Parental Education and Skill Indicators of Children: an Intergenerational Mobility Study

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Introduction & motivation

- Intergenerational social mobility in the context of:
  - Association between family socioeconomic status and education and economic outcomes of adults
  - Socioeconomic background: parental income, **education**, occupation
- In a society with low mobility it is expected to see a high association between parental education and outcomes of the adults.
  - Adults from low socioeconomic status tend to stay in the cycle of disadvantage
- Find out whether there is association between parental education and odds of study in STEM as well as gender gap in STEM.

Research Questions

Absolute mobility

- What are the ranges of absolute upward mobility in education in the U.S.?

Absolute mobility: refers to the extent to which people do better than their parents.

Relative mobility

- What is the extent of relative mobility in the U.S. using summary statistics and inferential statistics?
- Does relative mobility in the outcomes of interest vary across different segments of the population (race and gender)?

Relative mobility: relative mobility studies the extent to which an individual's chances depend on his/her parent's status such as education

Outcomes of interest: education, employment status, occupational skill classification, earnings, and cognitive skills (literacy, numeracy, and problem-solving scores)

Relationship between parental education and STEM

- Is parental education associated with propensity to study in STEM and gender gap in STEM?

Data

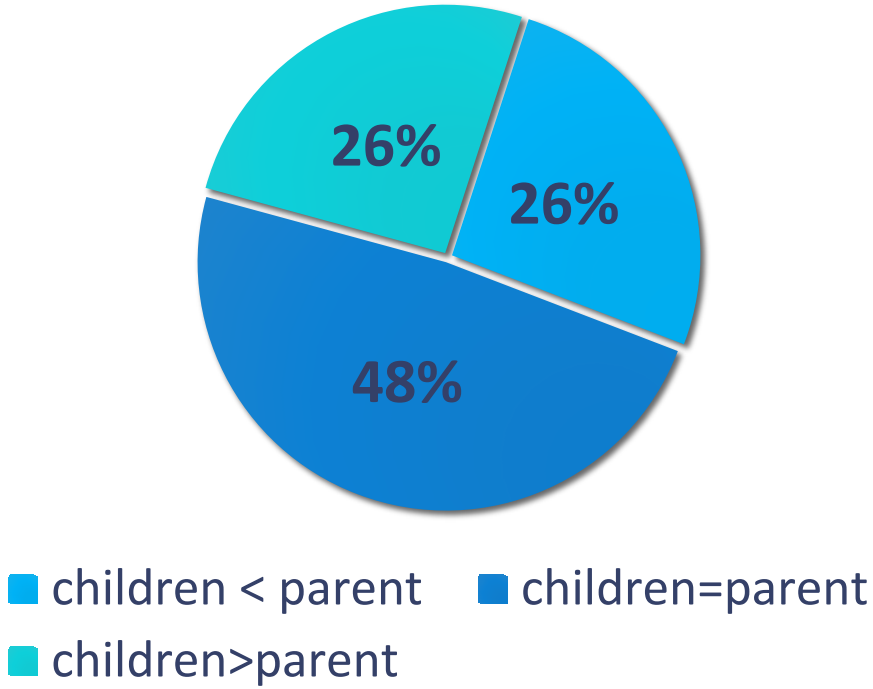
- Source: U.S. PIAAC 2012/2014 Public Use Data Files dataset
- Outcome variables:
  - Cognitive skills: literacy, numeracy, problem solving, and education
  - Occupation: employment status, earnings, occupation-skill
  - STEM filed of study
- Main explanatory variables: parental education
- Control variables: age groups, gender, language, racial groups, urban city, region, and (highest level of education achieved, skilled occupation).

