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Dynamics of the parenting practices and child development

Ivone Perazzo[†] Gonzalo Salas[†♣] Eliana Sena[†]

Abstract

This paper analyses the link between parenting practices and child development. It seeks to identify feedback mechanisms between these two dimensions, and introduces personality traits of the mother that can mediate between parenting and child development. The last of these is a novel element in the literature, as no previous papers that consider the three dimensions simultaneously. Additionally, there is little evidence of this type of dynamic for a country with relatively low development. It also seeks to contribute to the literature by identifying heterogeneous in relationships between parenting practices and child development. A strong link was found between the externalized problems of children and authoritarian parenting styles, with indications that this link is bidirectional. Was also found that the link usually reported in the literature, between personality traits and parenting practices, may have some biases if the child's problems are not considered, mainly due to the role of neuroticism and conscientiousness. Finally, it was found that feedback between externalized problems and authoritarian style is mostly observed when the mother has a high score in agreeableness, conscientiousness, and openness to experience. In cases where the mother has a high scoring of neuroticism, the inertia of authoritarian style plays a central role.

Keywords: Child Development, parenting practice, personality traits

JEL Classification: J13, D91, I15

Resumen

Este artículo analiza el vínculo entre el desarrollo infantil y las pr{acticas de crianza. Se busca identifica los mecanismos de retroalimentación entre estas dos dimensiones, y se introducen los rasgos de personalidad de la madre que pueden mediar entre la crianza y el desarrollo de los niños. Este último aspecto constituye una novedad en la literatura, en tanto no existen antecedentes que consideren las tres dimensiones de forma simultánea. Por otro lado, es escasa la evidencia de este tipo de dinámica para un país con bajo desarrollo relativo. También se busca contribuir a la literatura al identificar relaciones heterogéneas entre las prácticas de crianza y el desarrollo infantil. Se encuentra un fuerte vínculo entre los problemas externalizados de los niños y los estilos de crianza autoritarios, existiendo indicios de que dicho vínculo es bidireccional. Se encuentra también que el vínculo habitualmente reportado en la literatura, entre rasgos de personalidad y prácticas de crianza, puede presentar algunos sesgos si no se consideran los problemas del niño, fundamentalmente en al considerar el papel del neuroticismo y de la perseverancia. 1 Por último, se encuentra que la retroalimentación entre problemas externalizados y estilo autoritario se observa mayoritariamente cuando la madre tiene alto puntaje en amabilidad, perseverancia, y apertura. En los casos donde la madre presenta altos niveles de neuroticismo, la inercia del estilo autoritario juega un rol central.

Palabras clave: Desarrollo infantil, prácticas de crianza, rasgos de personalidad

Clasificación JEL: J13, D91, I15

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1. Introduction

In the recent years several studies have been exploring the way in which heterogeneous development of childhood skills affect performance in adulthood (Heckman et al., 2006; Heckman et al., 2013; Conti and Heckman, 2013). At the same time, previous findings have showed that gaps in these skills occur very early on life (Cunha et al, 2010; Schady et al., 2015). Early childhood, defined as the period that goes from gestation to six years, therefore gives unique opportunities to change the development course of children from low-income households (Young, 2003).

In this stage of life, development is affected by several factors, with the parenting practices and the familiar environment exerting a noteworthy effect (Del Bono et al., 2016; Mustard et al., 2003; Todd and Wolpin, 2003; Becker, 1965). Although there is no consensus about any single way in which parents should act for better results, evidence notes that an affective and stimulative parenting impacts a child's brain development though development of connections and connections neural patterns (Cunha et al., 2006; Heckman, 2008). However, it is important to note that there are few and very recent economic papers that incorporate parenting environments or the time that mothers dedicates to their children in certain activities as determinant factors of child performances (Del Bono et al., 2016).

The nature of this relationship remains unclear, given that the quality and amount of time spent by mothers in children and the child's performance interact and change over time (Todd and Wolpin, 2003; Cunha and Heckman, 2008). While some works find more evidence in favour of compensation mechanisms between the two, others find the existence of reinforcement mechanisms (Attanasio et al., 2015; Fiorini and Keane, 2014; Nicoletti and Tonei, 2017). At the same time, it has been shown that factors such as education level (Restrepo, 2012) and types of expenditure made in the home (Yi et al., 2015) could markedly influence the direction of the link between parenting practices and child's development.

In this context, the main objective of these papers is to provide evidence on the way in which child development and parenting practices are related, considering the possibility that this relation could be bidirectional, an aspect sparsely considered for developing countries. For instance, Campbell (1979) shows that a child's behaviour is related to the attention provided by parents, i.e. those children with the worst behaviour receive less attention. This idea is explored in the model of Heckman and Mosso (2014) where they propose an investment function that includes the parenting practices of parents and that has child skills as an argument.

Here 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 Survey on Nutrition, Child Development and Health (ENDIS, by its acronym in Spanish), applied in Uruguay, provides an unbeatable source of information for this approach, both for its longitudinal character and for the type of information that it reveals.

The kind of parenting is approximated in two ways. On the one hand, we use the parents' beliefs about parenting that are more adequate, from which it is determined which stimuli children should receive with the intention of obtaining a specific effect on their

development. Also, we use the Home Observation Measurement of the Environment (HOME) which brings an approximation to the quality of the home family environment. Although parenting beliefs are relevant to understand parents' behaviour, in most cases parenting theories are implicit (Arranz Freijo, 2004), so the two instruments are complementary.

According to Berlinski et al. (2015), when parents are more protective and less authoritarian, their children reach a higher verbal and intelligence score. The same authors pointed out that family is the factor that most affects a child's welfare, by speaking and playing with them, reading, or telling stories to them. The quality of interactions of children with the reference adults affect early social behaviour and the formation of attachments relationship (Oates, 2007). According to Cuervo (2010) the different activities that adults develop will generate deep and lasting effects on development, and on social and learning opportunities. In that sense, for instance, long and deeply negligent situations during childhood, and non-stimulating experiences, could be related to lower verbal and mathematical skills, physical and motor problems, externalized behavioural problems and poorer social skills, and even to psychiatric problems. The abovementioned parenting factors are analogues of the three styles proposed by Baumrind (1968, 1971). According to this author, there is an enabling style which 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, the authoritarian one, is based on children's obedience and frequent use of punishment to regulate children's behaviour. Finally, the permissive style is characterized by parents that base parenting on information but set few limits. In this paper, we will try to approximate whether the parents' beliefs could be associated with an authoritarian parenting style.

Finally, for the measurement of development, we identify children's problems based on the Child Behaviour Checklist (CBCL) questionnaire, which is part of the ASEBA system, developed by Achenbach. This psychometric test allows to identify socio-emotional problems that could be related, for instance, to a lack of attention and aggressive behaviour (externalized), and with those associated with anxiety, withdrawal, or isolation (internalized).

Trying to capture the interactions over time between parenting practices and child performance faces at least two difficulties. The first one is to be able to measure all the relevant inputs to the children's development, in particular the quality of the home environment. The second one is to be able to discern a correlation between inputs and outputs from a causal effect (Del Bono et al., 2016; Fiorini and Keane, 2014). The ENDIS allows to satisfactorily address the first difficulty by having a very rich set of variables that captures parenting style and home practices, as well as many other socio-economic dimensions, such as a mother's personality traits. The second problem is more complex. We exploit the longitudinal nature of the ENDIS, in other words, the change in child performance and parenting practices among individuals and over time. Similarly to what was suggested by Todd and Wolpin (2003, 2007), and then used by Del Bono et al. (2016) and also Fiorini and Keane (2014), we use an accumulative model, with added value and instrumental variables, where we associate parenting practices and child performances with contemporaneous and lagged variables, and the lags of the dependent variables of children.

