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## **Family Socio-economic Status, Mother's Psychosocial Skills and Children's Human Capital: Evidence from Four Low- and Middle-income Countries**

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### **Introduction**

Family background has been considered as one of most important factors associated with child development across different settings (Brooks-Gunn and Duncan 1997; Grantham-McGregor et al. 2007). There is evidence from industrialized countries supporting a strong link between different background factors, such as parental socio-economic status (SES), and parental cognitive and psychosocial skills on the one hand, and children's cognitive and psychosocial skills, on the other; these factors in turn are important determinants of educational achievement, earnings, and other key outcomes in later life (Osborne-Groves 2005a; Blanden et al. 2007; Cunha et al. 2006).

In the context of developing countries, there are few recent empirical studies investigating parental background correlates of children's cognitive skills (for example, Paxson and Schady 2007; Ardila et al. 2010; Fernald et al. 2011) and even fewer studies looking at background factors associated with children's psychosocial skills (for example, Dercon and Krishnan 2009; Dercon and Sanchez 2011). The few existing studies have considered the roles of parental SES, as measured by income or education, in shaping a child's cognitive and psychosocial skills and the extent to which a mother's cognitive and psychosocial skills predict the same skills in her child, but there is no evidence, to date, from developing countries, on the extent to which the mother's skills predict not only the same

but also other skills in her children. Moreover, although existing evidence supports a strong positive link between parental SES and child's developmental indicators, very little is known about whether this association is robust when controlling for other possible omitted background factors (Behrman 2010: 4904).

In this chapter, we address these gaps in the literature by looking at the association between parental SES and mother's psychosocial skills on the one hand, and the child's human capital at the age of 8 years on the other, in Ethiopia, India (the state of Andhra Pradesh), Peru, and Vietnam, using data from the Young Lives study. In particular, we investigate the following questions, on which there is little published evidence from developing countries:

- What is the extent of the intergenerational transmission of psychosocial skills?
- What is the link between the mother's psychosocial skills and the child's cognitive skills?
- What share of the association between the mother's psychosocial skills and the child's cognitive skills is mediated through the child's psychosocial skills?
- To what extent do maternal psychosocial skills explain the association between parental SES and children's cognitive and psychosocial skills?

We also investigate how the answers to these questions vary across the four study countries.

We find evidence that both parental SES and the mother's psychosocial skills are positively associated with children's cognitive and psychosocial skills across all countries and that the mother's psychosocial skills can partly explain the link between parental SES and the child's psychosocial skills but not the link between parental SES and cognitive skills. Overall, our findings suggest that twofold interventions, comprising programmes that raise household SES and programmes aiming to boost the mother's psychosocial competencies, may help promote child development in low- and middle-income countries.

The following section presents a discussion of the potential channels via which parental SES and the mother's psychosocial skills may impact on children's human capital. We then discuss the data and measures we use in our analysis before presenting our results and offering an interpretation of our findings.

## **The relationship between parental SES, maternal psychosocial skills and children's human capital**

The term human capital has been used in the economics literature to denote human productive capacities and capabilities that comprise health and cognitive and psychosocial skills (Heckman 2007). Cognitive skills refer to various dimensions of intelligence, such as an individual's verbal fluency or their ability to solve new problems, whereas psychosocial skills comprise personality traits such as extraversion and emotional stability (Almlund et al. 2011).

Parental background and skills have been hypothesized to be among the key determinants of children's human capital, with parental SES being the background factor receiving the most attention in the literature (for example, Paxson and Schady 2007; Currie 2009). A positive relationship has been postulated in the literature between parental SES, as measured by income and education, and children's cognitive and psychosocial skills. One of the mechanisms linking parental SES and a child's skills may operate through differences in access to material and social resources (Currie 2009: 89) and another through differing reactions to stress-inducing conditions by both the children themselves and their parents (Bradley and Corwyn 2002). Moreover, parents with a higher education level are expected to create a more intellectually and socio-emotionally stimulating environment for their children (Hoff 2003).

Similarly, parental personality traits are expected to play an important role in the formation of the child's human capital. In particular, parents' psychosocial characteristics may be directly (genetically) transmitted to the child (Loehlin 2005: 205) and in this way also influence the formation of the child's cognitive skills, as the two sets of skills are thought to be interrelated (Cunha and Heckman 2007). Moreover, the effectiveness with which parents promote the child's human capital may be related to parental psychosocial competencies. For example, according to Fuchs (1993), a parent's sense of self-efficacy and socio-emotional abilities lead to the adoption of parenting styles that foster the development of his/her offspring.

The relationship between parental SES and children's skills is not expected to be independent of that between parental psychosocial skills and children's skills. There is evidence supporting a positive relationship between an individual's psychosocial traits in

adulthood and his/her earnings (Osborne-Groves 2005b). Thus, if parental psychosocial traits are predicting the child's skills and they are correlated with parental SES, then part of the association between parental SES and children's skills documented in empirical studies may reflect unobserved differences in parental psychosocial traits, as most of these studies fail to control for parental psychosocial competencies. Empirical studies from high-income countries, however, find evidence that the intergenerational correlation in personal traits and behaviour is barely affected by family SES (Mayer et al. 2004; Duncan et al. 2005; Anger 2011), but there is no published evidence of this kind from developing countries, a gap which this chapter begins to fill.

### **The data and the dependent and independent variables**

The data used in our analysis are collected as part of the Young Lives study, which is an international study of childhood poverty following the lives of 12,000 children in Ethiopia, India (the state of Andhra Pradesh), Peru, and Vietnam (see the Introduction to this volume; and for details of the sampling methodology and type of information collected, see Brock and Knowles 2012). For the purposes of this chapter, we restrict our analysis to the sample of children who were 8 years old at the time of the 2009 survey across the four countries.

