Educational attainment at 21: where are the differences coming from?

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Motivation

"Of all the potential consequences of rising economic inequality, none is more worrisome (...) than the possibility that rising inequality will have the long-term effect of reducing **equality of opportunity** and intergenerational mobility" (Ermisch et al. 2012, Ch 1, p. 3)
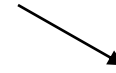
Studying the **determinants of educational attainment** is a first step in understanding the transmission of economic (dis)advantage

Background

Becker and Tomes (1979;1986)

$$H_t = \psi(X_{t-1}, S_{t-1}, E_t)$$

genetic and **cultural** endowments

('family culture', parents' tastes and expectations)

usually proxied by parental income
and education…

Research on a causal relationship between
parents' and children's education did not produce
consistent findings

[Björklund and Richardson (2001), Behrman and Rosenzweig (2002),
Black et al. (2003), Chevalier (2004), Plug (2004), Raaum and Westlie (2004)]

Background

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$$H_t = \psi(X_{t-1}, S_{t-1}, E_t)$$

Educational qualifications

genetic and **cultural** endowments

knowledge acquired at school
  + non-cognitive skills:

('family culture', parents' tastes and expectations)

human capital is <u>all</u> the knowledge and <u>abilities</u> that can be used in the production process

usually proxied by parental income and education…

Non-cognitive skills "are patterned
  across social lines" (Entwisle et al. 2005)

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➢ In Becker models, children are seen as "investment goods" and not agents

➢ In the literature on the determinants of children's outcomes more attention has been devoted to the parents' and government's choices (namely investment in school inputs) than to the students'/children's choices (Haveman and Wolfe 1995)

➢ Children's educational outcomes reflect their (own) choices, non-cognitive skills as well as knowledge acquired at school

Data and variables
Data

EPITeen (Epidemiological Investigation of Teenagers Health in Porto) **cohort**

 ➢ all public and private schools in Porto (Portugal) providing teaching to 13-year-olds during the 2003/2004 school year were contacted (27 public and 24 private);
 ➢ All public schools and 19 private schools (79%) agreed to participate;
 ➢ 2,787 eligible adolescents were identified, of whom 2160 students provided information for at least part of the proposed assessment (overall participation rate of 78%)
 ➢ 2nd follow-up in 2007/08 (17 yrs old) + new entrants: 2512 participants
 ➢ 3rd follow-up in 2012/13 (21 yrs old) + new entrants: 1761 participants
 ➢ The baseline evaluation required extensive data collection, comprising two self-administered questionnaires (one completed at home, another at school).

Sample
    Participants in all 3 waves: 1205

Outcome variable: Educational attainment

21 years old:

- Years of schooling: What is the last year of school you completed (in years) ?
- Attending education: Do you, currently, still attend some form of education? (no/yes)

		N	%
Did not complete 12th grade and are or not studying	**Not completed upper secondary**	141	11,81
Completed 12th grade, don't have bachelor's and are not studying	**Upper secondary (not enrolled in college)**	217	18,17
Completed 12th grade, don't have bachelor's and are studying	**in college**	404	33,84
Have bachelor's, or even masters, and are or not studying	**BSc degree**	432	36,18
	Total	1194	100

Explanatory variables

- Mother's years of schooling: What is the mother's complete education (last year completed)?
- Father's years of schooling: What is the fathers's complete education (last year completed)?
- Sex: (0 – Girls/ 1 - Boys)
- Birthweight: What was the weight of your child at birth? / 100 g.

13 years old:

- Practices sport outside school: Do you usually practice some sport outside school activities? (no/ yes)
- Read a book in the last 3 months: In the last three months, have you read any book? (no/ yes)
- Smokes or ever smoked: Do you smoke or have ever smoked? (no/ yes)
- Drinks or ever drunk: Do you drink or have ever drunk (even if you have only tried) alcoholic beverages (for example: wine, beer, liqueurs, white spirits) (no/ yes)
- Weight: What is the weight of your child currently? (kg) + What is the height of your child currently? (m)

	Body Mass Index	
	Boys	Girls
Normal weight	<= 21.8	<= 23
At risk of overweight	> 21.8 <=25.2	> 23 <=26.25
Overweight	>25.2	> 26.25

17 years old:

- Ever had sexual intercourse: Have you ever had sex? (no/ yes)
- Ever in a physical fight last 12 months: How many times have you been involved in a physical fight in the last 12 months? (never/ once/ two or more times)
- Ever suspended from school: Were you ever suspended from school? (no/ yes)

