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Inequality in the early years in LAC: A comparative study of size, persistence, and policies

A LACIR Paper

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Abstract

Gaps in child development by socioeconomic status (SES) start early in life, are large and can increase inequalities later in life. We use recent national-level, cross-sectional and longitudinal data to examine inequalities in child development (namely, language, cognition, and socio-emotional skills) of children 0-5 in five Latin American countries (Chile, Colombia, Mexico, Peru and Uruguay). In the cross-section analysis, we find statistically significant gaps with inequality patterns that widely differ across countries. For instance, gaps in language and cognition for Uruguay and Chile are much smaller than those for Colombia and Peru. When turning to the longitudinal data, average SES gaps are similar to those of the cross-section in language but differ substantially in cognition, mainly in Uruguay where they emerge as more unequal when cohort effects do not operate. Importantly, we also find that the ECD gaps found at early ages (0-5), still manifest 6-12 years later in almost all locations and realms in which we have measures of early child development, but they do not increase with age. Results are robust to using different measures of inequality (income and maternal education). Gaps are smaller but generally remain when adjusting for possible explanatory factors (e.g., family structure, parental education, geographic fixed effects). To reduce ECD inequality and promote equality in later life outcomes, policymakers should look to implementing evidence-based interventions at scale to improve developmental outcomes of the most disadvantaged children in society.

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1 Introduction

Human development is a complex process involving multiple skills that starts very early in life. Cognitive, language, and socioemotional skills develop in early childhood, and these are all important domains for the process of early childhood development (ECD).[1] It is now well established that economic success and wellbeing in adulthood is determined by experiences in the first five years of life

Better early cognitive skills, including those related to language, are associated with higher labor market earnings and lower levels of risky behavior (incarceration, drug addiction, and early pregnancy) later in life (Bernal and Keane, 2011; Gertler et al., 2014; Heckman et al., 2006; Walker et al., 2011). Analogously, socioemotional skills have important foundations in early childhood: a child in a secure relationship with their caregiver is less anxious and better able to explore and learn about the world (Bowlby, 1979; Thompson, 2016). Children with better socioemotional skills have been shown to perform better in US labor markets (Heckman et al., 2013).

To ensure learning, health, and well-being across their life cycle, children need developmentally appropriate and rich interactions with the adults that care for them (either in the home or outside the home). However, children in poverty and with low socio-economic status (SES) parents receive much lower household- and community-level inputs in their developmental process (e.g., nutrition, health, and responsive stimulation) than those not in poverty (Engle et al., 2011; Walker et al., 2011), leading to inequalities in ECD that can cause lower achievement at older ages (Grantham-McGregor et al., 2007; Hoddinott et al., 2013; Victora et al., 2010), and lower productivity and incomes (Gertler et al., 2014,2) that will likely impede breaking the poverty cycle. It is therefore clear that SES could be an important determinant of the persistence of inequality across generations.

Gaps in ECD outcomes by maternal education and household income have been documented worldwide: in the US (Heckman, 2008), in LAC (Schady et al., 2015), and in other low- or middle-income countries (LMIC) (Lopez Boo, 2016) using sample-based survey data.[2]

Recent population-based surveys from Mexico and Ecuador show similar gaps in development (IDB, 2023). Still, we know that these SES gaps in ECD are not immutable. The early years are important because they have long run effects but also because they are malleable (Araujo et al., 2015; Shonkoff et al., 2000). The early developmental process of children growing in disadvantaged environments can be ameliorated by well-designed, well-targeted, and well-implemented policy interventions. The design of such policies, however, requires a good understanding of the timing of the developmental process and its connections–in various dimensions–to socioeconomic differences.

Longitudinal evidence on the persistence of ECD disparities has been well-documented in high-income countries (Case and Paxson, 2008; Pavalko and Caputo, 2013), but less longitudinal research has been done in LMIC, partly for the lack of adequate data. This limitation can cause important mis-characterizations

[1] ECD is defined as the development of cognitive, language, motor, and socioemotional abilities during the first five years of life

[2] While these studies try to characterize the dynamics of disadvantage over the early years in LMIC, many, partly for the lack of good data they do so by using single cross section and considering children of different ages to study the evolution of development.

of the ECD process and SES gaps. Recent progress in collecting population-level and longitudinal child development indicators in Chile, Colombia, Mexico, Peru and Uruguay allow us to conduct an analysis of inequalities in some dimensions of child development using nationally-representative and longitudinal data to complement the previous scant findings. These countries have nationally representative panel data on child development outcomes in this millennium. Although we do not have a full array of countries, since ECD measures beyond health markers are rarely collected until elementary school, the countries for which we do have data cover a wide range of geographies and cultures. These differences allow us to compare and contrast findings in order to explore which disparities may be universal and which are context-specific.

Latin America is a particularly interesting context to study how income inequality (e.g., SES gaps in income) are reflected (or not) in ECD gaps by SES, not only because the region is characterized by high levels of income and wealth inequality, but also because different countries experience different levels and features of inequality. Moreover, most of the literature to date has relied on cross-sectional data, capturing limited age ranges and requiring strong assumptions to allow inferences about changes in the developmental process over time (Fernald et al., 2012,1; Paxson and Schady, 2007; Rubio-Codina et al., 2015; Schady et al., 2015).

LAC is also a compelling setting as it was the region that experienced the longest preprimary educational disruption during the pandemic (Boo et al., 2023), causing dramatic child development losses and worsening these gaps (Abufhele et al., 2022a; González et al., 2022), suggesting that our results may be understating the current level of ECD inequality in LAC.

The main contributions of this paper are three. First, the use nationally representative longitudinal data allows us to explore how ECD gaps evolve over age in their different dimensions (we mostly focus on language and socioemotional skills) in five different countries: Chile, Uruguay, Peru, Colombia and Mexico. We pay particular attention to the comparability across different contexts, ages and availability of comparable indicators over time. The need of comparable measures, which we discuss later, somewhat limits our exercise. Indicators of child outcomes are not the only ones that are difficult to compare across countries; the definition of socioeconomic gap, that can be done in terms of income, wealth , education or other variables, is also hard to compare across settings. Second, while we start presenting some evidence based on cross-sectional studies (where children of different ages are used to gain some evidence on the dynamics of child development) our focus will be on longitudinal studies, where available. The difference between using cross sectional and longitudinal data to analyze the evolution of child development and SES gaps with age is not trivial. In cross section studies, what we observe is different children at different ages. The evolution with age of inequality profiles found in cross-sectional studies, therefore, could be reflecting cohort effects. Thus, if more inequality is found for older children than for younger children, we cannot conclusively determine that inequality increases with age. Third, after documenting the existence, the size and persistence of SES gaps in different child development outcomes, we also consider potential drivers of child development, to try to understand the mechanisms behind the existence of socioeconomic gaps and delays. These considerations can be important for policy, which we also discuss.

Our findings indicate a common pattern of persistent SES gradients in ECD, emerging early but without

dramatic widening or narrowing with age. There are a few exceptions, with the most notable ones being a widening of the wealth gap in cognition in Mexico, language in rural Colombia and socio-emotional skills in Uruguay when using longitudinal data. In the case of Chile, we also observe a widening of the wealth gap in socio-empotional skills, but ony when using cross sectional data, therefore indicating the presence of cohort effects.

Importantly, the patterns of SES gradients vary considerably across countries and domains. In our cross-sectional analysis, we identify relatively small language and cognition gaps in Chile and Uruguay (the least unequal countries in our sample), while such gaps are more prominent in Colombia and Peru (the most unequal countries in the study). Moreover, we do not find significant gaps in socio-emotional development, except for Chile, where the gaps are positive and widen with age . When we compare SES gradients for different ages, we verify they never decrease over time and, sometimes, grow larger. This last analysis, however, should be interpreted with caution due to cohort effects that we cannot control for in our cross-sectional exercises.

Our longitudinal analysis presents relevant differences when compared to the cross-sectional one. First, while we do not observe important gaps for Uruguay in the cross-sectional exercises, such gaps emerge for cognitive and socio-emotional development in the longitudinal analysis. Second, when we analyze differences across ages – now controlling for cohort effects –, we see that language gaps are usually persistent but constant over time. Gaps in cognition, in turn, grow larger with age, except in Peru, where they are stable. While such gaps increase constantly in Mexico, they close over time in Uruguay and Chile. We finally document differences in the evolution of socio-emotional development gaps: while Uruguay presents increasing gaps, they are declining in Chile and stable in Colombia.

Because the disparities tend to persist into elementary school, inequalities in early childhood development need to be addressed promptly since they do not resolve later. Yet inequalities in child development are not irresolvable and our discussion examines which policy interventions may be most useful for closing the gaps we find.

The paper is organized as follows. We start, in section 2, with a short description of the available evidence, which, as we have already mentioned, is obtained mainly from cross-sectional data. In section 3 we discuss the data we use for the five countries we consider. In this section we also describe the developmental outcomes we consider and the measurement of SES. In the last part of section 3, we also describe the statistical analysis that yields the estimation of the size of SES gaps in child development. In section 4, we report our cross-sectional results. In section 5, we use longitudinal data to study the evolution of socioeconomic gaps from early childhood into middle childhood and adolescence in some cases. In section 6 we look at potential demographic, economic, and cultural mechanisms that could explain such gaps. Finally, Section 7 concludes the paper.

2 Previous literature on SES gradients in ECD in LAC

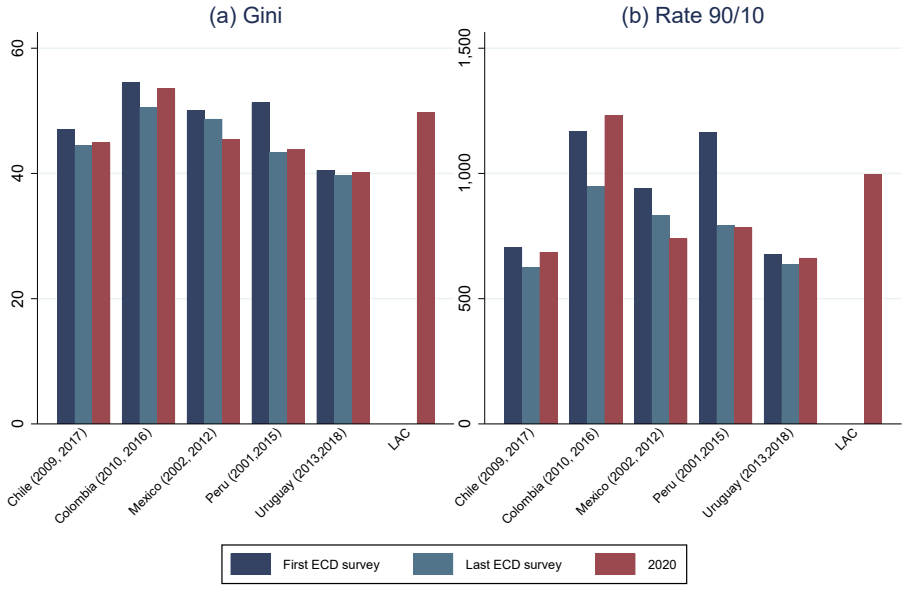
We are aware of only a few studies that engage in cross-country comparisons in the examination of SES gaps and even fewer using longitudinal data. In one cross-sectional analysis looking at disparities in ECD in India, Indonesia, Peru, and Senegal, within-country differences in height-for-age and child development scores by SES are evident as early as 3-23 months (Fernald et al., 2012). Findings from one study of children 3-6 years in five Latin American countries (some with cross-sectional-survey data and some with longitudinal-survey data) and other with 5 year-olds and 8-year-olds from the Young Lives Study Countries (Ethiopia, India, Peru and Vietnam), align with the hypothesis that disparities in language development (as measured by receptive vocabulary) widen at early ages, with little further change once children are in elementary school (Paxson and Schady, 2007; Schady et al., 2015). Rubio-Codina et al. (2015)'s SES gradient analysis from Bogota–that adds cognition, fine and gross motor and socio-emotional outcomes–has similar findings. Each paper finds consistent patterns, but the sizes of the SES disparities vary by country. Recent population-based data show similar gaps in development. For example, comparable population-based data from Ecuador and Mexico show differences in cumulative delays in language development between children of mothers who attained primary education or less and children of mothers who reached secondary or higher education (IDB, 2023).

The only longitudinal studies in Latin America examine children from Peru's Young Lives data or from Chile (which add a widely used behavior outcome) and find very similar patterns (Abufhele et al., 2022b; Reynolds et al., 2017; Reynolds, 2022).

The methodology used by these different studies was fairly similar. Gradients to measure SES were all some form of the wealth index, except for Reynolds et al. (2017)'s study from Chile (2017), which contrasted children in families receiving a cash transfer to those that were not. Additionally, Abufhele et al. (2022b)'s study of Chile (2022) incorporated job quality into the wealth index in addition to assets and services. Most analyses of SES gradients in ECD also standardize by age within the sample. However, Reynolds et al. (2017) use percentile in the distribution of scores. These methods are necessary because abilities change by age; the standardized score allows for comparisons of achievement of children at different ages.

All studies find evidence of wealth gaps in ECD prior to age 5 years, most of which are of significant magnitude. The largest cross-sectional gaps are found in language development. In urban Colombia and rural Ecuador, the difference between children growing in households in the top 20% of the wealth distribution of the available samples is 1 standard deviation higher than household in the bottom 20% (Schady et al., 2015). Language delays in low SES children in relation to high SES children in the latest population-based surveys in Mexico and Ecuador increase from less than two months when the child is two years to over 16 months at age five (IDB, 2023). Behavioral gaps in Chile and in Bogota are not as large (Abufhele et al., 2022b; Rubio-Codina et al., 2015). Other analyses examining the persistence of these gaps suggest some increases but very few decreases in gaps over age/time. One exception is the wealth gap in behavior in Chile, which shrinks as the children enter elementary school (Abufhele et al., 2022b).

Figure 1: Inequality Indicators of Study Countries



Note: Years of first and last ECD surveys in parentheses. Chile does not have inequality measures for 2010, year of first ECD survey in the country, so the figure shows measures for 2009.
Source: Income Inequality Trends provided by The World Bank's LAC Equity Lab www.worldbank.org/en/topic/poverty/lac-equity-lab1/income-inequality/inequality-trends

3 Data

The five countries in our study span three geographical areas, vary in levels of average income, and cover a range of income inequality. In Figure 1, we report the nation's level of inequality, as measured both by the Gini coefficient (Panel (a)) and the rate 90/10 (Panel (b)), i.e., the ratio of the average income of the richest 10 percent (the 90th percentile in the income distribution) by that of the poorest 10 percent (the 10th percentile in the income distribution). For comparison, we report such measures for the first and last years of the surveys used in this study, and 2020. Chile and Uruguay, in the Southern Cone, are the two wealthiest countries in our study, and among the wealthiest in the LAC region. Uruguay stands out in Latin America for being an egalitarian society and for its high income per capita, low level of inequality and poverty and the almost complete absence of extreme poverty (The World Bank 2022). Uruguay's Gini coefficient is the lowest in our study and even though it is similar to that of the US, it is still a third higher than the OECD nations' combined Gini. Colombia and Peru are middle-income, equatorial Andean nations. Colombia's Gini coefficient is the highest in our study. Peru's Gini, while not as high as Colombia's, is higher than Uruguay's. Moreover, although Peru's Gini is similar to Chile's, its rate 90/10 is quite higher. Finally, Mexico's per capita level of income falls between the Southern Cone countries and the Andean countries, although the overall economy is the largest. We note that Chile, Mexico, and Peru have relatively similar level of inequalities in 2020, but for the years relevant for our study Mexico's and Peru's inequality (measure from in 2001) are closer to Colombia's (measure from 2010).

We perform a cross sectional analysis (to compare our results to previous literature) and a longitudinal

analysis (that allows for comparison of the same children over time). In Table 1, we report details on sample size, the children's age range and which survey rounds are used for each analysis. We use data from the most recent waves of surveys for the cross-sectional analysis, using surveys that have tested vocabulary, since this has been the focus of previous studies. We also use the other ECD realms included in these surveys. For the longitudinal analysis, we use data from children age 6 years and younger in the first survey round and that also appear in the last survey round.

Table 1: Surveys, child development outcomes, and sample sizes of Study Countries

			Cross-Sectional Analysis Sample			Longitudinal Analysis Sample		
Country	**Survey Name**	**Outcome**	**Year**[a]	**Age Range (months)**	**N. Children**	**Years**[a]	**Age Range**[b] **(months)**	**N. Children**
Chile	Encuesta Longitudinal de Primera Infancia (ELPI)	Vocabulary	2017	30 - 71	2731	2010	30 - 151	7792
		Behavior		18-71	3919	2012	18-151	12045
		Cognition		11-71	3631	2017	7-143	7547
Colombia *Urban*	Encuesta Longitudinal Colombiana de Los Andes (ELCA)	Vocabulary	2013	31 - 71	1087	2010	36 - 200	1488
		Behavior		3-71	1886	2013	10-200	1306
		Cognition		-	-	2016	-	-
Colombia *Rural*	Encuesta Longitudinal Colombiana de Los Andes (ELCA)	Vocabulary	2013	33 - 71	1062	2010	36 - 193	1273
		Behavior		3-71	1805	2013	10-193	893
		Cognition		-	-	2016	-	-
Mexico	Mexican Family Life Survey (MxFLS)	Vocabulary	*Cross-sectional data from Mexico not used due to vocabulary not tested*			2002	-	-
		Behavior				2005-06	-	-
		Cognition				2009-12	60-160	1721
Peru	Ninos del Milenio (Young Lives)	Vocabulary	2008	53 - 71	1831	2001, 2005	53 - 190	1562
		Behavior		-	-	2008, 2012	-	-
		Cognition		53-71	1877	2015	53-190	1502
Uruguay	Encuesta Nutricion, Desarrollo Infantil y Salud (ENDIS)	Vocabulary	2018	1 - 59	2411	2013	5 - 139	2474
		Behavior		2-59	2314	2016	3-139	1177
		Cognition		1-59	2408	2019	5-139	1149

[a] The cross-sectional analysis uses only the most recent year for which data is available on children less than 6 yrs. The longitudinal analysis uses all survey years for which data is available for all outcome variables given that the children are less than 6 years in the first survey wave.

[b] Ages of the youngest child in the first survey round to the oldest child in the last survey round.

We refer to the surveys using the country names. Though generally the surveys are national, they have slightly different representation. Chile and Uruguay's surveys are nationally representative of children, although the first cohort of the Uruguay's survey (used in the longitudinal analysis) only has child development scores for children in the capital city Montevideo. The Mexican survey is nationally representative of households. The Peruvian survey is representative of children in all districts excluding the wealthiest 5% of districts. However, because wealthier households have fewer children, the representativeness of children is over 95%. The Colombian survey has two samples, one of which is representative of households in urban areas, excluding the remote Pacific region. The urban sample also excludes the wealthiest households, which are around 10% of the population, so, similar to the Peruvian survey, because wealthier families have fewer children, the representativeness of rural children is over 90%. The other portion of the Colombian sample is representative primarily of poor, rural farmers in four micro-regions. Around 20% of the

Colombian population is rural, but 46% of the entire Colombian survey sample is rural. Thus, we examine the two Colombian samples separately. It should be kept in mind that the measure of socio-economic background is computed *within* each 'country'. So, in the case of rural Colombia, the wealth quartiles are computed within the rural sample. Relatively richer households within that sample could be comparatively poorer than households in the urban sample, so that the comparison is hard to make.

3.1 Outcomes

We examine three realms of child development in our cross-sectional analysis: vocabulary, cognition, and socio-emotional skills. Specific outcome measures and their standardization procedures are described in Table A.1.

One important issue we need to address, given the attempt to compare different countries, is that of the different measures of development that are used in different countries and at different ages. For some domains of development, the same tests are available for different countries. For example, the Peabody Picture Vocabulary test is used for vocabulary in three countries (Chile, Colombia and Peru). For other dimensions, this is not the case. For example, we have the same indicator - the Child Behavior Checklist, or CBCL- as an indicator of socioemotional skills in Chile and Uruguay, but the indicator for that domain is different in the other countries. Additionally, at times different tests are applied at different ages within the same country. This is standard in the child development field as children's abilities change with age making it unreasonable to test the cognition of an 8-year-old with a test used to test the cognition of a 5-year-old. Standardizing scores by age allows us to compare where children fall in a distribution at different ages, thus removing the age factor.

The need for comparisons using the most similar data is the main motivation for the emphasis we give to language measures as markers of cognitive development. However, we consider separately alternative measures of cognition, which allows to include an additional country (Mexico) in the longitudinal analysis, although Colombia does not have this outcome.

3.2 Socio-economic gradients

We use a wealth index as our primary measure of economic inequality, which we use to relate to ECD inequality. For each country, we generate wealth indexes using the first factor of a list of assets and income per capita. For the cross-sectional analysis we used the index from the concurrent round. For the longitudinal analysis, we used the wealth index from the first round to consider the influence of income inequality at the youngest age available.[3]

For robustness, we consider two additional measures of SES: household income per capita and maternal education. Household income per capita is generated in most surveys by adding up all income sources and dividing by household size, excluding tenants and employees.[4] The results are available upon request.

[3] When a country-round did not have many assets or income measures in the survey (e.g. Uruguay 2013), we used proxy variables such as food security and income transfers to impoverished households. For Mexico, we used the reported value of assets since most assets were grouped (Tables of Factor Loadings Available upon request.)

[4] When income was not available (e.g. Uruguay 2013 and Peru 2001), we substituted the asset index (excluding the income

In our analysis, we consider quartiles in economic advantage, as measured by our wealth index or by income and by maternal education. This is straightforward for the continuous asset indices and household income per capita variables. When looking at maternal education, which is a categorical variable, we compare those with complete secondary or less to those with at least some tertiary education. Although some sectors have a small fraction of the population with tertiary education, most countries in Latin America have achieved high rates of secondary school completion, so examining the gradient along maternal secondary education will be most relevant for considering inequalities in the future.

4 Cross Sectional Analysis

For the cross-sectional analyses, we use the most recent survey wave with outcomes for children ages 6 years and younger (0-71 months). We also dropped observations that were missing any measure of inequality (asset index, income per capita, and maternal education). For each realm (vocabulary, cognition, and socio-emotional), after summarizing differences across children with different socioeconomic background (as represented by a wealth index we estimated in each country), we consider age profiles examining how the relevant outcomes evolve with age.

The statistical analysis we present below is based on a simple conceptual model:

$$Y_i^k = \tilde{g}^k(a_i, W_i, Z_i) + u_i^k \tag{1}$$

where Y_i^k is developmental domain k, we analyze for child i, a_i their age, W_i a wealth indicator, Z_i are other controls, such as age and month of interview and $\tilde{g}$ is a generic function. In the simplest specification variables are included in an additive way, to measure the overall effect of the wealth index, which we enter as dummy variables indicating the wealth quartile of child i family. In our empirical exercise, the specification of equation 1 we implement is the following.

$$Y_i^k = g^k(a_i, Z_i) + \beta_1^k Q_{1,i} + \beta_2^k Q_{2,i} + \beta_3^k Q_{3,i} + \beta_4^k Q_{4,i} + v_i^k \tag{2}$$

where $Q_{j,i}$ are dummy variables that equal 1 if the child belongs to wealth quartile $j, j = 1, ..4$. In the analysis below we report estimates of $\beta_s^k - \beta_1^k, s = 2, 3, 4$, representing the average difference between the top three wealth quartiles and the first quartile, after controlling for age and select Z variables.[5] We enter age as a polynomial, whose degree is chosen for each country. Notice that for each domain we estimate a different regression.

After presenting the average wealth effects, we delve deeper in the analysis of how potential wealth differences vary with age by estimating the following regression:

component). We categorized maternal education as incomplete primary, complete primary (which can include incomplete secondary), complete secondary, some tertiary, and advanced/complete tertiary.

[5] We use minimal controls in this main estimation in order to purely focus on the wealth differences. Although our outcomes are standardized and as such do not vary by age, we still include age should there be residual correlation. We also include indicators for month of survey should there be seasonal effects.

$$Y_i^k = g^k(Z_i) + \sum_{s=1}^{4} f_s^k(a_i)Q_{j,i} + \varepsilon_i^k \tag{3}$$

where the functions $f_s^k()$ are polynomials of different degrees in each country and domain (but of the same degree for different wealth quartiles j). This equation allows us to analyze the different shapes of the age profiles a_i for different wealth quartiles. It should be remembered, however, that in our cross section, as in most of the existing literature, children are not followed over time, so that different children are observed at different ages. These profiles, therefore, could reflect cohort effects, where children of different ages and SES level have experienced different environmental shocks. Thus if more inequality is found for older children than for younger children, we cannot conclude inequality increases with age; it could be that the older children experienced an SES-cutting economic shock (such as an earthquake or a recession) most detrimental to the poor that had resolved when the younger children were born.

In a cross section of data, the outcomes for different ages come from different children. In the presence of cohort effects, such an approach can yield misleading results of the age profile of development. For this reason, we prefer the longitudinal analysis that we present in the next section. However, we report the main results obtained from cross sectional analysis for comparability with most of the existing literature.

Our results on the cross sectional analysis are summarized in Figure 2. In the figure, for each of the domains considered (vocabulary, cognition and socioemotional skills) we plot the differences in mean standardized child development scores between the second, third and fourth quartile and the first quartile of the wealth index for each of the countries considered; that is, we plot the estimated $\beta_k - \beta_1,\ k = 2, 3, 4$ in equation 2, with the corresponding confidence interval. As was mentioned in section 3, for Colombia we distinguish between the rural and urban samples.

