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Accounting for Intergenerational Social Immobility in Low- and Middle-Income Countries

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Accounting for Intergenerational Social Immobility in Low- and Middle-Income Countries

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Abstract

This study investigates the transmission channels of intergenerational social immobility in low- and middle-income countries. Using a rich longitudinal survey dataset on Ethiopia, India, Peru, and Vietnam, we analyze through which factors socioeconomic status is passed on between generations. We reduce the information elicited throughout children's youth to certain latent factors of their development process, such as cognitive and non-cognitive skills as well as the characteristics of their social environment and the social opportunities they face. We then analyze to what extent each of these factors is explained by parental socioeconomic status, and how much each factor in turn determines the outcome of the children. Next, we combine these results in order to decompose the immobility into the different pathway factors. The findings indicate that children's aspirations and their cognitive skills can each account for around 20 percent of the correlation between parental and children's education. Starting a family while still a minor, and the need for child labor also play important, but smaller roles, explaining 10 percent and 6 percent of the immobility, respectively. While children's health, parent's attentiveness and the local school infrastructure only have small but still significant roles, parents' spending on education, children's social environment, and particularly children's non-cognitive skills have no significant part in the transmission of socioeconomic status in the sample of developing countries, once all other factors are taken into account.

JEL classification: I24, J62, O15

Keywords: Intergenerational social mobility, transmission mechanisms, low- and middle-income countries

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1 Introduction

The study of intergenerational social mobility has gained increasing attention recently (Chetty and Hendren 2018a; Güell et al. 2018). It is well established that parental socioeconomic status determines socioeconomic outcomes of children to a substantial degree. The specific reasons for this are still under discussion in the literature. Research points out the importance of differing characteristics of childhood by parental background such as differences between the children themselves, and the environment or opportunities to which they are exposed. These characteristics in turn strongly influence the socioeconomic prospects of the children. Intergenerational social immobility interferes with societal goals of equality in opportunities (Black and Devereux 2011) and efficiency (Causa and Johansson 2009). For reasons of data availability, most studies have focused on analyzing intergenerational immobility in developed countries. However, not only do countries that exhibit greater levels of economic inequality also show greater levels of social immobility (Corak 2013; Becker et al. 2018), a recent report by Narayan et al. (2018) also shows that poorer countries tend to have higher levels of immobility. As the degree of immobility in poorer countries seems to differ to that in richer ones, the particular channels of this immobility in developing country settings are also likely to be different. In the setting of developed countries, it has been shown that both the individual characteristics of children (Blanden et al. 2007) and their social environment (Chetty et al. 2014; Chetty and Hendren 2018a; Chetty and Hendren 2018b) contribute to children of disadvantaged households faring on average worse in their adult lives than children from more privileged backgrounds.

In this paper we analyze which factors of children’s development paths are influenced by parental socioeconomic status (education) and in turn determine schooling outcomes of children and, thus, constitute *pathway factors* of socioeconomic status in developing countries. We use longitudinal data surveying children in four countries from the major developing regions of the world, namely Ethiopia, India, Peru, and Vietnam. From the rich information on the children’s development paths, we extract common pathway factors via a factor analysis on thematic groups of measures of childhood characteristics. We then conduct a decomposition of the overall correlation between children’s and their parents’ education levels into the absolute and relative contributions of the different pathway factors. While it is by construction exogenous into which family a child is born, the relationship between later educational outcomes and earlier childhood characteristics can go in both ways, theoretically, for some of the pathway factors considered. Thus, the analysis does not establish a causal link, but being able to trace the children throughout their childhood to observe both childhood characteristics and later outcomes can greatly inform our understanding of the nature of relative intergenerational immobility in developing countries and how to address it. Our methodology accounts for potential endogeneity and multicollinearity of pathway factors in the best way possible with the longitudinal data at hand.

The findings indicate that in the developing country setting, lower cognitive skills and lower aspirations of children from lower socioeconomic status households contribute most to overall education immobility (around 20 percent each). They are followed by the higher likelihood

that poorer children will start a family while still underage (10 percent) and the need to do (harmful) child labor (6 percent). Children's health, parents' attentiveness at schooling age and the schooling infrastructure in the neighborhood only play a smaller (each below 4 percent) but still significant role. Children's non-cognitive skills, their social environment, and parents' spending on education, in contrast, do not significantly contribute to the "inheritance" of educational success. Children's non-cognitive skills and parents' spending on education are associated with parents' education level. However, they do not determine schooling outcomes in the sample of developing countries when controlling for other possible pathway factors. The children's social environment is not associated with parental education or income. Overall, the pathway factors analyzed can explain around 65 percent of the immobility observed. When decomposing each country's immobility separately, differences between the countries become apparent, but the main tendencies are similar in all four countries. With regard to gender differences, we observe that starting their own family while underage is as important a pathway factor for girls from lower socioeconomic status households as lower aspirations or cognitive skills are, but this is not so much the case for boys.

This paper contributes to the literature in several ways: First, it is the first to analyze the pathway factors of intergenerational immobility in developing countries. Second, it uses rich data elicited at different points in time throughout children's youth, analyzing a broad set of potential pathway factors simultaneously and comparing their relative importance. And third, it also allows the general levels of relative immobility to be compared across developing regions on the basis of information from a single survey including a broad set of control variables.¹

Existing studies have analyzed which pathways are responsible for the transmission of socioeconomic status across generations in developed countries. Bowles and Gintis (2002) are among the first to attempt to empirically identify the underlying pathways of intergenerational immobility. Using survey data from the US, they find evidence for the importance of wealth, race, and schooling when investigating the intergenerational transmission of income and earnings. Adopting the same approach, Blanden et al. (2007) evaluate the role of cognitive and non-cognitive skills, education, and labor market experience in the transmission of parents' socioeconomic status, measured by family income, to their sons' earnings in the UK. The authors are able to show that cognitive and non-cognitive skills are important factors, but much of their effect operates through education and labor market attachment. All of these factors together account for half of the association between parents' and sons' socioeconomic status. Similarly, Blanden et al. (2014) analyze the mediating role of early marriage, health status, labor market attachment, occupations, and education in a study using data from both the UK and the US. Schad (2015) replicates the analysis undertaken by Blanden et al. (2014) for Germany while considering the same age cohort, with similar results.

Methodologically, we extend the empirical approach by Bowles and Gintis (2002) and Blanden

¹ Narayan et al. (2018) present estimates of relative intergenerational educational immobility across many more countries, but at the cost of using different sources of data and not including any control variables. Bossuroy and Cogneau (2013), Balán et al. (1973), Emran and Shilpi (2011), Haile (2018), Hnatkovska et al. (2013), Lambert et al. (2014), and Mohammed (2019) estimate levels of intergenerational social immobility for single developing countries/regions, using different measures of socioeconomic status.

et al. (2014). Pathway factors are derived from characteristics that were elicited during the childhoods of the young adult respondents. Some of characteristics are specific to the low- and middle-income country context. Our analysis concentrates on education as the relevant outcome variable, not as a pathway factor, since children’s success in schooling is itself determined by many factors that are potentially influenced by parental background. In line with a large strand of the literature, our central measure of immobility is thus *educational* immobility (as in Narayan et al. 2018)², which we deconstruct into the different pathways.

The remainder of this paper is structured as follows: The next section presents the dataset and the estimation strategy. Section 3 estimates in a first step the overall degree of relative social immobility in the countries under study. Section 4 then presents the analysis of the pathway factors. In Section 4.1, the potential pathway factors of the intergenerational transmission of socioeconomic status and the factor analysis procedure to obtain them are introduced. In Section 4.2, we analyze the dependence of the different factors of childhood development on parental education, and in Section 4.3 we examine the role that these factors play for the children’s educational outcomes. Lastly, in Section 4.4, we decompose the degree of immobility into the different pathway factors and estimate their relative importance for the overall link between parents’ and children’s socioeconomic status through a mediation analysis. Two further subsections provide results for the decomposition across countries and by gender. Section 5 concludes.

2 Data and Estimation Strategy

For our analysis, we use data retrieved from the Young Lives dataset, which is a longitudinal and multi-dimensional survey investigating causes and consequences of childhood poverty. The dataset comprises five rounds across four countries – Ethiopia, India (Andhra Pradesh and Telangana), Peru, and Vietnam.³ These countries have been selected for the survey as they represent “the four major regions of the developing world, both low- and middle-income countries, and diverse socioeconomic and political systems” (Young Lives 2011a, p.1).⁴ The first survey round was conducted in 2002, when the children were seven or eight years old. From then on, interviews were repeated with the same children (and their families) approximately every three years in 2006, 2009, 2013, and 2016, so that the children were 21 or 22 years old when they were last interviewed. Children included in the survey were selected

² In robustness tests, we also use parental wealth as the explanatory parental background variable (comparable to the estimates of immobility in Landersø and Heckman 2017).

³ The data is based on the following datasets from the different rounds: Jones and Huttly (2018), Boyden (2018a), Boyden (2018b), Woldehanna et al. (2018), and Sanchez et al. (2018). In addition, we use the dataset by Boyden (2018c), which encompasses particular items across all five rounds.

⁴ Out of these four countries, Peru displays the highest GNI per capita (\$11,382.41 PPP adjusted constant 2011 international dollar, World Bank World Development indicators, all data for 2015), while Ethiopia is ranked the lowest (\$1,522.95). Vietnam (\$5,358.86) and India (\$5,663.79) take the middle positions. Considering population size, the ranking changes significantly. Peru has the smallest population (31,376,670) and India has the largest (1,311,050,527). Vietnam (91,703,800) and Ethiopia (99,390,750) are in between. Moreover, Ethiopia has the highest percentage of the population living on less than USD 1.90 US dollar (2011 PPP) a day (33.5 percent) followed by India (21.2 percent), Vietnam (4.8 percent) and Peru (4.7 percent).

via the application of a “‘pro-poor’ and multi-stage sampling procedure” (Aurino and Burchi 2017, p. 294).⁵ The survey asks a range of questions about the socioeconomic background of the families and the offspring’s situation in life at each point in time. Approximately 1,000 children were surveyed per country, with five data points for each child.⁶ However, due to different response rates between the countries for some of the survey items that we utilize in our analysis, the final sample for our main estimation is slightly more imbalanced between countries, with 903 observations from India, 899 from Vietnam, 754 from Ethiopia, and 568 from Peru.⁷

The Young Lives survey is utilized due to several reasons. Firstly, it is the most comprehensive data collection in developing countries on children and the potential hardships they face during their youth. Secondly, it allows for a relatively representative analysis of the developing world (Young Lives 2011b, p. 1). Thirdly, survey questions are nearly universally harmonized across the four countries, a fact that renders the comparison between the countries easy and avoids biases arising from how questions are framed. Lastly, attrition is “extremely” low due to immense efforts to sentinel children across their lives (Aurino and Burchi 2017, p. 304).⁸

While we conduct the subsequent estimation of intergenerational immobility and its pathways in a cross-sectional way, we exploit the panel structure of the data as we regress later outcomes in life (last round) on initial starting positions (first round). Children’s characteristics observed between those two points in time (first to fifth round) act as potential pathway characteristics. The decomposition is conducted through an estimation on how parental background determines the potential pathway factors as well as how these pathway factors in turn correlate with the outcomes. The analysis comprises four steps. (i) Firstly, we estimate the extent to which the children’s outcomes can be associated with their parental backgrounds, that is, the degree of overall relative immobility, which is then to be decomposed. (ii) For this decomposition, we first estimate for each pathway factor its correlation with the education of the parents. (iii) The influence of all pathway factors included in a joint regression on the later schooling outcomes of the children is then estimated. (iv) In a last step, we combine steps (ii) and (iii) to elicit the overall contribution of each pathway factor to the overall immobility estimated by step (i). Figure A1 in Appendix A graphically illustrates the approach, which is laid out in detail in the following.

The effect of the parental background on children’s outcomes, controlling for non-pathway variables, gives us the overall degree of social immobility. The baseline regression in order to

⁵ Firstly, 20 sites were non-randomly predetermined for each country with the purpose of mostly covering rather poorer areas. Within these pre-chosen sites, children of a certain age were randomly selected. Although this leaves the dataset nationally unrepresentative, it has the advantage of capturing the diversity of children in each country and of comparing poor and better-off children.

⁶ The original sample for Peru includes only 714 children as fewer children from provincial sites were recruited.

⁷ The deleted observations do not differ significantly from the remaining ones along the observed characteristics.

⁸ From the first to the fifth observation round there is an attrition of 186 observations in Ethiopia, 86 observations in India, 106 observations in Peru, and 90 observations in Vietnam. This corresponds to an attrition rate of 13 percent across all countries over the 15 years under study.

elicit this degree reads:

$$Ed_h^C = \beta Ed_h^P + X_h' \zeta_1 + \sum_k \alpha_{k,1} d_k + \epsilon_{h,1} \quad (1)$$

where Ed_h^C is the years of schooling of child h in round five and Ed_h^P is child h 's parents' socioeconomic status, that is, the years of schooling of the parents. Our coefficient of interest, β , is the measure of the degree of intergenerational immobility, representing the effect of, *ceteris paribus*, one additional year of parental schooling on the child's probability of obtaining one additional year of schooling. The vector X_h contains child h -specific control variables that are not expected to be correlated with parental background but potentially with their schooling success. We furthermore employ country fixed effects, d_k , in order to capture country k -wide effects, such as the overall level of schooling, thus only capturing *within-country* variation of education outcomes in our estimations. $\epsilon_{h,1}$ is the error term.

