

THE ROLE OF HUMAN CAPITAL IN SOCIAL MOBILITY IN LMICS

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Concepts, methods, and determinants

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Section 2. Definitions, Frameworks and Estimation Issues

- Definitions
- Frameworks
- Estimation Issues in Investigating Impacts of Parental Human Capital and Endowments on Child Outcomes

Definitions

- Social mobility
 - Intergenerational versus intragenerational
 - Absolute versus relative
- Human capital multidimensional: cognitive skills, socioemotional skills, physical and mental health.
 - NOT schooling attainment
 - Health and nutrition important
- Parental endowments are also a vector including elements such as economic resources, health, marital status, education, genetic factors, and social connections, not all of which are observed in data sets.

Framework: Figure 1

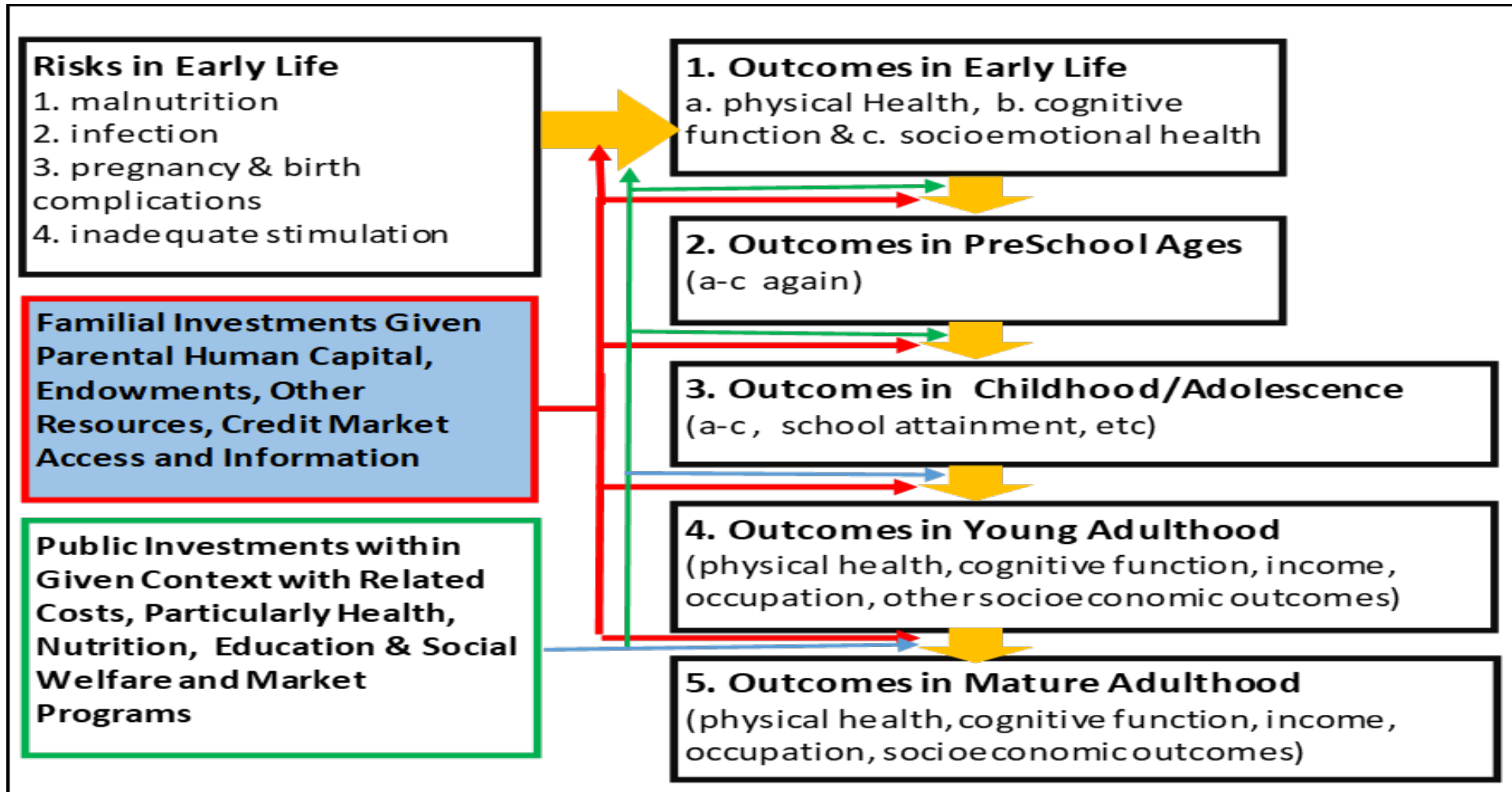


Figure 2. Becker's Woytinsky lecture: intersection of marginal rate of return and marginal costs determine equilibrium interest rate (r) and equilibrium human capital (H)

