How the Welfare State Affects Inequality and Social Mobility: A Comparison of the U.S. and Denmark

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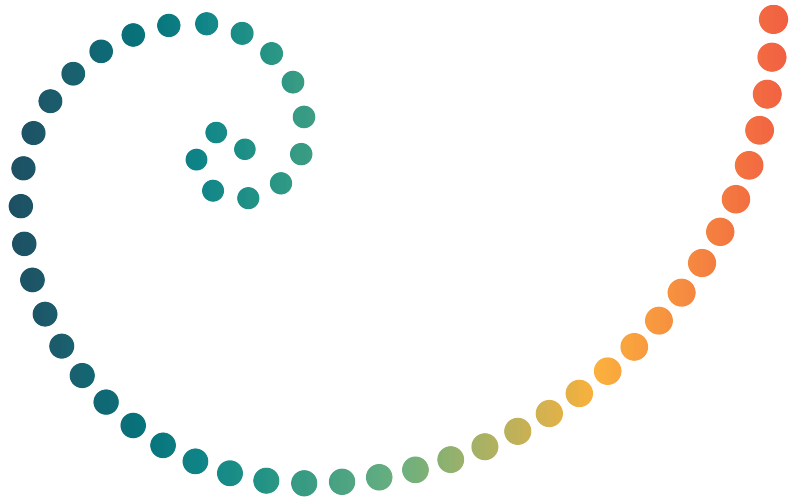

CENTER FOR THE ECONOMICS OF HUMAN DEVELOPMENT

The University of Chicago

DEPARTMENT OF

ECONOMICS

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The Scandinavian Welfare State is Widely Regarded as a Paradigm for Promoting Equality and Reducing Social Mobility

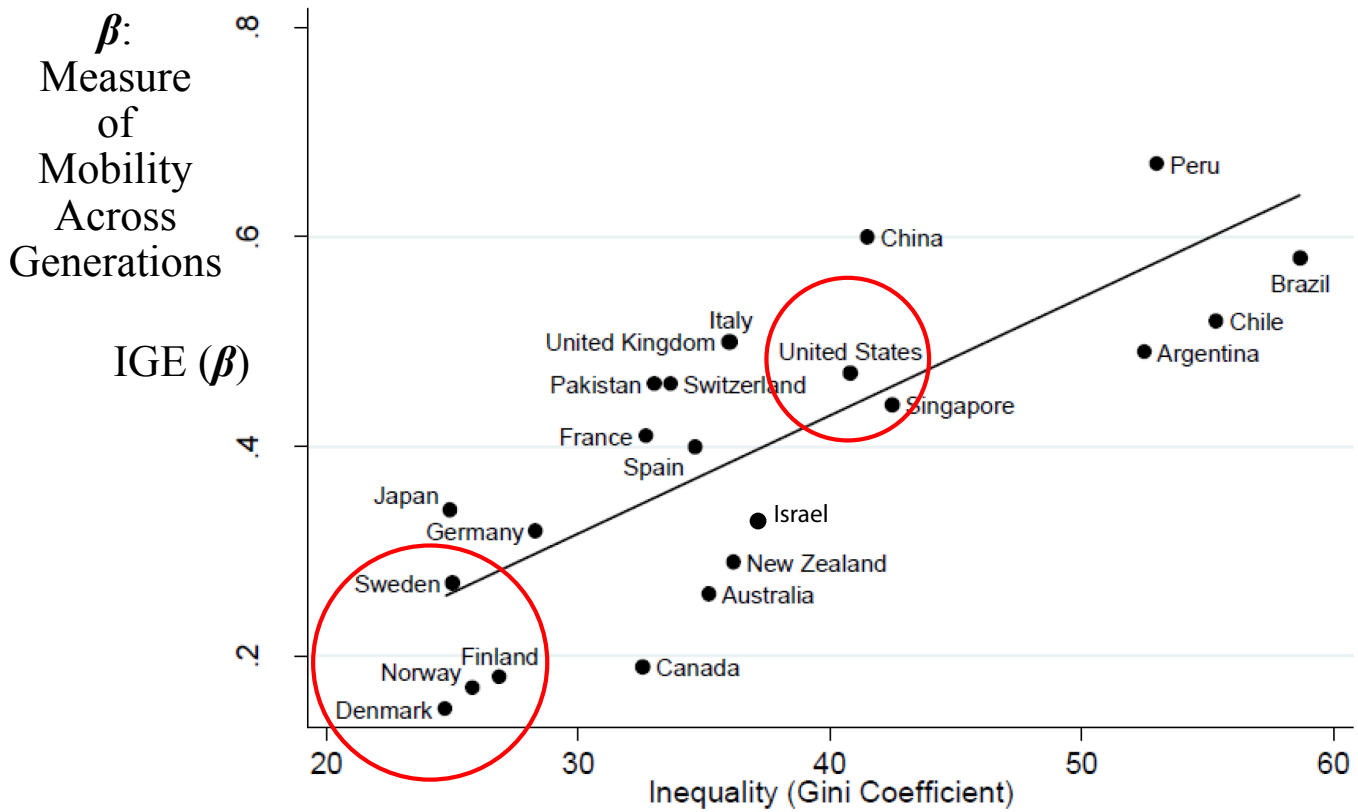
What Are the Sources of its Apparent Success?

