

# Parent's personality traits and child's reading ability\*

Thais Barcellos<sup>†</sup>  
and  
Guilherme Hirata<sup>‡</sup>

## Abstract

This paper analyses the relationship between parent's personality traits and their child's reading ability. Personality traits are measured using a five-factor model based on the Big-Five: extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. Reading ability is measured using reading fluency and text comprehension. To control for possible omitted factors, we use a broad set of control variables, including variables related to characteristics usually unobserved by the researcher, such as home environment quality and parent reading proficiency. Using OLS regressions, we found that emotional stability is positively correlated with reading fluency and text comprehension. The other four Big-Five personality traits are found not to have any association with children's outcome. We also found that emotionally stable parents engaging in frequent reading activities with the child in the home are a possible mechanism.

Keywords: Reading ability, personality traits, Big Five.

## Resumo

Este artigo analisa a relação entre a personalidade dos pais e a habilidade de leitura das crianças. Um modelo de cinco fatores baseado no Big Five é utilizado para medir personalidade: extroversão, amabilidade, conscienciosidade, estabilidade emocional e abertura ao novo. A habilidade de leitura é mensurada através da fluência de leitura e compreensão de texto. Para controlar para possíveis fatores omitidos, utiliza-se um amplo conjunto de covariáveis, incluindo variáveis relacionadas a fatores que geralmente não observados pelos pesquisadores, tais como qualidade do ambiente domiciliar e proficiência de leitura dos pais. Os resultados das regressões por MQO indicam que estabilidade emocional é positivamente correlacionada com habilidade de leitura e compreensão de texto. Nenhuma outra característica socioemocional apresenta correlação estatisticamente significativa. Manter hábitos de leitura com a criança é um possível mecanismo por meio do qual estabilidade emocional influencia a habilidade de leitura.

Palavras-chave: habilidade de leitura, habilidade socioemocional, Big Five.

JEL: I20, D91

Área: Economia Social e Demografia Econômica

---

\* We are thankful for the local authorities and principals from Arcoverde (PE) for all the cooperation and assistance provided and Walfrido Neto and Williana Melo for conducting the data collection. The authors were responsible for the research design and supervision to data collection. For financial support, we thank Instituto Alfa e Beto.

<sup>†</sup> IDados; *thais* at *idados.id*

<sup>‡</sup> IDados; *guilherme* at *idados.id*

## 1. Introduction

Reading is a fundamental skill in life because it a critical determinant of the learning process. A lack of reading skill affects child's academic achievement and later labour market success. It is one of the primary skills taught at school but initiated and supported at home by the parents by means of incentives to practice. Through engaging their children in reading longer and challenging texts, parents could affect children's reading ability. Therefore, parents' skills – cognitive and noncognitive – are potentially correlated with the child's reading ability.

This study investigates the relationship between parents' personality traits and children's reading ability. We use OLS regressions on a primary dataset collected in Arcoverde, a city located in Brazil's Northeast, that contain information on primary school children. For this purpose, we applied a five-factor personality model on parents – based on the so-called Big-Five – and measured reading fluency and text comprehension of children enrolled in 3<sup>rd</sup> to 5<sup>th</sup> grades. Besides, with a comprehensive survey on parents, we may control for several confounders that are usually not observed by the researcher, such as the quality of home environment and parents' cognitive ability.

Overall, results indicate that parent's emotional stability is positively correlated with both the child's text comprehension and reading fluency. This personality trait dimension is positively correlated with the frequency in which the parent reads with the child while negatively correlated with the regularity the parent helps their child with the homework. It indicates that parent's personality traits might affect their child reading ability through reading habits. Although we cannot attribute any causal relationship, it is a significant result which should be deeper investigated in the literature.

Personality can be defined as a set of characteristics in which environment and genetic factors of a person play a role in cognition, motivation and behaviour in different situations consistently (BEGUM, HUQUE, 2016). Evidence suggests that personality measures can be categorised in a five-factor model of personality called the "Big Five". The five traits are typically labelled extraversion, agreeableness, conscientiousness, emotional stability (opposite to neuroticism), and openness to experience or intellect (DONNELLAN, OSWALD, *et al.*, 2006, GOLDBERG, 1992, OLIVEIRA, 2019).

The extraversion dimension describes individuals who are talkative, assertive, and energetic, is characterised by positive emotions, and the tendency to seek out stimulation and the company of others. Agreeableness is a tendency to be compensated and cooperative,

describing those who are good-natured, cooperative, and trustful. Conscientiousness is a preference for planned rather than spontaneous behaviour; therefore, individuals tend to be orderly, responsible, and dependable. Neuroticism versus emotional stability describes a tendency to be easily distressed, expressing negative emotions, such as anger, anxiety, or depression. Lastly, openness to experience or intellect is the trait that distinguishes imaginative people from down-to-earth, describing people who are imaginative and independent-minded (BEGUM, HUQUE, 2016).