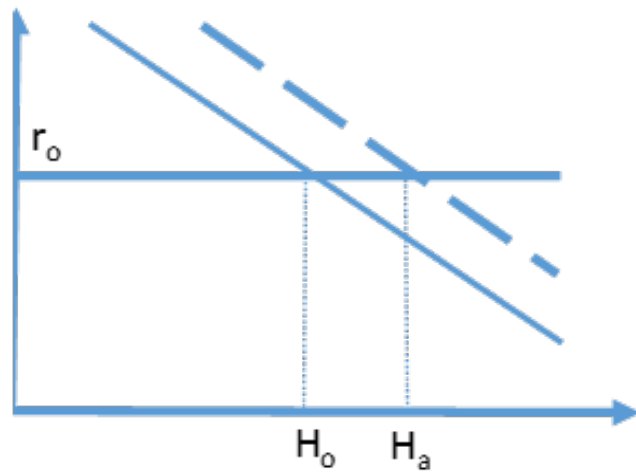


Figure 2a. Downward-sloping marginal rate of return and constant marginal costs, with dashed line giving higher marginal rate of return for each H

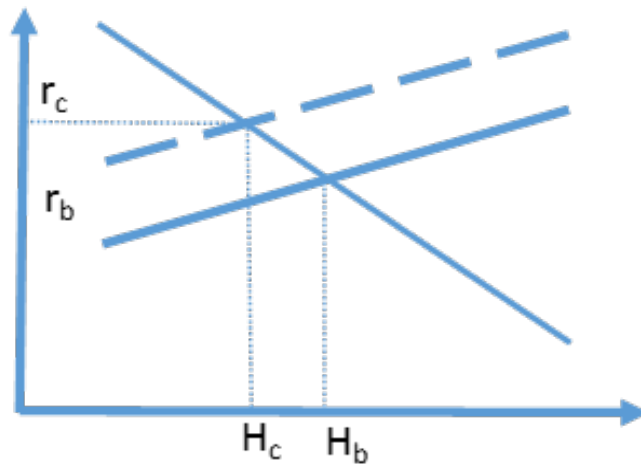


Figure 2b. Downward-sloping marginal rate of return and upward-sloping marginal costs, with dashed line giving higher marginal costs for each H

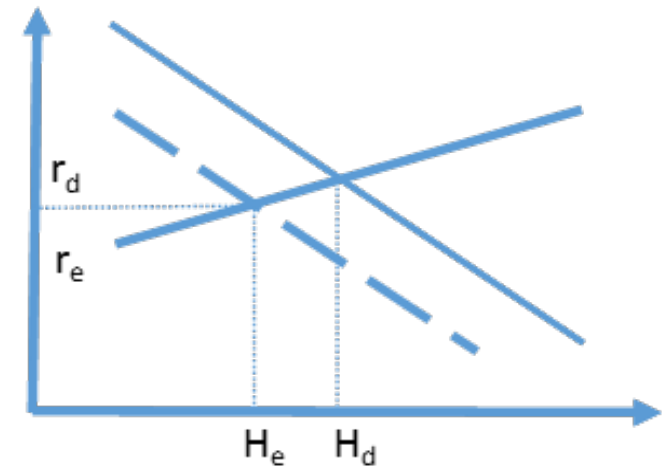


Figure 2c. Downward-sloping marginal rate of return and upward-sloping marginal costs, with dashed line giving lower marginal rate of return for each H

Figure 3. Parental Preferences and Allocation of Human Capital Between Two Children

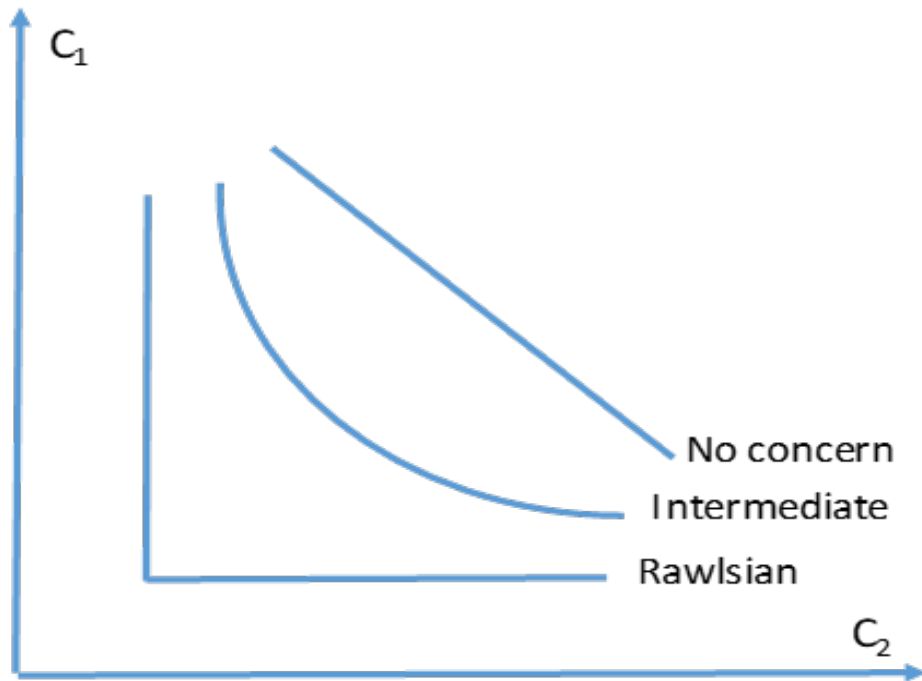


Figure 3a: Parental Preferences Regarding Earnings Distribution between Child 1 (C_1) and Child 2 (C_2): No concern about distribution (linear), intermediate (curved) and extreme (L-shaped)