This paper aims to contribute to the specialized literature in this area of economic development, by providing novel empirical evidence about one of the main basics of social mobility, namely early childhood performance. The specific contributions are threefold. In the first place, we will show how parenting practices and children's externalized and internalized problems interact, allowing a bidirectional link. These findings are in the context of a country with an intermediate level of development, whereas the majority of the literature pertains to high income countries. On the other hand, the studies that use accumulative models with added value use child development indicators as dependent variables. In this paper we chose to consider parenting practices because the interest is in exploring whether the link changes when we consider different development problems, and in particular if it is mediated by mothers' personality traits. This is a novel aspect, in that this work allows the link between parenting practices and child development to be heterogeneous, in particular from the selected characteristics of the mother characteristics. There is no previous finding, to the knowledge of the authors, which gives such flexibility to the link between parenting practices and children's development, with mothers' personality traits being a channel which is expected to mediate this relationship. Finally, in this paper we consider two different approaches to parenting practices. On the one hand, the beliefs relating to a particular style, the authoritarian one, and on the other hand the environment where the child grows up. These dimensions are complementary and give different information. Beliefs could be affected by cultural norms that define what should be and reinforce the home environment. We also do not find previous works that analyse both dimensions.

In this paper we find that externalized problems have stronger links with parenting practices based on punishment and authoritarian parenting practices. From the estimations we found there to be reinforcement between these parenting practices and externalized problems, although there is also evidence of a weaker reinforcement with internalized problems. In this paper we try to establish whether there are heterogeneities in the link between parenting practices and child development associated with key variables such as sex and age of the child, and the mother's education and personality traits. The child sex seem to determine the way in which families adapt their care strategies when the children have development problems, reacting differently as a function of sex combine with the level of problems. We find that the relationship between externalized or internalized problems and authoritarian parenting practices is stronger for boys. One of the main advantages of the database is the possibility to take into account how the mother's personality traits mediate the analysed variables. The most consistent result indicates that the link between authoritarian style and the externalized problems is influenced by the degree of emotional instability of the mother.

The work is organized as follows. In Section two we present the source of information, comment on the main variables and briefly describe the data. The empirical strategy is presented in Section three, indicating the different specifications that will be used later. Then, in Section four, we include the main results derived from these estimations. We close the paper with some conclusions derived from this work.

2. Data

2.1 Survey on Nutrition, Child Development and Health

The different stages of child development involve a process through which an individual goes through the path of becoming an adult. In this process, genetic, maturative, emotional, nutritional, health, educational, economic, cultural, and family aspects are all involved. This paper uses the ENDIS of Uruguay as a involve source of information. This survey is extremely rich, in that it presents not only substantial information on the child, but also, for instance, retrospective information on the parenting environment by the mother during her own childhood and current circumstances of the mother, such as those associated with her personality traits, which make it possible to approach the main objective of this paper from different perspectives and in a novel way.

We will work with two waves of the ENDIS, the first from 2013, and the second from 2015. This survey is carried out by the National Institute of Statistics (INE), and is representative of the whole country, the sampling frame being the same as for the main source of information of the country (Continuous Household Survey). In 2013, information was collected form households with a child younger than 48 months, while in the second wave these children were between 24 and 72 months. In the first wave 2665 households were visited, and 2306 homes in the second wave, 2091 of which were in the original sampling frame. From these households, 14% have information on more than one child (siblings). Since in the first wave psychometric instruments were collected only for the capital, Montevideo, our study only covers this city. Also, the CBCL is applied from 18 months, so the final number of cases for the empirical approach is 813 in the first wave and 990 in the second wave, yielding a balanced panel of 604 children.

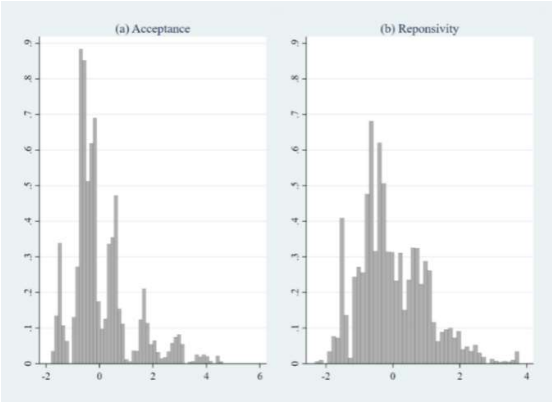
2.2 Parenting practices

In the literature, it is known that to achieve 'full development', children should be raised in a warm and positive environment (Caldwell, 1967). However, measuring the warmth of the environment or the quality of interactions between the child and parent (or principal carers) it is not easy task. The ENDIS is a particularly rich source of information to explore the links between parents and children. In the second wave we have the Home Observation Measurement Environment (HOME), which is designed to measure the quality of the home environment, both qualitatively and quantitatively, and has been used in several studies about the effects that the quality of time that the mother spends with their children has on the child's development (Rosales-Rueda, 2014; Todd and Wolpin, 2007). According to Berlinski et al. (2015) solid evidence exists on the correlation between HOME and child development in several environments. In the case of children between zero and three years old, the instrument is composed of 45 items, divided into 6 subscales. However, the ENDIS has 11 items on the responsivity and acceptance subscales. The first six items correspond to the responsivity subscale (the carer responsible for the child is physically affectionate, praises him), in which higher values indicates a colder or less sensitive relationship with the parents. The last 5 items correspond to the acceptance subscale which measures how parents manage children's behaviour and higher values indicate the presence of punitive or severe parents (the carer

yells at or hits the child during the interview). The HOME score is standardized by non-parametric regressions considering child age and the different interviewers.

In Figure 1 we present the standardized distribution of the score of HOME. In the case of the acceptance subscale we notice a high concentration in the low tail of the distribution, where almost two-thirds of the scores are below zero. The responsivity distribution is less heterogeneous, and almost 60% of the scores are under zero. It is important to note that, for the responsivity subscale, lower scores are associated with higher quality inside the home. In other words, it is expected that lower scores are related to fewer socio-emotional problems.

Figure 1 Distribution of the standardized score of acceptance and receptivity HOME subscales. 2nd wave.

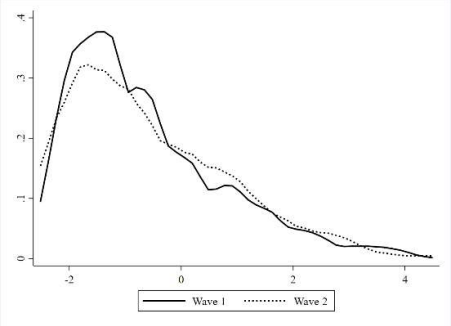


Source: ENDIS

Another group of questions, based on affirmations about the "should be", allow us to approximate adults beliefs with respect to parenting practices. In this case, we work with an aggregated index from a Principal Component Analysis (PCA). The relevant variables in the first factor are related to an authoritarian parenting practices style, for instance, "Often, the whims of children 'drive you up the wall' and you end up hitting or yelling at them" or " 'A good beating' from time to time does children good", hence, are the ones used to build this index. In Table A.1 in the Appendix, we present the factors that comes from PCA, which were used to build the index. The distribution of the index is present in Figure 2, for both waves.

Evidence exists that the authoritarian style is concentrated at low scores, which suggests that such beliefs are not frequent, which is consistent with the acceptance HOME subscale. In this case we have information from both waves, which is reflected in the graph. We observe an important change between waves, where there is a loss of mass between the values of -2 and -1, and a corresponding higher accumulation of responses between 0 and 1, which indicates an increase in these beliefs between these years.