Thereby, personality could affect parenting not only directly through maternal and paternal behaviour, but also indirectly through the way parent's social relationships in other contexts may influence how they take care of their children. Prinzie *et al.* (2009) investigate the association between personality traits and parenting conducting a meta-analysis. They find that each of the five personality traits is related to parental warmth and behavioural control, while only agreeableness and neuroticism are related to autonomy support. However, the authors highlight that virtually all studies investigate personality traits separately, which is an important issue to consider.

Many facets of neuroticism (emotional instability) such as depression, anxiety and irritability are associated with less competent parenting regardless of child's development stage: infants, toddlers, preschoolers, school-age children, or adolescents. Although there is no extensive evidence, an extraverted individual should function as a better parent since parenting is a social task. Thus, a positive association is related to sensitive, responsive, emotionally engaged, and stimulating parenting. Fewer studies have investigated the relationship between parenting and the other personality traits: agreeableness, intellect and conscientiousness. In general, the evidence is a positive link between these personality traits and positive parenting (BELSKY, BARENDS, 2002).

During the school-age years, parental use of induction or reasoning, consistent discipline, and expression of warmth are positively related to children's self-esteem, internalised controls, prosocial orientation, and intellectual achievement (BELSKY, 1984). Correlational negative results between parent's harsh and inconsistent discipline and children's academic achievement are described by Wentzel, Feldman e Weinberger (1991). Moreover, interventions on parenting behaviour can impact preschoolers' cognitive outcomes (CHANG, PARK, *et al.*, 2009).

Several reasons may link parents' temperament and family environment to children's development, such as genetic factors and lower quality practices of parenting (VALIENTE, LEMERY-CHALFANT, *et al.*, 2007). Children raised in chaotic environments tend to show

behavioural problems and low cognitive competence. Reversely, parents who provide literacy-rich environments improve children's early linguistic and cognitive development and emergent literacy (HARTAS, 2011). Stressors in the family environment may have adverse effects on children's development (BORNSTEIN, 2002).

Despite the literature that associates parenting to children's cognitive outcomes, we do not find any evidence relating parent's socioemotional ability to their child's cognitive outcome so far. Consequently, we bring a new contribution to the literature about the child's cognitive development highlighting parents' socioemotional skills beyond parenting practices. The paper proceeds overviewing data in Section 2, describing empirical strategy in Section 3, and presenting the main results in Section 4, followed by a mechanism investigation in Section 5. Our final remarks are discussed in Section 6.

## **2. Data and descriptive statistics**

The study was set in Arcoverde, a municipality of Pernambuco state, during the school year of 2018. With an estimated population of 70,000 as of 2019, it is a medium-income municipality in spite of being located at Northeast, the poorest region of Brazil. The survey targeted students enrolled in 3<sup>rd</sup> to 5<sup>th</sup> grades of the twelve primary public schools placed in the city. In each school and grade, students were randomly selected to participate in the survey. Students' and parents' assessments occurred during a weekend event. In partnership with an NGO, we promoted a series of reading-related activities for parents and students in a school located in the city centre. In between those activities, we assessed them.

Two student's reading ability were assessed: the number of words read per minute (reading fluency) and text comprehension. Reading fluency was assessed by tablet through a specific software that captures the number of words read per minute. The child was invited to read four texts with different difficulty levels. Text comprehension was assessed using an oral test. After reading the correspondent text, the child was asked two multiple-choice questions. This procedure was carried out with four different texts. The final score is the number of correct answers standardised (zero mean and standard deviation equals one).

Parents' assessments were used to gather information on their personality traits – our primary interest –, socioeconomic status, reading habits, reading ability and household environment. A Five-Factor Model of personality scales, also known as Big-Five, assesses parent's personality traits. We applied a 50-item questionnaire from the International

Personality Item Pool with five response options (five-point Likert-scale), and the internal reliability coefficient was 0.63. The Confusion, Hubbub, and Order Scale (CHAOS) assesses environment confusion at home (MATHENY, WACHS, *et al.*, 1995). The self-reported instrument includes 15 statements scored 1-4 (four-point Likert-scale)<sup>1</sup> and the internal consistency estimated by Cronbach's alpha was 0.69. To improve such instruments' psychometric properties, we developed a version with 30-item to Big-Five, which increased the internal reliability to 0.70, and removed two items from CHAOS instrument producing internal reliability of 0.74.<sup>2</sup>

The Cloze test (ABREU, GARCIA, *et al.*, 2017) measures reading proficiency by removing every 5<sup>th</sup> word in a text. Each word the person writes correctly scores one point, and zero otherwise. We use the number of correct answers standardised as the final score to measure parent's reading proficiency. Moreover, a short questionnaire assessed financial hardship, participation in social welfare program (*Bolsa Familia*), labour market participation, marriage status and household size.