Empirical model

Multinomial logit

$$\ln\left[\frac{\Pr(Y_i = j)}{\Pr(Y_i = J)}\right] = \beta_{0,j} + \beta_{1,j}x_{1,i} + \beta_{2,j}x_{2,i} + ... + \beta_{M,j}x_{M,i} \qquad \text{for j=1, 2, ...J-1}$$

where j are the possible outcomes and M the number of covariates

In this case

j=1 : not completed upper secondary

j=2: Upper secondary (not enrolled in college)

j=3: **in college (reference category)**

j=4 : BSc degree

	not completed upper secondary			Upper secondary (not enrolled in college)			BSc degree		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
mother's years of schooling	0.835***	0.849**	0.860**	0.835***	0.840***	0.840***	1.047	1.049	1.042
	(0.0421)	(0.0438)	(0.0467)	(0.0323)	(0.0333)	(0.0339)	(0.0279)	(0.0285)	(0.0285)
father's years of schooling	0.799***	0.804***	0.781***	0.862***	0.869***	0.864***	1.066*	1.065*	1.068*
	(0.0415)	(0.0434)	(0.0452)	(0.0332)	(0.0343)	(0.0348)	(0.0282)	(0.0286)	(0.0288)
sex	1.548	1.514	1.205	1.329	1.396	1.255	0.406***	0.393***	0.410***
	(0.423)	(0.442)	(0.381)	(0.295)	(0.326)	(0.309)	(0.0675)	(0.0677)	(0.0751)
birthweight	1.010	1.007	1.002	0.994	0.990	0.991	1.017	1.014	1.012
	(0.0258)	(0.0261)	(0.0273)	(0.0208)	(0.0211)	(0.0214)	(0.0164)	(0.0166)	(0.0167)
Practices sport outside school (13yrs)		0.665	0.567		0.643	0.603*		0.908	0.949
		(0.191)	(0.172)		(0.146)	(0.140)		(0.156)	(0.166)
Read a book in the last 3 months (13 yrs)		0.548*	0.583		0.817	0.842		1.404	1.410
		(0.156)	(0.173)		(0.195)	(0.203)		(0.301)	(0.305)
smokes or ever smoked (13yrs)		2.170*	1.784		1.541	1.426		0.657*	0.703
		(0.726)	(0.642)		(0.427)	(0.408)		(0.140)	(0.153)
drinks or ever drunk (13 yrs)		0.526*	0.499*		0.725	0.697		1.044	1.128
		(0.149)	(0.148)		(0.164)	(0.160)		(0.180)	(0.198)
weight (13 yrs) normal weight (ref)									
at risk of overweight		1.494	1.523		1.087	1.109		1.167	1.217
		(0.580)	(0.624)		(0.362)	(0.372)		(0.282)	(0.299)
overweight		0.797	0.880		1.350	1.357		1.317	1.293
		(0.380)	(0.428)		(0.456)	(0.463)		(0.375)	(0.371)
ever had sexual intercourse (17yrs)			1.706			1.234			0.629*
			(0.516)			(0.291)			(0.115)
ever in a physical fight last 12 months (17yrs) never (ref)									
once			3.192**			1.807			0.709
			(1.180)			(0.563)			(0.180)
two or more			2.024			1.476			0.958
			(0.806)			(0.486)			(0.263)
ever suspended from school (17yrs)			4.826**			1.863			0.313
			(2.474)			(0.923)			(0.189)
Observations	917	917	917	917	917	917	917	917	917

Exponentiated coefficients; Standard errors in parentheses; * p<0.05, ** p<0.01, *** p<0.001.

Outcome variable reference category: enrolled in college.

