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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 developing countries. From rich longitudinal data elicited throughout children's childhood and youth, we extract latent factors of their development process. These factors comprise individual attributes as well as characteristics of children's environments. We decompose social immobility by analyzing the extent to which the different factors mediate the link between the socioeconomic statuses of parents and children. The findings indicate that relevant factors for the intergenerational transmission of socioeconomic status in developed countries – such as children's cognitive skills and aspirations – are also important in developing countries. Moreover, we confirm conjecture about the role of transmission channels that are specific to the developing country context, namely starting a family while underage and having to perform child labor. Other factors – most notably various non-cognitive skills – play no role.

***JEL* Codes**: I24, J62, O15.
Keywords: Intergenerational social mobility, transmission channels, low- and middle-income countries, decomposition, mediation analysis, factor analysis

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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 substantially determines children's socioeconomic outcomes. However, the mechanisms that underlie these associations are much less understood. In particular, there is only little evidence for developing countries.[1] This is problematic: Just as countries with higher economic inequality show greater levels of social immobility (Corak 2013; Becker et al. 2018), Narayan et al. (2018) show that poorer countries tend to have higher levels of immobility, implying higher inequality of opportunity in developing countries. Because the degree of immobility in poorer countries is different from that in richer countries, the channels of immobility in developing countries are also likely to differ.

In this study we analyze the factors of children's development paths influenced by parental socioeconomic status that determine children's socioeconomic outcomes and, thus, constitute *pathway factors* of intergenerational immobility in developing countries. We use longitudinal data from surveys of children in four countries from the major developing regions of the world, namely Ethiopia, India, Peru, and Vietnam. From the rich information about the children's development and environment, we extract latent pathway factors from thematic groups of childhood characteristics by means of factor analysis. We then use mediation analysis to decompose the correlation between the children's outcomes and their parental backgrounds into the absolute and relative contributions of the different pathway factors.

The findings show that the most relevant pathway factors are the children's cognitive skills and aspirations. These individual characteristics each account for almost 20 % of immobility, the highest of all factors analyzed. However, no measure of non-cognitive skills elicited in the surveys plays a role in the setting of developing countries. Instead, other factors more specific to lower-income societies contribute to the transmission of socioeconomic status across generations: poorer children's higher likelihood of starting a family while underage and having to perform child labor account for 10 % and 6 % of immobility, respectively. Other factors that have been discussed in the literature as potential transmission channels in developing countries, namely children's health, parental attentiveness at school age, and the local school infrastructure also play statistically significant, but small, roles. Overall, the pathway factors analyzed explain around 64 % of the observed immobility. When decomposing each country's immobility separately, some differences between the countries become apparent. But the main tendencies from the pooled analysis are mirrored in all four countries, suggesting a general pattern for developing 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. Starting a family while underage is not so relevant for boys.

[1] In developed countries, it has been shown that both the individual characteristics of children (Blanden et al. 2007) and their local environment (Chetty and Hendren 2018a,b; Chetty et al. 2014, 2016; Acciari et al. 2019; Alesina et al. 2021) contribute to children of disadvantaged households faring worse in their adult lives than children from more privileged backgrounds.

This study contributes to the literature in several ways. First and foremost, it is the first to identify the pathway factors of intergenerational immobility in developing countries. Several 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 by means of mediation analysis. Using survey data from the United States (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 the parents' socioeconomic status, measured by family income, to their sons' earnings in the United Kingdom (UK). The authors 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 statuses. Similarly, Blanden et al. (2014), using data on fathers and sons from both the UK and the US, analyze the mediating role of early marriage, health status, labor market attachment, occupations, and education. The results confirm that a large part of the association is transmitted through education. Considering the same age cohort, Schad (2015) replicates the analysis undertaken by Blanden et al. (2014) for Germany and obtains similar results. In our study, we are able to include a much broader set of potential pathway factors. Some of the characteristics are specific to the low- and middle-income country context. Our analysis concentrates on children's education as the relevant socioeconomic outcome variable and not as a pathway factor, because children's educational success itself is determined by many factors that can be influenced by parental background. In our main specifications, we use the parents' level of education as the proxy for their socioeconomic status as well. Thus, in line with a large strand of literature, our primary measure of social immobility is *educational immobility*, which we deconstruct into the different pathways.[2]

Our paper also adds to the literature on the degree of social immobility in developing countries. The study design allows the levels of relative immobility to be compared across developing regions using recent data from a single survey. 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. By using novel and comprehensive data, we are able to mitigate many problems often associated with estimating intergenerational mobility in developing countries: We use information on education levels – elicited directly from the parents and children –, which avoids issues of life-cycle fluctuations of income levels and taking data in retrospective. Moreover, the sample is not plagued by co-residency bias which otherwise tends to produce a downward bias in the estimations of intergenerational mobility in developing countries (see Emran et al.

[2] As alternative parental background variables, we also use total household expenditures and parental wealth (where the latter is similar to Landersø and Heckman 2017).

2018, and Emran and Shilpi 2019 for an overview). In the data we use, children are tracked also after they have moved out of the household.

Finally, we also advance the literature methodologically. We extend the mediation analysis approach to the decomposition by Bowles and Gintis (2002) and Blanden et al. (2014). Pathway factors are extracted from a battery of data on childhood characteristics by means of factor analysis. This allows us to use the abundant data without encountering issues of multicollinearity and measurement error, which are common concerns when analyzing survey data. We additionally correct for typical forms of measurement error in the measures of non-cognitive skills in developing countries in particular (Laajaj and Macours 2019). The mediation analysis then picks up on recent discussions and advancements in the literature on the methodology.

The remainder of this paper is structured as follows: The next section presents the dataset and the estimation strategy. Section 3 estimates the degree of relative social immobility in the countries studied. Section 4 then presents our analysis of the pathway factors. Section 4.1 introduces the potential pathway factors of the intergenerational transmission of socioeconomic status and the factor analysis procedure used to obtain them from the data. In Section 4.2, we analyze the dependence of the different factors of childhood development on parental background, and in Section 4.3 we examine the role these factors play in children's educational outcomes. Finally, in Section 4.4, we decompose the degree of immobility into the different pathway factors by estimating by how much each factor mediates the link between parents' and children's socioeconomic status. Two subsections present 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, 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 were selected for the survey because they represent the four major regions of the developing world, both low- and middle-income countries, and diverse socioeconomic and political systems (Young Lives 2017).[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

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

[4] 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) are in the middle. Peru has the smallest population (31,376,670) and India 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 1.90 US dollar (2011 PPP) a day (33.5 %), followed by India (21.2 %), Vietnam (4.8 %), and Peru (4.7 %).

when they were last interviewed. Children included in the survey were selected by applying a "'pro-poor' and multi-stage sampling procedure" (Aurino and Burchi 2017, p. 294).[5] The survey asked a range of questions about the socioeconomic background of the families and their offspring's situation each 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 use in our analysis, the final sample for our main estimation is slightly imbalanced between countries, with 901 observations from India, 892 from Vietnam, 751 from Ethiopia, and 567 from Peru.[7]

The Young Lives survey has several advantages for the purpose of studying the channels of social immobility in developing countries. First, it is the most comprehensive data collection on children in developing countries and the hardships they may face. Second, it allows for a relatively representative analysis of the developing world. Third, survey questions are nearly universally harmonized across the four countries, which makes it easy to compare the countries and avoid biases arising from the way 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]

We conduct the estimation of intergenerational immobility and its pathways in the cross-section, but 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 of how parental background determines the potential pathway factors as well as how they in turn correlate with the outcomes. The mediation analysis comprises four steps. (i) We estimate the extent to which the children's outcomes can be associated with their parental backgrounds, that is, the degree of relative immobility, which is then decomposed. (ii) For the decomposition, we first estimate each pathway factor's correlation with the parents' education. (iii) Then the influence of all pathway factors on the children's educational outcomes is estimated by one joint regression. (iv) Finally, we combine steps ii and iii to elicit the overall contribution of each pathway factor to the overall immobility estimated in step i. Figure A1 in Appendix A graphically illustrates the approach, which is laid out in detail in the following.

The relationship between the parental background and children's outcomes, controlling for other characteristics, gives us the degree of social immobility. The baseline regression to elicit

[5] First, 20 sites were non-randomly predetermined for each country with the purpose of mostly covering poorer areas. Children of a certain age were randomly selected within these pre-selected sites. Although this leaves the dataset nationally unrepresentative, it captures the diversity of children in each country and allows to compare poor and better-off children.

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

[7] The observations deleted do not differ significantly from the rest with regard to the observed characteristics.

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

this degree reads:

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

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 parents' years of schooling. Our coefficient of interest, β, is the measure of the degree of intergenerational immobility, representing the relation between one additional year of parental schooling and 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 could be correlated with their educational success. The specific variables are introduced in Section 3. We employ country fixed effects, d_k, in order to capture country k-wide effects, such as the overall level of schooling, so that we capture only within-country variation of educational outcomes in our estimations. $\epsilon_{h,1}$ is the error term.

In line with most of the literature on educational immobility we conduct all estimations by employing an ordinary least squares (OLS) model.[9] 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.[10]

The 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 jointly drive similar survey measures. We present this procedure in detail in Section 4. The resulting set of pathway factors is given by $\mathcal{F}$. Having obtained the set of pathway factors, we test relationship a) and investigate whether the pathways $PW_{i,h}$, $i \in \mathcal{F}$, are correlated with the parents' education. The respective regression equations for each pathway $i \in \mathcal{F}$ read:

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

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), analyzing whether each of the pathway factors is also correlated with the

[9] The decomposition of the different pathways further below also requires linear estimation.

[10] Clustering at the country level is not only unnecessary, 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 leads to very few observations per cluster, again potentially biasing the estimations of the standard errors. See Cameron and Miller (2015) for a discussion. In either case, neither clustering of standard errors at the country nor at the site level affects any of our results.

children's educational outcomes. To this end, we estimate the following regression:

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

where the different ρ_i's indicate the relationship of each pathway i with 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 in Section 4.3. Because of the potential correlation between the pathway factor variables, it is important to include them jointly in one regression. Otherwise, the estimations of the ρ_i's would suffer from omitted variable bias. We will also return to this issue when discussing the results in Section 4.3.

In addition to the pathway factors, we include parental education as an explanatory variable in the estimation. γ_{ED^P} represents the *direct relation* between parental education and child h's educational outcome, which cannot be explained by means of the included pathway factors (see also Conti et al. 2016).[11]

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 between generations. The procedure can be understood through the following relationships. Inserting Equations (2) into Equation (3) yields

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

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 relation between parental education and children's education, and $\sum_i \rho_i \lambda_i$ is the indirect relationship mediated by the pathway factors.[12] In order to obtain the mediated relationship between parental socioeconomic status and the educational outcome by each pathway variable, the results from the estimations of the respective ρ_i and λ_i by Equations (2) and (3) are multiplied. The mediation analysis hence combines the estimation results of the two previous steps into one result.

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

[11] Including the parental background as an explanatory variable also further reduces the risk of omitted variable bias in the estimation of the relationship between the pathway factors and educational outcomes. It can capture, for example, the effects of networks and other children's characteristics that cannot be measured.

[12] See Gelbach (2016) for a discussion of the connection between the direct and indirect relations. He also suggests the method we used to elicit the contribution of the pathway variables.

For the indirect relation – constituted by the $\hat{\rho}_i\hat{\lambda}_i$'s – to be estimated without bias (and consequently, also the direct relation, since $\hat{\beta}-\sum_i \hat{\rho}_i\hat{\lambda}_i = \hat{\gamma}_{Ed^P}$), the error terms from estimating Equations (2) and (3), $\epsilon_{h,i,2}$ and $\epsilon_{h,3}$, must be uncorrelated (Blanden et al. 2014; Imai et al. 2010b). This cannot be tested (Imai et al. 2010a), but a number of sensitivity analyses can be conducted. We present these when discussing the results in Section 4.4.