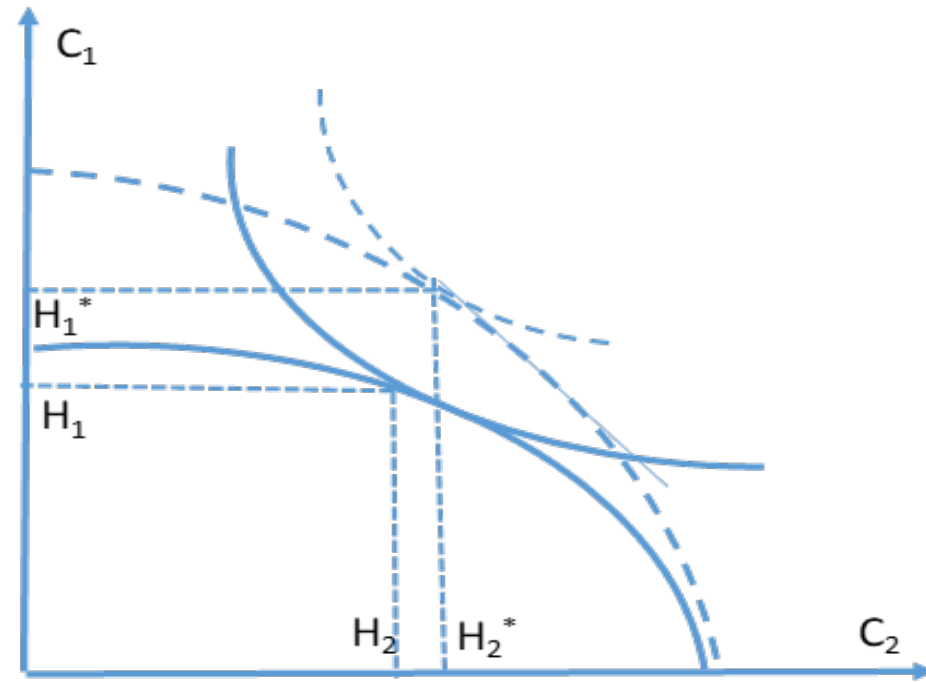


Figure 3b: Earnings Production Possibility Frontier Favoring Child 2 (C_2) (solid line) shifted somewhat to disfavor Child 1 (C_1) less so that equilibrium moves from (H_1, H_2) to (H_1^*, H_2^*)

Estimation Issues in Investigating Impacts of Parental Human Capital and Endowments on Child Outcomes

- Z is an outcome for which intergenerational social mobility is being estimated (e.g., income, occupation, cognitive skills, schooling attainment) for children (c) that depends linearly on the same outcome for the children's parents (p), child endowments E and a stochastic term u for random events and measurement error in Z_c :

$$Z_c = a_0 + a_p Z_p + a_e E_c + u_c \quad (1)$$

- Assume that these endowments are correlated across generations and generated by:

$$E_c = b_0 + b_p E_p + v_c \quad (2)$$

Possible resolutions

1. Longitudinal (panel) data, COHORTS (INCAP, Cebu), Jamaica
2. Experiments, RCTs (INCAP, PROGRESA, Jamaica)
3. Natural experiments (rain, earthquakes, policy changes)
4. Administrative data (Argentina, Chile, Philippines)
5. Instrumental variables
6. Kin
 - A. Sibling (twins) (Adults: Nicaragua, Chinese twins; Children)
 - B. Grandparents e.g., can manipulate (1) and (2) to get:

$$\begin{aligned} Z_c &= (a_0 + a_e b_0 - b_p a_0) + (a_p + b_p) Z_p - (b_p a_p) Z_{gp} + (v_c + u_c \\ &\quad - b_p u_p) \\ &= c_0 + c_1 Z_p + c_2 Z_{gp} + w_c \quad (3) \end{aligned}$$

Section 3. Determinants of Children's Human Capital

Cognitive Skills

- Cognitive skill development begins in early life during the first two lifecycle stages in Figure 1, then continues during schooling ages in the third lifecycle stage, and in the post-school ages in which learning occurs from experience as well as training in the fourth and fifth lifecycle stages.
- In utero:
 - Chilean earthquake impact on preschool children's cognitive skills only in low-income families.
 - Ramadan in utero has impact on Indonesian children's cognitive skills when 8-15, largest in lower quantiles and boy-girl differences.

