The role of parental education on children's educational outcomes: A comparison of Sweden and Hungary.

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Introduction

Motivation

Education is important for reduced inequality, boosting economic growth, and increased informed citizens.

Greater educational attainment leads to greater class fluidity (Breen 2010)

To understand cross country differences in this research area and why?

Many research findings show that parental education still affects young people's educational and early occupational attainment.

Why Sweden and Hungary

The relative advantage of having more educated parents emerges as stronger in the Eastern European countries and weaker in the Nordic European countries (Iannelli 2002).

Sweden is known for high level of education and equity along with comprehensive welfare system in general. Hungary shows higher variability in socio economic factors- Makes it an interesting case!!!!

Research question

To what extent does parental education influence children's educational outcomes in Hungary and Sweden? What are the differences in the impact of parental education on children's educational outcomes between these two countries?

Theory and Policy Context

Theory

Primary and Secondary Effects of Social Stratification (Raymond Boudon)

- **Primary Effects:** Direct influences of social background on academic performance (e.g., limited resources, unequal access to quality education).
- **Secondary Effects:** Social class shapes educational choices (e.g., students from lower classes might choose less demanding paths due to perceived limitations).

Cultural Capital (Pierre Bourdieu)

- Children from privileged backgrounds inherit cultural capital through family socialization, giving them an advantage in education and career.

Social Capital (Alejandro Portes)

- Children from higher social classes often benefit from stronger social networks that provide educational and career advantages.

Prior Findings

We find that parental education has a positive, large and significant causal effect on children’s education (Havari et. al, 2013).

Davis-Kean (2005) examined the process of how socioeconomic status, specifically parents' education and income, indirectly relates to children's academic achievement.

Both father's and mother's educational achievements are positively and significantly related to perceived parental encouragement, college plans, college attendance, and college graduation with or without controlling for child's intelligence (Sewell & Shah, 1968)

Hypotheses

Hypothesis 1:

The level of parental education has a significant impact on children's educational outcomes, with higher educated parents more likely to engage in educational activities with their children and provide them with greater opportunities for learning and academic success.

Hypothesis 2:

The socioeconomic status and family background characteristics of parents, such as emotional support and home possessions, also play a role in children's educational attainment.

Hypothesis 3:

The role of parental education in shaping children's educational outcomes differs between countries, with the effect of paternal education found to be greater than maternal education in low and middle-income countries like Hungary as opposed to Sweden.

Data Explanation

PISA 2018

"Programme for International Student Assessment," is a widely used dataset for studying educational outcomes and inequalities across countries.

It includes information on the educational achievements of 15-year-old students across 79 participating education systems, as well as background information on their parents and schools.

In our study we utilized linear regression models to explore the correlation between parental education and educational achievements of children in Sweden and Hungary

Descriptive Statistics

Dependent Variable:

- The study's dependent variable is children's educational outcomes, measured using the plausible values in mathematics and text structure.
- We will use Mathematic and Text Structure (reading and cognitive skills tests) score as the dependent variable.

Descriptive Statistics

Independent Variable:

- **Gender**: The gender of the students (Binary).
- **Country**: The country in which the student is located.
- **Highest Parental Education**: The highest level of education attained by either parent, measured on a scale from 0 (low education) to 6 (high education). We classify the variable as "1-Secondary education or lower", "2-Post-secondary education", and "3-Tertiary education" to facilitate a more direct analysis.
- **Mother's Highest Education**: The highest level of education attained by the mother.
- **Father's Highest Education**: The highest level of education attained by the father.
- **Number of Household Books**: The number of books in the home, indicates the availability of educational resources and intellectual stimulation within the home environment.
- **Emotional Support**: The index of Parents' emotional support perceived by students.

Descriptive Statistics

Sample Statistics:

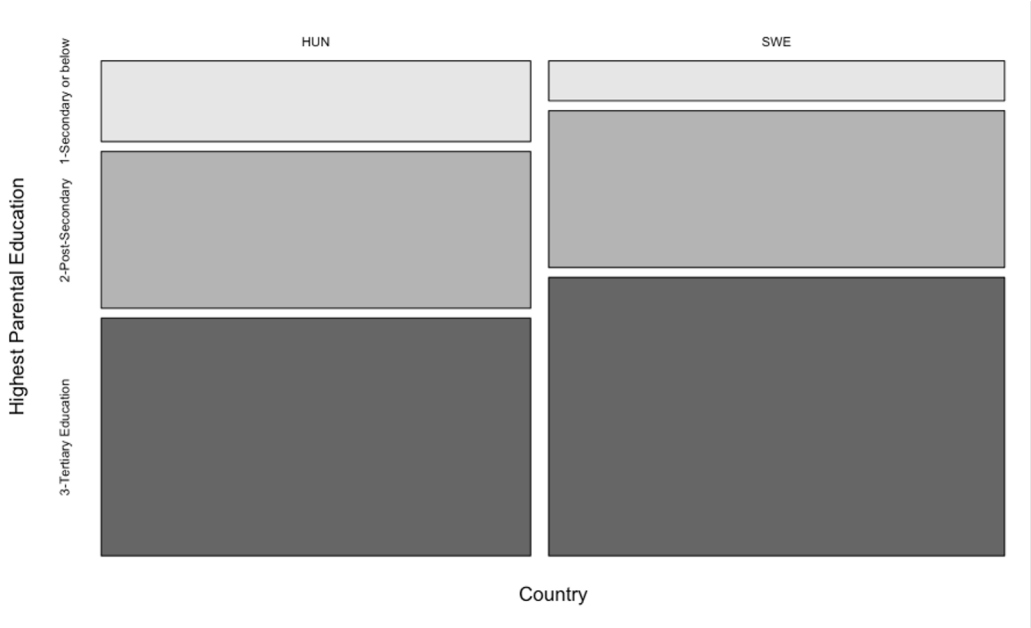
- A sample size of 8922 observations is considered
- 1714 observations dropped due to missing values in parental education, number of books and emotional support.

	Overall (N=8922)
Highest Parental Education	
1-Secondary or below	1121 (12.6%)
2-Post-Secondary	2944 (33.0%)
3-Tertiary Education	4857 (54.4%)
Mother's Education	
1-Secondary or below	1693 (19.0%)
2-Post-Secondary	3170 (35.5%)
3-Tertiary Education	4059 (45.5%)
Father's Education	
1-Secondary or below	2188 (24.5%)
2-Post-Secondary	3264 (36.6%)
3-Tertiary Education	3470 (38.9%)
Parental Emotional Support	
Mean (SD)	0.0132 (0.963)
Median [Min, Max]	0.213 [-2.45, 1.03]
Number of Books	
1.0-10	1091 (12.2%)
2.11-25	1220 (13.7%)
3.26-100	2403 (26.9%)
4.101-200	1709 (19.2%)
5.201-500	1457 (16.3%)
6.500+	1042 (11.7%)
Country	
HUN	4328 (48.5%)
SWE	4594 (51.5%)
Gender	
1-Male	4309 (48.3%)
2-Female	4613 (51.7%)

Descriptive Statistics

Sample Statistics:

- Difference in the highest parental education between Hungary and Sweden.



Regression Results

Linear Regression Models Predicting Math Scores:

- The coefficients represent the estimated effect of each variable on Math Scores.
- All coefficients indicate statistical significance at the 0.001 level, meaning they're unlikely due to chance.

	Model1			Model2			Model3		
Characteristic	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**
Highest Parental Education									
1-Secondary or below	—	—		—	—		—	—	
2-Post-Secondary	45	40, 51	<0.001	43	37, 49	<0.001	24	19, 30	<0.001
3-Tertiary Education	65	60, 71	<0.001	62	56, 67	<0.001	30	25, 35	<0.001
Gender									
1-Male	—	—		—	—		—	—	
2-Female	-6.1	-9.7, -2.6	<0.001	-7.6	-11, -4.1	<0.001	-13	-17, -10	<0.001
Parental Emotional Support				13	12, 15	<0.001	9.1	7.4, 11	<0.001
Number of Books									
1.0-10							—	—	
2.11-25							28	21, 34	<0.001
3.26-100							60	54, 66	<0.001
4.101-200							82	76, 88	<0.001
5.201-500							106	100, 113	<0.001
6.500+							106	99, 113	<0.001

[1] CI = Confidence Interval

Regression Results

Comparison of Parental Education on Math and Reading Scores:

- Being female is negatively associated with Math Scores but positively associated with Text Structure Scores.
- The impact of parental education on reading scores seems to be stronger than its impact on math scores.