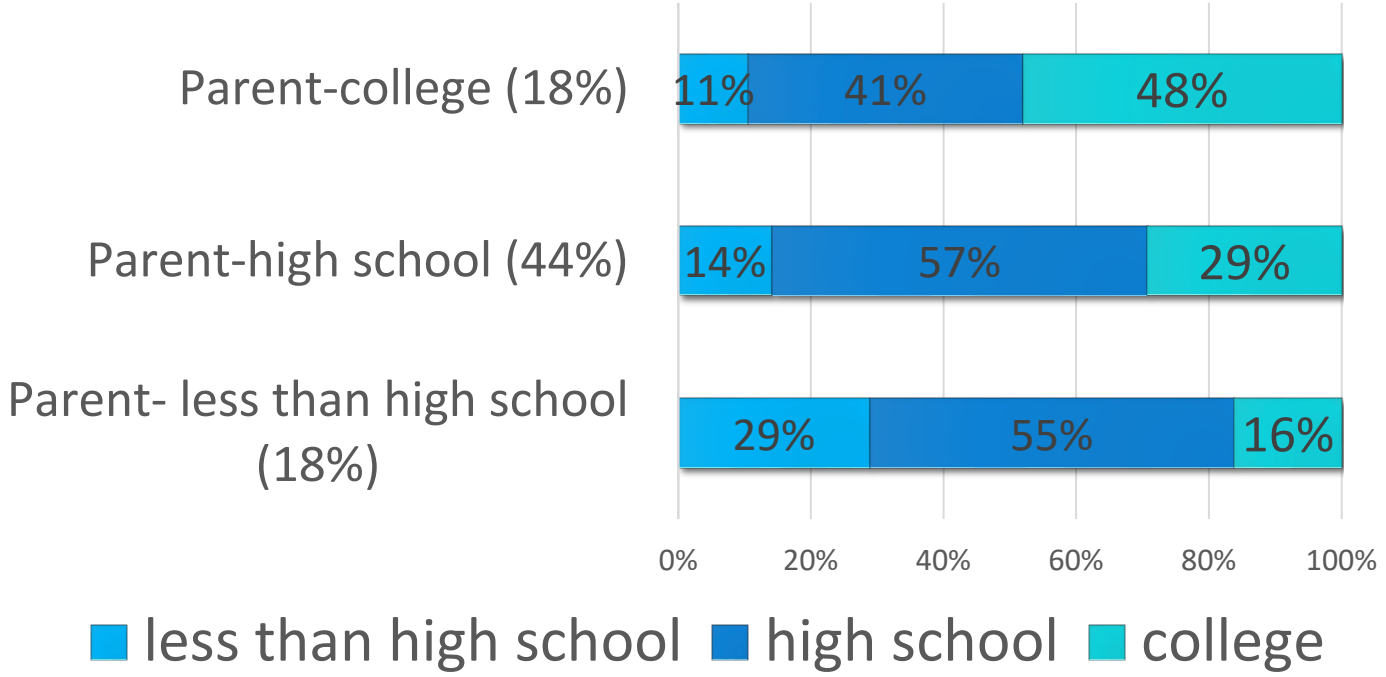
Specification

Outcome variable	Model
employment	Multinomial logistic regression
education, occupational-skill, earnings	Ordinal logistic regression
Study-STEM	Binary logistic regression
literacy, numeracy, problem solving	Linear regression

Results

Absolute mobility

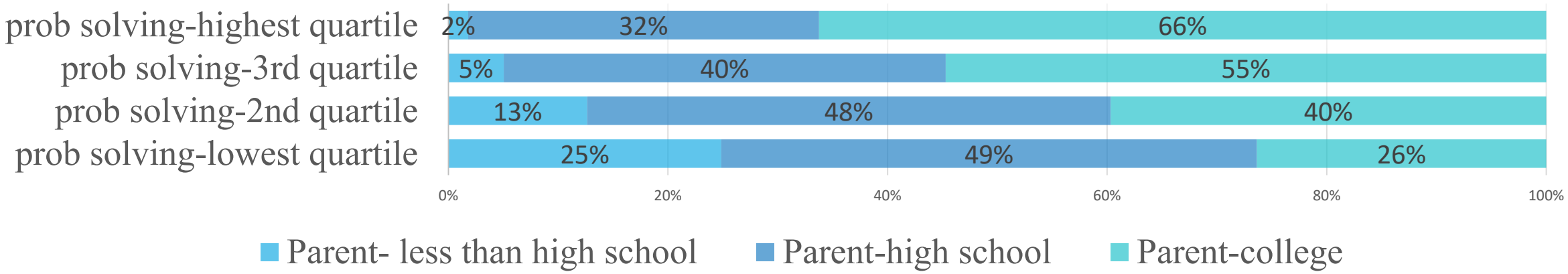




Relative mobility

Adults with higher parental education:

- have higher quartiles of Literacy, numeracy, and problem solving scores; are more likely to have college degree; be employed; earn higher quartiles of earnings; engaged in skilled occupations



	Literacy	Numeracy	Problem Solving
Parent-LHS	-10.840***	-14.45***	-11.407***
Parent-college	10.05***	9.66***	6.87***

* p < 0.10, ** p < 0.05, *** p < .01.

- As parental education increases the additional effects are not statistically different for males than females.
- Also, there is no significant differences across racial groups.
- Control variables: age groups, gender, language, racial groups, urban city, region, and highest level of education achieved.

