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Young Lives

Parental Background and Child Human Capital Development Throughout Childhood and Adolescence:

Evidence From Four Low- and Middle-Income Countries

Andreas Georgiadis

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About Young Lives

Young Lives is an international study of childhood poverty, following the lives of 12,000 children in four countries (Ethiopia, India, Peru and Vietnam) over 15 years. **www.younglives.org.uk**

Summary

Although there are a vast number of empirical studies documenting a strong positive link between parental socio-economic status (SES) and child outcomes, we do not know whether these associations remain robust when other parental background dimensions are controlled. This working paper investigates the association of child human capital indicators with a wide range of parental background dimensions across four low- and middle-income countries, and at different stages of childhood and adolescence, using data from the Young Lives cohort study in Ethiopia, India, Peru, and Vietnam.

The key finding is that parental income is strongly and positively associated with child nutritional status and cognitive achievement across all countries and at all stages of childhood and adolescence, even after controlling for other background dimensions, but the same does not hold for parental education. Child non-cognitive skills across all countries and at different ages, however, are mostly predicted by the mother's personality traits reflected in her non-cognitive skills, social capital, and aspirations for the child's education. Associations of parental background factors with child human capital measures do not change systematically with child age, except that mother's aspirations for child education exhibits a positive association with child cognitive and non-cognitive skills that is increasing in child age across countries.

Overall, the results suggest that policies that seek to improve the material circumstances of the household and mother's education and socioemotional competencies may be effective in promoting child cognitive and socioemotional development in low- and middle-income countries.

1. Introduction

Family background has been considered one of the key factors that determine individuals' well-being throughout childhood and adulthood. Although there are many background markers, the majority of studies have primarily being concerned with the importance of parental socio-economic status (SES), usually measured by income or education, and to a lesser extent with other background dimensions, such as parental health, cognitive and non-cognitive skills (Black and Devereux 2011). The empirical evidence from high-income countries suggest a strong positive association between parental SES and dimensions of children's human capital, such as health, cognitive and non-cognitive skills (Blanden et al. 2007; Currie 2009) at a given age, that in turns predict strongly key economic, social, health and behavioural outcomes in adulthood (Heckman 2007). There is also evidence from developed countries that the association between parental SES and children's human capital is not constant but may increase as children get older (Case et al. 2002; Cunha et al. 2006). In the case of developing countries, although there is abundant evidence that children in households with low SES are generally in poorer health, there are few studies investigating the association between SES and cognitive skills (Paxson and Schady 2007; Schady 2011) and even fewer looking at the link between SES and children's non-cognitive skills (Dercon and Krishnan 2009; Dercon and Sanchez 2011). Moreover, there is very little evidence, from low- and middle-income countries, on how these associations change over the child's life cycle.[1]

Although parental SES is widely considered to be the most important family background dimension, its strong positive association with child outcomes may partly, or fully, reflect a wide range of unobserved dimensions of background that are also important. This is because parents who have higher earnings are expected to be better educated, enjoy better health, and have better cognitive and non-cognitive skills, as well as more influential social networks and possibly stronger preferences for children's education and health, among other things (Curry 2009; Behrman 2010). This implies that exploring the link between SES and children's outcomes without taking into account other parental background components may systematically overestimate the importance of SES for children's development at different stages of the life cycle (Paxson and Schady 2007; Heckman 2007). In addition, the relationship between children's human capital and background factors other than SES, such as parental health and cognitive skills, is either understudied or studied in isolation of other family factors and we know almost nothing on how this relationship may change as children age in low- and middle-income countries.

This paper aims to address the above gaps in the literature by exploring the association between a wide range of family background dimensions and aspects of children's human capital at different stages of childhood and adolescence across four low- and middle-income countries. We use data from Young Lives, an international cohort study in Ethiopia, India, Peru and Vietnam that includes rich information on parental background and especially on mother's status, skills, and personal traits and children's human capital at different ages.

To our knowledge, there is no other study, to date, from developing countries, that has simultaneously examined the associations of such a wide set of background factors with

1 Some recent exceptions are studies that document the evolution of SES gradients in cognitive skills in early childhood (Paxson and Schady 2007; Schady et al. 2011; Fernald et al. 2011; Naudeau et al. 2011).

children's human capital outcomes and how these associations may differ across national and cultural contexts and over children's life cycles. The paper's evidence sheds light on the process and channels of the intergenerational transmission of poverty and inequality over the individual's life cycle in low- and middle-income countries that has also important implications for the design of effective policy interventions.

The key finding is that although parental income is the most important predictor of child's nutritional status and cognitive achievement across all countries and at all stages of childhood, even after controlling for other background dimensions, the same does not hold for parental education. Children's non-cognitive skills, however, are more strongly positively associated with mother's non-cognitive skills and social capital. The evidence suggests that SES and other background gradients in child's human capital are not increasing or decreasing with a child's age, except in the case of mother's aspirations for the child's education, for which the magnitude of the association with children's cognitive and non-cognitive skills is higher for older children.

The following section presents a simple conceptual framework that identifies potential channels via which different aspects of parental background may impact children's human capital. We then discuss the data and measures used in our analysis before presenting the results and an interpretation of our findings. The final section concludes.

2. Conceptual framework

Consider the standard framework in economics (Grossman 1972), according to which parents make choices to maximise utility subject to a budget and a technological constraint. The framework can be expressed by the following system of equations:

$$\max_{C,L,H} U(C,L,H;A_1,B_1) \quad (1)$$

$$H = H(M;D,\eta,A_2,B_2) \quad (2)$$

$$y = w(B_3)(T-L) \quad (3)$$

Equation (1) suggests that welfare depends directly on the level of consumption C, leisure L, and children's human capital H and indirectly on factors that are related to heterogeneity in tastes such as a child's characteristics, A_1, and parental background B_1. Equation (2) is the child's human capital production function, which describes the technology via which parental chosen inputs M are converted into child's human capital output H. The production function also postulates that environmental factors outside parent's control D, and the child's innate characteristics such as innate healthiness, ability, and personality traits η, as well as child's other characteristics A_2 and parental background B_2 determine the nature of the production technology. Finally, equation (3) is the budget constraint suggesting that labour income, that is the product of the wage w, that depends on parental characteristics B_3 , and hours of work (labour supply), expressed as the difference between total time endowment T and time spent in leisure L, and non-labour income I, constitute total household resources.[2]

2 Although the notation distinguishes between parental characteristics entering the utility function from those influencing child human capital production technology, and the wage, one cannot rule out that there is some overlap between these characteristics. The same holds for child characteristics influencing preferences and the productivity of child human capital production technology.

Under the above framework, parental background affects child human capital through the following channels:

(a) the utility function by determining differences in preferences. This expresses the fact that parents with different characteristics may have different preferences over children's human capital and thus, all other things being equal, they will make different investments, which in turn lead to different levels of children's human capital.

(b) the production function by determining the productivity of inputs. This suggests that parents with different characteristics may produce different levels of children's human capital using the same inputs.

(c) the budget constraint which expresses the material and financial constraints faced by parents. This implies that, all other things being equal, children in households with access to more resources, will have higher levels of human capital because their parents are able to buy more and better quality inputs.

Furthermore, parental characteristics may influence child human capital through genetic channels (Duncan et al. 2005; Currie 2009; Anger 2011); that is, they are a part of η or they directly, as inputs into the child's human capital production function, are a part of M (Todd and Wolpin 2003; Behrman 2010).

The relationship between parental background and child human capital is not expected to be constant over time, even if background is fixed, as parents are expected to have different welfare functions and face different technological and resource constraints at different stages of the child's lifetime (Todd and Wolpin 2003; Cunha et al. 2006). Behrman (2010) argues that choices for investment in children's education are expected to be the result of an intra-household bargaining process with the household welfare function being a weighted combination of the preferences of different household members, and the weights reflecting the bargaining power of each household member. He further suggests that the 'locus of decision-making relevant to investment in an individual's education is likely to shift from parents to child over the child's life cycle' (Behrman 2010, 4889). The key implication of the latter claim is that parental preferences are expected to become less important as the child ages.

The production technology may also be different at different ages of the child (Todd and Wolpin 2003; Cunha et al. 2006; Strauss and Thomas 2008). This may be because parental background is enhanced or deteriorates over time with experience, or because it is fixed but its effect varies over time reflecting a change in the efficiency in the use of inputs. For example, parental learning over time about the innate characteristics and capacities of the child may lead to a more efficient combination of inputs by parents. Moreover, if the technology of human capital formation over the life cycle exhibits self-productivity and dynamic complementarities, then the effect of parental background on children's human capital is expected to persist or even increase as children age (Heckman 2007; Case et al. 2002).

Parents are also expected to face different resource constraints at different stages of the life cycle of the child, as assets may accumulate over time and wage income may increase with experience, but also because different income shocks may be experienced at different periods. Finally, even if parental resources are fixed over time, the effect of income across the lifetime of the child is likely to be heterogeneous, as a result of self-productivity and dynamic complementarity in the child's human capital production technology (Carneiro et al. 2009).

3. Data

The data used in our analysis are collected as part of Young Lives, an international cohort study of childhood poverty in Ethiopia, India (the states of Andhra Pradesh and Telangana), Peru, and Vietnam. Young Lives follows 12,000 children of two different cohorts: around 2,000 children in each country born in 2001/02 (Younger Cohort) and 1,000 children in each country born in 1994/95 (Older Cohort). Young Lives has conducted four rounds of data collection, in 2002, 2006, 2009, and in 2013, and these surveys include information on the Younger Cohort at ages 1, 5, 8, and 12, and the Older Cohort at ages 8, 12, 15, and 19, respectively.

The Young Lives data include a rich set of information on household, parental, and community characteristics, as well as detailed information on children's characteristics and outcomes using the very similar instruments across the four countries.[3] For this paper, I restrict analysis to the data from Rounds 2 and 3 when the younger children were 5 and 8 years old and the older children were 12 and 15 years old respectively, mainly because the methods and measures of key outcomes were identical in these two rounds.[4] Henceforth, I will use the age of children to refer to the different round/cohort samples across countries.

Table 1 presents descriptive statistics of key characteristics of each country sample resulting from combining children from both cohorts and surveys. As the table suggests, in all countries the gender mix of children is balanced and the average age of children in the pooled sample is very similar. Moreover, children in Ethiopia are more likely to have an older sibling than the other countries, followed by children in Peru, India, and Vietnam, and in the vast majority of cases the primary caregiver of the child is the biological mother. Mother's average age is the lowest in India and very similar across the three other countries.

3.1 Dependent variables

The Young Lives data include information on measures of child health, and cognitive skills at ages 5, 8, 12, and 15 and measures on children's non-cognitive skills at ages 8, 12, and 15. In particular, the data include measures of children's anthropometry such as weight and height. I use child height-for-age Z-score (HAZ score) as the key child health indicator, as child height-for-age is a common indicator of chronic malnutrition that can summarise the nutritional history up to the current age (Glewwe et al. 2001), and is found to predict strongly child mortality and morbidity (Glewwe and Miguel 2008).[5] HAZ score means presented in Table 1 suggest that children from India and Ethiopia are the most malnourished, followed by those from Peru and Vietnam.[6]

3 For details of the Young Lives sampling methodology and type of information collected see Brock and Knowles (2012).

4 This is mainly because the information collected in Round 1 of Young Lives data collection was quite different than that collected in the subsequent two rounds and because the measurement of key outcomes in Round 4 is different in many cases than that in Rounds 2 and 3.