Figure 2. Distribution of authoritarian parenting style beliefs. 1st and 2nd waves

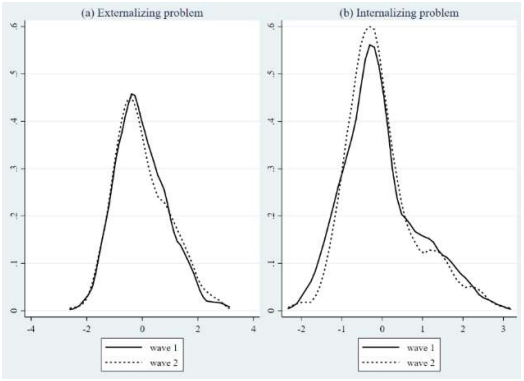


Source: ENDIS

2.3 Child development

For the measure of the child's development we use the CBCL, psychometric evidence present in both waves of the ENDIS, for child older than 18 months, that identifies externalized socio-emotional problems, for instance, lack of attention or aggressive behaviour; and internalized problems, like anxiety, isolation, or folding in on themselves. For this scale we use the same standardization procedure as for HOME. In Figure 3 the CBCL distribution is shown, for both externalized and internalized problems, in both the first and second wave. We observe small differences in scores: in the second wave the internalized problems are the most important, and the results are less dispersed. For the externalized problems we observe a slight movement to the right of distribution, reflecting increased problems of this nature.

Figure 3 Distribution of standardized score of externalized and internalized problems (CBCL). 1st and 2nd waves



Source: ENDIS

2.4 Other relevant variables

One of the contributions of this paper is related to the heterogeneities of links between parenting practices and children's development. The analysis will focus on age and sex of the child on the one hand, and education and the mother's personality traits on the

other. In Figure 1 we present the average values of authoritarian parenting practices beliefs and of HOME subscales for the first three variables. The results of parenting practices of the child are present for both waves, while in the case of HOME only the second wave is presented. When we consider the average score of authoritarian parenting practices belief, it corroborates something already suggested in Figure 1, which is that it increases between periods. Regarding children's age, we observe that the average score of authoritarian style increases with their age. The results differ for the acceptance subscale of HOME, where a higher observed score is related to a more hostile environment for the child. Also, the authoritarian style is more frequent among boys, and it is lower when the education level of the mother is higher. For the responsivity subscale, the score is higher when child's age is higher, which indicates greater warmth at home. Something similar occurs when we consider sex of the child and mother's educational level: lower scores are observed among girls and when the mother is more educated.

The two columns of Table 1 show the average score of the CBCL test, for internalized and externalized problems, considering the same variables that were used to describe the parenting practices. The scores are presented for both waves, taking into account the age and sex of the child and years of education of the mother. When we consider the CBCL, we observe, on average, little variations between waves. The internalized and externalized problems are lower at higher ages. At the same time, in both waves, we observe that boys have higher externalized problems than internalized ones. Lastly, for both kinds of problems, and in both waves, we observe lower score for higher education of the mother.

Parenting is not equivalent to family interaction. When we consider such interaction there is a factor specific to children, the mental health of the parents, as well as genetic and cultural aspects that are closely interrelated with socio-affective development (Arranz Freijo, 2004). The ENDIS allows to deeply explore several of these aspects. One that is extremely relevant for this work is the non cognitive abilities of parents, which provides information about intergeneration transmission (Anger and Shnitzlein, 2017), and is at least in part related to the role of the parents in terms of parenting (Belsky, 1984). To analyse those factors we use the *Big Five Inventory (BFI)*[1] with data from the second wave. The BFI is a widely used accepted approximation to conceptualize personality (Budria and Ferrer-i-Carbonell, 2012). 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 a quadratic expression of the interviewee's age, and employ the residual of that estimation to approximate the personality traits (Osborne, 2005; Heineck and Anger, 2010). To determine the role of the carer's personality traits in parenting, many empirical studies have using the BFI as a tool (Metsäpelto and Pulkkinen, 2003; Prinzie et al., 2009). A common result is that higher conscientiousness, agreeableness, extraversion,

[1] The name of this instrument comes from the fact that it allows us to analyse five personality traits, which are described in Almlund et al. (2011): neuroticism, understood as a chronic level of emotional instability and propensity for psychological distress; extraversion, which reflects the orientation of one's interest and energy towards the external world of people, is characterized by positive affection and sociability; openness to experience, associated with the tendency to be open to new aesthetic, cultural, and intellectual experiences; conscientiousness, as a tendency to be organized, responsible, and hardworking; and agreeableness, which reflects altruism and cooperation. The forty-four questions developed allow us to construct a score for each of these five traits from the average of the answers to each item in each dimension or personality trait, using a scale from one to five.

and openness to experiences are related to more desirable parenting practices, while neuroticism goes in opposite direction.

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

	HOME		Parenting style	CBCL	
	Responsivity	Acceptance	Authoritarian	Internal.	External.
(a) Total					
1st wave	-.-	-.-	-0.528	-0.021	-0.010
2nd wave	-0.033	0.108	-0.428	-0.050	-0.030
(b) Child age (months)					
1st wave					
<=24	-.-	-.-	-0.588	0.031	-0.034
>24	-.-	-.-	-0.508	-0.037	-0.002
2nd wave					
<=48	0.138	-0.014	-0.468	0.060	-0.006
>48	-0.073	0.016	-0.419	-0.075	-0.036
(c) Child sex					
1st wave					
Boy	-.-	-.-	-0.462	0.073	0.116
Girl	-.-	-.-	-0.590	-0.096	-0.124
2nd wave					
Boy	0.106	0.181	-0.180	0.049	0.203
Girl	-0.190	-0.176	-0.705	-0.191	-0.268
(d) Mother's education					
1st wave					
Up to 9 years	-.-	-.-	-0.115	0.146	0.203
Between 10 and 12	-.-	-.-	-0.719	0.054	0.023
More than 12 years	-.-	-.-	-0.965	-0.318	-0.340
2nd wave					
Up to 9 years	0.192	0.165	0.019	0.205	0.207
Between 10 and 12	-0.106	-0.065	-0.229	0.038	0.024
More than 12 years	-0.299	-0.149	-1.224	-0.484	-0.411

Source: ENDIS. Note: Mother's education is rom the first wave where 44.4% of the mothers have up to 9 years of education, 24.5% between 10 and 12 years of education, and 31.3% more than 12 years of education. Considering the children's sex and age, 47% are boys and 75.9% are less than 24 months in first wave, and 81.4% more than 48 in the second wave.

Having this instrument is very useful because it allows to relax the assumption that people, in this case the mothers, act independently of personality. In this work we use the median of each dimension of the BFI to divide each dimension into high and low score. In Table 2 we present the average values of the CBCL score and the parenting practices, considering high and low BFI scores. Our results are in line with previous literature. The average score of authoritarian parenting practices beliefs is higher among those with a high score in neuroticism than among those with a low score in that subscale (-0.619 vs. -0.240). The same is observed for both HOME subscales, although with less difference (-0.055 vs. -0.013 for responsivity and -0.006 vs. 0.028 for acceptance). There is little difference in in the average scores of the beliefs and HOME for the rest of the BFI dimension, except for openness, where those with high scores in this dimension is almost twice as far from the mean as those with low score (-0.553 vs. -0.290).