Thus, the estimated share that each pathway i contributes to the overall immobility is 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.[13]

3. Degree of Social Immobility

In this section, we estimate the degree of intergenerational immobility, that is, the extent to which the respondents' outcomes as young adults are related to their parents' socioeconomic status. The estimation is given by Equation (1).

To measure children's socioeconomic status, we take their outcome variable from the final observation period. The dataset does not allow some common outcome variables, such as children's wages, to be used because the surveyed children were on average only 22 years old in the last observation period and in many cases had not yet begun formal employment. Additionally, literature has shown that wages and earnings in young adulthood are often not representative of later socioeconomic status (see, for example, Chetty et al. 2014). We instead employ information about the children's educational achievements because it is the best observable measure of their socioeconomic status. Earlier studies on the intergenerational transmission of income show that educational outcome is a good predictor of later economic success (see 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.

[13] We abstract from causal interpretations throughout the paper. It is central to the literature on intergenerational mobility that the influence of the background on children is multidimensional and that it is the parents' characteristics, not only their income or education, that affect children's outcomes. Our observable measures of socioeconomic status are thus a proxy for the socioeconomic status in general. From this perspective, reverse causality can be excluded for the "effects" of the background on both, children's outcomes and on their and their youth's characteristics, as the time structure rules out that children's characteristics and outcomes influence their former background. This perspective underlines the ties between background in an abstract sense on the one hand and the offspring's and their youth's characteristics on the other hand as inherent tendencies. The relationship between pathway factor variables and children's outcomes, estimated by Equation (3), can even from this perspective be bidirectional if the knowledge of lower outcomes incentivizes children or their families to adjust their decisions and attitudes accordingly. This is also common to other studies that analyze the mediating factors of the persistence of socioeconomic status, such as Blanden et al. (2014, 2007), or those that analyze the mediating factors of randomized interventions, such as Heckman et al. (2013). Our study design alleviates this concern by using data on children's characteristics elicited early in the children's lives. Nonetheless, in order to be consistent in terminology, and in line with the majority of literature on intergenerational mobility, we in all steps restrict the interpretation of relationships to one of correlation.

We operationalize children's educational outcome by the years of schooling achieved by the child in the last observation round at age 21–22 years, denoted as Ed_h^C in Equations (1), (3), and (4). As the survey only provides information on children's first 12 years of schooling, we extract any additional years of schooling from information about the highest educational degree obtained. We use the concordance by Narayan et al. (2018, p. 80) to transpose levels used by the International Standard Classification of Education (ISCED, United Nations 2016) into the corresponding years of schooling.[14] The resulting number of years of schooling – and, hence, the main dependent variable – ranges from zero to 18. The average years of children's schooling 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.[15] The resulting average parental years of schooling is 5.6. This number is considerably lower than that of the children, which implies substantial absolute upward mobility in terms of education. Although some studies measure mobility by an *absolute* measure given by the probability that children will attain a higher educational level than their parents, this is meaningless here, since the majority of children in the sample received more education than their parents. The empirical strategy chosen instead estimates the degree of *relative* immobility, given by the dependence between parents' and their offspring's education levels, and its respective pathway factors.

When we use the raw number of the parents' and children's years of schooling, the estimation yields what is typically referred to as the intergenerational regression coefficient (IGRC). If we instead standardize the parents' and children's years of schooling to have a mean of zero and a standard deviation of one, respectively, we obtain the intergenerational correlation (IGC, for a discussion of the differences between the IGRC and the IGC, see Emran and Shilpi 2019). Estimating the IGC mitigates concerns of co-residency bias (Emran et al. 2018) and avoids capturing patterns of general upward mobility across the population when comparing estimations for different countries or regions. The IGC estimates are larger than the IGRC estimates if the variance of parental education is larger than the variance in children's education (which is the case in our data) and vice versa. We report both estimations here, but refer to the estimates related to the IGRC throughout the paper if not indicated otherwise because it facilitates interpretation, with no difference in the qualitative results.

As control variables X_h – that are not correlated with parental background but potentially influence children's educational outcomes –, we incorporate a set of variables typically used in other analyses of intergenerational immobility (see Solon 1999) that includes the child's gender,

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

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

Table 1. *Intergenerational Educational Immobility*

	Intergen. Regression Coefficient (IGRC)		Intergen. Correlation (IGC)	
Dependent Variable	Children's Education		Children's Education	
Parental Education	0.304***	(0.015)	0.370***	(0.018)
Controls	Yes		Yes	
Observations	3111		3111	
Adj. R^2	0.916		0.201	

Notes: This table shows the results from estimating Equation (1). In the first column the dependent variable is the years of schooling completed by the child at age 21–22. The parental education in the first column is the years of schooling completed by the parents. For the estimation of the intergenerational correlation in the second column, children's education and parental education are standardized to have a mean of zero and a standard deviation of one. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

birth rank, the household head's age and a squared term of that. Table B1 in Appendix B displays descriptive statistics for all variables used in this section.

All the 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 from 1 if child h is the first born to 5 for the fifth born. The variable takes a value of 6 if the child is the sixth or later born child. The birth order is considered because it has been theoretically and empirically shown that the level of children's education differs in intra-household comparison between the siblings born earlier and those born later (see, for instance, Ejrnæs and Pörtner 2004, and Black et al. 2005 for developed countries).[16] Including the age of the household head and its quadratic term controls for accumulation over age, which is particularly relevant for robustness tests using parental wealth as the proxy for the parents' socioeconomic status. Controlling for the age of the children is not necessary since the children in the sample have almost the same age due to the sampling design.

Estimation results for Equation (1) are shown in Table 1. Column 1 reports the IGRC, Column 2 the IGC. The estimated coefficient $\hat{\beta}$ for parental education is significant and positive, implying a considerable degree of social immobility. The IGRC is estimated to be around 0.3, the IGC at 0.37, which are slightly lower than comparable estimates for developing countries. It is, however, at the upper bound of most estimates for developed countries, confirming higher levels of immobility in developing countries.

The fact that we estimate somewhat lower levels of immobility than other studies on developing countries can have several causes. For example, Narayan et al. (2018) use different datasets

[16] Birth rank may be correlated with parental socioeconomic background because of decisions regarding the family structure. However, family structure and the attention that parents can devote to each child will be included as a measure of a pathway variable later, so that, conditional on these, the rank itself can be treated as exogenous.

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

Table C1 in Appendix C shows the results of the estimation using wealth to measure parents' socioeconomic status. This equally influences the children's educational outcomes, which is to be expected because 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 their offspring increase by 0.7 years, which implies a difference of 3.5 years in schooling between offspring from the poorest households and middle-class households. Table C2 in Appendix C shows the results of the estimation using total expenditure per household member to measure the parents' socioeconomic status, which confirms the qualitative results.

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 of the children's development path that potentially affects their outcome, which is likely influenced by their parents' socioeconomic status. First we introduce the potential pathway factors considered in the analysis. Then we analyze the absolute and relative contributions of the different pathway factors to the observed immobility estimated in the previous section.

4.1. *Pathway Factors*

The Young Lives data provides detailed information on children's circumstances, progress, abilities, and feelings throughout youth at the points they (and their families) were surveyed. Many survey items aim to elicit similar information. For example, the children's nutritional and/or health status is captured by measuring their weight, height, number of sick days, and general well-being. If all measures were included in the analysis at the same time, it would raise issues of multicollinearity and lead to underestimating their joint effect. Furthermore, survey data is prone to measurement error. To address this, we make use of the richness of the information in the data by extracting latent factors from grouped survey measures by means of 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 that they have been discussed as potential transmission pathways in the literature, whether in developing countries specifically or not. In the Young Lives survey, we identify measures of ten such underlying factors related to individual survey items that could be correlated with parental background and that also could affect their offspring's educational perspectives. These ten latent factors are:

(i) *Child labor*: It is likely that poorer children in developing countries have to work, either inside or outside the home. It is also likely that this will negatively impact their chances of succeeding in school (Woldehanna and Gebremedhin 2015; Putnick and Bornstein 2015; Emerson and Souza 2003).[17]

(ii) *Infrastructure*: The public (or private) infrastructure where a child lives may critically determine their likelihood of attending and being successful in school (Vuri 2008; Kazeem et al. 2010). Poorer parents are more likely to live in rural areas or where it is more difficult to get to school.

(iii) *Education spending*: Poorer parents have fewer financial resources to invest in their offspring's education (for school fees, learning materials, and private schools) (Kornrich and Furstenberg 2013), which affects educational 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 in turn decreases their chances of finishing school when they otherwise would have (Nguyen and Wodon 2014).[18]

(v) *Parental attentiveness*: The time and energy that parents devote to fostering and educating each of their children is an important determinant of their outcomes and is linked to the parents' socioeconomic status and 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 area's social structure and the children's peer groups can determine how well they fare in school and are influenced by their parents' potentially resource- or status-related location decisions (Sacerdote 2014, 2011).

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

(viii) *Aspirations*: What children want to achieve in life (or at school) is an important

[17] Child labor affects all four countries under consideration. In 2010–2011, Ethiopia had the highest percentage of children between 7 and 14 years in employment of these four countries (26.1 %), followed by Peru (20.7 %), then Vietnam (13 %), and India (2.5 %) (World Bank 2017). However, these official numbers do not include children working in their homes or family businesses. The UN Convention on the Rights of the Child includes all work that is "likely [...] to interfere with the child's education" (United Nations 1989, Article 32). Evidence for India shows that with better control and regulation of child labor, domestic work is becoming the more important form (see UNICEF 2018).

[18] Child marriage is not legal in any of the four countries studied. Nonetheless, like in many developing countries, it remains widespread, 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) % in Ethiopia (for a detailed overview over the phenomenon of child marriage in Ethiopia, see Erulkar and Muthengi 2009), 27 (7) % in India, 22 (3) % in Peru, and 11 (1) % in Vietnam. India thus has 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.

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 (that is, imitation: see also Agupusi 2019), missing information (Hoxby and Avery 2013; Hoxby and Turner 2015; Jensen 2010), or awareness of actual group constraints (Dalton et al. 2016).[19]

(ix) *Cognitive ability*: In developed countries, cognitive ability, whether transmitted by nature or nurture,[20] has been found in developed countries to be one of the central pathway factors of the intergenerational transmission of socioeconomic status (see, for example, Blanden et al. 2007).

(x) *Non-cognitive ability*: Along with cognitive skills, non-cognitive skills have been increasingly spotlighted as determinants of lifetime (and educational) outcomes in developed countries (see Kautz et al. 2014 for an overview). As with cognitive ability, children's non-cognitive skills are strongly associated 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 is no common latent factor for non-cognitive skills. Each skill that falls under this definition stands on its own and is not assumed to be strongly correlated with the others (Borghans et al. 2008). In order to not include too many non-cognitive factors in the presentation, we report only the estimations including grit as a factor of non-cognitive skills in the main text. Grit is defined as perseverance and the passion for long-term goals and has been shown to be key to educational and lifetime outcomes in developed countries (Duckworth et al. 2007).[22] However, including other factors of non-cognitive ability in our analysis, such as agency, pride, trust, and inclusion, either serially or all at the same time, yields the same results as grit. The results for grit are thus representative of all factors of non-cognitive ability elicited in the surveys.

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 that each group of measures is associated with only one factor. The set of measures for each factor i is denoted by $\mathcal{M}^i$ and the set of factors by $\mathcal{F}$. In order to more easily interpret the relationship between measures and the respective factors (the factor loadings),

[19] It is also argued that too high aspirations can dampen the efforts of children coming from low socioeconomic backgrounds, because the "aspiration gap" may be too large (Ray 2016). However, since our measures of aspirations rather target the lower end of the ambition distribution, we do not explicitly account for this possibility.

[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 the socioeconomic status in general and of human capital in particular.

