A new method for identifying what Cupid's invisible hand is doing. Is it spreading color blindness while turning us more "picky" about spousal education?

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(Francisco Mendonca)

EEA, Barcelona
Background papers


Background papers


Follow-up papers

5. Naszodi, A. (2023c) What do surveys say about the historical trend of inequality and the applicability of two table-transformation methods? Arxiv.org
6. Naszodi, A. (2023d) Historical trend of homophily: U-shaped or not U-shaped? Or, how would you set a criterion to decide which criterion is better to choose a criterion? Arxiv.org
Background papers


Introduction

Aim: to identify the historical trend of inequality in the US using data on couples.
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Idea: it is a sign of widening (/narrowing) social gap between different educational or racial groups if members of a given generation are less (/more) inclined to marry out of their own group relative to their peers in an older generation.
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Stylized U-shaped trend of inequality, US, 20th century:
- tax-declarations – income and wealth inequality
- test score gap between high-SES and low-SES students
- longevity gap – health disparity
U-shaped trend in income inequality
The fall and rise of the top 1% income share

U-shaped trend in wealth inequality
The fall and rise of the top 1% personal wealth share

U-shaped trend in inter-generational mobility, US: Test-score gap btw high-SES and low-SES students (14-17 yrs)

Replicated in Naszodi A, Cuccu L (2019). A new measure of relative intergenerational mobility
Trend in life expectancy gap between American college graduates and their peers with no college degree

Source: Case and Deaton (2021) Life expectancy in adulthood...
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Stylized U-shaped trend of inequality, US, 20th century:
- tax-declarations – income and wealth inequality
- test score gap between high SES and low SES students
- longevity gap – health disparity

Findings in the assortative mating literature:
- Typical: not-U-shaped trend in the inclination/degree of sorting/social norms/preferences... along the educational.
- U-shaped trend in Naszodi-Mendonca (2021, 2022, 2023) and Naszodi (2023)
Literature

Potential explanations for the diverse trends:
1. Number of educational categories distinguished (Eika et al. 2019)
2. Singles (Dupuy and Weber 2018)
3. Sorting along multiple dimensions or a single dimension (Rosenfeld 2008)

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+ Naszodi (2023): shocks are IID or not
Empirical findings

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+ Naszodi (2023): shocks are IID or not

Once we depart from the IID assumption, the U-shaped trend in inclination/degree of sorting/social norms/preferences... becomes robust to
- Number of educational categories distinguished (Naszodi-Mendonca 2021)
- Singles (Naszodi-Mendonca 2022)
- Sorting along multiple dimensions (Naszodi-Mendonca 2023)

...
Significance

Choice of the model influences what historical trend is identified, while the narrative of the past influences what future paths are believed to be possible.

- Models in the IID framework; not U-shaped trend; narrative: not even the welfare state could decrease inequality; increasing inequality in the future.

- Models outside the IID framework; U-shaped trend; narrative: the welfare state could effectively decrease inequality; it is possible to decrease inequality in the future.
Method outside IID
NM-method, Wikipedia

Empirical results for countries other than the US
International Demographic Inequality Lab, WWW.IDIL.LI
78 countries representing 4 continents
Thank you for your attention
U-shaped ceteris paribus effect of changing preferences for educational homogamy

Naszodi-Mendonca (2023)

Different trends in assortative mating, US

Source: Naszodi (2023a) Direct comparison or indirect comparison...
Notes: US census from IPUMS, age of wife/ female partner in [26,35], 4 education levels (no high school degree, high school, some college, college), counterfactuals are constructed either with IPF-algorithm or the NM-method.
Different trends in assortative mating, multi-country

Source: Permanyer et al (2019), IDIL.LI
Notes: survey data + census from IPUMS
women are 25–34
2 education levels (college, no college), counterfactuals are constructed either with MDbA or NM-method.

age of wife/ female partner is 30,
3 education levels (no high school, hs., college)
Main background paper


Inspiration from sociology:
changing *social cohesion/social gap* between different *education strata* reflected by changing *marital patterns*.

Economics:
Changes in *marital preferences* over the partner's *educational trait* can be identified from *changes in the equilibrium outcome in the marriage market* by controlling for other factors (such as the changes in the educational distributions of marriageable men and women).