#### *Dependent variables*

The Young Lives data include measures of children's cognitive and psychosocial skills at the age of 8. In particular, the 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 general measure of verbal cognitive development (for example, Rosenzweig and Wolpin 1994; Cueto et al. 2009; Schady 2011). Table 2.1, which presents the descriptive statistics for dependent and independent variables, includes averages of the PPVT test scores for all four countries.<sup>1</sup>

[Table 2.1 to come around here]

The Young Lives questionnaire also includes a set of items that are aiming to measure aspects of children's psychosocial competencies and in particular traits and

competencies related to self-esteem, self-efficacy and perception of respect from others<sup>2</sup> (see Dercon and Krishnan 2009; Dercon and Sanchez 2011, for discussions of these concepts and their definitions). Self-esteem, self-efficacy, and perception of respect are traits related to the personality domain of ‘neuroticism/emotional stability’ (Almlund et al. 2011: 71). This is why we combine all items in one measure we label ‘child’s psychosocial skills index’ (see Table A2.1 in the Appendix at the end of this chapter for details of the construct of this variable).<sup>3</sup> Table 2.1 includes averages of the psychosocial skills index, which suggest that the average value of the index is highest for the Vietnam sample and lowest for the Indian sample.

### *Independent variables*

The independent variables we use in the regression analysis of children’s cognitive and psychosocial skills include child demographic variables such as gender, age in months, and position in family birth order, as well as caregiver’s characteristics, such as whether the caregiver is the biological mother, and the age and ethnicity of the caregiver. We also include information on the region of residence and whether children live in a rural or urban community. As suggested by Table 2.1, in all countries the gender mix of children is balanced and, as expected, the average monthly age of children in the sample is very similar. Moreover, children in the Ethiopian sample have, on average, more older siblings than those in the other countries, with Vietnamese children having the lowest number of older siblings. In the vast majority of cases, the caregiver of the child is the biological mother. The mother’s average age is around 31 years in Ethiopia, Peru and Vietnam but slightly lower in India. The majority of households in Ethiopia, India, and Vietnam are rural, but in Peru 70 per cent of households are in urban communities.

In our analysis, we are particularly interested in the correlations of measures of a child’s human capital with measures of parental SES and parental psychosocial traits.

As measures of parental SES, we use parental education and household income. Parental education is measured by the mother’s and father’s years of schooling. Table 2.1 indicates that parental education is highest among the Peru sample, followed by the samples from Vietnam, India, and Ethiopia. Household income is measured using a wealth index, a standard proxy of income in medical, demographic, and economics literature (Filmer and

Pritchett 2006).<sup>4</sup> Table 2.1 includes average values of the wealth index (which takes values between 0 and 1) across the four countries.

As a measure of mother's psychosocial skills, we use a scale that combines a set of items aiming to assess the mother's self-efficacy, self-esteem, and perception of respect from others, which are very similar to the set of items used for the child (see Table A2.2 in the Appendix at the end of this chapter for details).<sup>5</sup> Again, Table 2.1 presents mean values of mothers' psychosocial skills index across countries and suggests that these values are highest for India and very similar for the other three countries.

## Results

### *Child's cognitive skills*

[Table 2.2 to go around here]

Table 2.2 presents regression results for the child's PPVT score across countries. For each country two specifications are estimated, one excluding and one including the mother's psychosocial skills.<sup>6</sup> The wealth index is positively and strongly correlated with the child's PPVT score in all countries.<sup>7</sup> Ethiopia stands out as the country where household income seems to be most strongly correlated with child's cognitive skills, whereas the correlation is quite similar across the other three countries. Parental education is positively associated with child's cognitive skills but the association is, on average, larger for mother's education than father's education, except in Peru, where the coefficients of mother's and father's education are similar. In general, the correlation of mother's education with child's PPVT score is highest in Vietnam, followed by Ethiopia, India, and Peru. The associations between father's education and child's PPVT score are similar in all countries except India, where they are lower.

Results in Table 2.2 suggest a strong positive association between mother's psychosocial skills and child's PPVT score, except in the case of Vietnam. These associations are stronger and quite similar in Ethiopia and India, but noticeably smaller in Peru. The inclusion of the mother's psychosocial skills among the explanatory variables does not change much the size of the estimated coefficients of the wealth index and the mother's

and father's education. Given the significant association between the mother's psychosocial skills and the child's cognitive achievement, this suggests a weak correlation between parental SES and mother's psychosocial skills.

The coefficients of all other explanatory variables in the child's PPVT regressions seem to have the expected sign that is also consistent with other studies (Fernald et al. 2006; Paxson and Schady 2007). In particular, there is a gender gap in cognitive achievement in India and Peru that is in favour of boys, but not in the other two countries. Older children, children with younger siblings, children who have older mothers, and children who live in urban communities tend to achieve higher scores across all countries. Another, perhaps surprising, result is that in Ethiopia, children whose primary caregivers are not the biological mothers perform much better than children whose primary caregivers are the biological mothers.

#### *Child's psychosocial skills*

Table 2.3 presents regression results for children's psychosocial skills.<sup>8</sup> Estimation results suggest that only the household's wealth index, maternal psychosocial skills and the binary indicator of whether residing in an urban community are strong predictors of the child's psychosocial skills across countries. As with the child's cognitive skills, the association between the wealth index and the child's psychosocial skills is highest in Ethiopia and similar in the other three countries.<sup>9</sup>

[Table 2.3 to go around here]

The correlation between the mother's and the child's psychosocial skills is positive and significant in all countries, but the magnitude of the association is highest in India, followed by Vietnam, Ethiopia, and Peru. Correlations between 0.1 and 0.3 have been considered small in the literature on the intergenerational transmission of personality traits (Loehlin 2005: 201). All studies in this literature, however, are from high-income countries and focus on parent-offspring correlations in personality traits in samples in which offspring are adults. Thus, if one considers that parent-offspring correlations are expected to increase as the child ages, because traits are becoming more stable with age, then our results may be

interpreted as suggesting a strong intergenerational transmission of psychosocial skills, especially in India.