	Math			Read		
Characteristic	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**
Highest Parental Education						
1-Secondary or below	—	—		—	—	
2-Post-Secondary	24	19, 30	<0.001	33	27, 39	<0.001
3-Tertiary Education	30	25, 35	<0.001	34	28, 40	<0.001
Parental Emotional Support	9.1	7.4, 11	<0.001	12	9.8, 14	<0.001
Number of Books						
1.0-10	—	—		—	—	
2.11-25	28	21, 34	<0.001	34	27, 42	<0.001
3.26-100	60	54, 66	<0.001	69	62, 75	<0.001
4.101-200	82	76, 88	<0.001	95	88, 102	<0.001
5.201-500	106	100, 113	<0.001	122	115, 129	<0.001
6.500+	106	99, 113	<0.001	119	111, 127	<0.001
Gender						
1-Male	—	—		—	—	
2-Female	-13	-17, -10	<0.001	15	11, 19	<0.001

Regression Results

Country-specific Comparison of Parental Education on Math and Reading Scores:

- Generally speaking, these coefficients for Hungary show more pronounced effects compared to Sweden.

	Hungary Math			Hungary Read			Sweden Math			Sweden Read		
Characteristic	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**
Highest Parental Education												
1-Secondary or below	—	—		—	—		—	—		—	—	
2-Post-Secondary	20	14, 27	<0.001	26	18, 33	<0.001	16	6.7, 25	<0.001	23	12, 34	<0.001
3-Tertiary Education	24	17, 31	<0.001	28	21, 36	<0.001	20	11, 29	<0.001	18	7.6, 28	<0.001
Parental Emotional Support	12	9.9, 15	<0.001	16	14, 19	<0.001	6.4	4.0, 8.8	<0.001	8.1	5.2, 11	<0.001
Number of Books												
1.0-10	—	—		—	—		—	—		—	—	
2.11-25	28	19, 37	<0.001	35	25, 45	<0.001	28	19, 37	<0.001	35	25, 46	<0.001
3.26-100	62	54, 70	<0.001	69	60, 78	<0.001	60	52, 68	<0.001	71	62, 81	<0.001
4.101-200	86	78, 95	<0.001	100	90, 109	<0.001	83	74, 91	<0.001	99	89, 109	<0.001
5.201-500	115	106, 123	<0.001	127	117, 137	<0.001	104	95, 113	<0.001	125	114, 135	<0.001
6.500+	120	111, 129	<0.001	133	123, 144	<0.001	101	91, 111	<0.001	118	105, 130	<0.001
Gender												
1-Male	—	—		—	—		—	—		—	—	
2-Female	-16	-20, -11	<0.001	16	11, 21	<0.001	-11	-16, -6.7	<0.001	14	8.7, 20	<0.001

[1] CI = Confidence Interval

Regression Results

Comparison of Paternal and Maternal Education on Math and Reading Scores by Country:

	Hungary Math						Sweden Math					
Characteristic	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**
Mother's Education												
1-Secondary or below	—	—					—	—				
2-Post-Secondary	18	12, 24	<0.001				15	7.8, 22	<0.001			
3-Tertiary Education	24	18, 30	<0.001				19	12, 26	<0.001			
Parental Emotional Support	12	9.7, 14	<0.001	12	10, 15	<0.001	6.2	3.8, 8.6	<0.001	6.3	3.9, 8.7	<0.001
Number of Books												
1.0-10	—	—		—	—		—	—		—	—	
2.11-25	29	20, 38	<0.001	30	21, 39	<0.001	28	19, 37	<0.001	28	19, 37	<0.001
3.26-100	63	55, 71	<0.001	64	56, 72	<0.001	60	52, 68	<0.001	61	53, 69	<0.001
4.101-200	86	78, 95	<0.001	89	80, 97	<0.001	82	74, 91	<0.001	83	75, 92	<0.001
5.201-500	114	105, 123	<0.001	117	109, 126	<0.001	103	95, 112	<0.001	104	95, 113	<0.001
6.500+	119	110, 128	<0.001	123	114, 132	<0.001	100	90, 110	<0.001	100	90, 110	<0.001
Gender												
1-Male	—	—		—	—		—	—		—	—	
2-Female	-15	-20, -11	<0.001	-16	-21, -12	<0.001	-12	-16, -6.8	<0.001	-11	-16, -6.6	<0.001
Father's Education												
1-Secondary or below				—	—					—	—	
2-Post-Secondary				14	8.3, 20	<0.001				16	9.4, 22	<0.001
3-Tertiary Education				17	11, 23	<0.001				20	13, 26	<0.001

[1] CI = Confidence Interval

Regression Results

Comparison of Paternal and Maternal Education on Math and Reading Scores by Country:

- Both maternal and paternal education have a significant positive association with math and reading scores in both countries.
- Maternal education is suggested to potentially have a more pronounced impact on the educational outcomes, which contrasts with our hypothesis and previous research findings.