To estimate the coefficients of Equation (1) we use an ordinary least squares (OLS) model, because the later analysis of the decomposition of the different pathways requires linear estimation. The country fixed effects d_k in the cross section capture potential correlation of the error term within countries, which is why we use heteroscedasticity robust standard errors without clustering them in our estimations.⁹

Pathway factors are characteristics of the children, their environment, or their opportunities, which are (a) potentially influenced by parental background and (b) also likely to affect the probability of being successful in school. We reduce the dimensionality of the ample information on children's development given by the data by employing a factor analysis. This identifies latent factors that drive similar survey measures jointly. We present this procedure in Section 4 in detail. The resulting set of pathway factors is given by \mathcal{F} . We then test relationship a) and investigate whether the parents' education in the first period influences the pathways $PW_{i,h}$. The respective regression equations for each pathway $i \in \mathcal{F}$ read:

$$PW_{i,h} = \lambda_i Ed_h^P + X_h' \zeta_{i,2} + \sum_k \alpha_{k,i,2} d_k + \epsilon_{h,i,2} \quad (2)$$

We estimate separate regressions of Equation (2) for each pathway factor. The pathway specific country fixed effect for country k is given by $\alpha_{k,i,2}$. The same set of variables X_h from Equation (1) remain to be controlled for.

After investigating the effect of parental background on the potential pathway factors, we test relationship (b) from above, analyzing whether each of the pathway factors in turn also exhibits an influence on the schooling outcomes of the children. In order to do so, we estimate

⁹ Clustering at the country level is not only not necessary, but would also potentially bias our results, given that there are only four clusters. The alternative would be to cluster standard errors on the very fine-grained level of survey sites, which in turn leads to very few observations per cluster, again potentially biasing the estimations of the standard errors. See Cameron and Miller (2015) for a discussion. Nonetheless, employing either clustering of standard errors on the country or site level does not affect any of our results.

the following regression:

$$Ed_h^C = \sum_i \rho_i PW_{i,h} + \gamma_{ED^P} ED_h^P + X_h' \zeta_3 + \sum_k \alpha_{k,3} d_k + \epsilon_{h,3} \quad (3)$$

where the different ρ_i indicate the influence of each pathway i on child h 's educational outcome. In this step, all mediating factors are included in the regression. This eliminates their common variation from the estimation, which may raise concerns of multicollinearity between the factors. We return to the issue of potential multicollinearity below. Because of potential correlation between the pathway factor variables, it is important to include all pathway factors because the estimations of the ρ_i 's would suffer omitted variable bias otherwise. We will also return to this issue below in the discussion of the results. In addition to the mediating pathway factors, we include parental education itself as an explanatory variable in the estimation. γ_{ED^P} represents the *direct effect* of parental education on child h 's educational outcome, which cannot be explained via the included pathway factors (see also Conti et al. 2016).¹⁰

In the last step, we apply the decomposition approach by Bowles and Gintis (2002) and extend it in the spirit of Blanden et al. (2014) to analyze the significance of each pathway factor in the transmission of socioeconomic status. The procedure can be understood alongside the following relationships. Inserting Equations (2) into Equation (3) yields

$$\begin{aligned} Ed_h^C = & (\gamma_{ED^P} + \sum_i \rho_i \lambda_i) Ed_h^P + X_h' (\zeta_3 + \sum_i \rho_i \zeta_{i,2}) \\ & + \sum_k (\alpha_{k,3} + \rho_i \alpha_{k,2}) d_k + \rho_i \epsilon_{h,i,2} + \epsilon_{h,3} \end{aligned} \quad (4)$$

Comparing this with Equation (1) reveals that $\zeta_3 + \sum_i \rho_i \zeta_{i,2} = \zeta_{i,1}$, and $\alpha_{k,3} + \rho_i \alpha_{k,2} = \alpha_{k,1}$. Most importantly, $\gamma_{ED^P} + \sum_i \rho_i \lambda_i = \beta$, where γ_{ED^P} is the direct effect of parental education on children's education, and $\sum_i \rho_i \lambda_i$ is the indirect effect mediated through the pathway factors.¹¹ In order to obtain this mediated effect of parental socioeconomic status on the educational outcome for each pathway variable individually, the results from the estimations of the ρ_i and λ_i by Equations (2) and (3) need to be multiplied for each pathway. The decomposition procedure hence combines the estimation results of the two previous steps into a joint result.

In order to test for statistical significance of the products of two estimated parameters (particularly $\hat{\rho}_i \hat{\lambda}_i$), we bootstrap standard errors with 1,000 replications. Bootstrapping is preferred over computing standard errors by the delta method, as it allows any assumptions on the underlying distribution to be dropped (Preacher and Hayes 2008).

For the indirect effect, and thus the $\hat{\rho}_i \hat{\lambda}_i$'s to be estimated without bias (and consequently also the direct effect, since $\hat{\beta} - \sum_i \hat{\rho}_i \hat{\lambda}_i = \hat{\gamma}_{ED^P}$), the error terms from estimating Equations

¹⁰ Including the parental background as an explanatory variable also further reduces the risk of omitted variable bias in the estimation of the effects of the pathways on education. It can capture, for example, the effects of networks, or other children's characteristics that cannot be measured.

¹¹ See Gelbach (2016) for a discussion of the relationship between the direct and indirect effects. He also suggests the method used here in order to elicit the contribution of the pathway variables.

(2) and (3), $\epsilon_{h,i,2}$ and $\epsilon_{h,3}$, must be uncorrelated (Imai et al. 2010b; Blanden et al. 2014). This cannot be tested (Imai et al. 2010a), but a number of sensitivity analysis can be conducted, to which we turn in the discussion of the results.

The estimated share that each pathway i contributes to the overall immobility is then given by $\frac{\hat{\rho}_i \hat{\lambda}_i}{\hat{\beta}}$. In the following, we present and discuss the results of each of the steps.

3 Degree of Social Immobility

In this section, we estimate the degree of intergenerational immobility, that is, the extent to which the young adult outcomes of respondents is related to the family background they had when they were children. The estimation is given by Equation (1).

To measure children’s socioeconomic status, we take the children’s outcome variable from the last observation period. The dataset does not allow the use of some commonly used outcome variables, such as children’s wages, since the surveyed children are on average only 22 years old in the last observation period and have in many cases not yet entered formal employment. Additionally, literature has shown that wages and earnings in young adulthood are often not representative of socioeconomic status later in life (see, e.g., Chetty et al. 2014). Therefore, we employ information on children’s educational achievements as it is the best observable measure for their socioeconomic status. Earlier studies on the intergenerational transmission of income show that the educational outcome is a good predictor of later economic success (see, e.g., Lambert et al. 2014 and Blanden et al. 2014), and the close association between education and lifetime earnings is well documented (starting with Mincer 1974). Wantchekon et al. (2015) demonstrate the social and economic benefits of education in a developing country setting.

We operationalize children’s educational outcome by the years of schooling achieved by the child at age 21/22, denoted as Ed_h^C in the equations above. As the survey provides information on children’s years of schooling only for the first 12 years, we extract any additional years of schooling from information on the highest educational degree obtained. We use the concordance by Narayan et al. (2018, p. 80) to transfer levels of the International Standard Classification of Education (ISCED) (United Nations 2016) into the corresponding years of schooling.¹² The resulting number of schooling years – and, hence, the main dependent variable – ranges from zero to 18. The average years of schooling of children in the sample is 11.6.

To assess a measure of parental education, Ed_h^P , we follow the same procedure as for the children’s education. We use the maximum number of the father’s and mother’s years of schooling (or the household head’s years of schooling if this is not the mother or father) from the first observation period as the main explanatory variable.¹³ The resulting average

¹² Where information on schooling is missing in the last observation round, information from the previous round is used.

¹³ As an alternative measure of parental socioeconomic status, we employ the households’ wealth index as the explanatory variable. The wealth index, which is frequently used in studies on developing countries, is a

parental years of schooling is 5.6. This number is considerably lower than those of the children, implying a general upward mobility between the generations in terms of education. While some studies measure mobility by an *absolute* measure, given by the probability of obtaining a higher education than children's parents, this would be meaningless in this context, since almost all children in the sample received more education than their parents. The empirical strategy chosen instead estimates the degree of *relative* immobility, given by the correlation of parental and offspring's education, and its respective pathway factors.

As control variables X_h that are not correlated with parental background but potentially influence schooling outcomes of the children, we incorporate a set of variables typical to other analyses of intergenerational immobility (see Solon 1999) that includes the gender of the child, the child's birth rank, the age of the household head and a squared term of the household head's age. Table B1 in Appendix B displays descriptive statistics for all variables used in this section. All control variables are observed during the first round of the survey. The child order, that is, each child's birth rank, is a categorical variable valued 1 if child h is the first born to 5 for the fifth born. The variable takes on a value of 6 if the child is the sixth or higher rank born child. The birth order is taken into account since it has been shown theoretically and empirically that the level of children's education differs in an intra-household comparison between the siblings who are born as one of the earlier children and those born as one of the later children (see, for instance, Ejrnæs and Pörtner 2004, and Black et al. 2005 for developed countries).¹⁴ Including the age of the household head and its quadratic term controls for accumulation over age in the robustness tests using parental wealth as the main explanatory variable. Controlling for the age of the children is not necessary since children in the sample have almost the same age due to the sampling design.

Estimation results for Equation (1) are shown in Table 1. It can safely be excluded that the children's schooling level at age 22 reversely influences their parents' education elicited when the children are age 8. The coefficient β for parental education is significant and positive, implying a considerable degree of social immobility. The educational immobility is estimated to be around 0.3, which is slightly lower than comparable estimates for developing countries.¹⁵ It is, however, at the upper bound of most estimates for developed countries, confirming

relative measure ranging from 0 to 1 and is constructed on the basis of three main components: indices for housing quality, consumer durables and access to services. Neither this, nor employing other measures of parental status in economic terms, such as PPP-adjusted monthly total expenditures per household member, affects our results qualitatively.

¹⁴ The birth rank may be correlated with parental socioeconomic background because of decisions regarding the family structure. However, family structure and the resulting attention that parents can devote to each child will be included as a measure of a pathway variable later, so that the rank itself, given the family structure decisions determined by socioeconomic status, can be treated as exogenous.

¹⁵ Differences in the estimates can have several causes. For example, Narayan et al. (2018) use different datasets for different countries and occasionally have to use averages for the years of schooling as more detailed data is not available. This also implies that they cannot include control variables in their analysis of more countries. Furthermore, the sample sizes used by Narayan et al. (2018) vary between countries with, for example, the dataset used for Vietnam consisting of fewer 200 observations than the dataset used in the present study. Last but not least, the lower estimate for the educational immobility in the present study might also reflect a general decrease in the educational immobility over time as the present study uses more recent cohorts than the study by Narayan et al. (2018).

Table 1: Intergenerational Educational Immobility

Dependent Variable	Children's Education	
Parental Education	0.304***	(0.015)
Controls		
Female	0.231*	(0.128)
Household Head's Age	0.033	(0.044)
Household Head's Age ²	−0.000	(0.000)
Birth Order (<i>Base: First Child</i>)		
Second Child	0.043	(0.164)
Third Child	−0.435**	(0.208)
Fourth Child	−1.040***	(0.263)
Fifth Child	−0.423	(0.308)
Sixth Child or More	−0.467	(0.287)
Ethiopia	8.201***	(0.968)
India	10.148***	(0.959)
Peru	9.641***	(0.958)
Vietnam	8.778***	(0.959)
Observations	3124	
Adj. R ²	0.915	

This table shows the results from estimating Equation (1). The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is the years of schooling completed by the parents. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

higher levels of immobility in developing countries when the data is comparable.¹⁶

Table 1 shows that female children fare slightly better in school, receiving 0.23 more years of education. While this difference is notable, it is small compared with the effect of parental education, of which one additional year exceeds the effect of the child's gender. The father's age is not associated with the average level of children's educational achievement as a young adult, but later-born children tend to have lower levels of education on average. The estimated coefficients regarding birth order imply that first and second-born children have the highest levels of education, and years of schooling gradually decrease for subsequent children.

4 Pathways

Having obtained the degree of social immobility, the next step is to identify the relative importances of the pathway factors that contribute to it. A pathway factor is a characteristic

¹⁶Table C1 in Appendix C shows the results of the estimation with parental wealth as the measure of the socioeconomic status of the parents. This equally influences schooling outcomes of the children, which is no surprise given that parental education and parental wealth are strongly correlated. If parental wealth, i.e., the wealth index, ceteris paribus increases by 0.1 units, the expected years of schooling of the offspring increase by 0.7 years, which implies a difference of 3.5 years in schooling between offspring from the poorest household and a middle-class household. Table C2 in Appendix C shows the results of the estimation with total expenditure per household member as the measure of the socioeconomic status of the parents.

of the child’s development path that potentially affects the child’s outcome, which is likely to be influenced by the parental socioeconomic status. First, we introduce the potential pathway factors considered in the analysis. Then, the absolute and relative contributions of the different pathway factors to the immobility observed above will be analyzed.