Table 2 Average score of CBCL and parenting style by mothers' BFI

	Extraversion		Agreeableness		Conscientiousness		Neuroticism		Openness	
	Low (50%)	High (50%)	Low (46%)	High (54%)	Low (48%)	High (52%)	Low (51%)	High (49%)	Low (48%)	High (52%)
(a) CBCL										
Externalized prob.	0.087	-0.151	0.030	-0.085	0.006	-0.065	-0.152	0.091	-0.051	-0.011
Internalized probl	0.037	-0.141	0.065	-0.157	-0.007	-0.091	-0.201	0.099	-0.076	-0.027
(b) Parenting style										
Autoritharian	-0.367	-0.492	-0.462	-0.397	-0.441	-0.417	-0.619	-0.240	-0.290	-0.553
(c) HOME										
Responsivity	0.031	-0.102	-0.072	0.008	0.067	-0.131	-0.055	-0.013	0.090	-0.145
Acceptance	-0.049	0.073	-0.075	0.090	0.068	-0.044	-0.006	0.028	0.034	-0.010

Source: ENDIS. Note: The identification of BFI score is for the second wave. CBCL score, parenting style and HOME are for the second wave.

When considering the average score of externalized and internalized problems according to high or low score of different dimension of the BFI, we obtain the expected results. On the one hand, mothers with high scores in neuroticism tend have children with more problems, while the opposite occurs among mothers with high scores in extraversion, agreeableness and conscientiousness.

Finally, it is important to point out that parenting practices and beliefs in certain parenting styles are transmitted and incorporated through, at least, three mechanisms (Sigel and McGillicuddy-De Lisi, 2002): kinesthetic-primary learning, which refers to the enduring impact of the parenting practices 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, learning incorporated in adulthood, that includes information, orientations and advice received by different communications routes (family, friends, experts, media, etc.). Regarding the first two factors, parenting experiences lived by parents have a strong effect. In fact, the background of environment and parenting practices during the parent's childhood, in particular presence of punishment, constitutes a risk factor (Cuervo, 2010). Also, the relationship between parents and child have on-going influence during adulthood through various impacts on social life and behaviour. In particular, a relationship characterized by affection and support is beneficial as opposed to those based on conflict and hostility (O'Connor and Scott, 2007). Belsky (2005) indicates that parenting style during a person's childhood affects the parenting style in adulthood, and, although he points out that intergenerational transmission of abuse is not inevitable, in general parenting style tends to be transmitted through parents. The ENDIS allows us to characterize the experiences lived by the principal carer during his/her childhood by asking, for instance, if he or she had a happy childhood or if there were high levels of unrest/tension in the home while growing up. This variable is used as an instrument, as indicated below. In Table 3 the same criteria are used, considering whether the mother reports a happy childhood, and if while growing up there was unrest and/or tension in the home. The results are as expected, the more marked differences being for authoritarian parenting practices beliefs and for externalized and internalized problems.

Table 3 Average score of CBCL and parenting practices by instrumental variable

	Happiness		Unrest	
	Yes (92.3%)	No (7.7%)	Yes (19.1%)	No (80.9%)
(a) CBCL				
Externalized problems	-0.084	0.616	0.440	-0.141
Internalized problems	-0.089	0.412	0.236	-0.117
(b) Parenting practices				
Autoritharian	-0.493	0.347	0.412	-0.626
(c) HOME				
Responsivity	-0.073	0.442	0.060	-0.056
Acceptance	-0.021	0.403	0.083	-0.006

Source: ENDIS. Note: The information is from the second wave.

3. Empirical strategy

To analyse the link between parenting practices and children development we take advantage of the longitudinal nature of the source of information. 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 specifically mentioning that we are using IV.

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

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

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

Second, lagged observables which vary over time ($Z_{i,1}^{w}$) are added to the contemporaneous estimation, thereby relaxing the first assumption. This model allows to capture, at least in part, the problems caused by simultaneity or reverse casualty among parenting practices 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 practices (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 ($X_{i,1}$). When we include controls we use, mostly, those present in the first wave. The exception is the BFI, which is 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 consider controls that we assume do not present exogeneity problems.[2]

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 practices in various situations), but presupposes that the effects of unobservable abilities decrease at a fixed rate (ρ) 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 is possible to perform when we consider authoritarian style, while HOME is not available for the first wave. This model is the one that previous studies name as 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 the *t-1* lags of the previous are correlated 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 perception about her own parenting context, such as presence of conflict, punishment and happy environment. These variables are used as instruments of lagged parenting practices of the mother.

It should be noted that this strategy does not allow us to completely control for the effect of other variables that may have previously affected our variables of interest, and therefore affect the parents' behaviour and the child's development as observed in the first wave of ENDIS, for instance, variables lagged for more than one period. However, we are not aware of any previous study that explains parenting practices and has the dependent variable lagged by more than one period.

With the aim of identifying heterogeneities in the link between parenting practices and children's development, we include specific estimations for some subgroups: boys and girls, high and low mother's education level, old and young age of children, and personality traits of the mother. For the last case, we identify which score is above and below the median for each dimension of the BFI of the mother.

4. Main results

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

[2] In some specifications we include controls that could present endogeneity problems to verify that the main results do not change.

4.1. Bond between parenting practices and children's development

One of the most used theoretical frameworks to analyse the determinants of parenting practices is that of Belsky (1984). According to this author, these determinants can be grouped into three sources of influence: child characteristics, contextual factors of stress and support, and personality traits of the parents. In this section, we present the estimation results of models that may help to understand how internalized and externalized problems of the children affect parenting practices and styles. As mentioned above, the sign on the effect of children's development on parenting practices is ambiguous. Problems in child's development could produce changes in the parent's behaviour, mitigating the negative effects, or reinforcing them (Nicoletti and Tonei, 2017). At the same time, the ENDIS allows to control for several factors, some of which were already pointed out in Section 2.

In the first column of the next tables we present the contemporaneous specification of the parent's beliefs or of the HOME subscales in relation to the socio-emotional problems of the child. In Columns 2 and 3 the lagged problems are included, as well as several controls in which personality traits and mother's education are included. Then, in column 4, other regressors that could present endogeneity problems are included (going to day care centre, mother's hours worked), to see if the results of the model are not altered. Finally, in column 5 the lagged dependent variable is included and in column 6 this variable is instrumented with the mother's background, specifically, the perception of having had a happy childhood and the presence of conflict in their home during their childhood.

The first estimation includes authoritarian style belief as the dependent variable (Table 4). When this variable is related with the externalized problems (panel a) we find that, for each point of increase in such problems, authoritarian parenting style belief increases by 0.53 standard deviations (sd). When the previous externalized problems of the child are included (column 2), as well as a range of relevant controls (column 3), in particular mother's characteristics, the coefficients of the contemporaneous effects of the socio-emotional problems drop considerable (around 0.3 sd). Notably, the historical information on child's development, which is positive and statistically significant in explaining authoritarian parenting style, indicates that omitting this information leads to overestimating the impact of the contemporaneous problems. Due to the fact that 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 externalized problems of the child 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 authoritarian parenting style, with the purpose of capturing the persistence in such beliefs. Although the persistence of such effect are relevant, the externalized problems of the child, both present and past, continues to be statistically significant although slightly less so than in the previous estimation. However, the medium term effects cease to be significant when the persistence of the outcome is instrumented by environment of the mother. This result may well be because the medium-term effects are capturing mistakes produced by the omission of relevant variables such as innate abilities of the mother and beliefs on parenting styles acquired from her experiences during her early childhood.

The evidence, especially from psychology, is blunt in pointing out that the link between coercive parenting practices and children's behavioural problems occur principally when children have externalized problems. In the case of the children and mothers analysed, the evidence is in line with previous literature. When we consider the internalized problems (panel b), authoritarian beliefs held by mother have effects, but are weaker and less robust. When we incorporate the lagged authoritarian parenting practice belief, the magnitude of the coefficient is lower, and the lagged variable is not significant. On the other hand, the persistence of coefficients does not change for either externalized and internalized problems are considered. That is to say that the inter-temporal dynamics are not affected when one type of problem or the other are considered.