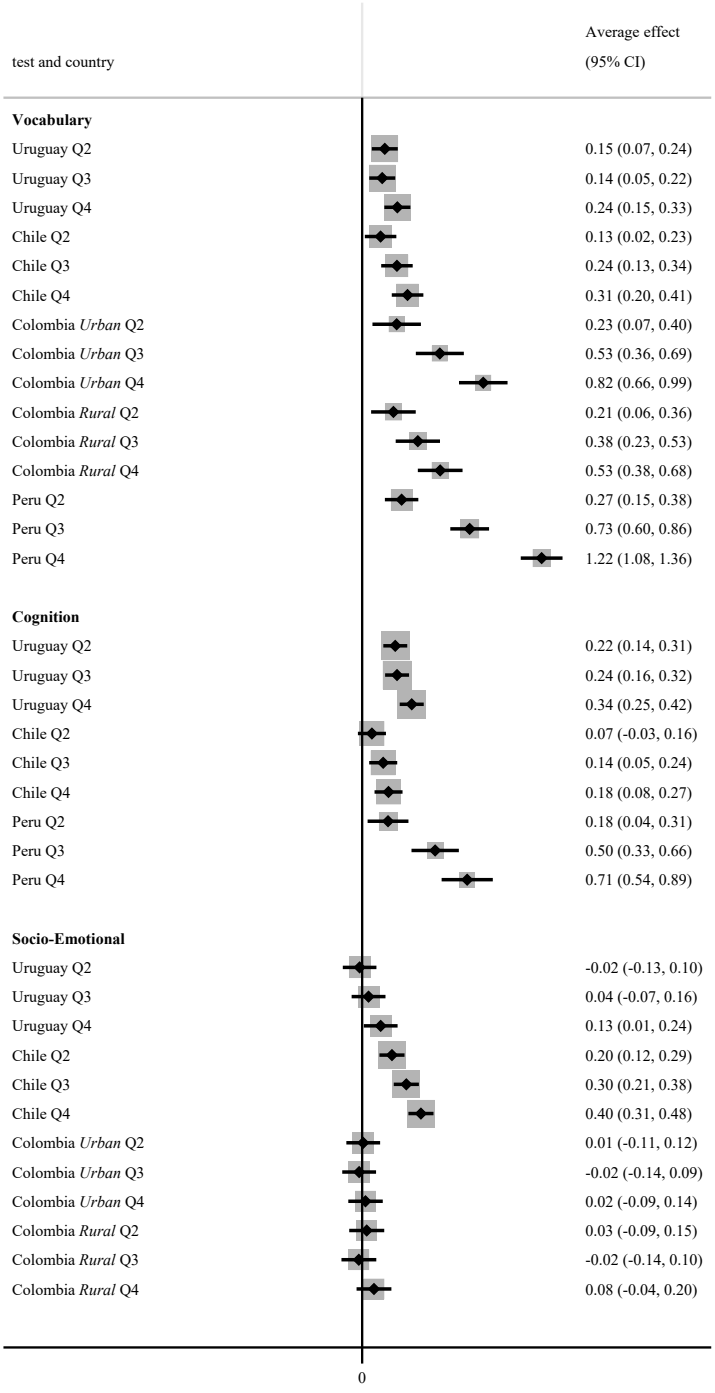
Several important features emerge from this picture, which are roughly consistent with the existing literature. For all countries there are significant differences in language and cognitive development among children from the bottom quartile and those from higher quartiles of the wealth index distribution. However, the pattern of these effects is different across the countries considered. The developmental gaps in vocabulary and cognition for Uruguay and Chile, are much smaller than those for Colombia and Peru.[6] Moreover, while in all countries the gaps increase as we consider higher quartiles, in Chile, and in particular in Uruguay (the less unequal country in our sample -as measured by the Gini-) there are no big differences between the second, third and fourth quartile. However, in Colombia (the most unequal in our sample), the differences between quartiles are substantially larger.

The picture for socioemotional skills that emerges is quite different, although it should be remembered that the measures available in the different countries are not strictly comparable. In this case, we observe no SES gaps in Colombia, very small gaps in Uruguay and larger and increasing gaps in Chile.[7]

[6] As mentioned above, for Colombia we only have measures of language development and we do not have a measure of cognition. Moreover, the wealth index quartiles for rural and urban Colombia are computed *within* the urban and rural samples.

[7] No socioemotional measures are available in Peru.

Figure 2: Cross-sectional analysis of mean differences by wealth quartile



Note: Q1, Q2, Q3, and Q4 correspond to the wealth quartiles. Differences between indicated quartile and Q1. Age-standardized scores (mean 0, sd 1). See Table 1 for data sources, ages included, and sample size. See Table A.1 for tests used in each country and realm. Children aged 0 to 5.

Having presented the average differences in different dimensions of child development in the countries under analysis, we look how these differences evolve with age. In particular, we estimate equation (3) for the different developmental domains. We choose the degree of the relevant polynomials after preliminary analysis of the data so as to get a best fit. We present the results of this exercise for language development

in Table 2, while the estimates for socioemotional skills are in Table 3.[8]

Table 2: Cross-sectional analysis of the vocabulary's growth curve

	Uruguay	**Chile**	**Colombia** *Urban*	**Colombia** *Rural*	**Peru**
Wealth Quartile 2	0.048	-7.776	-0.245	-7.524	-0.035
	(0.085) [0.573]	(4.242) [0.067]	(0.434) [0.574]	(11.771) [0.523]	(1.073) [0.974]
Wealth Quartile 3	-0.001	-6.282	-0.615	0.631	0.167
	(0.084) [0.990]	(4.933) [0.203]	(0.403) [0.128]	(12.180) [0.959]	(1.049) [0.873]
Wealth Quartile 4	-0.066	-10.040	0.076	24.466	3.128
	(0.087) [0.448]	(4.703) [0.033]	(0.421) [0.857]	(11.303) [0.031]	(1.053) [0.003]
Age	-0.003	-0.580	-0.017	-0.563	-0.045
	(0.002) [0.260]	(0.183) [0.002]	(0.005) [0.002]	(0.468) [0.230]	(0.013) [0.001]
Age x Wealth Quartile 2	0.004	0.480	0.009	0.460	0.006
	(0.003) [0.211]	(0.268) [0.073]	(0.008) [0.232]	(0.696) [0.509]	(0.017) [0.748]
Age x Wealth Quartile 3	0.005	0.416	0.022	-0.014	0.011
	(0.003) [0.107]	(0.306) [0.175]	(0.007) [0.003]	(0.717) [0.984]	(0.017) [0.493]
Age x Wealth Quartile 4	0.011	0.607	0.014	-1.401	-0.026
	(0.003) [0.000]	(0.296) [0.040]	(0.007) [0.057]	(0.663) [0.035]	(0.017) [0.123]
Age ^{2}		0.011		0.009	
		(0.004) [0.004]		(0.009) [0.332]	
Age^2 x Wealth Quartile 2		-0.009		-0.009	
		(0.005) [0.088]		(0.013) [0.500]	
Age^2 x Wealth Quartile 3		-0.008		0.000	
		(0.006) [0.168]		(0.014) [0.999]	
Age^2 x Wealth Quartile 4		-0.011		0.026	
		(0.006) [0.057]		(0.013) [0.040]	
Age ^{3}		-0.000		-0.000	
		(0.000) [0.011]		(0.000) [0.422]	
Age^3 x Wealth Quartile 2		0.000		0.000	
		(0.000) [0.110]		(0.000) [0.486]	
Age^3 x Wealth Quartile 3		0.000		0.000	
		(0.000) [0.166]		(0.000) [0.976]	
Age^3 x Wealth Quartile 4		0.000		-0.000	
		(0.000) [0.078]		(0.000) [0.048]	
N	2,407	2,731	1,086	1,060	1,830

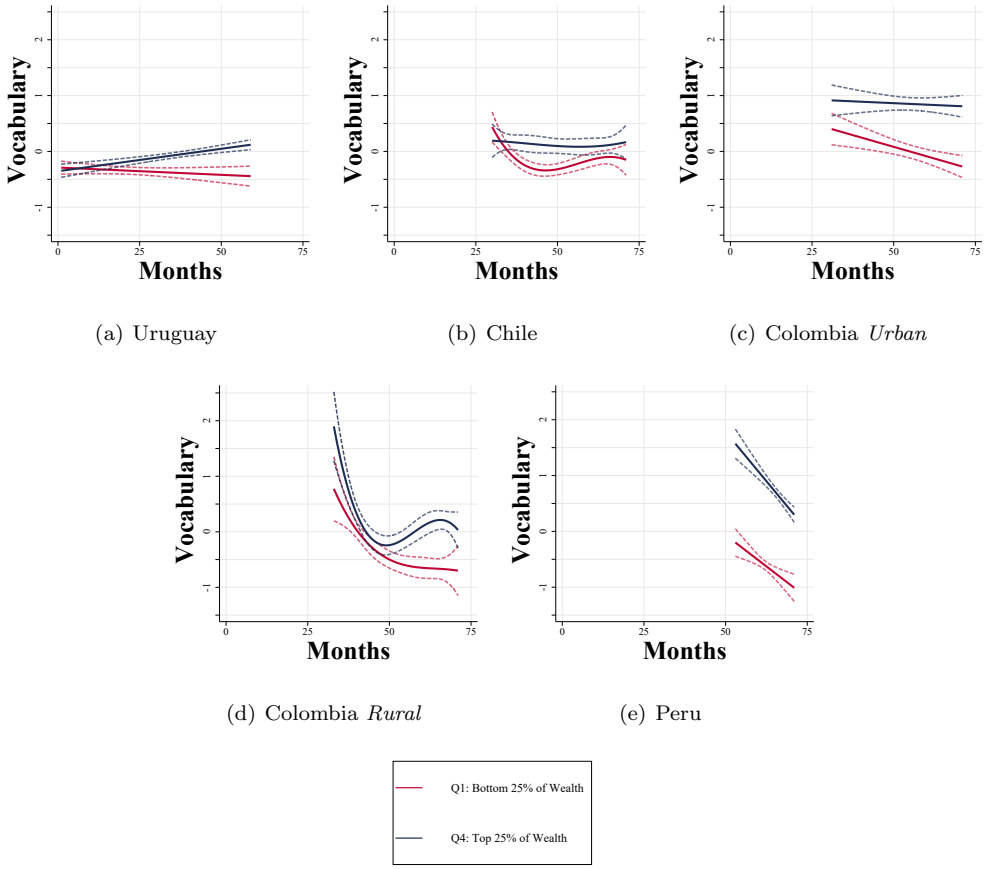
Note: Vocabulary is age-standardized, and measured with the PPVT test in Chile, Colombia, and Peru, and with the ASQ-3 communication module in Uruguay. OLS estimation of vocabulary on wealth quartile dummies, first degree age polynomial for Uruguay, Urban Colombia, and Peru, and third degree for Chile and Rural Colombia, and its interactions with the wealth dummies. One estimation per survey. Robust standard errors in parentheses and p-values in squared brackets.

We notice that, while for Chile and the rural Colombia sample, we fit a cubic polynomial specific to each wealth indicator quartile, in the case of Uruguay, urban Colombia and Peru, a linear age profile is sufficient to obtain a good fit. The meaning of these coefficients is better deduced from looking at Figure 3, which plots the profiles for the first and fourth wealth quartile, with the corresponding confidence interval. In the case of Uruguay, we see that the difference in development between the poorest and richest children is very small and not significant at the beginning of life, it grows with age and is already statistically significant at 26 months. For the Colombia urban sample, measures are available for children older than 25 months and, at that point the difference between first and fourth wealth quartile is larger than the same difference in Uruguay and increasing with time. In the case of Peru, measures are only available past 50 months and are even larger than in Colombia. In the case of Chile, we find that the difference, which is observed for children over 25 months old, is much smaller than in Colombia and Peru and does not

[8]We do not report this set of results for cognitive development in the cross-sectional analysis. When we discuss the longitudinal analysis, we present also estimates for this additional domain.

increase considerably with age. Note, however, that the shape of the cross-sectional age profiles should be taken with a grain of salt, as it could hide large cohort effects, as we mention above.

Figure 3: Cross-sectional analysis of the Vocabulary over age by wealth quartile



(a) Uruguay (b) Chile (c) Colombia *Urban*

(d) Colombia *Rural* (e) Peru

Note: Vocabulary is age-standardized, and measured with the ASQ-3 communication module in Uruguay, and the PPVT test in Chile, Colombia, and Peru. Predicted vocabulary skills based on OLS estimation of vocabulary on wealth quartile dummies, first degree age polynomial for Uruguay, Urban Colombia, and Peru, and third degree for Chile and Rural Colombia, and its interactions with the wealth dummies. One estimation per survey. Dashed lines are 95% confidence intervals based on robust standard errors.

In Table 3 and Figure 4 we repeat the same exercise for socio-emotional skills.[9] In this case, we do not have comparable measures for Peru. For all the other contexts, a linear specification for equation (2) is sufficient. The age profiles for different wealth quartiles overlap for Uruguay and the two Colombian sample. For Chile. instead, the difference between the first and forth wealth quartile grows with age and, by 25 months, is strongly significant.

Our findings are consistent with prior research, which does not find any reductions in the vocabulary gap with age (Lopez Boo, 2016; Reynolds et al., 2017; Schady et al., 2015), and sometimes finds widening (Paxson and Schady, 2007). The cognition result complements that of Rubio-Codina who also finds an increase in the wealth gap in cognition prior to age 5 years (2015). Finally, the differences in the behavior findings could be due to differences in behavioral tests, although previous findings also indicate a diversity of results (Rubio-Codina et al., 2015); context may have more influence over socio-emotional development

[9]We leave the analysis of cognition, for which measurements are not available for Colombia, for the longitudinal analysis.

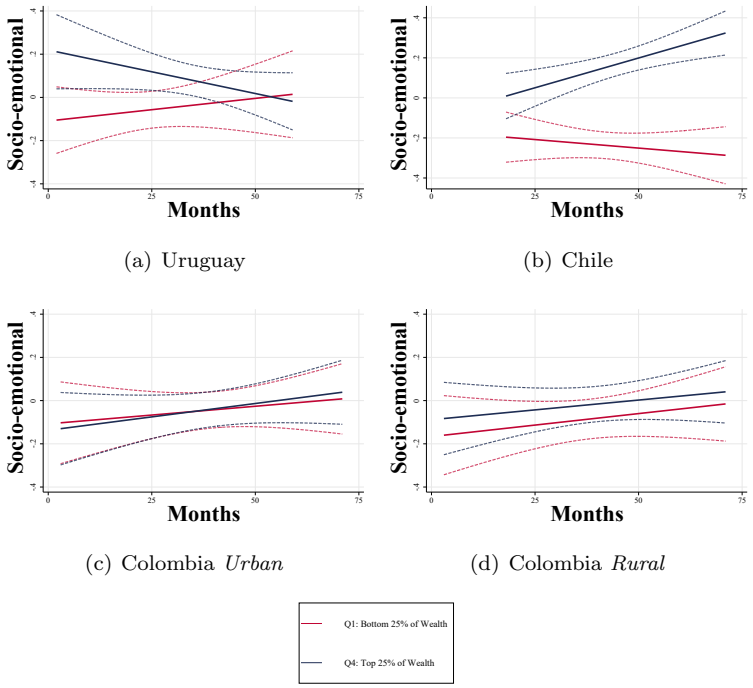
than does wealth. These findings however should be taken with caution as they could merely reflect the fact that children of different ages and SES level have experienced different environmental shocks. Observing larger ECD gaps as children age should not be an indication that inequality increases with age; it could be just that the older children experienced SES-specific environmental shocks.

Table 3: Cross-sectional analysis of the socio-emotional skills growth curve

	Uruguay	**Chile**	**Colombia** *Urban*	**Colombia** *Rural*
Wealth Quartile 2	0.015	-0.182	0.149	-0.025
	(0.113) [0.894]	(0.136) [0.180]	(0.131) [0.256]	(0.132) [0.852]
Wealth Quartile 3	0.145	0.095	0.097	0.028
	(0.116) [0.209]	(0.137) [0.488]	(0.132) [0.462]	(0.145) [0.847]
Wealth Quartile 4	0.329	0.067	-0.030	0.078
	(0.124) [0.008]	(0.133) [0.614]	(0.137) [0.829]	(0.135) [0.562]
Age	0.002	-0.002	0.002	0.002
	(0.003) [0.451]	(0.002) [0.445]	(0.002) [0.482]	(0.002) [0.351]
Age x Wealth Quartile 2	-0.001	0.009	-0.003	0.002
	(0.004) [0.835]	(0.003) [0.004]	(0.003) [0.284]	(0.003) [0.449]
Age x Wealth Quartile 3	-0.003	0.005	-0.003	-0.001
	(0.004) [0.414]	(0.003) [0.111]	(0.003) [0.342]	(0.003) [0.821]
Age x Wealth Quartile 4	-0.006	0.008	0.001	-0.000
	(0.004) [0.095]	(0.003) [0.008]	(0.003) [0.783]	(0.003) [0.919]
N	2,310	3,919	1,885	1,803

Note: Socio-emotional skills are age-standardized, and measured with the Child Behavioral Checklist in Uruguay and Chile, and with the ASQ-3 personal-social module for Colombia. OLS estimation of skills on wealth quartile dummies, first degree age polynomial, and its interactions with the wealth dummies. One estimation per survey. Dashed lines are 95% confidence intervals based on robust standard errors. Data is not available for Peru.

Figure 4: Cross-sectional analysis of the Socio-emotional skills over age by wealth quartile



(a) Uruguay (b) Chile

(c) Colombia *Urban* (d) Colombia *Rural*

Note: Socio-emotional skills are age-standardized, and measured with the Child Behavioral Checklist in Uruguay and Chile, and with the ASQ-3 personal-social module for Colombia. Predicted socio-emotional skills based on OLS estimation of skills on wealth quartile dummies, first degree age polynomial, and its interactions with the wealth dummies. One estimation per survey. Dashed lines are 95% confidence intervals based on robust standard errors. Data is not available for Peru.

5 Longitudinal Analysis

As discussed above, we see the longitudinal analysis as one of our main contributions to the existing literature. Our longitudinal analysis closely parallels the cross-sectional one. However, we add Mexico to the countries included in the analysis. Mexico, as well as Peru, start measurement of ECD realms around age 5, so these children are older than children from the other countries when first measured. However, both surveys have a survey wave prior to age 5, before the cognitive and vocabulary tests were applied. Thus, we use the wealth index and the values of the drivers from this earliest age to consider if these early wealth disparities result in differences in ECD scores at later ages.

To stress the fact that, unlike in the cross sectional analysis, here the same children are followed over time, we replace equations (2) and (3) with the following equations:

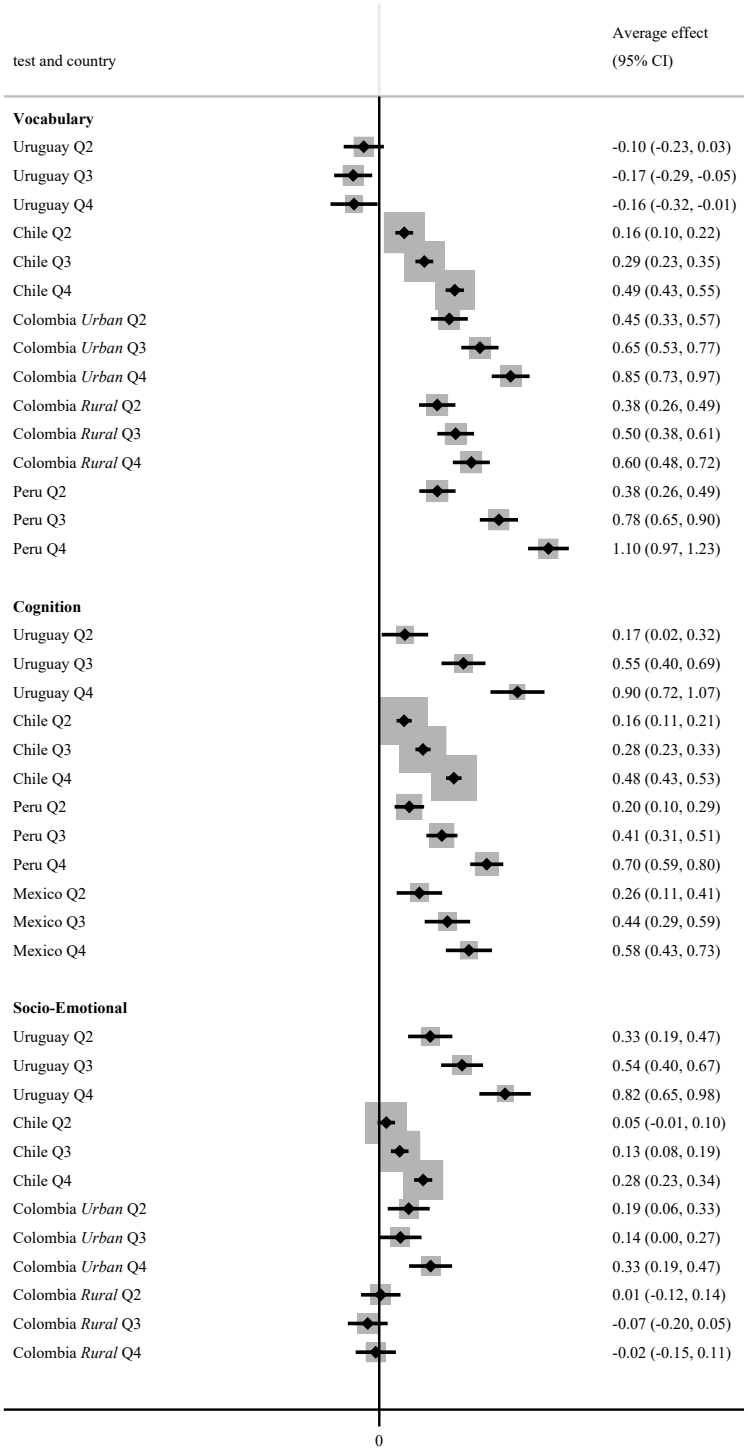
$$Y_{i,a}^k = g^k(a_i, Z_{i,a}) + \beta_1^k Q_{1,i} + \beta_2^k Q_{2,i} + \beta_3^k Q_{3,i} + \beta_4^k Q_{4,i} + v_{i,a}^k \tag{4}$$

$$Y_{i,a}^k = g^k(Z_{i,a}) + \sum_{s=1}^{4} f_s^k(a_i) Q_{s,i} + \varepsilon_{i,a}^k \tag{5}$$

where we have added the subscript a to the outcomes, control and residuals to denote the age of children i.

We use data on children who have outcome measures in every survey round and a summary of the final sample sizes is included in Table 1. Ages at follow-up are as young as 6 years (Uruguay) and as old as 16 years (Colombia). Note that Uruguay's longitudinal sample is restricted in representation in contrast to the cross-sectional analysis, because the first survey wave only tested children in the capital, Montevideo.

Figure 5: Longitudinal analysis of mean differences by wealth quartile



Note: Q1, Q2, Q3, and Q4 correspond to the wealth quartiles. Differences between indicated quartile and Q1. Standardized scores (mean 0, sd 1). On Grade is percent of children. See Table 1 for data sources, ages included, and sample size. See Table A.1 for tests used in each country and realm. Children aged 0 to 5 at baseline. Follow up up to 6 years later for Colombia and Uruguay, 7 for Chile, 9 to 12 for Mexico, and 10 for Peru.

The longitudinal analysis yields results, (Figure 5), that are only in part similar to those in the cross-sectional analysis. Wealth gaps are present and consistently positive in most locations and realms.

For the language domain, the (average) wealth gaps that are visible are similar to those in the cross-sectional analysis with the gaps being null in Uruguay, moderate in Chile and substantial in Colombia and Peru. As in the cross sectional analysis, cognitive measures are unavailable in Colombia, but we include such measures for Mexico in our longitudinal investigation.The most striking results steaming from cognition is that, if in the cross-secitonal analysis the gaps for Uruguay were quite small, now it seems that the country presents substantial gaps, substantially higher than in the other three countries. The gaps in Mexico are not too different from those in Peru.

It is well known that at young ages, language is strongly correlated with and a good predictor of cognition. Therefore, the fact that the results on cognition are substantially different from those on language in Uruguay is somewhat puzzling and might be related to the comparability of the measures used. Once again, there seems to be a need for more substantive, coherent and comparable measures of some important dimensions of development in the region.

For the socio-emotional domain, again, the results are somewhat different from those in the cross-sectional analysis. Cross-sectionally, Chile seemed to be the only country for which such gaps were visible and substantial. Now Uruguay presents large wealth gaps while those of Chile and Colombia are much smaller.

As with our cross-sectional analysis, after looking at the average difference for different wealth quartiles, we explore how these differences change with age, estimating equation (5) for the different countries considered. We stress again, however, that now the regressions we estimate use several measures for the same children, as they age.

In Table 4 we report the estimates of equation (5) for the language domain. We find the same fits as those in the cross sectional analyses: for Chile and rural Colombia we fit, for each wealth quartile, a cubic polynomial, while for Uruguay a quadratic function seems to provide a sufficient fit. For urban Colombia and Peru, we fit a linear function.