The mother's education is significantly and positively associated with the child's psychosocial skills only in India and Peru, but the correlation between father's education and child's psychosocial skills is not statistically significant in all countries. (This is the case in the specification that includes the mother's psychosocial skills among the independent variables.) Overall, these results are consistent with those presented by Dercon and Krishnan (2009) and Dercon and Sanchez (2011), who have investigated the correlates of psychosocial competencies among children aged 12 years old using Young Lives data. The main difference between our analysis and these studies, and in particular the study by Dercon and Sanchez, is that we use aggregate measures of psychosocial competencies of mother and child and we report correlations for each country separately, whereas Dercon and Sanchez looked at the mother-child correlations separately for each psychosocial trait in a sample that pooled together 12-year-old children from all four countries.

Moreover, results in Table 2.2 indicate that the share of the association between household wealth and child's psychosocial skills explained by the mother's psychosocial skills ranges from around 50 per cent in India and Vietnam to almost zero in Peru, and is around 20 per cent in Ethiopia. The extent to which the mother's psychosocial skills explain the association between household wealth and the child's psychosocial skills depends on the strength of the correlation between the mother's psychosocial skills and household wealth, and the mother's and child's psychosocial skills. Therefore, given that our results in the case of the child's cognitive skills suggest a weak association between the mother's psychosocial skills and household wealth, the observed pattern is mainly driven by the strong association between the mother's and child's psychosocial skills. In other words, in all countries, except Peru, the result that children in households with access to more resources have, on average, better psychosocial skills, can be partly explained by the fact that mothers with better psychosocial skills are slightly more likely to live in such households and because there is strong transmission of the mother's psychosocial skills to the child.

Children from households in urban communities have higher psychosocial skills index scores compared to those in rural households in all four countries. Boys exhibit better psychosocial skills than girls in India but girls outperform boys in Vietnam. Our results also



suggest that children with younger siblings have better psychosocial skills in Ethiopia and India. As in the case of cognitive skills, in Ethiopia, children whose caregiver is not their biological mother have on average better psychosocial skills compared to children whose caregiver is their biological mother.

#### *The relationship between the child's psychosocial and cognitive skills*

Empirical studies on the intergenerational transmission of cognitive and psychosocial skills in high-income countries find that a parent's skills primarily predict the same skills in their children, but no other skills (Duncan et al. 2005: 23–5). If this is true in our case, and provided that child's psychosocial and cognitive skills are related, we would expect that the observed association between the mother's psychosocial skills and the child's cognitive skills is fully mediated through the association between the mother's and the child's psychosocial skills. We test this hypothesis by including the child's psychosocial skills in the PPVT score regressions that also include the mother's psychosocial skills among the explanatory variables.

[Table 2.4 around here]

Results are presented in Table 2.4. In the case of India and Peru, results suggest that around 30 per cent of the association between mother's psychosocial skills and child's cognitive skills is mediated through the child's psychosocial skills. The share of the association between the mother's psychosocial skills and the child's cognitive skills that is explained by the child's psychosocial skills is negligible in Ethiopia. Moreover, in Ethiopia and Vietnam, the child's psychosocial skills are not correlated with child's cognitive skills, a result that is not consistent with the hypothesis that there are synergies between cognitive and psychosocial skills (Cunha and Heckman 2007). This may be explained in two ways. First, our measure of psychosocial competencies is associated with one domain of personality, namely with 'neuroticism/emotional stability' and it may be the case that this domain is not related to performance in cognitive achievement tests in Ethiopia and Vietnam. Almlund et al. (2011: 87) suggest that different domains of personality such as neuroticism/emotional stability and conscientiousness can impact IQ scores; the former because children who are higher in neuroticism are more likely to experience test anxiety; and the latter because

children who are higher in conscientiousness are on average more motivated, curious, and persistent – characteristics that are linked to good performance in IQ tests that require factual knowledge. Thus, it may be that test anxiety does not much affect performance in the PPVT in Ethiopia and Vietnam. A second explanation of lack of correlation between psychosocial and cognitive skills may be the fact that since personality is not fully developed at such a young age: personality traits are unstable and thus our measure of psychosocial traits is expected to be plagued with error that leads to coefficients of smaller magnitude and insignificant results, and this problem may be more severe in the case of Ethiopia and Vietnam.

The significant and positive association between child's psychosocial and cognitive skills in India and Peru is consistent with evidence from other studies using Young Lives data (Helmerts and Patnam 2011; Outes-Leon et al. 2010).

Overall, the evidence on the association between maternal psychosocial skills and child's cognitive skills suggests that a part of the association is explained by the fact that the mother's psychosocial skills predict the child's psychosocial skills, which in turn predict the child's cognitive skills. But the evidence also suggests that the mother's psychosocial skills predict the child's cognitive skills over and above the child's psychosocial skills in all countries except Vietnam. An explanation of the latter finding may be that the mother's psychosocial skills pick up some variation in mother's cognitive skills, as the literature suggests that psychosocial skills are partly outcomes of cognitive processes (Almlund et al. 2011).<sup>10</sup>

Our findings suggest that the mother's skills primarily predict the same skills in the child, as supported by the strong intergenerational correlation of psychosocial skills, but that the mother's skills also play a role in the development of the child's other skills.