Econometrics:

Change in the unobservable preferences ?
Change in the share of homogamous couples
Change in the observed educational distributions
Prevalence of educational homogamy among young couples, US

Young couples: male partners’ age in [30;34]
Educational categories:

H: >=BA
M: =high-school
L: <high-school
Co-movement of labor market and marriage market, US

Source: Naszodi and Mendonca (2022) Changing educational homogamy: Shifting preferences or evolving educational distribution?
Reasons to believe in the U-trend

**Empirical:**
- U-shaped trend is robust to the choice of the input data (see next slides)
- Consistent with survey evidence (see next slides)
- Not sensitive to including single individuals into the analysis (see Naszodi and Mendonca, 2022)
- Comovement with other measures of inequality (see Naszodi and Mendonca, 2022)
- Not sensitive to taking into account sorting along race (see Naszodi and Mendonca, 2023)

**Theoretical:**
- The NM-method, which results in the U-shaped pattern, commutes with the operation of merging neighbouring categories
- The NM-fulfills a monotonicity condition: IGM and AM
Co-movement of labor market and marriage market, US

Source: Naszodi and Mendonca (2022) Changing educational homogamy: Shifting preferences or evolving educational distribution?
Path to the Holly Grail

1. What is your name?
2. What are you looking for?
3. What is your favorite color?
4. What is the capital of Srí Lanka?
5. What is the airspeed velocity of an unladen swallow?
Path to our results

1. What indicator to use to quantify the strength of marital preferences?
2. What decomposition scheme to use?
3. What age group?
4. How to validate our empirical results?
5. How many educational categories to use?
6. How to transform a matrix-valued indicator into a scalar?
7. How to construct counterfactuals?
8. Shall we use decent methods (where strong assumptions force the method to deliver what is in line with our prior – e.g. logit model), or do we prefer models relying on less strong assumptions that let the data speak even if the findings are non sense – e.g. Linear probability model)?
9. ...
Young couples: male partners’ age in $[30;34]$
Educational categories:
- $H$: $\geq$ BA
- $M$: = high-school
- $L$: < high-school

I. Decomposition, US

Change in the share of homogamous couples [percentage points]

- Total change in the share of homogamous couples
- Due to change in the marital preferences (desires)
- Due to change in the educational distributions (opportunities)
- The joint effect of changing desires and opportunities

Young couples: male partners’ age in [30;34]

Educational categories:
- H: >=BA
- M: =high-school
- L: <high-school
II. Supplementary analysis for validation: Pew survey, 2010

Is it important for a woman to be well-educated to become a good wife/partner? (Male respondents)
II. Supplementary analysis for validation: Pew survey, 2010

Is it important for a man to be well-educated to become a good husband/partner? (Female respondents)
## II. Controlling for age-effects