Table 4 Authoritarian parenting style estimation. Effects of externalized and internalized problems.

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) IV
(a) Externalized prob.						
CBCL externalized problems	0.534***	0.415***	0.321***	0.327***	0.293***	0.243**
(t)	[0.081]	[0.080]	[0.081]	[0.081]	[0.079]	[0.100]
CBCL externalized problems		0.342***	0.262***	0.256**	0.178*	0.031
(t-1)		[0.090]	[0.098]	[0.099]	[0.093]	[0.157]
Authoritarian style (t-1)					0.382***	1.057**
					[0.079]	[0.512]
Observations	517	517	517	517	517	517
R-squared	0.086	0.113	0.200	0.206	0.301	
F (endogenous regressors)						2.228
P-value						0.136
Chi2 (overidentifying)						0.011
P-value						0.918
(b) Internalized prob.						
CBCL internalized problems	0.426***	0.366***	0.205*	0.215*	0.209**	0.217*
(t)	[0.100]	[0.096]	[0.111]	[0.111]	[0.101]	[0.123]
CBCL internalized problems		0.246***	0.172**	0.164**	0.124	0.034
(t-1)		[0.082]	[0.080]	[0.080]	[0.078]	[0.122]
Authoritarian style (t-1)					0.404***	1.158**
					[0.077]	[0.519]
Observations	517	517	517	517	517	517
R-squared	0.046	0.063	0.165	0.171	0.280	
F (endogenous regressors)						2.921
P-value						0.088
Chi2 (overidentifying)						0.037
P-value						0.848
Exogenous controls	No	No	Yes	Yes	Yes	Yes
Endogenous controls	No	No	No	Yes	No	No

Source: ENDIS. Note: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Exogenous controls include: 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 daycare centre, and per capita income. All variables included as controls, except the BFI, corresponding to t-1.

In the case of the HOME acceptance component (Table 5), which measures the presence of hostility and punishment in the home, consistent with the results obtained for authoritarian parenting style, we find a positive correlation with the children's externalized problems (panel a). An increase in the contemporaneous problems of children results in a 0.35 sd increase in the HOME acceptance component, which indicates whether parents are more punitive or severe. However, past problems do not seem to explain the present home environment. In fact, not only are they not statistically significant, but also the contemporaneous children's socio-emotional problems are not

affected. This indicates that there is not a feedback process between such parenting practices and the children's development, which is consistent with the results of Nicoletti and Tonei (2017) with respect to the low temporal variability of HOME compared to other parenting practice indicators. Nevertheless, due to not having a previous measurement of HOME, it is not possible to draw a conclusion about the persistence of effects in this case. On the other hand, when considering internalized problems as a co-variable (panel b), the contemporaneous variables continue to be the only ones that are significant, although with a smaller coefficients than for externalized problems. Once again, there is no evidence of feedback between these parenting practices and the children's problems.

Table 5 Acceptance HOME score estimation. Effects of externalized and internalized problems. OLS

	(1)	(2)	(3)	(4)
(a) Externalized prob.				
CBCL (t)	0.347***	0.330***	0.322***	0.329***
	[0.052]	[0.057]	[0.057]	[0.058]
CBCL (t-1)		0.048	0.001	-0.005
		[0.059]	[0.054]	[0.054]
Observations	517	517	517	517
R-squared	0.109	0.111	0.165	0.172
(b) Internalized prob.				
CBCL (t)	0.219***	0.215***	0.202***	0.204***
	[0.057]	[0.061]	[0.063]	[0.063]
CBCL (t-1)		0.016	-0.031	-0.034
		[0.056]	[0.050]	[0.049]
Observations	517	517	517	517
R-squared	0.036	0.037	0.110	0.115
Exogenous controls	No	No	Yes	Yes
Endogenous controls	No	No	No	Yes

Source: ENDIS. Note: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Exogenous controls include: 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 daycare centre, and per capita income. All variables included as controls, except the BFI, corresponding to t-1.

Finally, we present the estimations for the responsivity HOME subscale, which measures the absence of warmth in parent-child interactions (Table 6). Higher values of this subscale indicate a colder or less sensitive relationship of parents towards their children. In this case, similar results to the HOME acceptance subscale are found, particularly for externalized 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 child's externalized problems. A relevant difference between the two subscales is that with the responsivity subscale, the externalized problems coefficients falls sharply as new variables are included (from 0.21 sd to 0.13 sd). This implies that mothers' characteristics, such as education and personally traits, are relevant in explaining the presence of a receptive environment in relation to children's problems, which does not happen with acceptance, as will be shown in the next section. When the internalized problems are considered, this occurs more markedly only when the contemporaneous variable remains significant and no controls are included. Once controlling for several characteristics of the mother, children, and home, the internalized problems of the children do not affect the presence of a receptive environment.

Altogether, the evidence seems to indicate that the mother's authoritarian parenting practices beliefs tend to have feedback with the children's externalized and internalized problems. Consistent with this result, the persistence of the mother's authoritarian parenting practices beliefs are relevant, explaining around the 40% when both problems are included as controls, but far from 100%, which could be indicating the existence of changes in these kinds of beliefs over time and according to circumstances. Nicoletti and Tonei (2017) find that parents react by investing more time in their children when their socio-emotional problems improve. In other words, there is a reinforcement behaviour in the face of changes in these kinds of children's problems. They explain this as due to the physical costs that parents face when they have to interact with children with behavioural problems, as well as the time constraint of parents. In the case of HOME, the results indicate that, although the parenting environment is negatively reinforced by the presence of children's socio-emotional problems, in particular externalized problems, this link should be expected to be contemporaneous -- in other words, parents adapt their behaviour to present circumstances.

Table 6 Responsivity HOME score estimation. Effects of externalized and internalized problems. OLS

	(1)	(2)	(3)	(4)
(a) Externalized prob.				
CBCL (t)	0.211***	0.189***	0.129**	0.132**
	[0.062]	[0.060]	[0.058]	[0.059]
CBCL (t-1)		0.063	0.016	0.011
		[0.056]	[0.052]	[0.052]
Observations	517	517	517	517
R-squared	0.044	0.047	0.133	0.138
(b) Internalized prob.				
CBCL (t)	0.161***	0.147***	0.069	0.074
	[0.051]	[0.056]	[0.056]	[0.056]
CBCL (t-1)		0.056	0.016	0.011
		[0.050]	[0.045]	[0.045]
Observations	517	517	517	517
R-squared	0.021	0.024	0.121	0.127
Exogenous controls	No	No	Yes	Yes
Endogenous controls	No	No	No	Yes

Source: ENDIS. Note: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Exogenous controls include: 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 daycare centre, and per capita income. All variables included as controls, except the BFI, correspond to t-1.

That results differ between the two parenting practices indicators is not surprising to the extent that the first is self-reported by mothers about their considerations about which are the best parenting practices, and the second is based on the pollster's observation of interaction between mother and child. In fact, it is possible to think that the first has a higher bias produce by the parents' wishes to obtain good reported results that they consider as good behaviour, although the HOME is not complete exempt of this.