Average predicted probabilities by sex with 95%CI
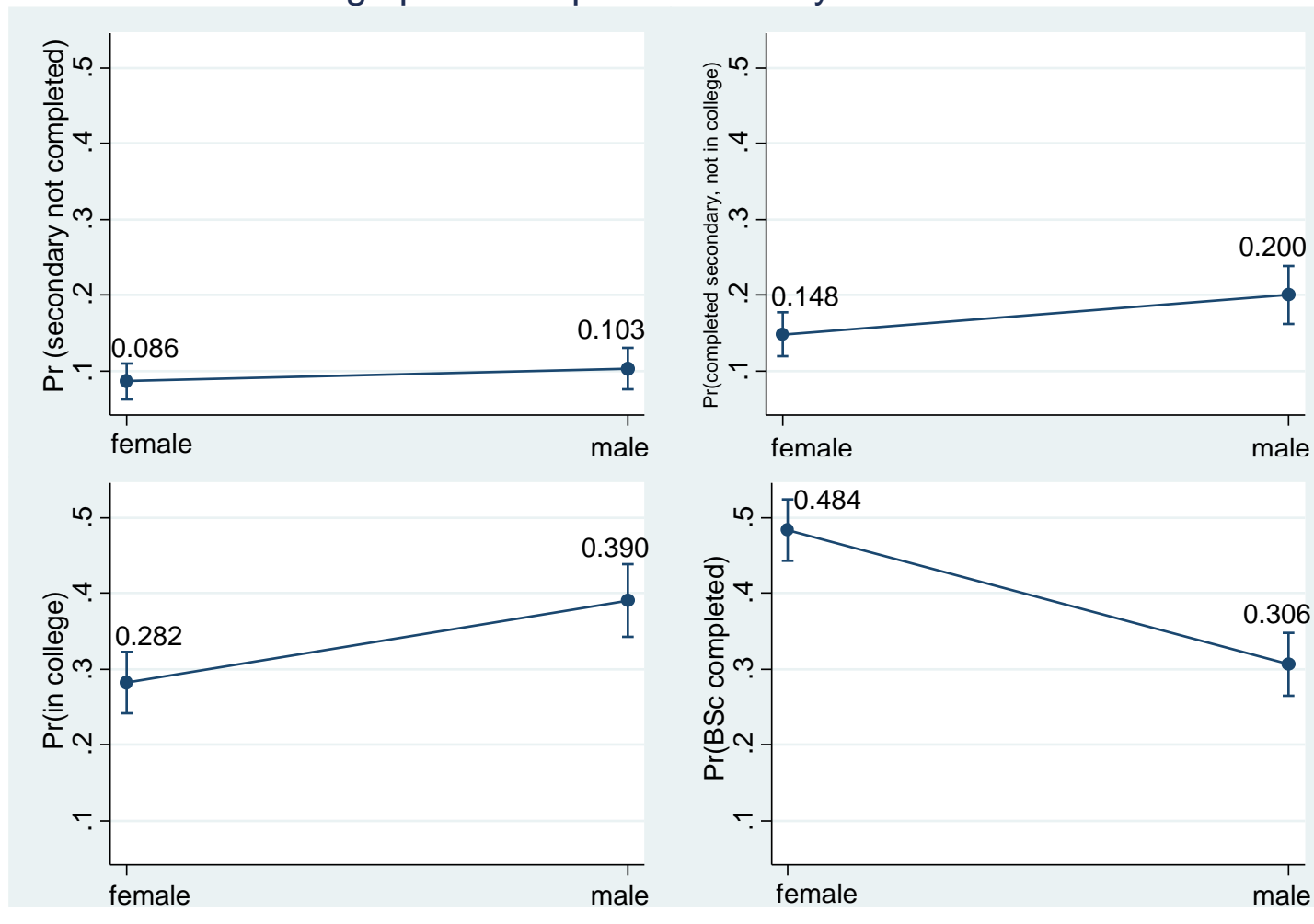
Interactions of weight with sex (full model)

	RRR	Std. Err	P-value
not completed upper secondary			
weight			
normal weight (base)	1		
1. at risk overweight	1.879	1.204	0.325
2.overweight	3.674	2.821	0.090
weight*Sex			
1*male	0.679	0.562	0.640
2*male	0.094	0.099	0.025
Upper secondary (not enrolled in college)			
weight			
normal weight (base)	1		
1. at risk overweight	1.099	0.613	0.866
2.overweight	6.275	3.840	0.003
weight*Sex			
1*male	0.957	0.669	0.949
2*male	0.073	0.058	0.001
BSc degree			
weight			
normal weight (base)	1		
1. at risk overweight	1.490	0.543	0.274
2.overweight	4.087	2.355	0.015
weight*Sex			
1*male	0.664	0.332	0.412
2*male	0.188	0.129	0.015

Conclusions

Educational attainment at 21: **where are the differences coming from ?**

➤ A substantial part of the differences comes from family background which suggests substantial inequality of opportunity

  ➤ parental education matters more for lower levels of education

➤ There are important gender differences

  ➤ As Entwisle et al. (2005), we also find that gender come into play at higher levels of schooling (but not at lower levels)

  ➤ The 'effect 'of being over weighted for females is the opposite of the one found for males

➤ Having tried alcoholic drinks at 13 yrs old lowers the odds of not having completed upper secondary at 21 (!)