In two out of twelve schools, children preselected by a lottery to be assessed were not found in at least one of the school grades. We removed these two schools from the sample (eight observations were dropped). The final random sample surveyed 110 students in reading fluency and 109 students in text comprehension (one student refused to do the test) and missed information for seven caregivers not found by the field team. Beyond that, some caregivers did not complete the socioeconomic questionnaire. In these cases, in order to increase the number of observations in regressions, we imputed some information with the average.

Table 1 presents the sample descriptive statistics before imputations. Overall, the sample is balanced in terms of gender and has a little bit more students in higher grades. In terms of cognitive abilities, children can read around 57 words per minute on average and answer 3 out of 8 text comprehension questions correctly.

On average, parents fill up 25% of the reading proficiency test correctly, and the correlation of this measure with schooling is 0.45.<sup>3</sup> Meanwhile, the reading habits survey shows that 47% of the caregivers do not read with the child, but 77% of them helps the child with their homework.

---

<sup>1</sup> Items examples: "No matter how hard we try, we always seem to be running late" and "We can usually find things when we need them"

<sup>2</sup> Appendix Table 6 presents procedures, psychometric properties, and linear correlation between the original and the new version of both instruments. We test regressions with both versions of the instruments and find similar results.

<sup>3</sup> Spearman's rank correlation significant at 5% level.

Most caregivers who answered the questionnaire are the child's parent (69% are the mother and 10% the father) and on average are aged 36 years old. 67% of respondents said that there is at least another child under 14 living in the household. Almost half are married with no formal schooling degree (42%) or at least a high school degree (41%), and 80% declared having books at home. A large share is not employed (61%) and receives benefits from the conditional cash transfer *Bolsa Familia* Program (75%). Financial hardship is present in several families since 42% have not paid a bill in the last six months, and 34% have a utility service suspended in the previous six months.

Table 1 – Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
<b>Child</b>					
Reading fluency	436	57,5	32,3	0	148
Text 2	109	55,7	32,6	0	143
Text 3	109	63,5	35,3	0	148
Text 4	110	54,3	29,2	0	125
Text 5	108	56,7	31,5	0	126
Text comprehension	109	3,4	2,0	0	8
Boy	110	0,53	0,50	0	1
3 <sup>rd</sup> grade	33	0,30	0,46	0	1
4 <sup>th</sup> grade	38	0,35	0,48	0	1
5 <sup>th</sup> grade	39	0,35	0,48	0	1
<b>Caregiver</b>					
Parent	103	0,79	0,41	0,0	1
Age	102	36,1	9,1	18	65
Married	103	0,48	0,50	0	1
Schooling					
No schooling	43	0,42	0,50	0	1
Primary	18	0,17	0,38	0	1
High school or more	42	0,41	0,49	0	1
Labour supply					
Not employed	63	0,61	0,49	0	1
Work Part-time	15	0,15	0,35	0	1
Work Full-time	25	0,24	0,43	0	1
CLOZE	103	0,25	0,20	0	0,7
CHAOS	103	-0,02	1,01	-1,9	2,9
Conditional cash transfer (BFP)	100	0,75	0,44	0	1
Have not paid a bill (last 6 months)	102	0,42	0,50	0	1
Utility service suspended (last 6 months)	103	0,34	0,48	0	1
Children under 14-year-old					
Just the kid	33	0,33	0,47	0	1
kid + 1	39	0,39	0,49	0	1
kid + 2 or more	29	0,29	0,45	0	1
Have books at home	103	0,80	0,40	0	1

<b>Reading habits</b>					
Read with the child					
Do not read	44	0,47	0,50	0	1
Once or twice a week	26	0,28	0,45	0	1
Three or more times a week	24	0,26	0,44	0	1
Homework help					
Not help	22	0,23	0,43	0	1
Sometimes	39	0,41	0,50	0	1
Often	33	0,35	0,48	0	1

A one-parameter logistic model to binary items built a socioeconomic status index (SES).<sup>4</sup> We use indicators of high school degree, work, married, BFP beneficiary (inverted), have not paid a bill (inverted), had a utility service suspended (inverted), any other child under 14 years old (as a proxy to the number of household dependents), and have books at home. The index downsizes the vector of covariates and avoids including too much noise in the regressions. Appendix Figure 1 shows this variable distribution.