- In childhood:
 - Negative rainfall shocks birth year in Mexico not associated with measures of early child cognitive skills.
 - For Nicaraguan boys of age 10, exposure to a CCT before age 2 appears critical for cognitive skills.
 - Propensity score matching estimates of the impacts of measles vaccinations by ages 6-18 months show cognitive and schooling benefits in Ethiopia, India and Vietnam. Whether children are vaccinated, in turn, is significantly associated with parental schooling attainment and household wealth.
 - Improved parenting through home visits or small mothers' groups appears important in early-life cognitive skills development, particularly for children from poorer family backgrounds, in Colombia, India, Jamaica.
 - But fairly strong socioeconomic gradients in preschool child cognitive skills by parental wealth, income and schooling attainment begin at early ages and persist and in some cases enlarge by school initiation ages in Chile, Colombia, Ecuador, Ethiopia, India, Madagascar, Nicaragua, Peru, Vietnam

- For Chile:
 - Maternal cognitive measures significantly predict early childhood cognitive and language skills for children ages 1-7 years even when controlling for maternal schooling attainment.
 - No robust association for alternative estimates (OLS with multiple controls, IV, PSM) between proportion of time since birth that mothers have worked and cognitive skills of 3 year olds.
 - Presence of grandparents associated with increased child performance on vocabulary tests and presence of fathers associated with increased household income – but not with significant changes in preschool age children’s performance on cognitive tests. Thus household structure, which is more likely to include extended families in LMICs than in HICs, may be important in how family background affects child development.
- For Argentina, quasi-experimental evidence that preschool programs increase basic school performance on standardized tests.
- Early-life nutritional status (height-for-age z scores, HAZ), subsequent changes in HAZ and better water and sanitation predict better mid-childhood and adolescent cognitive tests in Ethiopia, India, Peru, and Vietnam. HAZ in early life and subsequent changes in HAZ, in turn, are predicted by parental resources including parental schooling attainment (variation in whether fathers’ or mothers’ schooling has larger associations), household consumption, and maternal height.

- For the Philippines, estimates using sibling information to control for endogeneity, find that better-nourished children perform significantly better in school, partly because enter school earlier and thus have more time to learn but mostly because of greater learning productivity per year of schooling, with benefit-cost ratio ~ 3 .
- Undernutrition delaying enrollment in primary schooling is also found for Ghana and for instrumental variable estimates for Pakistan.
- Transfers to students and to teachers for learning mathematics in Mexican high schools conditioned on levels and improvements in performance, results in fairly large effects (~ 0.60 SD).
- For rural China where > 60 million children “left-behind” when parents migrate to urban areas for work, dynamic panel estimates that control for both unobserved individual heterogeneity and endogeneity in parental absence indicate absence of both parents reduces children’s contemporary cognitive achievements by 5.4 percentile points for math and 5.1 percentile points for Chinese.

- For post-school ages, limited evidence.
 - For Guatemala, production functions estimates for adult (26-42 y) verbal and nonverbal cognitive skills using data following individuals for ~35 years and treating adult human capital as endogenous indicate: (1) School attainment has significant and substantial effect on adult verbal cognitive skills but not on adult nonverbal cognitive skills; and (2) pre-school and post-school experiences also have substantial positive significant effects on adult cognitive skills. Pre-school experiences captured by HAZ at 6 years are substantially and significantly associated with adult nonverbal cognitive skills, even after controlling for school attainment, indicating considerable human capital dynamic cross-complementarities. Post-school tenure in skilled jobs has significant positive effects on both types of cognitive skills.
 - Results from a few very different LMICs (Guatemala, Malawi, Mexico, South Africa) indicate that cognitive skills change and often deteriorate with age, thus suggesting that intergenerational comparisons at different points in the lifecycle likely to overstate mobility. Schooling may play a mitigating role through reducing diabetes that is associated with cognitive decline in Mexico and participation in paid labor market may play a mitigating role at least for women in Malawi

- Information and perceived returns to investments in schooling:
 - For eighth-grade boys in the Dominican Republic, a study finds that the perceived returns to secondary school are extremely low, despite high measured returns. Students at randomly selected schools were given information on the higher measured returns completed on average 0.20–0.35 more years of school over the next four years than those who were not.
 - A field experiment in Malawi finds that poor parents' baseline beliefs about their children's academic performance are inaccurate, but providing them with clear and digestible academic performance information causes them to update their beliefs and correspondingly adjust their investments: they increase school enrollments of their higher-performing children, decrease enrollments of their lower-performing children, and choose educational inputs that are more closely matched to their children's academic level. Heterogeneity analysis suggests information frictions are worse among the poor.

- Indirect evidence that imperfect capital markets may affect parental investments in their children in that, at least within the standard model in Figure 2, otherwise parental resources per se would not affect child outcomes.
 - Parental resources are significant predictors of child schooling for the rural Philippines and Vietnam, using panel data to control for unobserved endowments the level of investments in children.
 - For Peru the progress through school is consistent with borrowing constraints being restraining for households that appear by their loan activity to be constrained in the capital market, but not for households that are not so constrained.
 - For Malaysia children's schooling attainment is associated with their fathers' positions in the earnings cycle, suggesting the importance of credit constraints.
 - For rural India whether households are liquidity-constrained affects time that mothers spend with their daughters (which presumably leads to greater cognitive stimulation), but not their sons.
 - For Ghana, however, no significant evidence that borrowing constraints limit early school enrollment.