## **Conclusions**

A very large number of children in developing countries fail to reach their developmental potential as a result of deprivation in early life (Grantham-McGregor et al. 2007; Glewwe and Miguel 2008); this is partly determined by parental deprivation over a range of dimensions such as income, education, and skills and personality traits. There is evidence supporting a strong positive link between parental income and education on the one hand,

and child's development indicators, such as cognitive and psychosocial skills, on the other, in developing countries; nevertheless there is very little evidence on the role of parental skills in a child's development. In this chapter, we have begun to fill this gap by exploring the role of the mother's psychosocial skills in shaping the child's cognitive and psychosocial skills in a sample of 8-year-old children from Ethiopia, India, Peru, and Vietnam, using data from the Young Lives cohort study.

We find evidence of strong positive correlation between the mother's and the child's psychosocial skills across all four study countries, and especially in India. The mother's psychosocial skills can explain a large share of the correlation between household wealth and child's psychosocial skills in all countries, except Peru, which suggests that children in households with more material resources have stronger psychosocial skills because in these households the caregiver also has better psychosocial skills. Although, household wealth is a strong predictor of children's psychosocial skills across countries, the same is not the case for parental education.

The mother's psychosocial skills are positively associated with the child's cognitive skills in all countries except Vietnam, but only a part of this association is explained through the association between the mother's and the child's psychosocial skills. We also produce evidence suggesting no association between the child's psychosocial and cognitive skills in Ethiopia and Vietnam, which may be a result of measurement error or may suggest that the particular domain of personality picked up in our measures does not matter for cognitive achievement at this age and in these countries. Household wealth and parental education exhibit a strong association with a child's cognitive skills and only a very small share of this association can be explained by the mother's psychosocial skills.

Overall, our results seem to suggest that policies that seek to improve the material circumstances of the household and boost the education of the parents may be effective in promoting child development in low- and middle-income countries, and that programmes aiming to improve mother's psychosocial skills may also hold promise.

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<sup>1</sup> The maximum PPVT score is 204. Note that PPVT scores are not intended to be cross-nationally and cross-culturally comparable.

<sup>2</sup> Other usual terms used to describe psychosocial competencies are socio-emotional skills and personality traits (Almlund et al. 2011).

<sup>3</sup> Several studies in the literature use an aggregate measure of psychosocial variables to investigate the effect of psychosocial skills on other outcomes (Edwards 1977; Jencks 1979; Filer 1981). The Cronbach's alpha, a statistic used to diagnose the internal reliability of the items, i.e., whether the items jointly represent a common underlying conceptual construct/factor, is 0.62 (see Table A2.1 in the Appendix at the end of this chapter), which is smaller than the 0.7 threshold. However, this does not necessarily suggest that the items are not statistically congruent, but may be attributed to the fact that personality traits are unstable in childhood (Costa and McCrae 1994).

<sup>4</sup> For details of the components and construction of the wealth index in Young Lives data, see Woldehanna et al. (2011).

<sup>5</sup> The Cronbach's alpha of the items is 0.67 (see Table A2.2 in the Appendix at the end of this chapter), suggesting that the composite measure is an internally reliable measure of mother's 'neuroticism/emotional stability'.

<sup>6</sup> Note that in the regressions we included a standardized version of the mother's psychosocial skills index that is derived from the actual measure by subtracting the mean and dividing by the standard deviation of the country-specific distribution of the actual measure.

<sup>7</sup> Again in the regressions we included a standardized version of the wealth index.

<sup>8</sup> In the regressions we included a standardized version of the child's psychosocial skills index.

<sup>9</sup> This is the case in the specification that includes the mother's psychosocial skills among the independent variables.

<sup>10</sup> Part of the differences in mother's cognitive skills is expected to be picked up by other controls in the model such as mother's education.

## References

Almlund, Mathilde, Angela Duckworth, James Heckman and Tim Kautz (2011) *Personality Psychology and Economics*, IZA Discussion Paper No. 5500, Bonn: Institute for the Study of Labor

Anger, Silke (2011) *The Intergenerational Transmission of Cognitive and Non-cognitive Skills During Adolescence and Young Adulthood*, IZA Discussion Paper No. 5749, Bonn: Institute for the Study of Labour

Ardila, Alfredo, Monica Rosselli, Esmeralda Matute and Soledad Guajardo (2010) 'The Influence of the Parent's Educational Level on the Development of Executive Functions', *Developmental Neuropsychology* 28.1: 539–60

Behrman, Jere (2010) 'Investment in Education: Inputs and Incentives', in Dani Rodrik and Mark Rosenzweig (eds) *Handbook of Development Economics*, vol. 5, Amsterdam: North-Holland

Blanden, Jo, Paul Gregg and Lindsey Macmillan (2007) 'Accounting for Intergenerational Income Persistence: Noncognitive Skills, Ability and Education', *Economic Journal* 117.1: C43–C60

Boyden, Jo and Michael Bourdillon (eds) (2012) *Childhood Poverty Multidisciplinary Approaches*, Basingstoke: Palgrave Macmillan

Bradley, Robert and Robert Corwyn (2002) 'Socio-economic Status and Child Development', *Annual Review of Psychology* 53: 371–99

Brock, Karen and Caroline Knowles (2012) 'Doing Longitudinal Research: Opportunities and Challenges in a Study of Childhood' in Jo Boyden and Michael Bourdillon (eds), pp. 15-23

Brooks-Gunn, Jeanne and Greg Duncan (1997) 'The Effects of Poverty on Children', *Future Child* 7.2: 55–71

Costa, Paul and Robert McCrae (1994) 'Set Like Plaster: Evidence for the Stability of Adult Personality' in Todd Heatherton and Joel Weinberger (eds) *Can Personality Change?*, Washington, DC: American Psychological Association

Cueto, Santiago, Juan Leon, Gabriela Guerrero and Ismael Munoz (2009) *Psychometric Characteristics of Cognitive Development and Achievement Instruments in Round 2 of Young Lives*, Young Lives Technical Note 15, Oxford: Young Lives