	Hungary Read						Sweden Read					
Characteristic	**Beta**	**95% CI†**	**p-value**	**Beta**	**95% CI†**	**p-value**	**Beta**	**95% CI†**	**p-value**	**Beta**	**95% CI†**	**p-value**
Mother's Education												
1-Secondary or below	—	—					—	—				
2-Post-Secondary	22	15, 29	<0.001				20	12, 29	<0.001			
3-Tertiary Education	26	19, 33	<0.001				17	8.4, 25	<0.001			
Parental Emotional Support	16	13, 19	<0.001	16	14, 19	<0.001	7.9	5.0, 11	<0.001	8.1	5.3, 11	<0.001
Number of Books												
1.0-10	—	—		—	—		—	—		—	—	
2.11-25	35	25, 45	<0.001	37	27, 47	<0.001	35	25, 46	<0.001	36	26, 46	<0.001
3.26-100	70	61, 79	<0.001	72	63, 81	<0.001	71	62, 80	<0.001	73	63, 82	<0.001
4.101-200	100	90, 110	<0.001	103	93, 112	<0.001	98	88, 108	<0.001	100	90, 110	<0.001
5.201-500	127	117, 137	<0.001	131	121, 141	<0.001	124	113, 134	<0.001	126	116, 136	<0.001
6.500+	133	122, 143	<0.001	137	126, 147	<0.001	116	104, 129	<0.001	119	107, 131	<0.001
Gender												
1-Male	—	—		—	—		—	—		—	—	
2-Female	17	12, 22	<0.001	16	11, 21	<0.001	14	8.7, 20	<0.001	14	8.9, 20	<0.001
Father's Education												
1-Secondary or below				—	—					—	—	
2-Post-Secondary				16	9.2, 22	<0.001				12	4.7, 20	0.001
3-Tertiary Education				20	13, 26	<0.001				6.7	-0.71, 14	0.076

† CI = Confidence Interval

Key Findings

- Parental education, emotional support, and home resources (books) are **positively** associated with math and reading scores in both countries.
- The effects of these factors appear **more pronounced** in Hungary compared to Sweden.
- Both maternal and paternal education have significant positive associations with math and reading scores, with maternal education potentially having a **greater impact** on math scores, contrary to the initial hypothesis.

Limitations

- **Causality:** The study reveals **correlations** between parental education, family background factors, and children's educational outcomes, but it does not establish causality.

- **Unobserved Factors:** The analysis does not account for all relevant factors that could influence children's educational outcomes, such as **parental involvement**, school quality, peer effects, or other unmeasured individual or community-level characteristics.

- **Cross-sectional Data:** The study uses cross-sectional PISA data, which provides a **snapshot** in time. This limits the ability to infer causal relationships and understand the dynamic processes underlying the development of educational outcomes **over time**.

- **Country-specific Nuances:** While the comparison between Sweden and Hungary is informative, the study may not capture the full complexity of the educational **systems**, **policies**, and **cultural factors** that shape parental influences in each country.

- **Measurement Limitations:** The study relies on **self-reported** measures of parental education and other family background characteristics, which could be **subject** to reporting bias or measurement error.

Policy Recommendations

- **Targeted Interventions:** Policymakers could consider implementing targeted interventions to support families, especially those from **disadvantaged backgrounds**, in providing a more stimulating and enriching **home environment** for learning (e.g.: more books).

- **Enhancing Access to Higher Education:** Improve access to higher education, particularly for parents from lower socioeconomic backgrounds. This could include initiatives such as **affordable tuition**, **financial aid**, and **outreach efforts** to encourage educational advancement.

- **Bridging the Gap between Nordic and Eastern European Countries:** Policymakers could investigate ways to adapt the more universalistic **welfare state** approaches of Nordic countries to the Eastern European context, with the aim of **reducing educational disparities**.

- **Support shared parental responsibility:** Challenge **gender norms** by involving fathers in early childhood education along with mothers. Advocate for policies that facilitate fathers' participation in childcare responsibilities, such as **extending parental leave**.

Thanks!