Socioemotional Skills

- Limited evidence on determinants of child socioemotional skills.
- Some studies noted above with regard to cognitive skills also find that improved parenting developed through home visits or small mothers' groups appear important factors in early-life socioemotional skills development, particularly for children from poorer family backgrounds.
- Maternal cognitive skills significantly predict child socioemotional skills for Chilean children ages 1-7 y.
- A study using a random sample of 2,617 adults aged 15-64 in 13 urban areas in Colombia finds that higher levels of mothers' schooling attainment significantly predict better scores on adults' 1) extroversion and openness to experience, 2) emotional stability and hostile attribution bias, and 3) conscientiousness, grit, and decision making.

Health and Nutritional Status

- Prevalence of undernutrition

	Low birth weight: % of live births < 2500 gm in 2015 (updated May 2019)	Stunting (moderate and severe): % of children in 2018 aged 0-59 months < 2 SD below medians for WHO standards for well-nourished populations (updated March 2019)
Sub-Saharan Africa	14	33.3
Middle East and North Africa	11.3	14.7
South Asia	27	34.4
East Asia and the Pacific	7.9	8.4
Latin America & Caribbean	8.8	9
Europe & Central Asia	6.9	9
North America	7.9	2.6
Sources: (downloaded 12 August 2019): https://data.unicef.org/resources/resource-type/datasets/# https://data.unicef.org/resources/dataset/malnutrition-data/		

- Projected 143 million children < 5y stunted in 2020; 59.4 overweight.

- Trajectories in stunting and overweight from age one y to mid-adolescence and from mid-childhood to early adulthood in two cohorts for Ethiopia, India, Peru and Vietnam. Multinomial logit prediction reveals that higher wealth quartiles and maternal schooling are protective against high-stunting-probability-trajectory-group membership, but higher wealth and urban residence predict high-overweight-probability-trajectory-group membership.
- Another study using the same data investigates relations between household conditional wealth (i.e. wealth at age 15 not predicted by wealth at age 5, thus controlling for wealth at age 5 and any correlated factors) and child height at age 15 and finds two dimensions of heterogeneity: (1) the effect of conditional wealth on adolescent height is stronger for boys than for girls, which is striking because a number of studies reviewed in this chapter report that girls tend to benefit more at the margin from positive changes. (2) growth of children after age 5 who were stunted at that age is significantly more responsive to conditional wealth than the growth of non-stunted children.
- For Nicaraguan boys of age 10, exposure to a CCT before age 2 does not appear critical for physical growth due to subsequent catch-up.

- Prenatal care is emphasized as critical for birth outcomes, and the extent of prenatal care tends to be associated with parental education and other resources. However, prenatal-care utilization is not significantly associated with birth weights in pooled sample from Brazil, Guatemala, the Philippines and South Africa, but unit increase in a prenatal care utilization is significantly associated with 0.09 higher HAZ at 24 months.
- Fixed-effects analysis of monthly panel with all births in Mexico from 2008 to 2010 merged with homicide data at municipality level finds that exposure to homicides in first trimester of gestation increases infant birth weight and reduces proportion of low birth weights, more so among low-SES women in urban areas—and null among the most advantaged women. The authors suggest that mechanism driving this surprising positive effect is an increase in mothers' health-enhancing behaviors (particularly the use of prenatal care) as a result of exposure to violence.
- In the Young Lives longitudinal data for Ethiopia, India, Peru, and Vietnam, HAZ in early life and to a lesser extent subsequent changes in HAZ are predicted by parental resources including parental schooling attainment (with variation in whether fathers' or mothers' schooling attainment has larger associations), parental household consumption, and maternal height.
- For rural India there is evidence that favorable rainfall shocks in childhood increase the survival probabilities of girls to a greater extent than they increase boys' survival probabilities and that price shocks have greater impact on girls than on boys, both of which suggest families treat girls more as luxuries at the margin when there are real income changes.

- Child nutrient intakes not determined substantially by parental income.
 - Production function estimates for height and weight growth for children between 6 and 24 months old in Guatemala and the Philippines, using instrumental variables to control for endogeneity, find that protein intake, but not energy from other nutrients, plays an important and positive role in height and weight growth. Protein-income elasticity low.
 - Meta-analysis shows that while the average impact of income transfers from social protection programs on HAZ is positive, effect sizes are small and not statistically significant, consistent with the production function estimates if households use these transfers largely to increase the quantity of calories consumed, if the increases in protein consumption is small in magnitude, or if these proteins are not allocated to children.
 - Another recent study finds no impacts of Green Revolution-induced increases in rice productivity on children's HAZ, also consistent with the production function estimates and small protein elasticities with respect to income.
 - Estimates of the parental allocation decisions regarding proteins in Guatemala indicate fairly small income elasticities but that the reference population for the distribution of HAZ that the parents use is important and that parents use the local distribution of HAZ for 2-year olds in making their decisions regarding proteins to feed their new-born children over the first two years of their lives, with substantial spillovers on other families and their children.
- A study on Bangladesh finds that maternal nutritional knowledge, instrumented to control for endogeneity and measurement error, has significant impact on children's dietary diversity if and only if the household has good market access, illustrating one way in which context matters.