Cunha, Flavio and James Heckman (2007) 'The Technology of Skill Formation', *American Economic Review* 97.2: 31-47

Cunha, Flavio, James Heckman, Lance Lochner and Dimitri Masterov (2006) 'Interpreting the Evidence on Life Cycle Skill Formation' in Eric Hanushek and Finis Welch (eds) *Handbook of the Economics of Education*, vol. 1, Amsterdam: North-Holland

Currie, Janet (2009) 'Healthy, Wealthy and Wise: Socio-economic Status, Poor Health in Childhood and Human Capital Development', *Journal of Economic Literature* 47.1: 87–122

Dercon, Stefan and Pramila Krishnan (2009) 'Poverty and the Psychosocial Competencies of Children: Evidence from the Young Lives Sample in Four Developing Countries', *Children, Youth and Environments* 19.2: 1–26

Dercon, Stefan and Alan Sanchez (2011) 'Long-Term Implications of Under-Nutrition on Psychosocial Competencies: Evidence from Four Developing Countries', Young Lives Working Paper 72, Oxford: Young Lives

Duncan, Greg, Ariel Kalil, Susan Mayer, Robin Tepper and Monique Payne (2005) 'The Apple Does Not Fall Far from the Tree' in Samuel Bowles, Herbert Gintis and Melissa Osborne-

Groves (eds) *Unequal Chances: Family Background and Economic Success*, Princeton: Princeton University Press

Edwards, Richard (1977) 'Personal Traits and "Success" in Schooling and Work', *Educational and Psychological Measurement* 37.1: 125–38

Fernald, Lia, Lynette Neufeld, Lauren Barton, Lourdes Schnaas, Juan Rivera and Paul Gertler (2006) 'Parallel Deficits in Linear Growth and Mental Development in Low-Income Mexican Infants in the Second Year of Life', *Public Health Nutrition* 9.2: 178–86

Fernald, Lia, Ann Weber, Emanuela Galasso and Lisy Rarsifandrihamanana (2011) 'Socio-economic Gradients and Child Development in a Very Low Income Population: Evidence from Madagascar', *Developmental Science* 14.4: 832–847

Filer, Randall (1981) 'The Influence of Affective Human Capital on the Wage Equation', *Research in Labor Economics* 4: 367–416

Filmer, Deon and Lant Pritchett (2001) 'Estimating Effects Without Expenditure Data – Or Tears: An Application to Educational Enrollments in States of India', *Demography* 38.1: 115–132

Fuchs, Victor (1993) 'Poverty and Health: Asking the Right Questions' in Eli Ginzberg and David Rogers (eds) *Medical Care and the Health of the Poor*, Boulder, CO: Westview Press

Glewwe, Paul and Edward Miguel (2008) 'The Impact of Child Health and Nutrition on Education in Less Developed Countries' in Paul Schultz and John Strauss (eds) *Handbook of Development Economics*, vol. 4, Amsterdam: North-Holland

Grantham-McGregor, Sally, Yin Bun Cheung, Santiago Cueto, Paul Glewwe, Linda Richter, Barbara Strupp and the International Child Development Steering Group (2007)

‘Developmental Potential in the First 5 Years for Children in Developing Countries’, *The Lancet* 369: 60–70

Heckman, James (2007) *The Economics, Technology and Neuroscience of Human Capability Formation*, IZA Discussion Paper No. 2875, Bonn: Institute for the Study of Labour

Helmers, Christian and Manasa Patnam (2011) ‘The Formation and Evolution of Childhood Skill Acquisition: Evidence from India’, *Journal of Development Economics* 95.2: 252–66

Hoff, Erica (2003) ‘The Specificity of Environmental Influence: Socio-economic Status Affects Early Vocabulary Development Via Maternal Speech’, *Child Development* 74.5: 1368-1378

Jencks, Christopher (1979) *Who Gets Ahead? The Determinants of Economic Success in America*, New York: Basic Books

Loehlin, John (2005) ‘Resemblance in Personality and Attitudes Between Parents and Their Children’ in Samuel Bowles, Herbert Gintis and Melissa Osborne-Groves (eds) *Unequal Chances: Family Background and Economic Success*, Princeton: Princeton University Press

Mayer, Susan, Greg Duncan and Kalil Ariel (2004) *Like Mother Like Daughter? SES and the Intergenerational Correlation of Traits, Behaviors and Attitudes*, Working Paper No. 415, Chicago, IL: Harris School of Public Policy Studies, University of Chicago

Osborne-Groves, Melissa (2005a) ‘Personality and the Intergenerational Transmission of Economic Status’, in Samuel Bowles, Herbert Gintis and Melissa Osborne-Groves (eds) *Unequal Chances: Family Background and Economic Success*, Princeton: Princeton University Press

Osborne-Groves, Melissa (2005b) ‘How Important is Your Personality? Labor Market Returns to Personality for Women in the US and the UK’, *Journal of Economic Psychology* 26: 827–41



Outes-Leon, Ingo, Alan Sanchez and Oswaldo Molinas (2010) 'Psychosocial Status and Cognitive Achievement in Peru', Working Paper 65, Oxford: Young Lives

Paxson, Christina and Norbert Schady (2007) 'Cognitive Development Among Young Children in Ecuador: The Roles of Wealth, Health and Parenting', *Journal of Human Resources* 42.1: 49–84

Rosenzweig, Mark and Kenneth Wolpin (1994) 'Are There Increasing Returns to the Intergenerational Production of Human Capital? Maternal Schooling and Child Intellectual Achievement', *Journal of Human Resources* 29.2: 670–93

Schady, Norbert (2011) 'Parent's Education, Mother's Vocabulary, and Cognitive Development in Early Childhood: Longitudinal Evidence from Ecuador', *American Journal of Public Health* 101.12: 2299–2306