4.1 Pathway Factors

The Young Lives data provides detailed information on children’s circumstances, progress, abilities, and feelings throughout their youth at the points when they (and their families) were surveyed. Many of the numerous survey items aim to elicit similar information, for example, the children’s nutritional and/or health status is captured by measuring their weight, height, sick days, and general well-being. When including all items in the analysis at the same time, issues of multicollinearity are likely to arise. Furthermore, survey data is prone to measurement error. To address this, we make use of the richness of the information given in the data by extracting latent factors from grouped survey measures via a factor analysis. This reduces the dimensionality of the data and at the same time addresses measurement error. The factors to be analyzed are chosen based on whether they have been discussed as potential transmission pathways in the literature, either in developing country context specifically or not. In the Young Lives survey, we identify measures of ten such underlying factors related to individual survey items that could potentially be correlated with parental background and at the same time affect schooling perspectives of the offspring. These ten latent factors are:

- (i) *Child labor*: It is likely that poorer children in developing countries will face a greater need to do child labor, either inside or outside the home, and it is equally likely that this will negatively impact their chances at succeeding in school (Woldehanna and Gebremedhin 2015; Putnick and Bornstein 2015; Emerson and Souza 2003).¹⁷
- (ii) *Infrastructure*: The public (or private) infrastructure in the area that a child lives in may critically determine the likelihood of children attending and being successful in school (Vuri 2008; Kazeem et al. 2010). Poorer parents are more likely to live in rural areas, and those areas with less and more cumbersome access to school.
- (iii) *Education spending*: Poorer parents have fewer financial resources to invest into the education of their offspring (for school fees, learning materials, and private school) (Kornrich and Furstenberg 2013), which affects schooling outcomes (Singh 2015).
- (iv) *Underage family engagement*: Children from poorer backgrounds are more inclined to start a family (either forced or unforced) while still at school age (Wodon et al. 2017), which

¹⁷ Child labor is an issue that affects all four countries under consideration. Ethiopia is the country among these four with the highest percentage of children between 7 and 14 years in employment (26.1 percent) followed by Peru (20.7 percent), then Vietnam (13 percent), and India (2.5 percent) in 2010/11 (World Bank 2017). However, these official numbers do not include children working in their households or family businesses. The UN Convention on the Rights of the Child does include all work that is “likely [...] to interfere with the child’s education” (United Nations 1989, Article 32). Evidence for India shows that together with a better control and regulation on child labor, the character of actual child labor is changing towards domestic work (see UNICEF 2018).

in turn decreases their chances of finishing school at the point they otherwise would have (Nguyen and Wodon 2014).¹⁸

(v) *Parent attentiveness*: The time and energy that parents devote to fostering and educating their individual children is an important determinant of children’s outcomes and is linked to the socioeconomic status of the parents and their decisions regarding the family structure (Gould et al. 2019; Chetty et al. 2014; Darroch and Singh 2013; Goodman et al. 2012; Black et al. 2005).

(vi) *Social environment*: The social structure in the area and the peer groups that children experience can determine how well they fare in school and are influenced by the potentially resource- or status-related location decisions of the parents (Chetty and Hendren 2018a; Chetty and Hendren 2018b; Acciari et al. 2019).

(vii) *Health*: The health status of children is a major focus of the Young Lives study. Woodhead et al. (2014, p.13) find on the basis of data from the younger cohort of the dataset that “in Peru over 50 percent of the children from households in the poorest quintile were stunted in 2006, compared to just under 10 percent in the wealthiest quintile”. Childhood health is, in turn, found to affect children’s educational attainment in developed countries (Case et al. 2005).

(viii) *Aspirations*: What children want to achieve in life (or school) is an important determinant of actual outcomes (Figlio et al. 2019; Genicot and Ray 2017). The reason poorer children’s aspirations are lower than those of richer children may be due to differences in preferences (i.e., imitation, see also Agupusi 2019), missing information (Hoxby and Turner 2015; Hoxby and Avery 2013; Jensen 2010), or awareness of actual group constraints (Dalton et al. 2016).¹⁹

(ix) *Cognitive ability*: Cognitive ability, be its transmission by nature or nurture²⁰, has been found in developed countries to be one of the central pathway factors of the intergenerational transmission of socioeconomic status (see, e.g., Blanden et al. 2007).

(x) *Non-cognitive ability*: Along with cognitive skills, non-cognitive skills have also been increasingly spotlighted as determinants of lifetime (and schooling) outcomes in developed countries (see Kautz et al. 2014 for an overview). As with cognitive ability, there is a strong

¹⁸ Child marriage is officially not permitted in any of the four countries under study. Nonetheless, as in many developing countries, it remains a prevalent phenomenon, particularly for girls (Duflo 2012). According to UNICEF data from 2017, the percentage of women between 20 and 24 who are married before 18 (15), is 40 (14) percent in Ethiopia (for a detailed overview over the phenomenon of child marriage in Ethiopia, see Erulkar and Muthengi 2009), 27 (7) percent in India, 22 (3) percent in Peru, and 11 (1) percent in Vietnam. India has thus the largest number of child brides in the world in absolute terms, although the numbers have been decreasing. While cross-country differences in tendencies to start a family while underage may be driven by cross-cultural differences, within countries, poverty is a central determinant.

¹⁹ It is also argued that too high aspirations can dampen the efforts of children coming from a low socioeconomic background, because the “aspiration gap” may be too large (e.g. Ray 2016). However, since our measures of aspirations target more the lower end of the ambition distribution, we do not explicitly account for this possibility in our analysis.

²⁰ See Majlesi et al. (2019) for a recent discussion of the distinction between the roles of nature and nurture in the process of intergenerational transmission of socioeconomic status in general and of human capital in particular.

association of children’s non-cognitive skills with the socioeconomic status of their parents (Kosse et al. 2020).²¹ In the Young Lives data, there are several groupings of measures that aim to identify different non-cognitive skills. The literature is clear, however, that there exists no common latent factor for non-cognitive skills, as is more so for cognitive skills, but that each skill that falls under this definition stands on its own (and is not necessarily strongly correlated with the others) (Borghans et al. 2008). Therefore, in order to not include too many non-cognitive factors in the presentation, in our main results we only report the estimations on grit, which is defined as perseverance and the passion for long-term goals, since it has been shown that this is particularly important for education and lifetime outcomes in other settings (Duckworth et al. 2007).²²

The factors can be broadly distinguished as “opportunity” pathways (i-iii), “social” pathways (iv-vi), and “individual” pathways (vii-x), although this classification is not important for the further analysis. Tables B2 and B3 list the measures from the surveys for each factor. The relationship between the measures and the factors is laid out in the following.

We assume only one factor per group of measures, and that each measure is associated with only one factor. The set of measures for each factor i is denoted \mathcal{M}^i , and the set of factors is denoted by \mathcal{F} . In order to more easily interpret the relationship between measures and the respective factors (the factor loadings), all measures are standardized to have a mean of zero and a standard deviation of one. The relationship between the measures $m_j^{i,h}$, $j \in \mathcal{M}^i$ associated with factor $i \in \mathcal{F}$, is given by:

$$m_j^{i,h} = \psi_j^i PW_{i,h} + \eta_j^{i,h} \quad (5)$$

where $PW_{i,h}$ is the factor score of factor i for child h . $\eta_j^{i,h}$ is an error term with a mean of zero. Since the measures are standardized to have a mean of zero and the factors are scale free, the measurement system does not include a non-zero intercept. ψ_j^i is the factor loading for measure j of factor i . Estimating the measurement system yields both the factor loadings ψ_j^i , $j \in \mathcal{M}^i$, $i \in \mathcal{F}$ and the factor scores for the latent factors $PW_{i,h}$, $i \in \mathcal{F}$. Intuitively, the estimation of the measurement system with only one factor per set of measures extracts as the factor scores $PW_{i,h}$ of the principal factor i that common variation of its measures $m_j^{i,h}$, $j \in \mathcal{M}^i$, which can explain most of these measures’ common variation. For a detailed discussion of the approach, see, for example, Heckman et al. (2013), Kim and Mueller (1978), and Gorsuch (1983). In the sample at hand, the Kaiser-Meyer-Olkin (KMO) statistic (Kaiser 1974) is well above 0.7, which confirms the adequacy of the sample for a factor analysis. The fourth columns of Tables B2 and B3 list the respective factor loadings for the individual measures.

²¹ Black et al. (2017) analyze the roles of nature versus nurture for non-cognitive skills, and find a genetic component of the transmission of non-cognitive ability.

²² The measures of grit are the only measures of a pathway factor that we use from the fifth survey round, because they were only elicited in this last round. We therefore must assume at least some stability of this factor over time. However, also including other factors, such as agency, pride, and trust, into our analysis as non-cognitive skills, or all at once, does not change our results on this factor or on all others.

The grouping of measures by underlying factors was conducted intuitively, and in line with the structure of the surveys. This still allows for some degrees of freedom on the side of the researcher. A more data driven approach would be to conduct an exploratory factor analysis (EFA), which groups measures according to their actual relationship, thereby identifying underlying factors by the data structure. Such an approach has the downside that it puts similar weight on all measures without regard to their conceptual importance, and hence tends to emphasize factors for which there are more measures available. For confirmation, we also conduct an EFA, which supports the general groupings of measures (and thus interpretation of factors as laid out above) presented in Tables B2 and B3. The only difference is that selection by EFA (which also leaves many degrees of freedom to the researcher through the choice of factor retention criteria) tends to drop some concepts from the analysis for which fewer measures are available in the data. The main results of the analysis remain the same irrespective of the choice of approach to grouping the measures to factors. The results from employing an EFA are briefly discussed in Section 4.4 and presented in detail in Appendix D. We report the results of the intuitive approach in the main text because it a) most comprehensively uses all information given, with those measures showing lower factor loadings contributing less, but still informatively to identification, and because it b) gives a slightly more nuanced overview of the different contributions of different factors that have been identified by previous literature to potentially play a role in the intergenerational transmission of socioeconomic status as discussed above.

Besides reducing dimensionality, employing factor analysis also deals with measurement error in the individual survey measures by extracting only common variation from the measures (see Wansbeek and Meijer 2003).²³ In order to more straightforwardly interpret some of the estimation results, the factor variables themselves are also standardized after the extraction from the measures.²⁴ The ten factor scores $PW_{i,h}$ obtained for each individual child are considered to be potential pathway variables in the decomposition of the social immobility observed in the developing countries under study.

4.2 Parental Socioeconomic Status and Pathways

In order to play a role in the transmission of socioeconomic background, a pathway factor needs to depend on the parental background. In order to find out whether this is the case for the pathways considered, we estimate Equation (2) for each pathway $i \in \mathcal{F}$. The same set of control variables X_h and country fixed effects remain to be controlled for. In this first step of the decomposition – as for the estimation of the overall immobility above – we can safely

²³ As Heckman et al. (2013) points out, an alternative to factor analysis would be to create simple averages of the grouped measures. Besides ignoring the covariability between the measures, and arbitrary weighting, and thus also giving measures weight that are not correlated with other measures of an underlying factor of interest, this would also correct for measurement error only through simple averaging out of error terms, whereas factor analysis excludes the (uncorrelated) error terms in estimating the individual factor scores.

²⁴ If a child or parent did not give an answer to one of the 42 survey items used as measures, we assigned it the mean of the respective answer in order to still use the information provided through one of the other measures of the respective factor. If information on all (three to eight) measures from one respective factor was missing, we dropped the observation from the sample.

exclude reverse causality, since it is unlikely that characteristics of an offspring's development influence the previous education level of the parents.²⁵

Table 2: Correlation between Parental Education and Pathways

Panel A					
Dependent Variable	Child Labor	Infra-structure	Education Spending	Underage Family	Parent Attentiveness
Parental Education	-0.044*** (0.004)	0.062*** (0.004)	0.061*** (0.006)	-0.037*** (0.004)	0.032*** (0.004)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	3124	3124	3124	3124	3124
Adj. R ²	0.156	0.216	0.198	0.113	0.110

Panel B					
Dependent Variable	Social Environment	Health	Aspirations	Cognitive Ability	Non-Cognitive Ability
Parental Education	-0.001 (0.004)	0.038*** (0.004)	0.069*** (0.004)	0.052*** (0.004)	0.017*** (0.004)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	3124	3124	3124	3124	3124
Adj. R ²	0.266	0.184	0.163	0.196	0.050

This table shows the results from estimating the relationship between parental education and different pathway factors based on child characteristics as dependent variables, as given by Equation (2). Parental education is the years of schooling completed by the parents. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

The results of estimating Equation (2) are shown in Table 2. They show that each of the hypothesized pathway factors, except for the social environment, is significantly influenced by parental education. This also rationalizes our choice of pathways analyzed. Because the pathway variables are standardized, the relative size of the estimated coefficients show which pathway factors are more strongly influenced by one additional year of schooling of the parents. The estimated coefficients on parental education are more or less in the same range for all factors that are significantly influenced by parental education, ranging from 0.017 standard deviations for non-cognitive ability to 0.069 standard deviations for aspirations. This means that we can observe an influence of parental socioeconomic status on the prevalence of child labor, the infrastructure children face, parental education spending, the probability of starting a family while underage, parent attentiveness, children's health, their aspirations, and their cognitive and non-cognitive skills, all in at least comparable dimensions.

²⁵ All characteristics that can be correlated with parental socioeconomic status, such as the area that the household lives in, are part of what is understood as a pathway. In other words, for the abstract unborn child, the "treatment" of into which family they are born can be considered random.