5 The HAZ score involves a standardisation of the child's height produced by subtracting the median and dividing by the standard deviation of a reference distribution of height for healthy children of the same age and gender provided by the World Health Organization 2007 standards (WHO 2007).

6 Note that Young Lives data were not selected to be nationally representative or state representative for the case of Andhra Pradesh and Telangana (Brock and Knowles 2012).

Cognitive development of children is assessed using the Peabody Picture Vocabulary Test (PPVT), a test of receptive vocabulary that has been widely used as a measure of verbal cognitive achievement (Rosenzweig and Wolpin 1994; Cueto et al. 2009; Schady 2011). Average PPVT test scores for all four countries are presented in Table 1.[7]

Table 1. *Descriptive statistics for dependent and independent variables for the pooled sample across countries*

Variable	Ethiopia	India	Peru	Vietnam
Height-for-age	-1.35	-1.56	-1.39	-1.30
	(1.15)	(1.02)	(1.07)	(1.04)
PPVT raw score	63.67	56.34	49.26	86.70
	(44.71)	(36.66)	(26.43)	(48.83)
Child's non-cognitive skills index	0.00	0.00	0.00	0.00
	(1.00)	(1.00)	(1.00)	(1.00)
Male	0.52	0.52	0.51	0.51
	(0.50)	(0.50)	(0.50)	(0.50)
Child's age in years	9.02	9.06	8.52	9.05
	(3.58)	(3.54)	(3.41)	(3.59)
Child's birth order	3.57	2.09	2.69	1.97
	(2.30)	(1.22)	(1.98)	(1.18)
Mother is the primary caregiver	0.89	0.96	0.95	0.93
	(0.31)	(0.20)	(0.22)	(0.25)
Mother's age in years	33.71	30.00	33.02	33.60
	(7.10)	(5.79)	(7.36)	(6.67)
Mother's education (years)	2.73	3.33	7.55	6.82
	(3.63)	(4.31)	(4.40)	(4.40)
Father's education (years)	3.91	4.99	8.90	7.61
	(3.76)	(4.98)	(3.61)	(3.76)
Wealth index	0.00	0.00	0.00	0.00
	(1.00)	(1.00)	(1.00)	(0.99)
Mother's height in cm	158.67	151.41	149.86	152.18
	(5.75)	(5.96)	(5.39)	(5.66)
Mother's bargaining power index	0.00	0.00	0.00	0.00
	(0.97)	(0.98)	(0.98)	(0.99)
Mother's non-cognitive skills index	0.00	0.00	0.00	0.00
	(0.95)	(0.99)	(0.97)	(0.98)
Mother's subjective well-being index	0.00	0.00	0.00	0.00
	(0.95)	(0.99)	(0.97)	(0.98)
Mother's social capital index	0.01	0.00	0.01	0.00
	(0.89)	(0.95)	(0.93)	(0.97)
Mother's aspirations for child's education (years)	14.92	12.70	15.24	14.37
	(2.12)	(2.80)	(1.70)	(2.20)
Community is urban	0.40	0.25	0.70	0.20
	(0.49)	(0.43)	(0.46)	(0.40)
Number of observations	5911	5950	5443	6003

Notes: Figures are averages, standard deviations in parentheses. All indices in the table are normalised by subtracting the mean and dividing by the standard deviation of the country/age of child specific sample. Information on child non-cognitive skills was not collected for children at age 5.

7 The maximum value of the PPVT score is 204. Note that PPVT scores are not meant to be cross-nationally and cross-culturally comparable.

The Young Lives questionnaires include a set of items that measure aspects of children's non-cognitive skills and in particular traits and competencies related to self-esteem and self-efficacy (see Dercon and Krishnan 2009; Dercon and Sanchez 2011, for discussion of the definition of these traits and how the Young Lives survey questionnaire items relate to them).[8] As self-esteem and self-efficacy are traits related to the personality domain of 'neuroticism/emotional stability' (Almlund et al. 2011), I combine all items in one measure labelled as 'child's non-cognitive skills index'.[9] Table 1 presents normalised values of the non-cognitive skills index calculated by subtracting the mean and dividing by the standard deviation of the associated country/age-specific sample.

In sum, the child HAZ score, PPVT score, and non-cognitive skills index are the dependent variables in the analysis that follows.

3.2 Independent variables

On the right-hand side of the regressions I estimate, I include child demographic variables such as gender, age in months, and birth order. I also include locality characteristics, such as region of residence and whether residence is in an urban or rural area. Nevertheless, the main interest is in variables reflecting different dimensions of parental background that, according to the framework sketched earlier, are expected to be associated with child human capital measures. The background dimensions considered include mother's demographic information such as age and ethnicity and a range of other components that in the literature or policy practice have been hypothesised to be important. The dimensions I consider are:

- household income
- parental education
- mother's health
- mother's intra-household bargaining power
- mother's non-cognitive skills
- mother's subjective well-being
- mother's social capital
- mother's aspirations for the child's education

Descriptive statistics on these variables are reported in Table 1. In describing these variables in more detail I use the conceptual framework described earlier to explain why these variables are expected to be correlated with child human capital, and that these correlations may change over the child's life.

3.3 Household income

Family income is an important indicator of socio-economic status. According to the conceptual framework, household income determines the extent of financial constraints in the household that affect the quantity and quality of inputs chosen by parents. This suggests that

8 Another usual term used to describe non-cognitive skills is psychosocial or socioemotional skills and personality traits (Almlund et al. 2011) that are defined as 'patterns of thought, feelings, and behavior that reflect the tendency to respond in certain ways under certain circumstances' (Roberts 2009). The term non-cognitive, however, should not be interpreted as if these traits are independent of cognitive processes (Anger,2011).

9 Details of the construct of this variable and other composite measures used in the paper can be found in the appendix.

a positive association between household income and child's human capital is expected at any given point in time. Moreover, the effect of income on child human capital outcomes may differ across stages of the child's life cycle (Carneiro et al. 2009). The measure of income used in the analysis is the household's wealth index, that combines a set of items related to housing quality, access to services, and consumer durables owned by the household (Filmer and Pritchett 2006; for details see also Woldehanna et al. 2011). Table 1 presents average values of the standardised wealth index across the four countries.

3.4 Parental education

Parental education is another standard proxy for family socio-economic status. According to Curry (2009), parental education may affect child outcomes through multiple channels. Education may shift both tastes and productivity of inputs, since more educated parents may have stronger preferences over child health and education and may be able to combine inputs more effectively. Moreover, education is an indicator of parental human capital, which in turn is expected to affect wages and income earned in the labour market and thus to affect child human capital through the budget constraint. Given that the importance of the channels through which parental education may impact child human capital may change with the age of the child, the effect of parental education on child human capital may also vary across stages of the child's life cycle. The measure of parental education used in the analysis is years of schooling. Table 1 suggests that parental schooling is the highest in Peru, followed by Vietnam, then India, and is lowest in Ethiopia.

3.5 Mother's health

Mother's health is expected to be correlated with tastes and the productivity of inputs, but also to determine mother's individual labour productivity which in turn predicts earnings (Strauss and Thomas 2008). Except for these channels, maternal health is expected to be linked to child health through biological channels and in turn through cross-productivity effects to influence other dimensions of child human capital such as cognitive and non-cognitive skills (Cunha and Heckman 2007). Again, the link between mother's health and child human capital may change with child's age, depending on the relative importance of genetic and environmental mechanisms at play in each life cycle stage. We used mother's height as an indicator for mother's health, since, following our previous discussion, this reflects the history of health and nutrition shocks throughout life (Currie and Vogl 2012).

Table 1 presents mean mother's height measured in centimetres for all four countries. On average, mothers in Ethiopia are the tallest, with the other three countries having very similar averages of mother's height.

3.6 Mother's intra-household bargaining power

The conceptual framework suggests that parental preferences affect the choice of inputs and through this choice the level of child human capital. In the case that the intra-household allocation of resources is determined by a bargaining process between household members, the final allocation will be determined by the weighted preferences of all household members with the weights depending on each member's bargaining power (Chiappori 1988). If mothers have stronger preferences on child health and other human capital relative to fathers (Behrman 2010), then, all other things being equal, in households where the mother has higher bargaining power, more resources are expected to be allocated on child human capital investments.

Based on this logic, one would expect a positive association between mother's bargaining power and child human capital. However, mother's bargaining power may become less important as the child ages because decision-making power shifts gradually from parents to the child. In order to measure the extent of mother's intra-household bargaining power, I produce an index combining a set of indicators suggesting whether or not the mother makes decisions over a range of household assets and economic activities (such as land, animals, business, and self-employment), and whether she controls income generated from these assets and activities (see Table A2 for details). Table 1 presents means of the normalised values of the mother's intra-household bargaining power measure.

3.7 Mother's non-cognitive skills

Fuchs (1993) suggests that a parent's sense of self-efficacy and socioemotional abilities are expected to have an important effect on the way she/he chooses to combine inputs in order to produce child human capital. This is taken into account in the conceptual framework presented previously, that allows a parent's non-cognitive skills to affect the productivity of investments in child human capital. Because non-cognitive skills are also a part of individual human capital that strongly predicts wages (Osborne Groves 2005), parental non-cognitive skills may affect child's human capital also via the budget constraint.

Finally, non-cognitive skills may be also genetically transmitted directly from parents to children, but this intergenerational transmission is expected to be more apparent when children have reached middle adulthood, as the personality of children is not fully developed during childhood and adolescence and may still be quite malleable (Costa and McCrae 1994). Self-productivity, dynamic complementarity, and cross-productivity effects in the formation of individual human capital over the life cycle imply that the link between parental non-cognitive skills and child human capital may persist or become stronger as the child ages.

The data include information on the same aspects of non-cognitive skills of the mother as those of the child, a set of items on mother's self-efficacy and self-esteem, but also a set of items on the mother's "sense of inclusion and perception of respect" that is another personality trait related to self-esteem.[10] All items related to mother's non-cognitive skills were combined into an index produced by averaging all items (see Table A3 for details). Table 1 presents means of normalised values of mothers' non-cognitive skills index across countries.

3.8 Mother's subjective well-being

Mother's subjective well-being is expected to affect child's human capital through mother's preferences, productivity of human capital technology, and the budget constraint. Subjective well-being can be linked to individual preferences through its relationship with an individual's personality (DeNeve and Cooper 1998) that in turn is related to individual preferences (Van Praag 1985; Almlund et al. 2011).

Mother's subjective well-being is associated with the productivity of human capital production technology through a number of mechanisms. First, its relationship with positive parenting, as there is evidence that mothers scoring highly in terms of life satisfaction are more likely to adopt an authoritative parenting style (Barling et al. 1993; Desjardins et al. 2008) that is

10 See Dercon and Krishan 2009 for definition and related background literature. Questions on 'sense of inclusion' were also included in the case of 12 and 15-year-old children but not for 8 year olds, which is why we chose to exclude these items from the non-cognitive skills index of all children.

associated with better academic and socioemotional child outcomes (Masten et al. 1998; Bugental and Grusec 2006). Second, maternal subjective well-being may lead to a more secure caregiving or attachment system that is widely believed to be key for the child's physical, cognitive and socioemotional development, particularly during infancy (Belsky 1997; Masten et al. 1998). Third, higher mother's life satisfaction is linked to more and better quality parental involvement in child's stimulation and development (Becker 2010).