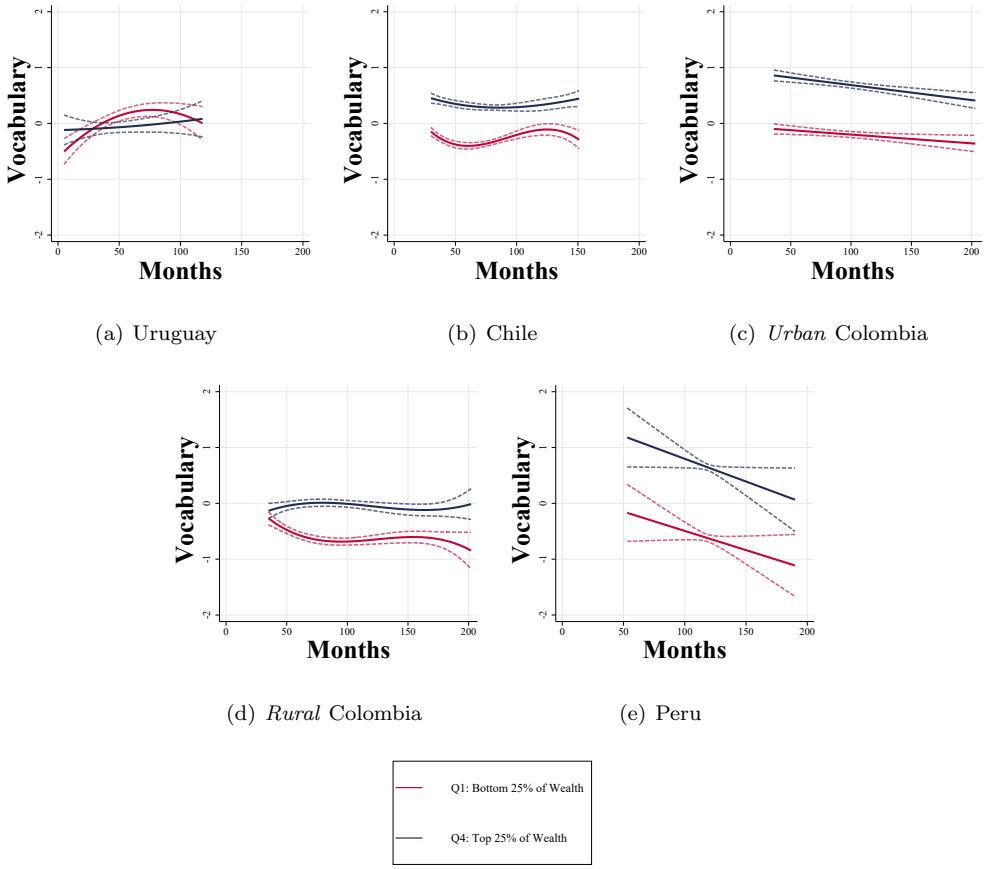
As in the cross sectional analysis, we describe some of the implications of these estimates graphically, in Figure 6, which plots the polynomial for the first and fourth wealth quartile. While the shapes of these polynomials are different in the different countries, there is no strong evidence that the gaps in development across wealth quartile tend to increase with age, with the possible exception of rural Colombia. We also notice that the gap for Uruguay is very small.

Table 4: Longitudinal analysis of the vocabulary growth curve

	Uruguay	**Chile**	**Colombia** *Urban*	**Colombia** *Rural*	**Peru**
Wealth Quartile 2	0.375	-0.226	0.442	-1.078	0.342
	(0.160) [0.019]	(0.253) [0.372]	(0.081) [0.000]	(0.364) [0.003]	(0.079) [0.000]
Wealth Quartile 3	0.242	-0.574	0.758	-1.151	0.835
	(0.156) [0.121]	(0.260) [0.027]	(0.081) [0.000]	(0.360) [0.001]	(0.080) [0.000]
Wealth Quartile 4	0.489	-0.139	1.008	-1.149	1.419
	(0.186) [0.008]	(0.282) [0.623]	(0.084) [0.000]	(0.361) [0.001]	(0.080) [0.000]
Age	0.022	-0.049	-0.002	-0.034	-0.007
	(0.005) [0.000]	(0.009) [0.000]	(0.001) [0.014]	(0.009) [0.000]	(0.004) [0.081]
Age x Wealth Quartile 2	-0.017	0.017	-0.001	0.041	0.000
	(0.006) [0.003]	(0.011) [0.117]	(0.001) [0.356]	(0.012) [0.001]	(0.001) [0.699]
Age x Wealth Quartile 3	-0.013	0.042	-0.001	0.044	0.000
	(0.006) [0.021]	(0.011) [0.000]	(0.001) [0.174]	(0.012) [0.000]	(0.001) [0.726]
Age x Wealth Quartile 4	-0.022	0.039	-0.001	0.051	-0.001
	(0.006) [0.001]	(0.012) [0.001]	(0.001) [0.147]	(0.012) [0.000]	(0.001) [0.029]
Age ^{2}	-0.000	0.001		0.000	
	(0.000) [0.000]	(0.000) [0.000]		(0.000) [0.001]	
Age^2 x Wealth Quartile 2	0.000	-0.000		-0.000	
	(0.000) [0.003]	(0.000) [0.162]		(0.000) [0.004]	
Age^2 x Wealth Quartile 3	0.000	-0.001		-0.000	
	(0.000) [0.038]	(0.000) [0.000]		(0.000) [0.003]	
Age^2 x Wealth Quartile 4	0.000	-0.001		-0.000	
	(0.000) [0.001]	(0.000) [0.000]		(0.000) [0.000]	
Age ^{3}		-0.000		-0.000	
		(0.000) [0.000]		(0.000) [0.004]	
Age^3 x Wealth Quartile 2		0.000		0.000	
		(0.000) [0.226]		(0.000) [0.015]	
Age^3 x Wealth Quartile 3		0.000		0.000	
		(0.000) [0.000]		(0.000) [0.018]	
Age^3 x Wealth Quartile 4		0.000		0.000	
		(0.000) [0.000]		(0.000) [0.001]	
N	4,260	25,937	7,733	8,431	7,202
p-value*	0.001	0.003	0.147	0.000	0.029

Note: Vocabulary is age-standardized, and measured with the PPVT test in Chile, Colombia, and Peru, and with the ASQ-3 communication module in Uruguay. OLS estimation of vocabulary on wealth quartile dummies, second degree age polynomial for Uruguay, third for Chile and Rural Colombia, and first for Urban Colombia and Peru, and its interactions with the wealth dummies. One estimation per survey. Robust standard errors in parentheses and p-values in squared brackets. p-value*: p-value of a test on whether the average derivative of vocabulary with respect to age is different between the average child in the bottom and top quartile.

Figure 6: Longitudinal analysis of the Vocabulary over age by wealth quartile



(a) Uruguay (b) Chile (c) *Urban* Colombia

(d) *Rural* Colombia (e) Peru

Note: Vocabulary is age-standardized, and measured with the ASQ-3 communication module in Uruguay, and the PPVT test in Chile, Colombia, and Peru. Predicted vocabulary skills based on OLS estimation of vocabulary on round fixed effects, wealth quartile dummies, second degree age polynomial for Uruguay, third for Chile and Rural Colombia, and first for Urban Colombia and Peru, and its interactions with the wealth dummies. One estimation per survey. Dashed lines are 95% confidence intervals based on standard errors clustered at the child level. Data is not available for Mexico.

Table 5: Longitudinal analysis of the cognition's growth curve

	Uruguay	**Chile**	**Peru**	**Mexico**
Wealth Quartile 2	0.181	-0.175	0.418	-0.080
	(0.264) [0.494]	(0.095) [0.067]	(0.093) [0.000]	(0.225) [0.723]
Wealth Quartile 3	0.258	-0.206	0.600	-0.563
	(0.236) [0.274]	(0.092) [0.026]	(0.088) [0.000]	(0.229) [0.014]
Wealth Quartile 4	0.410	-0.325	0.889	-0.075
	(0.279) [0.142]	(0.090) [0.000]	(0.089) [0.000]	(0.213) [0.724]
Age	0.032	-0.013	-0.004	-0.006
	(0.013) [0.016]	(0.006) [0.021]	(0.004) [0.262]	(0.002) [0.003]
Age x Wealth Quartile 2	-0.004	0.016	-0.001	0.003
	(0.017) [0.799]	(0.005) [0.001]	(0.001) [0.131]	(0.002) [0.122]
Age x Wealth Quartile 3	-0.006	0.029	-0.001	0.008
	(0.016) [0.685]	(0.005) [0.000]	(0.001) [0.362]	(0.002) [0.000]
Age x Wealth Quartile 4	-0.018	0.044	-0.001	0.005
	(0.018) [0.338]	(0.005) [0.000]	(0.001) [0.322]	(0.002) [0.007]
Age ^{2}	-0.001	0.000		
	(0.000) [0.006]	(0.000) [0.238]		
Age^2 x Wealth Quartile 2	0.000	-0.000		
	(0.000) [0.640]	(0.000) [0.022]		
Age^2 x Wealth Quartile 3	0.000	-0.000		
	(0.000) [0.334]	(0.000) [0.000]		
Age^2 x Wealth Quartile 4	0.001	-0.001		
	(0.000) [0.100]	(0.000) [0.000]		
Age ^{3}	0.000	-0.000		
	(0.000) [0.006]	(0.000) [0.597]		
Age^3 x Wealth Quartile 2	-0.000	0.000		
	(0.000) [0.535]	(0.000) [0.179]		
Age^3 x Wealth Quartile 3	-0.000	0.000		
	(0.000) [0.247]	(0.000) [0.000]		
Age^3 x Wealth Quartile 4	-0.000	0.000		
	(0.000) [0.069]	(0.000) [0.000]		
N	4,309	24,104	7,128	2,808
p-value*	0.881	0.000	0.322	0.007

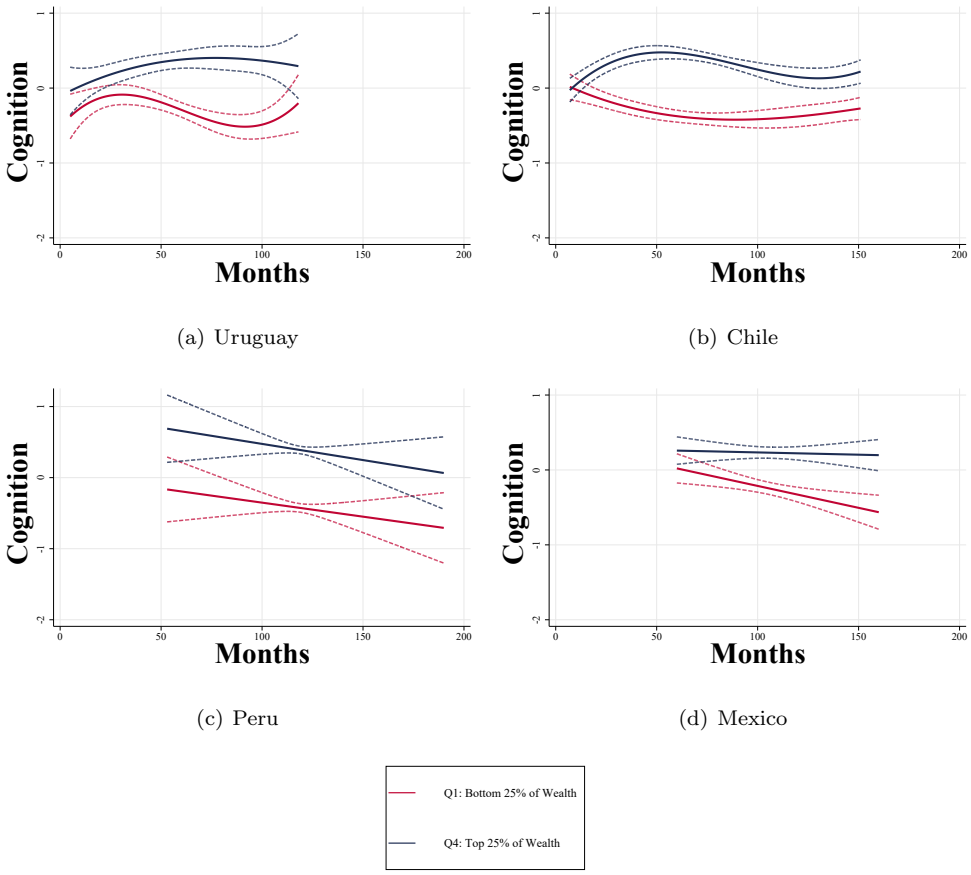
Note: Cognitive skills are age-standardized, and measured with the ASQ-3 problem-solving module (rounds 1, 2, and 4) and WISC (round 3) in Uruguay, the Battele (rounds 1 and 3) and TADI (round 2) in Chile, CDA (round 1) and mathematics tests (rounds 2, 3, and 4) in Peru, and Raven in Mexico. OLS estimation of skills on round fixed effects, wealth quartile dummies, third degree age polynomial for Uruguay and Chile, and first for Peru and Mexico, and its interactions with the wealth dummies. One estimation per survey. Dashed lines are 95% confidence intervals based on standard errors clustered at the child level. Data is not available for Colombia. p-value*: p-value of a test on whether the average derivative of cognition with respect to age is different between the average child in the bottom and top quartile.

In Table 5, we repeat the exercise for cognition, where, again, we loose Colombia and add Mexico. For Uruguay and Chile we fit a cubic polynomial in age, while for Peru and Mexico we have linear functions.

When looking at the evolution of cognitive gaps with age, in Figure 7, we observe an increasing gap in Mexico, driven by a decline in the standardised cognition measure for the bottom quartile. For Peru, the trends are parallel, while for Uruguay and Chile there is an increase in the first few months followed by a decline. It should be noticed that the age interval considered in the four countries is different, with Chile

and Uruguay starting earlier.

Figure 7: Longitudinal analysis of the Cognitive skills over age by wealth quartile



(a) Uruguay (b) Chile

(c) Peru (d) Mexico

Note: Cognitive skills are age-standardized, and measured with the ASQ-3 problem-solving module (rounds 1, 2, and 4) and WISC (round 3) in Uruguay, the Battele (rounds 1 and 3) and TADI (round 2) in Chile, CDA (round 1) and mathematics tests (rounds 2, 3, and 4) in Peru, and Raven in Mexico. Predicted cognitive skills based on OLS estimation of skills on round fixed effects, wealth quartile dummies, third degree age polynomial for Uruguay and Chile, and first for Peru and Mexico, and its interactions with the wealth dummies. One estimation per survey. Dashed lines are 95% confidence intervals based on standard errors clustered at the child level. Data is not available for Colombia.

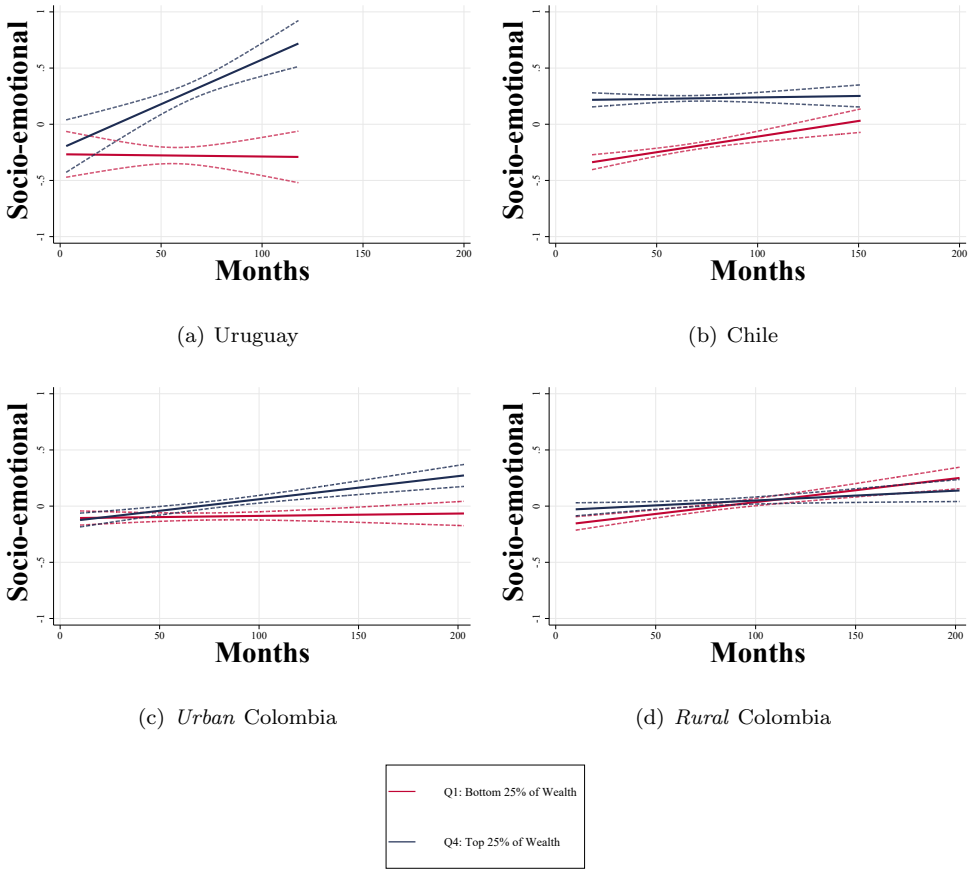
Table 6: Longitudinal analysis of the socio-emotional skills growth curve

	Uruguay	**Chile**	**Colombia** *Urban*	**Colombia** *Rural*
Wealth Quartile 2	0.050	0.139	-0.067	0.026
	(0.099) [0.614]	(0.034) [0.000]	(0.042) [0.109]	(0.040) [0.517]
Wealth Quartile 3	0.195	0.338	-0.034	0.095
	(0.091) [0.032]	(0.033) [0.000]	(0.044) [0.429]	(0.043) [0.026]
Wealth Quartile 4	0.055	0.599	-0.039	0.137
	(0.123) [0.655]	(0.032) [0.000]	(0.042) [0.348]	(0.041) [0.001]
Age	-0.000	0.003	0.000	0.002
	(0.002) [0.912]	(0.001) [0.000]	(0.000) [0.618]	(0.000) [0.000]
Age x Wealth Quartile 2	0.003	-0.001	0.001	-0.000
	(0.002) [0.111]	(0.000) [0.030]	(0.001) [0.010]	(0.001) [0.871]
Age x Wealth Quartile 3	0.004	-0.002	0.001	-0.001
	(0.001) [0.006]	(0.000) [0.000]	(0.001) [0.222]	(0.001) [0.015]
Age x Wealth Quartile 4	0.008	-0.003	0.002	-0.001
	(0.002) [0.000]	(0.000) [0.000]	(0.001) [0.000]	(0.001) [0.015]
N	4,350	29,728	7,518	7,920
p-value*	0.000	0.000	0.000	0.015

Note: Socio-emotional skills are age-standardized, and measured with the Child Behavioral Checklist in Uruguay (from round 2) and Chile, and the ASQ-3 personal-social module for Colombia and Uruguay's first round. OLS estimation of skills on round fixed effects, wealth quartile dummies, first degree age polynomial, and its interactions with the wealth dummies. One estimation per survey. Dashed lines are 95% confidence intervals based on standard errors clustered at the child level. Data is not available for Peru and Mexico. p-value*: p-value of a test on whether the average derivative of socio-emotional skills with respect to age is different between the average child in the bottom and top quartile.

Finally, in Table 6, we report the results of the same exercise performed on socioemotional skills. For this domain, we fit linear function of age for each of the wealth quartile for the four countries considered. The implications of these results are illustrated in Figure 8, where we plot the age profiles for the first and fourth wealth quartiles. The results are very different across the four countries. In Uruguay, the wealth gaps are nearly non existent at the youngest ages, but they increase dramatically with age. In Chile, instead, the gaps among wealth quartile decline with age. In the two Colombian samples, the gaps are very small (and non existent in the rural sample). In the urban sample, the gap modestly increase with age.

Figure 8: Longitudinal analysis of the Socio-emotional skills over age by wealth quartile



(a) Uruguay

(b) Chile

(c) *Urban* Colombia

(d) *Rural* Colombia

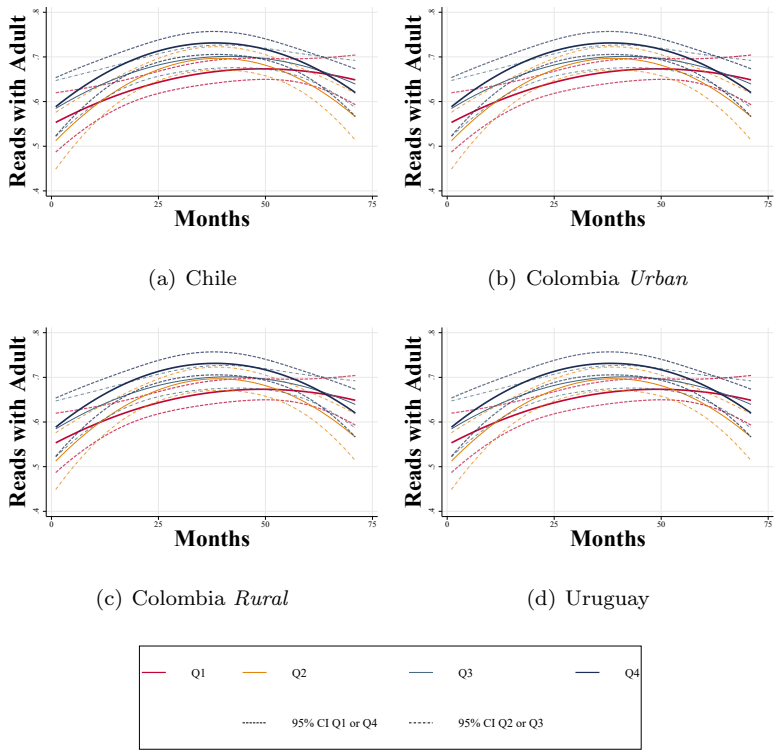
Note: Socio-emotional skills are age-standardized, and measured with the Child Behavioral Checklist in Uruguay (from round 2) and Chile, and the ASQ-3 personal-social module for Colombia and Uruguay's first round. Predicted socio-emotional skills based on OLS estimation of skills on round fixed effects, wealth quartile dummies, first degree age polynomial, and its interactions with the wealth dummies. One estimation per survey. Dashed lines are 95% confidence intervals based on standard errors clustered at the child level. Data is not available for Peru and Mexico.

In brief, in the longitudinal analysis, average SES gaps are similar to those of the cross-section in language but differ substantially in cognition and socio-emotional, mainly in Uruguay where they emerge as more unequal. If we focus on the evolution of skills gaps with age, such gaps are overall constant for language, perhaps with the exception of rural Colombia, where they grow slightly larger with time. Cognitive skills present different patterns depending on the country: for Chile and Uruguay, the gap is zero at early ages; it increases over time but closes again at later ages. While the cognitive skills gap seems constant in Peru, it increases with age in Mexico. However, the most significant country differences emerge for socio-emotional skills, with Uruguay showing an increasing gap and Chile a declining one (and Colombia a stable gap). Importantly, we find that ECD gaps found at early ages (0-5), still manifest 6-12 years later in almost all locations and realms but they do not increase with age (with the possible exception of rural Colombia in language, Mexico for cognition and Uruguay for socio-emotional).

6 Potential determinants of the SES gaps in child development

In this section, we examine various factors that may be contributing to the inequality gap. For example, children who are wealthier are read to at higher rates by adults (Figure 9), and experience higher general interactions (broadly defined between conversing, playing, and engaging) (Figure 10). Such mechanisms could explain the gap.

Figure 9: Reads with a adult over age by wealth quartile



(a) Chile

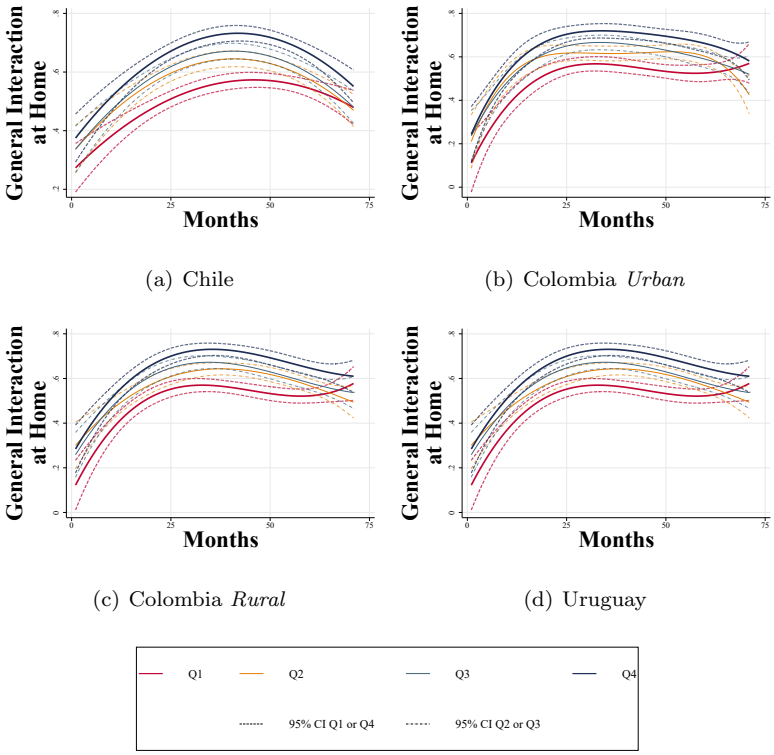
(b) Colombia *Urban*

(c) Colombia *Rural*

(d) Uruguay

Note: Predicted Reads with Adult based on OLS estimation of investment on wealth quartile dummies, second degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on robust standard errors. The outcome is an indicator of whether the primary or secondary caregiver reads to the child at least 4 times a week for Chile, whether someone reads to the child at least 2 or 3 times a week for Colombia, and whether someone reads with the child for Uruguay.