As seen, the set of control variables covers several dimensions regarding the environment the child is exposed at home that is potentially correlated with both child's outcomes and parent's traits. The school grade is a fixed effect to measure not only the accumulated knowledge provided by the school but also a proxy for the child age. Parent's age might influence how personality influences parenting. The caregiver kinship is a variable indicating if the caregiver respondent is the parent which is an important control to answer our research question.

Reading habits at home may be associated with improvements on child's language and cognitive outcomes beyond meaningful impacts on parent-child interactions (WEISLEDER, MAZZUCHELLI, *et al.*, 2018). Therefore, they can work as a mechanism through which parent's personality affects their child's reading ability. Belsky (1984) outlines the parental functioning influence by not only the parent's personality, but also by the social context and the individual child.

### **3. Empirical strategy**

To understand how parent's personality traits might affect their child's reading ability, we ran several OLS regressions controlling for factors recognised in the literature for affecting the child's cognitive outcomes. Among these variables, we have measures for characteristics that

---

<sup>4</sup> In this psychometric model, items are assumed to be equally discriminating and vary in their difficulty only.

are usually unobserved by the researcher, such as home environment and parent reading ability. Although we cannot rule out the possibility of still having a relevant omitted factor, we are preventing as much as possible from confounders that are potentially correlated with parenting and could bias our estimates.

The main equation is set as follow:

$$Y_i = \alpha + \sum_{j=1}^5 \beta_j D_{ij} + \gamma X_i + \delta Z_i + \theta SES_i + \lambda cloze_i + \mu chaos_i + \psi_i + \epsilon_i \quad (1)$$

where  $Y_i$  is the reading ability outcome (text comprehension or reading fluency) of child  $i$ ,  $D_{ij}$  is a dummy indicating if the child's parent's personality trait  $j$  scores above the median,  $X_i$  is a vector of child's features (school grade attended and gender),  $Z_i$  is a vector of child's parent's features (age and caregiver kinship),  $SES$  is the socioeconomic status index of child's household/family,  $cloze$  is the measure of child's parent's reading proficiency,  $chaos$  is the measure of child's household environment confusion,  $\psi$  is the school fixed effect, and  $\epsilon$  is a stochastic error.  $\beta_j$  is our parameter of interest, which measures the relationship between the child's parent's personality trait  $j$  and the child's reading ability  $Y$ .

To investigate possible mechanisms through which parent's personality might affect their child reading ability, we ran ordered logistic regressions of parenting-related variables on personality traits. We used the same set of controls from the main equation on two outcomes: the frequency the parent reads with their child and the regularity the parent helps their child with the homework.

Estimations using reading fluency as an outcome are controlled for the text read, and the standard errors are clustered at individual level. All estimations use a sample with full parent's information; therefore, we include a dummy for imputed observations. Furthermore, we control for school fixed effect to avoid any self-selection of parents with a particular personality enrolling their children in a specific school.

#### 4. Main results

This section presents the main results relating parent's personality traits and child's reading ability. Table 2 shows the results for reading fluency and Table 3 for text comprehension. Both resembling tables report the estimated coefficients for the five personality traits. Each column represents a different specification in which we change the control variables included in the

model by adding them successively. We start with reading fluency since it is an essential component for comprehension: readers who take a long time to decode words tend to misunderstand what is being read.<sup>5</sup>

Table 2 shows that there is only one parent’s personality trait that is correlated with reading fluency: emotional stability. Although this correlation is only significant at 10%, the coefficient remains pretty much stable across specifications. Thus, if there is an omitted unobserved factor, it is probably orthogonal to our measure of emotional stability. This is reinforced by the fact that the point estimates for each one of the other Big Five measures are also stable – except perhaps for the first two columns with school and child’s controls only –, even though they are not statistically significant.

The positive correlation between emotional stability and reading fluency is expected by the parenting literature. Quantitatively, parents scoring above the emotional stability median score is associated with an increase by approximately 10 words read per minute, which is a substantial effect, equivalent to 0.32 of a standard deviation. These parents tend to be fewer neurotics, calm, even-tempered, and less likely to feel tense or rattled, which is related to positive parenting (BELSKY, BARENDS, 2002).