There is also some evidence that higher subjective well-being leads to higher income (Diener et al. 2002), with one explanation being that individuals reporting higher life satisfaction are found to be more productive in a laboratory setting (Oswald et al. 2009). Thus, based on this evidence, mother's subjective well-being may also affect child's human capital through the budget constraint.

The association between mother's subjective well-being and child's human capital may persist over the child's life cycle. This is likely to be the case provided that parenting style, the attachment system, and parental involvement are key inputs to the child human capital production function in the early period of development and that this period is critical, that is the only period when investments can be effective in fostering the acquisition of capabilities (Cunha and Heckman 2007). The measure of maternal subjective well-being employed in my analysis was produced by combining two items assessing current life satisfaction and expected life satisfaction in the near future using the Cantril ladder of life measure (Cantril 1966) (see Table A4 for details). Means of normalised values of mother's subjective well-being measure across countries are presented in Table 1.

3.9 Mother's social capital

Social capital refers to the institutions, relationships, and norms that shape the quality and quantity of social interactions (Griffith 2004; Putnam 1995). There are many different levels of social capital such as community, family, and individual social capital. Individual social capital is often reflected in the extent of an individual's social networks and their quality that is assessed on the basis of whether they are trusting (Portes 1998).

Mother's social capital is expected to influence mother's preferences, productivity, and access to resources that in turn are linked to child human capital. An individual's trust in others, that is a component of individual social capital, indicates social preference, and relates to risk aversion and reciprocity (Almlund et al. 2011).

Moreover, trust relates to an individual's personality traits or non-cognitive skills as it is a facet of the personality domain known as 'agreeableness', that is defined as 'the tendency to act in a cooperative, unselfish manner' (Almlund et al. 2011) that in turn is expected to determine child human capital through increasing the productivity of production technology (Fuchs 1993). Except of being part of an aspect of mother's non-cognitive skills, trust is also found to be positively correlated with other aspects of non-cognitive skills such as emotional stability and openness to experience and thus directly linked to child non-cognitive skills (Dohmen et al. 2008).

Finally, a higher level of social capital is expected to affect child human capital by enabling mothers to access material and other resources, such as information and other support (Tuan et al. 2005) and by helping households to cope with negative economic shocks (Carter et al. 2003).

Although social capital is postulated among the key family factors influencing child competencies (Masten et al. 1998), this influence may become less pronounced as the child grows older and establishes networks that are independent of the household.

In order to develop a measure of mother's social capital, I combined information on the extent of mother's formal and informal social networks in the community and different forms of trust (see Table A5 for details). Means of normalised values of mother's social capital measure across countries are presented in Table 1.

3.10 Mother's aspirations for the child's level of education

The framework presented above suggests that parental preferences influence the level of the child's human capital. The Young Lives data include information that could be used as a direct proxy of parental preferences over the child's level of human capital. In particular, caregivers were asked to report the level of education they would ideally like the child to achieve in the future. Table 1 presents means of educational aspirations of parents measured in years of schooling across countries. In general, most mothers in all four countries reported that they would like their child to achieve a university degree, and this is reflected in the similar average of mother's aspired schooling for the child across the four countries.

4. Results

Associations between indicators of the different dimensions of parental background and the three child human capital measures are reported in Tables 2 to 4. When discussing the results, I first draw attention to coefficients that are significantly different from zero, but in some cases I also consider coefficients that are not statistically significant and have a large magnitude. This is because statistical significance in this case is expected to be affected by the high degree of multicolinearity between parental background variables and the sample size is much smaller for children aged 12 and 15 (half that of children aged 5 and 8).

Statistical associations reported run along many different dimensions – different parental background markers, different child outcomes, different countries and different age groups of children – that makes results difficult to digest. Therefore I organise the interpretation of results as follows: for each child outcome I discuss the direction of its association separately with each parental background dimension across the different age-specific subsamples of children and, in the case that the latter associations are systematically sizeable across age groups, I also present graphs of the coefficients across countries and over the different age groups to identify any systematic differences in the magnitudes of these associations between samples of younger and older children within each country. The main purpose of the graphs is to document age-patterns in the associations between a given parental background indicator and child outcomes, which is why coefficients are presented in a single age series for each country, although coefficients estimates at different ages are not based on the sample of the same individuals. Moreover, to keep exposition simple, I do not present 95% confidence intervals for coefficients in the graphs, but these can be derived using estimates of the coefficients and their standard errors reported in the tables.

4.1 Child's height-for-age Z-score

Table 2 presents regression results for the child HAZ score across countries and age groups. The wealth index is positively and significantly associated (in most of the cases) with child HAZ score across countries and age groups. However, Figure 1 suggests that this association is not systematically larger or smaller for older children. The correlation of mother's and father's education with child HAZ score is positive in the majority of cases, and in the cases it is negative, it is never statistically significantly different from zero. Overall, however, the estimated coefficients of parental education variables are insignificant in the majority of cases.

Table 2. *Regressions for HAZ score across countries and at different ages*

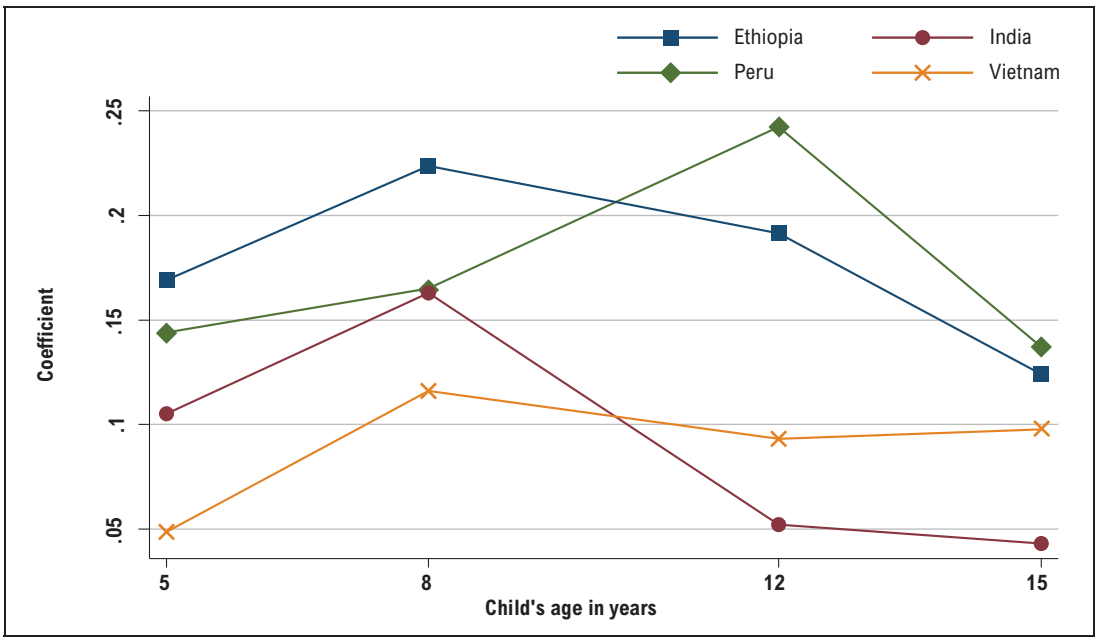
	Age 5				Age 8			
	Ethiopia	India	Peru	Vietnam	Ethiopia	India	Peru	Vietnam
Wealth index	0.169***	0.105***	0.144***	0.049	0.224***	0.163***	0.165***	0.116***
	(0.038)	(0.033)	(0.031)	(0.033)	(0.036)	(0.035)	(0.030)	(0.037)
Mother's education	0.022**	0.003	0.018***	0.028***	0.008	0.018**	0.010	0.017**
	(0.009)	(0.007)	(0.007)	(0.007)	(0.008)	(0.007)	(0.006)	(0.008)
Father's education	0.011	0.012**	0.008	0.022***	-0.005	0.004	0.015**	0.018**
	(0.008)	(0.005)	(0.007)	(0.007)	(0.008)	(0.006)	(0.007)	(0.008)
Mother's height	0.047***	0.042***	0.063***	0.050***	0.039***	0.041***	0.059***	0.047***
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mother's bargaining power	0.010	0.025	-0.050**	-0.018	0.010	0.022	-0.044**	-0.014
	(0.025)	(0.023)	(0.020)	(0.019)	(0.026)	(0.023)	(0.020)	(0.021)
Mother's non-cognitive skills	-0.014	0.043**	0.003	-0.014	-0.004	-0.004	-0.011	0.031
	(0.028)	(0.022)	(0.022)	(0.021)	(0.025)	(0.025)	(0.022)	(0.026)
Mother's subjective well-being	0.074***	0.065***	0.033	0.076***	0.034	0.005	0.023	0.042
	(0.028)	(0.025)	(0.021)	(0.023)	(0.026)	(0.026)	(0.020)	(0.024)
Mother's social capital	-0.029	-0.003	0.026	0.004	-0.010	0.029	0.031	-0.001
	(0.033)	(0.023)	(0.024)	(0.021)	(0.033)	(0.023)	(0.054)	(0.024)
Mother's aspirations for child's education	-0.002	0.012	0.042***	0.003	0.020	0.014**	0.062***	0.002
	(0.015)	(0.009)	(0.013)	(0.011)	(0.012)	(0.007)	(0.016)	(0.011)
R-squared	0.17	0.18	0.40	0.37	0.15	0.21	0.36	0.30
Observations	1908	1937	1950	1956	1881	1923	1937	1943

	Age 12				Age 15			
	Ethiopia	India	Peru	Vietnam	Ethiopia	India	Peru	Vietnam
Wealth index	0.191***	0.052	0.242***	0.093	0.124**	0.043	0.137***	0.098**
	(0.052)	(0.043)	(0.058)	(0.053)	(0.055)	(0.045)	(0.041)	(0.043)
Mother's education	0.023	0.029***	0.001	-0.012	0.015	0.033***	0.011	-0.016
	(0.014)	(0.010)	(0.010)	(0.011)	(0.013)	(0.011)	(0.009)	(0.010)
Father's education	0.001	-0.003	0.006	0.026**	0.009	-0.007	-0.002	0.027***
	(0.013)	(0.008)	(0.012)	(0.012)	(0.013)	(0.009)	(0.010)	(0.010)
Mother's height	0.034***	0.032***	0.062***	0.050***	0.040***	0.038***	0.059***	0.059***
	(0.007)	(0.06)	(0.007)	(0.006)	(0.007)	(0.006)	(0.006)	(0.005)
Mother's bargaining power	-0.039	0.029	-0.017	-0.045	-0.064	0.010	0.012	-0.021
	(0.040)	(0.034)	(0.031)	(0.033)	(0.042)	(0.032)	(0.029)	(0.029)
Mother's non-cognitive skills	0.042	-0.003	0.053	0.020	-0.060	-0.016	-0.012	-0.054**
	(0.041)	(0.033)	(0.034)	(0.032)	(0.043)	(0.030)	(0.034)	(0.027)
Mother's subjective well-being	0.047	0.075**	-0.012	0.062**	0.006	0.041	0.045	0.032
	(0.040)	(0.034)	(0.031)	(0.032)	(0.041)	(0.035)	(0.033)	(0.030)
Mother's social capital	-0.027	-0.020	-0.012	-0.095***	0.048	0.007	-0.102	-0.028

	Age 12				Age 15			
	Ethiopia	India	Peru	Vietnam	Ethiopia	India	Peru	Vietnam
	(0.044)	(0.037)	(0.037)	(0.034)	(0.075)	(0.036)	(0.095)	(0.031)
Mother's aspirations for child's education	-0.002	-0.010	0.021	0.058**	-0.015	0.035***	0.025	0.032
	(0.016)	(0.012)	(0.020)	(0.023)	(0.017)	(0.014)	(0.016)	(0.020)
R-squared	0.2	0.14	0.41	0.25	0.23	0.16	0.31	0.26
Observations	974	977	680	988	968	970	669	967

Notes: Robust standard errors in parentheses, ** significant at 5%, *** significant at 1%. All specifications also included controls for child's age in months, child's birth order, whether the caregiver is the biological mother, mother's age, mother's ethnicity, a dummy for whether place of residence is urban, and region dummies, but coefficients are not reported.