Table 3: Effect of Pathways on Children’s Education

Dependent Variable	Children’s Education	
Parental Education	0.108***	(0.014)
Pathways		
Child Labor	−0.385***	(0.065)
Infrastructure	0.172***	(0.061)
Education Spending	0.075	(0.053)
Underage Family	−0.816***	(0.061)
Parent Attentiveness	0.237***	(0.056)
Social Environment	0.133**	(0.061)
Health	0.143**	(0.059)
Aspirations	0.845***	(0.065)
Cognitive Ability	1.189***	(0.067)
Non-Cognitive Ability	0.053	(0.056)
Controls	Yes	
Observations	3124	
Adj. R ²	0.940	

This table shows the results from estimating Equation (3). The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is the years of schooling completed by the parents. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

4.3 Pathways and Children’s Educational Outcome

To see whether these potential pathway factors which are almost all dependent on parental background in turn also influence schooling outcomes of the children, we estimate Equation (3). We include all pathway factors at once, while continuing to control for the same control variables X_h and country fixed effects from above.

In this second step of the decomposition, reverse causality cannot be excluded completely. It is possible that the (implicit or explicit) knowledge of one’s own prospects in school reversely influences some of the pathway factors, such as the child’s aspirations.²⁶ In order to minimize this possibility, all measures of the pathway factors are taken from the earliest possible observation round, where the distance to the actual schooling outcome is still the longest.²⁷

Table 3 shows the results from estimating the effect of the pathways on children’s later educational outcome, as given by Equation (3). The estimated coefficient for parental education, that is, the direct effect of parental education on that of the children not captured

²⁶ This is also common to other studies that analyze the mediating factors of randomized interventions, such as Heckman et al. (2013), or those of socioeconomic status, such as Blanden et al. (2014) and Blanden et al. (2007).

²⁷ The measures for underage family engagement are retrospectively taken from the fourth round. Grit as a measure of non-cognitive skills is taken from the fifth round, but the results do not change much if we use other measures of non-cognitive skills taken from earlier rounds.

by the pathways considered, amounts to 0.108. Almost all of the considered pathway factors, namely child labor, infrastructure, underage family engagement, parent attentiveness, social environment, childhood health, the children’s aspirations, and their cognitive skills exhibit a significant influence on the probability of children to stay in school longer.²⁸ One standard deviation increase in cognitive ability and aspirations increases the average length of schooling by 1.189 years and 0.845 years, respectively, while one standard deviation increase in underage family engagement and child labor decreases the years of schooling by 0.816 and 0.385, respectively. However, in contrast to studies on high-income countries, the results show no significant effect of non-cognitive ability on schooling outcomes. This striking finding is, instead, in line with those from Nordman et al. (2015), who find that non-cognitive skills cannot explain wage differences in Bangladesh.²⁹ The spending on education cannot significantly explain children’s educational outcomes either, when controlling for all other covariates.

4.4 Decomposition

The results above show that parental background affects (almost all of) the different pathway factors, and (almost all of) the pathway factors in turn affect children’s educational outcomes. We now combine these results to analyze whether these links are relevant in determining the correlation between parents’ and children’s education levels, and how much each pathway contributes relatively. To this end, the results from the estimations above are combined as outlined in Equation (4).

The coefficients of the respective indirect effects mediated through each pathway and its fraction of the estimated degree of social immobility are displayed in Table 4. Bootstrapped standard errors are shown in parentheses. The last row reiterates the overall degree of social immobility as shown in Table 1 as the sum of the estimated direct and indirect effects $\hat{\gamma}_{EdP} + \sum_i \hat{\rho}_i \hat{\lambda}_i = \hat{\beta} = 0.304$. Column (1) shows the product of the estimated $\hat{\lambda}_i$ ’s and the estimated $\hat{\rho}_i$ ’s for all pathway factors $i \in \mathcal{F}$. Note that the coefficients display the effect of parental education on children’s education mediated by each pathway, since the units of the pathway factors cancel out in the product. The second column provides the fraction by which a certain pathway i contributes to the overall effect of parental education, given by $\frac{\hat{\rho}_i \hat{\lambda}_i}{\hat{\beta}}$. The explained component of β displays the extent to which the pathways together account for

²⁸ Since almost all pathway factors are influenced by parental background, multicollinearity may be a concern for the results presented here. However, the correlation of the pathway factor variables is not large. Table C3 shows the correlation coefficients, none of which exceed 0.31. We furthermore compute the variance inflation factors (VIFs) for the above estimation (see Table C4 in Appendix C). None of the factors exhibit problematic error correlation with the others. Table C5 furthermore reports the results of estimating Equation (3) while excluding one pathway factor at a time in Columns (2) through (11). Column (1) displays the results shown in Table 3 again for reference. The results for the pathways only change marginally when consecutively excluding one pathway at a time. All these exercises confirm that multicollinearity is no concern with the data at hand.

²⁹ The result can also not fully be explained by the fact that the analysis does not capture potential cross-productivities of non-cognitive skills with other pathways such as cognitive skills. Cunha et al. (2010) show in a different setting that these cross-productivities are negligible, and the correlation of non-cognitive skills with other factors is also relatively low in the data, as shown in Table C3.

Table 4: Decomposition

Explained components of total $\hat{\beta}$	(1)		(2)	
	Part of total $\hat{\beta}$		Percent of total $\hat{\beta}$	
Child Labor	0.017***	(0.003)	0.056***	(0.010)
Infrastructure	0.011***	(0.004)	0.035***	(0.013)
Education Spending	0.005	(0.003)	0.015	(0.010)
Underage Family	0.030***	(0.004)	0.100***	(0.012)
Parent Attentiveness	0.008***	(0.002)	0.025***	(0.007)
Social Environment	-0.000	(0.001)	-0.000	(0.002)
Health	0.005**	(0.002)	0.018**	(0.008)
Aspirations	0.059***	(0.005)	0.193***	(0.019)
Cognitive Ability	0.061***	(0.006)	0.202***	(0.019)
Non-Cognitive Ability	0.001	(0.001)	0.003	(0.003)
Explained component of $\hat{\beta}$	0.196***	(0.010)	0.645***	(0.037)
Unexplained component of $\hat{\beta}$	0.108***	(0.015)	0.355***	(0.037)
Total $\hat{\beta}$	0.304***	(0.015)		

This table shows the results from a decomposition approach, as presented in Equation (4). Thereby, the respective coefficients from estimating Equations (2) and (3), as given in Tables 2 and 3, are multiplied to elicit the mediating effect of the pathway variables in the transmission of the overall effect of parental socioeconomic status (parental education) on the children's educational outcome (Total $\hat{\beta}$). The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is the years of schooling completed by the parents. The pathway factors mainly represent characteristics of the children between the ages 11 and 18. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. Column (1) gives the absolute share and Column (2) gives the relative share of the pathway variables in the total $\hat{\beta}$. Bootstrapped standard errors are reported in parentheses (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

the observed degree of social immobility, that is, $\sum_i \hat{\rho}_i \hat{\lambda}_i$, or $\frac{\sum_i \hat{\rho}_i \hat{\lambda}_i}{\hat{\beta}}$ in percentage terms. The unexplained component of $\hat{\beta}$ is the residual part of the persistence of socioeconomic status, which cannot be accounted for by the included pathway mechanisms, hence the direct effect $\hat{\gamma}_{EdP}$ from Table 3, or $\frac{\hat{\gamma}_{EdP}}{\hat{\beta}}$. The results of the decomposition with parental wealth as the measure of parents' socioeconomic status are displayed in Table C6 in Appendix C. They are very similar to the results based on parental education presented here.³⁰

Of the ten pathways under consideration, we find evidence for seven of them to significantly contribute to the overall effect of parental background on children's educational outcome. The channels of higher cognitive skills and higher aspirations of children of parents with higher education thereby play the largest roles by far, with each alone accounting for around 20 percent of the immobility observed. Underage family engagement and child labor account for

³⁰ Table C7 in Appendix C additionally presents the results for the decomposition approach when employing the logarithmized PPP-adjusted monthly total expenditures per household member as the measure of the socioeconomic status of the parents. These results are also similar to those when employing education or the wealth index.

10 percent and 5.6 percent, respectively. Infrastructure, parent attentiveness, and children's health status are also responsible for the educational immobility observed statistically, but to lesser extents (each below 4 percent). The social environment of the children, their non-cognitive skills and the spending on education play no role. Non-cognitive skills and the spending on education are influenced by the parental background, but show no correlation with schooling attainment, whereas for the social environment it is the other way around. In sum, the three pathways are thus not important for the transmission of socioeconomic status in the four developing countries under study.

There is still a part of $\hat{\beta}$ that cannot be explained via the investigated transmission mechanisms, measured by the direct effect of parental socioeconomic status on children's outcome. However, 65 percent of the observed persistence of socioeconomic status can be explained by the ten pathways under study (of which seven actually contribute).

As noted above, the estimation of the coefficients above may be biased if the error terms $\epsilon_{h,i,2}$ and $\epsilon_{h,3}$ are correlated. The most obvious reason for correlation of the error terms in the two steps would be omitted mediating pathway variables, which are correlated with the factors included. This risk is greatly reduced relative to a setting with only one mediating variable (as in, e.g., Imai et al. 2010a and Imai et al. 2010b) the more mediating variables are included in the estimation (Preacher and Hayes 2008). Table C8 in Appendix C shows the results of estimating Equation (3) when the pathway factors are successively included in the estimation, starting with the most important one, that is, the one that accounts for the largest part of the immobility observed in Table 4. At some point, adding more pathway factors does not change the result on the previously included ones. This indicates that including a relatively large number of pathway factors as done here reduces the concern about a bias stemming from omitted variables. Another potential source of bias could be that parental education influences the *effect* of the pathway factors or control variables on the educational outcome (rather than influencing only the *level* of the pathway factors), implying the ζ_3 and ρ_i coefficients are actually not constant but rather a function of parental education (Heckman et al. 2013). To exclude that this is the case and that this leads to a correlation of the error terms of Equations (2) and (3), we split the sample by the median in terms of parental education and estimate Equation (3) separately for each subsample. The comparisons of the $\hat{\zeta}_3$ and $\hat{\rho}_i$ coefficients are reported in Table C9. They by large show no statistically significant difference.³¹

Different proceedings to obtain the number of relevant factors and the measures included from the survey data and to group the measures accordingly provide slightly different interpretations, none of which, however, stands at odds with the interpretation of the central results given here. Appendix D shows the relevant groupings when the selection pursued is purely data driven, that is, through an EFA, and presents the findings from the respective decomposition analysis. The results of this exercise confirm that cognitive ability (particularly literacy) and career focus in life (which combines measures of underage family engagement and aspirations) are the most important pathway factors of social immobility, while childhood health, parent

³¹ This is in line with Falk et al. (2019), who find that parental background only influences the level, but not the productivity of cognitive and non-cognitive abilities.

attentiveness, and the spending on education by the parents play only a minor role for the transmission of socioeconomic status. In addition, the analysis also shows that non-cognitive skills play no role. While some differentiations, which are driven by correlation patterns between the measures, are notable, this rather confirms the appropriateness of the intuitive approach presented above and in the previous sections. The intuitive approach allows for the explicit analysis of the role of, for example, the child labor pathway, which is dropped in an EFA, and additionally it allows for the differentiation between the role of aspirations and a curtailed adolescence caused by starting a family while underage.³²

The results obtained are derived from a relatively diversified sample of children in developing countries. In the following, we analyze whether intergenerational mobility and its transmission mechanisms differ between settings or particular groups of children. We therefore conduct our estimation of the mobility and its pathways on subsamples of the data. While our estimation follows the path laid out in this and the previous sections, in the following we only report the results of the decomposition. For reasons of exposure and the restricted overall number of observations, we conduct one subsample analysis at a time. While this is a worthwhile exercise, it must be noted that statistical inference is more difficult because of the relatively low number of observations for subsamples and results should be taken with caution. In our interpretation, we concentrate on those results that hold true across different specifications of the model and only highlight differences across subsamples that also concern the magnitude of the estimated relative importance of the pathways.

4.5 Results by Country

First, we undertake separate analyses for each country under study. The overall level of social mobility has been shown in different contexts to be affected by the cultural and political environment, and so could be the dependencies of the pathway factors on parental background and their respective relevance in determining schooling outcomes. Thus, the relative importance of the pathway factors in the overall transmission may also differ by the country setting. Table 5 shows the results of the decomposition analysis for each of the four countries in the sample.

India has the lowest level of social immobility in our sample. This supports results by Mohammed (2019) who also finds that intergenerational immobility is lower in India than some previous studies suggested. Ethiopia and Vietnam display relatively large levels of

³²For a factor to be identified meaningfully only from the data, at least three strongly correlated measures need to be identified. Child labor, for example, is thus dropped by EFA procedure because there are only three measures for the concept, of which one is not correlated strongly enough with the others for all three together to be identified as being driven by a common factor when compared with the other 39 measures considered. Note that this makes no statement about the relationship of the respective group of measures with either the parents' or the children's education. An alternative approach would be to simply include an individual measure as a proxy for child labor (such as the hours worked) as a pathway variable. This yields similar results on the absolute and relative importance of the pathway (as it does for infrastructure and the social environment), but for reasons of methodological consistency, and because of the advantages of factor analysis laid out above when utilizing information from all available measures, here we take the middle ground using the derived factor scores from an intuitive grouping as pathway factors.

