation of the mother's cognitive skills, show the expected sign. These variables are linked with reduced authoritarian parenting beliefs, although only the first is significant when considering the authoritarian parenting style and the responsivity subscale. Both have the expected sign. In the acceptance subscale, the coefficient is not statistically significant when externalizing problems are included, showing that different mechanisms operate in the formation of punitive beliefs and the home environment. When we exclude externalizing problems, the mother's education coefficient becomes statistically significant, with the expected sign. This variable's omission could make it appear that higher educational levels also reflect low scores for the child's problems

### **4.3 Heterogeneous dynamics in the link between parenting and child development**

This section presents heterogeneous effects for the variables that we identify as moderators in parenting: the BFI and mother's education. Results are presented only for the authoritarian parenting style, which is the parenting indicator that exhibits information in the lags and higher average link with problems in children, particularly externalizing behaviors (the link with internalizing problems in children disappeared when externalizing and internalizing problems were included simultaneously).

We present the results for model 1 (contemporaneous specification), model 2 (we incorporate lagged externalizing problems), and model 3 (we include several exogenous controls). We also test whether the differences in the coefficients for each of the groups are significant. Later we will discuss the lagged authoritarian style (remember that this variable stopped being significant when the estimations were made with instrumental variables).

In Figure 4, we present the coefficients in  $t$  and  $t-1$  for 'externalizing problems' (and their confidence interval at 5%) for high and low BFI scores and for high and low educational levels in the mother.<sup>4</sup>

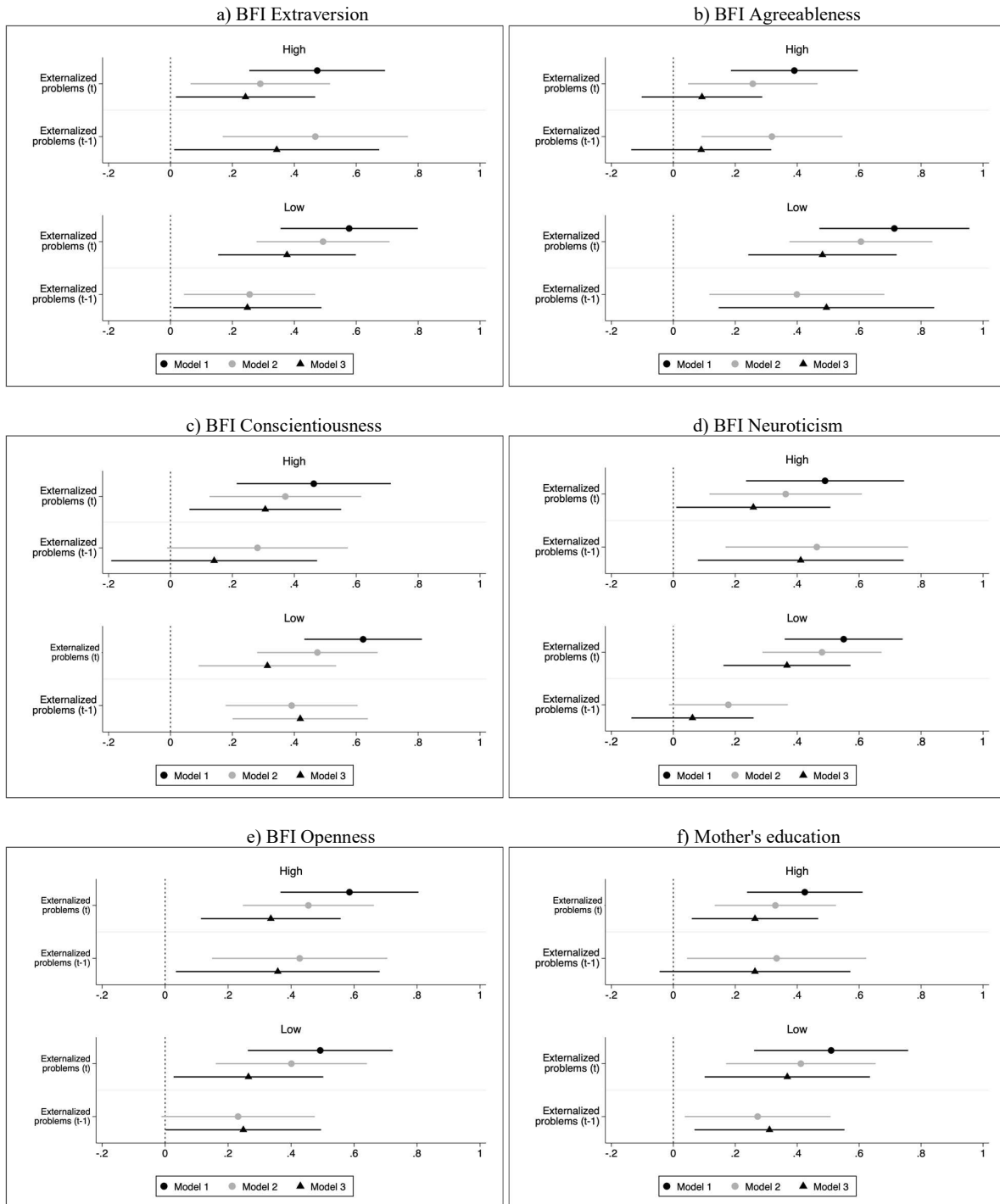
First, we distinguish between mothers with high and low extroversion, in other words, with lower or higher tendency to focus their interest and energy on the external world (Subfigure a). There are few differences between these mothers in regard to both problems (the link is lower when extroversion levels are high). In fact, hypothesis testing does not permit us to rule out that the contemporaneous and lagged coefficients are equal. These results are similar to those obtained when we distinguish between mothers with high or low openness scores (Subfigure e) and high or low education level (Subfigure f). In both cases, we reject the null hypothesis for contemporaneous and lagged problems.