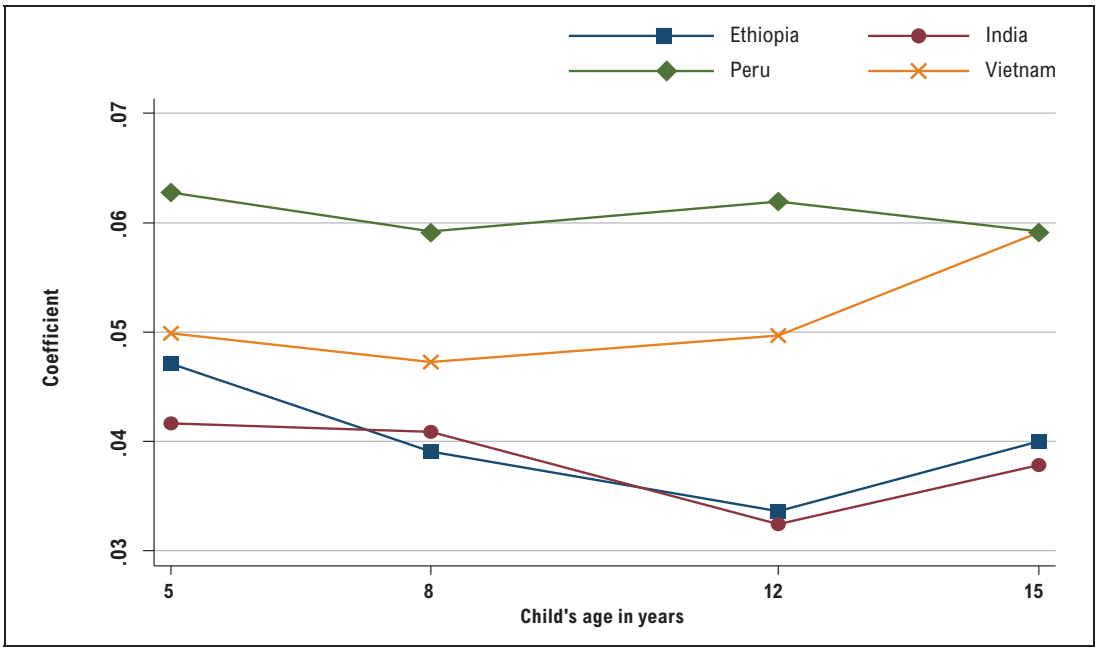
Figure 1. *Size of the coefficient of wealth index in child HAZ score regressions*



Source: Young Lives Study 2006 and 2009.

Table 2 also suggests a strong intergenerational correlation of height that could be, at least partly, explained on the basis of a genetic mechanism. Figure 2 shows that this intergenerational correlation is similar for all age groups within each country and that the coefficient of mother's height is systematically higher in Peru, followed by Vietnam and very similar for India and Ethiopia for all age groups. Mother's bargaining power does not seem to have a systematic relationship with child HAZ score except in the case of Peru, where the association is negative and significant for those aged 5 and 8 years old. The negative correlation of the mother's bargaining power with child's HAZ is not consistent with conventional wisdom and may possibly be explained by the fact that mothers with higher intra-household decision-making power and more control over resources may allocate more time on market rather than household production and thus more control over resources may lead to less maternal involvement in child care. Mother's non-cognitive skills do not seem to be an important predictor of child HAZ except for children aged 5 in India and 15 in Vietnam, but the association is positive in the former and negative in the latter case.

Figure 2. *Size of the coefficient of mother's height in child HAZ score regressions*



Source: Young Lives Study 2006 and 2009.

The coefficients of the mother's subjective well-being are positive for all countries and age groups (except of the case of Peru at age 12), but they are significant for 5-year-old children except of Peru and for 12-year-old children in India and Vietnam. The finding that mother's subjective well-being matters mostly for 5 year olds is consistent with the hypothesis that mother's life satisfaction is more likely to be important in the early years of the child's life cycle.

Mother's social capital does not seem to explain systematically the variation in child HAZ and its association with HAZ is not always positive. In fact, the only case where the association between mother's social capital and child HAZ is significant is for 12-year-old children in Vietnam, where the association is negative. This negative association is not necessarily surprising, as Portes (1998) highlights that social capital may have negative consequences due to excess claims on group members and the reinforcement of harmful norms. Moreover, higher level of social capital is associated with higher confidence in the available health services that may crowd out maternal involvement in the care of the child.

Finally, correlations between mother's aspirations for the child's education are positive and significant only in the case of Peru for 5 and 8 year olds, for India for children aged 8 and 15, and for Vietnam for 12-year-old children.

In sum, we find evidence that family income is positively associated with child HAZ score across all countries and that this association persists at all stages of childhood, but that this income gradient does not increase or decrease with child age.[11] This is consistent with the prediction of the framework presented earlier suggesting that parents with higher SES may

11 The difference in the magnitude of the coefficients across different age-groups of children is not only expected to reflect age effects but also cohort, and time effects. One could possibly and maybe plausibly assume away time effects by arguing that at least some parental background dimensions are fixed and thus not sensitive to transitory time shocks. In order to deal with cohort effects, I estimated HAZ score regressions separately for each cohort sample combining observations at different ages and tested whether the coefficient of each background dimension changes significantly as each cohort ages. I found no significant change with age in the coefficients of all background dimensions.

have stronger preferences over investment on child health, are able to buy more and better quality health inputs and combine them more efficiently, and this is why their children exhibit higher levels of health. Nevertheless, the link between parental SES and child health suggested by the correlation of HAZ score and parental education is rather weak across countries and age groups. Moreover, our results seem to be consistent with an intergenerational transmission of health in all countries that persists over childhood and adolescence. We also find evidence that mother's subjective well-being is positively associated with child health across countries at age 5 only and that mother's aspirations are positively associated with child health except in Ethiopia, but not for all age groups. Finally, the evidence suggests that all other background factors are either not significantly associated with child health across countries and age groups or that their association may be country and age-specific.

4.2 Child cognitive skills

Table 3 presents regression results for child PPVT score for all countries and age groups of children. Results indicate a positive association of PPVT score with the household's wealth index and parental education for all countries and age groups. This seems to support a link between parental SES and child cognitive skills. Figures 3, 4, 5, and 6, however, provide no evidence of increasing or decreasing SES gradients in cognitive achievement over a child's life cycle within any of the four countries.[12]

Table 3. *Regressions for PPVT score across countries and age groups*

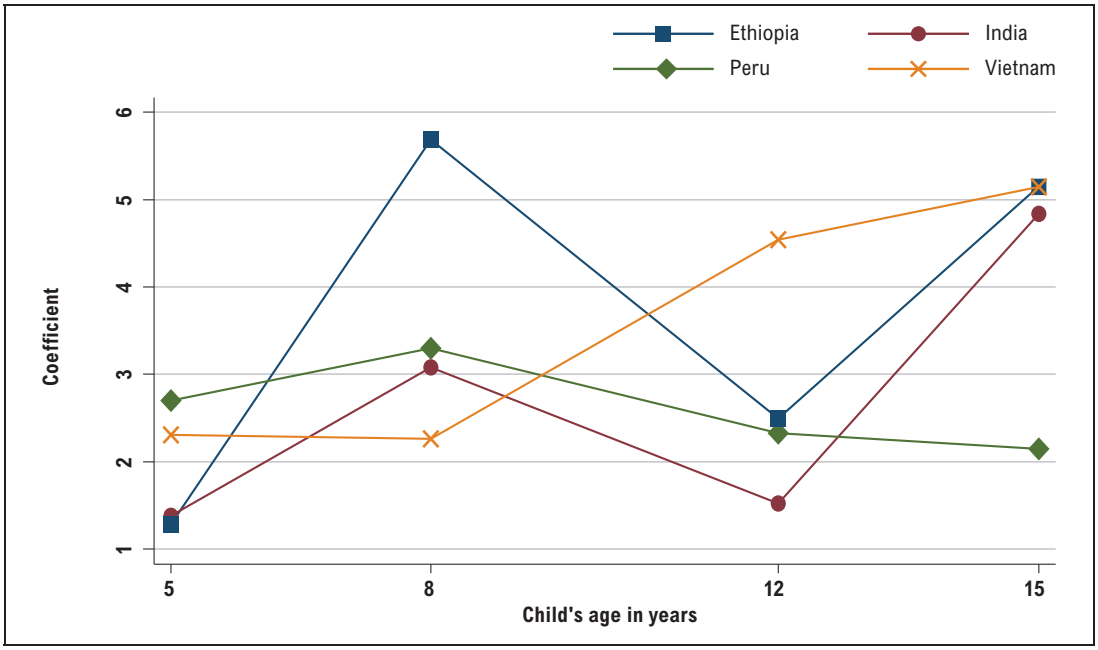
	Age 5				Age 8			
	Ethiopia	**India**	**Peru**	**Vietnam**	**Ethiopia**	**India**	**Peru**	**Vietnam**
Wealth index	1.284***	1.380**	2.701***	2.310***	5.688***	3.083***	3.297***	2.263***
	(0.467)	(0.701)	(0.561)	(0.618)	(1.046)	(0.780)	(0.363)	(0.689)
Mother's education	0.535***	1.097***	0.172	0.370**	0.783***	0.727***	0.421***	0.860***
	(0.113)	(0.145)	(0.125)	(0.146)	(0.274)	(0.197)	(0.085)	(0.179)
Father's education	0.130	0.361***	0.276**	0.551***	0.626**	0.394***	0.506***	0.544***
	(0.092)	(0.121)	(0.136)	(0.135)	(0.243)	(0.148)	(0.087)	(0.166)
Mother's height	0.058	-0.037	-0.121	0.089	0.072	-0.028	-0.035	0.051
	(0.045)	(0.071)	(0.069)	(0.062)	(0.109)	(0.088)	(0.047)	(0.080)
Mother's bargaining power	0.090	-0.306	-0.023	-1.207***	-0.093	-0.061	0.122	-0.277
	(0.275)	(0.454)	(0.368)	(0.370)	(0.653)	(0.618)	(0.248)	(0.479)
Mother's non-cognitive skills	-0.033	0.108	0.180	0.156	2.235***	2.643***	0.504**	0.982
	(0.274)	(0.429)	(0.383)	(0.384)	(0.682)	(0.665)	(0.255)	(0.585)
Mother's subjective well-being	0.322	1.910***	0.883**	0.396	-0.616	-0.590	0.369	-0.309
	(0.260)	(0.522)	(0.352)	(0.425)	(0.687)	(0.616)	(0.264)	(0.552)
Mother's social capital	0.585	0.253	-1.562***	-0.037	0.201	-0.412	-2.119***	-1.480***
	(0.343)	(0.473)	(0.428)	(0.377)	(0.915)	(0.599)	(0.691)	(0.551)
Mother's aspirations for child's education	0.096	0.308*	0.408**	0.149	0.846***	0.506***	0.957***	0.721***
	(0.104)	(0.173)	(0.192)	(0.168)	(0.293)	(0.172)	(0.206)	(0.220)
R-squared	0.3	0.26	0.3	0.36	0.47	0.23	0.45	0.32
Observations	1861	1851	1903	1747	1857	1901	1842	1848