[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 the last round. We must therefore assume at least some stability of this factor over time. All other non-cognitive factor measures were obtained in earlier survey rounds.

all measures have been 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:

$$m_j^{i,h} = \psi_j^i PW_{i,h} + \eta_j^{i,h} \tag{5}$$

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 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 of the principal factor i that common variation of its measures m_j^i, $j \in \mathcal{M}^i$, which can explain most of these measures' common variation. For detailed discussions of this approach, see Heckman et al. (2013), Kim and Mueller (1978), and Gorsuch (1983). In our sample, the Kaiser-Meyer-Olkin (KMO) statistic (Kaiser 1974) is well above 0.7 and the Bartlett (1951)-test of sphericity is significant at the 1%-level, which confirms the adequacy of the sample for a factor analysis. Column 4 in Tables B2 and B3 lists the respective factor loadings for the individual measures.

In order to more straightforwardly interpret some of the estimation results, the factor variables themselves are also standardized after extracting them from the measures.[23] The ten factor scores $PW_{i,h}$ obtained for each child are considered to be potential pathway variables in the decomposition of the observed social immobility.

Besides reducing dimensionality, employing factor analysis also deals with measurement error in the individual survey measures by extracting only the common variation from the measures (see Wansbeek and Meijer 2003).[24] The quality of the factor scores nonetheless depends on the accurateness of the underlying measures. The quality of the data is particularly questionable for survey measures of non-cognitive skills in developing countries, as Laajaj and Macours (2019) point out. As far as possible when using pre-existing data, we follow the recommendations of Laajaj and Macours (2019) in order to address potential shortcomings of the non-cognitive skills data: First, in order to derive the factor scores, we create our own scale from the data by conducting the factor analysis described above instead of relying on existing scales obtained in different contexts. Second, in advance of the factor analysis, we correct the measures of non-cognitive skills for the interviewers' influence (by controlling for

[23] If a child or parent did not answer one of the 42 survey items used as measures, we assigned it the mean of the respective answer in order to 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.

[24] As Heckman et al. (2013) points out, an alternative to factor analysis would be creating simple averages of the grouped measures. Besides ignoring the covariability between the measures and using arbitrary weighting, thereby giving weight to measures that are not correlated with other measures of an underlying factor of interest, this would correct for measurement error by simply averaging out error terms. Factor analysis, in contrast, excludes the (uncorrelated) error terms when estimating the individual factor scores.

interviewer fixed effects)[25] and for acquiescence bias (by subtracting the acquiescence score). These procedures ensure that answering patterns that are generated solely by the survey design do not play a role for the measurement system. Appendix D elaborates on how we deal with non-cognitive skills data.

We intuitively associate measures with underlying factors, in line with the structure of the surveys. This gives the researcher some degrees of freedom. A more purely data driven approach would be to conduct an exploratory factor analysis (EFA), which groups measures according to their actual relationship, identifying underlying factors by the data structure. The downside of such an approach is that it gives the same consideration to all measures without considering their conceptual importance, and hence tends to emphasize factors measured by many items. To affirm the groupings from intuitive approach, we also conduct an EFA, which supports the general associations of measures (and the interpretation of factors as detailed 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 concepts from the analysis which have fewer measures. We report the results of the intuitive approach in the main text because it uses all the information given, with those measures with lower factor loadings contributing less, but still informatively to the identification of the latent factors. Also, the intuitive grouping of measures allows to disentangle the role of related but independent concepts. This gives a more nuanced overview of the contributions of different factors, particularly those with fewer measures. The main results of the analysis remain the same irrespective of the method to group the measures of factors. The results from employing an EFA are briefly discussed in Section 4.4 and presented in detail in Appendix E.

4.2. *Parental Socioeconomic Status and Pathways*

In order to play a role in the transmission of socioeconomic status, a pathway factor has to depend on parental background. To find out whether this is the case for the pathways considered, we estimate Equation (2) for each pathway $i \in \mathcal{F}$. We control for same set of variables X_h and country fixed effects. To facilitate interpretation, we use the plain (non-standardized) number of years of parents' schooling as explanatory variable, analoguous to the estimation of the IGRC.[26]

The results of estimating Equation (2) are shown in Table 2. Each of the hypothesized pathway factors (except for the social environment) is significantly correlated with parental education. This also rationalizes our choice of pathways to analyze. Because the pathway variables are standardized, the relative size of the estimated coefficients shows which pathway factors are more strongly correlated with parental schooling. The estimated coefficients for parental education are more or less in the same range for all factors significantly influenced by parental education, ranging from 0.017 standard deviations for grit to 0.069 standard deviations for

[25] The interviewer identification is not published with the Young Lives data, but was made available for the purpose of this study.

[26] Using the standardized number of years only re-scales the estimates.

Table 2. *Correlation between Parental Education and Pathways*

Panel A					
Dependent Variable	Child Labor	Infra-structure	Education Spending	Underage Family	Parental Attentiveness
Parental Education	-0.044^{***}	0.062^{***}	0.061^{***}	-0.037^{***}	0.034^{***}
	(0.004)	(0.004)	(0.006)	(0.004)	(0.004)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	3111	3111	3111	3111	3111
Adj. R^2	0.157	0.216	0.198	0.112	0.107

Panel B					
Dependent Variable	Social Environment	Health	Aspirations	Cognitive Ability	Non-Cognitive: Grit
Parental Education	-0.001	0.038^{***}	0.069^{***}	0.051^{***}	0.017^{***}
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	3111	3111	3111	3111	3111
Adj. R^2	0.283	0.186	0.163	0.196	0.004

Notes: 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).

aspirations. This means that we can observe that parental background is related to the prevalence of child labor, the infrastructure the children have, parental education spending, the probability of starting a family while underage, parental attentiveness, children's health, their aspirations, and their cognitive and non-cognitive skills. Aspirations, the infrastructure, and education spending are the factors most strongly dependent on parental background, followed by cognitive ability and child labor. Health status, underage family engagement and parent attentiveness are also associated with parental background, although to a lesser extent. Grit is even lesser related to the background, and the social environment is not related to it at all.

4.3. *Pathways and Children's Educational Outcome*

To see whether these potential pathway factors that are almost all dependent on parental background are also related to children's educational outcomes, 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. In line with the previous estimations, we use the non-standardized number of years of children's schooling as dependent variable to facilitate interpretation.

Table 3 shows the results from estimating the effect of the pathways on the children's later educational outcomes, as given by Equation (3). The estimated coefficient for parental education, that is, the direct relation between parental education and children's education that is not captured by the considered pathways, amounts to 0.11. Almost all the pathway factors considered, namely child labor, infrastructure, underage family engagement, parental attentiveness, social environment, childhood health, the children's aspirations, and their cognitive skills are significantly related to children staying in school longer.[27] One standard deviation increase in cognitive ability and aspirations is associated with an increase in the average length of schooling by 1.174 years and 0.827 years, respectively, while one standard deviation increase in underage family engagement and child labor is associated with a decrease in the years of schooling by 0.823 and 0.385, respectively. However, the results show only a small association of the non-cognitive skill grit with educational outcomes. Its estimated coefficient is smaller than for almost any other variable, and is only marginally statistically significant. This striking finding stands in contrast to studies of high-income countries but is in line with the results obtained by Nordman et al. (2015), who find that non-cognitive skills cannot explain wage differences in Bangladesh.[28] Spending on education also cannot

[27] Since almost all pathway factors are related to 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 exceeds 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 for comparison. The results for the pathways only marginally change when consecutively excluding one pathway at a time. All these exercises confirm that multicollinearity is of no concern with the data at hand.

[28] The result can also not be explained fully by the fact that the analysis does not capture potential cross-

Table 3. *Effect of Pathways on Children's Education*

Dependent Variable	Children's Education	
Parental Education	0.110***	(0.014)
Pathways		
Child Labor	−0.385***	(0.065)
Infrastructure	0.167***	(0.061)
Education Spending	0.070	(0.053)
Underage Family	−0.823***	(0.062)
Parental Attentiveness	0.243***	(0.055)
Social Environment	0.137**	(0.062)
Health	0.138**	(0.060)
Aspirations	0.827***	(0.065)
Cognitive Ability	1.174***	(0.067)
Non-Cognitive: Grit	0.091*	(0.054)
Controls	Yes	
Observations	3111	
Adj. R^2	0.941	

Notes: 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).

significantly predict children's educational outcomes.

4.4. *Decomposition*

The results above show that parental background is associated with (almost all) the different pathway factors, and (almost all) the pathway factors are predicting children's educational outcomes. We now combine these results to analyze whether these links are relevant to determining the correlation between parents' and children's educational levels, and each pathway's relative contribution. To this end, the results from the estimations above are combined as shown 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 measured by the IGRC (Table 1) as the sum of the estimated direct and indirect relations $\hat{\gamma}_{Ed^P} + \sum_i \hat{\rho}_i \hat{\lambda}_i = \hat{\beta} = 0.304$. Column (1) shows the product of the estimated $\hat{\lambda}_i$'s and

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 grit 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) Part of total $\hat{\beta}$		(2) Percent of total $\hat{\beta}$	
Child Labor	0.017***	(0.003)	0.056***	(0.011)
Infrastructure	0.010***	(0.004)	0.034***	(0.013)
Education Spending	0.004	(0.003)	0.014	(0.011)
Underage Family	0.030***	(0.004)	0.099***	(0.012)
Parental Attentiveness	0.008***	(0.002)	0.027***	(0.007)
Social Environment	−0.000	(0.001)	−0.000	(0.002)
Health	0.005**	(0.002)	0.017**	(0.008)
Aspirations	0.057***	(0.005)	0.189***	(0.018)
Cognitive Ability	0.060***	(0.006)	0.197***	(0.018)
Non-Cognitive: Grit	0.002	(0.001)	0.005	(0.003)
Explained component of $\hat{\beta}$	0.194***	(0.010)	0.638***	(0.035)
Unexplained component of $\hat{\beta}$	0.110***	(0.014)	0.362***	(0.035)
Total $\hat{\beta}$	0.304***	(0.015)		
Observations	3111			

Notes: 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 estimated $\hat{\rho}_i$'s for all pathway factors $i \in \mathcal{F}$.[29] Column 2 provides the fraction by which a certain pathway i contributes to the overall dependence of children's education on parental education, given by $\frac{\hat{\rho}_i \hat{\lambda}_i}{\hat{\beta}}$.[30] The explained component of $\hat{\beta}$ displays the extent to which all the pathways account for 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 pathway mechanisms included, hence the direct relation $\hat{\gamma}_{EdP}$ from Table 3, or $\frac{\hat{\gamma}_{EdP}}{\hat{\beta}}$. The results of the decomposition with parental wealth and the total expenditures per household member as the measures of parents' socioeconomic status are displayed in Tables C6 and C7 in Appendix C. They are very similar to the results based on parental education presented here.

Of the ten pathways under consideration, we find evidence that seven of them significantly

[29] The coefficients display the immobility mediated by the respective pathway because the units of the pathway variables cancel out in the product.

[30] These percentage values are identical when the IGC is decomposed, which is why we do not report these estimations separately.

contribute to the overall relation between parental background and children's educational outcome. The channels of higher cognitive skills and the higher aspirations of children of parents with higher education play by far the largest roles, accounting for 20 % and 19 % of the immobility observed, respectively. Underage family engagement and child labor account for 10 % and 6 %, respectively. Infrastructure, parental attentiveness, and children's health status are also responsible for the educational immobility observed statistically, but to lesser extents (each below 4 %). The social environment of the children, their grit and the amounts spent on education play no role. Grit and education spending are related to the parental background, but show no strong enough correlation with educational attainment, whereas the social environment influences educational outcomes, but does not depend on parental background. In sum, the three pathways are not important for the transmission of socioeconomic status in the developing countries studied. The fact that also these variables display significant relationships in one of the two steps suggests that the non-finding in the respective other step documents a real missing relationship rather than inaccurate measures.

Including other non-cognitive skills in the estimation confirms that the available measures of non-cognitive skills, namely factors of agency / locus of control, pride / self-esteem, and inclusion, although equally related to the parental background, play no role in the transmission of socioeconomic status, as they are not associated with children's educational outcomes in this setting.[31] We elaborate on this result in Appendix D.

