Gender differences in the effect of education on fertility

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Education, fertility, gender differences

• Differences in fertility exist among educational groups
• … and between women and men:
  o Positive relationship (men): income effect
  o Negative relationship (women): opportunity costs
• The Gender Revolution emphasizes the “turnaround and reversals” of the relationship between women’s education and fertility
• Men become more involved in the private sphere
Gender differences in the effect of education on fertility: A zero-sum game?

- Income effect for men fades away
- Opportunity costs show up

- Opportunity costs for women decrease
- Income effect show up
Gender differences in the effect of education on fertility: A zero-sum game?

- Gender differences in fertility are usually based on the “economic” interpretation of education
- We suggest that looking at the characteristics of field of study may shed lights on the gender differences (if any!)
  - Field of study is good proxy for future earning potential
  - Proxy for a “masculine” vs “feminine” socialization process during education and potential occupation
Expectations:

1. Positive effect of the level of education for men on first, second and third birth
2. Negative effect of the level of education on first birth for women, but not for higher order births
3. Positive effect of earning potential on all birth transition rates for men but a negative effect for women
4. Women graduated in fields of study characterized by higher share of women have higher rate of first-second-third birth
5. Men graduated in fields of study characterized by higher share of women have lower rate of first-second-third birth
Analytical strategy

Two step procedure:

• First step:
  - Estimation of the earning potential by field of study/country/sex using the European Labour Force Survey
  - Calculation of the share of women by field using EUROSTAT 1998-2012

• Second step:
  - Merge results obtained in first step to GGS data
  - Estimating the effect of educational level and characteristics of field of study on the transition to first, second and third birth
Groups of field of study considered

<table>
<thead>
<tr>
<th>Groups of Field of Study: UNESCO Guidelines</th>
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</thead>
<tbody>
<tr>
<td>General/Unspecified field</td>
</tr>
<tr>
<td>Humanities &amp; Arts</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Social Sciences/Business/Economics/Law</td>
</tr>
<tr>
<td>Science &amp; Technology</td>
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<tr>
<td>Agriculture</td>
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<tr>
<td>Health &amp; Welfare</td>
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<tr>
<td>Services</td>
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<tr>
<td>Not applicable (Low educated) ISCED &lt;=2</td>
</tr>
</tbody>
</table>
First step: estimating earning potential by field

- Selected sample: people that declared to be employee, full time working people, 20-64 years old; pooling years 2009-2013
- Linear regression by country/field/sex:

\[
Y \text{ (income deciles)} = a + b_1(\text{age}) + b_2(\text{age}^2) + \\
+ b_3(\text{years since start to work}) + \\
+ b_4(\text{educational level}) + \\
+ b_5(\text{survey year}) + \epsilon_i
\]
Second step: hazard of first and higher order births

- Generation and Gender Survey of eight countries which collected information about field of study: Austria, Belgium, Bulgaria, Czech Republic, France, Lithuania, Poland and Romania (Norway excluded because no income info with LFS)

- Individuals born between 1950-1987

- No missing information about the level of education

- Observation starts at time of graduation

- We pool all the countries together, overall:
  - ~25000 male respondents
  - ~28000 female respondents
Method and variables

**Method:** piecewise linear hazard model – first, second and third birth estimated jointly (Kravdal 2001)

- **Time process first birth:** time since graduation
- **Time process higher order births:** time since last birth

**Main independent variables:** educational level (low; medium; high); field of study and its characteristics:

- Earning potential in income deciles: deviation from country mean
- Share of women: male (<33%); balanced (33-66%); female (>66%)

**Controls first birth:** respondent’s age at graduation; cohort; parents’ educational level; #siblings; countries dummies; in union

**Controls higher order births:** respondent’s age at first birth + same as first birth
The effect of educational level on the transition to first birth

Reference: medium education

The diagram shows the relative risks of transitioning to a first birth for different educational levels and across genders. The vertical bars represent the confidence intervals for each data point. The reference is medium education, and the diagram compares low and high educational levels for both male and female populations.
The effect of educational level on the transition to first birth

Reference: medium education
The effect of educational level on the transition to first birth

<table>
<thead>
<tr>
<th>Reference: medium education</th>
<th>M1</th>
<th>M1+Field</th>
<th>M1+Field+EarningP</th>
</tr>
</thead>
<tbody>
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<td>Low</td>
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</table>

Relative Risks

- M1: Reference category
- M1+Field: Education level
- M1+Field+EarningP: Education level and earning proportion

Low and High educational levels are compared for both male and female populations.
The effect of educational level on the transition to first birth

Reference: medium education
The effect of educational level on the transition to first birth

Reference: medium education
The effect of earning potential by field on first birth (Relative Risks)

<table>
<thead>
<tr>
<th>Controls + Edu + Field</th>
<th>Controls + Edu + Field + ProportionW</th>
<th>Controls + Edu + Field + ProportionW + Union</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Women</strong></td>
<td>0.96 [0.91 - 1.01]</td>
<td>0.95 [0.90 - 1.01]</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>1.11* [1.03 - 1.21]</td>
<td>1.13* [1.04 - 1.23]</td>
</tr>
</tbody>
</table>

*p<.05; Note: models control for splines of time since graduation; respondent’s birth cohort; age at graduation and its square; respondent’s father and mother educational level; respondent’s #siblings, dummies for countries.
The effect of type of field on transition to first birth

Reference: balanced - fields
The effect of type of field on transition to first birth

Reference: balanced - fields
Second birth: a summary

- Both highly educated men and women show a higher rate than medium educated.
- Women graduated in fields of study with higher earning potential have a lower second birth rate.
- Both women and men graduated in a female-dominated field of study have lower second birth rate than women and men graduated in a balanced field.
Conclusion & Discussion

• Differences between women and men of the effect of educational level follow our expectations mainly with regard to first birth (positive for men and negative for women)

• As expected for women a higher earning potential leads to lower rate of higher order births – not so evident for men

• Female-dominated fields of study are not so conducive of childbearing…both for men and women

• Future steps:
  o Account for differential in the steepness of the earning potential by level of education
  o Look at cohort changes
Thank you for your attention!

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