Panel A.	**Education**	**Skilled-Occupation**	**Earnings**
Parent-LHS	0.3426***	0.7739**	0.6945***
Parent-college	2.4845***	1.1636	1.1064**
Panel B. by gender			
Parent-LHS*female	0 .8392	1.3644	0.7699
Parent-college*female	1.2234***	0.8586	1.5103***

- Control variables: age groups, gender, language, racial groups, urban city, region, and highest level of education achieved (additional control of skilled-occupation for earnings).

* p < 0.10, ** p < 0.05, *** p < .01.

Panel A.	**Unemployed**	**Out of labor force**
Parent- LHS	1.0987	1.2491***
Parent-college	0.8071*	0.7518***
Panel B. by gender		
Parent-LHS*female	1.1315	0.7694
Parent-college*female	1.0651	0.9839

- Hispanics have lower odds to be unemployed or out of labor force compared to whites when parental education changes from high school to LHS
- There is no racial differences when parental education increases from HS to college.

* p < 0.10, ** p < 0.05, *** p < .01.

Panel A.	STEM
Parent-LHS	0.8259
Parent-college	0.8794***
Panel B. by gender	
Parent-LHS*female	0.7686
Parent-college*female	1.1285

- There is no racial differences when parental education increases from HS to college.

* p < 0.10, ** p < 0.05, *** p < .01.

Conclusion

- Strong association between family socioeconomic background and adults education and economic outcomes.
  - Adults with higher educated parents are more likely to: attain college degrees, be employed, engage in skilled occupations and receive higher quartiles of earnings.
- Higher parental education helps in reducing gender gap in skilled-occupation and earnings.
- This study did not find any impact of parental education on the probability to study STEM as well as gender gap in STEM.

Policy implications

- Importance of adult literacy & education: improving the outcomes of the next generation as well as reducing gender gap
- Policies promoting early interventions to improve health and educational opportunities
- Effective redistributive policies to shaping equal opportunities for all children, social assistance programs (e.g. Head Start)
- Policies promoting higher parental involvement through education system.

Thank you

Specification cont.

- ***Multinomial logistic:***

$$ln\left(\frac{P\left(Outcome_{child_i}\right)}{P\left(OutcomeRef_{child_i}\right)}\right) = \beta_0 + \beta_1 EducCollege_{parent_i} + \beta_2 EducLessHighSchool_{parent_i} + \beta_3 X_{child_i} + \varepsilon_i$$

- **Linear regression:**

$$Outcome_{child_i} = \beta_0 + \beta_1 EducCollege_{parent_i} + \beta_2 EducLessHighSchool_{parent_i} + \beta_3 X_{child_i} + \varepsilon_i$$

Specification cont.