Table 5: Decomposition by Country

	Ethiopia		India		Peru		Vietnam	
Explained percent of total $\hat{\beta}$								
Child Labor	0.044**	(0.022)	0.101***	(0.028)	0.057*	(0.034)	0.023**	(0.011)
Infrastructure	0.076**	(0.036)	0.020	(0.026)	0.024	(0.033)	-0.006	(0.014)
Education Spending	-0.003	(0.024)	0.105**	(0.043)	0.007	(0.019)	0.017	(0.023)
Underage Family	0.088***	(0.023)	0.110***	(0.023)	0.052	(0.035)	0.097***	(0.019)
Parent Attentiveness	0.015	(0.011)	0.051***	(0.018)	0.020	(0.029)	0.001	(0.010)
Social Environment	-0.003	(0.006)	0.001	(0.007)	-0.010	(0.017)	0.002	(0.003)
Health	0.026	(0.016)	-0.012	(0.017)	0.021	(0.025)	0.009	(0.012)
Aspirations	0.031	(0.027)	0.270***	(0.046)	0.101***	(0.038)	0.243***	(0.036)
Cognitive Ability	0.196***	(0.045)	0.264***	(0.044)	0.132**	(0.053)	0.111***	(0.024)
Non-Cognitive Ability	0.001	(0.004)	-0.001	(0.011)	0.011	(0.016)	-0.002	(0.006)
Explained component of $\hat{\beta}$	0.473***	(0.074)	0.908***	(0.102)	0.416***	(0.088)	0.494***	(0.049)
Unexplained component of $\hat{\beta}$	0.527***	(0.074)	0.092	(0.102)	0.584***	(0.088)	0.506***	(0.049)
Total $\hat{\beta}$	0.323***	(0.034)	0.256***	(0.027)	0.269***	(0.036)	0.394***	(0.030)
Observations	754		903		568		899	

This table shows the results from a decomposition approach, as laid out in Section 4.4, separately for the different countries under study. Thereby, for each subsample, the respective coefficients from estimating Equations (2) and (3), are multiplied to elicit the mediating effect of the pathway variables in the transmission of the overall effect of parental socioeconomic status on the children's educational outcome (Total $\hat{\beta}$). The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is the years of schooling completed by the parents. The pathway factors mainly represent characteristics of the children between ages 11 and 18. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. The table presents the relative shares of the pathway variables in the total $\hat{\beta}$ for each country. Bootstrapped standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

immobility. While the overall degree of immobility differs between the countries, the pathways responsible for this do so only partially. In line with the decomposition analysis across all countries, non-cognitive skills, the social environment of the children, and education spending (except for in India) do not play a role in the transmission process. In turn, cognitive ability and aspirations (with the exception of Ethiopia) are main contributors to each country's social immobility. However the relative importance of the pathways under investigation differ between the countries. In India and Vietnam aspirations play an even larger role than cognitive skills, while cognitive skills play the largest role in Ethiopia and India. Comparatively, underage family engagement and child labor can also explain large parts of the social immobility observed in India, while those fractions are smaller in the other countries. Interestingly, in Ethiopia, the infrastructure also plays an important role and so does spending on education in India.

The findings imply that not only the degree of intergenerational social immobility but also the relative importance of the pathways contributing to the transmission of socioeconomic status can differ somewhat between countries in the setting of developing countries. The result that cognitive ability plays a large role, whereas non-cognitive ability does not, holds for all countries equally. The importance of aspirations differs somewhat between the countries, but it is sizeable in almost all countries, as is that of underage family engagement. Child labor is not the most important pathway factor in any of the countries, but it is a relevant one in all.³³

4.6 Results by Gender

Lastly, we look at whether across the sample overall transmission and its pathways differ by gender of the child. The differences in the *levels* of the pathway factor variables between boys and girls are negligible when looking at children from all backgrounds, implying that daughters are not systematically disadvantaged along the characteristics we analyze as pathway factors. This is in line with the literature that finds that gender biases in household resource allocation have decreased starkly in recent years (Choi and Hwang 2015; Kingdon 2005). The only exception is the factor of underage family engagement, which is much more prevalent among girls. The average differences do not, however, tell anything about whether children from lower socioeconomic backgrounds may be relatively more disadvantaged along some dimensions if they are male or female, or whether differences in the characteristics may have more or less effect on the educational outcome for either gender. To this end, we estimate the decomposition separately for male and female children. Table 6 shows the results. We see that the estimated level of intergenerational immobility ($\hat{\beta}$) is slightly higher for girls than for boys, which is in line with studies on developed economies (Corak 2006).

³³ An additional interesting extension for the estimation on the full sample would be to weight the observations according to the actual country size in order to obtain a more “globally” representative sample. This would of course still only be representative of the four countries for which data is available. However, since India has a much larger population (both in adults and children, ca. 85 percent of the combined population of all four countries), observations from India would dominate the estimation. The results for the weighted analysis by actual population sizes thus looks very similar to the one of the Indian subsample, i.e., the second column of Table 5. We, therefore, do not report it separately.

Table 6: Decomposition by Gender

	Female Children		Male Children	
Explained percent of total $\hat{\beta}$				
Child Labor	0.054***	(0.012)	0.057***	(0.018)
Infrastructure	0.009	(0.015)	0.071***	(0.023)
Education Spending	-0.001	(0.017)	0.028**	(0.013)
Underage Family	0.163***	(0.020)	0.020***	(0.008)
Parent Attentiveness	0.019**	(0.009)	0.030***	(0.011)
Social Environment	-0.000	(0.002)	-0.002	(0.005)
Health	0.008	(0.009)	0.032**	(0.015)
Aspirations	0.170***	(0.025)	0.203***	(0.029)
Cognitive Ability	0.182***	(0.023)	0.215***	(0.031)
Non-cognitive Ability	0.001	(0.004)	0.005	(0.005)
Explained component of $\hat{\beta}$	0.606***	(0.042)	0.660***	(0.061)
Unexplained component of $\hat{\beta}$	0.394***	(0.042)	0.340***	(0.061)
Total $\hat{\beta}$	0.341***	(0.021)	0.267***	(0.022)
Observations	1544		1580	

This table shows the results from a decomposition approach, as laid out in Section 4.4, separately for the subsamples of female and male children in Columns (1) and (2), respectively. Thereby, for each subsample, the respective coefficients from estimating Equations (2) and (3), are multiplied to elicit the mediating effect of the pathway variables in the transmission of the overall effect of parental socioeconomic status on the children's educational outcome (Total $\hat{\beta}$). The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is the years of schooling completed by the parents. The pathway factors mainly represent characteristics of the children between ages 11 and 18. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. The table presents the relative shares of the pathway variables in the total $\hat{\beta}$ by gender. Bootstrapped standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

The transmission mechanisms for female and male children are different insofar that underage family engagement is much more important a pathway factor for girls than for boys, and is almost as important as cognitive skills for girls. This result is not surprising, given that the problem of being married and/or becoming a parent when still a minor is mostly a problem for girls in the first place. Our results show that it is particularly a problem for girls from socioeconomically weak households, and that it is an important driver of their worse schooling prospects. Child labor and parent attentiveness are equally important relatively for both boys and girls, but all other factors are more (aspirations, cognitive skills) or only (infrastructure, education spending, health) important for boys in relating their own education levels to their parents’.

Most of the main results from the analysis hence hold equally for female and male children, namely that cognitive ability and aspirations play the largest role in the transmission process. Non-cognitive skills are not relevant for either. Also, child labor plays an equally relevant role for both sexes. However, early family engagement restricts girls from lower socioeconomic status households more than it does for boys. For these, the factors contributing to the “inheritance” of socioeconomic status are more diverse.

5 Conclusion

There has been little previous research on intergenerational social immobility and none on its transmission mechanisms in developing countries. Using the extensive Young Lives dataset, we analyze the channels of social immobility in developing countries. We find that educational mobility is most strongly mediated through the differences in cognitive skills and aspirations between children of different backgrounds. For girls, child marriage and/or parenthood, that is, the factor of underage family engagement is an almost equally important factor correlating with parental background and own schooling outcomes. Child labor also plays a relevant role as a transmission channel of relative educational levels between parents and their children. Other factors, namely infrastructure, parent attentiveness, and children’s health status are also statistically significant, but not as economically relevant. Together, the pathways analyzed in this paper can explain roughly 65 percent of social immobility in the countries under study.

Overall, the longitudinal survey data used allows us to incorporate more pathway factors than any previous study, including those on developed countries. Some of the pathway factors analyzed are specific to developing countries, such as underage family engagement and child labor. The number of measurements provided in the data made it possible to address measurement error through a factor analysis of related measures.

The result that differences in cognitive skills accounts for much of the immobility observed is similarly found in previous studies in developed countries. Unlike those results, however, we find no role of non-cognitive skills. While non-cognitive skills differ between children of different parental backgrounds, they are not found to determine the schooling outcomes of the surveyed children. This is an interesting fact concerning developing countries that deserves further attention, given the increased interest in the role of non-cognitive skills as transmission

channels of social immobility (see, e.g., Chowdhury et al. 2018, Falk et al. 2019).

We find some differences between the countries studied, both in terms of overall immobility, and with regard to the relevant transmission channels. While cognitive skills are the most important pathway factor in all four countries non-cognitive skills play no role in either of the individual countries. A limitation of our study is that it only captures four developing countries, although the data collection at least aimed to represent the different developing regions of the world. Relating differences in the relative importance of the channels to institutional or macroeconomic characteristics (such as widespread conditional cash transfer programs in Peru) would be an interesting avenue for future research. While our paper cannot make causal inferences, it illustrates clearly which factors should be considered when thinking about intergenerational social immobility in developing countries. This analysis can thus set the basis for future research investigating the roles of different pathway factors in more detail and for potential policies in developing countries to more effectively target their relatively high levels of intergenerational social immobility.

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A Appendix A: Decomposition Approach

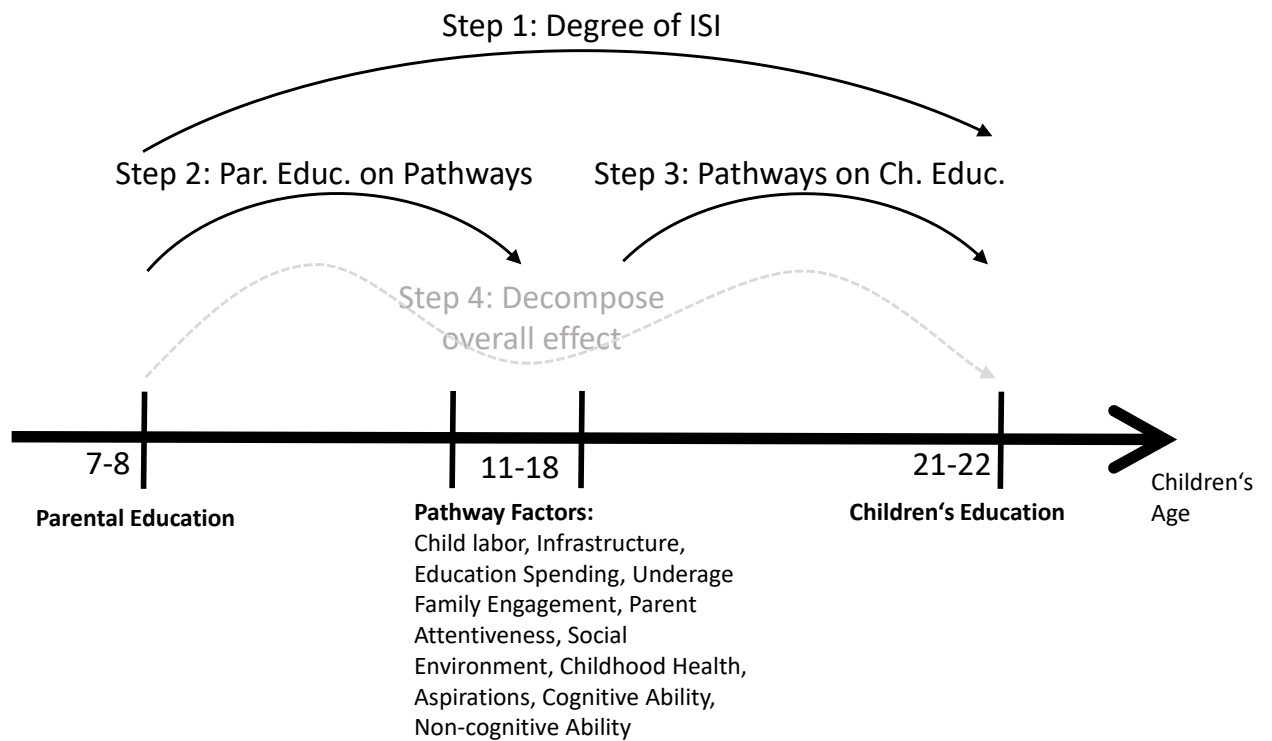


Figure A1: Graphical representation of decomposition approach

B Appendix B: Data Descriptions

Table B1: Descriptive statistics

	N	Mean	SD	Min.	Max.	Observ.	Round
Parental Education	3124	5.614	4.850	0	16	1	
Children's Education	3124	11.577	4.002	0	18	5	
Controls							
Female (<i>Male</i>)	3124	0.494	0.500	0	1	1	
Household head's Age	3124	40.192	10.731	18	91	1	
Household head's Age ²	3124	1730.544	1028.724	324	8281	1	
Birth Order (<i>First Child</i>)	3124	2.705	1.648	1	6	1	
First Child	919	29.4		0	1	1	
Second Child	841	26.9		0	1	1	
Third Child	508	16.3		0	1	1	
Fourth Child	291	9.3		0	1	1	
Fifth Child	228	7.3		0	1	1	
Sixth Child or More	337	10.8		0	1	1	
Ethiopia	3124	0.241	0.428	0	1	1	
India	3124	0.289	0.453	0	1	1	
Peru	3124	0.182	0.386	0	1	1	
Vietnam	3124	0.288	0.453	0	1	1	

This table presents the descriptive statistics of the main variables of children's and parents' education levels and the control variables used in all estimations. For categorical variables, the base category is displayed in parentheses.