4.2. Other links of interest with parenting practices: the role of BFI and mother's education; sex and age of children.

In this section we present the coefficients of some co-variables included in the estimations mentioned in the previous section. It is about those controls that will later be used to inquire about heterogeneity of links between parenting practices and children's development: BFI and mother's education, and sex and age of the child. The coefficients are presented in odd columns of Table 7. These correspond to column 3 of previous estimations, in other words, considering only exogenous controls. We include those specifications where the children's externalized problems are used as independent variables. When other specifications are considered, either column 4 or 5, or when children's internalized problem are included, there are no changes in the magnitude or significance of coefficients.

Although, as previously noted, the parent's characteristics and parenting practices have been found in multiple studies to be factors that affect children's behaviour and their development, it is relatively infrequent for both factors to be analysed at the same time. Previous findings indicate that negative parenting practices, as well some personality traits, principally operate by affecting children's externalized problem. In particular, it has been found that personally traits, usually measured based on the BFI, are directly mediated by parenting practices and in form of heritance (Prinzie, 2005). The evidence indicates that personally traits affect the parents' behaviour through their effects on how they feel, think, and act (Prienzie et al., 2009). Different behaviour is also expected as a function of the mother's education. Therefore, at this point it is relevant to analyse if the mothers with certain characteristics, related to education or personality, are more prone to certain parenting practices. With the objective of giving a first look at these aspects, in even columns of Table 7 we included similar estimations that do not include externalized problems. Thus, we can provide evidence about whether the link between parenting practices and mothers' personality traits are altered when children's externalized problems are included as controls. Additionally, with this specification the findings of this specification are more in line with previous findings, while, as opposed to other works, in general this work estimates the link between personality traits of adults and parenting practices, regardless of development problems.

When we consider sex and age of the children, we find that the first is exclusively related with the acceptance subscale of the HOME, which means that the home environment is more punitive when the child is a boy. When we omit the externalized problems as control, the coefficient rises by almost 50%, which indicates that omitting this variable leads to overestimation of the role of child sex. In the case of child age, non-significant effect are found, but when we include externalized problems the coefficient becomes significant and negative in the responsivity subscale. If this variable is omitted, it could be understood that parenting practices become warmer as the child ages is higher, when what really happens is that more externalized problems are observed, which is redundant with less warmth in the home environment.

We find that a higher scoring on neuroticism (less emotional stability) positively affects authoritarian parenting practices beliefs. Persons with less emotional stability tend to be more anxious and tense, limiting their capacity to maintain effective relationships and respond appropriately to children's demands, more frequently attributing bad intentions to children, and responding with physical and verbal punishments (Prinzie et al., 2009).

When we exclude of the estimation of externalized problems this coefficient rise by 30%, hence, omitting such problems could lead to attributing part of the link to this characteristic of mothers.

The positive result is less clear when we consider agreeableness. Although this personality trait has been paid less attention by the literature (Huver et al., 2010), it is indicative of a predisposition to empathy. The ones that have they are in general unassuming and kind people, who may then a priori be expected to have more capacity to give affection and protection. However, this result is more ambiguous in terms of its link with children's problem (Oliver et al., 2009). Currently, at least one previous finding finds that a greater degree of agreeableness is related with a higher degree of coercion (Prinzie et al., 2004).

In terms of conscientiousness, it is a feature related to better outcomes of the child, due to capturing a greater propensity of parents to be responsible and to set boundaries for their children (Olvider et al., 2009), but it does not have a clear 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 belief is produced by some stress factor(s) in the home, such as the child's externalized problem, which are usually not taken into account in the literature on the topic. In fact, 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 one moment of time instead of interactions between potentially cumulative components (Prinzie et al., 2009). Also, the links are analysed without considering potential socio-emotional problems of the child. For instance, Clark et al. (2000) finds that children's temperament positively affects the use of punishment from mothers with high levels of extroversion, whereas in other contexts the opposite would be expected from mothers with high scores in that personality trait. Finally, Prinzie et al. (2009) find that there are mediators of the links between the BFI and parenting practices that are often not taken into account, particularly in the case of agreeableness. There is evidence that mother's age and child's age tend to reduce the link between agreeableness and the warmth in interactions.

Table 7 Parenting practices estimation. Link with BFI and mother's education and sex and age of the child

	Authoritarian style		HOME			
			Responsivity		Acceptance	
	(1)	(2)	(3)	(4)	(5)	(6)
Sex of the child (1=Boy)	-0.115	-0.211	-0.065	-0.097	-0.197**	-0.272***
	[0.158]	[0.168]	[0.098]	[0.097]	[0.094]	[0.100]
Age of the child in days	-0.001	0.001	-0.001	-0.0003*	-0.001	-0.001
	[0.001]	[0.001]	[0.001]	[0.0002]	[0.002]	[0.001]
Mother's education	-0.120***	-0.147***	-0.042***	-0.050***	-0.010	-0.029**
	[0.028]	[0.063]	[0.015]	[0.015]	[0.015]	[0.015]
BFI						
Extraversion	0.006	-0.055	-0.063	-0.084	0.062	0.011
	[0.072]	[0.077]	[0.049]	[0.053]	[0.053]	[0.057]
Agreeableness	0.177**	0.186*	-0.073	-0.071	0.076	0.081
	[0.090]	[0.095]	[0.052]	[0.054]	[0.051]	[0.057]
Conscientiousness	0.124*	0.092	-0.121**	-0.129**	-0.060	-0.079
	[0.072]	[0.086]	[0.057]	[0.064]	[0.045]	[0.056]
Neuroticism	0.228**	0.301***	-0.098*	-0.081	-0.050	-0.015
	[0.091]	[0.100]	[0.050]	[0.051]	[0.052]	[0.059]
Openness	-0.052	-0.008	-0.039	-0.024	-0.023	0.012
	[0.079]	[0.084]	[0.052]	[0.053]	[0.054]	[0.057]
Control externalized probl.	Yes	No	Yes	No	Yes	No

Source: ENDIS. 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.

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 finding previously mentioned, in which mother's beliefs and actual prenting practices do not necessarily match, at least in the same moment of time. We do find a link between responsivity HOME, and neuroticism and conscientiousness dimensions. The responsivity subscale of HOME reflects whether the carer responds verbally to the child, praises him, and is physically affectionate. Higher values indicate a colder or less sensitive relationship with parents. Therefore, the link between conscientiousness and a less receptive environment is the expected one, and this is not modified if we include, or not, the children's externalized problems. However, in the case of neuroticism, we find a negative coefficient which is contrary to the expected results, although the relationship is weak. When we exclude these externalized problems the link is no longer significant, potentially indicating that the effect of this variable is captured in the neuroticism dimension, at least partly compensating for its link with the receptivity subscale.

Regarding mother's education, which together with the degree of openness could be considered as an approximation of the mother's cognitive abilities, the sign is the expected one. They are linked with reduced authoritarian parenting belief, although only the first is significant when we consider authoritarian parenting style and the responsivity subscale. Both have the expected sign. In the case of the acceptance subscale, the coefficient is not statistically significant when externalized problems are included, once again showing that different mechanisms operate in the formation of punitive beliefs and the home environment. When we exclude externalized problems, the mother's education coefficient becomes statistically significant, with the expected sign. The omission of this variable could make it appear as though higher educational levels also reflect low score for problems of the child.

4.3 Heterogeneous dynamics of the link between parenting practices and children's development.

In this section we present heterogeneous effects for the variables that the literature indicates as key mediators to understand parenting practices: the BFI, mother's education, age and sex of child. Results are presented only for authoritarian parenting practices belief, which is the indicator of parenting practices that has information in the lags and higher average links with children's problems, in particular the externalized ones. We present the results for model 1 (contemporaneous specification), model 2 (we incorporate lagged externalized problems), model 3 (we incorporate several controls such as personality traits and mother's education) and model 5 (we incorporate a lagged endogenous variable). In almost all these cases, the openness by these groups does not change when we incorporate internalized problems as a co-variable. Therefore, the results will be focused on externalized problems, except in those cases where differences that internalized problems generate are relevant.