Table 2 – Reading fluency results

Reading flow	(1)	(2)	(3)	(4)	(5)	(6)
Openness to experience	1.813 (6.294)	5.493 (5.568)	6.414 (5.252)	6.346 (5.360)	6.308 (5.416)	6.309 (5.480)
Conscientiousness	1.161 (6.826)	-4.121 (6.364)	-1.863 (6.258)	-1.885 (6.222)	-1.764 (6.254)	-1.552 (6.232)
Extraversion	-5.290 (6.034)	-4.400 (5.620)	-3.567 (5.791)	-3.539 (5.759)	-3.877 (6.115)	-4.311 (6.082)
Agreeableness	-9.925 (6.491)	-9.178 (5.840)	-2.231 (6.686)	-2.100 (6.973)	-2.342 (6.911)	-3.045 (6.946)
Emotional stability	1.674 (6.103)	6.150 (5.770)	11.47* (5.892)	11.38* (5.998)	11.25* (6.082)	10.25* (6.093)
Controls						
Child’s feature		✓	✓	✓	✓	✓
Parent’s feature			✓	✓	✓	✓
SES				✓	✓	✓
Reading proficiency					✓	✓
Environment confusion						✓
School fixed effect	✓	✓	✓	✓	✓	✓
Imputation	✓	✓	✓	✓	✓	✓

<sup>5</sup> See Foorman *et al.* (2015) for evidence about this.

Observations	436	436	409	409	409	409
Adjusted R-squared	0.0740	0.192	0.207	0.205	0.203	0.209

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Text comprehension is the ability of understanding a passage of a text and a crucial link to reading effectiveness. Table 3 presents the text comprehension results. Note that the outcome is the number of correct answers standardised. As in the previous table, the personality traits' estimated coefficients are stable across specifications. Again, emotional stability is the only parent trait associated with the outcome. The higher the parent's emotional stability, the better is the child's text comprehension.

On average, children born to parents with high emotional stability (above median) present a text comprehension performance 0.46 of a standard deviation higher in comparison to children born to less emotional stable parents. According to Prinzie *et al.* (2009), parents who score high on neuroticism (emotional instability) fail to provide structure and guidance, showing inconsistent parent behaviour. Furthermore, this feature is related to less competent parenting, taking the form of less active and involved parenting, as well as more negative, intrusive, and overcontrolling parenting (BELSKY, BARENDS, 2002).

Table 3 – Text comprehension results

Text comprehension	(1)	(2)	(3)	(4)	(5)	(6)
Openness to experience	0.157 (0.214)	0.187 (0.213)	0.286 (0.208)	0.269 (0.210)	0.269 (0.211)	0.269 (0.211)
Conscientiousness	-0.00401 (0.205)	-0.120 (0.219)	-0.0138 (0.218)	-0.0226 (0.216)	-0.00641 (0.213)	-0.00347 (0.214)
Extraversion	-0.206 (0.212)	-0.150 (0.210)	-0.135 (0.210)	-0.126 (0.208)	-0.178 (0.203)	-0.183 (0.204)
Agreeableness	-0.103 (0.207)	-0.0638 (0.204)	0.0908 (0.212)	0.133 (0.220)	0.0883 (0.223)	0.0810 (0.227)
Emotional stability	0.269 (0.200)	0.349* (0.203)	0.521** (0.211)	0.489** (0.215)	0.473** (0.215)	0.463** (0.223)
Controls						
Child's feature		✓	✓	✓	✓	✓
Parent's feature			✓	✓	✓	✓
SES				✓	✓	✓
Reading proficiency					✓	✓
Environment confusion						✓
School fixed effect	✓	✓	✓	✓	✓	✓
Imputation	✓	✓	✓	✓	✓	✓

Observations	109	109	102	102	102	102
Adjusted R-squared	0.0454	0.0675	0.134	0.133	0.133	0.123

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

The personality trait related with the two outcomes of reading ability is positively associated with autonomy support. High levels of autonomy support encourage children to actively explore, discover, and formulate their own view and goals. The conceptual opposite is coercion which is often characterised by intrusiveness, high power assertion, or overcontrolling behaviour (PRINZIE, STAMS, *et al.*, 2009).

Regarding the control variables, the parameters exhibit signs as expected. The estimated coefficients for the control variables are not reported but are available upon request from the authors. Students in higher grades present larger scores and boys perform worse than girls – the difference is not statistically significant to text comprehension though. Parent indicator is positive or null but not significant as well as the parent’s reading proficiency and the socioeconomic status are – it might be due to the small sample size. Caregivers age is negatively related to reading outcomes as it is the home environment confusion coefficient, as expected, but both are not statistically significant.