- A 2017 study analyzes relations between parental schooling and stunting using 376,992 preschool children from 56 LMICs. It compares a naïve OLS model to specifications that include cluster fixed effects and cohort-based educational rankings to attempt to reduce biases from omitted variables and finds that estimated effects of parental schooling are:
 - (a) substantially reduced in models that include fixed effects and cohort rankings;
 - (b) larger for mothers than for fathers particularly for higher schooling levels (e.g., > 10 grades);
 - (c) minimal for primary schooling but generally increasing with more schooling;
 - (d) increasing with household wealth;
 - (e) larger in countries/regions with higher burdens of undernutrition;
 - (f) larger in countries/regions with higher schooling quality; and
 - (g) highly variable across country sub-samples.

The authors conclude that their more stringent models imply that even the achievement of very ambitious schooling targets would only lead to modest reductions in stunting rates in high-burden countries and they speculate that schooling might have more impact on the nutritional status of the next generation if school curricula focused on directly improving health and nutritional knowledge of future parents.

- There is much less literature investigating the determinants of physical well-being for older children in LMICs, especially with control for endogeneity and unobserved parental endowments that are likely to bias cross-section estimates. But there are some studies that estimate parental preferences underlying intrahousehold allocations of nutrients among children using the SET model (Figure 3) .
 - For rural Indian children up to 13 y of age with sibling control for unobserved family endowments, (1) important seasonal differences, with greater inequality aversion in surplus season when food relatively abundant, (2) a promale bias of ~5% in lean season that larger for lower castes and households with more educated household heads (but not related to land holdings), (3) significant birth-order effects favoring lower birth orders, and (4) significant inequality aversion but less than for the U.S., particularly in the lean season, so that more vulnerable children (e.g., girls, higher birth order) are particularly at risk when food is most scarce.
 - For China, using identical twins of average age 11 y to control for unobserved endowments, in response to health shocks, parents make compensatory and reinforcing investments in different dimensions of human capital across children. Compared with the twin sibling who did not suffer from negative early health shocks at age 0–3, the other twin sibling who did received 305 yuan more health investment, but received 182 yuan less educational investment. The study concludes that overall families acts as net equalizers in response to child early health shocks across children.

Section 4. Impacts of Children's Human Capital

- Children's human capital may be an outcome for which mobility is of interest. But it also may be mediating variable for other outcomes for which mobility is of interest.

Cognitive Skills

- For Guatemala significant positive effects (about two-thirds larger in the IV than in OLS estimates) of adult cognitive skills on wages using instruments from over 35 years of the life cycle including early-life experimentally-allocated nutritional supplements.
- For nine middle-income countries -- Armenia, Bolivia, Colombia, Georgia, Ghana, Kenya, Serbia, Ukraine and Vietnam -- another study, though it does not control for endogeneity, controls for selectivity regarding who receives earnings and presents quantile estimates to examine how schooling and skills differences between men and women relate to gender gaps in earnings and finds that post-secondary schooling and cognitive skills are more important for women's earnings at the lower end and middle of the earnings distribution.

- Many studies of associations between schooling attainment, an input into cognitive skills, but most do not control for endogeneity. For urban China, studies using twins to control for unobserved endowments and cross-twins schooling reports to control for measurement error:
 - OLS estimates of wage relations suggest that additional year of schooling increases earnings by 8.4% but within-twins fixed-effects with correction for measurement error estimates are 3.8%, suggesting that large portion of the estimated returns to education is due to omitted ability or family effect.
 - OLS estimates suggest that schooling is significantly associated with adult health-related behaviors (smoking, drinking, exercising) but not with own or spouse health outcomes (general health, mental health, overweight, chronic diseases). However, within-identical-twins estimators change the estimates for approximately half of these health indicators, in one case declining in absolute magnitude and becoming insignificant and in the other cases increasing in absolute magnitudes.
- For rural Philippines, using panel data to provide relevant instruments (particularly distance to schools and measures of household resources at the time of schooling) to endogenize investments in schooling in wage functions, the estimated return to schooling increases more than 60 percent suggesting the dominance of measurement error and increasing returns to higher schooling in OLS estimates.

Socioemotional Skills

- Much recent attention in HICs, less but increasing for LMICs.
- Analysis of longitudinal data on poor rural Chinese children finds that both cognitive and socioemotional skills when children 9–12, 13–16, and 17–21 y old, are important predictors of whether they remain in school or enter the workforce at age 17–21. Conditioning on grades of schooling attained, no strong evidence that skills measured in childhood predict wages in the early years of labor market participation.
- In Colombia, cognitive skills are strongly associated with higher earnings and holding formal jobs or high-qualified occupation. Socioemotional skills have little direct influence on these outcomes but play stronger roles in labor market participation. Both skills, especially cognitive, strongly associated with tertiary education. Inferences generally consistent across types of estimates (OLS, logit, and IV) and aggregated measures (structural estimations of latent skills).
- In Argentina and Chile, for young adults in their late 20s self-efficacy predominates in associations with higher wages, with stronger effects for workers with postsecondary degrees, and also is the socioemotional skill most associated with higher labor force participation and the probability of being employed.