12 When I try to account for cohort effects, I find some evidence of an increasing wealth gradient in cognitive achievement for Ethiopia between ages 5 and 8 and for India between ages 12 and 15. Similarly, I find evidence of an increasing maternal education gradient in cognitive skills for Vietnam between ages 5 and 8 and of an increasing paternal education gradient for Ethiopia between ages 5 and 8 and for Peru between 12 and 15, but a decreasing gradient for Vietnam between ages 12 and 15.

	Age 12				Age 15			
	Ethiopia	India	Peru	Vietnam	Ethiopia	India	Peru	Vietnam
Wealth index	2.495**	1.525	2.324***	4.543***	5.154***	4.834***	2.149***	5.147***
	(1.133)	(0.965)	(0.831)	(1.090)	(1.111)	(1.220)	(0.753)	(1.047)
Mother's education	0.492	0.263	0.466***	0.541**	0.314	0.924***	0.257	0.232
	(0.253)	(0.208)	(0.143)	(0.228)	(0.288)	(0.265)	(0.143)	(0.211)
Father's education	0.274	0.259	-0.116	1.001***	0.386	0.178	0.543***	0.224
	(0.250)	(0.166)	(0.185)	(0.258)	(0.253)	(0.211)	(0.188)	(0.234)
Mother's height	0.098	0.105	-0.066	0.254	0.131	0.186	0.010	0.041
	(0.127)	(0.117)	(0.088)	(0.133)	(0.139)	(0.145)	(0.091)	(0.112)
Mother's bargaining power	0.953	-0.106	0.712	-1.616**	-0.566	0.003	-0.487	-0.249
	(0.776)	(0.703)	(0.502)	(0.663)	(0.914)	(0.902)	(0.471)	(0.632)
Mother's non-cognitive skills	3.149***	0.729	0.804	-0.932	1.435	0.864	-0.045	0.063
	(0.767)	(0.763)	(0.529)	(0.720)	(0.942)	(0.924)	(0.490)	(0.593)
Mother's subjective well-being	0.283	2.852***	-1.032	-1.191	0.104	0.379	-0.159	-0.703
	(0.807)	(0.778)	(0.540)	(0.694)	(0.940)	(0.980)	(0.543)	(0.656)
Mother's social capital	-1.549	0.767	-0.473	0.303	0.770	1.963**	-5.016***	0.554
	(0.821)	(0.724)	(0.549)	(0.633)	(1.645)	(0.906)	(1.507)	(0.646)
Mother's aspirations for child's education	1.257***	1.961***	0.941**	2.422***	1.333***	2.945***	2.146***	2.347***
	(0.345)	(0.292)	(0.388)	(0.676)	(0.415)	(0.309)	(0.416)	(0.528)
R-squared	0.35	0.27	0.34	0.50	0.3	0.31	0.4	0.41
Observations	953	971	672	945	962	944	652	947

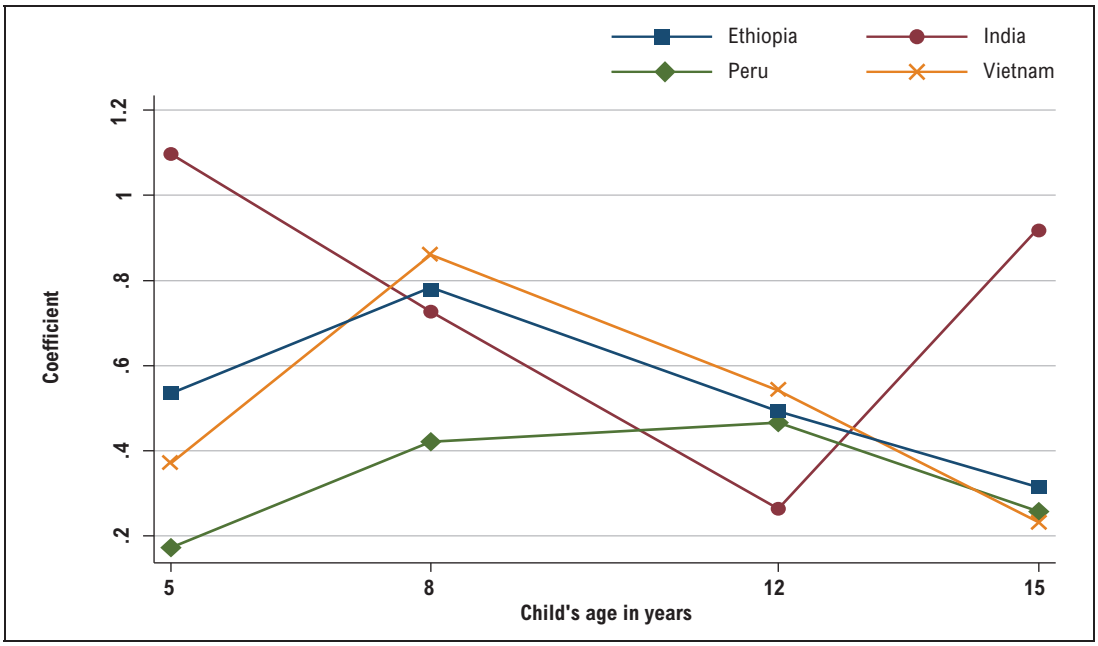
Notes: Robust standard errors in parentheses, ** significant at 5%, *** significant at 1%. All specifications also included controls for child's age in months, child's birth order, whether the caregiver is the biological mother, mother's age, mother's ethnicity, a dummy for whether place of residence is urban, and region dummies, but coefficients are not reported.

Figure 3. *Size of the coefficient of wealth index in child PPVT score regressions*



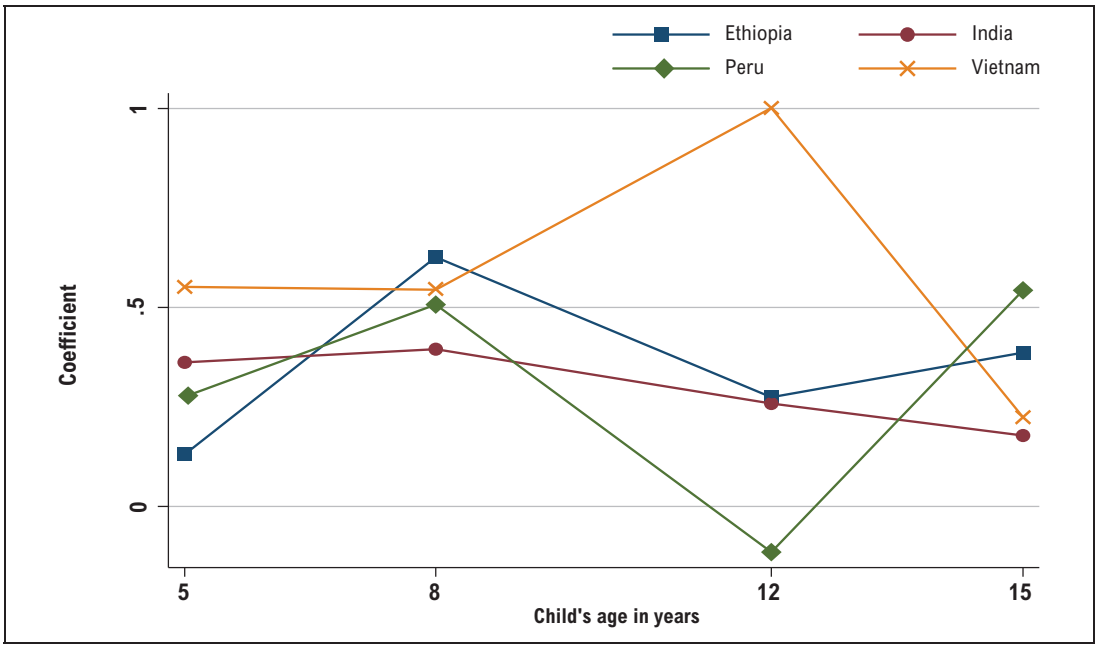
Source: Young Lives Study 2006 and 2009.

Figure 4. *Size of the coefficient of mother's education in child PPVT score regressions*



Source: Young Lives Study 2006 and 2009.

Figure 5. *Size of the coefficient of father's education in child PPVT score regressions*



Source: Young Lives Study 2006 and 2009.

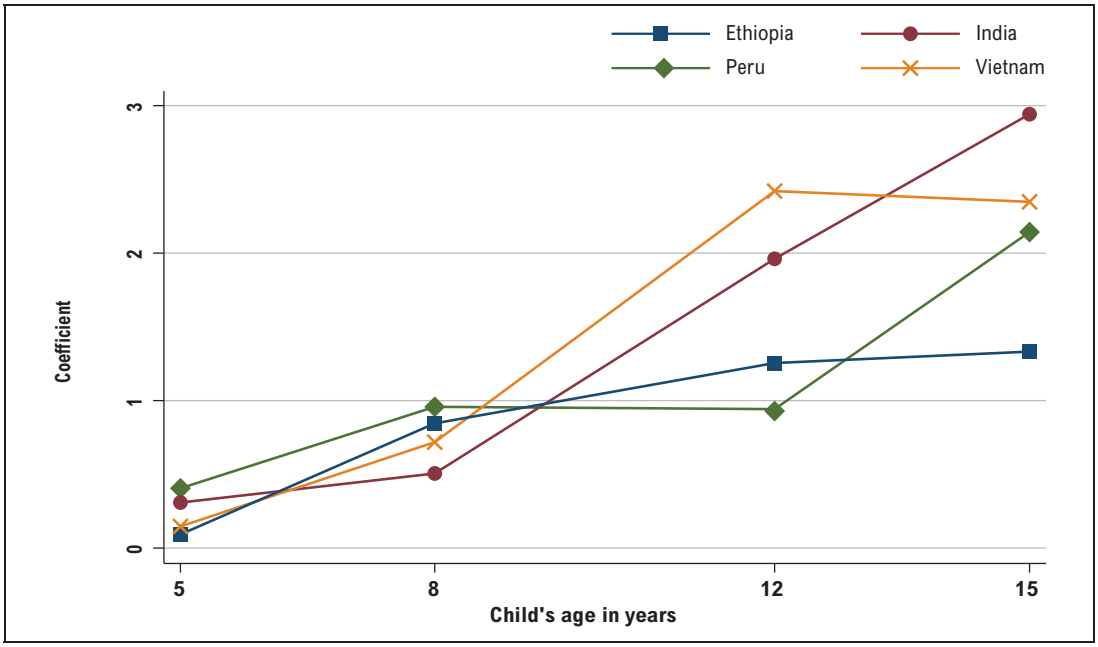
Maternal height exhibits no systematic relationship with child cognitive development and neither does mother's intra-household bargaining power, except for Vietnam where the association is negative at all ages. The latter pattern is similar to that observed for HAZ score in Peru and could be explained in terms of less maternal involvement in the cognitive stimulation of the child by mothers with more control over household resources. Mother's non-cognitive skills are positively and significantly associated with the child's PPVT score at

age 8, except for Vietnam. Mother's subjective well-being exhibits a positive and significant association with cognitive skills for India at ages 5 and 12, a pattern again very similar to that identified for HAZ.