#### 4.1 Heterogeneity

This section presents heterogeneity results according to child’s gender, socioeconomic status and home environment. For each dimension, we add interaction terms between each personality trait and the variable of interest in equation (1). The set of control variables is the same used previously. Table 4 reports the interaction term coefficients for both outcomes: reading fluency and text comprehension.<sup>6</sup>

In general, we see no differential association between parent’s trait and child reading ability according to these dimensions. One could expect to see differences across socioeconomic status since it is potentially related to learning environments (FEINSTEIN, 2003) and also to parenting practices and cognitive and noncognitive stimulation (HECKMAN, 2006). The same is valid for home environment. Nevertheless, there seems to be no relationship between parents’ traits and SES or home environment. We hypothesise that this could be a result of low variation in these variables, i.e. parents are all poor and face a poor home environment relative to what it would be expected considering the whole population. For

<sup>6</sup> Full results are available upon request from the authors.

instance, Matheny and colleagues (1995) describe an environment as chaotic when is noisy, crowded, and there is an environmental confusion (e.g. the number of people coming and going in the home). Parents in more crowded homes are less verbally responsive to their children, speaking in less sophisticated ways and using less diverse language (EVANS, MAXWELL, *et al.*, 1999). If this is the case for most of the families in our sample, our chaos index will capture only small differences across families by construction.

Results also point out that higher emotional stability is positively correlated with boys' reading abilities in comparison to girls'. The estimated coefficients are sizeable suggesting that the overall effect in Table 2 and Table 3 come from boys. Gender difference in language achievement has been recurrently documented in the literature. The girls' advantage in reading comprehension can be explained by item format and intrinsic reading motivation. Girls tend to perform better in reading fluency too, and one explanation comes from the advantage of processing speed tasks involving digits, alphabets and naming (ROIVAINEN, 2011). Thus, the different association between emotional stability and reading ability across gender might be attributed to girls' "independence".

Table 4 – Personality traits influence according to child gender, socioeconomic status and home environment

	Boys × Trait		SES × Trait		Chaos × Trait	
	Fluency (1)	Comprehension (2)	Fluency (3)	Comprehension (4)	Fluency (5)	Comprehension (6)
Openness to experience	1.442 (6.335)	0.0319 (0.249)	1.587 (11.10)	0.123 (0.388)	-1.722 (5.778)	0.255 (0.200)
Conscientiousness	-4.867 (7.574)	-0.0979 (0.219)	2.866 (9.233)	-0.353 (0.309)	-1.422 (5.189)	-0.163 (0.198)
Extraversion	-3.915 (7.310)	-0.357 (0.226)	-8.314 (10.40)	-0.697** (0.311)	3.359 (5.823)	0.153 (0.213)
Agreeableness	-3.601 (8.206)	0.119 (0.248)	-6.043 (9.888)	0.449 (0.285)	2.186 (5.555)	-0.272 (0.174)
Emotional stability	21.89*** (6.945)	0.783*** (0.252)	-5.693 (9.722)	0.0570 (0.333)	3.445 (5.461)	0.0313 (0.247)

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The relationships discussed in this subsection needs to be further investigated using different contexts and large sample sizes. Our contribution to literature is only suggestive and presents some directions for future research.

## 5. Mechanisms

This section analyses possible mechanisms through which parent’s personality traits might affect child’s reading ability. For this purpose, we investigate whether different types of parent-child interactions at home are correlated with the parent’s personality traits. One kind of interaction refers to reading habits. We use the frequency parents and children engage in reading activities together: never, once or twice a week, or three times a week at least. The other type of parent-child interaction is how often the parents assist their child in homework: never, sometimes, or often.

Table 5 presents the ordered logit regression estimated coefficients for parent’s personality traits on both outcomes. The coefficient does not have a meaningful quantitative interpretation. Positive values indicate that parents scoring high in the personality trait tend to engage in reading activities with their child more frequently or tends to assist their child in homework more often than parents scoring low.

Table 5 – Mechanisms: parent-child interactions

	Read with the child	Homework help
	(1)	(2)
Openness to experience	1.058* (0.630)	0.531 (0.544)
Conscientiousness	-0.00635 (0.710)	0.836 (0.556)
Extraversion	-0.00796 (0.541)	-0.273 (0.604)
Agreeableness	-0.127 (0.627)	-0.298 (0.586)
Emotional stability	0.962* (0.580)	-1.287** (0.615)
Observations	94	94

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

As one can see, parent’s emotional stability is positively associated with parent-child reading interactions frequency. This result uncovers a possible mechanism through which emotionally stable parents can influence children’s reading proficiency. It seems to be the case that reading with the child increases child reading practising: the more often the children read,

the better their reading ability results. Emotional stable parents tend to be more successful in this job.

On the other hand, higher emotional stability is associated with less assistance in homework. Previous evidence found that this trait is positively associated with parenting (BELSKY, BARENDS, 2002). In the context of our sample, in which parents have a low level of education, to be better in parenting could mean to be more aware of your own limitations when it comes to formal education. It is probably not an easy task for these parents to help their children with 3<sup>rd</sup> to 5<sup>th</sup> grade school homework. So what parents do is to engage in reading activities to help their children, something that has been shown to work even when parents are less educated (WEISLEDER, MAZZUCHELLI, *et al.*, 2018).