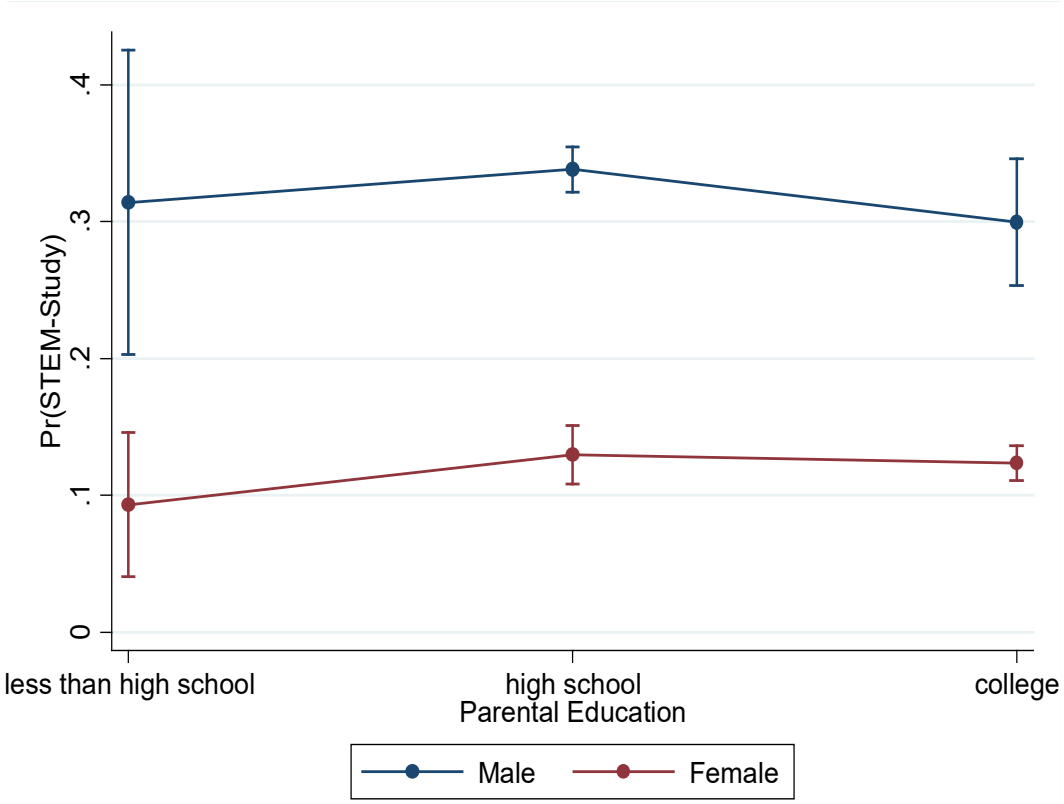
- **Interaction terms:**

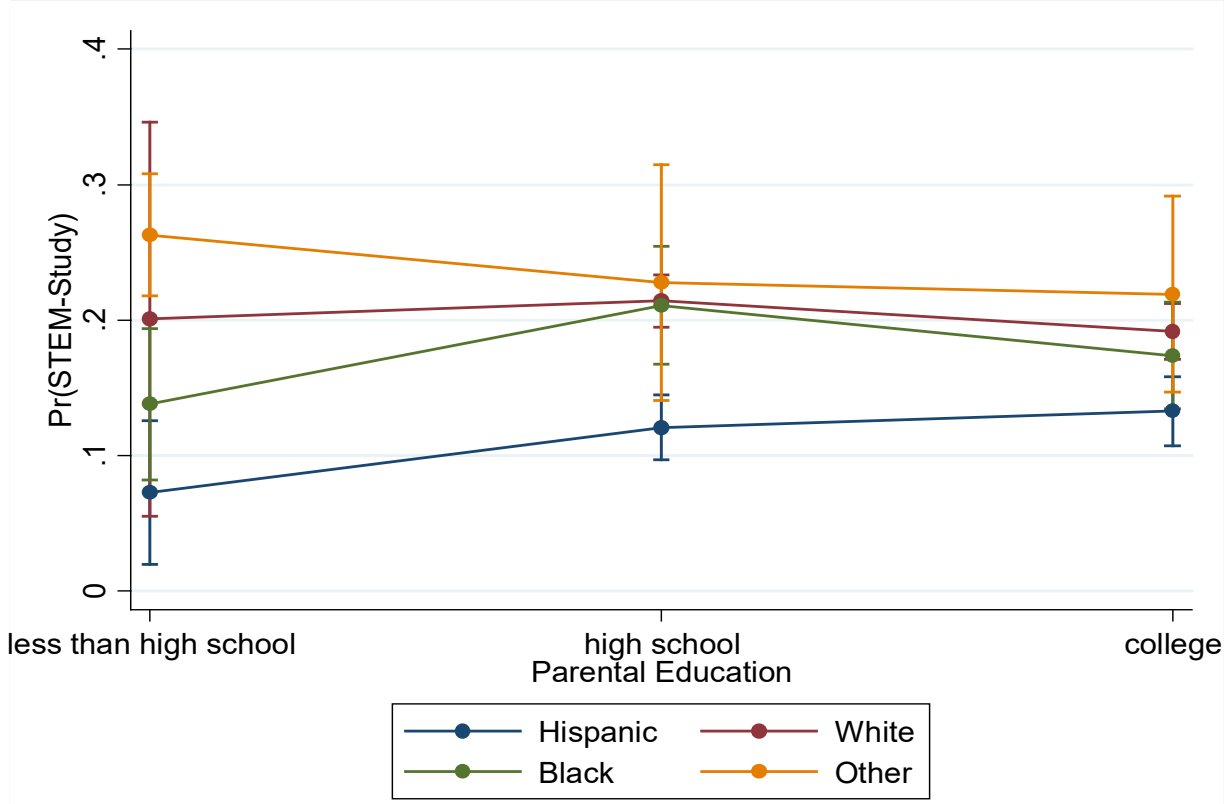
$$ln\left(\frac{P\left(Outcome_{child_i}\right)}{P\left(OutcomeRef_{child_i}\right)}\right) = \beta_0 + \beta_1 EducCollege_{parent_i} + \beta_2 EducLessHighSchool_{parent_i} + \beta_3 EducCollege_{parent_i} * popcharacter_{child_i} + \beta_4 EduLessHighSchool_{parent_i} * popcharacter_{child_i} + \beta_5 X_{child_i} + \varepsilon_i$$