Results in Table 3 indicate a significant and large negative association between mother's social capital and child PPVT score in Peru at all ages. Mother's social capital is also negatively correlated with the child's PPVT score at age 8 in Vietnam, but positively for 15 year olds in India. As discussed previously, mother's social capital may have both positive and negative implications for child's outcomes and as suggested by the evidence here, the negative consequences seem to outweigh the positive in most cases.

The correlation between mother's aspirations for the child's education with cognitive achievement is positive and significant for all countries and ages. Figure 6 suggests that the size of the coefficient of mother's aspirations is increasing with the age of the children in the sample and that this pattern is consistent across countries, supporting the suggestion that disparities in child cognitive skills by maternal aspirations over the child's education are more pronounced for older children.[13]

Figure 6. *Size of the coefficient of mother's aspirations for child education in child PPVT score regressions*



Source: Young Lives Study 2006 and 2009.

All in all, the evidence supports a strong positive link between parental SES, as measured by income and education, and child cognitive achievement at all ages and across all countries, but these associations seem to be stable rather than increasing with child age. The evidence also finds a positive correlation between mother's aspirations for the child's education and the child's cognitive development across countries that is systematically larger in magnitude for older children.

13 This pattern is consistent also within cohorts.

Other parental background factors seem to matter for child cognitive achievement only in a given country. In particular, mother's bargaining power and social capital are negatively associated with child PPVT score across age groups in Vietnam and Peru respectively, whereas mother's subjective well-being is positively associated with child cognitive achievement in India for some age groups.

4.3 Child non-cognitive skills

Regression results for child non-cognitive skills for all countries at ages 8, 12 and 15 are reported in Table 4. As in the case of child HAZ and PPVT score, the wealth index is positively correlated with child non-cognitive skills across all countries and age groups. In many of the cases, however, these associations are not statistically significant. Figure 7 suggests that wealth gradients in non-cognitive skills are increasing with age for Peru and Vietnam and show no clear pattern for the other two countries.[14] Mother's and father's education are positively associated with child non-cognitive skills across countries and age groups, but in most of the cases these associations are insignificant. Mother's height, intra-household bargaining power and subjective well-being do not show any systematic relationship with child non-cognitive skills.

Table 4. *Regressions for child's non-cognitive skills across countries and age groups*

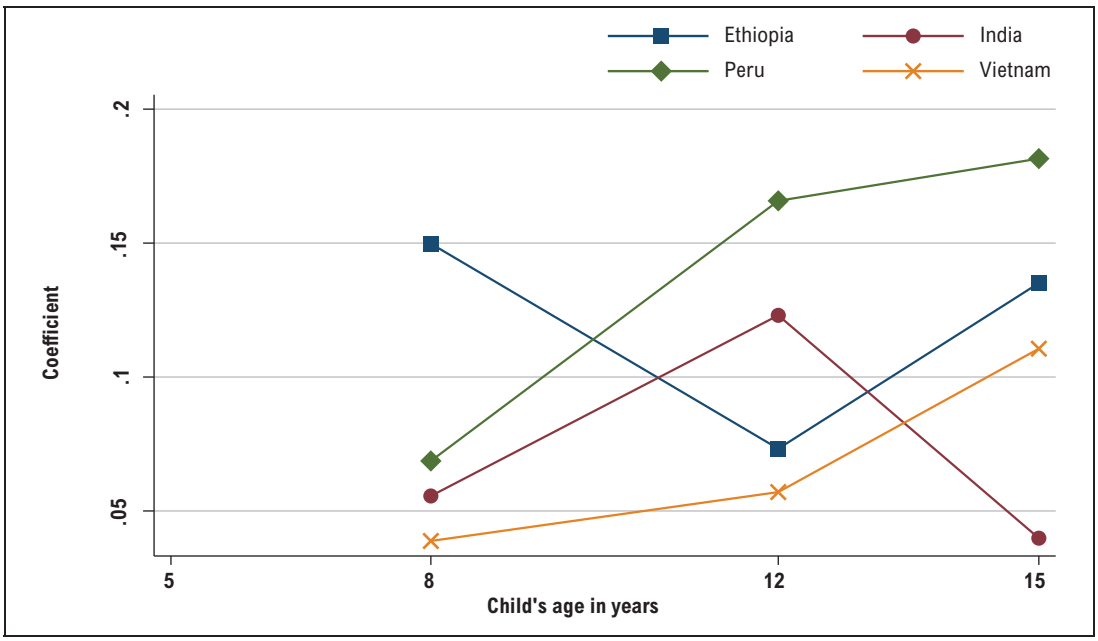
	Age 8				Age 12			
	Ethiopia	**India**	**Peru**	**Vietnam**	**Ethiopia**	**India**	**Peru**	**Vietnam**
Wealth index	0.150***	0.056	0.069**	0.039	0.073	0.123***	0.166***	0.057
	(0.030)	(0.030)	(0.032)	(0.036)	(0.040)	(0.042)	(0.055)	(0.056)
Mother's education	0.004	0.011	0.020***	0.010	-0.016	0.012	0.030***	0.017
	(0.008)	(0.006)	(0.008)	(0.008)	(0.010)	(0.009)	(0.012)	(0.012)
Father's education	0.007	0.005	-0.002	-0.008	0.034***	0.018**	0.010	0.026**
	(0.007)	(0.005)	(0.008)	(0.007)	(0.009)	(0.008)	(0.014)	(0.013)
Mother's height	-0.001	0.002	0.002	-0.001	0.002	0.007	0.006	0.001
	(0.004)	(0.003)	(0.004)	(0.003)	(0.005)	(0.005)	(0.007)	(0.005)
Mother's bargaining power	-0.036	-0.039	0.003	-0.025	0.037	-0.012	-0.035	-0.063
	(0.024)	(0.021)	(0.023)	(0.022)	(0.029)	(0.031)	(0.036)	(0.033)
Mother's non-cognitive skills	0.145***	0.387***	0.081***	0.196***	0.381***	0.318***	0.129***	0.240***
	(0.025)	(0.025)	(0.027)	(0.028)	(0.033)	(0.040)	(0.043)	(0.033)
Mother's subjective well-being	0.007	0.015	0.031	0.029	0.044	-0.044	-0.047	0.025
	(0.024)	(0.023)	(0.023)	(0.026)	(0.029)	(0.035)	(0.041)	(0.034)
Mother's social capital	0.207***	0.074***	0.146**	0.056**	0.074**	0.025	-0.038	-0.052
	(0.033)	(0.021)	(0.062)	(0.024)	(0.035)	(0.033)	(0.039)	(0.034)
Mother's aspirations for child's education	-0.011	0.021***	0.040**	0.037***	0.018	0.032**	0.032	0.058**
	(0.011)	(0.007)	(0.016)	(0.012)	(0.014)	(0.012)	(0.026)	(0.026)
R-squared	0.23	0.30	0.11	0.16	0.31	0.21	0.24	0.14
Observations	1877	1917	1921	1949	979	994	685	990

14 The difference in the coefficients of the wealth index in the regressions of non-cognitive skills for Peru and Vietnam between children aged 12 and 15 is not statistically significant.

	Age 15			
	Ethiopia	India	Peru	Vietnam
Wealth index	0.135***	0.040	0.182***	0.111
	(0.046)	(0.044)	(0.050)	(0.057)
Mother's education	0.009	0.012	0.049***	0.015
	(0.010)	(0.010)	(0.011)	(0.012)
Father's education	0.014	0.021**	-0.020	0.007
	(0.010)	(0.008)	(0.014)	(0.013)
Mother's height	0.003	0.008	-0.005	-0.002
	(0.005)	(0.005)	(0.007)	(0.006)
Mother's bargaining power	0.045	-0.058	-0.015	0.024
	(0.034)	(0.032)	(0.037)	(0.035)
Mother's non-cognitive skills	0.177***	0.001	0.143***	0.071**
	(0.039)	(0.033)	(0.041)	(0.034)
Mother's subjective well-being	0.016	0.027	0.010	0.030
	(0.035)	(0.033)	(0.040)	(0.033)
Mother's social capital	0.259***	0.160***	0.082	0.092**
	(0.069)	(0.034)	(0.121)	(0.040)
Mother's aspirations for child's education	0.010	0.069***	0.052**	0.058***
	(0.013)	(0.012)	(0.026)	(0.022)
R-squared	0.24	0.15	0.12	0.11
Observations	973	974	672	970

Notes: Robust standard errors in parentheses, ** significant at 5%, *** significant at 1%. All specifications also included controls for child's age in months, child's birth order, whether the caregiver is the biological mother, mother's age, mother's ethnicity, a dummy for whether place of residence is urban. and region dummies, but coefficients are not reported.

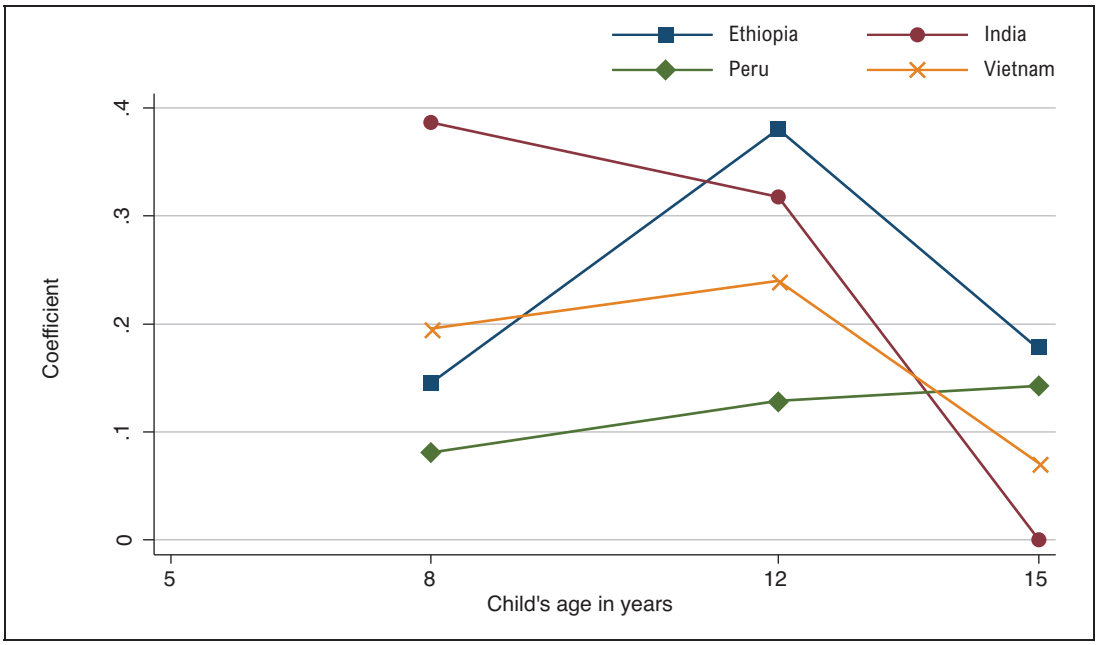
Figure 7. *Size of the coefficient of wealth index in child non-cognitive skills regressions*



Source: Young Lives Study 2006 and 2009.