Woldehanna, Tassew, Retta Gudisa, Yisak Tafere and Alula Pankhurst (2011) *Understanding Changes in the Lives of Poor Children: Initial Findings from Ethiopia Round 3 Survey*, Young Lives Country Report, Oxford: Young Lives

**Table 2.1 Descriptive statistics for dependent and independent variables across countries**

|  | <b>Ethiopia</b>  | <b>India</b>     | <b>Peru</b>      | <b>Vietnam</b>   |
|--|------------------|------------------|------------------|------------------|
| PPVT raw score                         | 68.35<br>(36.77) | 49.25<br>(26.71) | 46.73<br>(13.54) | 76.99<br>(23.82) |
| Child's psychosocial skills index      | 0.48<br>(0.14)   | 0.45<br>(0.13)   | 0.56<br>(0.10)   | 0.62<br>(0.10)   |
| Male                                   | 0.53<br>(0.50)   | 0.54<br>(0.50)   | 0.50<br>(0.50)   | 0.51<br>(0.50)   |
| Age (months)                           | 98.79<br>(3.99)  | 97.34<br>(3.90)  | 96.70<br>(3.54)  | 98.35<br>(3.78)  |
| Child's position in family birth order | 3.42<br>(2.20)   | 1.98<br>(1.10)   | 2.63<br>(1.91)   | 1.84<br>(1.07)   |
| Mother is the primary caregiver        | 0.88<br>(0.33)   | 0.95<br>(0.21)   | 0.96<br>(0.21)   | 0.94<br>(0.23)   |
| Mother's age (years)                   | 31.46<br>(6.22)  | 27.67<br>(4.26)  | 31.13<br>(6.63)  | 31.18<br>(5.73)  |
| Mother's education (years)             | 2.62<br>(3.71)   | 3.55<br>(4.42)   | 7.67<br>(4.35)   | 6.86<br>(3.87)   |
| Father's education (years)             | 3.65<br>(3.91)   | 5.41<br>(5.04)   | 8.99<br>(3.87)   | 7.55<br>(3.84)   |
| Wealth index                           | 0.33<br>(0.18)   | 0.51<br>(0.18)   | 0.54<br>(0.21)   | 0.59<br>(0.20)   |
| Mother's psychosocial skills index     | 0.65<br>(0.11)   | 0.75<br>(0.11)   | 0.65<br>(0.07)   | 0.68<br>(0.11)   |
| Community is urban                     | 0.39<br>(0.49)   | 0.24<br>(0.43)   | 0.72<br>(0.45)   | 0.21<br>(0.41)   |
| Number of observations                 | 1,999            | 2,011            | 2,052            | 2,003            |

*Notes:* Figures are averages. Standard errors in parentheses.

| <i>Independent variables</i>    | (1)                | (2)                | (3)                | (4)                | (5)                | (6)               | (7)                | (8)                |
|---------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
|                                 | <b>Ethiopia</b>    |                    | <b>India</b>       |                    | <b>Peru</b>        |                   | <b>Vietnam</b>     |                    |
| Male                            | -0.14<br>(1.29)    | -0.30<br>(1.29)    | 5.10***<br>(1.08)  | 4.89***<br>(1.08)  | 0.95**<br>(0.47)   | 0.96**<br>(0.47)  | 0.64<br>(0.92)     | 0.66<br>(0.92)     |
| Child's age                     | 1.73***<br>(0.16)  | 1.73***<br>(0.16)  | 0.65***<br>(0.14)  | 0.62***<br>(0.14)  | 0.53***<br>(0.07)  | 0.52***<br>(0.07) | 0.92***<br>(0.13)  | 0.92***<br>(0.13)  |
| Child's birth order             | -1.04***<br>(0.39) | -1.05***<br>(0.39) | -1.54***<br>(0.54) | -1.45***<br>(0.53) | -0.58***<br>(0.23) | -0.57**<br>(0.22) | -1.67***<br>(0.52) | -1.65***<br>(0.52) |
| Mother is the primary caregiver | -6.14***<br>(2.11) | -6.22***<br>(2.12) | -0.60<br>(2.72)    | -1.23<br>(2.69)    | 1.78<br>(1.26)     | 1.80<br>(1.26)    | -1.08<br>(2.15)    | -1.33<br>(2.16)    |
| Mother's age                    | 0.40***<br>(0.15)  | 0.40***<br>(0.15)  | 0.32**<br>(0.15)   | 0.32**<br>(0.15)   | 0.10*<br>(0.05)    | 0.10*<br>(0.05)   | 0.27***<br>(0.10)  | 0.28***<br>(0.11)  |
| Wealth index                    | 7.73***<br>(1.01)  | 7.18***<br>(1.02)  | 3.63***<br>(0.76)  | 3.15***<br>(0.77)  | 3.72***<br>(0.36)  | 3.66***<br>(0.36) | 3.05***<br>(0.63)  | 2.87***<br>(0.65)  |
| Mother's education              | 0.85***<br>(0.28)  | 0.83***<br>(0.28)  | 0.75***<br>(0.19)  | 0.67***<br>(0.19)  | 0.52***<br>(0.08)  | 0.50***<br>(0.08) | 0.97***<br>(0.18)  | 0.95***<br>(0.18)  |
| Father's education              | 0.74***<br>(0.25)  | 0.69***<br>(0.25)  | 0.44***<br>(0.15)  | 0.40***<br>(0.15)  | 0.58***<br>(0.09)  | 0.58***<br>(0.09) | 0.62***<br>(0.16)  | 0.60***<br>(0.16)  |
| Community is urban              | 11.43***<br>(2.33) | 11.94***<br>(2.33) | 2.98*<br>(1.64)    | 2.71*<br>(1.63)    | 3.16***<br>(0.76)  | 3.13***<br>(0.76) | 7.12***<br>(1.68)  | 7.25***<br>(1.69)  |
| Mother's psychosocial skills    |                    | 2.42***<br>(0.66)  |                    | 2.46***<br>(0.64)  |                    | 0.65***<br>(0.24) |                    | 0.69<br>(0.55)     |
| R-squared                       | 0.44               | 0.44               | 0.22               | 0.23               | 0.43               | 0.44              | 0.32               | 0.32               |
| Observations                    | 1,852              | 1,852              | 1,901              | 1,901              | 1,838              | 1,838             | 1,840              | 1,840              |