Figure 10: General interaction at home over age by wealth quartile



(a) Chile

(b) Colombia *Urban*

(c) Colombia *Rural*

(d) Uruguay

Note: Predicted General Interaction at Home based on OLS estimation of investment on wealth quartile dummies, second degree age polynomial for Chile, third degree for Rural Colombia and Uruguay, and fourth degree for Urban Colombia, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on robust standard errors. The outcome is an indicator of whether the primary or secondary caregiver plays or converses with the child at daily for Chile, whether someone plays daily with the child at home, or at least almost always answer questions or looks the child in the eye for Colombia, and whether someone tells stories, sings, or plays with the child for Uruguay.

To perform this analysis, we consider sets of variables from those listed in Table 7 and only use those for which more than 80% of children have responses.[10]

As with the estimates of developmental domains, we summarize parental investment by factor analysis, using a variety of measures related to such a latent variable. We use standard methods which are detailed in Appendix B.

To perform a mediation analysis. and check whether a certain set of potential drivers can explain the SES gaps we have documented, we add each set of drivers to equation 3 and 5 separately, and then include them all together. A statistically significant difference between the coefficients on $Q_{s,i}$ in equations 3 or 5 with and without the drivers considered would suggest that these covariates contribute to explaining the observed SES gaps.

The cross-sectional results reveal that few sets of drivers (or even all included together) reduce the wealth gap by a statistically significant amount; when the gap is reduced, the magnitude is quite small. We present the regressions that contain the latent variable for parental time investment (Appendix Tables

[10] As some children do not have complete information on the covariates included in the drivers, we impute the remaining missing values using the mean value (or modal value in the case of bivariate variables) of the quartile they are in. Most importantly, this restriction does come into play with the ECD investments with variables like preschool, reads with adult, and general interaction not consistently being asked in all surveys and ages. Therefore, as we only use the set of variables that are available for a large portion of the sample, our findings should be considered a minimum, as other unobserved factors in the same category could contribute to reduce the gap further.

Table 7: List of Drivers

Category of Driver	**Specific Variables**
ECD Inputs	Parental time investment (factor) Reads with an adult General interaction at home Enrolled in school or preschool
Anthropometrics	Height-for-age Z-scores BMI-for-age Z-scores
Child Demographics	Male Indigenous Black Religion
Parent Characteristics	Mother's age at first birth Mother's education Father's education Mother's employment status Father's employment status
Income	Total household income Government Income Unearned income (non-governmental) Mother's wage
Family Structure	Biological mother in Household Biological father in Household Grandmother in Household Grandfather in Household Stepfather in Household # of children 0-5 Number of males & females in the following age groups: 6-12, 13-17, 18-25, 26-pre-retirement, retirement
Geography & Community	Urban/rural Region or municipal indicators
Other controls	Date/Month of survey

B.27-B.29) and another set that contain the additional three ECD investment variables (Appendix Tables B.30-B.39). Because the gap reductions from the other variables are broadly statistically insignificant, we do not present those results.

The wealth gap in vocabulary maintains the majority of the gap with these drivers included, while the socioemotional gap is mostly reduced by the inclusion of drivers, except in Chile. The cognitive realm falls somewhere in the middle. When we consider the how longer-term wealth gaps change by the adjusting for the drivers, there are fewer cases of the driver totally reducing the gap (i.e., confidence interval includes 0) in this long-term analysis than in the cross-sectional, short-term analysis. In particular, with the exception of Colombia Rural, the socio-emotional gap is almost always statistically significant, which was not the case in the cross-sectional data.

Examining results using the procedure above (adding each variable separately and then all together), we find very few cases in which these investments reduce the wealth gap in child development.

7 Conclusions and discussion on policies to reduce SES gap in ECD

This study has documented the presence of socioeconomics gaps in early childhood developmental levels in five countries in LAC. The gaps are present in most locations and realms (vocabulary, socio-emotional and cognitive development). The magnitudes of such gaps are meaningful, and, in some cases, quite large: for instance, Peru's wealth gap in vocabulary (both in the cross section and longitudinal analysis) is over 1 SD. Additionally , our research shows that while very few of the wealth gaps seem decreasing with age, a few are increasing with age and even when the gaps do not increase, they generally persist well into adolescence.

It is interesting to make some comparisons between Colombi a, the most income inequal of the countries studied, and Uruguay, the most income equal. Except for the longitudinal analysis of wealth gaps in the socio-emotional realm, Uruguay's gap sizes are modest or null. Colombia has large gaps in vocabulary. That these are large even though the Colombian population was divided into urban and rural samples indicates that there is likely even more inequality present once combined at a national scale. That gaps are present in these two distinct contexts of inequality, poverty, and culture indicates that the developmental pathways are dependent on economic inputs.

Although previous studies have looked at the wealth gaps in ECD our study contributions are related to the data used, a broader scope of analysis, - including most reals of ECD- and the unique longitudinal examination. The data we use was collected at a national level; while some previous studies have been limited by using data from impact evaluations which cover a limited population. And even if two of our data sources (Peru and urban Colombia) are not quite nationally representative, they do over-select the poor which are more populous and help get closer to representation of children, if not of households. Although we may be missing some children at the highest end of the wealth distribution, these large-

scale surveys are the closest we have to encompassing the breadth of the population in such countries. Additionally, we examine three outcomes across multiple countries, which provides a more comprehensive picture of child development. Although some studies examine multiple realms and others include multiple countries, providing the analysis with the same methodology across both results in valuable comparisons and examination of trends. Finally, our longitudinal approach from five countries that follows young children into primary school and–in some cases–adolescence provides strong evidence that gaps perceived in cross-sectional data are not an artifact but are veritably consistent over time. In brief, this research has updated previous studies and expanded their scope to cover additional countries, spans more ages and covers a number of outcomes, indicating the robustness of the finding that wealth gaps in ECD are present in a variety of realms over the course of childhood throughout Latin America. Due to learning losses from the pandemic influencing the most impoverished (Abufhele et al., 2022a; González et al., 2022; Proulx et al., 2021), we expect current gaps are even larger than those we document here.

There are some limitations to this research. Some of our outcomes are not tested with the same instrument across countries or across rounds, particularly in the case of socio-emotional skills. Thus, some comparisons may be tenuous based on slightly different underlying constructs. Additionally, standardization was done within country, so we cannot make between-country comparisons regarding absolute scores. These limitations suggest that we need to be cautious about our conclusions with respect to comparisons across rounds and location. Nevertheless, most countries used the same vocabulary test, which was repeated across several survey rounds, and these results were some of the most consistent, suggesting that our findings are not artifacts of different evaluation instruments.

The fact that gaps are present that early in life suggests early policy intervention is necessary. Because we find such a difference between the ECD outcomes of the wealthiest and poorest quartiles of the populations, reducing poverty is an obvious first step to reducing socio-economic gaps in ECD. Conditional cash transfers (CCTs) have helped to improve ECD levels in the short term, particularly where they have reached the poorest households (Millán et al., 2019). Exposure to CCTs has for instance led to better cognitive development in Honduras (López Bóo and Creamer, 2019), Ecuador (Araujo et al., 2017), and Nicaragua (Barham et al., 2013). It is of note that the impacts of CCTs of greatest magnitude have been observed in the domains where socioeconomic gaps are largest: language development. The gains, where they have been measured in the medium term, have persisted in the majority of cases (Colombia (Econometría-SEI, 2012), Nicaragua (Barham et al., 2013; Macours et al., 2012), and El Salvador (Sanchez Chico et al., 2018), but not Ecuador (Araujo et al., 2019)).

An additional policy resource to consider is center-based care–including both childcare and preschool–. Childcare centers offer childcare, feeding, and stimulation services outside the home for children ages 0-3 and preschool, for children 3-5, which offer early education, care, and often nutrition to children from age three to the start of primary school .

The expansion of preschool offerings is promising; it had a positive impact on primary school performance in Argentina (Berlinski et al., 2009), academic progress in high school in Guatemala (Bastos et al., 2016), and cumulative years of schooling in Uruguay (Berlinski et al., 2008), as well as on the likelihood

of attaining a higher level of education, finding employment, and having a higher income in adulthood in developed countries where longitudinal studies have been conducted (Belfield et al., 2006; Reynolds et al., 2018; Rossin-Slater and Wüst, 2016). Preschool access has also demonstrated other social benefits, such as a reduction in disciplinary problems in schools, a drop in crime rates, greater participation in civic duties (Figlio et al., 2009; Garces et al., 2000; Schweinhart et al., 2005), and increased life expectancy (Rossin-Slater and Wüst, 2016).

There is also potential to have more children in childcare, although the global literature shows that positive impacts in these age range only tend to appear when quality is high and when the population is vulnerable (IDB, 2023). In LAC, there have been studies in recent years of the impact of at scale childcare programs on ECD with mixed results. An RCT in Nicaragua shows substantive, positive short-term effects on child development of access to childcare centers for children under age four (Hojman and Lopez-Boo, 2022). In Colombia and Bolivia, non-experimental evaluations also showed positive effects of childcare attendance on ECD outcomes, but only for some groups (Behrman et al., 2004; Bernal and Fernández, 2013; Bernal and Ramírez, 2019). Studies in less vulnerable samples find no impacts on child development in Rio de Janeiro (Attanasio et al., 2017) and negative effects on child-adult interactions in Chile (Noboa-Hidalgo and Urzúa, 2012).

Children living in remote areas might not have center based care accessible, so alternative approaches are needed to help parents stimulate child development. Wealth gaps in these type of early child development inputs exist in LAC. Children who are wealthier are read to at higher rates by adults, and the same gaps are find in other inputs (broadly defined like having books, conversing, playing, and engaging). Some evaluations have shown impacts of home visiting programs on such intermediate parental inputs indicators (Fernald et al., 2017; Hamadani et al., 2014; Powell et al., 2004; Tofail et al., 2013), although the increase in ECD may be the result of greater household investment in children (materials and time) rather than greater productivity on the part of the caregiver (Attanasio et al., 2020). Few studies have examined medium- or long-term effects, and their results have been mixed (Love et al., 2013; Olds et al., 2010). Reach Up and Learn in Jamaica has shown particularly positive long-term results: its initial impact of approximately one standard deviation (Grantham-McGregor et al., 1991) has translated into improved academic attainment, reduced depression, less violent behavior, and earnings that were around 25% higher 20 years later (Gertler et al., 2014; Walker et al., 2011), and 43% higher at age 31 (Gertler et al., 2014,2; Walker et al., 2011). One larger scale implementation of this model within a vulnerable Colombian population did not sustain the initial effects on cognition (0.26 SD) and receptive language (0.22 SD) (Attanasio et al., 2014) two years after the intervention was completed (Andrew et al., 2018). Based on lessons from Colombia, the model was adapted to be implemented nationwide in Peru with the Cuna Mas program and evaluated using a randomized controlled trial (RCT). Intent-to-treat estimates of such experience showed impacts on development of 0.10 SD after two years of intervention (Araujo et al., 2021b). In recent years, several large-scale government-implemented programs in the region found mixed results for ECD outcomes when evaluating home vists programs' impact. A twice-monthly home visiting program that reached 32,900 children ages zero through three in 37 high-poverty, rural municipalities in

Nicaragua achieved impacts of 0.11 SD on child development and 0.15 SD on child behavior (intent-to-treat estimates) (Lopez Boo et al., 2023b). In Mexico, an evaluation of the Programa de Educación Inicial showed weekly group sessions to have had positive effects on cognition, language, and memory in children under age four who also benefitted from the conditional CTP (Fernald et al., 2017). In the city of Fortaleza, Brazil, the play-based home-visiting program for children under age three, Programa Cresça com seu Filho, was fully integrated into the primary healthcare system for delivery. The program currently serves nearly 30,000 children, and its RCT showed positive impacts on home environment quality but no effects on child development (Lopez Boo et al., 2023a).

To reduce national socio-economic inequalities in ECD, implementation of high-quality programs at scale is necessary, but brings operational, monitoring, and evaluation challenges. Policymakers must commit to long term improvements in process quality in addition to considering the more easily measured metric of number of children and families served. In the long term, these investments will pay off for the children and the future of the country and the region. Yet, many interventions could help improve child wellbeing. Understanding the benefits and costs of ECD programs is crucial when choosing which policies to implement, as some programs have greater benefit-cost ratios than others: benefit-cost ratios of home visits at scale range from 5.4 in Peru (Araujo et al., 2021a) to 11.7 in Nicaragua (Lopez Boo et al., 2023b), while for at-scale childcare, they have been calculated to be 6.2 in Nicaragua (Hojman and Lopez-Boo, 2022). Both FSP and childcare show benefit-cost ratios that are up to four times larger than those of preschool programs (Araujo et al., 2021a; Berlinski and Schady, 2015; Hojman and Lopez-Boo, 2022; Lopez Boo et al., 2023b).

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Appendix

A Sample Information

Table A.1: **Information on measurement of child development by realm and survey**

Realm	Measure	Chile			Colombia			Mexico			Peru				Uruguay				Description
		2010	2012	2017	2010	2013	2016	2002	2005-06	2009-12	2005	2008	2012	2015	2013	2016	2019	2018a	
Vocabulary	*Test de Vocabulario de Imagenes Peabody (TVIP) Peabody Picture Vocabulary Test*	x	x	x	x	x	x				x	x	x	x					TVIP tests receptive vocabulary by having the child choose from pictures which word was spoken. Age standardized using smoothing functions across the entire ages tested.
	Ages and Stages Questionnaire Version 3 - Communication Subscale (ASQ3-C)														x	x		*x*	ASQ3 uses parental response to evaluate the risk of developmental delay in children from 2 to 66 months using 21 age-specific questionnaires that shift according to milestones expected for the age. The scores were standardized within each age group taking the same questionnaire. We use only questions from the communication realm.
Socio-emotional	Child Behavior Checklist (CBCL)	x	x	x												x	x		The internal and external CBCL subscale scores were combined and the z-scores were calculated. As these scores did not vary systematically across age, we did not adjust for age in the standardization.
	Ages and Stages Questionnaire Socio-emotional (ASQ-SE)					x									x			*x*	This parent-reported Ages and Stages instrument of social-emotional development measures self-regulation, compliance, communication, adaptive behaviors, autonomy, affect, and interaction with people. The scores were standardized within each age group taking the same questionnaire.
	Strengths and Difficulties Questionnaire (SDQ)						x												The parent-reported Strengths and Difficulties Questionnaire asks about 25 attributes within five categories: emotional symptom, conduct problems, hyperactivity/inattention, peer-relationship problems, and prosocial behavior. Age standardized using smoothing functions across the entire ages tested.
Cognition	Battelle	x		x															Battelle (cognitive section) tests a child's ability to learn, remember, and solve problems. Cognition refers to intellect or mental abilities and involves processing and using information. Age standardized using smoothing functions across the entire ages tested. 2010 applies the full version of the test, so we use the cognitive subscale. 2017 uses the screening version, a shorter test without subscales, so we use the total score.
	Test de Aprendizaje de Desarrollo Infantil (TADI) Test of Infant Learning & Development		x																Test of Infant Learning & Development (TADI), a Chilean assessment administered directly to children ages three months to six years (Pardo et al., 2012). The TADI begins with easy tasks for the age level and becomes progressively harder. Age standardized using smoothing functions across the entire ages tested.
	Cognitive Development Assessment (CDA) -quantity subtest										x								The Cognitive Development Assessment (CDA) was developed by the International Evaluation Association (IEA) for 4-year-old children. In the quantity subscale, the task was for children to pick an image that best reflected the concept verbalized by the examiner (e.g., few, most, nothing, etc). The validity and reliability of the CDA was established within the Young Lives sample.
	Math Test (age 8)											x							Young Lives researchers gathered items from various freely-published testing programs and developed a few items based on measures commonly used to assess mathematics skills. 9 items measure basic quantitative and number notions and 20 items were word problems, read by an enumerator. Since all children were roughly the same age, the scores were standardized without age adjustments.
	Math Test (ages 12 & 15)												x	x					The first section was fully computational using basic operations, and the latter section included problem solving questions; these were released items that were publicly available from Trends in International Mathematics and Science Survey (TIMSS) and Program for International Student Assessment (PISA). Topics included (1) data interpretation, (2) number problem solving, (3) measurement, and (4) basic knowledge of geometry. Since all children were roughly the same age, the scores were standardized without age adjustments.
	Raven's Progressive Matrices							x	x	x									Given to children ages 6 and above. The questions consist of visual geometric design with a missing piece, with choices that fill in the piece.
	Wechsler Intelligence Scale for Children (WISC)																x		Wechsler Intelligence Scale for Children is an intelligence test that measures a child's intellectual ability. 5 cognitive domains were included that impact performance: verbal comprehension, visual spatial, fluid reasoning, working memory, and processing speed.
	Ages and Stages Questionnaire Version 3 - Problem Solving (ASQ3-PS)														x	x		*x*	The Ages and Stages Questionnaire (3rd edition) uses parental response to evaluate the risk of developmental delay in children from 2 to 66 months using 21 age-specific questionnaires that shift according to age-expected milestones. The scores were standardized within each age group taking the same questionnaire. Problem solving asks how a child thinks, solves problems, and plays with toys.

Note: Realms measures within realms are organized by consistency across countries. Cognition has less consistency and outcomes are ordered to align those used in the same country. In some cases, the data is sparse at the tails of the age distribution. We restrict the sample such that the span of the youngest three months must include at least 30 observations; likewise for the oldest three months. Shaded cells are used in the cross-sectional analysis. (a) Uruguay started a new cohort in 2018: x's in italic are not used in the longitudinal analysis.

B Parental Investment

Measurement System

Table B.2 describes the items we use to measure parental time investment. We use common items to set a common scale across countries. To avoid convergence problems, we discard items with small variation. In particular, we do not use categorical items with less than 5% of the sample in at least one category or items highly correlated with other items (i.e., polychoric correlation above 0.9).

Table B.2: Parental time investment items by country

Item	Chile	Colombia: Rural	Colombia: Urban	Peru	Uruguay
PI 1. Has external help for child care	✓				✓
PI 2. Washed [regularly] (mom)	✓				
PI 3. Took her to preschool/school [regularly] (mom)	✓				
PI 4. Went to parent-teacher meetings [regularly] (mom)	✓				
PI 5. Read [last 7 days] (primary caregiver)	✓	✓	✓		
PI 6. Told stories [last 7 days] (primary caregiver)	✓				
PI 7. Sang [last 7 days] (primary caregiver)	✓				
PI 8. Tought animals [last 7 days] (primary caregiver)	✓				
PI 9. Tought colors [last 7 days] (primary caregiver)	✓				
PI 10. Tought numbers [last 7 days] (primary caregiver)	✓				
PI 11. Tought letters [last 7 days] (primary caregiver)	✓				
PI 12. Played [last 7 days] (primary caregiver)	✓				
PI 13. Named, told, or drew things [last 7 days] (primary caregiver)	✓				
PI 14. Went outside [last 7 days] (primary caregiver)	✓				
PI 15. Went to a museum [last 7 days] (primary caregiver)	✓				
PI 16. Number of times child was alone > 1 hr in the last week	✓				
PI 17. Played at home		✓		✓	
PI 18. Played outside (primary caregiver)		✓	✓		
PI 19. Watched TV (primary caregiver)		✓	✓		
PI 20. Tought letters, colors, or numbers (primary caregiver)		✓	✓		
PI 21. Played in the street (anyone)				✓	
PI 22. Played in the playground (anyone)				✓	
PI 23. Read [last 3 days] (mom)					✓
PI 24. Read [last 3 days] (dad)					✓
PI 25. Read [last 3 days] (any)					✓
PI 26. Told stories	✓				✓
PI 27. Told stories [last 3 days] (dad)					✓
PI 28. Told stories [last 3 days] (any)					✓
PI 29. Sang [last 3 days] (mom)					✓
PI 30. Sang [last 3 days] (dad)					✓
PI 31. Sang [last 3 days] (any)					✓
PI 32. Went outside [last 3 days] (mom)					✓
PI 33. Went outside [last 3 days] (dad)					✓
PI 34. Went outside [last 3 days] (any)					✓
PI 35. Played [last 3 days] (dad)					✓
PI 36. Played [last 3 days] (any)					✓
PI 37. Named, told, or drew things [last 3 days] (mom)					✓
PI 38. Named, told, or drew things [last 3 days] (dad)					✓
PI 39. Named, told, or drew things [last 3 days] (any)					✓
PI 40. Hours of after school care that the mom provides					✓
PI 41. Hours of after school care that the dad provides					✓
PI 42. Hours of after school care that the family members provide					✓
PI 43. Hours of after school care that the child spends alone					✓

Denote the observed parental time investment item j as m_c^j, where c denotes the country, Chile (CH), Rural Colombia (RC), Urban Colombia (UC), Peru (PE), or Uruguay (UR).

Assuming each latent construct of the categorical items, $m_c^{*,j}$, is additively separable in the logarithm of the latent parental investment:

$$m_c^{*,j} = \alpha_c^j + \lambda_c^j ln\theta_c + \varepsilon_c^j \tag{6}$$

where $\alpha_c^j = 0$ if m_c^j is not continuous. Then, we assume that each observed categorical item is a function of its latent construct such that:

$$m_c^j = \begin{cases} m_c^{*,j} & \text{if } m_c^j \text{ is continuous} \\ 0 & \text{if } m_c^j \text{ is not continuous and } m_c^{*,j} < \tau_{1\ c}^j \\ 1 & \text{if } m_c^j \text{ is not continuous and } m_c^{*,j} \in [\tau_{1\ c}^j, \tau_{2\ c}^j) \\ 2 & \text{if } m_c^j \text{ is not continuous and } m_c^{*,j} \in [\tau_{2\ c}^j, \tau_{3\ c}^j) \\ 3 & \text{if } m_c^j \text{ is not continuous and } m_c^{*,j} \geq \tau_{3\ c}^j) \end{cases} \tag{7}$$

To scale $ln\theta_{CH}$ to *"PI 12. Primary caregiver played with the child in the last 7 days"*, we set $\lambda_{CH}^{12} = 1$ and $\tau_{1,\ CH}^{12} = 0$.

To scale $ln\theta_{RC}$ to $ln\theta_{CH}$, we impose invariance on the loading and the first threshold of *"PI 5. Primary caregiver read to the child in the last 7 days."* That is $\lambda_{RC}^5 = \lambda_{CH}^5$ and $\tau_{1,\ RC}^5 = \tau_{1,\ CH}^5$.

To scale $ln\theta_{UC}$ to $ln\theta_{RC}$, we impose invariance on the loading and the first threshold of *"PI 18. Played outside with the primary caregiver."* That is $\lambda_{UC}^{18} = \lambda_{RC}^{18}$ and $\tau_{1,\ UC}^{18} = \tau_{1,\ RC}^{18}$.

To scale $ln\theta_{PE}$ to $ln\theta_{RC}$, we impose invariance on the loading and the first threshold of *"PI 17. Played at home with the primary caregiver."* That is $\lambda_{PE}^{17} = \lambda_{RC}^{17}$ and $\tau_{1,\ PE}^{17} = \tau_{1,\ RC}^{17}$. Note that the definition of this binary item is different across countries. For Colombia it is equal to one if the primary caregiver plays at home with the child at least three times a week, while for Peru it is equal to one if it they played at home the day before the interview.

To scale $ln\theta_{UR}$ to $ln\theta_{CH}$, we impose invariance on the loading and the first threshold of *"PI 26. Primary caregiver told stories."* That is $\lambda_{UR}^{26} = \lambda_{CH}^{26}$ and $\tau_{1,\ UR}^{26} = \tau_{1,\ CH}^{26}$. Note that the definition of this binary item is different across countries. For Chile it is equal to one if the primary caregiver tells stories at least once a week, while for Uruguay it is equal to one if it the mom told stories in the last three days.

Exploratory Factor Analysis and Factor Models

For the Exploratory Factor Analysis, we estimate the measurement systems by GMM assuming normality of the latent contructs. Then we identify and remove those items with a small loading (i.e., with an absolute value less than 0.1). For those measurement systems with at least one low-predicting item, we present the estimation with (EFA) and without (Factor models) the low-predicting items. The latter estimation is the one used to obtain the predicted log of parental investment.