- Study for the Peruvian working - age (14 - 50) urban population considers wide range of cognitive (Peabody receptive language, verbal fluency, working memory, and numeracy/problem - solving) and personality traits to proxy for socioemotional skills (Big - Five Factors, Grit). Using IV to address potential endogeneity, the findings are that socioemotional and cognitive skills are equally valued. A one SD change in overall cognitive skill and in perseverance facet of Grit each generates 9% increase on average earnings, conditional on schooling. Increase in schooling of 3 grades has 15% increase in earnings, conditional on skills. The returns to other socioemotional skills vary across dimensions of personality: 5% higher earnings for emotional stability and 8% lower earnings for agreeableness.
- A study using linked employer-employee data from the formal sector of Bangladesh explores gender wage gaps associated with measures of cognitive skills and personality traits. The results are that while cognitive skills are important in determining mean wages, personality traits have little explanatory power. However, quantile regressions indicate that personality traits matter in certain parts of the conditional wage distribution, especially for females. Cognitive skills as measured by reading and numeracy also confer different benefits across the wage distribution to females and males respectively. Quantile decompositions indicate that these skills and traits reduce the unexplained gender gap, mainly in the upper parts of the wage distribution.
- In Armenia, Bolivia, Colombia, Georgia, Ghana, Kenya, Serbia, Ukraine and Vietnam estimates indicate that men and women have positive earnings returns to openness to new experiences and risk-taking behavior and negative returns to hostile attribution bias.

Health and Nutritional Status

- Estimates of Present Discounted Values of Seven Major Benefits of Moving Infant Out of Low-Birth-Weight Status in Low-Income Country

	Annual Discount Rate		
	3%	5%	10%
1. Reduced infant mortality	94	93	89
2. Reduced neonatal care	42	42	42
3. Reduced costs of infant and child illness	36	35	34
4. Productivity gain from reduced stunting	152	85	25
5. Productivity gain from increased cognitive ability	367	205	60
6. Reduced costs of chronic diseases	49	15	1
7. Intergenerational benefits	92	35	6
Total	832	510	257

With 5% discount rate, majority of estimated gains are from increased adult productivities, not relatively short-run gains in infancy that have been emphasized in much previous biomedical literature (though this depends critically on how averted mortality is valued). Estimates of benefit-cost ratios using these impacts range from 0.6 to 35.2.

- For Chile, within-twins birth weight estimates, which control for all unobserved family and genetic background factors that twins have in common, have no effects on cognitive scores for children < 3 y, positive effects for children 3-7 y, and substantial effects on first graders' math and fourth graders' math and language test scores.
- For the Philippines, estimates using sibling information for instruments (which results in substantially larger estimates than OLS) find that better-nourished children at time of initial enrollment decisions perform significantly better in school at age ~11 years, partly because they enter school earlier and thus have more time to learn but mostly because of greater learning productivity per year of schooling, with particularly large effects for more undernourished children. These estimates imply that a unit increase in HAZ would have effects on student achievement equal to 1.1 grades of school (2.1 grades for the most undernourished children) with a benefit-cost ratio of at least 3.
- For Pakistan, estimates using price shocks as instruments (which results in substantially larger estimates than OLS) find fairly substantial reductions in starting age for schools with higher preschool HAZ, larger for girls than for boys.
- For Ghana, preschool undernutrition also results in significant schooling delays.

- For rural Indian, propensity score matching estimates using longitudinal data from a controlled protein-energy supplement nutrition trial in 1987-90 are that in 2003–2005 children born in intervention villages are 7.8% more likely enrolled in school and complete 0.84 more schooling grades than children born in control villages, but no association between supplementary nutrition and school test scores
- Estimates using the Guatemalan INCAP data with an experimentally-allocated protein-enhanced supplement for children under 24 months of age indicates long-run mostly-positive significant effects over the life cycle, through increasing schooling for by over a grade for females, increasing adult reading comprehension and cognitive abilities by ~ 0.25 SD for both adult men and women, increasing hourly wage rates for men by over 40% and increasing birth weights for children of women who received the supplements by >100 gm.
- A study using Chinese twins data to control for endowments finds impact of birthweight on schooling attainment, cognitive achievement as measured by ninth grade language and math tests, and wages. These effects are significantly larger for females than for males, which the authors interpret to reflect a comparative advantage of females in more skilled occupations together with a shift towards skill-intensive occupations associated with economic growth

Section 5. Implications of Estimates Such as in Sections 3 & 4 for Absolute and Relative Mobility

- Effects of Mexican Oportunidades CCT Program on Schooling Attainment, Height and Distribution of Future Earnings:
 - Nonparametric simulation studies how increases in schooling attainment and height affect earnings distribution when children become adults.
 - Suggest human capital investment in today's youth increases their mean earnings, but only modest effect on earnings inequality in part because 1) difficult to target low adult earners on basis of childhood characteristics and 2) nonlinearities in how height and education influence earnings.

- Simulations of Impacts of Increasing Schooling and Income of Poor Parents on Distributions of Children's Cognitive and Health Outcomes in Young Lives' Countries of Ethiopia, India, Peru and Vietnam
 - Changing parental schooling to at least nine grades reduces inequality in parental schooling considerably but with very little change in the inequality of the distribution of the human capital of their children, in part because of unobserved child endowments.
 - Same if per capita consumption of parents is raised to a minimum of \$1 a day or to the 20th percentile of the per capita consumption distribution.
 - Conclude that increases in parental schooling attainment and per capita consumption for poor households are likely desirable in themselves to improve welfare, but not likely to have large impacts on reducing human capital (and eventually probably adult per capita consumption) poverty and certainly not inequality in the next generation of adults.