There is still a part of $\hat{\beta}$ that cannot be explained through these transmission mechanisms, measured by the direct relationship between parental socioeconomic status and the children's outcome. However, 64 % of the observed persistence of socioeconomic status can be explained by the ten pathways analyzed (seven of which 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 a correlation of the error terms in the two steps would be the omission of mediating pathway factor variables which are correlated with the included factors. 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) when multiple 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 estimated coefficient of the others. This indicates that including a relatively large number of pathway factors as we do here reduces the concern about 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 educational outcome (rather than influencing only the *level* of the pathway factors), implying that the ζ_3 and ρ_i coefficients are not constant but rather a function of parental education (Heckman et al. 2013). To ensure that this is not the case and that this does not lead to a correlation of the error terms of Equations (2) and (3), we split the sample by the median in terms

[31] The non-cognitive factor of trust is not strongly dependent on parental background, although it is correlated with success in school. In sum, however, this makes it another insignificant pathway.

of parental education and estimate Equation (3) for each subsample. The comparisons of the $\hat{\zeta}_3$ and $\hat{\rho}_i$ coefficients are reported in Table C9. They by and large show no statistically significant difference.[32]

Different proceedings to obtain the number of relevant factors and their measures from the survey data lead to slightly different interpretations, none of which, however, stands at odds with the interpretation of our main results. Appendix E shows the relevant groupings when the selection 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 (which combines measures of underage family engagement and aspirations) are the most important pathway factors for social immobility, while childhood health, parental attentiveness, and spending on education play only minor roles in the transmission of socioeconomic status. The analysis also shows that the available non-cognitive skill factors play no role. While some differences driven by correlation patterns between the measures are notable, this generally confirms the appropriateness of the intuitive approach presented. The intuitive approach allows for the explicit analysis of the role of the child labor pathway, for example, which is dropped in an EFA, and also accounts for the differentiation between the role of aspirations and a curtailed adolescence caused by starting a family while underage.[33]

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, we only report the results of the decomposition. For reasons of exposition and because of the limited overall number of observations, we conduct one subsample analysis at a time. This is a worthwhile exercise but it must be noted that making a statistical inference is more difficult because of the relatively low number of observations for subsamples. Hence, the results obtained from the analyses of subsamples 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.

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

[33] For a factor to be identified meaningfully by an EFA, at least three strongly correlated measures for it need to be identified. The EFA procedure drops child labor, for example, because there are only three measures for the concept, one of which is not correlated strongly enough with the others for the three to be identified as being driven by a common factor compared with the other 59 measures considered. This says nothing 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 the advantages of factor analysis when using information from all available measures, we take the middle ground, using the derived factor scores from an intuitive grouping as pathway factors.

Table 5. *Decomposition by Country*

Explained % of total $\hat{\beta}$	Ethiopia		India		Peru		Vietnam	
Child Labor	0.045**	(0.021)	0.102***	(0.028)	0.061*	(0.035)	0.020*	(0.011)
Infrastructure	0.079**	(0.035)	0.018	(0.027)	0.019	(0.033)	−0.005	(0.014)
Education Spending	−0.004	(0.024)	0.106**	(0.045)	0.005	(0.020)	0.017	(0.021)
Underage Family	0.086***	(0.024)	0.112***	(0.023)	0.054	(0.034)	0.095***	(0.019)
Parental Attentiveness	0.015	(0.011)	0.044**	(0.018)	0.024	(0.033)	0.009	(0.011)
Social Environment	−0.002	(0.006)	0.002	(0.007)	−0.008	(0.019)	0.002	(0.003)
Health	0.027	(0.016)	−0.012	(0.017)	0.024	(0.025)	0.005	(0.013)
Aspirations	0.028	(0.027)	0.270***	(0.044)	0.097**	(0.038)	0.232***	(0.036)
Cognitive Ability	0.199***	(0.044)	0.262***	(0.044)	0.119**	(0.053)	0.106***	(0.024)
Non-Cognitive: Grit	0.000	(0.006)	−0.003	(0.012)	0.013	(0.016)	0.003	(0.005)
Explained component of $\hat{\beta}$	0.472***	(0.071)	0.901***	(0.098)	0.408***	(0.091)	0.483***	(0.047)
Unexplained component of $\hat{\beta}$	0.528***	(0.071)	0.099	(0.098)	0.592***	(0.091)	0.517***	(0.047)
Total $\hat{\beta}$	0.326***	(0.035)	0.254***	(0.026)	0.265***	(0.036)	0.400***	(0.028)
Total IGC	0.325***	(0.034)	0.287***	(0.030)	0.321***	(0.041)	0.448***	(0.030)
Observations	751		901		567		892	

Notes: 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. For the estimation of the IGC, children's education and parental education are standardized to have a mean of zero and a standard deviation of one within each country subsample. 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. Bootstrapped standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

4.5. *Results by Country*

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

When comparing estimations of the degree of immobility between countries, it is important to also analyze the IGC. By standardizing the years of schooling within each generation, differences in variances between the generations are controlled for. These may arise from different changes in absolute levels of schooling in the countries studied. The IGC estimates are listed in the second to last row of Table 5 right below the estimated IGRC ($\hat{\beta}$). However, the relative country ranking remains the same in our data irrespective of which measure is used. India has the lowest level of social immobility. This supports results by Mohammed (2019) who also finds that intergenerational immobility is lower in India than some previous

studies had suggested. Ethiopia and Vietnam display relatively large levels of immobility.

While the degree of immobility differs between the countries, the pathways responsible for this only vary somewhat. In line with the decomposition analysis across all countries, non-cognitive skills, the children's social environment, and education spending (except in India) play no role in the transmission process. Cognitive ability and aspirations (but not in Ethiopia) are main contributors to each country's social immobility. However, the relative importance of the pathways studied 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 Peru. Underage family engagement and child labor can also explain large parts of the social immobility observed in India, but less in the other countries. Interestingly, in Ethiopia, 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 developing countries. In all countries, cognitive ability plays a large role, whereas non-cognitive ability does not. The importance of aspirations differs somewhat between the countries, but is sizeable in almost all, as is underage family engagement. Child labor is not the most important pathway factor in any country, but it is a relevant one in all.[34]

4.6. *Results by Gender*

Lastly, we look at whether immobility and its pathways differ by the child's gender.[35] 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 (both the IGRC, $\hat{\beta}$, and the IGC) is slightly higher for girls than for boys, which is in line with studies in developed economies (Corak 2006).[36]

The transmission mechanisms for female and male children are different insofar as underage

[34] An additional possible extension for the estimation in the full sample would be to weight the observations according to country size in order to obtain a more "globally" representative sample. This would of course only be representative of these four countries. However, since India has a much larger population (adults and children, around 85 % of the population of all four countries combined), observations from India would dominate the estimation. The results for the weighted analysis by actual population sizes resemble the one in the Indian subsample, Column 2 of Table 5. This is why we do not report it separately.

[35] The gender differences in the *levels* of the pathway factor variables 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 significantly 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 more or less affect the educational outcome for either gender.

[36] Again, the estimated differences in IGC and IGRC between the two genders are quite similar, mirroring the fact that the variance of daughters' education levels is only slightly smaller than that of sons' education levels, compared to the variance of the respective parents' education levels.

Table 6. *Decomposition by Gender*

	Female Children		Male Children	
Explained % of total $\hat{\beta}$				
Child Labor	0.053***	(0.013)	0.058***	(0.019)
Infrastructure	0.009	(0.015)	0.069***	(0.023)
Education Spending	−0.002	(0.018)	0.027**	(0.013)
Underage Family	0.161***	(0.020)	0.021**	(0.008)
Parental Attentiveness	0.021**	(0.009)	0.033***	(0.012)
Social Environment	−0.000	(0.002)	−0.001	(0.005)
Health	0.007	(0.009)	0.032**	(0.015)
Aspirations	0.168***	(0.025)	0.200***	(0.030)
Cognitive Ability	0.180***	(0.024)	0.208***	(0.030)
Non-cognitive: Grit	0.003	(0.004)	0.010	(0.006)
Explained component of $\hat{\beta}$	0.599***	(0.044)	0.657***	(0.062)
Unexplained component of $\hat{\beta}$	0.401***	(0.044)	0.343***	(0.062)
Total $\hat{\beta}$	0.341***	(0.021)	0.267***	(0.021)
Total IGC	0.425***	(0.026)	0.318***	(0.025)
Observations	1537		1574	

Notes: 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. For the estimation of the IGC, children's education and parental education are standardized to have a mean of zero and a standard deviation of one. 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. Bootstrapped standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

family engagement is a much more important pathway factor for girls than for boys, and is almost as important as cognitive skills for girls. This result is not surprising, given that being married and/or becoming a parent when still a minor is mostly a problem for girls. Our results show that it is particularly problematic for girls from socioeconomically weak households, and that it is an important driver of their worse educational prospects. Child labor and parental attentiveness are equally important for both genders. However, aspirations and cognitive skills are more important for boys than for girls, and infrastructure, education spending, and health are significant pathway factors only for boys.

Most of the main results hence hold for both female and male children, particularly that cognitive ability and aspirations play the largest role in the transmission process. Non-cognitive skills are not relevant for either. Child labor plays an equally relevant role for both sexes. However, early family engagement restricts girls from lower socioeconomic status households more than boys. The factors contributing to boys' "inheritance" of socioeconomic status are more diverse.

5. Conclusion

Intergenerational social immobility interferes with the societal goals of equality of opportunities (Black and Devereux 2011) and efficiency (Causa and Johansson 2009). There has been little 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 differences in cognitive skills and aspirations between children of different backgrounds. For girls, child marriage and/or motherhood, that is, the factor of underage family engagement is an almost equally important pathway factor. Child labor also plays a role in transmitting socioeconomic status from parents to children. Other factors, namely, infrastructure, parental attentiveness, and children's health status are also statistically significant, but not as economically relevant. Together, the pathways analyzed in this paper can explain around 64 % of social immobility in the countries studied.

Longitudinal survey data has made it possible for 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 in the data allowed us to address measurement error through a factor analysis of related measures.

The finding that differences in cognitive skills account for much of the immobility observed is also found in studies of developed countries. Unlike them, however, we do not find that available non-cognitive factors play a role. While most non-cognitive skills differ between children with different parental backgrounds, they are not found to be associated with educational outcomes of the children surveyed once all other factors are accounted for. We reported the findings on grit in the main text, but this holds equally for factors of agency / locus of control, pride / self-esteem, inclusion, and trust. This does not imply that non-

cognitive skills generally play no role in the transmission of educational attainment across generations because the part of immobility which remains unexplained in our study could be driven by other non-cognitive skills. However, the fact that none of the rather commonly analyzed non-cognitive factors measured in this study plays a role once all other factors are accounted for is surprising. It deserves particular attention for developing countries given the growing interest in the role of non-cognitive skills as transmission channels of social immobility (see Chowdhury et al. 2018 and Falk et al. 2019).

We find some differences between the countries studied, both in terms of the degree of immobility, and with regard to the relevant transmission channels. While cognitive skills and / or aspirations are the most important pathway factors in each of the four countries, none of the available non-cognitive skills plays a relevant role in any country. One limitation of our study is that it only captures four developing countries, although the data collection aimed to represent the major developing regions in the world. Relating differences in the relative importance of the channels to institutional or macroeconomic characteristics would be an interesting avenue for future research.

Another limitation of this study is that the children were first observed when they were 8 years old. This does not allow us to analyze the significance of individual factors or the dynamics between the factors in early childhood. For example, the observation that children's health status is not an important pathway factor might turn out different when analyzing earlier years, if earlier health status influences other observable (such as cognitive skills) or unobservable factors in our sample. Our analysis is restricted to statements about the relevance of the factors at the ages surveyed. Regarding the policy implications, this means that early childhood interventions aiming to level other factors such as health may also help to generate equal opportunities. Our findings only suggest through which factors this effect is most likely to operate. More explicitly analyzing cross-productivities between the different factors in a dynamic perspective could further increase our understanding of the process of intergenerational transmission of socioeconomic status.

While our paper cannot make causal inferences, it clearly illustrates which factors should be considered relevant channels of intergenerational social immobility in developing countries. Our study thus provides a frame for future, in-depth, causal analyses of particular pathway factors. It also lays the groundwork for informing policy considerations about how to more effectively target the relatively high levels of intergenerational social immobility in developing countries.