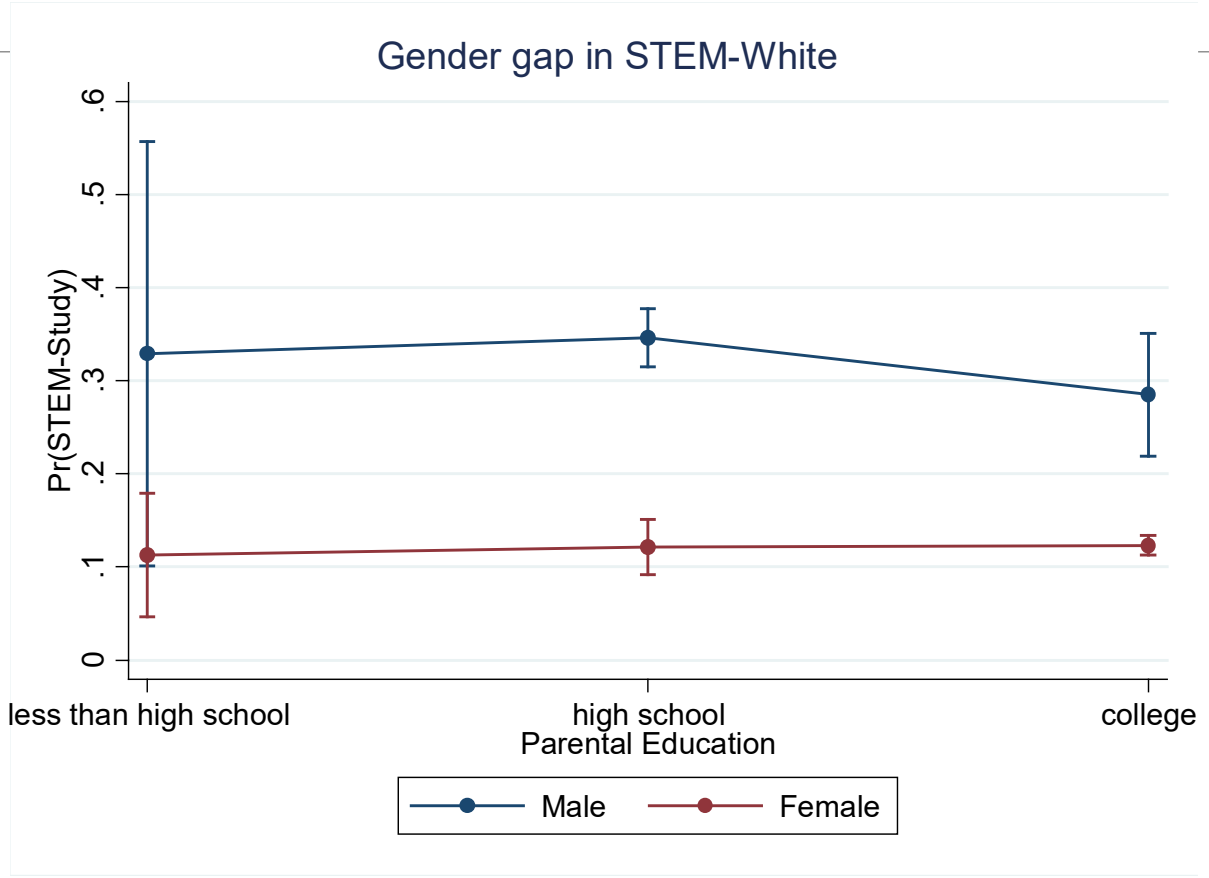
- **Stem-Study:**

$$ln\left(\frac{P\left(STEM_{child_i}\right)}{P\left(NoSTEM_{child_i}\right)}\right) = \beta_0 + \beta_1 EducCollege_{parent_i} + \beta_2 EducLessHighSchool_{parent_i} + \beta_3 X_{child_i} + \beta_r + \varepsilon_i$$

Appendix


Pr(STEM-Study)
0
.1
.2
.3
.4
less than high school
high school
college
Parental Education
Male
Female


Pr(STEM-Study)
0
.1
.2
.3
.4
less than high school
high school
college
Parental Education
Hispanic
White
Black
Other


Gender gap in STEM-White
Pr(STEM-Study)
0
.1
.2
.3
.4
.5
.6
less than high school
high school
college
Parental Education
Male
Female

Panel C. by race	Education	Occupation-skill	Earnings
Parent-LHS*Hispanic	1.3790	1.1832	1.5774***
Parent-LHS*Black	1.4812***	1.0831	1.1642
Parent-LHS*Other	1.8152	1.3938	1.3177
Parent-college*Hispanic	0.7752	0.7972**	1.1667
Parent-college*Black	0.7737	1.1516*	0.9921
Parent-college*Other	0.8644	0.9685	1.0185

* p < 0.10, ** p < 0.05, *** p < .01.