Table B2: Factor Analysis: Pathway Factors and Measures I

Measure	Description	Observ. Round (Child's Age)	Loading
Factor 1: Child Labor			
Working Hours	Sum of hours doing household chores, caring for others, the hours spent working in the own farm business and hours spent in a paid activity for a company/person not related to the child on a typical day	round 2 (11/12)	.4124588
Activity for Money	Did you do anything in the last 12 month for money? (Yes (1) / No (0))	round 2 (11/12)	.4576733
Work Injury	Seriously injured while working in last 4 yrs. (Yes (1) / No (0))	round 2 (11/12)	.2599525
Factor 2: Infrastructure			
Access to Education	Do you have access to education/ schools? (Yes (1)/ No (0))	round 2 (11/12)	.0845545
Type of Living Site	Rural (0)/ Urban (1) living site	round 2 (11/12)	.3268614
Time to School	(Hypothetical) time to get to school in minutes	round 2 (11/12)	.3106173
Factor 3: Education Spending			
Spent on Uniforms Boys	Amount spent on school uniform for boys in last 12 months (in int. dollar cents)	round 2 (11/12)	.2133757
Spent on Uniforms Girls	Amount spent on school uniform for girls in last 12 months (in int. dollar cents)	round 2 (11/12)	.2568653
Spent on Schooling Fees	Amount spent on payment for schooling fees in last 12 months (in int. dollar cents)	round 2 (11/12)	.7076046
Spent on School Books	Amount spent on school books and stationery in last 12 months (in int. dollar cents)	round 2 (11/12)	.6544147
Spent on Internet Use	Amount spent on Internet use bought in last 30 days (in int. dollar cents)	round 2 (11/12)	.2225174
Private Schooling	Enrolled at private Schooling during second observation period. (Yes (1)/ No (0))	round 2 (11/12)	.5334853
Factor 4: Underage Family			
Child Marriage	Child married while still under age (Yes (1)/ No (0))	round 4 (18/19)	.6066028
Child Parent	Number of children born by child while still under age	round 4 (18/19)	.6120937
Expected Child Marriage	At what age should child get married? Binary variable that is 1 if age is below 18.	round 2 (11/12)	.3047877
Expected Child Parent	At what age should child have a child? Binary variable that is 1 if age is below 18.	round 2 (11/12)	.2231096
Factor 5: Parent Attentiveness			
Without Father	Father not in household/ dead (Yes (0) / No (1))	round 1 (7/8)	.0764556
Number of Children	Number of additional children under age in each household	round 2 (11/12)	.2184941
Attention received	I receive lots of time and attention from my parents. (3 point scale: "Yes/ Strongly agree" (2), "More or less" (1), "No/ Strongly disagree" (0))	round 2 (11/12)	.4220944
Love received	I always feel loved by my parents. (3 point scale: "Yes/ Strongly agree" (2), "More or less" (1), "No/ Strongly disagree" (0))	round 2 (11/12)	.4054283
Conversation	My parents rarely talk to me about the things that matter to me. (3 point scale: "Yes/ Strongly agree" (0), "More or less" (1), "No/ Strongly disagree" (2))	round 2 (11/12)	.3367257
Supported by Parents	My parents never support me in the things i want to do. (3 point scale: "Yes/ Strongly agree" (0), "More or less" (1), "No/ Strongly disagree" (2))	round 2 (11/12)	.4309264
Free Speech	I usually feel able to speak my views and feelings with my parents. (3 point scale: "Yes/ Strongly agree" (2), "More or less" (1), "No/ Strongly disagree" (0))	round 2 (11/12)	.3614116
Treated Worse	My parents treat me worse than other children in my family. (3 point scale: "Yes/ Strongly agree" (0), "More or less" (1), "No/ Strongly disagree" (2))	round 2 (11/12)	.3272322

This table shows the measures from the survey data by the factors that they are associated to as presented in Section 4. Column (2) describes the codings of the respective measures from the survey question. Column (3) lists the observation round and respective age of the children when the information was elicited. The respective factor loadings of each measure are depicted in Column (4).

Table B3: Factor Analysis: Pathway Factors and Measures II

Measure	Description	Observ. Round (Child's Age)	Loading
Factor 6: Social Environment			
Safe Area	Is the area you live in safe for children? (Yes (1) / No (0))	round 1 (7/8)	.1537112
Friends with Alcohol	How many of your best friends drink alcohol at least once a month? (4 point scale: "All of my friends" (1); "Most of my friends" (2); "A few of my friends" (3); "None of my friends" (4))	round 3 (14/15)	.5076987
Friends with Trouble	Have other young people - tried to get you into trouble with your friends? (4 point scale: "4 or more times" (1); "2-3 times" (2); "Once" (3); "Never" (4))	round 3 (14/15)	.2814288
Friends Beaten Up	How many of your best friends have ever been beaten up? (4 point scale: "All of my friends" (1); "Most of my friends" (2); "A few of my friends" (3); "None of my friends" (4))	round 3 (14/15)	.156782
Friends who Smoke	How many of your friends smoke cigarettes at least once a month? (4 point scale: "All of my friends" (1); "Most of my friends" (2); "A few of my friends" (3); "None of my friends" (4))	round 3 (14/15)	.5100455
Shock-theft	Shock-theft/destruction of housing/consumer goods (Yes (0) / No (1))	round 2 (11/12)	.1315144
Trust in Neighborhood	I feel I can trust my neighbours to look after my house. (3 point scale: "No" (1); "More or less" (2); "Yes" (3))	round 2 (11/12)	.1822156
Safe to go Outside	I think it is safe for my child to go out on the street on his/her own. (3 point scale: "No" (1); "More or less" (2); "Yes" (3))	round 2 (11/12)	.3584995
Factor 7: Health			
Weight-for-age	Weight-for-age z-score	round 1 (7/8)	.8292648
Height-for-age	Height-for-age z-score	round 1 (7/8)	.6391929
Thinness Indicator	Low BMI for age (3 point scale: "Severely thin" (0), "Moderately thin" (1), "Not thin" (2))	round 1 (7/8)	.3851939
Birth Weight	Birth weight in grams	round 3 (14/15)	.2065564
Factor 8: Aspirations			
Job Aspirations Child	What do you want to be when you grow up? (Occupations coded to a scale of ambition from 1-4 following Pasquier-Doumer and Risso Brandon 2015)	round 2 (11/12)	.5233446
School Aspirations Child	Self-reported grade that children want to complete when finishing school (ISCED classification).	round 2 (11/12)	.3948109
Job Aspirations Parents	When child is 20yrs old what do you think she/he will be doing? (Occupations coded to a scale of ambition from 1-4 following Pasquier-Doumer and Risso Brandon 2015)	round 2 (11/12)	.6969314
School Aspirations Parents	What level of education would you like child to complete? (ISCED classification)	round 2 (11/12)	.6210628
Factor 9: Cognitive Ability			
PPVT Test Score	Score (0 to 228) of Picture Picture Peabody Vocabulary Test (PPVT) corrected for different mother languages	round 2 (11/12)	.4227734
Math Score	Score of math test (0 to 9) corrected for different countries	round 2 (11/12)	.5871772
Reading Level	Child's reading level (4 point scale)	round 2 (11/12)	.6910719
Writing Level	Child's writing level (3 point scale)	round 2 (11/12)	.8752038
Literacy	Child can read and write a sentence without difficulty (Yes/No)	round 2 (11/12)	.8431402
Factor 10: Non-Cognitive Ability			
GRIT 1	New ideas and projects sometimes distract me from previous ones.* (reversed scale)	round 5 (21/22)	.1865644
GRIT 2	Setbacks do not discourage me.*	round 5 (21/22)	.1651933
GRIT 3	I have been obsessed with a certain idea or project for a short time but later lost interest.* (reversed scale)	round 5 (21/22)	.2640217
GRIT 4	I am a hard worker.*	round 5 (21/22)	.4513838
GRIT 5	I often set a goal but later choose to pursue a different one.* (reversed scale)	round 5 (21/22)	.249902
GRIT 6	I have difficulty maintaining my focus on projects that take more than a few month to complete.* (reversed scale)	round 5 (21/22)	.2478068
GRIT 7	I finish whatever I begin.*	round 5 (21/22)	.5052899
GRIT 8	I am diligent.*	round 5 (21/22)	.5085138
* All GRIT-measures are based on 5 point scale ranging from from "Not like me at all" to Very much like me"			

This table shows the measures from the survey data by the factors that they are associated to as presented in Section 4. Column (2) describes the codings of the respective measures from the survey question. Column (3) lists the observation round and respective age of the children when the information was elicited. The respective factor loadings of each measure are depicted in Column (4).

C Appendix C: Additional Tables

Table C1: Intergenerational Immobility with Parental Wealth

Dependent Variable	Children's Education	
Parental Wealth	6.990***	(0.306)
Controls		
Female	0.276**	(0.127)
Household Head's Age	0.009	(0.042)
Household Head's Age ²	−0.000	(0.000)
Birth Order (<i>Base: First Child</i>)		
Second Child	−0.139	(0.162)
Third Child	−0.739***	(0.202)
Fourth Child	−1.282***	(0.261)
Fifth Child	−0.573*	(0.303)
Sixth Child or More	−0.860***	(0.271)
Ethiopia	8.555***	(0.940)
India	9.317***	(0.932)
Peru	9.819***	(0.931)
Vietnam	8.525***	(0.934)
Observations	3117	
Adj. R ²	0.917	

This table shows the results from estimating Equation (1). The dependent variable is the years of schooling completed by the child at age 21/22. Parental wealth is a wealth index, which is an index of housing, durable consumption and access to services retrieved when the child was 7 or 8 years old. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

Table C2: Intergenerational Immobility with Total Expenditures

Dependent Variable	Children's Education	
Total Expenditures	1.683***	(0.111)
Controls		
Female	0.271**	(0.131)
Household Head's Age	0.060	(0.044)
Household Head's Age ²	-0.001	(0.000)
Birth Order (<i>Base: First Child</i>)		
Second Child	-0.082	(0.168)
Third Child	-0.750***	(0.213)
Fourth Child	-1.589***	(0.273)
Fifth Child	-1.054***	(0.309)
Sixth Child or More	-1.231***	(0.283)
Ethiopia	-4.991***	(1.314)
India	-4.010***	(1.352)
Peru	-3.304**	(1.375)
Vietnam	-4.507***	(1.358)
Observations	3124	
Adj. R ²	0.910	

This table shows the results from estimating Equation (1). The dependent variable is the years of schooling completed by the child at age 21/22. The measure for parental socioeconomic status is the natural logarithm of monthly total expenditures per household member in PPP-adjusted US dollar cents retrieved when the child was 11 or 12 years old. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

Table C3: Correlation of Pathway Factors

	Child Labor	Infra-structure	Education Spending	Underage Family	Parent Attentiveness	Social Environment	Health	Aspirations	Cognitive Ability	Non-Cognitive Ability
Child Labor	1									
Infrastructure	−0.0700	1								
Education Spending	−0.0817	0.188	1							
Underage Family	0.140	−0.0960	−0.0461	1						
Parent Attentiveness	−0.141	0.0878	0.140	−0.00434	1					
Social Environment	−0.114	−0.171	0.0306	0.0193	0.0687	1				
Health	0.0342	0.293	0.124	0.0214	0.0719	−0.235	1			
Aspirations	−0.151	0.204	0.117	−0.220	0.0869	−0.0956	0.170	1		
Cognitive Ability	−0.276	0.235	0.104	−0.130	0.181	−0.122	0.202	0.309	1	
Non-Cognitive Ability	−0.0434	−0.0465	0.0522	−0.0344	0.0450	0.137	0.00798	0.00370	−0.0101	1

This table shows the Pearson correlations of the factor scores for the pathway factors analyzed in Section 4. For more detailed information on the pathway factors see Tables B2 and B3 in the Appendix.