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A. Appendix A: Decomposition Approach

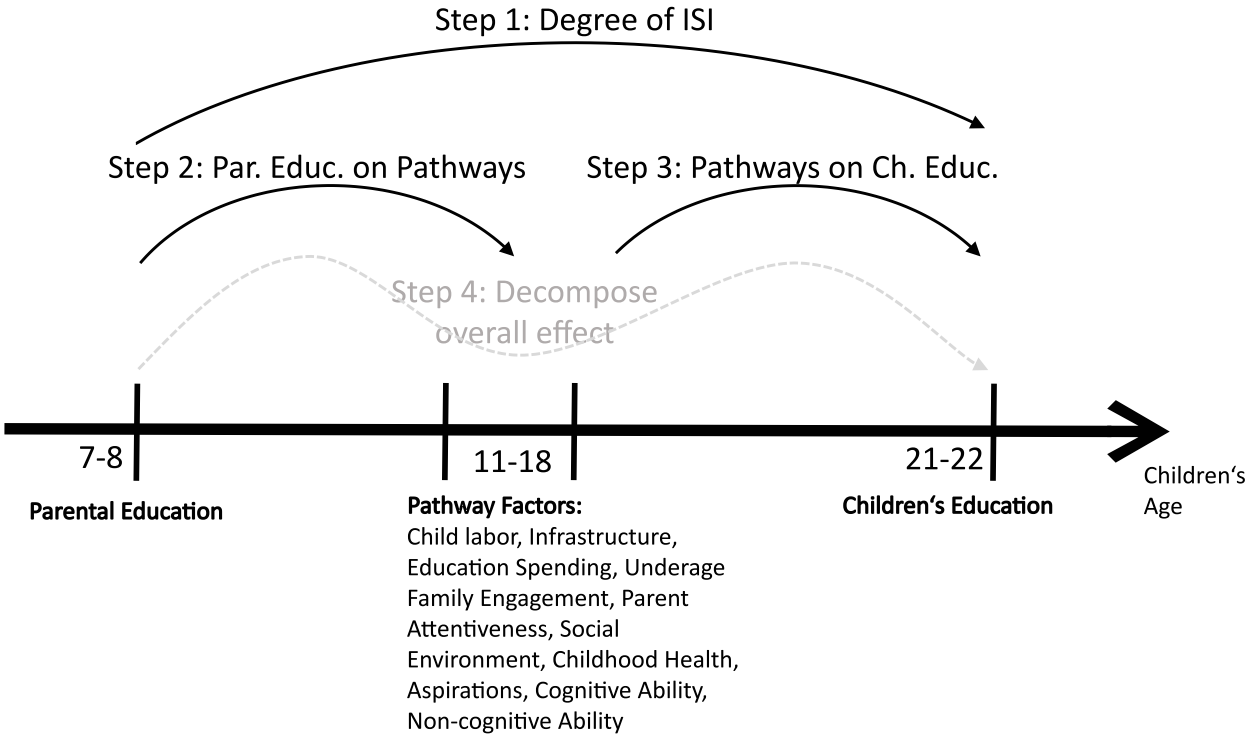

Fig. A1. *Graphical Representation of Decomposition Approach*

Notes: This figure shows the points in time of children's youth when different information used in the analysis were elicited in the Young Lives survey. The arrows illustrate the four steps of the decomposition of the immobility (estimated by Step 1) by representing different regressions. Step 4 is conducted by multiplication of the results from Steps 2 and 3 for each pathway factor. The details of the procedure are presented in Section 2, the derivation of the pathway factor variables from the measures listed in Tables B2 and B3 is described in Section 4.1.

B. Appendix B: Data Descriptions

Table B1. *Descriptive statistics*

	N	Mean	SD	Min.	Max.	Observ. Round
Parental Education	3111	5.624	4.849	0	16	1
Children's Education	3111	11.604	3.983	0	18	5
Controls						
Female *(Male)*	3111	0.494	0.500	0	1	1
Household head's Age	3111	40.175	10.719	18	91	1
Household head's Age^2	3111	1728.896	1027.522	324	8281	1
Birth Order *(First Child)*	3111	2.699	1.645	1	6	1
First Child	918	29.5		0	1	1
Second Child	839	27.0		0	1	1
Third Child	507	16.3		0	1	1
Fourth Child	288	9.3		0	1	1
Fifth Child	227	7.3		0	1	1
Sixth Child or More	332	10.7		0	1	1

Notes: 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)	.4108165
Activity for Money	Did you do anything in the last 12 month for money? (Yes (1) / No (0))	round 2 (11/12)	.4561807
Work Injury	Seriously injured while working in last 4 yrs. (Yes (1) / No (0))	round 2 (11/12)	.2618216
Factor 2: Infrastructure			
Access to Education	Do you have access to education/ schools? (Yes (1)/ No (0))	round 2 (11/12)	.0850769
Type of Living Site	Rural (0)/ Urban (1) living site	round 2 (11/12)	.3272573
Time to School	(Hypothetical) time to get to school in minutes (reversed 'scale')	round 2 (11/12)	.3108573
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)	.2133759
Spent on Uniforms Girls	Amount spent on school uniform for girls in last 12 months (in int. dollar cents)	round 2 (11/12)	.2569218
Spent on Schooling Fees	Amount spent on payment for schooling fees in last 12 months (in int. dollar cents)	round 2 (11/12)	.7075522
Spent on School Books	Amount spent on school books and stationery in last 12 months (in int. dollar cents)	round 2 (11/12)	.6544925
Spent on Internet Use	Amount spent on Internet use bought in last 30 days (in int. dollar cents)	round 2 (11/12)	.2225879
Private Schooling	Enrolled at private Schooling during second observation period. (Yes (1)/ No (0))	round 2 (11/12)	.5333374
Factor 4: Underage Family			
Child Marriage	Child married while still under age (Yes (1)/ No (0))	round 4 (18/19)	.602508
Child Parent	Number of children born by child while still under age	round 4 (18/19)	.6081108
Expected Child Marriage	At what age should child get married? Binary variable that is 1 if age is below 18.	round 2 (11/12)	.3093091
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)	.227415
Factor 5: Parental Attentiveness			
Without Father	Father not in household/ dead (Yes (0) / No (1))	round 1 (7/8)	.0977428
Number of Children	Number of additional children under age in each household (reversed 'scale')	round 2 (11/12)	.2097638
Attention received	I receive lots of time and attention from my parents. (4 point scale: "Strongly agree" (4), "Agree" (3), "Disagree" (2), "Strongly disagree" (0)) *	round 2 (11/12)	.4609369
Love received	I always feel loved by my parents. (4 point scale: "Strongly agree" (4), "Agree" (3), "Disagree" (2), "Strongly disagree" (0)) *	round 2 (11/12)	.4821234
Conversation	My parents rarely talk to me about the things that matter to me. (4 point scale: "Strongly agree" (0), "Agree" (2), "Disagree" (3), "Strongly disagree" (4)) *	round 2 (11/12)	.3691352
Supported by Parents	My parents never support me in the things i want to do. (4 point scale: "Strongly agree" (0), "Agree" (2), "Disagree" (3), "Strongly disagree" (4)) *	round 2 (11/12)	.4262255
Free Speech	I usually feel able to speak my views and feelings with my parents. (4 point scale: "Strongly agree" (4), "Agree" (3), "Disagree" (2), "Strongly disagree" (0)) *	round 2 (11/12)	.417134
Treated Worse	My parents treat me worse than other children in my family. (4 point scale: "Strongly agree" (0), "Agree" (2), "Disagree" (3), "Strongly disagree" (4)) *	round 2 (11/12)	.2415364
	* The data for Peru is measured on a 3 point scale. It is adjusted to fit the other countries according to "Yes" (4/1), "More or less" (2.5), "No" (1/4).		

Notes: 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 coding 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)	.1620399
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)	.502055
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)	.2823117
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)	.1574725
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)	.5046139
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)	.2166706
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)	.3764654
Factor 7: Health			
Weight-for-age	Weight-for-age z-score	round 1 (7/8)	.8283363
Height-for-age	Height-for-age z-score	round 1 (7/8)	.6376938
Thinness Indicator	Low BMI for age (3 point scale: "Severly thin" (0), "Moderately thin" (1), "Not thin" (2))	round 1 (7/8)	.3838101
Birth Weight	Birth weight in grams	round 3 (14/15)	.2114022
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)	.3942359
School Aspirations Child	Self-reported grade that children want to complete when finishing school (ISCED classification).	round 2 (11/12)	.5211735
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)	.6196113
School Aspirations Parents	What level of education would you like child to complete? (ISCED classification)	round 2 (11/12)	.6951409
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)	.4185806
Math Score	Score of math test (0 to 9) corrected for different countries	round 2 (11/12)	.5806241
Reading Level	Child's reading level (4 point scale)	round 2 (11/12)	.6885873
Writing Level	Child's writing level (3 point scale)	round 2 (11/12)	.8748256
Literacy	Child can read and write a sentence without difficulty (Yes (1)/No (0))	round 2 (11/12)	.8442525
Factor 10: Non-Cognitive Ability: Grit			
Grit 1	New ideas and projects sometimes distract me from previous ones.* (reversed scale)	round 5 (21–22)	.3383537
Grit 2	Setbacks do not discourage me.*	round 5 (21–22)	.2111658
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)	.4961914
Grit 4	I am a hard worker.*	round 5 (21–22)	.5967454
Grit 5	I often set a goal but later choose to pursue a different one.* (reversed scale)	round 5 (21–22)	.5107226
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)	.4936018
Grit 7	I finish whatever I begin.*	round 5 (21–22)	.6485168
Grit 8	I am diligent.*	round 5 (21–22)	.6619797
	* All GRIT-measures are based on 5 point scale ranging from from "Not like me at all" (1) to "Very much like me" (5)		

Notes: 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 coding 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	6.930***	(0.306)
Controls	Yes	
Observations	3104	
Adj. R^2	0.918	

Notes: 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	1.654***	(0.110)
Controls	Yes	
Observations	3111	
Adj. R^2	0.911	

Notes: 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: Grit
Child Labor	1									
Infrastructure	−0.0694	1								
Education Spending	−0.0815	0.188	1							
Child Engagement	0.141	−0.0966	−0.0461	1						
Parental Attentiveness	−0.161	0.0693	0.129	−0.0110	1					
Social Environment	−0.114	−0.179	0.0275	0.0234	0.0705	1				
Health	0.0356	0.292	0.124	0.0202	0.0555	−0.244	1			
Aspirations	−0.151	0.202	0.116	−0.221	0.0814	−0.104	0.167	1		
Cognitive Ability	−0.276	0.234	0.103	−0.128	0.179	−0.130	0.203	0.302	1	
Non-Cognitive: Grit	−0.0331	0.0152	0.0528	−0.0376	0.0251	0.0429	0.0533	0.0449	0.0346	1

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

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

	(1) Children's Education		(2) VIF
Parental Education	0.110***	(0.014)	4.180
Pathways			
Child Labor	−0.385***	(0.065)	1.323
Infrastructure	0.167***	(0.061)	1.342
Education Spending	0.070	(0.053)	1.279
Underage Family	−0.823***	(0.062)	1.183
Parental Attentiveness	0.243***	(0.055)	1.154
Social Environment	0.137**	(0.062)	1.284
Health	0.138**	(0.060)	1.318
Aspirations	0.827***	(0.065)	1.418
Cognitive Ability	1.174***	(0.067)	1.016
Non-Cognitive: Grit	0.091*	(0.054)	2.177
Controls	Yes		
Observations	3111		
Adj. R^2	0.941		