- Simulations of Impact of Human Capital Investments Targeted Towards the Low End of the Earnings Distribution in Chile
 - Suggest significant impacts of well-targeted increases in schooling on reducing inequality and poverty headcounts in schooling, earnings, and wage rates.
 - Desirability of targeting directly towards the outcome of interest (e.g., towards those with low wage rates, not low schooling, if full income is of primary concern) despite possible difficulties in doing so (since wage experiences typically are not revealed until after most people have completed schooling).
 - But, though the magnitudes of some of the simulated impacts on the poverty headcounts are fairly large, magnitudes of reductions in Gini coefficient estimates for earnings and for wage rates are not very large.
 - Thus significant scope for reducing inequality and probably somewhat more poverty through human capital interventions, expectations should not be for massive changes through these mechanisms alone unless there really are massive improvements in the human capital of the poorer members of society.

- Roles of Macro and Educational Policy Contexts in Moderating Effects of Parental Family Background on Children's Schooling in Latin America
 - Macro conditions – in particular those related to the extent of internal market development – importantly shape intergenerational mobility by loosening strong link between parents' background and children's schooling.
 - Similarly, educational policies can loosen that link, thus enhancing mobility. Increasing public resources available for basic schooling in general and for improving school quality in particular have important positive impacts on intergenerational schooling mobility.

Section 6. Conclusions

Overall Summary

- Parental human capital and endowments may play significant, though not necessarily substantial, roles in affecting mobility. They are important determinants of children's outcomes, some of which are of interest in themselves as commonly-used indicators of mobility and some of which may serve as transmission channels for subsequent child outcomes such as adult earnings and occupation that are of interest for social mobility.
- Important to use wider definition of human capital than just, e.g., schooling attainment on which much literature has focused. In many LMICs physical health and nutritional status are important dimensions of children's human capital, especially for early lifecycle stages. As such they may be channels through which parental human capital and endowments affect how children develop over their life cycles and thus social mobility.
- Estimates of how observed components of parental human capital and endowments affect children's human capital and various outcomes often vary considerably from simple associations – in some cases are considerably larger with control for measurement error and nonlinearities and in a number of cases are much smaller with control for unobserved endowments for which human capital may be serving as proxies.

- Unobserved parental endowments related, for example, to genetic endowments, family culture and family connections, often have substantial effects with implication that focusing only on observed components likely to be misleading and overstate the extent of social mobility since these endowments are not likely to be affected by policy interventions even if observed parental and child human capital may be affected by policies.
- Unlikely that any single characterization of parental human capital and endowments and social mobility fits all or most LMICs. There is too much heterogeneity in contexts – market development, policies, culture, demography, resources. Capital and information markets are likely to vary, with direct effects on investments in children. Parental knowledge about various dimensions of and inputs into child development, for example, may be useful only if there are considerable market or policy alternatives. The incentives to invest in various dimensions of child development also are likely to depend importantly on current and expected future macro developments.
- The estimates suggest that parental human capital and endowments often have significant effects directly or indirectly on child outcomes and thus potentially the extent of intergenerational mobility and the extent of intragenerational mobility.

- These effects tend to be larger in a number of studies for those who are thought to be more vulnerable, such as those who are undernourished, girls or from low-SES families.
- But in many, though not all, cases the effects are much smaller than would be suggested by the simple associations presented in much of the literature once there is control for unobserved endowments. This may suggest that social persistence is less and social mobility greater than might seem to be the case from simple intergenerational and intragenerational associations of observed variables. However this may be misleading regarding the extent of social mobility because the serially correlated unobserved endowments both across and within generations increase persistence and limit social mobility.

Gaps in the Literature

Data Limitations

- Critical Variables: mental health; socioemotional skills; parental beliefs, expectations, style; cognitive skills (with quite limited availability for parents and broader, but still fairly limited availability for their children); physical health, with focus on child anthropometric indicators but more limited indicators over other parts of the lifecycle; capital market constraints.
- Longitudinal data that permit controlling for biases due to measurement errors, endogeneity, unobserved factors that also have data over substantial segments of their children's life cycles, particularly into young and mature adulthood.
 - Experimental data: very few data sets with relevant experiments long enough ago to control for parental human capital and endowments
 - Quasi-experimental data relatively rare.
 - LMICs on adult siblings in general and on adult twins in particular.
 - Limited successful efforts to link historical administrative data on policies, natural conditions, etc. to micro intergenerational data.

Methodological limitations

- External validity – context
 - Specify and control for critical dimensions of contexts (e.g., macro)
 - Comparable cross-country data (e.g., Young Lives)
 - Structural models
- Beyond parent-child, given extended families and multigenerations, other social networks.
- Focus on one outcome (e.g., school attainment, but school quality, social networks may imply less mobility or may be other, such as land)
- Partial equilibrium (not market-wide nor general equilibrium).
- Better integration of mechanisms (e.g., puberty, household formation)
- Little on intragenerational mobility, relative mobility