The next personality trait analyzed is agreeableness, which is a higher or lower tendency to cooperate with altruism (Subfigure b). For these groups of mothers, the differences are higher than for extroversion variables. Among mothers with a lower agreeableness score, the contemporaneous and lagged children's externalizing problems are critical. In this case, we cannot reject the null hypothesis ( $\chi^2(1) = 6.46$  for contemporaneous problems and  $\chi^2(1) = 3.80$  for lagged problems). In fact, in model 3, the association of externalizing problems with the authoritarian style disappears when we consider contemporary and lagging problems. Therefore, this personality trait is an important moderator for the link between parenting and externalizing problems in children. This becomes more relevant because of the direct and positive association between agreeableness and authoritarian style (estimate from Table 6). This positive relationship may be hiding the dynamic between parenting and externalizing problems in children, as evidenced among mothers with low agreeableness.

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<sup>4</sup> To identify the low and high scores in the BFI, we set the threshold at the median of the distribution, while for the mother's education, we set the threshold at nine years of schooling.

**Figure 1 Authoritarian parenting style estimation. Externalizing problems coefficients (t and t-1) and authoritarian style (t-1) according to different moderators. Different models**



Note: Robust standard errors in brackets. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . The threshold to identify the high and low scores in the BFI's different dimensions is the median. In the case of the mother's education, the threshold is nine years of education. Exogenous controls include: the education of the mother, age and age squared of the mother, age of the child in days, sex of the child, absence of the father, postpartum depression, problematic consumption during pregnancy, low birth weight, BFI, support in the upbringing, and presence of younger siblings. All variables included as controls, except the BFI, corresponding to t-1. Source: ENDIS.

For conscientiousness (Subfigure c), there were differences between those with high and low scores, but these were less marked. There is feedback between externalizing problems and authoritarian style when conscientiousness is low, however the link is weak and direct when the conscientiousness score is high. However, the null hypothesis test indicates differences between the coefficients only for the lagged problem, although the Chi2 value was not high ( $\text{Chi}^2(1) = 2.06$ ). Again, the moderating role of this personality trait is relevant. On the other hand, in this case, the positive link that had been observed in Table 6 between conscientiousness and authoritarian style disappeared when externalizing problems were removed as a control. This result shows that the connection with the authoritarian style is direct among those who are more inclined to establish limits (high conscientiousness). For those who are less prone to set a limit, the authoritarian style emerges when the child exhibits the externalizing problems behavior.

Next, we present the results for mothers groups according to their score in emotional instability or neuroticism (Subfigure d). The more emotionally unstable the mother, the stronger positive association between authoritarian parenting and the lagged externalizing problems behavior in children. By contrast, the lagged problems of the child do not seem to influence mothers with low neuroticism. It should be noted that with this dimension of BFI, we cannot reject the null hypothesis for lagged externalizing problems in children ( $\text{Chi}^2(2) = 3.26$ ).

In Table 7, we present the lagged authoritarian style's coefficient for the specific estimates of each of the moderators. Estimates by OLS and IV are included. It is found that inertia exists in the authoritarian style when the score of agreeableness and conscientiousness is high and when the mother's education is low. The significant result associated with the BFI occurs in groups where the feedback process between the authoritarian style and externalizing problems was weak or non-existent. In these cases, the intergenerational transmission of parenting styles seems to work, in contrast to the mechanism associated with mother-child interaction. When mother's education level is low, the authoritarian style appears to be nourished by both mechanisms.