We also found that openness to experience is associated with parent-child reading habits. Parents who score high in this dimension are more likely to be involved with their child and to provide more stimulation (PRINZIE, STAMS, *et al.*, 2009). This trait is related to parent's expectations about their child's development. However, the association between openness to experience and children's reading ability are found not to be statistically significant (the coefficients are positive). It could be the case that differences in personality traits (emotional stability and openness to experience) lead to different types of stimulation while reading. Encouraging children to read is likely to be beneficial for the development of their literacy skills. An extensive empirical literature has found a positive association between the frequency children read and their scores on standardised achievement tests (JERRIM, LOPEZ-AGUDO, *et al.*, 2020). The results suggest that the way reading habits are stimulated in the home might play an essential role in child development. This is another topic for future research.

## **6. Conclusion**

This paper studied the relationship between parent's personality traits and their child's reading ability. We found that emotional stability is positively correlated with reading fluency (words read per minute) and text comprehension. The other four Big-Five personality traits are found not to have any association with children's outcome.

We also found that a possible mechanism through which emotional stability influences reading ability is emotionally stable parents engaging in frequent reading activities with the

child in the home. This could improve children's reading habits leading to better reading performance.

While there is a rich literature on the relationship between children's cognitive outcomes and parenting and parents' characteristics, studies investigating the association between parent's socioemotional ability and their children's cognitive outcomes are scarce. This paper contributes to the literature by filling this gap.

## References

- ABREU, K. N. M. de, GARCIA, D. C. de, HORA, K. da, *et al.* "O teste de Cloze como instrumento de medida da proficiência em leitura: fatores linguísticos e não linguísticos", **Revista De Estudos Da Linguagem**, v. 25, n. 3, p. 1767, 2017. DOI: 10.17851/2237-2083.25.3.1767-1799.
- BEGUM, T., HUQUE, A.-U.-. "Parents' Personality and Their Expectations about Child's Development", **Universal Journal of Psychology**, v. 4, n. 5, p. 222–227, 2016. DOI: 10.13189/ujp.2016.040502. Disponível em: <http://www.hrpub.org>. Acesso em: 30 out. 2019.
- BELSKY, J. "The Determinants of Parenting: A Process Model", **Child Development**, v. 55, n. 1, p. 83–96, 1984. DOI: 10.2307/1129836.
- BELSKY, J., BARENDT, N., "Handbook of Parenting Vol.3". In: BORNSTEIN, M. H. (Org.), **Handbook of Parenting Vol.3**, 2nd. ed. New Jersey, Lawrence Erlbaum Associates, 2002. . DOI: 10.4324/9781410612137. Disponível em: <https://www.taylorfrancis.com/books/9781135650810>.
- BORNSTEIN, M. H. (Org.). **Handbook of Parenting Vol.5**. 2nd. ed. New Jersey, Lawrence Erlbaum Associates, 2002. Disponível em: <https://www.taylorfrancis.com/books/9780429686610>. Acesso em: 29 out. 2019.
- CHANG, M., PARK, B., KIM, S. "Parenting Classes, Parenting Behavior, and Child Cognitive Development in Early Head Start: A Longitudinal Model", **School Community Journal**, v. 19, n. 1, p. 155–174, 2009.
- DONNELLAN, M. B., OSWALD, F. L., BAIRD, B. M., *et al.* "The Mini-IPIP scales: Tiny-yet-effective measures of the Big Five factors of personality", **Psychological Assessment**, v. 18, n. 2, p. 192–203, 2006. DOI: 10.1037/1040-3590.18.2.192.
- EVANS, G. W., MAXWELL, L. E., HART, B. "Parental language and verbal responsiveness to children in crowded homes", **Developmental psychology**, v. 35, n. 4, p. 1020–1023, 1999. DOI: 10.1037/0012-1649.35.4.1020.
- FEINSTEIN, L. "Inequality in the early cognitive development of British children in the 1970 cohort", **Economica**, v. 70, n. 277, p. 73–97, 2003. DOI: 10.1111/1468-0335.t01-1-00272.