**Table 2.2 Regression results for child's PPVT score**

*Notes:* Robust standard error in parentheses. \*\*\* significant at 1%, \*\*significant at 5%. All regressions include dummies for region and mother's ethnicity but coefficients are not reported.

| <i>Independent variables</i>    | (1)             | (2)      | (3)          | (4)      | (5)         | (6)     | (7)            | (8)     |
|---------------------------------|-----------------|----------|--------------|----------|-------------|---------|----------------|---------|
|                                 | <b>Ethiopia</b> |          | <b>India</b> |          | <b>Peru</b> |         | <b>Vietnam</b> |         |
| Male                            | -0.07*          | -0.08*   | 0.19***      | 0.16***  | -0.02       | -0.02   | -0.09**        | -0.09** |
|                                 | (0.04)          | (0.04)   | (0.04)       | (0.04)   | (0.04)      | (0.04)  | (0.04)         | (0.04)  |
| Child's age                     | 0.01*           | 0.01*    | -0.001       | -0.01    | -0.001      | -0.001  | 0.001          | 0.002   |
|                                 | (0.00)          | (0.00)   | (0.01)       | (0.00)   | (0.01)      | (0.01)  | (0.01)         | (0.01)  |
| Child's birth order             | -0.04***        | -0.04*** | -0.09***     | -0.08*** | -0.02       | -0.02   | -0.03          | -0.03   |
|                                 | (0.01)          | (0.01)   | (0.02)       | (0.02)   | (0.02)      | (0.02)  | (0.03)         | (0.03)  |
| Mother is the primary caregiver | -0.12*          | -0.13**  | 0.02         | -0.08    | -0.14       | -0.14   | 0.12           | 0.05    |
|                                 | (0.07)          | (0.06)   | (0.10)       | (0.09)   | (0.11)      | (0.11)  | (0.09)         | (0.09)  |
| Mother's age                    | 0.001           | 0.001    | 0.01         | 0.01     | 0.002       | 0.001   | -0.001         | 0.001   |
|                                 | (0.00)          | (0.00)   | (0.01)       | (0.01)   | (0.01)      | (0.01)  | (0.00)         | (0.00)  |
| Wealth index                    | 0.21***         | 0.17***  | 0.15***      | 0.08***  | 0.10***     | 0.09*** | 0.13***        | 0.07**  |
|                                 | (0.03)          | (0.03)   | (0.03)       | (0.03)   | (0.03)      | (0.03)  | (0.03)         | (0.03)  |
| Mother's education              | 0.01            | 0.01     | 0.03***      | 0.02**   | 0.03***     | 0.02*** | 0.02**         | 0.01    |
|                                 | (0.01)          | (0.01)   | (0.01)       | (0.01)   | (0.01)      | (0.01)  | (0.01)         | (0.01)  |
| Father's education              | 0.004           | 0.001    | 0.02***      | 0.01*    | -0.001      | -0.001  | 0.002          | -0.004  |
|                                 | (0.01)          | (0.01)   | (0.01)       | (0.01)   | (0.01)      | (0.01)  | (0.01)         | (0.01)  |
| Community is urban              | 0.19***         | 0.23***  | 0.16***      | 0.12**   | 0.19***     | 0.18*** | 0.20***        | 0.25*** |
|                                 | (0.07)          | (0.07)   | (0.06)       | (0.06)   | (0.06)      | (0.06)  | (0.08)         | (0.08)  |
| Mother's psychosocial skills    |                 | 0.18***  |              | 0.39***  |             | 0.12*** |                | 0.22*** |
|                                 |                 | (0.02)   |              | (0.02)   |             | (0.03)  |                | (0.03)  |
| R-squared                       | 0.20            | 0.23     | 0.17         | 0.29     | 0.10        | 0.12    | 0.11           | 0.14    |
| Observations                    | 1,877           | 1,877    | 1,901        | 1,901    | 1,921       | 1,921   | 1,949          | 1,949   |

**Table 2.3 Regression results for child's psychosocial skills index**

*Notes:* Robust standard error in parentheses. \*\*\* significant at 1%, \*\*significant at 5%. All regressions include dummies for region and mother's ethnicity but coefficients are not reported.

**Table 2.4 Regression results for child's PPVT score including child's psychosocial skills index in the explanatory variables**