Estimated coefficients of mother's non-cognitive skills are significant and positive except for India at age 15, a pattern consistent with an intergenerational transmission of non-cognitive skills. Figure 8 suggests that the intergenerational correlation of non-cognitive skills is highest at age 12 for Ethiopia and Vietnam, and at 8 and 15 for India and Peru respectively.[15] The mother–offspring correlations in non-cognitive skills may seem small compared to those from studies from high-income countries (Mayer et al. 2004; Duncan et al. 2005; Osborne Groves 2008; Anger 2011). This may be explained in terms of the age non-cognitive skills are measured, as in studies from high-income countries the offspring's non-cognitive skills are measured in adulthood, when they are expected to be much more stable compared to childhood and adolescence. If this instability of traits tends to decrease as children grow older, then we would expect to observe an increasing pattern in the intergenerational associations of non-cognitive skills, but this does not seem to be the case in the Young Lives data.

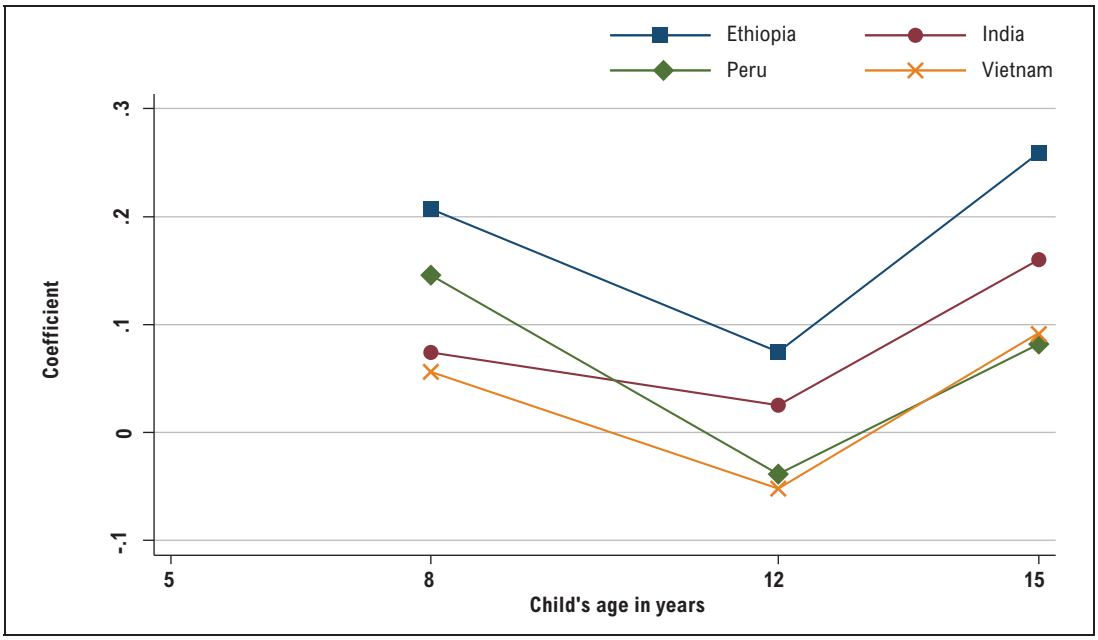
Figure 8. *Size of the coefficient of mother's non-cognitive skills in child non-cognitive skills regressions*



Source: Young Lives Study 2006 and 2009.

15 The difference in the coefficients of mother's non-cognitive skills in child's non-cognitive skills regressions between children aged 12 and 15 is significant for all countries except Peru.

Figure 9. *Size of the coefficient of mother's social capital in child non-cognitive skills regressions*



Source: Young Lives Study 2006 and 2009.

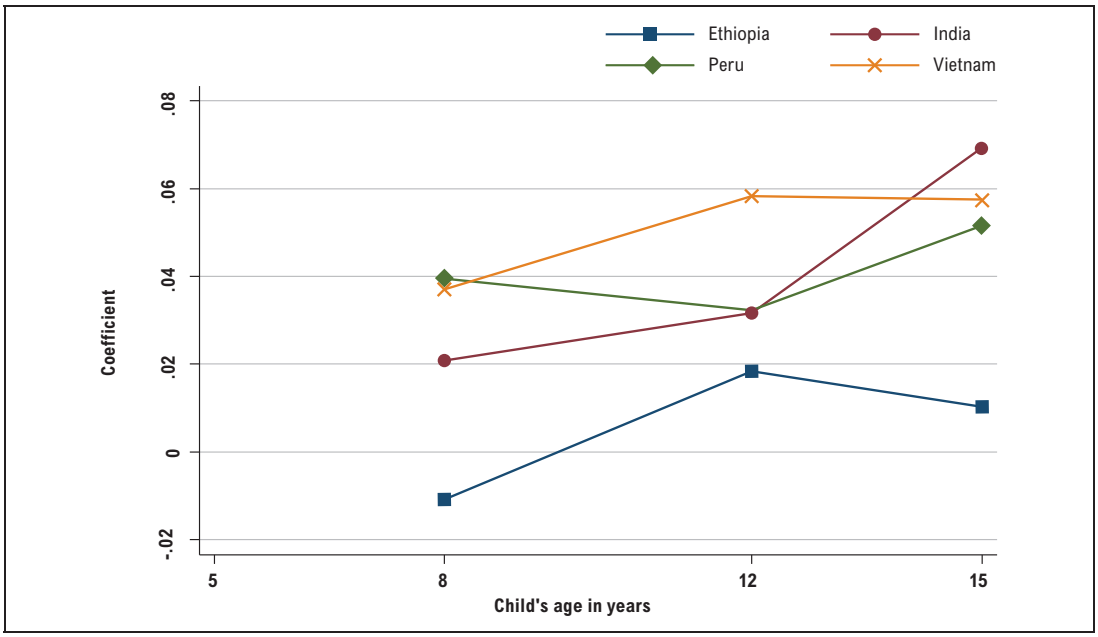
Moreover, mother's social capital seems also to be systematically and positively associated with child non-cognitive skills. Figure 9 suggests that these associations are highest among children aged 15 for all countries, and for all age groups are highest in Ethiopia, followed by India and then Vietnam and Peru. The increasing mother's social capital gradient in non-cognitive skills between ages 12 and 15[16] is not consistent with the hypothesis that mother's social capital becomes less important as the child grows older. The positive link between child non-cognitive skills and mother's social capital can be explained by the fact that mother's level of trust that is a component of our measure of social capital is also a trait linked to mother's non-cognitive skills (Almlund et al. 2011)

The correlation between mother's aspirations for the child's education and child non-cognitive skills is positive and significant for all age groups for India and Vietnam, but not for Ethiopia and Peru. Figure 10 suggests that the association between mother's aspirations for child's education and child's non-cognitive skills exhibits a pattern that is increasing with child age for all countries.[17]

16 The difference in the coefficients of mother's social capital in child's non-cognitive skills regressions between children aged 12 and 15 is positive and significant for all countries.

17 The difference in the coefficients of mother's aspirations for the child's education in child non-cognitive skills regressions between children aged 12 and 15 is positive and significant only for India.

Figure 10. *Size of the coefficient of mother's aspirations for child's education in child's non-cognitive skills regressions*



Source: Young Lives Study 2006 and 2009.

In sum, the evidence on the association of non-cognitive skills with different dimensions of parental background suggests that mother's personality traits such as self-efficacy, self-esteem, perception of respect and trust, as well as mother's aspirations for the child's education, are the background factors that matter most for the child's non-cognitive skills across countries and age groups and that parental SES doesn't matter that much for these type of skills. Results suggest that among all background factors, only maternal aspirations for child education exhibit an association with child non-cognitive skills that is increasing with child age across countries.

5. Conclusions

A large number of studies from low- and middle-income countries document a strong positive link between parental SES, as measured by income and education and child health and education outcomes, but very few studies have examined the link between parental SES and child cognitive and non-cognitive skills. Moreover, evidence on how the association between parental SES and child human capital evolve over the child's life cycle is scarce. One of the key problems of studies investigating the link between parental SES and child human capital at a given stage of childhood or over a period of the child's life cycle is that it is uncertain whether the observed associations and their pattern as the child ages remain robust to the inclusion of other parental background dimensions that are possibly associated with parental SES and child outcomes.

This paper addresses the above gaps in the literature by investigating the association of wide range of parental background dimensions, including parental income and education, but also dimensions such as mother's non-cognitive skills, intra-household bargaining power, social capital and aspirations for child's education with child health, cognitive, and non-cognitive

skills across four low- and middle-income countries and at different stages of childhood and adolescence using data from the Young Lives cohort study in Ethiopia, India, Peru, and Vietnam. I find evidence that the most systematic predictors of child health include household income and mother's health, but not parental education, and that mother's aspirations for the child's education and mother's subjective well-being are significantly and positively associated with child health in some countries, mainly for younger children.

Moreover, parental income and education are positively and significantly associated with child cognitive skills across all countries and the same holds for mother's aspirations for the child's education. Mother's social capital and intra-household bargaining power are also significantly associated with child cognitive achievement for some countries and age groups, but the direction of these associations is negative. I also find that mother's personality traits reflected in her non-cognitive skills, social capital, and aspirations for the child's education are strongly and positively associated with child non-cognitive skills across all countries and age groups, and the same is not the case for parental SES measures. Finally, results suggest that in most cases parental background gradients in child human capital are stable across age groups, except in the case of mother's aspirations gradients in cognitive and non-cognitive skills.

Overall, my results suggest that policies that seek to improve the material circumstances of the household and mother's education and socioemotional competencies may be effective in promoting child cognitive and socioemotional development in low- and middle-income countries.