Selection of the degree of age-polynomial

Table B.3: Age-polynimia for Chile

	P. Investment	**P. Investment**	**P. Investment**	**P. Investment**	**P. Investment**
Age	-0.00488	0.04978	0.04696	0.05985	0.06149
	(0.00134) [0.00028]	(0.00793) [0.00000]	(0.03170) [0.13855]	(0.10443) [0.56664]	(0.30206) [0.83869]
Age^2		-0.00063	-0.00056	-0.00108	-0.00117
		(0.00009) [0.00000]	(0.00078) [0.47774]	(0.00412) [0.79399]	(0.01675) [0.94435]
Age^3			-0.00000	0.00001	0.00001
			(0.00001) [0.92730]	(0.00007) [0.90505]	(0.00044) [0.98078]
Age^4				-0.00000	-0.00000
				(0.00000) [0.89861]	(0.00001) [0.98809]
Age^5					0.00000
					(0.00000) [0.99552]
N	3,661	3,661	3,661	3,661	3,661

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.4: Age-polynimia for Colombia *Urban*

	P. Investment	**P. Investment**	**P. Investment**	**P. Investment**	**P. Investment**
Age	0.03841	0.18292	0.19180	0.25949	-6.32946
	(0.00212) [0.00000]	(0.02537) [0.00000]	(0.22596) [0.39619]	(1.60645) [0.87171]	(11.76337) [0.59066]
Age^2		-0.00132	-0.00149	-0.00342	0.24998
		(0.00023) [0.00000]	(0.00426) [0.72739]	(0.04620) [0.94098]	(0.45423) [0.58222]
Age^3			0.00000	0.00003	-0.00478
			(0.00003) [0.96905]	(0.00058) [0.96539]	(0.00866) [0.58067]
Age^4				-0.00000	0.00004
				(0.00000) [0.96704]	(0.00008) [0.58133]
Age^5					-0.00000
					(0.00000) [0.58224]
N	917	917	917	917	917

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.5: Age-polynimia for Colombia *Rural*

	P. Investment	**P. Investment**	**P. Investment**	**P. Investment**	**P. Investment**
Age	0.05037	0.30315	0.67198	4.84073	24.81652
	(0.00311) [0.00000]	(0.03759) [0.00000]	(0.31517) [0.03326]	(2.42601) [0.04629]	(16.95049) [0.14351]
Age^2		-0.00235	-0.00936	-0.12933	-0.90341
		(0.00035) [0.00000]	(0.00600) [0.11935]	(0.06996) [0.06482]	(0.65727) [0.16962]
Age^3			0.00004	0.00155	0.01635
			(0.00004) [0.24554]	(0.00088) [0.07899]	(0.01259) [0.19426]
Age^4				-0.00001	-0.00015
				(0.00000) [0.08914]	(0.00012) [0.21852]
Age^5					0.00000
					(0.00000) [0.24301]
N	946	946	946	946	946

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.6: Age-polynimia for Uruguay

	P. Investment	**P. Investment**	**P. Investment**	**P. Investment**	**P. Investment**
Age	0.00159	0.00760	0.01872	-0.01657	0.00962
	(0.00083) [0.05510]	(0.00312) [0.01489]	(0.00769) [0.01503]	(0.01572) [0.29196]	(0.02806) [0.73187]
Age^2		-0.00010	-0.00059	0.00214	-0.00092
		(0.00006) [0.05874]	(0.00033) [0.07252]	(0.00117) [0.06671]	(0.00312) [0.76794]
Age^3			0.00001	-0.00007	0.00007
			(0.00000) [0.14207]	(0.00003) [0.02978]	(0.00014) [0.60869]
Age^4				0.00000	-0.00000
				(0.00000) [0.01946]	(0.00000) [0.44531]
Age^5					0.00000
					(0.00000) [0.32055]
N	2,437	2,437	2,437	2,437	2,437

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.7: Age-polynimia for Peru

	P. Investment	**P. Investment**	**P. Investment**	**P. Investment**	**P. Investment**
Age	0.01726	0.10393	3.39970	-201.20194	0.00000
	(0.00739) [0.01968]	(0.19473) [0.59363]	(4.05685) [0.40219]	(71.08813) [0.00473]	(0.00000) [.]
Age^2		-0.00069	-0.05326	4.86436	-1.57940
		(0.00153) [0.65504]	(0.06447) [0.40896]	(1.70388) [0.00438]	(0.58116) [0.00667]
Age^3			0.00028	-0.05211	0.05085
			(0.00034) [0.41363]	(0.01811) [0.00407]	(0.01852) [0.00614]
Age^4				0.00021	-0.00061
				(0.00007) [0.00381]	(0.00022) [0.00568]
Age^5					0.00000
					(0.00000) [0.00527]
N	1,223	1,223	1,223	1,223	1,223

Note: Robust standard errors in parentheses and p-values in squared brackets.

Factor Analysis

Table B.8: Parental time investment's exploratory factor analysis for **Chile**

	Intercept	**Loading**	**Threshold 1**	**Threshold 2**	**Threshold 3**	**Var item***
PI 1. Has external help for child care	0.00	0.05	0.70			1.00
		(0.01) [0.00]	(0.02) [0.00]			
PI 2. Washed [regularly] (mom)	0.00	0.13	-1.03			0.99
		(0.01) [0.00]	(0.03) [0.00]			
PI 3. Took her to preschool/school [regularly] (mom)	0.00	0.32	0.06			0.93
		(0.01) [0.00]	(0.03) [0.03]			
PI 4. Went to parent-teacher meetings [regularly] (mom)	0.00	0.29	-0.20			0.94
		(0.01) [0.00]	(0.03) [0.00]			
PI 5. Read [last 7 days] (primary caregiver)	0.00	0.74	-0.56	0.71		0.74
		(0.02) [0.00]	(0.04) [0.00]	(0.04) [0.00]		
PI 6. Told stories [last 7 days] (primary caregiver)	0.00	0.51	-0.50			0.85
		(0.01) [0.00]	(0.03) [0.00]			
PI 7. Sang [last 7 days] (primary caregiver)	0.00	1.07	-0.92	0.68	1.54	0.60
		(0.02) [0.00]	(0.06) [0.00]	(0.05) [0.00]	(0.06) [0.00]	
PI 8. Tought animals [last 7 days] (primary caregiver)	0.00	1.40	-1.06	0.96	2.10	0.50
		(0.03) [0.00]	(0.08) [0.00]	(0.07) [0.00]	(0.07) [0.00]	
PI 9. Tought colors [last 7 days] (primary caregiver)	0.00	1.72	-1.13	1.16	2.49	0.43
		(0.04) [0.00]	(0.09) [0.00]	(0.08) [0.00]	(0.09) [0.00]	
PI 10. Tought numbers [last 7 days] (primary caregiver)	0.00	2.00	-1.70	1.17	2.68	0.38
		(0.06) [0.00]	(0.11) [0.00]	(0.10) [0.00]	(0.11) [0.00]	
PI 11. Tought letters [last 7 days] (primary caregiver)	0.00	1.40	-0.75	1.03	2.17	0.50
		(0.03) [0.00]	(0.07) [0.00]	(0.07) [0.00]	(0.07) [0.00]	
PI 12. Played [last 7 days] (primary caregiver)	0.00	1.11	-1.16	0.65	1.67	0.59
		(0.02) [0.00]	(0.06) [0.00]	(0.06) [0.00]	(0.06) [0.00]	
PI 13. Named, told, or drew things [last 7 days] (primary caregiver)	0.00	1.00	0.00	0.99		0.63
				(0.05) [0.00]		
PI 14. Went outside [last 7 days] (primary caregiver)	0.00	0.64	-0.62	0.87	1.63	0.79
		(0.01) [0.00]	(0.04) [0.00]	(0.04) [0.00]	(0.04) [0.00]	
PI 15. Went to a museum [last 7 days] (primary caregiver)	0.00	0.46	0.63	1.45	1.96	0.87
		(0.01) [0.00]	(0.03) [0.00]	(0.04) [0.00]	(0.04) [0.00]	
PI 16. Number of times child was alone > 1 hr in the last week	0.04	-0.02				
	(0.01) [0.00]	(0.00) [0.00]				
Parental Investment factor	1.07					1.52
	(0.04) [0.00]					(0.04) [0.00]

Note: N = 3,661. Standard errors in parenthesis, and two tailed p-values in squared brackets.

Table B.9: Parental time investment's factor model for **Chile**

	Intercept	Loading	Threshold 1	Threshold 2	Threshold 3	Var item*
PI 2. Washed [regularly] (mom)	0.00	0.13	-1.03			0.99
		(0.01) [0.00]	(0.03) [0.00]			
PI 3. Took her to preschool/school [regularly] (mom)	0.00	0.34	0.07			0.92
		(0.01) [0.00]	(0.03) [0.01]			
PI 4. Went to parent-teacher meetings [regularly] (mom)	0.00	0.31	-0.18			0.93
		(0.01) [0.00]	(0.03) [0.00]			
PI 5. Read [last 7 days] (primary caregiver)	0.00	0.75	-0.55	0.71		0.73
		(0.02) [0.00]	(0.04) [0.00]	(0.04) [0.00]		
PI 6. Told stories [last 7 days] (primary caregiver)	0.00	0.55	-0.48			0.83
		(0.01) [0.00]	(0.04) [0.00]			
PI 7. Sang [last 7 days] (primary caregiver)	0.00	0.97	-0.91	0.60	1.41	0.64
		(0.02) [0.00]	(0.06) [0.00]	(0.05) [0.00]	(0.05) [0.00]	
PI 8. Tought animals [last 7 days] (primary caregiver)	0.00	1.45	-1.08	1.00	2.18	0.49
		(0.03) [0.00]	(0.08) [0.00]	(0.07) [0.00]	(0.08) [0.00]	
PI 9. Tought colors [last 7 days] (primary caregiver)	0.00	1.72	-1.13	1.15	2.48	0.43
		(0.04) [0.00]	(0.09) [0.00]	(0.08) [0.00]	(0.09) [0.00]	
PI 10. Tought numbers [last 7 days] (primary caregiver)	0.00	1.99	-1.70	1.17	2.67	0.38
		(0.06) [0.00]	(0.11) [0.00]	(0.10) [0.00]	(0.11) [0.00]	
PI 11. Tought letters [last 7 days] (primary caregiver)	0.00	1.40	-0.75	1.03	2.17	0.50
		(0.03) [0.00]	(0.07) [0.00]	(0.07) [0.00]	(0.07) [0.00]	
PI 12. Played [last 7 days] (primary caregiver)	0.00	1.11	-1.16	0.65	1.68	0.59
		(0.02) [0.00]	(0.06) [0.00]	(0.06) [0.00]	(0.06) [0.00]	
PI 13. Named, told, or drew things [last 7 days] (primary caregiver)	0.00	1.00	0.00	0.99		0.63
				(0.05) [0.00]		
PI 14. Went outside [last 7 days] (primary caregiver)	0.00	0.64	-0.62	0.87	1.63	0.78
		(0.01) [0.00]	(0.04) [0.00]	(0.04) [0.00]	(0.04) [0.00]	
PI 15. Went to a museum [last 7 days] (primary caregiver)	0.00	0.49	0.66	1.50	2.01	0.86
		(0.01) [0.00]	(0.03) [0.00]	(0.04) [0.00]	(0.04) [0.00]	
Parental Investment factor	1.08					1.53
	(0.04) [0.00]					(0.05) [0.00]

Note: N = 3,661. Standard errors in parenthesis, and two tailed p-values in squared brackets.

Table B.10: Parental time investment's factor model for **Rural Colombia**

	Intercept	Loading	Threshold 1	Threshold 2	Threshold 3	Var item*
PI 5. Read [last 7 days] (primary caregiver)	0.00	0.75	-0.55	0.55		0.64
				(0.14) [0.00]		
PI 17. Played at home (primary caregiver)	0.00	0.74	-3.63			0.64
		(0.18) [0.00]	(0.54) [0.00]			
PI 18. Played outside (primary caregiver)	0.00	0.31	-0.10	0.25		0.90
		(0.06) [0.00]	(0.09) [0.24]	(0.08) [0.00]		
PI 19. Watched TV (primary caregiver)	0.00	0.34	-1.07	-0.76		0.88
		(0.06) [0.00]	(0.10) [0.00]	(0.10) [0.00]		
PI 20. Tought letters, colors, or numbers (primary caregiver)	0.00	0.73	-1.11	-0.77	0.00	0.65
		(0.18) [0.00]	(0.26) [0.00]	(0.24) [0.00]	(0.19) [0.98]	
Parental Investment factor	-1.64					2.54
	(0.12) [0.00]					(0.72) [0.00]

Note: N = 946. Standard errors in parenthesis, and two tailed p-values in squared brackets.

Table B.11: Parental time investment's factor model for **Urban Colombia**

	Intercept	**Loading**	**Threshold 1**	**Threshold 2**	**Threshold 3**	**Var item***
PI 5. Read [last 7 days] (primary caregiver)	0.00	0.78	-0.54	0.42		0.77
		(0.16) [0.00]	(0.20) [0.01]	(0.18) [0.02]		
PI 18. Played outside (primary caregiver)	0.00	0.31	-0.10	0.36		0.95
				(0.07) [0.00]		
PI 19. Watched TV (primary caregiver)	0.00	0.36	-1.44	-1.22		0.93
		(0.07) [0.00]	(0.12) [0.00]	(0.12) [0.00]		
PI 20. Tought letters, colors, or numbers (primary caregiver)	0.00	1.83	-2.59	-2.17	-1.27	0.45
		(0.98) [0.06]	(1.34) [0.05]	(1.18) [0.07]	(0.87) [0.14]	
Parental Investment factor	-1.17					1.16
	(0.14) [0.00]					(0.33) [0.00]

Note: N = 917. Standard errors in parenthesis, and two tailed p-values in squared brackets.

Table B.12: Parental time investment's factor model for **Peru**

	Intercept	**Loading**	**Threshold**	**Var item***
PI 17. Played at home (primary caregiver)	0.00	0.74	-3.63	0.82
PI 21. Played in the street (anyone)	0.00	-1.32	9.63	0.63
		(1.17) [0.26]	(7.74) [0.21]	
PI 22. Played in the playground (anyone)	0.00	0.43	-1.18	0.93
		(0.17) [0.01]	(1.04) [0.26]	
Parental Investment factor	-6.46			0.87
	(0.19) [0.00]			(0.59) [0.14]

Note: N = 1,223. Standard errors in parenthesis, and two tailed p-values in squared brackets.

Table B.13: Parental time investment's exploratory factor analysis for **Uruguay**

	Intercept	**Loading**	**Threshold**	**Var item***
PI 1. Has external help for child care	0.00	0.06	1.17	1.00
		(0.02) [0.00]	(0.04) [0.00]	
PI 23. Read [last 3 days] (mom)	0.00	0.52	-0.65	0.90
		(0.02) [0.00]	(0.04) [0.00]	
PI 24. Read [last 3 days] (dad)	0.00	1.15	-0.31	0.68
		(0.05) [0.00]	(0.08) [0.00]	
PI 25. Read [last 3 days] (any)	0.00	-0.66	1.47	0.85
		(0.02) [0.00]	(0.05) [0.00]	
PI 26. Told stories [last 3 days] (mom)	0.00	0.55	-0.48	0.89
PI 27. Told stories [last 3 days] (dad)	0.00	1.20	-0.23	0.66
		(0.05) [0.00]	(0.08) [0.00]	
PI 28. Told stories [last 3 days] (any)	0.00	-0.92	2.03	0.76
		(0.03) [0.00]	(0.07) [0.00]	
PI 29. Sang [last 3 days] (mom)	0.00	0.30	-1.42	0.96
		(0.02) [0.00]	(0.04) [0.00]	
PI 30. Sang [last 3 days] (dad)	0.00	3.24	-3.14	0.31
		(0.23) [0.00]	(0.28) [0.00]	
PI 31. Sang [last 3 days] (any)	0.00	-1.34	1.97	0.62
		(0.05) [0.00]	(0.10) [0.00]	
PI 32. Went outside [last 3 days] (mom)	0.00	0.22	-0.90	0.98
		(0.02) [0.00]	(0.03) [0.00]	
PI 33. Went outside [last 3 days] (dad)	0.00	0.43	-0.51	0.93
		(0.01) [0.00]	(0.04) [0.00]	
PI 34. Went outside [last 3 days] (any)	0.00	-1.02	1.95	0.72
		(0.04) [0.00]	(0.08) [0.00]	
PI 35. Played [last 3 days] (dad)	0.00	1.46	-2.35	0.59
		(0.05) [0.00]	(0.10) [0.00]	
PI 36. Played [last 3 days] (any)	0.00	-2.92	3.25	0.34
		(0.24) [0.00]	(0.31) [0.00]	
PI 37. Named, told, or drew things [last 3 days] (mom)	0.00	0.95	-1.50	0.75
		(0.03) [0.00]	(0.07) [0.00]	
PI 38. Named, told, or drew things [last 3 days] (dad)	0.00	1.16	-0.90	0.68
		(0.05) [0.00]	(0.08) [0.00]	
PI 39. Named, told, or drew things [last 3 days] (any)	0.00	-1.18	2.04	0.67
		(0.05) [0.00]	(0.09) [0.00]	
PI 40. Hours of after school care that the mom provides	0.07	0.08		
	(0.03) [0.01]	(0.01) [0.00]		
PI 41. Hours of after school care that the dad provides	0.34	0.41		
	(0.04) [0.00]	(0.01) [0.00]		
PI 42. Hours of after school care that the any family member provide	-0.22	-0.26		
	(0.04) [0.00]	(0.01) [0.00]		
PI 43. Hours of after school care that the child spends alone	-0.15	-0.17		
	(0.09) [0.11]	(0.01) [0.00]		
Parental Investment factor	-0.84			0.88
	(0.05) [0.00]			(0.05) [0.00]

Note: N = 2,437. Standard errors in parenthesis, and two tailed p-values in squared brackets.

Table B.14: Parental time investment's factor model for Uruguay

	Intercept	Loading	Threshold	Var item*
PI 23. Read [last 3 days] (mom)	0.00	0.52	-0.65	0.90
		(0.02) [0.00]	(0.04) [0.00]	
PI 24. Read [last 3 days] (dad)	0.00	1.15	-0.31	0.68
		(0.05) [0.00]	(0.08) [0.00]	
PI 25. Read [last 3 days] (any)	0.00	-0.66	1.47	0.85
		(0.02) [0.00]	(0.05) [0.00]	
PI 26. Told stories [last 3 days] (mom)	0.00	0.55	-0.48	0.89
PI 27. Told stories [last 3 days] (dad)	0.00	1.20	-0.23	0.66
		(0.05) [0.00]	(0.08) [0.01]	
PI 28. Told stories [last 3 days] (any)	0.00	-0.92	2.02	0.76
		(0.03) [0.00]	(0.07) [0.00]	
PI 29. Sang [last 3 days] (mom)	0.00	0.30	-1.41	0.96
		(0.02) [0.00]	(0.04) [0.00]	
PI 30. Sang [last 3 days] (dad)	0.00	3.22	-3.12	0.31
		(0.22) [0.00]	(0.28) [0.00]	
PI 31. Sang [last 3 days] (any)	0.00	-1.33	1.97	0.62
		(0.05) [0.00]	(0.10) [0.00]	
PI 32. Went outside [last 3 days] (mom)	0.00	0.22	-0.90	0.98
		(0.02) [0.00]	(0.03) [0.00]	
PI 33. Went outside [last 3 days] (dad)	0.00	0.43	-0.51	0.93
		(0.01) [0.00]	(0.04) [0.00]	
PI 34. Went outside [last 3 days] (any)	0.00	-1.02	1.95	0.72
		(0.04) [0.00]	(0.08) [0.00]	
PI 35. Played [last 3 days] (dad)	0.00	1.45	-2.34	0.59
		(0.05) [0.00]	(0.10) [0.00]	
PI 36. Played [last 3 days] (any)	0.00	-2.91	3.24	0.34
		(0.24) [0.00]	(0.31) [0.00]	
PI 37. Named, told, or drew things [last 3 days] (mom)	0.00	0.94	-1.49	0.75
		(0.03) [0.00]	(0.07) [0.00]	
PI 38. Named, told, or drew things [last 3 days] (dad)	0.00	1.16	-0.89	0.67
		(0.05) [0.00]	(0.08) [0.00]	
PI 39. Named, told, or drew things [last 3 days] (any)	0.00	-1.17	2.03	0.67
		(0.05) [0.00]	(0.09) [0.00]	
PI 41. Hours of after school care that the dad provides	0.33	0.40		
	(0.04) [0.00]	(0.01) [0.00]		
PI 42. Hours of after school care that the any family member provide	-0.22	-0.26		
	(0.04) [0.00]	(0.01) [0.00]		
PI 43. Hours of after school care that the child spends alone	-0.15	-0.17		
	(0.09) [0.11]	(0.01) [0.00]		
Parental Investment factor	-0.84			0.89
	(0.05) [0.00]			(0.05) [0.00]

Note: N = 2,437. Standard errors in parenthesis, and two tailed p-values in squared brackets.

Selection of the degree of age-polynomial

Table B.15: Age-polynimia for Chile

	Reads with Adult	**Reads with Adult**	**Reads with Adult**	**Reads with Adult**	**Reads with Adult**
Age	-0.00081	0.00800	0.00830	0.03676	-0.09009
	(0.00046) [0.08019]	(0.00271) [0.00318]	(0.01090) [0.44636]	(0.03610) [0.30859]	(0.10779) [0.40330]
Age^2		-0.00010	-0.00011	-0.00127	0.00598
		(0.00003) [0.00100]	(0.00027) [0.68639]	(0.00143) [0.37441]	(0.00596) [0.31608]
Age^3			0.00000	0.00002	-0.00017
			(0.00000) [0.97700]	(0.00002) [0.40924]	(0.00016) [0.26554]
Age^4				-0.00000	0.00000
				(0.00000) [0.40952]	(0.00000) [0.23384]
Age^5					-0.00000
					(0.00000) [0.21050]
N	4,108	4,108	4,108	4,108	4,108

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.16: Age-polynimia for Colombia *Urban*

	Reads with Adult	**Reads with Adult**	**Reads with Adult**	**Reads with Adult**	**Reads with Adult**
Age	0.00592	0.01698	0.01805	0.00654	0.02030
	(0.00054) [0.00000]	(0.00229) [0.00000]	(0.00629) [0.00416]	(0.01391) [0.63806]	(0.02803) [0.46904]
Age^2		-0.00014	-0.00018	0.00046	-0.00068
		(0.00003) [0.00000]	(0.00019) [0.35734]	(0.00074) [0.53534]	(0.00221) [0.76049]
Age^3			0.00000	-0.00001	0.00003
			(0.00000) [0.86160]	(0.00001) [0.39655]	(0.00007) [0.72699]
Age^4				0.00000	-0.00000
				(0.00000) [0.38826]	(0.00000) [0.65851]
Age^5					0.00000
					(0.00000) [0.60411]
N	1,886	1,886	1,886	1,886	1,886

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.17: Age-polynimia for Colombia *Rural*

	Reads with Adult	**Reads with Adult**	**Reads with Adult**	**Reads with Adult**	**Reads with Adult**
Age	0.00763	0.01444	0.02099	0.02875	0.00505
	(0.00052) [0.00000]	(0.00221) [0.00000]	(0.00626) [0.00082]	(0.01367) [0.03567]	(0.02738) [0.85361]
Age^2		-0.00009	-0.00030	-0.00073	0.00123
		(0.00003) [0.00234]	(0.00020) [0.13058]	(0.00074) [0.32310]	(0.00219) [0.57566]
Age^3			0.00000	0.00001	-0.00006
			(0.00000) [0.29508]	(0.00001) [0.48036]	(0.00007) [0.44903]
Age^4				-0.00000	0.00000
				(0.00000) [0.56591]	(0.00000) [0.39800]
Age^5					-0.00000
					(0.00000) [0.37298]
N	1,805	1,805	1,805	1,805	1,805

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.18: Age-polynimia for Uruguay

	Reads with Adult	**Reads with Adult**	**Reads with Adult**	**Reads with Adult**	**Reads with Adult**
Age	0.00083	0.00339	0.00469	-0.00104	-0.00726
	(0.00030) [0.00604]	(0.00118) [0.00400]	(0.00294) [0.11097]	(0.00595) [0.86178]	(0.01138) [0.52333]
Age^2		-0.00004	-0.00010	0.00034	0.00107
		(0.00002) [0.01789]	(0.00011) [0.37574]	(0.00041) [0.39903]	(0.00118) [0.36512]
Age^3			0.00000	-0.00001	-0.00004
			(0.00000) [0.60631]	(0.00001) [0.27707]	(0.00005) [0.37847]
Age^4				0.00000	0.00000
				(0.00000) [0.24107]	(0.00000) [0.42847]
Age^5					-0.00000
					(0.00000) [0.48662]
N	2,440	2,440	2,440	2,440	2,440

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.19: Age-polynimia for Chile

	General Interaction at Home	**General Interaction at Home**	**General Interaction at Home**	**General Interaction at Home**	**General Interaction at Home**
Age	-0.00329	0.00470	-0.01734	-0.05484	-0.11947
	(0.00047) [0.00000]	(0.00275) [0.08735]	(0.01094) [0.11309]	(0.03595) [0.12715]	(0.10649) [0.26196]
Age^2		-0.00009	0.00047	0.00199	0.00568
		(0.00003) [0.00337]	(0.00027) [0.08646]	(0.00143) [0.16359]	(0.00594) [0.33862]
Age^3			-0.00000	-0.00003	-0.00013
			(0.00000) [0.04004]	(0.00002) [0.20844]	(0.00016) [0.41200]
Age^4				0.00000	0.00000
				(0.00000) [0.28285]	(0.00000) [0.47826]
Age^5					-0.00000
					(0.00000) [0.52789]
N	4,108	4,108	4,108	4,108	4,108

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.20: Age-polynimia for Colombia *Urban*

	General Interaction at Home	**General Interaction at Home**	**General Interaction at Home**	**General Interaction at Home**	**General Interaction at Home**
Age	0.00146	0.01075	0.10031	0.59648	1.67315
	(0.00094) [0.12238]	(0.00737) [0.14481]	(0.04100) [0.01454]	(0.20607) [0.00386]	(0.94570) [0.07708]
Age^2		-0.00010	-0.00206	-0.01886	-0.06822
		(0.00008) [0.20160]	(0.00089) [0.02008]	(0.00689) [0.00631]	(0.04285) [0.11165]
Age^3			0.00001	0.00026	0.00135
			(0.00001) [0.02576]	(0.00010) [0.00971]	(0.00094) [0.15210]
Age^4				-0.00000	-0.00001
				(0.00000) [0.01417]	(0.00001) [0.19642]
Age^5					0.00000
					(0.00000) [0.24239]
N	1,395	1,395	1,395	1,395	1,395

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.21: Age-polynimia for Colombia *Rural*