Notes: 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. 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	0.110***	0.115***	0.118***	0.113***	0.127***	0.115***	0.110***	0.113***	0.147***	0.131***	0.111***
	(0.014)	(0.015)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.014)	(0.015)	(0.015)	(0.014)
Pathways											
Child Labor	−0.385***		−0.401***	−0.390***	−0.469***	−0.405***	−0.389***	−0.383***	−0.460***	−0.590***	−0.386***
	(0.065)		(0.065)	(0.065)	(0.067)	(0.065)	(0.065)	(0.065)	(0.068)	(0.068)	(0.065)
Infrastructure	0.167***	0.203***		0.170***	0.196***	0.164***	0.164***	0.184***	0.188***	0.261***	0.166***
	(0.061)	(0.061)		(0.061)	(0.062)	(0.061)	(0.061)	(0.061)	(0.063)	(0.065)	(0.061)
Education Spending	0.070	0.098*	0.075		0.091*	0.074	0.071	0.074	0.106*	0.100*	0.073
	(0.053)	(0.054)	(0.053)		(0.054)	(0.053)	(0.053)	(0.053)	(0.058)	(0.057)	(0.053)
Underage Family	−0.823***	−0.858***	−0.828***	−0.825***		−0.822***	−0.827***	−0.813***	−0.912***	−0.874***	−0.824***
	(0.062)	(0.061)	(0.062)	(0.062)		(0.062)	(0.061)	(0.061)	(0.062)	(0.064)	(0.062)
Parental Attentiveness	0.243***	0.269***	0.241***	0.244***	0.242***		0.249***	0.247***	0.287***	0.320***	0.244***
	(0.055)	(0.056)	(0.055)	(0.055)	(0.057)		(0.055)	(0.055)	(0.057)	(0.060)	(0.055)
Social Environment	0.137**	0.150**	0.133**	0.137**	0.164***	0.150**		0.126**	0.154**	0.130**	0.143**
	(0.062)	(0.062)	(0.062)	(0.062)	(0.064)	(0.062)		(0.062)	(0.064)	(0.064)	(0.062)
Health	0.138**	0.132**	0.158***	0.141**	0.076	0.145**	0.128**		0.160***	0.223***	0.144**
	(0.060)	(0.060)	(0.059)	(0.060)	(0.060)	(0.060)	(0.060)		(0.061)	(0.063)	(0.059)
Aspirations	0.827***	0.861***	0.831***	0.830***	0.925***	0.842***	0.830***	0.831***		1.039***	0.828***
	(0.065)	(0.066)	(0.065)	(0.065)	(0.066)	(0.065)	(0.065)	(0.065)		(0.066)	(0.065)
Cognitive Ability	1.174***	1.246***	1.189***	1.176***	1.218***	1.195***	1.173***	1.185***	1.337***		1.175***
	(0.067)	(0.066)	(0.067)	(0.067)	(0.069)	(0.067)	(0.067)	(0.067)	(0.066)		(0.067)
Non-Cognitive: Grit	0.091*	0.096*	0.089*	0.094*	0.102*	0.093*	0.098*	0.098*	0.099*	0.101*	
	(0.054)	(0.054)	(0.054)	(0.054)	(0.055)	(0.054)	(0.054)	(0.054)	(0.055)	(0.057)	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3111	3111	3111	3111	3111	3111	3111	3111	3111	3111	3111
Adj. R^2	0.941	0.940	0.941	0.941	0.937	0.940	0.941	0.941	0.937	0.934	0.941

Notes: 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. 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) Part of total $\hat{\beta}$		(2) Percent of total $\hat{\beta}$	
Child Labor	0.425***	(0.086)	0.061***	(0.013)
Infrastructure	0.047	(0.153)	0.007	(0.022)
Education Spending	0.086	(0.068)	0.012	(0.010)
Underage Family	0.616***	(0.077)	0.089***	(0.011)
Parental Attentiveness	0.182***	(0.047)	0.026***	(0.007)
Social Environment	−0.011	(0.014)	−0.002	(0.002)
Health	0.121**	(0.061)	0.018**	(0.009)
Aspirations	1.167***	(0.110)	0.168***	(0.016)
Cognitive Ability	1.480***	(0.131)	0.214***	(0.019)
Non-Cognitive: Grit	0.012	(0.013)	0.002	(0.002)
Explained component of $\hat{\beta}$	4.126***	(0.261)	0.595***	(0.040)
Unexplained component of $\hat{\beta}$	2.804***	(0.343)	0.405***	(0.040)
Total $\hat{\beta}$	6.930***	(0.311)		

Notes: 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. 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	0.105***	(0.021)	0.064***	(0.013)
Infrastructure	0.091***	(0.027)	0.055***	(0.017)
Education Spending	0.048*	(0.027)	0.029*	(0.017)
Underage Family	0.105***	(0.027)	0.063***	(0.015)
Parental Attentiveness	0.069***	(0.017)	0.042***	(0.010)
Social Environment	−0.009	(0.006)	−0.005	(0.004)
Health	0.051**	(0.021)	0.031**	(0.013)
Aspirations	0.412***	(0.039)	0.249***	(0.026)
Cognitive Ability	0.345***	(0.039)	0.209***	(0.022)
Non-Cognitive: Grit	0.008	(0.005)	0.005	(0.003)
Explained component of $\hat{\beta}$	1.226***	(0.083)	0.742***	(0.053)
Unexplained component of $\hat{\beta}$	0.427***	(0.105)	0.258***	(0.053)
Total $\hat{\beta}$	1.654***	(0.113)		

Notes: 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. 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	0.221***	0.163***	0.142***	0.133***	0.124***	0.118***	0.114***	0.111***	0.110***	0.110***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Pathways										
Cognitive Ability	1.632***	1.381***	1.317***	1.228***	1.210***	1.188***	1.177***	1.174***	1.173***	1.174***
	(0.066)	(0.068)	(0.067)	(0.068)	(0.067)	(0.067)	(0.067)	(0.067)	(0.067)	(0.067)
Aspirations		1.020***	0.904***	0.860***	0.855***	0.838***	0.835***	0.831***	0.830***	0.827***
		(0.067)	(0.066)	(0.065)	(0.065)	(0.065)	(0.065)	(0.065)	(0.065)	(0.065)
Underage Family			−0.867***	−0.824***	−0.820***	−0.821***	−0.830***	−0.829***	−0.827***	−0.823***
			(0.061)	(0.062)	(0.062)	(0.061)	(0.061)	(0.061)	(0.061)	(0.062)
Child Labor				−0.433***	−0.416***	−0.395***	−0.397***	−0.391***	−0.389***	−0.385***
				(0.065)	(0.065)	(0.065)	(0.065)	(0.065)	(0.065)	(0.065)
Infrastructure					0.178***	0.181***	0.164***	0.162***	0.164***	0.167***
					(0.061)	(0.061)	(0.061)	(0.061)	(0.061)	(0.061)
Parental Attentiveness						0.254***	0.251***	0.250***	0.249***	0.243***
						(0.055)	(0.055)	(0.055)	(0.055)	(0.055)
Health							0.135**	0.133**	0.128**	0.138**
							(0.059)	(0.059)	(0.060)	(0.060)
Education Spending								0.074	0.071	0.070
								(0.053)	(0.053)	(0.053)
Non-Cognitive: Grit									0.098*	0.091*
									(0.054)	(0.054)
Social Environment										0.137**
										(0.062)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3111	3111	3111	3111	3111	3111	3111	3111	3111	3111
Adj. R^2	0.930	0.935	0.939	0.940	0.940	0.941	0.941	0.941	0.941	0.941

Notes: 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. 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	0.075**	0.221***	
	(0.036)	(0.032)	
Controls			
Female	0.692***	0.896***	0.845
	(0.159)	(0.153)	*0.358*
Household Head's Age	−0.013	−0.009	0.005
	(0.046)	(0.051)	*0.946*
Household Head's Age^2	0.000	0.000	0.002
	(0.000)	(0.001)	*0.966*
Birth Order *(Base: First Child)*			
Second Child	0.051	0.196	0.277
	(0.208)	(0.183)	*0.599*
Third Child	−0.446*	−0.037	1.330
	(0.242)	(0.239)	*0.249*
Fourth Child	−0.384	−0.345	0.002
	(0.299)	(0.341)	*0.967*
Fifth Child	0.164	0.171	0.005
	(0.294)	(0.457)	*0.945*
Sixth Child or More	−0.268	0.619	3.355
	(0.282)	(0.490)	*0.067**
Ethiopia	10.512***	8.691***	1.371
	(1.056)	(1.142)	*0.242*
India	12.350***	10.094***	2.209
	(1.039)	(1.106)	*0.137*
Peru	12.075***	9.857***	2.019
	(1.077)	(1.129)	*0.155*
Vietnam	10.011***	9.319***	0.205
	(1.050)	(1.114)	*0.651*
Pathways			
Child Labor	−0.440***	−0.305***	0.928
	(0.078)	(0.116)	*0.335*
Infrastructure	0.221***	0.072	1.475
	(0.080)	(0.092)	*0.224*
Education Spending	0.424***	0.066	7.998
	(0.111)	(0.061)	*0.005****
Underage Family	−0.706***	−1.131***	9.297
	(0.067)	(0.122)	*0.002****
Parental Attentiveness	0.246***	0.247***	0.000
	(0.075)	(0.081)	*0.996*
Social Environment	0.119	0.121	0.000
	(0.084)	(0.089)	*0.984*
Health	0.143*	0.123	0.030
	(0.080)	(0.085)	*0.861*
Aspirations	0.784***	0.850***	0.199
	(0.077)	(0.125)	*0.655*
Cognitive Ability	1.230***	1.029***	1.583
	(0.076)	(0.140)	*0.208*
Non-Cognitive: Grit	0.087	0.090	0.001
	(0.076)	(0.073)	*0.976*

Notes: 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. 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: Additional Measures of Non-Cognitive Abilities

The Young Lives data contains several measures of non-cognitive skills of the children surveyed. The measures are grouped along five dimensions: *agency*, *trust*, *pride*, *inclusion*, and *grit*. The questions to elicit agency are similar to what is often referred to in the literature as the locus of control, that is, how much the children feel that their own actions affect their personal situation. Trust refers to how much a child trusts others (not, how trustworthy he or she is). Pride is close to the concept of self-esteem. Inclusion captures how comfortable a child feels in its broader social environment. Grit is the persistency and determination to follow their own goals. The measures of agency, trust, pride, and inclusion were elicited in the second round, when the children were 11 or 12 years old. Only grit was elicited in the fifth round at age 21 or 22, mirroring the relevance that this particular skill was found to have for socioeconomic outcomes in developed countries (Duckworth et al. 2007).

In order to summarize survey measures of non-cognitive skills, previous studies employing the Young Lives data in different contexts used simple indices of the respective items measuring agency, trust, pride, and inclusion (see Dercon and Singh 2013). We began by grouping the measurement items accordingly in line with the surveys, but then employed factor analysis to create our own measurement system from the pre-defined groups instead of using the "naïve" means of the different factor measures as the factor variable.[37]

Laajaj and Macours (2019) point out that survey-based measures of non-cognitive skills in developing countries are problematic, most importantly because some questions developed for developed countries may be poorly understood in other contexts and when respondents have lower education levels. This can result in larger measurement error in the questions and increased acquiescence bias (stemming from respondents' tendency to affirm statements in surveys, irrespective of their content and whether they are positively or negatively framed). Also, interviewer effects may be more pronounced when interviewers have to bridge a cultural and potentially language induced gap between the survey designer and the respondent. Ideally, surveys should be designed to minimize these problems, for example, by balancing the number of negatively and positively framed questions within each subset of measures, and by adjusting questions according to the test-retest stability. Since the data is from an intensive survey programme conducted over more than 15 years, adjusting the survey questions is no option for our study. Instead, we tested the data for signs of typical measurement errors and applied ex-post corrections, following recommendations by Laajaj and Macours (2019). The data provides enough information for us to do that: When factors are measured by positively and negatively framed questions, these are numerically quite well-balanced. Also, although interviewer identification is not part of the original Young Lives dataset, it was made available for this study by Young Lives.