**Pew survey, 2010 and 2017**

<table>
<thead>
<tr>
<th>Generation</th>
<th>Survey year</th>
<th>Num. of responses</th>
<th>Num. of responses “very important”</th>
<th>Share of “picky” respondents*</th>
<th>Estimated population share**</th>
<th>Generation-effect with age-effect (younger-older)</th>
<th>Age-effect (older-younger)</th>
<th>Net generation-effect (younger-old)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male respondents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late Boomer (1956-1960)</td>
<td>2010</td>
<td>75</td>
<td>25</td>
<td>33.3</td>
<td>33.5</td>
<td>${-11.2}$</td>
<td>-24.2</td>
<td></td>
</tr>
<tr>
<td>Early Boomer (1946-1950)</td>
<td>2010</td>
<td>56</td>
<td>25</td>
<td>44.6</td>
<td>44.7</td>
<td>${-18.4,-4.0}$</td>
<td>-31.7,-16.6</td>
<td></td>
</tr>
<tr>
<td>Boomer (1946-1964)</td>
<td>2010</td>
<td>271</td>
<td>104</td>
<td>38.4</td>
<td>38.4</td>
<td>${-9.1}$</td>
<td>-10.7,-7.5</td>
<td></td>
</tr>
<tr>
<td>Boomer (1946-1964)</td>
<td>2017</td>
<td>754</td>
<td>221</td>
<td>29.3</td>
<td>29.3</td>
<td>${-3.3}$</td>
<td>-6.6</td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Late Boomer (1956-1960)</td>
<td>2010</td>
<td>92</td>
<td>32</td>
<td>34.8</td>
<td>34.9</td>
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<td>-6.6</td>
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<tr>
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<td>2010</td>
<td>84</td>
<td>32</td>
<td>38.1</td>
<td>38.2</td>
<td>${-9.4,-2.8}$</td>
<td>-13.1,-0.2</td>
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<tr>
<td>Boomer (1946-1964)</td>
<td>2010</td>
<td>302</td>
<td>116</td>
<td>38.4</td>
<td>38.4</td>
<td>${-2.3}$</td>
<td>-3.8,-0.8</td>
<td></td>
</tr>
<tr>
<td>Boomer (1946-1964)</td>
<td>2017</td>
<td>809</td>
<td>292</td>
<td>36.1</td>
<td>36.1</td>
<td>${-2.3}$</td>
<td>-3.8,-0.8</td>
<td></td>
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Source: Naszodi A (2021). *A note on what surveys say about the applicability of the IPF algorithm*
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<tr>
<td>Late GenX (1976-1980)</td>
<td>2010</td>
<td>45</td>
<td>20</td>
<td>44.4</td>
<td>[60% conf. interval] (in %)</td>
<td>13.2</td>
<td></td>
<td>9.8</td>
</tr>
<tr>
<td>Early GenX (1966-1970)</td>
<td>2010</td>
<td>61</td>
<td>19</td>
<td>31.1</td>
<td>[60% conf. interval] (in %)</td>
<td>31.4</td>
<td></td>
<td>[1.3; 18.2]</td>
</tr>
<tr>
<td>GenX (1965-1980)</td>
<td>2010</td>
<td>176</td>
<td>67</td>
<td>38.1</td>
<td>[60% conf. interval] (in %)</td>
<td>-2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male respondents</td>
<td>2010</td>
<td>756</td>
<td>270</td>
<td>35.7</td>
<td>[60% conf. interval] (in %)</td>
<td>[4.5; -0.3]</td>
<td></td>
<td></td>
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<tr>
<td>Female respondents</td>
<td>2010</td>
<td>53</td>
<td>24</td>
<td>45.3</td>
<td>[60% conf. interval] (in %)</td>
<td>5.2</td>
<td></td>
<td>2.7</td>
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<td></td>
<td></td>
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<tr>
<td>GenX (1965-1980)</td>
<td>2010</td>
<td>188</td>
<td>78</td>
<td>41.5</td>
<td>[60% conf. interval] (in %)</td>
<td>-1.8</td>
<td></td>
<td></td>
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<td>2017</td>
<td>715</td>
<td>284</td>
<td>39.7</td>
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<td></td>
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Source: Naszodi A (2021). A note on what surveys say about the applicability of the IPF algorithm
III. Robustness

4 European countries

Source: Naszodi A (2021). Decomposition scheme matters more than you may think
III. Robustness
4 European countries

- Total change in the share of homogamous couples
- Due to change in the educational distributions
- Due to change in the marital preferences
- Due to the interaction term

<table>
<thead>
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<th>Year</th>
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<tr>
<td>1982-1990</td>
<td>FR</td>
</tr>
<tr>
<td>1990-1999</td>
<td>HU</td>
</tr>
<tr>
<td>1999-2011</td>
<td>PT</td>
</tr>
<tr>
<td>2001-2011</td>
<td>RO</td>
</tr>
<tr>
<td>2011-2015</td>
<td>US</td>
</tr>
</tbody>
</table>

Change in the share of homogamous couples [percentage points]
III. Robustness
4 European countries

Change in the share of homogamous couples [percentage points]

- Total change in the share of homogamous couples
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FR  HU  PT  RO  US

III. Robustness, US educational categories, definition of young couples
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Change in the share of homogamous couples [percentage points]

- Total change in the share of homogamous couples
- due to change in the marital preferences
- due to change in the educational distributions
- due to the interaction term
III. Robustness to controlling for sorting along race

I. Result of the benchmark decomposition:
Evidence for a structural break in the process of the social gap between different educational groups.

II. Validated by using survey data (U-shape)

III. Robustness
(1) to the sample
- countries,
- educational categories,
- definition of young couples

(2) to controlling for sorting along race;
- having singels in the model

(3) Robust to the method:
Does the main finding change if we perform the analysis with a commonly applied method? YES
NOT robust to the choice of the model
Choo-Siow model, Iterative Proportional Fitting = RAS
III/3 NOT robust to the choice of the model
Choo-Siow model, Iterative Proportional Fitting=RAS
NOT robust to the choice of the model
Choo-Siow model, Iterative Proportional Fitting=RAS
III/3 Some remarks on model uncertainty

1. Paul Rulkens: "Why the majority is always wrong" TEDxMaastricht

2. **Validation with state-of-the art approach:**

3. **Additional supporting evidence in the literature:**
   - **Inter-generational mobility:**

   - **Wealth inequality:**