**Table 7 Estimation of inertia of the authoritarian style according to moderators**

Moderators	OLS		IV		Endogenous regressors		Overidentifying		N	
	Coef.	Sd	Coef.	Sd	F	p-value	Chi2	p-value		
Mother's BFI										
Extraversion	High	0.311***	[0.075]	0.156	[0.180]	15.11	0.000	4.858	0.028	259
	Low	0.458***	[0.126]	0.697	[0.483]	2.64	0.105	0.022	0.883	258
Agreeableness	High	0.444***	[0.117]	0.599**	[0.239]	10.7	0.001	0.915	0.339	281
	Low	0.254***	[0.087]	-0.334	[0.356]	6.33	0.013	1.690	0.194	236
Conscientiousness	High	0.414***	[0.134]	0.421*	[0.236]	15.2	0.000	0.003	0.956	267
	Low	0.358***	[0.072]	-0.411	[0.626]	4	0.119	3.232	0.072	250
Neuroticism	High	0.463***	[0.117]	0.268	[0.395]	5.53	0.020	0.778	0.378	243
	Low	0.314***	[0.089]	0.171	[0.239]	8.95	0.003	3.896	0.048	263
Openness	High	0.342***	[0.085]	0.199	[0.254]	10.9	0.001	2.022	0.155	270
	Low	0.416***	[0.110]	0.238	[0.354]	2	0.024	0.970	0.325	247
Mother's education	High	0.299***	[0.072]	-0.312	[0.655]	2.43	0.120	0.595	0.441	288
	Low	0.443***	[0.104]	0.501*	[0.285]	8.05	0.005	1.926	0.165	229

Note: The table shows the coefficient and standard deviation of the authoritarian parenting style in t-1, estimated by OLS and IV. Robust standard errors in brackets. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The threshold to identify the high and low scores in the BFI's different dimensions is the median. In the case of the mother's education, the threshold is nine years of education. Exogenous controls include: the education of the mother, age and age squared of the mother, age of the child in days, sex of the child, absence of the father, postpartum depression, problematic consumption during pregnancy, low birth weight, BFI, support in the upbringing, and presence of younger siblings. All variables included as controls, except the BFI, corresponding to t-1. The instrumental variables used are two: (i) the mother was frequently beaten in childhood, and (ii) conflict in the home was high during childhood. Source: ENDIS.

## 5. Final comments

This work's main objective is to introduce novel evidence that will contribute to a better understanding of the link between child development and parenting, considering the possibility of feedback between the two dimensions. We consider externalizing and internalizing problems in children, parenting related to parents' beliefs regarding an authoritarian parenting style, and the HOME inventory scale (more precisely, the responsivity and acceptance subscale). We use a set of variables as moderators, including the personality traits of mothers. The simultaneous combination of these variables with parenting and a child's behavioral problems is unusual in the literature.

We find that the hypothesis of feedback between parenting and externalizing problems in children is plausible. The evidence is weaker when we consider internalizing problems. On the other hand, no evidence is found in favor of the feedback hypothesis when assessing the home environment, which is consistent with the literature, which assigns a more structural component to these aspects.



One of the hypotheses of this work is that the mother's personality traits are moderators of the link between parenting and the child's behavioral problems; given this, their inclusion is relevant to understand the association. We find evidence in line with this hypothesis. On the one hand, we find that the relationship between personality traits and upbringing is altered when we include the child's externalizing problems as controls. In this sense, omitting this variable may lead to a spurious association, where the magnitude of the coefficients associated with the personality traits captures the child's characteristics. On the other hand, the feedback process results between parenting and externalizing problems are stronger among mothers with high agreeableness and conscientiousness and low neuroticism. The authoritarian style's inertia is verified in cases where agreeableness and conscientiousness are high, underlining the importance of the intergenerational transmission of parenting styles.

Feedback processes amplify inequality. This is known as a 'born accident,' and constitutes a barrier to social mobility. In these cases, there should be a substantial public intervention in the early life stage, and these considerations should be taken into account in the design of public policy. Interventions often attempt to influence parents' forms of caring and providing opportunities for their children and in general, decisions are made based on professional observations and home visits. In these cases, standardized procedures may quickly identify risks, allowing for a systematic approach that could break this vicious circle of inequality.

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## Appendix

**Table A.1. Principal Component Analysis. Parents' beliefs about parenting styles**

	Wave 1		Wave 2	
	Factor 1	Factor 2	Factor 1	Factor 2
If a child asks how babies are born, the truth must be told	-0.076	0.280	-0.203	0.469
Even though they are very small, being with other children helps them grow	-0.035	0.554	0.022	0.534
Often, a child's whims can 'drive you up the wall' and you end up hitting or yelling at them	0.423	0.370	0.431	0.032
Babies who touch everything are not spoiled, they are learning	-0.011	0.358	-0.061	0.576
In order for them to learn to eat by themselves you have to let them get dirty and play with the spoon	0.079	0.594	0.006	0.629
Boys have to be educated so that they know how to take charge in the household	0.686	-0.245	0.646	0.036
Sometimes, to make them to understand, even if they are small, there is no choice but to hit them	0.495	0.191	0.452	-0.044
Boys have to be taught to take care of themselves, and one has to take care of the girls.	0.716	-0.227	0.649	0.051
Children learn to behave well when they are spoken to and when you are patient with them	-0.034	0.264	-0.052	0.504
Girls have to be taught that the woman's place is in the home	0.748	-0.219	0.352	0.075
'A good beating' from time to time is good for a child	0.530	0.203	0.716	0.064
To get rid of children's 'tantrums' you have to let them cry until they get tired	0.355	0.373	0.411	-0.112
Children eat better when you are patient with them and they are given something to play with and entertain themselves	0.211	0.049	0.486	0.133

Note: Factor 1 and those variables whose value is greater than 0.2 are considered for the construction of the authoritarian style index. Source: ENDIS.