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Appendix

Table A1. *Definitions, coding, and means of items included in the child non-cognitive akills index (Cronbach's Alpha=0.6)*

Variable	Item coding	Item means			
		Ethiopia	India	Peru	Vietnam
Self-efficacy					
If I try hard I can improve my situation in life	5-point; 1: strongly agree, 0: strongly disagree	0.89	0.86	0.83	0.81
Other people in my family make all the decisions about how I spend my time	5-point; 1: strongly agree, 0: strongly disagree	0.36	0.26	0.35	0.41
I like to make plans for my future studies and work	5-point; 1: strongly agree, 0: strongly disagree	0.81	0.74	0.81	0.80
If I study hard at school I will be rewarded by a better job in the future	5-point; 1: strongly agree, 0: strongly disagree	0.86	0.85	0.86	0.88
I have no choice about the work I do-I must do this sort of work	5-point; 1: strongly agree, 0: strongly disagree	0.42	0.48	0.45	0.65
Self-esteem					
I am proud of my clothes	5-point; 1: strongly agree, 0: strongly disagree	0.64	0.75	0.78	0.76
I am proud of my shoes	5-point; 1: strongly agree, 0: strongly disagree	0.63	0.74	0.77	0.74
I am never embarrassed because I do not have the right books, pencils or other equipment for school	5-point; 1: strongly agree, 0: strongly disagree	0.65	0.48	0.67	0.66
I am proud that I have the correct uniform	5-point; 1: strongly agree, 0: strongly disagree	0.75	0.74	0.75	0.78
I am proud of the work I have to do	5-point; 1: strongly agree, 0: strongly disagree	0.74	0.74	0.81	0.74

Notes: For 12-year-old children all items were coded at a four point scale with the lowest value expressing strong disagreement, and highest value strong agreement with the statement. For 12-year-old children four out of the five self-esteem items were phrased in a negative way. In particular the statements "I am proud of my clothes", "I am proud of my shoes", "I am never embarrassed because I do not have the right books, pencils or other equipment for school", "I am proud that I have the correct uniform" were phrased respectively as follows: "I am ashamed of my clothes", "I am ashamed of my shoes", "I am often embarrassed because I do not have the right books, pencils or other equipment for school", "I am worried that I do not have the correct uniform." When necessary the coding of the items has been reversed so that all items suggest higher self-efficacy and self-esteem.

Table A2. *Definitions, coding, and means of items included in the caregiver's intra-household bargaining power index (Cronbach's Alpha=0.81)*

Variable	Item coding	Item means			
		Ethiopia	India	Peru	Vietnam
Is caregiver responsible for making decisions about the land?	Binary; 1: yes, 0: no	0.64	0.24	0.65	0.42
Does caregiver control earnings from any of the land?	Binary; 1: yes, 0: no	0.67	0.24	0.63	0.30
Can caregiver make decisions about any of the animals?	Binary; 1: yes, 0: no	0.80	0.43	0.89	0.31
Does caregiver control use of earnings from livestock?	Binary; 1: yes, 0: no	0.82	0.42	0.85	0.21
Does caregiver make decisions about work for wage activities?	Binary; 1: yes, 0: no	0.75	0.61	0.67	0.30
Does caregiver control earnings from work from wage activities?	Binary; 1: yes, 0: no	0.46	0.33	0.77	0.81
Does caregiver make decisions about business and self-employment activities?	Binary; 1: yes, 0: no	0.79	0.41	0.79	0.26
Does caregiver control earnings from business and self-employment activities?	Binary; 1: yes, 0: no	0.81	0.48	0.82	0.22

Table A3. *Definitions, coding, and means of items included in caregiver's non-cognitive skills index (Cronbach's Alpha=0.7)*

Variable	Item coding	Item means			
		Ethiopia	India	Peru	Vietnam
Self-efficacy					
If I try hard I can improve my situation in life	5-point; 1: strongly agree, 0: strongly disagree	0.91	0.85	0.85	0.84
I like to make plans for my future	5-point; 1: strongly agree, 0: strongly disagree	0.85	0.78	0.85	0.79
I have no choice about which should to send my child to	5-point; 1: strongly agree, 0: strongly disagree	0.44	0.78	0.46	0.39
If my child gets really sick, I can do little to help him/her get better	5-point; 1: strongly agree, 0: strongly disagree	0.64	0.85	0.75	0.36
I can do little to help my child do well in school, no matter how hard I try	5-point; 1: strongly agree, 0: strongly disagree	0.64	0.79	0.74	0.34
Self-esteem					
I feel proud to show my friends or other visitors where I live	5-point; 1: strongly agree, 0: strongly disagree	0.73	0.80	0.81	0.73
I feel proud of my clothes	5-point; 1: strongly agree, 0: strongly disagree	0.66	0.80	0.77	0.71
I feel proud of the job done by my spouse	5-point; 1: strongly agree, 0: strongly disagree	0.76	0.83	0.85	0.80
The job I do makes me feel proud	5-point; 1: strongly agree, 0: strongly disagree	0.78	0.85	0.86	0.80
I feel proud of my children	5-point; 1: strongly agree, 0: strongly disagree	0.87	0.89	0.93	0.88
Perception of respect					
When I am at shops/market I am usually treated by others with fairness and with respect	5-point; 1: strongly agree, 0: strongly disagree	0.81	0.85	0.82	0.84
Other people in my street/village look down on me and my family	5-point; 1: strongly agree, 0: strongly disagree	0.76	0.82	0.77	0.85
My children's teachers are unfriendly or rude to me	5-point; 1: strongly agree, 0: strongly disagree	0.78	0.84	0.80	0.88

Notes: For caregivers of 5- and 12-year-old children all items were coded at a four point scale with the lowest value expressing strong disagreement and highest strong agreement with the statement. For caregivers of 5- and 12-year-old children the statement "I feel proud of my clothes" was phrased as "I am ashamed of my clothes". When necessary the coding of the items has been reversed so that all items suggest higher self-efficacy, self-esteem and perception of respect. For India, because no information was collected on mother's non-cognitive skills for children at age 15, we used the information collected when these children were 12 years old.

Table A4. *Definitions, coding, and means of items included in the caregiver's subjective well-being index (Cronbach's Alpha=0.88)*

Variable	Item coding	Item means			
		Ethiopia	India	Peru	Vietnam
Where on the ladder do you feel you personally stand at the present time?	9-point; 1: best possible life, 0: worst possible life	0.33	0.27	0.49	0.40
Where do you think you will be on the ladder in four years from now?	9-point; 1: best possible life, 0: worst possible life	0.55	0.41	0.70	0.56

Table A5. *Definitions, coding, and means of items included in caregiver's social capital index (Cronbach's Alpha=0.73)*

Variable	Item coding	Item means			
		Ethiopia	India	Peru	Vietnam
Social networks					
If you had a problem is there someone who would help you?	Binary; 1: yes, 0: no	0.85	0.95	0.84	0.93
How many people can you rely on in time of need?	8-point; 1: over 30, 0: none	0.30	0.33	0.25	0.28
Number of organisations, groups or informal associations to which the caregiver is a member	Binary: 1:one or more, 0: none	0.21	0.20	0.15	0.39
Number of organisations, groups or informal associations to which the caregiver holds a leading or powerful position	Binary: 1:one or more, 0: none	0.03	0.08	0.04	0.02
Number of organisations, groups or informal associations to which the caregiver is a member and in which a parent or close relative of the caregiver hold a leadership or powerful position before	Binary: 1:one or more, 0: none	0.01	0.02	0	0
Do you have relatives living in this community?	Binary; 1: yes, 0: no	0.89	0.91	0.88	0.94
Trust					
The nearest primary school provides a good quality education for children	5-point; 1: strongly agree, 0: strongly disagree	0.80	0.74	0.68	0.81
The nearest health facility provides a good quality health service for children	5-point; 1: strongly agree, 0: strongly disagree	0.74	0.69	0.61	0.75
The local police/militia do their job well	5-point; 1: strongly agree, 0: strongly disagree	0.70	0.61	0.42	0.75
People in this community can affect local government decisions that matter for people's lives	5-point; 1: strongly agree, 0: strongly disagree	0.59	0.63	0.53	0.68
Most people in this community are basically honest	5-point; 1: strongly agree, 0: strongly disagree	0.73	0.72	0.60	0.73
I believe the government does what is right for people like me	5-point; 1: strongly agree, 0: strongly disagree	0.74	0.62	0.41	0.84
I am confident of the ability of government officials to do their job	5-point; 1: strongly agree, 0: strongly disagree	0.68	0.66	0.50	0.77
I feel I can trust my neighbours to look after my house if I am away	5-point; 1: strongly agree, 0: strongly disagree	0.78	0.80	0.63	0.79
I feel I can trust people in this community to look after my child	5-point; 1: strongly agree, 0: strongly disagree	0.74	0.79	0.43	0.77
I think it is safe for my child to go out on the street on his/her own	5-point; 1: strongly agree, 0: strongly disagree	0.61	0.82	0.30	0.44

Notes: For caregivers of 5- and 12-year-old children all items were coded at a four point scale with the lowest value expressing strong disagreement and highest strong agreement with the statement. When necessary the coding of the items has been reversed so that all items suggest higher agreement with the given statement and that higher values of the resulting scale are associated with either a more extensive social network or more trust.

Parental Background and Child Human Capital Development Throughout Childhood and Adolescence: Evidence From Four Low- and Middle-Income Countries

Although there are a vast number of empirical studies documenting a strong positive link between parental socio-economic status (SES) and child outcomes, we do not know whether these associations remain robust when other parental background dimensions are controlled. This working paper investigates the association of child human capital indicators with a wide range of parental background dimensions across four low- and middle-income countries, and at different stages of childhood and adolescence, using data from the Young Lives cohort study in Ethiopia, India, Peru, and Vietnam.

The key finding is that parental income is strongly and positively associated with child nutritional status and cognitive achievement across all countries and at all stages of childhood and adolescence, even after controlling for other background dimensions, but the same does not hold for parental education. Child non-cognitive skills across all countries and at different ages, however, are mostly predicted by the mother's personality traits reflected in her non-cognitive skills, social capital, and aspirations for the child's education. Associations of parental background factors with child human capital measures do not change systematically with child age, except that mother's aspirations for child education exhibits a positive association with child cognitive and non-cognitive skills that is increasing in child age across countries.

Overall, the results suggest that policies that seek to improve the material circumstances of the household and mother's education and socioemotional competencies may be effective in promoting child cognitive and socioemotional development in low- and middle-income countries.

Young Lives

An International Study of Childhood Poverty

About Young Lives

Young Lives is an international study of childhood poverty, involving 12,000 children in 4 countries over 15 years. It is led by a team in the Department of International Development at the University of Oxford in association with research and policy partners in the 4 study countries: Ethiopia, India, Peru and Vietnam.

Through researching different aspects of children's lives, we seek to improve policies and programmes for children.

Young Lives Partners

Young Lives is coordinated by a small team based at the University of Oxford, led by Professor Jo Boyden.

- *Ethiopian Development Research Institute, Ethiopia*
- *Pankhurst Development Research and Consulting plc, Ethiopia*
- *Centre for Economic and Social Studies, Hyderabad, India*
- *Save the Children India*
- *Sri Padmavathi Mahila Visvavidyalayam (Women's University), Andhra Pradesh, India*
- *Grupo de Análisis para el Desarollo (GRADE), Peru*
- *Instituto de Investigación Nutricional, Peru*
- *Centre for Analysis and Forecasting, Vietnamese Academy of Social Sciences, Vietnam*
- *General Statistics Office, Vietnam*
- *Oxford Department of International Development, University of Oxford, UK*

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