	General Interaction at Home	**General Interaction at Home**	**General Interaction at Home**	**General Interaction at Home**	**General Interaction at Home**
Age	-0.00118	0.00149	0.05239	-0.27845	0.39576
	(0.00098) [0.22930]	(0.00775) [0.84751]	(0.04350) [0.22864]	(0.21747) [0.20061]	(1.01712) [0.69727]
Age^2		-0.00003	-0.00115	0.01006	-0.02087
		(0.00008) [0.72813]	(0.00094) [0.22490]	(0.00727) [0.16671]	(0.04609) [0.65077]
Age^3			0.00001	-0.00015	0.00053
			(0.00001) [0.23450]	(0.00010) [0.13970]	(0.00101) [0.59979]
Age^4				0.00000	-0.00001
				(0.00000) [0.11985]	(0.00001) [0.54695]
Age^5					0.00000
					(0.00000) [0.49523]
N	1,326	1,326	1,326	1,326	1,326

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.22: Age-polynimia for Uruguay

	General Interaction at Home	**General Interaction at Home**	**General Interaction at Home**	**General Interaction at Home**	**General Interaction at Home**
Age	0.00622	0.02117	0.03144	0.04017	0.05572
	(0.00056) [0.00000]	(0.00214) [0.00000]	(0.00527) [0.00000]	(0.01083) [0.00021]	(0.01942) [0.00415]
Age^2		-0.00026	-0.00071	-0.00139	-0.00320
		(0.00004) [0.00000]	(0.00022) [0.00116]	(0.00078) [0.07646]	(0.00210) [0.12808]
Age^3			0.00001	0.00002	0.00010
			(0.00000) [0.03841]	(0.00002) [0.25490]	(0.00009) [0.25229]
Age^4				-0.00000	-0.00000
				(0.00000) [0.37622]	(0.00000) [0.32201]
Age^5					0.00000
					(0.00000) [0.36803]
N	2,440	2,440	2,440	2,440	2,440

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.23: Age-polynimia for Chile

	Preschool Attendance	**Preschool Attendance**	**Preschool Attendance**	**Preschool Attendance**	**Preschool Attendance**
Age	0.01910	0.01629	-0.04131	0.06579	0.20443
	(0.00050) [0.00000]	(0.00342) [0.00000]	(0.01455) [0.00455]	(0.04973) [0.18590]	(0.15058) [0.17468]
Age^2		0.00004	0.00169	-0.00323	-0.01214
		(0.00004) [0.39060]	(0.00040) [0.00003]	(0.00222) [0.14559]	(0.00948) [0.20026]
Age^3			-0.00001	0.00008	0.00035
			(0.00000) [0.00002]	(0.00004) [0.05571]	(0.00028) [0.21622]
Age^4				-0.00000	-0.00000
				(0.00000) [0.02108]	(0.00000) [0.25963]
Age^5					0.00000
					(0.00000) [0.32800]
N	3,299	3,299	3,299	3,299	3,299

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.24: Age-polynimia for Colombia *Urban*

	Preschool Attendance	**Preschool Attendance**	**Preschool Attendance**	**Preschool Attendance**	**Preschool Attendance**
Age	0.01784	0.02943	0.00916	-0.03585	-0.02996
	(0.00048) [0.00000]	(0.00227) [0.00000]	(0.00596) [0.12463]	(0.01279) [0.00512]	(0.02576) [0.24501]
Age^2		-0.00018	0.00058	0.00349	0.00293
		(0.00004) [0.00000]	(0.00022) [0.00988]	(0.00085) [0.00004]	(0.00252) [0.24579]
Age^3			-0.00001	-0.00008	-0.00005
			(0.00000) [0.00080]	(0.00002) [0.00018]	(0.00010) [0.58531]
Age^4				0.00000	0.00000
				(0.00000) [0.00083]	(0.00000) [0.92719]
Age^5					0.00000
					(0.00000) [0.82752]
N	1,516	1,516	1,516	1,516	1,516

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.25: Age-polynimia for Colombia *Rural*

	Preschool Attendance	**Preschool Attendance**	**Preschool Attendance**	**Preschool Attendance**	**Preschool Attendance**
Age	0.01198	-0.00009	0.02026	-0.01722	-0.03124
	(0.00055) [0.00000]	(0.00231) [0.96780]	(0.00617) [0.00104]	(0.01236) [0.16393]	(0.02448) [0.20215]
Age^2		0.00019	-0.00057	0.00185	0.00319
		(0.00004) [0.00000]	(0.00024) [0.01864]	(0.00086) [0.03180]	(0.00253) [0.20778]
Age^3			0.00001	-0.00005	-0.00010
			(0.00000) [0.00271]	(0.00002) [0.02286]	(0.00011) [0.33259]
Age^4				0.00000	0.00000
				(0.00000) [0.01215]	(0.00000) [0.47459]
Age^5					-0.00000
					(0.00000) [0.64346]
N	1,451	1,451	1,451	1,451	1,451

Note: Robust standard errors in parentheses and p-values in squared brackets.

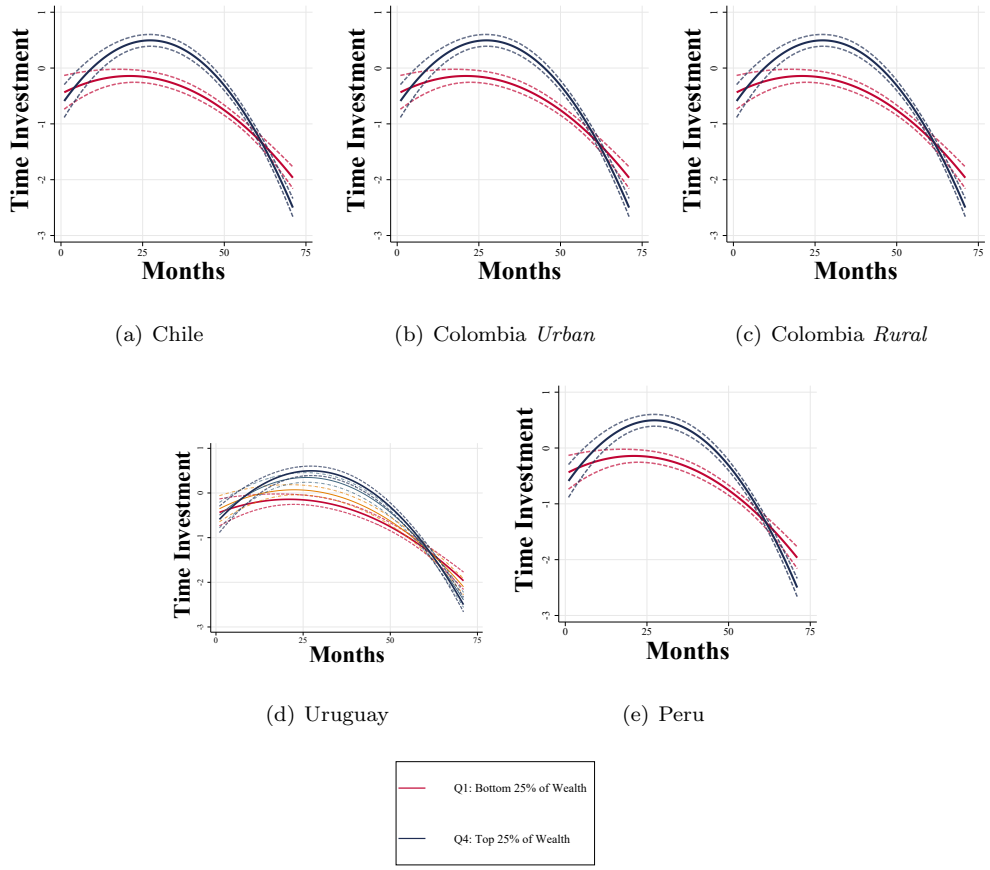
Table B.26: Age-polynimia for Uruguay

	Preschool Attendance	Preschool Attendance	Preschool Attendance	Preschool Attendance	Preschool Attendance
Age	0.01677	0.02200	0.02529	0.03680	0.02319
	(0.00037) [0.00000]	(0.00163) [0.00000]	(0.00397) [0.00000]	(0.00816) [0.00001]	(0.01416) [0.10170]
Age^2		-0.00009	-0.00023	-0.00113	0.00046
		(0.00003) [0.00097]	(0.00017) [0.16039]	(0.00061) [0.06512]	(0.00161) [0.77302]
Age^3			0.00000	0.00003	-0.00005
			(0.00000) [0.37909]	(0.00002) [0.10760]	(0.00007) [0.51474]
Age^4				-0.00000	0.00000
				(0.00000) [0.12404]	(0.00000) [0.38218]
Age^5					-0.00000
					(0.00000) [0.29873]
N	2,440	2,440	2,440	2,440	2,440

Note: Robust standard errors in parentheses and p-values in squared brackets.

Changes over age

Figure B.1: Parental time investment over age by wealth quartile



(a) Chile (b) Colombia *Urban* (c) Colombia *Rural*

(d) Uruguay (e) Peru

Note: Predicted time investment based on OLS estimation of investment on wealth quartile dummies, fourth degree age polynomial for Peru and second degree for Chile, Colombia, and Uruguay, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on robust standard errors.

Adding the Parental Time Investment Driver

Table B.27: Mediation Analysis for Vocabulary

	Chile	**Chile**	**Colombia** *Rural*	**Colombia** *Rural*	**Colombia** *Urban*	**Colombia** *Urban*	**Peru**	**Peru**	**Uruguay**	**Uruguay**
Wealth Quartile 2	0.123	0.119	0.287	0.287	0.232	0.212	0.313	0.314	0.149	0.143
	(0.052) [0.018]	(0.052) [0.021]	(0.082) [0.000]	(0.082) [0.000]	(0.099) [0.019]	(0.099) [0.032]	(0.078) [0.000]	(0.078) [0.000]	(0.048) [0.002]	(0.048) [0.003]
Wealth Quartile 3	0.223	0.208	0.478	0.486	0.564	0.548	0.784	0.783	0.134	0.118
	(0.056) [0.000]	(0.056) [0.000]	(0.084) [0.000]	(0.084) [0.000]	(0.099) [0.000]	(0.099) [0.000]	(0.075) [0.000]	(0.075) [0.000]	(0.048) [0.005]	(0.049) [0.015]
Wealth Quartile 4	0.294	0.272	0.582	0.597	0.884	0.853	1.239	1.235	0.235	0.210
	(0.058) [0.000]	(0.058) [0.000]	(0.079) [0.000]	(0.080) [0.000]	(0.097) [0.000]	(0.098) [0.000]	(0.075) [0.000]	(0.075) [0.000]	(0.045) [0.000]	(0.047) [0.000]
Parental time investment		0.064		-0.038		0.116		0.019		0.046
		(0.016) [0.000]		(0.025) [0.140]		(0.044) [0.009]		(0.021) [0.362]		(0.022) [0.039]
N	2,443	2,443	917	917	870	870	1,205	1,205	2,404	2,404

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.28: Mediation Analysis for Socio-Emotional

	Chile	**Chile**	**Colombia** *Rural*	**Colombia** *Rural*	**Colombia** *Urban*	**Colombia** *Urban*	**Uruguay**	**Uruguay**
Wealth Quartile 2	0.205	0.199	0.164	0.163	0.061	0.028	-0.007	-0.003
	(0.049) [0.000]	(0.048) [0.000]	(0.085) [0.055]	(0.085) [0.055]	(0.088) [0.488]	(0.088) [0.749]	(0.061) [0.912]	(0.061) [0.955]
Wealth Quartile 3	0.276	0.262	0.036	0.035	-0.002	-0.027	0.058	0.066
	(0.048) [0.000]	(0.048) [0.000]	(0.085) [0.672]	(0.086) [0.686]	(0.091) [0.986]	(0.091) [0.768]	(0.060) [0.338]	(0.062) [0.287]
Wealth Quartile 4	0.400	0.383	0.152	0.149	0.169	0.120	0.147	0.158
	(0.048) [0.000]	(0.047) [0.000]	(0.083) [0.067]	(0.083) [0.074]	(0.085) [0.046]	(0.085) [0.162]	(0.059) [0.013]	(0.062) [0.011]
Parental time investment		0.048		0.006		0.185		-0.021
		(0.013) [0.000]		(0.026) [0.814]		(0.039) [0.000]		(0.029) [0.474]
N	3,515	3,515	946	946	917	917	2,310	2,310

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table B.29: Mediation Analysis for Cognition

	Chile	**Chile**	**Peru**	**Peru**	**Uruguay**	**Uruguay**
Wealth Quartile 2	0.073	0.070	0.188	0.190	0.226	0.214
	(0.050) [0.149]	(0.050) [0.166]	(0.098) [0.054]	(0.097) [0.052]	(0.045) [0.000]	(0.045) [0.000]
Wealth Quartile 3	0.150	0.142	0.318	0.316	0.237	0.207
	(0.050) [0.003]	(0.050) [0.005]	(0.090) [0.000]	(0.090) [0.000]	(0.045) [0.000]	(0.046) [0.000]
Wealth Quartile 4	0.161	0.152	0.592	0.586	0.341	0.297
	(0.052) [0.002]	(0.053) [0.004]	(0.089) [0.000]	(0.090) [0.000]	(0.042) [0.000]	(0.044) [0.000]
Parental time investment		0.028		0.031		0.083
		(0.014) [0.048]		(0.028) [0.268]		(0.019) [0.000]
N	3,232	3,232	1,223	1,223	2,404	2,404

Note: Robust standard errors in parentheses and p-values in squared brackets.

Adding Other ECD Investment drivers

Vocabulary

Table B.30: Mediation analysis for Vocabulary in Chile

	Vocabulary	**Vocabulary**	**Vocabulary**	**Vocabulary**	**Vocabulary**
Wealth Quartile 2	0.177	0.177	0.174	0.175	0.173
	(0.058) [0.002]	(0.058) [0.002]	(0.058) [0.003]	(0.058) [0.003]	(0.058) [0.003]
Wealth Quartile 3	0.251	0.244	0.247	0.251	0.244
	(0.063) [0.000]	(0.063) [0.000]	(0.063) [0.000]	(0.063) [0.000]	(0.063) [0.000]
Wealth Quartile 4	0.343	0.333	0.335	0.347	0.334
	(0.066) [0.000]	(0.065) [0.000]	(0.066) [0.000]	(0.066) [0.000]	(0.066) [0.000]
Reads with adult		0.138			0.116
		(0.046) [0.003]			(0.050) [0.021]
General interaction at home			0.097		0.064
			(0.046) [0.035]		(0.050) [0.202]
Preschool attendance				-0.086	-0.093
				(0.051) [0.095]	(0.051) [0.069]
N	1,959	1,959	1,959	1,959	1,959

Note: Robust standard in parentheses and p-values in squared brackets.

Table B.31: Mediation analysis for Vocabulary in Colombia *Rural*

	Vocabulary	**Vocabulary**	**Vocabulary**	**Vocabulary**	**Vocabulary**
Wealth Quartile 2	0.126	0.127	0.129	0.125	0.128
	(0.097) [0.192]	(0.096) [0.188]	(0.097) [0.184]	(0.096) [0.195]	(0.096) [0.184]
Wealth Quartile 3	0.281	0.289	0.282	0.278	0.285
	(0.093) [0.003]	(0.093) [0.002]	(0.093) [0.003]	(0.093) [0.003]	(0.093) [0.002]
Wealth Quartile 4	0.360	0.368	0.359	0.359	0.365
	(0.095) [0.000]	(0.095) [0.000]	(0.095) [0.000]	(0.095) [0.000]	(0.095) [0.000]
Reads with adult		0.125			0.104
		(0.069) [0.071]			(0.069) [0.133]
General interaction at home			0.063		0.054
			(0.072) [0.382]		(0.072) [0.453]
Preschool attendance				0.165	0.151
				(0.071) [0.021]	(0.072) [0.036]
N	704	704	704	704	704

Note: Robust standard in parentheses and p-values in squared brackets.

Table B.32: Mediation analysis for Vocabulary in Colombia *Urban*

	Vocabulary	**Vocabulary**	**Vocabulary**	**Vocabulary**	**Vocabulary**
Wealth Quartile 2	0.180	0.179	0.187	0.179	0.186
	(0.109) [0.098]	(0.109) [0.100]	(0.109) [0.086]	(0.109) [0.099]	(0.109) [0.087]
Wealth Quartile 3	0.439	0.433	0.448	0.429	0.435
	(0.106) [0.000]	(0.105) [0.000]	(0.106) [0.000]	(0.106) [0.000]	(0.106) [0.000]
Wealth Quartile 4	0.745	0.741	0.761	0.736	0.750
	(0.109) [0.000]	(0.109) [0.000]	(0.109) [0.000]	(0.110) [0.000]	(0.110) [0.000]
Reads with adult		0.081			0.080
		(0.075) [0.281]			(0.076) [0.293]
General interaction at home			-0.063		-0.068
			(0.082) [0.439]		(0.082) [0.410]
Preschool attendance				0.083	0.075
				(0.093) [0.373]	(0.093) [0.425]
N	730	730	730	730	730

Note: Robust standard in parentheses and p-values in squared brackets.

Table B.33: Mediation analysis for Vocabulary in Uruguay

	Vocabulary	**Vocabulary**	**Vocabulary**	**Vocabulary**	**Vocabulary**
Wealth Quartile 2	0.155	0.150	0.135	0.151	0.132
	(0.048) [0.001]	(0.047) [0.002]	(0.048) [0.005]	(0.048) [0.002]	(0.048) [0.006]
Wealth Quartile 3	0.134	0.126	0.109	0.127	0.102
	(0.048) [0.005]	(0.047) [0.007]	(0.048) [0.022]	(0.048) [0.008]	(0.047) [0.031]
Wealth Quartile 4	0.241	0.231	0.196	0.227	0.186
	(0.045) [0.000]	(0.045) [0.000]	(0.046) [0.000]	(0.046) [0.000]	(0.046) [0.000]
Reads with adult		0.181			0.114
		(0.085) [0.033]			(0.086) [0.185]
General interaction at home			0.188		0.163
			(0.033) [0.000]		(0.034) [0.000]
Preschool attendance				0.113	0.081
				(0.032) [0.000]	(0.033) [0.014]
N	2,407	2,407	2,407	2,407	2,407

Note: Robust standard in parentheses and p-values in squared brackets.

Socio-emotional

Table B.34: Mediation analysis for Socio-Emotional in Chile

	Socio-Emotional	**Socio-Emotional**	**Socio-Emotional**	**Socio-Emotional**	**Socio-Emotional**
Wealth Quartile 2	0.145	0.145	0.138	0.145	0.140
	(0.050) [0.004]	(0.050) [0.004]	(0.050) [0.006]	(0.050) [0.004]	(0.050) [0.005]
Wealth Quartile 3	0.281	0.276	0.273	0.282	0.274
	(0.050) [0.000]	(0.049) [0.000]	(0.049) [0.000]	(0.050) [0.000]	(0.049) [0.000]
Wealth Quartile 4	0.375	0.366	0.364	0.377	0.363
	(0.049) [0.000]	(0.049) [0.000]	(0.049) [0.000]	(0.049) [0.000]	(0.049) [0.000]
Reads with adult		0.112			0.090
		(0.037) [0.002]			(0.039) [0.021]
General interaction at home			0.099		0.070
			(0.036) [0.006]		(0.038) [0.064]
Preschool attendance				-0.039	-0.046
				(0.035) [0.265]	(0.035) [0.194]
N	3,113	3,113	3,113	3,113	3,113

Note: Robust standard in parentheses and p-values in squared brackets.

Table B.35: Mediation analysis for Socio-Emotional in Colombia *Rural*

	Socio-Emotional	**Socio-Emotional**	**Socio-Emotional**	**Socio-Emotional**	**Socio-Emotional**
Wealth Quartile 2	0.110	0.108	0.115	0.107	0.111
	(0.088) [0.213]	(0.088) [0.220]	(0.088) [0.191]	(0.088) [0.225]	(0.088) [0.207]
Wealth Quartile 3	-0.002	0.022	-0.003	-0.004	0.018
	(0.086) [0.980]	(0.085) [0.797]	(0.085) [0.972]	(0.085) [0.965]	(0.085) [0.831]
Wealth Quartile 4	0.012	0.018	0.007	0.013	0.014
	(0.088) [0.896]	(0.088) [0.837]	(0.087) [0.938]	(0.088) [0.881]	(0.087) [0.870]
Reads with adult		0.239			0.222
		(0.060) [0.000]			(0.061) [0.000]
General interaction at home			0.172		0.159
			(0.066) [0.009]		(0.065) [0.015]
Preschool attendance				0.108	0.076
				(0.063) [0.088]	(0.063) [0.227]
N	977	977	977	977	977

Note: Robust standard in parentheses and p-values in squared brackets.

Table B.36: Mediation analysis for Socio-Emotional in Colombia *Urban*

	Socio-Emotional	**Socio-Emotional**	**Socio-Emotional**	**Socio-Emotional**	**Socio-Emotional**
Wealth Quartile 2	0.032	0.028	0.020	0.030	0.015
	(0.081) [0.691]	(0.080) [0.727]	(0.081) [0.807]	(0.081) [0.708]	(0.081) [0.855]
Wealth Quartile 3	-0.054	-0.064	-0.071	-0.050	-0.074
	(0.084) [0.517]	(0.084) [0.441]	(0.085) [0.403]	(0.083) [0.548]	(0.084) [0.376]
Wealth Quartile 4	-0.036	-0.046	-0.065	-0.031	-0.068
	(0.079) [0.652]	(0.079) [0.559]	(0.081) [0.421]	(0.079) [0.693]	(0.081) [0.400]
Reads with adult		0.121			0.119
		(0.058) [0.037]			(0.058) [0.043]
General interaction at home			0.123		0.114
			(0.063) [0.050]		(0.063) [0.072]
Preschool attendance				-0.070	-0.085
				(0.067) [0.292]	(0.067) [0.205]
N	1,034	1,034	1,034	1,034	1,034

Note: Robust standard in parentheses and p-values in squared brackets.

Table B.37: Mediation analysis for Socio-Emotional in Uruguay

	Socio-Emotional	**Socio-Emotional**	**Socio-Emotional**	**Socio-Emotional**	**Socio-Emotional**
Wealth Quartile 2	-0.007	-0.005	0.004	-0.004	0.006
	(0.061) [0.912]	(0.061) [0.929]	(0.062) [0.944]	(0.061) [0.949]	(0.062) [0.926]
Wealth Quartile 3	0.058	0.060	0.073	0.064	0.076
	(0.060) [0.338]	(0.060) [0.320]	(0.061) [0.234]	(0.060) [0.290]	(0.061) [0.210]
Wealth Quartile 4	0.147	0.149	0.171	0.155	0.176
	(0.059) [0.013]	(0.059) [0.012]	(0.061) [0.005]	(0.060) [0.010]	(0.061) [0.004]
Reads with adult		-0.045			-0.004
		(0.081) [0.579]			(0.083) [0.958]
General interaction at home			-0.102		-0.093
			(0.043) [0.018]		(0.044) [0.036]
Preschool attendance				-0.071	-0.057
				(0.043) [0.093]	(0.043) [0.179]
N	2,310	2,310	2,310	2,310	2,310

Note: Robust standard in parentheses and p-values in squared brackets.

Cognition

Table B.38: Mediation analysis for Cognition in Chile

	Cognition	**Cognition**	**Cognition**	**Cognition**	**Cognition**
Wealth Quartile 2	0.066	0.066	0.062	0.066	0.063
	(0.056) [0.236]	(0.056) [0.239]	(0.056) [0.266]	(0.056) [0.241]	(0.056) [0.263]
Wealth Quartile 3	0.151	0.148	0.147	0.147	0.142
	(0.055) [0.006]	(0.055) [0.008]	(0.055) [0.008]	(0.055) [0.008]	(0.055) [0.010]
Wealth Quartile 4	0.203	0.196	0.198	0.197	0.189
	(0.059) [0.001]	(0.059) [0.001]	(0.059) [0.001]	(0.059) [0.001]	(0.059) [0.001]
Reads with adult		0.071			0.053
		(0.041) [0.081]			(0.044) [0.226]
General interaction at home			0.058		0.039
			(0.040) [0.153]		(0.043) [0.370]
Preschool attendance				0.069	0.065
				(0.041) [0.092]	(0.041) [0.113]
N	2,894	2,894	2,894	2,894	2,894

Note: Robust standard in parentheses and p-values in squared brackets.

Table B.39: Mediation analysis for Cognition in Uruguay

	Cognition	**Cognition**	**Cognition**	**Cognition**	**Cognition**
Wealth Quartile 2	0.226	0.222	0.208	0.225	0.206
	(0.045) [0.000]	(0.044) [0.000]	(0.044) [0.000]	(0.045) [0.000]	(0.044) [0.000]
Wealth Quartile 3	0.237	0.230	0.213	0.234	0.210
	(0.045) [0.000]	(0.045) [0.000]	(0.045) [0.000]	(0.045) [0.000]	(0.045) [0.000]
Wealth Quartile 4	0.341	0.333	0.300	0.335	0.295
	(0.042) [0.000]	(0.042) [0.000]	(0.043) [0.000]	(0.042) [0.000]	(0.043) [0.000]
Reads with adult		0.155			0.094
		(0.061) [0.011]			(0.064) [0.138]
General interaction at home			0.174		0.162
			(0.030) [0.000]		(0.032) [0.000]
Preschool attendance				0.051	0.019
				(0.030) [0.091]	(0.030) [0.523]
N	2,404	2,404	2,404	2,404	2,404

Note: Robust standard in parentheses and p-values in squared brackets.