We correct for the influence of interviewers by subtracting interviewer fixed effects for each item. To correct for acquiescence bias, we first invert the reverse-coded items. We then take the difference between the respective average answers of initially positively and initially negatively framed items within each subset of factor measures for each individual, and divide it by two. This gives the acquiescence score. We then subtract each respondent's acquiescence score from the initially positively coded items and add it to the previously reverse-coded items. We standardize the resulting item measures to facilitate interpretation. After these corrections, we apply the factor analysis to create

[37] We later also consider different groupings of the measures by underlying factors by the data structure, see Appendix E.

our own scale tailored to the data, as described in Section 4.1. Those measurement items that are not strongly correlated with others of the same factor obtain lower factor loadings. This applies especially for the items apparently badly understood. These, then, play no big role for the resulting measurement system of the factors.[38] The individual measures and respective factor loadings of the non-cognitive factors not presented in the main text are displayed in Table D1.

[38] This procedure alone generally addresses much of the measurement error in the data.

Table D1. *Factor Analysis: Pathway Factors and Measures III - Additional Non-Cognitive Ability Factors*

Measure	Description	Observ. Round (Child's Age)	Loading
Factor: Trust			
Trust 1	Most people in my neighbourhood are basically honest. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.5644366
Trust 2	Most people in my neighbourhood can be trusted. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.5716265
Trust 3	I believe the government does what is right for people like me. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.085382
Trust 4	I feel safe when I go out of the house on my own. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.1078175
Factor: Agency			
Agency 1	If I try hard I can improve my situation in life. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.4512696
Agency 2	Other people in my family make all the decisions about how I spend my time. (4 point scale: "Strongly Agree (1), "Agree" (2), "Disagree" (3), "Strongly Disagree" (4))	round 2 (11/12)	.107581
Agency 3	I like to make plans for my future studies and work. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.4331815
Agency 4	If I study hard I will be rewarded with a better job in the future. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.4015094
Factor: Pride			
Pride 1	I feel proud to show my friends where I live. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.3797052
Pride 2	I am ashamed of my clothes. (4 point scale: "Strongly Agree (1), "Agree" (2), "Disagree" (3), "Strongly Disagree" (4))	round 2 (11/12)	.5582121
Pride 3	I feel proud of the job done by the head of household. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.3786565
Pride 4	I am often embarrassed because I do not have the right supplies for school. (4 point scale: "Strongly Agree (1), "Agree" (2), "Disagree" (3), "Strongly Disagree" (4))	round 2 (11/12)	.3752637
Pride 5	I am proud of my achievements at school. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.32805
Pride 7	I am ashamed of my shoes. (4 point scale: "Strongly Agree (1), "Agree" (2), "Disagree" (3), "Strongly Disagree" (4))	round 2 (11/12)	.5301617
Pride 8	I am worried that I don't have the correct uniform. (4 point scale: "Strongly Agree (1), "Agree" (2), "Disagree" (3), "Strongly Disagree" (4))	round 2 (11/12)	.3300156
Factor: Inclusion			
Inclusion 1	At the shops I am treated with fairness. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.3165524
Inclusion 2	Adults in my street treat me worse than other children of my age. (4 point scale: "Strongly Agree (1), "Agree" (2), "Disagree" (3), "Strongly Disagree" (4))	round 2 (11/12)	.3241421
Inclusion 3	Other children in my class treat me with respect. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.3954467
Inclusion 4	Other pupils in my class tease me. (4 point scale: "Strongly Agree (4), "Agree" (3), "Disagree" (2), "Strongly Disagree" (1))	round 2 (11/12)	.3226703
Inclusion 5	My teachers treat me worse than other children. (4 point scale: "Strongly Agree (1), "Agree" (2), "Disagree" (3), "Strongly Disagree" (4))	round 2 (11/12)	.2195039

Notes: This table shows the measures from the survey data by the non-cognitive factors they are associated to in the surveys. Column (2) describes the coding 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 factor loading of each measure are depicted in Column (4). The data for Peru in this table is measured on a 3 point scale. It is adjusted to fit the other countries according to "Yes" (4/1), "More or less" (2.5), "No" (1/4). Data on the measures "I have no choice about the work I do." (Agency 5), "I am embarrassed by the work I have to do." (Pride 6) and "The job I do makes me feel proud." (Pride 9) is only available for a small subset of the sample ($\sim$ 1400 respondents) and are, hence, not included in the analysis.

The resulting factor variables of the different non-cognitive skills are not strongly correlated with each other. Table D2 shows the respective correlation coefficients, none exceeding 0.36. This implies that the different dimensions should not be merged into one larger factor of non-cognitive skills. In order to not overload the presentations in the main text with different measures of non-cognitive skills, we chose to display the results for grit only, which was elicited in the surveys methodogically most advanced. While grit is significantly related to the parental background, it is not associated with the children's educational outcomes.

Table D2. *Correlation of Non-Cognitive Ability Measures*

	Grit	Trust	Agency	Pride	Inclusion
Grit	1				
Trust	0.0300	1			
Agency	0.0397	−0.0394	1		
Pride	0.0405	0.176	0.360	1	
Inclusion	0.0417	0.229	0.207	0.269	1

Notes: This table shows the Pearson correlations of the factor scores for the non-cognitive ability measures available. For more detailed information on the non-cognitive ability measures, see Table D1.

However, the role of all other non-cognitive factors may be interesting. First, we analyze whether these factors are also related to parental background. Table D3 presents the results of the estimations of Equation (2) for the additional non-cognitive factors. Column (1) reiterates the result with only grit from the main text for comparison. All non-cognitive factors are significantly and positively dependent on parental education with the exception of trust, which is insignificant.

Table D3. *Correlation between Parental Education and Non-Cognitive Ability Measures*

	Grit	Trust	Agency	Pride	Inclusion
Parental Education	0.017***	0.001	0.036***	0.040***	0.019***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	3111	3111	3111	3111	3111
Adj. R^2	0.004	0.002	0.026	0.034	0.004

Notes: This table shows the results from estimating the relationship between parental education and different non-cognitive ability 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 non-cognitive ability factors, see Table D1. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

We then test whether these non-cognitive factors predict the children's educational outcomes. We re-estimate Equation (3), replacing grit by each of the other non-cognitive factors and including them altogether. The results are shown in Columns (1) to (6) in Table D4. All additional non-cognitive factors but trust have no significant relationship with the educational outcomes. This

result mirrors the weak result for grit in the regressions in the main text. This also carries over to the decomposition. Table D5 shows the results of the decomposition in percentage terms when the additional non-cognitive skills are included, Column (1) again replicating the results described in the main text. Neither non-cognitive factor plays a significant role in the transmission of relative educational attainment in developing countries, in one case because they are not strongly enough related to parental background (trust), but mostly because they do not significantly predict children's educational outcomes. The fact that all are relevant in one step also suggests that the measurement system successfully captures underlying factors that either depend on parental background or relate to educational outcomes, but do not contribute to the overall link between parental background and children's educational outcomes.

We also include the measures for all non-cognitive skills in the EFA in Appendix E. The purely data driven approach confirms that none of the factors measured by the relatively extensive survey questions for this data plays a substantial role in the intergenerational persistence of relative educational attainment. Although some of the factors resemble factors often analyzed in different settings as playing important roles (the "Big Five" and others), such as conscientiousness (grit), emotional stability (pride), and locus of control (agency), they of course do not capture all non-cognitive skills that could play roles in this transmission.

Table D4. *Effect of Pathways with Different Non-Cognitive Ability Measures on Children's Education*

Children's Education	(1)	(2)	(3)	(4)	(5)	(6)
Parental Education	0.110*** (0.014)	0.111*** (0.014)	0.111*** (0.014)	0.110*** (0.014)	0.111*** (0.014)	0.108*** (0.014)
Pathways						
Child Labor	−0.385*** (0.065)	−0.389*** (0.065)	−0.385*** (0.065)	−0.386*** (0.065)	−0.387*** (0.065)	−0.389*** (0.065)
Infrastructure	0.167*** (0.061)	0.163*** (0.061)	0.166*** (0.061)	0.166*** (0.061)	0.167*** (0.061)	0.166*** (0.061)
Education Spending	0.070 (0.053)	0.073 (0.052)	0.072 (0.053)	0.071 (0.052)	0.073 (0.053)	0.067 (0.053)
Underage Family	−0.823*** (0.062)	−0.822*** (0.062)	−0.825*** (0.062)	−0.824*** (0.061)	−0.825*** (0.062)	−0.821*** (0.062)
Parental Attentiveness	0.243*** (0.055)	0.256*** (0.056)	0.237*** (0.057)	0.231*** (0.057)	0.240*** (0.056)	0.234*** (0.058)
Social Environment	0.137** (0.062)	0.155** (0.062)	0.144** (0.062)	0.143** (0.062)	0.143** (0.062)	0.152** (0.062)
Health	0.138** (0.060)	0.143** (0.059)	0.142** (0.059)	0.143** (0.059)	0.143** (0.059)	0.136** (0.060)
Aspirations	0.827*** (0.065)	0.823*** (0.065)	0.825*** (0.065)	0.826*** (0.065)	0.827*** (0.065)	0.817*** (0.066)
Cognitive Ability	1.174*** (0.067)	1.174*** (0.067)	1.172*** (0.067)	1.172*** (0.067)	1.175*** (0.067)	1.168*** (0.067)
Non-Cognitive Ability:						
Grit	0.091* (0.054)					0.092* (0.054)
Trust		−0.119** (0.053)				−0.141** (0.055)
Agency			0.031 (0.058)			−0.008 (0.062)
Pride				0.056 (0.058)		0.073 (0.063)
Inclusion					0.024 (0.056)	0.038 (0.058)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3111	3111	3111	3111	3111	3111
Adj. R^2	0.941	0.941	0.941	0.941	0.941	0.941

Notes: 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 Table D1. Robust standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

Table D5. *Decomposition with Different Non-Cognitive Ability Measures*

	(1)		(2)		(3)		(4)		(5)		(6)	
Explained % of total $\hat{\beta}$												
Child Labor	0.056***	(0.011)	0.056***	(0.011)	0.056***	(0.011)	0.056***	(0.011)	0.056***	(0.011)	0.056***	(0.011)
Infrastructure	0.034***	(0.013)	0.033***	(0.012)	0.034***	(0.013)	0.034***	(0.012)	0.034***	(0.013)	0.034***	(0.012)
Education Spending	0.014	(0.011)	0.015	(0.011)	0.015	(0.011)	0.014	(0.011)	0.015	(0.011)	0.013	(0.011)
Underage Family	0.099***	(0.012)	0.099***	(0.012)	0.099***	(0.012)	0.099***	(0.012)	0.099***	(0.012)	0.099***	(0.011)
Parent Attentiventiveness	0.027***	(0.007)	0.028***	(0.007)	0.026***	(0.007)	0.026***	(0.007)	0.027***	(0.007)	0.026***	(0.007)
Social Environment	−0.000	(0.002)	−0.000	(0.002)	−0.000	(0.002)	−0.000	(0.002)	−0.000	(0.002)	−0.000	(0.002)
Health	0.017**	(0.008)	0.018**	(0.008)	0.018**	(0.008)	0.018**	(0.008)	0.018**	(0.008)	0.017**	(0.008)
Aspirations	0.189***	(0.018)	0.188***	(0.019)	0.188***	(0.019)	0.189***	(0.019)	0.189***	(0.019)	0.187***	(0.019)
Cognitive Abilility	0.197***	(0.018)	0.197***	(0.019)	0.196***	(0.018)	0.196***	(0.019)	0.197***	(0.018)	0.196***	(0.019)
Non-Cognitive Ability:												
Grit	0.005	(0.003)									0.005	(0.004)
Trust			−0.000	(0.002)							−0.000	(0.002)
Agency					0.004	(0.007)					−0.001	(0.007)
Pride							0.007	(0.008)			0.010	(0.008)
Inclusion									0.001		0.002	(0.004)
Explained component of β	0.638***	(0.035)	0.634***	(0.036)	0.636***	(0.036)	0.639***	(0.036)	0.635***	(0.036)	0.644***	(0.037)
Unexplained component of β	0.362***	(0.035)	0.366***	(0.036)	0.364***	(0.036)	0.361***	(0.036)	0.365***	(0.036)	0.356***	(0.037)
Total $\hat{\beta}$	0.304***	(0.015)	0.304***	(0.015)	0.304***	(0.014)	0.304***	(0.014)	0.304***	(0.015)	0.304***	(0.015)
Observations	3111		3111		3111		3111		3111		3111	

Notes: This table shows the results from a decomposition approach, as laid out in Section 4.4, separately for the usage of different measures for non-cognitive ability. Thereby, for each estimation, 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, B3 and D1. The table presents the relative shares of the pathway variables in the total $\hat{\beta}$ when employing the different measures for non-cognitive ability. Bootstrapped standard errors are reported in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

E. Appendix E: Exploratory Factor Analysis

In this section, we introduce the results from the decomposition analysis when the factors are identified by an EFA. For a more detailed formal discussion, see Section H in the online appendix of Heckman et al. (2013). 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 serve as potential measures. We follow standard EFA procedure (see, 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 plus the 20 measures of additional non-cognitive skills are considered as potential measures. Measures are retained if they load strongly on one and only one factor. The factors are likely to be correlated. To obtain the factor loadings, we apply an oblique rotation, which allows for the factors to be correlated. For the 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 an 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. Below we present the results when applying the two methods most regularly used in the literature, the scree test (Cattell 1966) and the parallell analysis test (Horn 1965). In both cases 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 assessed against the respective criterion, and only those that fulfill it are retained.