| <i>Independent variables</i>    | (1)<br><b>Ethiopia</b> | (2)<br><b>India</b> | (3)<br><b>Peru</b> | (4)<br><b>Vietnam</b> |
|---------------------------------|------------------------|---------------------|--------------------|-----------------------|
| Male                            | -0.24<br>(1.29)        | 4.63***<br>(1.08)   | 0.98**<br>(0.47)   | 0.67<br>(0.92)        |
| Child's age                     | 1.72***<br>(0.16)      | 0.63***<br>(0.14)   | 0.52***<br>(0.07)  | 0.92***<br>(0.13)     |
| Child's birth order             | -1.03***<br>(0.39)     | -1.32**<br>(0.53)   | -0.53**<br>(0.22)  | -1.65***<br>(0.52)    |
| Mother is the primary caregiver | -6.13***<br>(2.12)     | -1.10<br>(2.68)     | 2.05<br>(1.28)     | -1.34<br>(2.16)       |
| Mother's age                    | 0.40***<br>(0.15)      | 0.31**<br>(0.15)    | 0.10*<br>(0.05)    | 0.28***<br>(0.11)     |
| Wealth index                    | 7.06***<br>(1.03)      | 3.01***<br>(0.77)   | 3.49***<br>(0.35)  | 2.86***<br>(0.64)     |
| Mother's education              | 0.82***<br>(0.28)      | 0.64***<br>(0.19)   | 0.46***<br>(0.08)  | 0.95***<br>(0.18)     |
| Father's education              | 0.69***<br>(0.25)      | 0.38***<br>(0.15)   | 0.58***<br>(0.09)  | 0.60***<br>(0.16)     |
| Community is urban              | 11.77***<br>(2.33)     | 2.50<br>(1.63)      | 2.81***<br>(0.75)  | 7.22***<br>(1.69)     |
| Mother's psychosocial skills    | 2.29***<br>(0.68)      | 1.81***<br>(0.69)   | 0.44*<br>(0.24)    | 0.67<br>(0.56)        |
| Child's psychosocial skills     | 0.72<br>(0.70)         | 1.68**<br>(0.66)    | 1.72***<br>(0.25)  | 0.12<br>(0.50)        |
| R-squared                       | 0.44                   | 0.23                | 0.45               | 0.32                  |
| Observations                    | 1,852                  | 1,901               | 1,838              | 1,840                 |

*Notes:* Robust standard error in parentheses. \*\*\* significant at 1%, \*\*significant at 5%. All regressions include dummies for region and mother's ethnicity but coefficients are not reported.

## Appendix: Composite variables

**Table A2.1 Summated scale for child's psychosocial skills (Cronbach's alpha=0.62)**

|   | Ethiopia | India | Item means<br>Peru | Vietnam |
|---|----------|-------|--------------------|---------|
| <i>Self-efficacy</i>  |          |       |                    |         |
| If I try hard I can improve my situation in life  | 0.85     | 0.82  | 0.79               | 0.79    |
| Other people in my family make all the decisions about how I spend my time                          | 0.30     | 0.27  | 0.32               | 0.34    |
| I like to make plans for my future studies and work   | 0.75     | 0.68  | 0.77               | 0.77    |
| If I study hard at school I will be rewarded by a better job in the future                          | 0.83     | 0.83  | 0.82               | 0.85    |
| I have no choice about the work I do – I must do this sort of work                                  | 0.41     | 0.48  | 0.43               | 0.52    |
| <i>Self-esteem</i>  |          |       |                    |         |
| I feel my clothing is right for all occasions   | 0.61     | 0.75  | 0.72               | 0.74    |
| I am proud of my clothes  | 0.63     | 0.72  | 0.76               | 0.76    |
| I am proud of my shoes  | 0.61     | 0.68  | 0.74               | 0.74    |
| I am never embarrassed because I do not have the right books, pencils or other equipment for school | 0.59     | 0.40  | 0.64               | 0.55    |
| I am proud that I have the correct uniform  | 0.74     | 0.71  | 0.78               | 0.80    |
| I am proud of the work I have to do   | 0.72     | 0.74  | 0.77               | 0.76    |
| <i>Perception of respect</i>  |          |       |                    |         |
| Do you think people in this area treat you well or badly?   | 0.93     | 0.98  | 0.94               | 0.98    |

*Notes:* Items in the first two categories are coded on a scale of 0 to 1, where 1 = strongly agree and 0 = strongly disagree. When necessary, the coding of the items has been reversed so that all items suggest higher self-efficacy and self-esteem. Perception of respect is coded on a binary scale, where 1 = well and 0 = badly.

**Table A2.2 Summated scale for caregiver's psychosocial skills (Cronbach's alpha=0.67)**

| Variable  | Item means |       |      |         |
|---|------------|-------|------|---------|
|   | Ethiopia   | India | Peru | Vietnam |
| <i>Self-efficacy</i>  |            |       |      |         |
| If I try hard I can improve my situation in life  | 0.88       | 0.79  | 0.75 | 0.78    |
| I like to make plans for my future  | 0.81       | 0.72  | 0.74 | 0.71    |
| I have no choice about which school to send my child to                                 | 0.48       | 0.70  | 0.37 | 0.36    |
| If my child gets really sick, I can do little to help him/her get better                | 0.67       | 0.76  | 0.73 | 0.77    |
| I can do little to help my child do well in school, no matter how hard I try            | 0.66       | 0.72  | 0.71 | 0.70    |
| <i>Self-esteem</i>  |            |       |      |         |
| I feel proud to show my friends or other visitors where I live                          | 0.67       | 0.72  | 0.73 | 0.63    |
| I feel proud of my clothes  | 0.62       | 0.66  | 0.69 | 0.63    |
| I feel proud of the job done by my spouse   | 0.74       | 0.76  | 0.75 | 0.72    |
| The job I do makes me feel proud  | 0.73       | 0.76  | 0.76 | 0.69    |
| I feel proud of my children   | 0.82       | 0.83  | 0.87 | 0.83    |
| <i>Perception of respect</i>  |            |       |      |         |
| When I am at shops/market I am usually treated by others with fairness and with respect | 0.77       | 0.77  | 0.74 | 0.78    |
| Other people in my street/village look down on me and my family                         | 0.75       | 0.73  | 0.70 | 0.84    |
| My children's teachers are unfriendly or rude to me                                     | 0.77       | 0.76  | 0.69 | 0.84    |

*Notes:* Items in the first two categories are coded on a scale of 0 to 1, where 1 = strongly agree and 0 = strongly disagree. When necessary, the coding of the items has been reversed so that all items suggest higher self-efficacy and self-esteem. Perception of respect is coded on a binary scale, where 1 = well and 0 = badly.