Supplementary Material

Supplementary Material A Cross-Sectional Analysis

Selection of the degree of age-polynomial

Table SM A.1: Age-polynimia for vocabulary

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Uruguay**	**Peru**
Age	-0.200	-0.150	-0.842	0.003	1.992
	(0.112) [0.076]	(0.275) [0.585]	(0.253) [0.001]	(0.009) [0.742]	(2.790) [0.475]
Age ^{2}	0.003	0.002	0.014	-0.000	-0.032
	(0.002) [0.152]	(0.005) [0.688]	(0.005) [0.004]	(0.000) [0.306]	(0.045) [0.474]
Age ^{3}	-0.000	-0.000	-0.000	0.000	0.000
	(0.000) [0.260]	(0.000) [0.779]	(0.000) [0.014]	(0.000) [0.097]	(0.000) [0.473]
N	2,731	1,087	1,062	2,411	1,831

Note: Robust standard errors in parentheses and p-values in squared brackets.

Table SM A.2: Age-polynimia for socio-emotional skills

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Uruguay**
Age	-0.033	-0.008	0.014	0.007
	(0.031) [0.292]	(0.013) [0.520]	(0.014) [0.319]	(0.014) [0.603]
Age ^{2}	0.001	0.000	-0.000	-0.000
	(0.001) [0.428]	(0.000) [0.751]	(0.000) [0.419]	(0.001) [0.685]
Age ^{3}	-0.000	-0.000	0.000	0.000
	(0.000) [0.656]	(0.000) [0.963]	(0.000) [0.434]	(0.000) [0.773]
N	3,919	1,886	1,805	2,314

Note: Robust standard errors in parentheses and p-values in squared brackets.

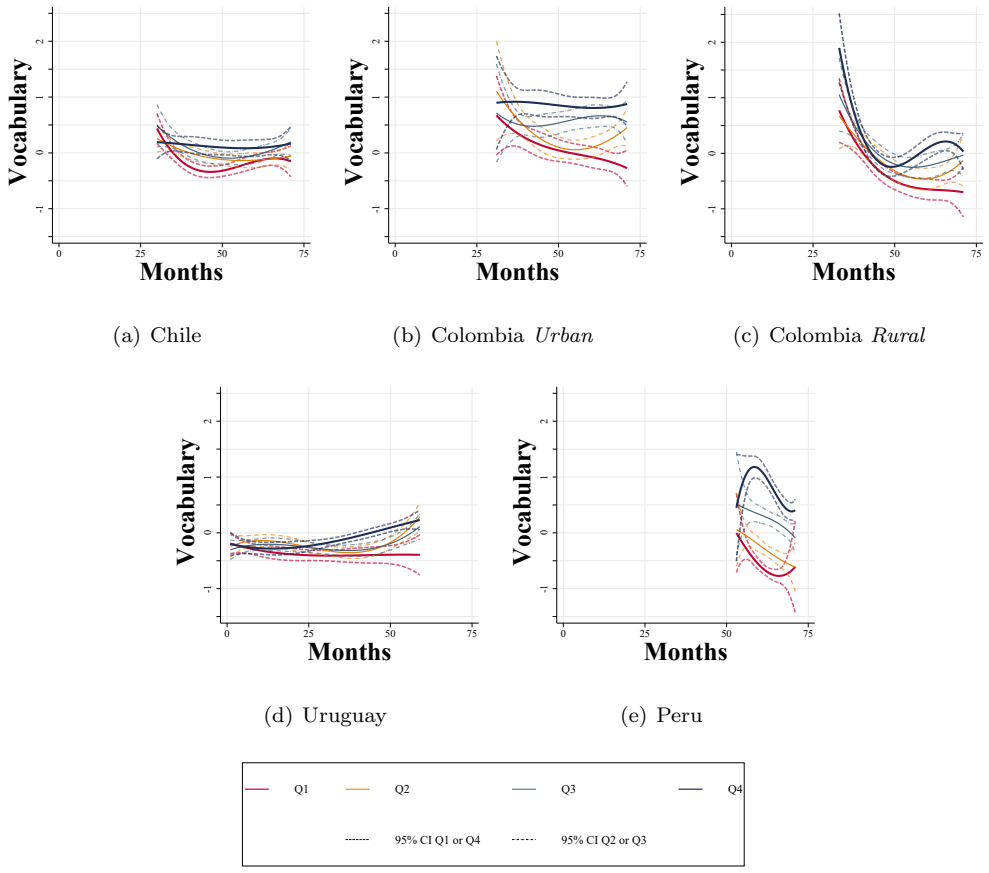
Table SM A.3: Age-polynimia for cognitive skills

	Chile	**Uruguay**	**Peru**
Age	-0.031	0.029	2.045
	(0.025) [0.211]	(0.008) [0.001]	(2.929) [0.485]
Age ^{2}	0.001	-0.001	-0.033
	(0.001) [0.191]	(0.000) [0.000]	(0.047) [0.479]
Age ^{3}	-0.000	0.000	0.000
	(0.000) [0.183]	(0.000) [0.000]	(0.000) [0.474]
N	3,631	2,408	1,877

Note: Robust standard errors in parentheses and p-values in squared brackets.

Changes over age for all quartiles

Figure SM A.1: Cross-sectional analysis of the Vocabulary over age by wealth quartile



(a) Chile (b) Colombia *Urban* (c) Colombia *Rural*

(d) Uruguay (e) Peru

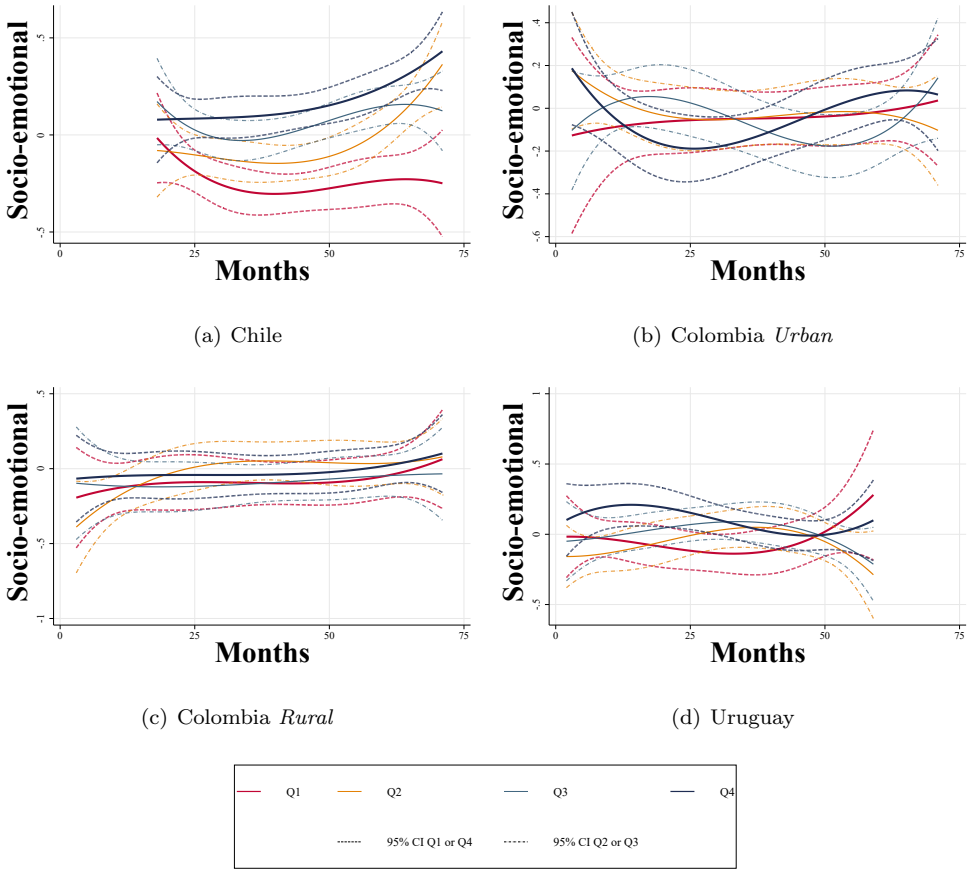
Note: Vocabulary is age-standardized, and measured with the PPVT test in Chile, Colombia, and Peru, and with the ASQ-3 communication module in Uruguay. Predicted vocabulary skills based on OLS estimation of vocabulary on wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on robust standard errors.

Table SM A.4: Cross-sectional analysis of the vocabulary's growth curve

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Uruguay**	**Peru**
Wealth Quartile 2	-7.776	0.816	-7.524	-0.093	-3.737
	(4.242) [0.067]	(10.806) [0.940]	(11.771) [0.523]	(0.158) [0.555]	(193.764) [0.985]
Wealth Quartile 3	-6.282	0.980	0.631	-0.151	31.662
	(4.933) [0.203]	(11.215) [0.930]	(12.180) [0.959]	(0.148) [0.308]	(199.517) [0.874]
Wealth Quartile 4	-10.040	-5.771	24.466	-0.012	-267.590
	(4.703) [0.033]	(11.204) [0.607]	(11.303) [0.031]	(0.161) [0.942]	(197.308) [0.175]
Age	-0.580	-0.258	-0.563	-0.018	0.688
	(0.183) [0.002]	(0.426) [0.545]	(0.468) [0.230]	(0.019) [0.340]	(7.305) [0.925]
Age x Wealth Quartile 2	0.480	0.024	0.460	0.045	-0.069
	(0.268) [0.073]	(0.635) [0.970]	(0.696) [0.509]	(0.027) [0.090]	(9.388) [0.994]
Age x Wealth Quartile 3	0.416	-0.091	-0.014	0.040	-1.861
	(0.306) [0.175]	(0.662) [0.891]	(0.717) [0.984]	(0.026) [0.119]	(9.609) [0.846]
Age x Wealth Quartile 4	0.607	0.358	-1.401	0.004	12.392
	(0.296) [0.040]	(0.664) [0.590]	(0.663) [0.035]	(0.026) [0.887]	(9.484) [0.191]
Age ^{2}	0.011	0.004	0.009	0.000	-0.016
	(0.004) [0.004]	(0.008) [0.594]	(0.009) [0.332]	(0.001) [0.578]	(0.118) [0.890]
Age^2 x Wealth Quartile 2	-0.009	-0.002	-0.009	-0.002	0.005
	(0.005) [0.088]	(0.012) [0.881]	(0.013) [0.500]	(0.001) [0.060]	(0.151) [0.971]
Age^2 x Wealth Quartile 3	-0.008	0.003	0.000	-0.002	0.036
	(0.006) [0.168]	(0.013) [0.843]	(0.014) [0.999]	(0.001) [0.135]	(0.154) [0.816]
Age^2 x Wealth Quartile 4	-0.011	-0.007	0.026	0.000	-0.189
	(0.006) [0.057]	(0.013) [0.608]	(0.013) [0.040]	(0.001) [0.887]	(0.152) [0.213]
Age ^{3}	-0.000	-0.000	-0.000	-0.000	0.000
	(0.000) [0.011]	(0.000) [0.615]	(0.000) [0.422]	(0.000) [0.709]	(0.001) [0.859]
Age^3 x Wealth Quartile 2	0.000	0.000	0.000	0.000	-0.000
	(0.000) [0.110]	(0.000) [0.787]	(0.000) [0.486]	(0.000) [0.039]	(0.001) [0.949]
Age^3 x Wealth Quartile 3	0.000	-0.000	0.000	0.000	-0.000
	(0.000) [0.166]	(0.000) [0.823]	(0.000) [0.976]	(0.000) [0.122]	(0.001) [0.787]
Age^3 x Wealth Quartile 4	0.000	0.000	-0.000	-0.000	0.001
	(0.000) [0.078]	(0.000) [0.611]	(0.000) [0.048]	(0.000) [0.964]	(0.001) [0.238]
N	2,731	1,086	1,060	2,407	1,830

Note: Vocabulary is age-standardized, and measured with the PPVT test in Chile, Colombia, and Peru, and with the ASQ-3 communication module in Uruguay. OLS estimation of vocabulary on wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Robust standard errors in parentheses and p-values in squared brackets.

Figure SM A.2: Cross-sectional analysis of the Socio-emotional skills over age by wealth quartile



(a) Chile

(b) Colombia *Urban*

(c) Colombia *Rural*

(d) Uruguay

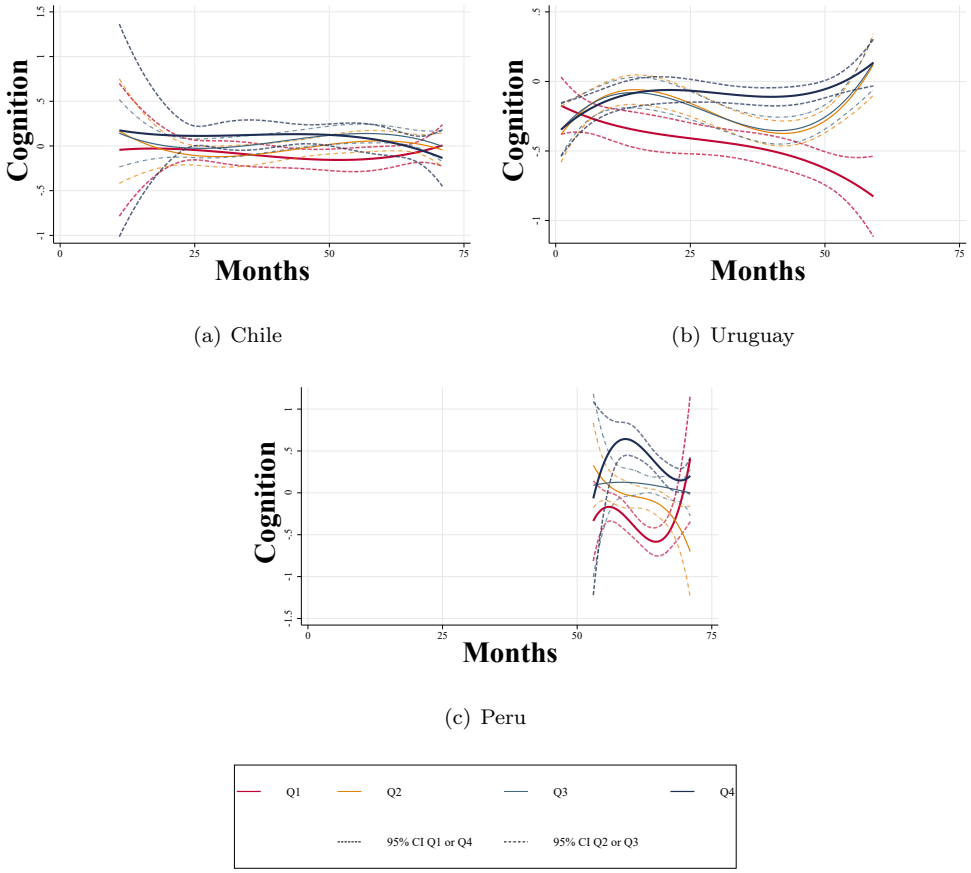
Note: Socio-emotional skills are age-standardized, and measured with the Child Behavioral Checklist in Chile and Uruguay, and with the ASQ-3 personal-social module for Colombia. Predicted socioemotional skills based on OLS estimation of skills on wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on robust standard errors. Data is not available for Peru.

Table SM A.5: Cross-sectional analysis of the socio-emotional skills' growth curve

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Uruguay**
Wealth Quartile 2	-1.108	0.393	-0.262	-0.136
	(1.154) [0.337]	(0.372) [0.291]	(0.324) [0.419]	(0.250) [0.587]
Wealth Quartile 3	0.213	-0.040	0.144	-0.035
	(1.102) [0.847]	(0.373) [0.914]	(0.352) [0.683]	(0.270) [0.898]
Wealth Quartile 4	-0.934	0.458	0.153	0.078
	(1.129) [0.408]	(0.366) [0.211]	(0.314) [0.627]	(0.257) [0.762]
Age	-0.080	0.007	0.013	0.002
	(0.065) [0.221]	(0.032) [0.817]	(0.028) [0.638]	(0.030) [0.940]
Age x Wealth Quartile 2	0.093	-0.032	0.023	-0.005
	(0.089) [0.299]	(0.040) [0.414]	(0.038) [0.543]	(0.039) [0.908]
Age x Wealth Quartile 3	-0.006	0.024	-0.017	-0.000
	(0.085) [0.941]	(0.040) [0.541]	(0.039) [0.657]	(0.039) [0.991]
Age x Wealth Quartile 4	0.086	-0.052	-0.009	0.022
	(0.087) [0.325]	(0.039) [0.181]	(0.037) [0.799]	(0.037) [0.558]
Age ^{2}	0.002	-0.000	-0.000	-0.000
	(0.002) [0.299]	(0.001) [0.835]	(0.001) [0.637]	(0.001) [0.701]
Age^2 x Wealth Quartile 2	-0.002	0.001	-0.000	0.001
	(0.002) [0.290]	(0.001) [0.468]	(0.001) [0.738]	(0.002) [0.514]
Age^2 x Wealth Quartile 3	0.000	-0.001	0.001	0.001
	(0.002) [0.873]	(0.001) [0.378]	(0.001) [0.646]	(0.002) [0.628]
Age^2 x Wealth Quartile 4	-0.002	0.001	0.000	-0.001
	(0.002) [0.373]	(0.001) [0.224]	(0.001) [0.817]	(0.001) [0.657]
Age ^{3}	-0.000	0.000	0.000	0.000
	(0.000) [0.374]	(0.000) [0.823]	(0.000) [0.605]	(0.000) [0.527]
Age^3 x Wealth Quartile 2	0.000	-0.000	0.000	-0.000
	(0.000) [0.253]	(0.000) [0.485]	(0.000) [0.871]	(0.000) [0.304]
Age^3 x Wealth Quartile 3	-0.000	0.000	-0.000	-0.000
	(0.000) [0.849]	(0.000) [0.316]	(0.000) [0.637]	(0.000) [0.391]
Age^3 x Wealth Quartile 4	0.000	-0.000	-0.000	0.000
	(0.000) [0.382]	(0.000) [0.287]	(0.000) [0.829]	(0.000) [0.830]
N	3,919	1,885	1,803	2,310

Note: Socio-emotional skills are age-standardized, and measured with the Child Behavioral Checklist in Chile and Uruguay, and with the ASQ-3 personal-social module for Colombia. OLS estimation of skills on wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Robust standard errors in parentheses and p-values in squared brackets.

Figure SM A.3: Cross-sectional analysis of the Cognitive skills over age by wealth quartile



(a) Chile

(b) Uruguay

(c) Peru

Note: Cognitive skills are age-standardized, and measured with the Battele in Chile, mathematics tests in Peru, and ASQ-3 in Uruguay. Predicted cognitive skills based on OLS estimation of skills on wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on robust standard errors. Data is not available for Colombia.

Table SM A.6: Cross-sectional analysis of the cognitive skills' growth curve

	Chile	**Uruguay**	**Peru**
Wealth Quartile 2	0.891	-0.281	394.357
	(1.332) [0.504]	(0.168) [0.094]	(178.647) [0.027]
Wealth Quartile 3	0.719	-0.241	260.396
	(1.181) [0.543]	(0.163) [0.139]	(205.451) [0.205]
Wealth Quartile 4	0.507	-0.227	29.109
	(1.964) [0.796]	(0.164) [0.168]	(200.243) [0.884]
Age	0.017	-0.020	13.600
	(0.080) [0.835]	(0.020) [0.310]	(6.479) [0.036]
Age x Wealth Quartile 2	-0.086	0.078	-19.657
	(0.103) [0.402]	(0.027) [0.003]	(8.724) [0.024]
Age x Wealth Quartile 3	-0.070	0.070	-13.133
	(0.092) [0.448]	(0.026) [0.008]	(9.880) [0.184]
Age x Wealth Quartile 4	-0.039	0.057	-2.121
	(0.150) [0.792]	(0.025) [0.025]	(9.606) [0.825]
Age ^{2}	-0.001	0.001	-0.227
	(0.002) [0.734]	(0.001) [0.462]	(0.106) [0.032]
Age^2 x Wealth Quartile 2	0.002	-0.003	0.326
	(0.002) [0.322]	(0.001) [0.002]	(0.142) [0.021]
Age^2 x Wealth Quartile 3	0.002	-0.003	0.220
	(0.002) [0.333]	(0.001) [0.005]	(0.158) [0.164]
Age^2 x Wealth Quartile 4	0.001	-0.002	0.047
	(0.003) [0.701]	(0.001) [0.055]	(0.153) [0.762]
Age ^{3}	0.000	-0.000	0.001
	(0.000) [0.656]	(0.000) [0.406]	(0.001) [0.028]
Age^3 x Wealth Quartile 2	-0.000	0.000	-0.002
	(0.000) [0.278]	(0.000) [0.001]	(0.001) [0.019]
Age^3 x Wealth Quartile 3	-0.000	0.000	-0.001
	(0.000) [0.266]	(0.000) [0.002]	(0.001) [0.146]
Age^3 x Wealth Quartile 4	-0.000	0.000	-0.000
	(0.000) [0.613]	(0.000) [0.047]	(0.001) [0.697]
N	3,631	2,404	1,876

Note: Cognitive skills are age-standardized, and measured with the Battele in Chile, mathematics tests in Peru, and ASQ-3 in Uruguay, and Raven in Mexico. OLS estimation of skills on wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Robust standard errors in parentheses and p-values in squared brackets.

Supplementary Material B Longitudinal Analysis

Selection of the degree of age-polynomial

Table SM B.7: Age-polynimia for vocabulary

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Peru**	**Uruguay**
Age	-0.016	-0.005	-0.011	0.003	0.008
	(0.004) [0.000]	(0.005) [0.350]	(0.005) [0.032]	(0.010) [0.794]	(0.006) [0.175]
Age ^{2}	0.000	0.000	0.000	-0.000	-0.000
	(0.000) [0.000]	(0.000) [0.567]	(0.000) [0.026]	(0.000) [0.772]	(0.000) [0.393]
Age ^{3}	-0.000	-0.000	-0.000	0.000	0.000
	(0.000) [0.001]	(0.000) [0.653]	(0.000) [0.033]	(0.000) [0.754]	(0.000) [0.478]
N	31,424	8,604	8,767	7,277	4,957

Note: Standard errors clustered at the child level in parentheses and p-values in squared brackets.

Table SM B.8: Age-polynimia for socio-emotional skills

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Uruguay**
Age	-0.005	0.002	0.005	-0.001
	(0.002) [0.012]	(0.002) [0.299]	(0.002) [0.001]	(0.005) [0.800]
Age ^{2}	0.000	-0.000	-0.000	0.000
	(0.000) [0.003]	(0.000) [0.044]	(0.000) [0.000]	(0.000) [0.644]
Age ^{3}	-0.000	0.000	0.000	-0.000
	(0.000) [0.001]	(0.000) [0.008]	(0.000) [0.000]	(0.000) [0.571]
N	37,623	8,920	8,838	5,577

Note: Standard errors clustered at the child level in parentheses and p-values in squared brackets.

Table SM B.9: Age-polynimia for cognitive skills

	Chile	**Mexico**	**Peru**	**Uruguay**
Age	-0.003	-0.002	0.008	0.018
	(0.002) [0.105]	(0.037) [0.957]	(0.009) [0.393]	(0.006) [0.001]
Age ^{2}	0.000	0.000	-0.000	-0.000
	(0.000) [0.360]	(0.000) [0.863]	(0.000) [0.377]	(0.000) [0.002]
Age ^{3}	-0.000	-0.000	0.000	0.000
	(0.000) [0.634]	(0.000) [0.788]	(0.000) [0.364]	(0.000) [0.005]
N	31,671	3,285	7,202	5,532

Note: Standard errors clustered at the child level in parentheses and p-values in squared brackets.

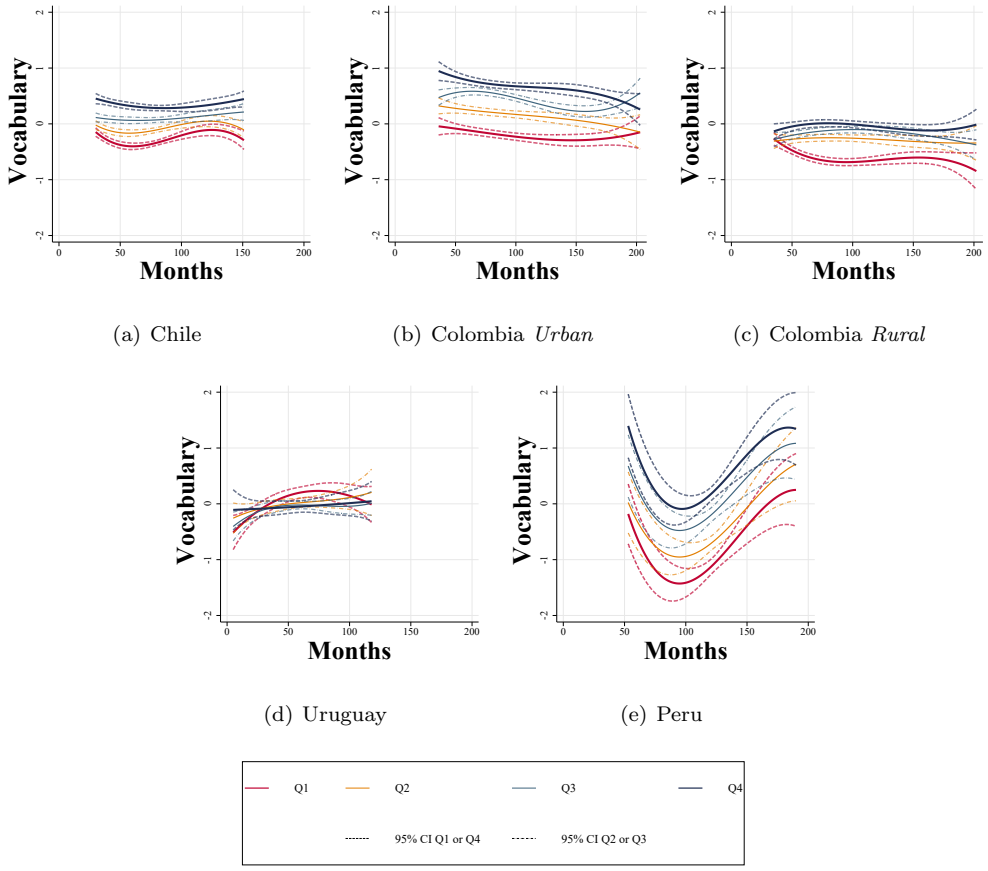
Table SM B.10: Age-polynimia for on grade

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Mexico**	**Peru**	**Uruguay**
Age	0.025	0.022	0.022	0.016	0.047	0.000
	(0.000) [0.000]	(0.000) [0.000]	(0.000) [0.000]	(0.002) [0.000]	(0.001) [0.000]	(0.000) [0.201]
Age ^{2}	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000) [0.000]	(0.000) [0.000]	(0.000) [0.000]	(0.000) [0.000]	(0.000) [0.000]	(0.000) [0.007]
N	30,787	11,107	11,397	3,249	7,642	6,557

Note: Standard errors clustered at the child level in parentheses and p-values in squared brackets.