Scree Test

For the scree test, all the eigenvalues of the respective factors are plotted in descending order. The eigenvalues indicate the variation of all measures explained by each factor. The scree plot for our data is shown in Figure E1. A kink in the plot indicates that one 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 iteratively, repeating the factor analysis with the remaining measures. As a result, the 38 measures listed in Table E1 – grouped by the underlying factors they load on – are retained. The KMO statistic of the remaining set of measures is well above 0.7, and the Bartlett (1951)-Test of sphericity is significant at the 1%-level, indicating that the data is well suited for a factor analysis. The respective factor loadings are shown next to each measure in Table E1. For comparison, the last column lists the factor each measure was associated with in the main analysis or in Appendix D. We see that most measures associated with cognitive ability before jointly load strongly on the first factor, which we 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 one's career. Measures for health and parental spending on education associate with common factors, respectively. Measures of non-cognitive skills load on two different factors, where one is measured by intended measures of pride, agency, and inclusion, and one by intended measures of grit, which we thus name accordingly.

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 E2. They show that cognitive ability identified through the measures at hand contributes 17 % to the observed immobility. The broader factor

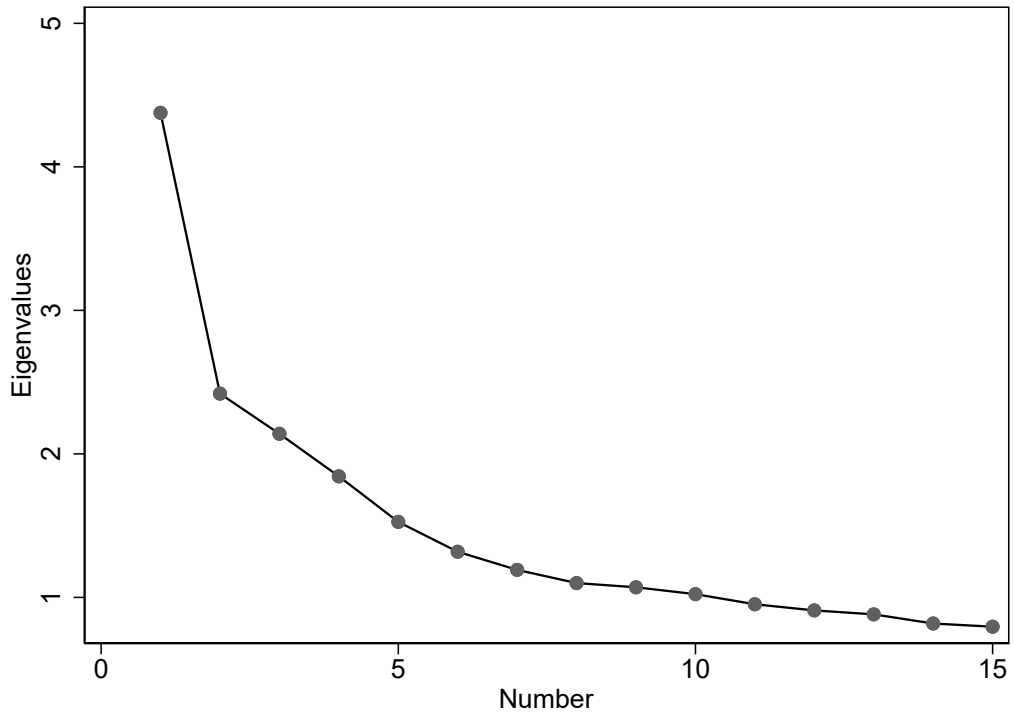

Fig. E1. *Screeplot of Eigenvalues*

Notes: This figure shows the eigenvalues of the first 15 factors derived from an exploratory factor analysis on the measures presented in Tables B2, B3, and D1, in descending order.

Table E1. *Pathway Factors - Scree Test*

Measure	Loading	Factor in Main Analysis
Factor 1: Cognitive Ability		
Working Hours	-.3575272	Child Labor
Math Score	.5180421	Cognitive Ability
Reading Level	.7037583	Cognitive Ability
Writing Level	.8893501	Cognitive Ability
Literacy	.8552604	Cognitive Ability
Factor 2: Career Focus		
Child Marriage	-.4663458	Underage Family
Child Parent	-.3388466	Underage Family
School Aspirations Child	.5063673	Aspirations
Job Aspirations Child	.3832976	Aspirations
School Aspirations Parents	.6740016	Aspirations
Job Aspirations Parents	.5719432	Aspirations
PPVT Test Score	.3932562	Cognitive Ability
Factor 3: Health		
Type of Living Site	.409975	Infrastructure
Safe to Go Outside	-.3157924	Social Environment
Weight-for-age	.8576906	Health
Height-for-age	.5996694	Health
Thinness Indicator	.3850286	Health
Factor 4: Education Spending		
Spent on Schooling Fees	.7309852	Education Spending
Spent on School Books	.6006255	Education Spending
Private Schooling	.5523265	Education Spending
Factor 5: Non-Cognitive: Pride/ Agency/ Inclusion		
Agency 1	.4018122	Non-Cognitive: Agency
Agency 3	.3984641	Non-Cognitive: Agency
Agency 4	.3872979	Non-Cognitive: Agency
Pride 1	.3416665	Non-Cognitive: Pride
Pride 2	.4844442	Non-Cognitive: Pride
Pride 3	.3880352	Non-Cognitive: Pride
Pride 4	.4313333	Non-Cognitive: Pride
Pride 5	.390607	Non-Cognitive: Pride
Pride 7	.4408822	Non-Cognitive: Pride
Pride 8	.3895082	Non-Cognitive: Pride
Inclusion 1	.3615031	Non-Cognitive: Inclusion
Inclusion 3	.3687392	Non-Cognitive: Inclusion
Factor 6: Non-Cognitive: Grit		
Grit 3	.4141618	Non-Cognitve: Grit
Grit 4	.4771053	Non-Cognitve: Grit
Grit 5	.4133051	Non-Cognitve: Grit
Grit 6	.4143307	Non-Cognitve: Grit
Grit 7	.5252134	Non-Cognitve: Grit
Grit 8	.5396567	Non-Cognitve: Grit

Notes: 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.

of career focus explains 38 %. Health and parental spending on education contribute statistically significant but only small parts to the transmission of socioeconomic status. Although the combined non-cognitive factor of pride, agency, and inclusion in this estimation is statistically significant, the result shows an economically small role below 2 % and grit plays no role at all. These results are very much in line with the results presented in the main text, except that the factors derived by an EFA do not allow for differentiating between the role played by different aspects of career focus, which is expressed in measures of early aspirations by parents and children as well as becoming a spouse and/or a parent when underage.

Table E2. *Decomposition - Scree Test*

Explained components of total $\hat{\beta}$	(1) Part of total $\hat{\beta}$		(2) Percent of total $\hat{\beta}$	
Cognitive Ability	0.051***	(0.005)	0.167***	(0.017)
Career Focus	0.115***	(0.008)	0.378***	(0.027)
Health	0.005*	(0.003)	0.017*	(0.010)
Education Spending	0.006*	(0.004)	0.021*	(0.012)
Non-Cognitive: Pride/ Agency/ Inclusion	0.006**	(0.003)	0.019**	(0.009)
Non-Cognitive: Grit	0.002	(0.001)	0.005	(0.003)
Explained component of $\hat{\beta}$	0.185***	(0.010)	0.608***	(0.036)
Unexplained component of $\hat{\beta}$	0.119***	(0.015)	0.392***	(0.036)
Total $\hat{\beta}$	0.304***	(0.015)		

Notes: 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 E1. 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).

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 would retain all factors with an eigenvalue greater than zero, as they contribute to explaining common variation. It typically yields too many factors to be meaningfully interpreted. Horn (1965)'s parallel analysis corrects for the fact that some common variation is likely to arise from noise in the data. Applied to the 62 measures from the survey, the parallel analysis still recommends to retain 32 factors. For most of these factors, however, not enough measures load strongly enough or not only on the respective factor, so only three factors are retained that can be meaningfully interpreted, captured by only 9 measures overall. The KMO statistic of the sample is again above 0.7 and the Bartlett (1951)-test of sphericity yields

a significance above 1%. The measures retained are listed in Table E3, next to the respective factor loadings and the factor they were associated with in the main analysis. Even more concepts are dropped than with the scree test but the factors identified are still very much in line with the most important ones obtained through intuitive association. Of the previous measures of cognitive ability, only those of literacy are retained to measure a common factor. Children's and parents' expressions of aspirations derive from another common factor, as do those of education spending. No further common factors are identified by this procedure. The factors identified also contain the two most relevant groupings from the intuitive approach and yield no further insight beyond that.

Table E3. *Pathway Factors - Parallel Analysis*

Measure	Loading	Factor in Main Analysis
Factor 1: Literacy		
Reading Level	.6812535	Cognitive Ability
Writing Level	.880773	Cognitive Ability
Literacy	.8847258	Cognitive Ability
Factor 2: Aspirations		
School Aspirations Child	.5063695	Aspirations
School Aspirations Parents	.7178389	Aspirations
Job Aspirations Parents	.5878717	Aspirations
Factor 3: Education Spending		
Spent on Schooling Fees	.7309852	Education Spending
Spent on School Books	.6006255	Education Spending
Private Schooling	.5523265	Education Spending

Notes: 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 E4 depicts the results from the decomposition analysis with the three factors obtained from an EFA applying the Horn (1965) criterion. Literacy accounts for 14 % of the overall association between parental and offspring's education, and aspirations play a large role with 24 %. Education spending is a negligible channel of the intergenerational transmission of socioeconomic status in our sample. Although the information content derived through this approach is smaller compared to the intuitive approach or the scree test, these results give some support to the central interpretations from the main analysis.

These analyses confirm that the results derived using an intuitive approach of identifying factors from the given set of measures are not at odds with those from the more data driven approach of an EFA. They also show that the former allows for a slightly more nuanced interpretation and the inclusion of factors which have less but still meaningful measures in the data. However, the main results remain valid irrespective of the specific approach to dimensionality reduction.

Table E4. *Decomposition - Parallel Analysis*

Explained components of total $\hat{\beta}$	(1) Part of total $\hat{\beta}$		(2) Percent of total $\hat{\beta}$	
Literacy	0.044***	(0.005)	0.143***	(0.017)
Aspirations	0.073***	(0.006)	0.240***	(0.022)
Education Spending	0.011***	(0.004)	0.036***	(0.012)
Explained component of $\hat{\beta}$	0.128***	(0.009)	0.420***	(0.030)
Unexplained component of $\hat{\beta}$	0.176***	(0.015)	0.580***	(0.030)
Total $\hat{\beta}$	0.304***	(0.015)		

Notes: 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 E3. 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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