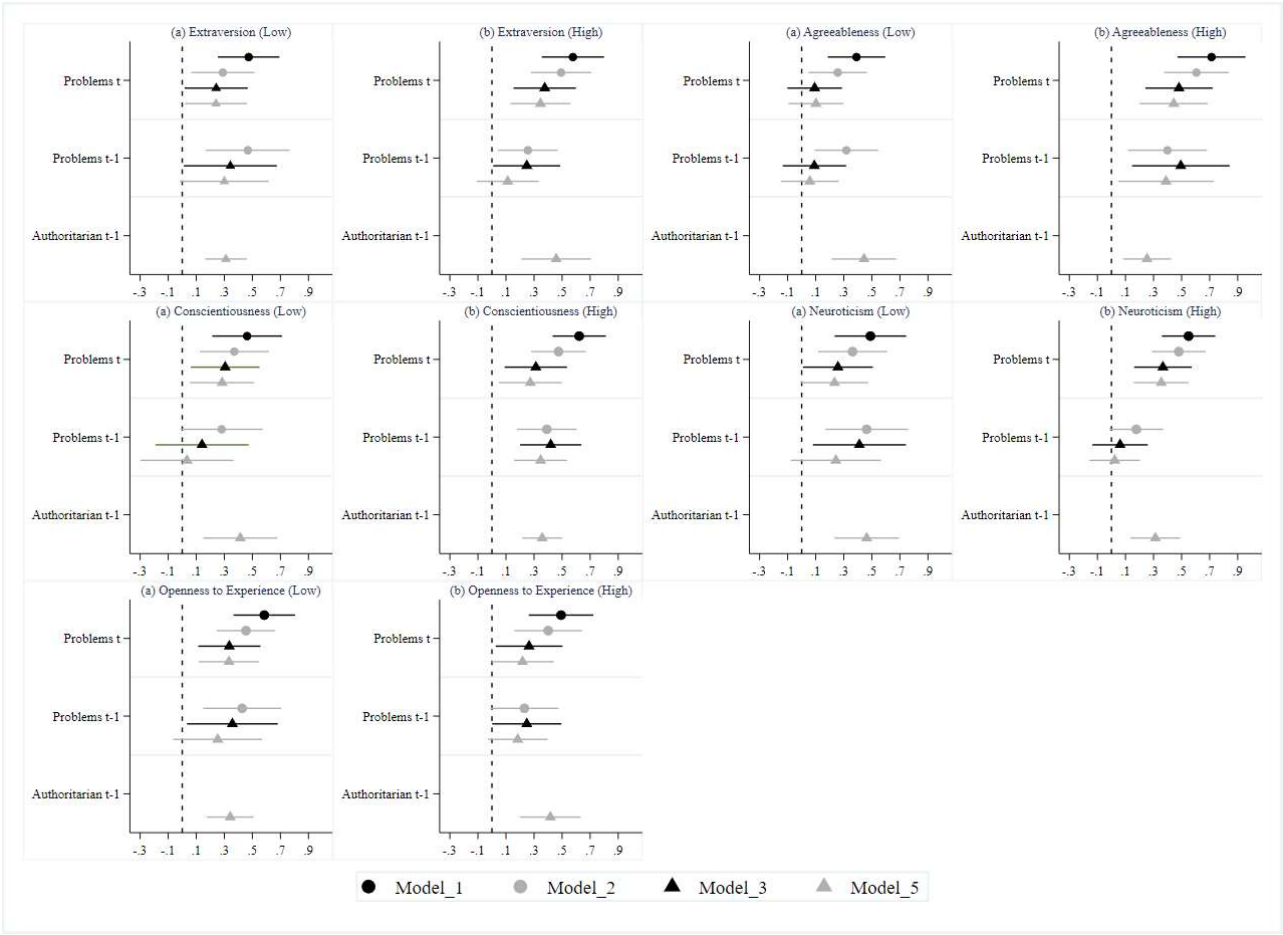
In Figure 4 we present the openness by low and high levels of each of the personality traits included in the BFI. First, we distinguish between mothers with high and low extraversion, in other words, with lower or higher tendency to focus their interest and energy on the external world. In the case of mothers with low extraversion, the contemporaneous externalized problems of children and the persistence of this belief is a little bit lower than the average, while the lagged externalized problems seems to have a stronger effect on these beliefs for this group of women. Mothers with high levels of extraversion respond to these variables in the opposite manner: larger weight of children's current problems, larger weight of persistence and less weight of children's past problems. In fact, the children's externalized problems are not significant, which shows that the feedback is only observable in the cases where the mother has a low extraversion score. These results are similar to the one that is obtained when we distinguish between mothers with high or low score in openness, in other words, a higher or lower tendency to be open to new aesthetic, cultural, and intellectual experiences. However, in this case the feedback is observable only for the mothers with a high score.

The next personality trait analysed is agreeableness, which is the higher or lower tendency to act in cooperation, with altruism. This is a personality trait that matters, given that its link with authoritarian parenting practicing beliefs is significant but with an opposite to expected sign. For these groups of mothers the differences are higher than for extraversion variables. While among mothers with a lower agreeableness score the most relevant variables to explain authoritarian parenting practices belief is the inertia of the variable, among mothers with a higher agreeableness score the contemporaneous and lagged children's externalized problems are more important. That is to say that these last ones are more prone to modify their beliefs in response to the problems that the child has. When we observe the mothers by high or low score in this trait, the results are similar. On the whole, this higher tendency of more agreeable and conscientious mothers to respond to their child's problem reinforces their authoritarian beliefs, whereas less agreeable and conscientious ones tend more so maintain a similar level, which explains the positive association found between these personalities traits and authoritarian parenting practices belief mentioned above.

Finally, we present the results for the groups of mothers according to their score in emotional instability or neuroticism. The more emotionally unstable mother present a stronger positive association between contemporaneous externalized problems of children and authoritarian parenting practices beliefs, while the previous problems of the child do not seem to influence these. In the case of more emotionally stable mothers, the contemporaneous and the lagged associations are positive and similar, but in the models where controls are included are not significant.

We are certain in our finding that the dynamic of the link between parenting practices and externalized problems is mediated by mothers' personality traits. The process of reinforcement of mothers' beliefs and children's problems is observed more clearly in the cases where the mother has a low extroversion score, and high score of openness, agreeableness and conscientiousness. Naturally, the inertia of the authoritarian parenting practices occurs in the other groups, account for 0.5 sd, value found for mothers with a low neuroticism score.

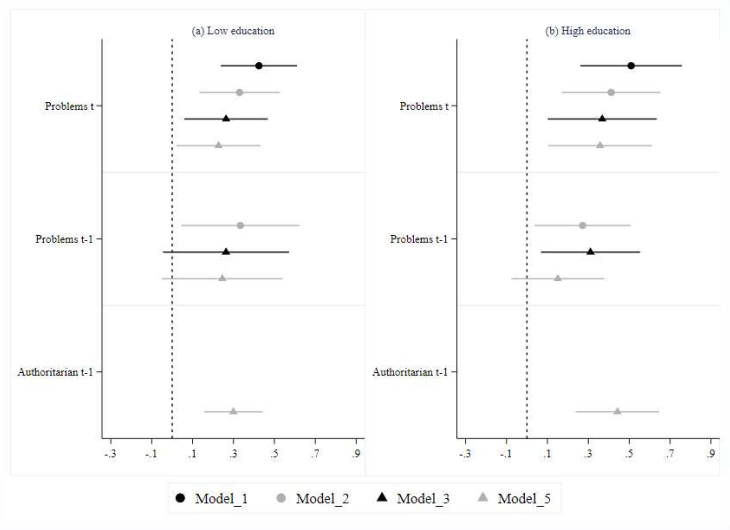
Figure 4 Authoritarian parenting estimation. Externalized problems coefficients (t and t-1) and authoritarian style (t-1) according to BFI score. Different models



Source: ENDIS.