Changes over age for all quartiles

Figure SM B.4: Longitudinal analysis of the Vocabulary over age by wealth quartile



(a) Chile (b) Colombia *Urban* (c) Colombia *Rural*

(d) Uruguay (e) Peru

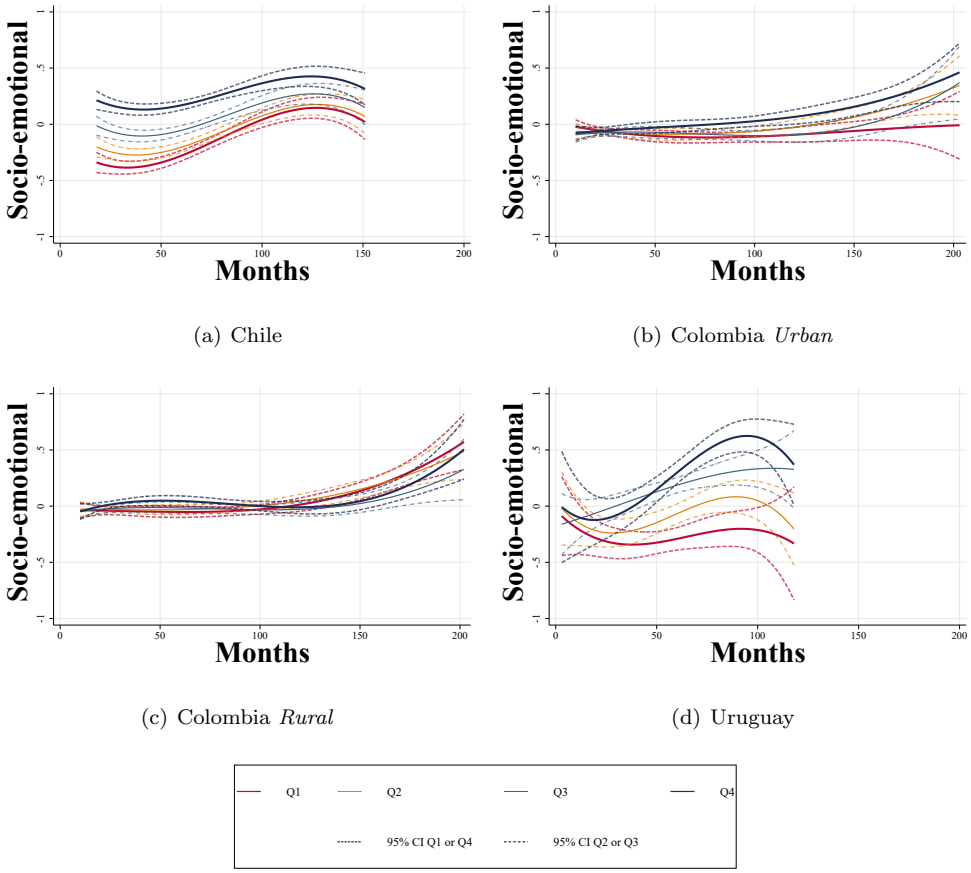
Note: Vocabulary is age-standardized, and measured with the PPVT test in Chile, Colombia, and Peru, and with the ASQ-3 communication module in Uruguay. Predicted vocabulary skills based on OLS estimation of vocabulary on round fixed effects, wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on standard errors clustered at the child level. Data is not available for Mexico.

Table SM B.11: Longitudinal analysis of the vocabulary's growth curve

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Peru**	**Uruguay**
Wealth Quartile 2	-0.226	0.458	-1.078	-1.471	0.321
	(0.253) [0.372]	(0.406) [0.259]	(0.364) [0.003]	(0.772) [0.057]	(0.246) [0.193]
Wealth Quartile 3	-0.574	-0.170	-1.151	0.332	0.127
	(0.260) [0.027]	(0.399) [0.669]	(0.360) [0.001]	(0.738) [0.652]	(0.239) [0.594]
Wealth Quartile 4	-0.139	1.397	-1.149	2.572	0.517
	(0.282) [0.623]	(0.431) [0.001]	(0.361) [0.001]	(0.751) [0.001]	(0.301) [0.086]
Age	-0.049	-0.001	-0.034	-0.208	0.025
	(0.009) [0.000]	(0.009) [0.883]	(0.009) [0.000]	(0.026) [0.000]	(0.013) [0.057]
Age x Wealth Quartile 2	0.017	-0.004	0.041	0.052	-0.013
	(0.011) [0.117]	(0.013) [0.724]	(0.012) [0.001]	(0.021) [0.016]	(0.015) [0.388]
Age x Wealth Quartile 3	0.042	0.028	0.044	0.016	-0.004
	(0.011) [0.000]	(0.012) [0.026]	(0.012) [0.000]	(0.021) [0.439]	(0.014) [0.776]
Age x Wealth Quartile 4	0.039	-0.017	0.051	-0.029	-0.024
	(0.012) [0.001]	(0.013) [0.212]	(0.012) [0.000]	(0.021) [0.164]	(0.018) [0.188]
Age ^{2}	0.001	-0.000	0.000	0.002	-0.000
	(0.000) [0.000]	(0.000) [0.762]	(0.000) [0.001]	(0.000) [0.000]	(0.000) [0.403]
Age^2 x Wealth Quartile 2	-0.000	0.000	-0.000	-0.000	0.000
	(0.000) [0.162]	(0.000) [0.590]	(0.000) [0.004]	(0.000) [0.017]	(0.000) [0.851]
Age^2 x Wealth Quartile 3	-0.001	-0.000	-0.000	-0.000	-0.000
	(0.000) [0.000]	(0.000) [0.029]	(0.000) [0.003]	(0.000) [0.473]	(0.000) [0.719]
Age^2 x Wealth Quartile 4	-0.001	0.000	-0.000	0.000	0.000
	(0.000) [0.000]	(0.000) [0.171]	(0.000) [0.000]	(0.000) [0.205]	(0.000) [0.536]
Age ^{3}	-0.000	0.000	-0.000	-0.000	0.000
	(0.000) [0.000]	(0.000) [0.587]	(0.000) [0.004]	(0.000) [0.000]	(0.000) [0.838]
Age^3 x Wealth Quartile 2	0.000	-0.000	0.000	0.000	0.000
	(0.000) [0.226]	(0.000) [0.463]	(0.000) [0.015]	(0.000) [0.020]	(0.000) [0.770]
Age^3 x Wealth Quartile 3	0.000	0.000	0.000	0.000	0.000
	(0.000) [0.000]	(0.000) [0.043]	(0.000) [0.018]	(0.000) [0.529]	(0.000) [0.460]
Age^3 x Wealth Quartile 4	0.000	-0.000	0.000	-0.000	-0.000
	(0.000) [0.000]	(0.000) [0.130]	(0.000) [0.001]	(0.000) [0.212]	(0.000) [0.889]
N	25,937	7,733	8,431	7,202	4,260

Note: Vocabulary is age-standardized, and measured with the PPVT test in Chile, Colombia, and Peru, and with the ASQ-3 communication module in Uruguay. OLS estimation of vocabulary on round fixed effects, wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Standard errors clustered at the child level in parentheses and p-values in squared brackets.

Figure SM B.5: Longitudinal analysis of the Socio-emotional skills over age by wealth quartile



(a) Chile

(b) Colombia *Urban*

(c) Colombia *Rural*

(d) Uruguay

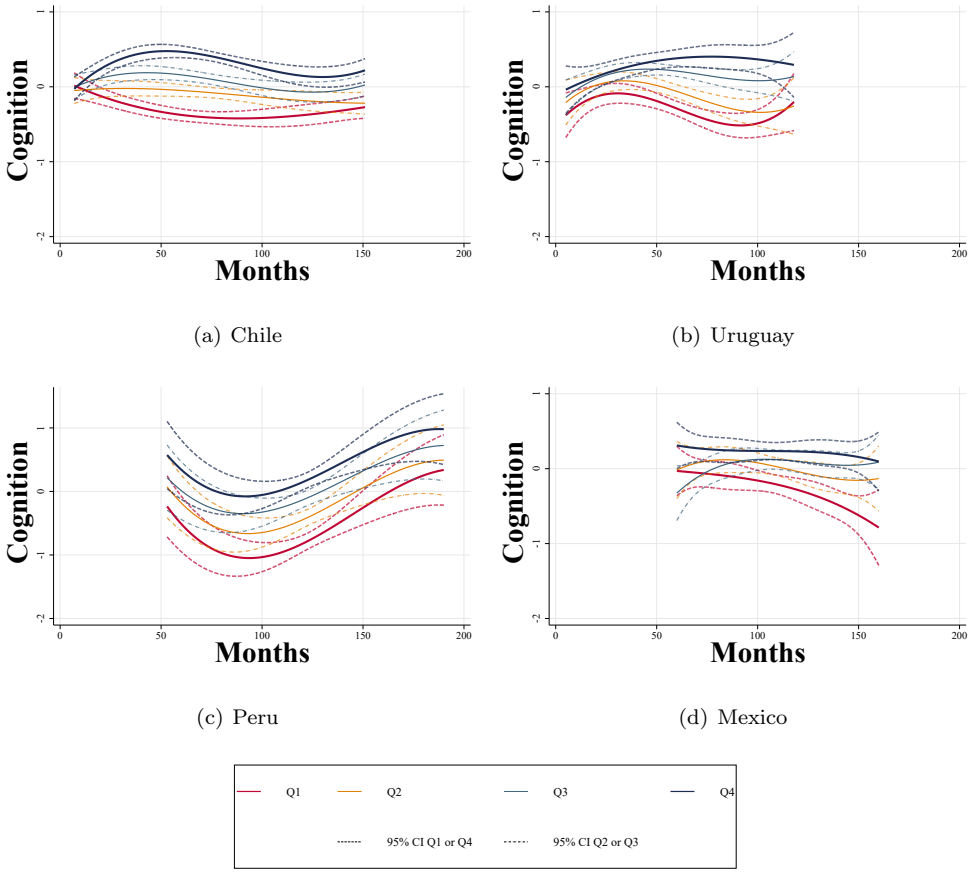
Note: Socio-emotional skills are age-standardized, and measured with the Child Behavioral Checklist in Chile and Uruguay from the second round, and with the ASQ-3 personal-social module for Colombia and Uruguay's first round. Predicted socioemotional skills based on OLS estimation of skills on round fixed effects, wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on standard errors clustered at the child level. Data is not available for Peru and Mexico.

Table SM B.12: Longitudinal analysis of the socio-emotional skills' growth curve

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Uruguay**
Wealth Quartile 2	0.166	-0.065	0.012	0.085
	(0.143) [0.245]	(0.086) [0.452]	(0.084) [0.883]	(0.269) [0.753]
Wealth Quartile 3	0.366	-0.132	-0.035	-0.138
	(0.138) [0.008]	(0.085) [0.120]	(0.088) [0.688]	(0.246) [0.575]
Wealth Quartile 4	0.557	-0.113	-0.074	0.087
	(0.137) [0.000]	(0.084) [0.178]	(0.085) [0.382]	(0.341) [0.798]
Age	-0.016	-0.004	0.000	-0.019
	(0.005) [0.002]	(0.003) [0.254]	(0.003) [0.967]	(0.013) [0.156]
Age x Wealth Quartile 2	-0.001	0.003	-0.000	-0.003
	(0.007) [0.842]	(0.005) [0.574]	(0.004) [0.943]	(0.017) [0.855]
Age x Wealth Quartile 3	-0.002	0.007	0.003	0.024
	(0.007) [0.745]	(0.005) [0.166]	(0.005) [0.540]	(0.016) [0.128]
Age x Wealth Quartile 4	0.000	0.006	0.007	0.000
	(0.007) [0.943]	(0.005) [0.216]	(0.005) [0.116]	(0.020) [0.998]
Age ^{2}	0.000	0.000	-0.000	0.000
	(0.000) [0.000]	(0.000) [0.445]	(0.000) [0.719]	(0.000) [0.178]
Age^2 x Wealth Quartile 2	-0.000	-0.000	0.000	0.000
	(0.000) [0.949]	(0.000) [0.650]	(0.000) [0.849]	(0.000) [0.628]
Age^2 x Wealth Quartile 3	-0.000	-0.000	-0.000	-0.000
	(0.000) [0.928]	(0.000) [0.184]	(0.000) [0.600]	(0.000) [0.308]
Age^2 x Wealth Quartile 4	-0.000	-0.000	-0.000	0.000
	(0.000) [0.549]	(0.000) [0.398]	(0.000) [0.142]	(0.000) [0.515]
Age ^{3}	-0.000	-0.000	0.000	-0.000
	(0.000) [0.000]	(0.000) [0.632]	(0.000) [0.319]	(0.000) [0.230]
Age^3 x Wealth Quartile 2	0.000	0.000	-0.000	-0.000
	(0.000) [0.867]	(0.000) [0.575]	(0.000) [0.774]	(0.000) [0.559]
Age^3 x Wealth Quartile 3	0.000	0.000	0.000	0.000
	(0.000) [0.835]	(0.000) [0.168]	(0.000) [0.774]	(0.000) [0.424]
Age^3 x Wealth Quartile 4	0.000	0.000	0.000	-0.000
	(0.000) [0.489]	(0.000) [0.399]	(0.000) [0.222]	(0.000) [0.418]
N	29,728	7,518	7,920	4,350

Note: Socio-emotional skills are age-standardized, and measured with the Child Behavioral Checklist in Chile and Uruguay from the second round, and with the ASQ-3 personal-social module for Colombia and Uruguay's first round. OLS estimation of skills on round fixed effects, wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Standard errors clustered at the child level in parentheses and p-values in squared brackets.

Figure SM B.6: Longitudinal analysis of the Cognitive skills over age by wealth quartile



(a) Chile

(b) Uruguay

(c) Peru

(d) Mexico

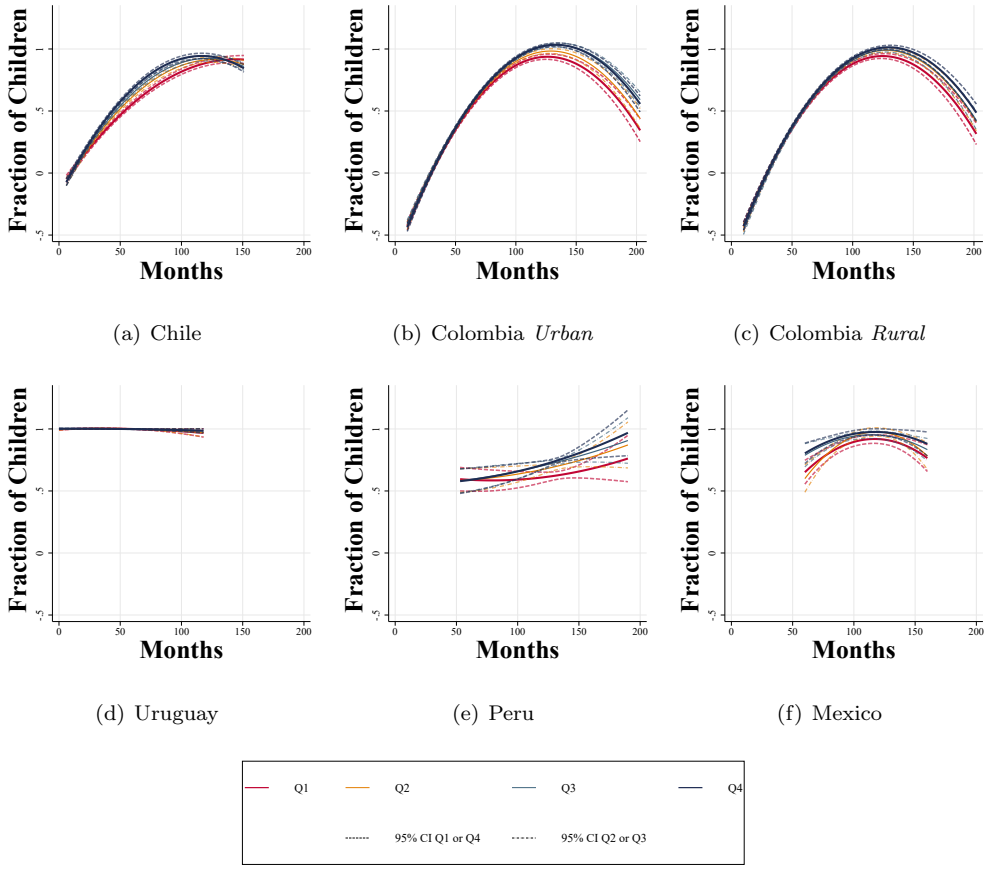
Note: Cognitive skills are age-standardized, and measured with the Battele (rounds 1 and 3) and TADI (round 2) in Chile, CDA (round 1) and mathematics tests (rounds 2, 3, and 4) in Peru, and ASQ-3 (rounds 1, 2, and 4) and WISC (round 3) in Uruguay, and Raven in Mexico. Predicted cognitive skills based on OLS estimation of skills on round fixed effects, wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on standard errors clustered at the child level. Data is not available for Colombia.

Table SM B.13: Longitudinal analysis of the cognitive skills' growth curve

	Chile	**Mexico**	**Peru**	**Uruguay**
Wealth Quartile 2	-0.175	-2.617	0.015	0.181
	(0.095) [0.067]	(4.219) [0.535]	(0.734) [0.984]	(0.264) [0.494]
Wealth Quartile 3	-0.206	-4.139	-0.621	0.258
	(0.092) [0.026]	(4.079) [0.310]	(0.760) [0.414]	(0.236) [0.274]
Wealth Quartile 4	-0.325	0.884	0.209	0.410
	(0.090) [0.000]	(3.883) [0.820]	(0.744) [0.778]	(0.279) [0.142]
Age	-0.013	-0.008	-0.139	0.032
	(0.006) [0.021]	(0.093) [0.931]	(0.023) [0.000]	(0.013) [0.016]
Age x Wealth Quartile 2	0.016	0.082	0.008	-0.004
	(0.005) [0.001]	(0.125) [0.512]	(0.020) [0.701]	(0.017) [0.799]
Age x Wealth Quartile 3	0.029	0.111	0.030	-0.006
	(0.005) [0.000]	(0.120) [0.358]	(0.020) [0.143]	(0.016) [0.685]
Age x Wealth Quartile 4	0.044	-0.017	0.016	-0.018
	(0.005) [0.000]	(0.115) [0.885]	(0.020) [0.427]	(0.018) [0.338]
Age ^{2}	0.000	0.000	0.001	-0.001
	(0.000) [0.238]	(0.001) [0.917]	(0.000) [0.000]	(0.000) [0.006]
Age^2 x Wealth Quartile 2	-0.000	-0.001	-0.000	0.000
	(0.000) [0.022]	(0.001) [0.510]	(0.000) [0.798]	(0.000) [0.640]
Age^2 x Wealth Quartile 3	-0.000	-0.001	-0.000	0.000
	(0.000) [0.000]	(0.001) [0.407]	(0.000) [0.221]	(0.000) [0.334]
Age^2 x Wealth Quartile 4	-0.001	0.000	-0.000	0.001
	(0.000) [0.000]	(0.001) [0.898]	(0.000) [0.574]	(0.000) [0.100]
Age ^{3}	-0.000	-0.000	-0.000	0.000
	(0.000) [0.597]	(0.000) [0.852]	(0.000) [0.000]	(0.000) [0.006]
Age^3 x Wealth Quartile 2	0.000	0.000	0.000	-0.000
	(0.000) [0.179]	(0.000) [0.495]	(0.000) [0.936]	(0.000) [0.535]
Age^3 x Wealth Quartile 3	0.000	0.000	0.000	-0.000
	(0.000) [0.000]	(0.000) [0.421]	(0.000) [0.357]	(0.000) [0.247]
Age^3 x Wealth Quartile 4	0.000	-0.000	0.000	-0.000
	(0.000) [0.000]	(0.000) [0.946]	(0.000) [0.795]	(0.000) [0.069]
N	24,104	2,808	7,128	4,309

Note: Cognitive skills are age-standardized, and measured with the Battele (rounds 1 and 3) and TADI (round 2) in Chile, CDA (round 1) and mathematics tests (rounds 2, 3, and 4) in Peru, and ASQ-3 (rounds 1, 2, and 4) and WISC (round 3) in Uruguay, and Raven in Mexico. OLS estimation of skills on round fixed effects, wealth quartile dummies, third degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Standard errors clustered at the child level in parentheses and p-values in squared brackets.

Figure SM B.7: Longitudinal analysis of the On grade over age by wealth quartile



(a) Chile (b) Colombia *Urban* (c) Colombia *Rural*

(d) Uruguay (e) Peru (f) Mexico

Note: Predicted on grade based on OLS estimation of the outcome on round fixed effects, wealth quartile dummies, second degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Dashed lines are 95% confidence intervals based on standard errors clustered at the child level.

Table SM B.14: Longitudinal analysis of the on grade's growth curve

	Chile	**Colombia** *Urban*	**Colombia** *Rural*	**Mexico**	**Peru**	**Uruguay**
Wealth Quartile 2	-0.038	-0.002	-0.015	-0.366	-0.095	-0.001
	(0.011) [0.001]	(0.029) [0.952]	(0.030) [0.628]	(0.346) [0.290]	(0.045) [0.034]	(0.005) [0.909]
Wealth Quartile 3	-0.047	0.022	-0.037	0.428	-0.139	0.004
	(0.011) [0.000]	(0.028) [0.430]	(0.031) [0.235]	(0.308) [0.164]	(0.044) [0.002]	(0.004) [0.294]
Wealth Quartile 4	-0.051	-0.017	0.001	0.464	-0.116	0.005
	(0.011) [0.000]	(0.030) [0.569]	(0.030) [0.973]	(0.295) [0.116]	(0.042) [0.006]	(0.003) [0.084]
Age	0.015	0.025	0.026	0.019	-0.002	0.000
	(0.001) [0.000]	(0.001) [0.000]	(0.001) [0.000]	(0.004) [0.000]	(0.002) [0.157]	(0.000) [0.095]
Age x Wealth Quartile 2	0.003	0.000	0.000	0.007	0.002	0.000
	(0.001) [0.000]	(0.001) [0.791]	(0.001) [0.639]	(0.006) [0.286]	(0.001) [0.067]	(0.000) [0.952]
Age x Wealth Quartile 3	0.004	-0.000	0.001	-0.006	0.003	-0.000
	(0.001) [0.000]	(0.001) [0.533]	(0.001) [0.416]	(0.006) [0.264]	(0.001) [0.003]	(0.000) [0.292]
Age x Wealth Quartile 4	0.005	0.000	0.000	-0.007	0.002	-0.000
	(0.001) [0.000]	(0.001) [0.564]	(0.001) [0.943]	(0.006) [0.210]	(0.001) [0.021]	(0.000) [0.110]
Age ^{2}	-0.000	-0.000	-0.000	-0.000	0.000	-0.000
	(0.000) [0.000]	(0.000) [0.000]	(0.000) [0.000]	(0.000) [0.000]	(0.000) [0.133]	(0.000) [0.075]
Age^2 x Wealth Quartile 2	-0.000	0.000	0.000	-0.000	-0.000	-0.000
	(0.000) [0.000]	(0.000) [0.754]	(0.000) [0.806]	(0.000) [0.335]	(0.000) [0.383]	(0.000) [1.000]
Age^2 x Wealth Quartile 3	-0.000	0.000	0.000	0.000	-0.000	0.000
	(0.000) [0.000]	(0.000) [0.052]	(0.000) [0.910]	(0.000) [0.316]	(0.000) [0.094]	(0.000) [0.303]
Age^2 x Wealth Quartile 4	-0.000	0.000	0.000	0.000	-0.000	0.000
	(0.000) [0.000]	(0.000) [0.398]	(0.000) [0.333]	(0.000) [0.240]	(0.000) [0.682]	(0.000) [0.163]
N	22,748	8,926	9,810	2,776	7,562	5,881

Note: OLS estimation of on grade on round fixed effects, wealth quartile dummies, second degree age polynomial, and its interactions with the wealth dummies. One estimation per country. Standard errors clustered at the child level in parentheses and p-values in squared brackets.