Table C4: Effect of Pathways on Children's Education - VIFs

	(1)	(2)
	Children's Education	VIF
Parental Education	0.108*** (0.014)	4.157
Pathways		
Child Labor	-0.385*** (0.065)	1.319
Infrastructure	0.172*** (0.061)	1.344
Education Spending	0.075 (0.053)	1.276
Underage Family	-0.816*** (0.061)	1.184
Parent Attentiveness	0.237*** (0.056)	1.161
Social Environment	0.133** (0.061)	1.286
Health	0.143** (0.059)	1.322
Aspirations	0.845*** (0.065)	1.423
Cognitive Ability	1.189*** (0.067)	1.069
Non-Cognitive Ability	0.053 (0.056)	2.197
Controls	Yes	
Observations	3124	
Adj. R ²	0.940	

The first column of this table shows the results from estimating Equation (3). The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is the years of schooling completed by the parents. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. The second column presents the corresponding variance inflation factors (VIF) to the estimation in the first column. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

Table C5: Effect of Pathways on Children's Education (excluding pathway factors one by one)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Parental Education	0.108*** (0.014)	0.113*** (0.015)	0.116*** (0.014)	0.112*** (0.014)	0.125*** (0.015)	0.112*** (0.014)	0.108*** (0.014)	0.111*** (0.014)	0.145*** (0.015)	0.129*** (0.015)	0.109*** (0.014)
Pathways											
Child Labor	-0.385*** (0.065)		-0.401*** (0.065)	-0.391*** (0.065)	-0.467*** (0.067)	-0.404*** (0.065)	-0.390*** (0.065)	-0.383*** (0.065)	-0.461*** (0.068)	-0.590*** (0.068)	-0.385*** (0.065)
Infrastructure	0.172*** (0.061)	0.208*** (0.061)		0.175*** (0.061)	0.199*** (0.063)	0.169*** (0.061)	0.169*** (0.061)	0.190*** (0.061)	0.194*** (0.063)	0.270*** (0.065)	0.170*** (0.061)
Education Spending	0.075 (0.053)	0.104* (0.054)	0.080 (0.053)		0.095* (0.054)	0.078 (0.053)	0.076 (0.053)	0.080 (0.053)	0.112* (0.058)	0.105* (0.057)	0.075 (0.053)
Underage Family	-0.816*** (0.061)	-0.850*** (0.060)	-0.821*** (0.061)	-0.817*** (0.061)		-0.813*** (0.061)	-0.820*** (0.060)	-0.805*** (0.061)	-0.906*** (0.061)	-0.870*** (0.063)	-0.817*** (0.061)
Parent Attentiveness	0.237*** (0.056)	0.263*** (0.057)	0.235*** (0.056)	0.238*** (0.056)	0.230*** (0.058)		0.244*** (0.056)	0.240*** (0.056)	0.281*** (0.058)	0.319*** (0.061)	0.238*** (0.056)
Social Environment	0.133** (0.061)	0.147** (0.061)	0.129** (0.061)	0.134** (0.061)	0.161** (0.063)	0.149** (0.061)		0.122** (0.061)	0.151** (0.063)	0.127** (0.064)	0.136** (0.061)
Health	0.143** (0.059)	0.138** (0.060)	0.164*** (0.059)	0.146** (0.059)	0.079 (0.060)	0.149** (0.060)	0.133** (0.059)		0.169*** (0.061)	0.227*** (0.063)	0.148** (0.059)
Aspirations	0.845*** (0.065)	0.879*** (0.065)	0.849*** (0.065)	0.848*** (0.065)	0.942*** (0.066)	0.859*** (0.065)	0.848*** (0.065)	0.849*** (0.065)		1.069*** (0.067)	0.845*** (0.065)
Cognitive Ability	1.189*** (0.067)	1.260*** (0.066)	1.204*** (0.067)	1.191*** (0.067)	1.234*** (0.068)	1.210*** (0.067)	1.188*** (0.067)	1.200*** (0.067)	1.362*** (0.066)		1.191*** (0.067)
Non-Cognitive Ability	0.053 (0.056)	0.054 (0.056)	0.046 (0.056)	0.053 (0.056)	0.066 (0.057)	0.056 (0.056)	0.059 (0.056)	0.062 (0.056)	0.059 (0.057)	0.074 (0.059)	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3124	3124	3124	3124	3124	3124	3124	3124	3124	3124	3124
Adj. R ²	0.940	0.940	0.940	0.940	0.937	0.940	0.940	0.940	0.937	0.934	0.940

The first column of this table shows the results from estimating Equation (3). The subsequent columns show the the results from estimating Equation (3) while dropping one pathway in each column. The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is the years of schooling completed by the parents. The pathway factors mainly represent characteristics of the children between ages 11 and 18. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

Table C6: Decomposition with Parental Wealth

Explained components of total $\hat{\beta}$	(1)		(2)	
	Part of total $\hat{\beta}$		Percent of total $\hat{\beta}$	
Child Labor	0.426***	(0.083)	0.061***	(0.012)
Infrastructure	0.070	(0.155)	0.010	(0.022)
Education Spending	0.093	(0.070)	0.013	(0.010)
Underage Family	0.620***	(0.076)	0.089***	(0.011)
Parent Attentiveness	0.170***	(0.046)	0.024***	(0.007)
Social Environment	-0.009	(0.013)	-0.001	(0.002)
Health	0.124**	(0.062)	0.018**	(0.009)
Aspirations	1.206***	(0.108)	0.173***	(0.017)
Cognitive Ability	1.529***	(0.128)	0.219***	(0.018)
Non-Cognitive Ability	0.004	(0.010)	0.001	(0.001)
Explained component of $\hat{\beta}$	4.233***	(0.261)	0.606***	(0.040)
Unexplained component of $\hat{\beta}$	2.756***	(0.348)	0.394***	(0.040)
Total $\hat{\beta}$	6.990***	(0.316)		

This table shows the results from a decomposition approach, as presented in Equation 4 while the parental wealth is used as a proxy for the socioeconomic status of the parents. Thereby, the respective coefficients from estimating Equations (2) and (3) with parental wealth used as a proxy for the socioeconomic status of the parents are multiplied to elicit the mediating effect of the pathway variables in the transmission of the overall effect of parental education on the children's educational outcome (Total $\hat{\beta}$). The dependent variable is the years of schooling completed by the child at age 21/22. The parental wealth variable is an index of housing, durable consumption and access to services retrieved when the child was 7 or 8 years old. The pathway factors mainly represent characteristics of the children between ages 11 and 18. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. Column (1) gives the absolute share and Column (2) gives the relative share of the pathway variables in the total $\hat{\beta}$. Bootstrapped standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

Table C7: Decomposition with Total Expenditures

Explained components of total $\hat{\beta}$	(1) Part of total $\hat{\beta}$		(2) Percent of total $\hat{\beta}$	
Child Labor	0.106***	(0.022)	0.063***	(0.013)
Infrastructure	0.093***	(0.028)	0.055***	(0.017)
Education Spending	0.050*	(0.026)	0.030*	(0.016)
Underage Family	0.108***	(0.026)	0.064***	(0.015)
Parent Attentiveness	0.062***	(0.016)	0.037***	(0.009)
Social Environment	-0.007	(0.005)	-0.004	(0.003)
Health	0.052**	(0.022)	0.031**	(0.013)
Aspirations	0.426***	(0.039)	0.253***	(0.026)
Cognitive Ability	0.360***	(0.041)	0.214***	(0.023)
Non-Cognitive Ability	0.005	(0.005)	0.003	(0.003)
Explained component of $\hat{\beta}$	1.256***	(0.086)	0.746***	(0.052)
Unexplained component of $\hat{\beta}$	0.428***	(0.103)	0.254***	(0.052)
Total $\hat{\beta}$	1.683***	(0.108)		

This table shows the results from a decomposition approach, as presented in Equation (4) while the natural logarithm of total expenditures per household member in PPP-adjusted dollar cents is used as a proxy for the socioeconomic status of the parents. Thereby, the respective coefficients from estimating Equations (2) and (3) with the natural logarithm of monthly total expenditures per household member in PPP-adjusted dollar cents used as a proxy for the socioeconomic status of the parents are multiplied to elicit the mediating effect of the pathway variables in the transmission of the overall effect of parental education on the children's educational outcome (Total $\hat{\beta}$). The dependent variable is the years of schooling completed by the child at age 21/22. The measure for parental socioeconomic status is the natural logarithm of monthly total expenditures per household member in PPP-adjusted dollar cents retrieved when the child was 11 or 12 years old. The pathway factors mainly represent characteristics of the children between ages 11 and 18. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. Column (1) gives the absolute share and Column (2) gives the relative share of the pathway variables in the total $\hat{\beta}$. Bootstrapped standard errors are reported in parentheses (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table C8: Effect of Pathways on Children's Education (including pathway factors one by one)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Parental Education	0.219*** (0.014)	0.160*** (0.014)	0.140*** (0.014)	0.130*** (0.014)	0.121*** (0.014)	0.116*** (0.014)	0.112*** (0.014)	0.108*** (0.014)	0.108*** (0.014)	0.108*** (0.014)
Pathways										
Cognitive Ability	1.659*** (0.066)	1.396*** (0.067)	1.332*** (0.067)	1.244*** (0.068)	1.226*** (0.067)	1.204*** (0.067)	1.192*** (0.067)	1.190*** (0.067)	1.188*** (0.067)	1.189*** (0.067)
Aspirations		1.034*** (0.067)	0.922*** (0.066)	0.878*** (0.065)	0.872*** (0.065)	0.856*** (0.065)	0.852*** (0.065)	0.848*** (0.065)	0.848*** (0.065)	0.845*** (0.065)
Underage Family			-0.856*** (0.060)	-0.814*** (0.061)	-0.810*** (0.061)	-0.812*** (0.060)	-0.823*** (0.060)	-0.821*** (0.060)	-0.820*** (0.060)	-0.816*** (0.061)
Child Labor				-0.433*** (0.065)	-0.415*** (0.065)	-0.394*** (0.065)	-0.396*** (0.065)	-0.390*** (0.065)	-0.390*** (0.065)	-0.385*** (0.065)
Infrastructure					0.184*** (0.061)	0.186*** (0.061)	0.169*** (0.061)	0.166*** (0.061)	0.169*** (0.061)	0.172*** (0.061)
Parent Attentiveness						0.249*** (0.056)	0.246*** (0.056)	0.246*** (0.056)	0.244*** (0.056)	0.237*** (0.056)
Health							0.140** (0.059)	0.138** (0.059)	0.133** (0.059)	0.143** (0.059)
Education Spending								0.076 (0.053)	0.076 (0.053)	0.075 (0.053)
Non-Cognitive Ability									0.059 (0.056)	0.053 (0.056)
Social Environment										0.133** (0.061)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3124	3124	3124	3124	3124	3124	3124	3124	3124	3124
Adj. R ²	0.929	0.935	0.939	0.940	0.940	0.940	0.940	0.940	0.940	0.940

This table shows the results from estimating Equation (3) while stepwise including one pathway after another according to their importance in the decomposition (Table 4). The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is the years of schooling completed by the parents. The pathway factors mainly represent characteristics of the children between ages 11 and 18. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

Table C9: Test of Independence of Coefficients from Parental Background

	Below Median	Above Median	Test on Difference
Parental Education	0.083** (0.036)	0.218*** (0.032)	
Controls			
Female	0.701*** (0.160)	0.897*** (0.154)	0.784 <i>0.376</i>
Household Head's Age	-0.012 (0.046)	-0.013 (0.051)	0.000 <i>0.990</i>
Household Head's Age ²	0.000 (0.000)	0.000 (0.001)	0.000 <i>0.995</i>
Birth Order (<i>Base: First Child</i>)			
Second Child	0.058 (0.208)	0.196 (0.183)	0.251 <i>0.617</i>
Third Child	-0.437* (0.243)	-0.034 (0.238)	1.401 <i>0.237</i>
Fourth Child	-0.384 (0.298)	-0.347 (0.341)	0.007 <i>0.935</i>
Fifth Child	0.160 (0.294)	0.173 (0.458)	0.001 <i>0.982</i>
Second Child or More	-0.247 (0.281)	0.622 (0.490)	2.370 <i>0.124</i>
Ethiopia	10.454*** (1.059)	8.823*** (1.152)	1.085 <i>0.297</i>
India	12.269*** (1.043)	10.255*** (1.117)	1.737 <i>0.188</i>
Peru	11.969*** (1.080)	9.985*** (1.135)	1.603 <i>0.206</i>
Vietnam	9.990*** (1.054)	9.445*** (1.120)	0.126 <i>0.723</i>
Pathways			
Child Labor	-0.436*** (0.078)	-0.327*** (0.117)	0.597 <i>0.440</i>
Infrastructure	0.219*** (0.080)	0.067 (0.092)	1.557 <i>0.212</i>
Education Spending	0.434*** (0.111)	0.067 (0.061)	8.412 <i>0.004***</i>
Underage Family	-0.710*** (0.067)	-1.128*** (0.123)	8.927 <i>0.003***</i>
Parent Attentiveness	0.270*** (0.076)	0.202** (0.083)	0.366 <i>0.545</i>
Social Environment	0.110 (0.082)	0.129 (0.090)	0.025 <i>0.874</i>
Health	0.133* (0.080)	0.145* (0.086)	0.010 <i>0.922</i>
Aspirations	0.773*** (0.077)	0.900*** (0.126)	0.747 <i>0.387</i>
Cognitive Ability	1.228*** (0.076)	1.049*** (0.141)	1.261 <i>0.262</i>
Non-Cognitive Ability	0.065 (0.080)	0.035 (0.076)	0.076 <i>0.783</i>

This table shows the results from estimating Equation (3) for the subsamples below and above the median of parents' completed years of schooling, respectively, in Column (1) and (2). The dependent variable is the years of schooling completed by the child at age 21/22. The pathway factors represent characteristics of the children between ages 11 and 18 mainly. For detailed information on the pathway factors see Tables B2 and B3 in the Appendix. Standard errors are reported in parentheses (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$). The third column presents the result of a "Chow test" on the difference on the coefficients in the two estimations, reporting Chi2 values and *p-values*.

D Appendix D: Exploratory Factor Analysis

In this section, we introduce the results to the decomposition analysis when the factors are identified by an EFA. For a more detailed formal discussion, see for example the online appendix of Heckman et al. (2013), Section H. Intuitively, the EFA procedure aims to identify the set of underlying common factors \mathcal{F} and the respective measures $j \in \mathcal{M}^i$ for each factor $i \in \mathcal{F}$ from correlations between all variables that can hold as potential measures. We follow standard EFA procedure (see, e.g., Child 2006, Thompson 2004) in obtaining the meaningful sets and the respective ψ_j^i given by Equation (5). All 42 measures used in the main text hold as potential measures. Measures are retained if they load strongly on one and only one factor. By construction of our analysis, the factors are likely to be correlated. Therefore, to obtain the factor loadings, we apply an oblique rotation, which allows for correlation of the factors. As rotation criterion, we apply the promax criterion with power three throughout (Hendrickson and White 1964). Other oblique rotation methods produce similar results (see Fabrigar et al. 1999). In EFA, determining the number of relevant factors to be retained is key. It should be the minimum number that can meaningfully explain much of the common variation of most measures. There are several selection criteria to determine this, each of which can yield quite different results. We in the following present the results when applying the two methods most regularly used in the literature, namely the scree test (Cattell 1966) and the parallel analysis test (Horn 1965). In both cases, first, as many factors as there are measures are determined to capture all common variation of the measures by factors. Then, the contribution of each factor is evaluated against the respective criterion.