Next we distinguish according to mothers' educational level, considering those who have up to 9 years of education as having a low educational level. First, the main differences found are for the most educated mothers, the link between authoritarian parenting practices and the children's externalized problem, all of which are lower. Second, the weight of persistence is higher. Third, the link between children's present externalized problems has a similar level for both groups of mothers. It should be noted that, in the case of the personality trait of openness to experience, a proxy for intelligence, we obtain similar results: higher persistence in beliefs and higher association with children's present problems. This could be indicating that mothers with higher cognitive abilities, although they adapt their beliefs to the contemporaneous problems of the child, have more stable beliefs over time.

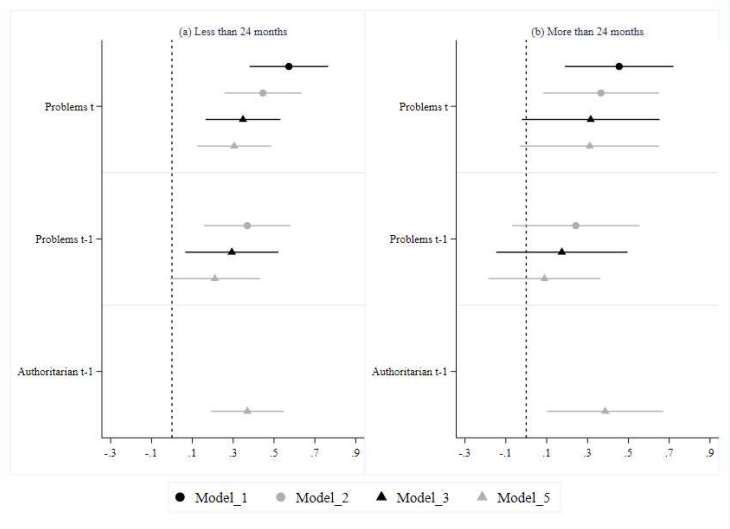
Figure 5 Authoritarian style estimation. Externalized problems coefficients (t and t-1) and authoritarian style (t-1) by mother's education. Different models



Source: ENDIS.

When distinguishing according to children's age, between those under 24 months and those who are older, we clearly observe that the children's externalized problems have contemporaneous and lagged effects on authoritarian beliefs only among those who are younger than two years old, the feedback hypothesis being plausible (Figure 6). In the case of the older children we only find a contemporaneous link that tends to disappear as we introduce controls to the model. For both groups of children, the persistence of the beliefs is strongly positive. It should be noted that the externalized problems are lower among the older children, so to some extent it is expected that the association between authoritarian beliefs and children's problems is higher at early ages. Finally, it is interesting to notice that the persistence has a similar association in both groups, which could be indicating that the inertia remains stable in the first years of children's life.

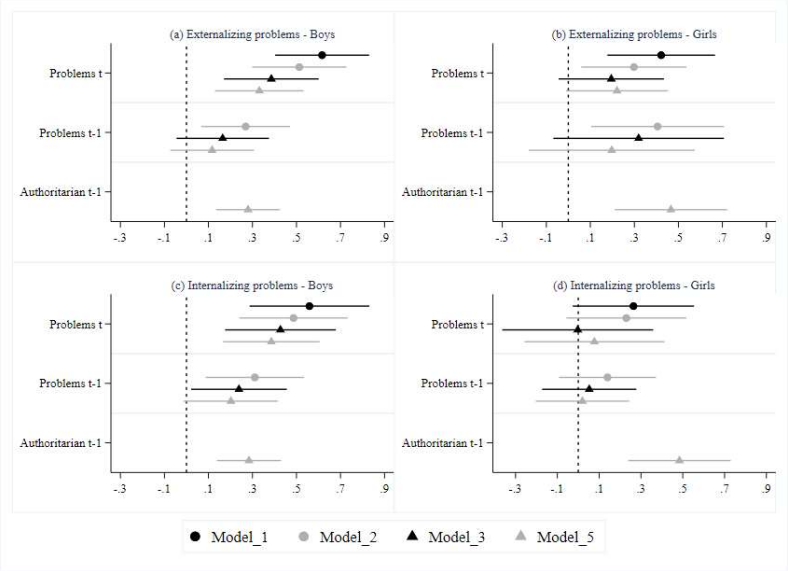
Figure 6 Authoritarian style estimation. Externalized problems coefficients (t and t-1) and authoritarian style (t-1) by child age. Different models



Source: ENDIS.

Given the differences observed when we distinguish between sexes, in Figure 7 we include the estimated coefficients for both externalized and internalized problems. It is noteworthy that, for both externalized and internalized contemporaneous problems, the link with authoritarian parenting practices is observed for boys, and in the case of girls only in the less demanding specification in externalized problems. In the case of boys the lag on internalized problems also has effect, therefore in this case it is possible that there is feedback between these problems and authoritarian styles. It is also interesting to note that, for both kinds of problems, the persistence is less strong for boys than for girls, which accounts for more stability of this link.

Figure 7 Authoritarian style estimation. Externalized problems coefficients (t and t-1) and authoritarian style (t-1) by child sex. Different models



Source: ENDIS.

5. Final comments

The main objective of this work is to introduce novel evidence that allows to specify the link between child development and parenting practices, considering the possibility of feedback between the two dimensions. In order to do that, we consider externalized and internalized problems of the child, parenting practices related to parents' beliefs regarding an authoritarian parenting style, home environment (responsivity and acceptance) and a set of variables which includes personality traits of mothers', which is unusual in the literature.

We find that the hypothesis of feedback between parenting practices and externalized problems is plausible. The evidence is weaker when we consider internalized problems. It is possible to refute the hypothesis of feedback when we consider the home environment, which is consistent with the literature, which assigns a more structural component to these aspects.

We verify the relevance of considering personality traits of mothers' simultaneously with children's problems to understand how authoritarian parenting practices beliefs form. Also, the link between such beliefs and conscientiousness of the mother is not identified in the case of not including children's externalized problems in the estimation. However, neuroticism is fundamentally overestimated. Something similar happens with the home environments when we consider the acceptance subscale and mothers' education as co-variables. By introducing externalized problems, related to low education levels, the link with acceptance is no longer significant.

Finally, we explore if the feedback between parenting style and externalized problems could be associated with certain personality traits of the mother. We verify this for low extraversion, high agreeableness, conscientiousness and openness. In the case of low

neuroticism, we find that the inertia between periods for authoritarian parenting style is high. The presence of feedback is also more plausible when children are boys and younger.

Feedback processes amplify the inequality associated with that which in literature is known as a 'born accident'. In these cases where this happens a substantial public intervention focuses on very early stage of life. For that reason, it is necessary to include these aspects when thinking of the best design of public policies. For the policies oriented to influence the stimulation that parents bring to their children, and that, for instance, are based on professionals visiting homes. In these cases standardized procedures will be possible for a quick identification of such risks that allow a systematic approach that breaks with this vicious circle of inequality.

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ANNEX

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 better	-0.035	0.554	0.022	0.534
Often, the whims of children '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 girls to take care of them	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 house	0.748	-0.219	0.352	0.075
'A good beating' from time to time does children good	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

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