- FOORMAN, B. R., HERRERA, S., PETSCHER, Y., *et al.* "The structure of oral language and reading and their relation to comprehension in Kindergarten through Grade 2", **Reading and Writing**, v. 28, n. 5, p. 655–681, 2015. DOI: 10.1007/s11145-015-9544-5.
- GOLDBERG, L. R. **Development of Factors for Big Five Factor Structure. Psychological Assessment**. 1992.
- HARTAS, D. "Families' social backgrounds matter: Socioeconomic factors, home learning and young children's language, literacy and social outcomes", **British Educational Research Journal**, v. 37, n. 6, p. 893–914, 2011. DOI: 10.1080/01411926.2010.506945.
- HECKMAN, J. J. "Investing in Disadvantaged Children", **Social Sciences**, v. 312, n. June, p. 2005–2007, 2006. DOI: 10.1016/j.adolescence.2005.09.001.
- JERRIM, J., LOPEZ-AGUDO, L. A., MARCENARO-GUTIERREZ, O. D. "Does it matter what children read? New evidence using longitudinal census data from Spain", **Oxford Review of Education**, v. 00, n. 00, p. 1–19, 2020. DOI: 10.1080/03054985.2020.1723516. Disponível em: <https://doi.org/10.1080/03054985.2020.1723516>.
- MATHENY, A. P., WACHS, T. D., LUDWIG, J. L., *et al.* "Bringing order out of chaos: Psychometric characteristics of the confusion, hubbub, and order scale", **Journal of Applied Developmental Psychology**, v. 16, n. 3, p. 429–444, 1995. DOI: 10.1016/0193-3973(95)90028-4.
- OLIVEIRA, J. P. "Psychometric Properties of the Portuguese Version of the Mini-IPIP five-Factor Model Personality Scale", **Current Psychology**, v. 38, n. 2, p. 432–439, 2019. DOI: 10.1007/s12144-017-9625-5.
- PRINZIE, P., STAMS, G. J. J. M., DEKOVIČ, M., *et al.* "The Relations Between Parents' Big Five Personality Factors and Parenting: A Meta-Analytic Review", **Journal of Personality and Social Psychology**, v. 97, n. 2, p. 351–362, 2009. DOI: 10.1037/a0015823.
- ROIIVAINEN, E. "Gender differences in processing speed: A review of recent research", **Learning and Individual Differences**, v. 21, n. 2, p. 145–149, 2011. DOI: 10.1016/j.lindif.2010.11.021. Disponível em:

<http://dx.doi.org/10.1016/j.lindif.2010.11.021>.

VALIENTE, C., LEMERY-CHALFANT, K., REISER, M. "Pathways to problem behaviors: Chaotic homes, parent and child effortful control, and parenting", **Social Development**, v. 16, n. 2, p. 249–267, 2007. DOI: 10.1111/j.1467-9507.2007.00383.x.

WEISLEDER, A., MAZZUCHELLI, D. S. R., LOPEZ, A. S., *et al.* "Reading aloud and child development: A cluster-randomised trial in Brazil", **Pediatrics**, v. 141, n. 1, 1 jan. 2018. DOI: 10.1542/peds.2017-0723.

WENTZEL, K. R., FELDMAN, S. S., WEINBERGER, D. A. "Parental Child Rearing and Academic Achievement in Boys: The Mediational Role of Social-Emotional Adjustment", **The Journal of Early Adolescence**, v. 11, n. 3, p. 321–339, 26 ago. 1991. DOI: 10.1177/0272431691113002. Disponível em: <http://journals.sagepub.com/doi/10.1177/0272431691113002>. Acesso em: 17 jul. 2019.

## APPENDIX

To develop a five-factor model with 30 items, we combine items of the specific factor to maximise the internal consistency measured by Cronbach's alpha. The procedure systematically removes one item at a time choosing the combination that provides the highest alpha. The process stops when removing an item does not increase the reliability coefficient. We only consider information from people who answered at least six out of ten items of the factor. Four factors build the maximum reliability with six items; therefore, we impose six items to Conscientiousness factor, which had maximised with eight items. The choice of the six items was taken by principal component analysis with orthogonal rotation. We removed the two components that provide less information to the leading eigenvector. This increases Cronbach's alpha from 0.34 (8-items) to 0.42 (6-items). The total variance explained by the first principal component of all reduced factors increases comparatively to the original ones.

Table 6 – Instruments psychometric properties

<b>Measure</b>	<b>Average inter-item covariance</b>	<b>Alpha</b>	<b># items</b>	<b>PCA</b>	<b>Correlation</b>
CHAOS	0.14	0.69	15	22.8%	0.92
	0.18	0.74	13	26.2%	
Openness	0.14	0.47	50	22.0%	0.91
	0.22	0.63	30	36.6%	
Conscientiousness	0.09	0.33	50	17.1%	0.84
	0.11	0.42	30	26.9%	
Extraversion	0.14	0.39	50	19.6%	0.65
	0.15	0.52	30	29.6%	
Agreeableness	0.15	0.55	50	29.4%	0.96
	0.38	0.78	30	48.5%	
Emotional stability	0.37	0.71	50	33.6%	0.96
	0.41	0.81	30	51.0%	

Figure 1 – Socioeconomic status distribution