Scree Test

For the scree test, all eigenvalues of the respective factors are plotted in descending order. The eigenvalues indicate the overall variation of all measures explained by each factor. The scree plot is shown in Figure D1. A kink in the plot indicates that an additional factor does not add much to explaining the overall variation of the measures. We observe a kink at Factor 6, implying that six factors should be retained. All measures that do not load strongly on one of the six factors or not on one in particular are then dropped repetitively. The KMO statistic of the sample is above 0.7 for all subsets of measures throughout the procedure. As a result, the 23 measures listed in Table D1, grouped by the underlying factors they load on, are retained. Next to each measure, the table shows the respective factor loadings. For comparison, the last column lists the factor each measure was associated with in the main analysis. We see that most measures associated with cognitive ability before also jointly load strongly on the first factor, which we therefore again name cognitive ability. Measures associated with the factors of underage family engagement and aspirations before (and a verbal crystalline IQ score) jointly load on one factor, which we thus interpret as the focus on the own career in life. Measures for health and parents' spending on education load on one factor, respectively. Measures of grit load on two different factors, which we for simplicity do not further differentiate by concept, since the main difference between the measures is that the items were framed positively or negatively, respectively, in the survey, where one set was

accordingly re-coded for the purpose of this analysis.

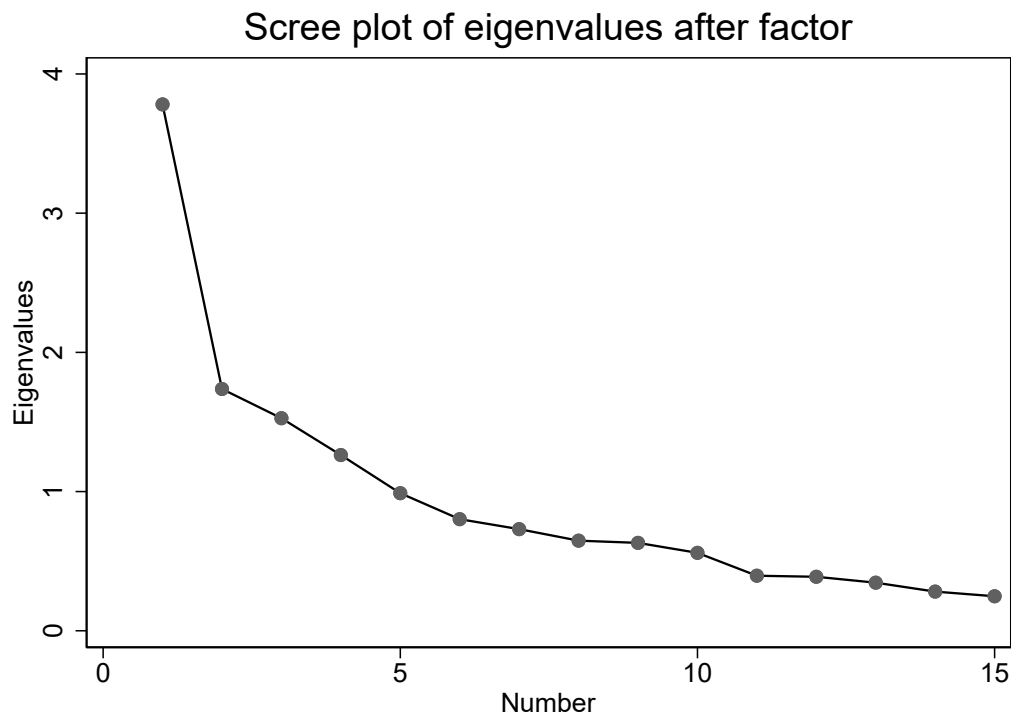


Figure D1: Screeplot

The results of the decomposition analysis employing the six factors identified from the EFA with the scree test as retention criterion are shown in Table D2. They show that cognitive ability identified through the measures at hand contributes 15 percent to the immobility observed. The broader factor of career focus explains 38 percent. Health and parental spending on education contribute statistically significant, but only small parts, to the transmission of socioeconomic status. Neither factor of non-cognitive skills plays any significant role. These results are very much in line with the results presented in the main text, only that the factors derived by EFA do not allow for a differentiation between the role of different aspects of career focus in life, which is expressed in measures of early aspirations by parents and children as well as becoming a spouse and/or a parent while minor.

Horn's Parallel Analysis

Horn's parallel analysis is an extension of the Kaiser-Guttman-criterion (Kaiser 1960, Kaiser 1961, Guttman 1954) for the retention of factors. This criterion applied in this context would have all factors with an eigenvalue greater than zero retained, as they contribute to explaining common variation. This criterion typically yields too great a number of factors to be retained to be meaningfully interpreted. The parallel analysis by Horn (1965) corrects for the fact

Table D1: Pathway Factors - Scree Test

Measure	Loading	Factor in Main Analysis
Factor 1: Cognitive Ability		
Math Score	.5019793	Cognitive Ability
Reading Level	.7016624	Cognitive Ability
Writing Level	.8928062	Cognitive Ability
Literacy	.8661021	Cognitive Ability
Factor 2: Career Focus		
Child Marriage	-.4988565	Underage Family
Child Parent	-.3622	Underage Family
School Aspirations Child	.4889706	Aspirations
School Aspirations Parents	.6822044	Aspirations
Job Aspirations Parents	.5380688	Aspirations
PPVT Test Score	.3873841	Cognitive Ability
Factor 3: Health		
Weight-for-age	.8226664	Health
Height-for-age	.6468711	Health
Thinness Indicator	.3803076	Health
Factor 4: Education Spending		
Spent on Schooling Fees	.7310288	Education Spending
Spent on School Books	.6005435	Education Spending
Private Schooling	.5524878	Education Spending
Factor 5: Non-Cognitive Ability I		
GRIT 1	.4083569	Non-Cognitive Ability
GRIT 3	.4738374	Non-Cognitive Ability
GRIT 5	.4807182	Non-Cognitive Ability
GRIT 6	.4686453	Non-Cognitive Ability
Factor 6: Non-Cognitive Ability II		
GRIT 4	.5139976	Non-Cognitive Ability
GRIT 7	.5469264	Non-Cognitive Ability
GRIT 8	.5608441	Non-Cognitive Ability

This table shows the factors derived from an exploratory factor analysis with the scree-test as criterion for determination of the number of factors. For each factor, the measures associated with the factor are listed. Column (2) depicts the respective factor loadings. Column (3) shows the factor that each measure was associated with in the analysis in the main text.

Table D2: Decomposition - Scree Test

Explained components of total $\hat{\beta}$	(1)		(2)	
	Part of total $\hat{\beta}$		Percent of total $\hat{\beta}$	
Cognitive Ability	0.048***	(0.005)	0.153***	(0.014)
Career Focus	0.118***	(0.007)	0.376***	(0.016)
Health	0.005**	(0.002)	0.015**	(0.007)
Education Spending	0.007**	(0.004)	0.024**	(0.011)
Non-Cognitive Ability I	0.001	(0.001)	0.003	(0.003)
Non-Cognitive Ability II	0.000	(0.001)	0.000	(0.002)
Explained component of $\hat{\beta}$	0.179***	(0.010)	0.570***	(0.013)
Unexplained component of $\hat{\beta}$	0.135	(0.000)	0.430***	(0.013)
Total $\hat{\beta}$	0.314***	(0.010)		

This table shows the results from a decomposition approach, as presented in Equation (4). Thereby, the respective coefficients from estimating Equations (2) and (3) are multiplied to elicit the mediating effect of the pathway variables in the transmission of the overall effect of parental socioeconomic status (parental education) on the children's educational outcome (Total $\hat{\beta}$). The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is measured by the years of schooling completed by the parents. The pathway factors represent characteristics of the children between ages 11 and 18 mainly. For detailed information on the pathway factors see Table D1. Column (1) gives the absolute share and Column (2) gives the relative share of the pathway variables in the total $\hat{\beta}$. Bootstrapped standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

that some common variation is likely to arise from noise in the data. Applying it to the 42 measures from the survey, the parallel analysis still recommends 19 factors be retained. For most of these factors, however, not enough measures load strongly enough or not particularly on the respective factor, such that only seven factors are retained that can be meaningfully interpreted, captured by 22 measures overall. Also with this procedure, the KMO statistic of the sample is above 0.7 for all subsets of measures throughout. The retained measures are listed in Table D3, next to the respective factor loadings and the factor they were associated with in the main analysis. Again, we see that some concepts are dropped, but the identified factors are still very much in line with the ones obtained by an intuitive association. For measures of cognitive ability, only those of literacy are retained as to measure a common factor. Children's and parents' expressions of aspirations derive from another common factor, as do those of education spending. Two factors are respectively associated with the attentiveness of the parents to the child and with non-cognitive skills, where again the distinction appears to arise from different framings in the survey items. Overall, the factors identified again generally support the most relevant groupings from the intuitive approach.

Table D4 depicts the results from the decomposition analysis with the seven factors obtained from EFA applying the Horn (1965) criterion. Literacy is responsible for 14 percent of the overall association between parental and offspring's education, aspirations play a large role with 24 percent, education spending and parent attentiveness play only small roles, and non-cognitive skills are not important in the intergenerational transmission of socioeconomic status in the sample at all. These results further support the central interpretations from the main analysis.

The analyses presented above confirm that the results derived with the intuitive approach of identifying factors from the given set of measures are in line with those from the more data driven approach via an EFA. They also show that the former allows for a slightly more nuanced interpretation, and furthermore allows the inclusion of factors in the analysis for which there are less but still meaningful measures available in the data. The main results, however, remain valid irrespective of the exact approach of dimensionality reduction.

Table D3: Pathway Factors - Parallel Analysis

Measure	Loading	Factor in Main Analysis
Factor 1: Literacy		
Reading Level	.6838274	Cognitive Ability
Writing Level	.8811562	Cognitive Ability
Literacy	.8838982	Cognitive Ability
Factor 2: Aspirations		
School Aspirations Child	.5093383	Aspirations
School Aspirations Parents	.7195964	Aspirations
Job Aspirations Parents	.5887357	Aspirations
Factor 3: Education Spending		
Spent on Schooling Fees	.7310288	Education Spending
Spent on School Books	.6005435	Education Spending
Private Schooling	.5524878	Education Spending
Factor 4: Parent Attentiveness I		
Conversation	.379615	Parent Attentiveness
Supported by Parents	.4564446	Parent Attentiveness
Treated Worse	.3646377	Parent Attentiveness
Factor 5: Parent Attentiveness II		
Attention received	.4480594	Parent Attentiveness
Love received	.4272053	Parent Attentiveness
Free Speech	.4209845	Parent Attentiveness
Factor 6: Non-Cognitive Ability I		
GRIT 4	.5139976	Non-Cognitive Ability
GRIT 7	.5469264	Non-Cognitive Ability
GRIT 8	.5608441	Non-Cognitive Ability
Factor 7: Non-Cognitive Ability II		
GRIT 1	.4083569	Non-Cognitive Ability
GRIT 3	.4738374	Non-Cognitive Ability
GRIT 5	.4807182	Non-Cognitive Ability
GRIT 6	.4686453	Non-Cognitive Ability

This table shows the factors derived from an exploratory factor analysis applying Horn's parallel analysis to determine the number of factors. For each factor, the measures associated with the factor are listed. Column (2) depicts the respective factor loadings. Column (3) shows the factor that each measure was associated with in the analysis in the main text.

Table D4: Decomposition - Parallel Analysis

Explained components of total $\hat{\beta}$	(1)		(2)	
	Part of total $\hat{\beta}$		Percent of total $\hat{\beta}$	
Literacy	0.044***	(0.005)	0.143***	(0.017)
Aspirations	0.073***	(0.006)	0.239***	(0.021)
Education Spending	0.010***	(0.004)	0.034***	(0.012)
Parent Attentiveness I	0.008***	(0.002)	0.025***	(0.007)
Parent Attentiveness II	0.002	(0.001)	0.006	(0.004)
Non-Cognitive Ability I	0.000	(0.001)	0.000	(0.002)
Non-Cognitive Ability II	0.001	(0.001)	0.005	(0.003)
Explained component of $\hat{\beta}$	0.138***	(0.009)	0.452***	(0.032)
Unexplained component of $\hat{\beta}$	0.167***	(0.015)	0.548***	(0.032)
Total $\hat{\beta}$	0.304***	(0.015)		

This table shows the results from a decomposition approach, as presented in Equation 4. Thereby, the respective coefficients from estimating Equations (2) and (3) are multiplied to elicit the mediating effect of the pathway variables in the transmission of the overall effect of parental socioeconomic status (parental education) on the children's educational outcome (Total $\hat{\beta}$). The dependent variable is the years of schooling completed by the child at age 21/22. Parental education is measured by the years of schooling completed by the parents. The pathway factors represent characteristics of the children between ages 11 and 18 mainly. For detailed information on the pathway factors see Table D3. Column (1) gives the absolute share and Column (2) gives the relative share of the pathway variables in the total $\hat{\beta}$. Bootstrapped standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

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