Recent Danish Cohorts Are Doing More or Less the Same as Their Parents Unlike the U.S.

Figure 1: Intergenerational Mobility and Inequality: The "Gatsby Curve"

$$\underbrace{\ln Y_1}_{\text{income of child}} = \alpha + \underbrace{\beta}_{\text{IGE}} \underbrace{\ln Y_0}_{\text{income of parent or parents}} + \varepsilon$$

$\beta \uparrow$, Mobility $\downarrow$



Source: Corak (2016), *"Inequality from Generation to Generation: The United States in Comparison"*.

Denmark Is a Laboratory for Understanding Inequality and Social Mobility

- Reducing inequality and promoting social mobility is a central focus of the modern Danish welfare state.
- Traditional explanations of inequality and social mobility related to social policy do not hold in Denmark.
- Need a fresh look at the origins of inequality and social mobility.
- High level of social services in Denmark.
- Equality in services **offered** is mandated in Denmark.
- Universal health care; teachers paid the same everywhere; free daycare; free college.
- Greater social cohesion
  (U.S. versus Danish response to COVID-19).
- **Post tax and transfers**, income inequality is low and intergenerational income mobility is higher in Denmark than in the U.S.

Our Joint Research

- The reduced inequality and greater intergenerational mobility is **not** due to superior production of child human capital.
- Educational intergenerational mobility is remarkably similar in the U.S. and Denmark (education of child related to that of parents).
- There are substantial skill and education gaps across families by background.

- Advantages from Denmark's universal access to services are reaped relatively more by the affluent rather than by the disadvantaged **(Matthew Effects)** who don't often know how—or find it more difficult—to use these services.
- Strong evidence of **sorting** of families by parental income and education.
- "Power of place" is real. It is a consequence of family sorting and family influence than of place per se.
- Families purposefully **choose** neighborhoods and timing of moves.
- Not random (in contrast to influential claims otherwise).
- Sorting in Denmark is comparable to that in the U.S.
- This sorting affects estimated intergenerational mobility.

- Sorting leads to strong family income gradients in child outcomes.
- Also sorting by teachers into more advantaged districts.
- Despite equal wages across neighborhoods, payment to teachers differs in terms of the quality of students taught.

Our Argument

1. A central premise of the welfare state (since the writings of Max Weber) is the equality of access—in Denmark this is mandated by law, yet equal access to state services does not imply equal use of public services.
    a. Equality in the law does not imply equality in use of services.
    b. **"Matthew effects"** (to those who have, more is given) play a powerful role.
        i. Parents often reinforce public services delivered.
        ii. Pick neighborhoods that offer better public services.
        iii. Enforce delivery of services.
    c. Karlson and Landersø (2021) show how the move to universal access (rather than a focus on disadvantage through compulsory schooling) **increased** the dependence of a child's educational status on affluence and endowments of parents.
2. Denmark has a free housing market, as do most Western economies—sorting is large and increasing.

The Argument (Cont'd)

3. Sorting by parental income and resources plays a powerful role in the U.S. and Denmark.
4. The **choice** of the neighborhood of residence to raise children has a powerful role in explaining intergenerational inequality, which has been ignored in much recent work.
5. Parents **purposefully** select neighborhoods when children are very young often well before schooling begins (not random with regards to age of child).

The Argument (Cont'd)

6. Access to register data enables us to investigate appropriate measures of lifetime well-being for measuring family influence.

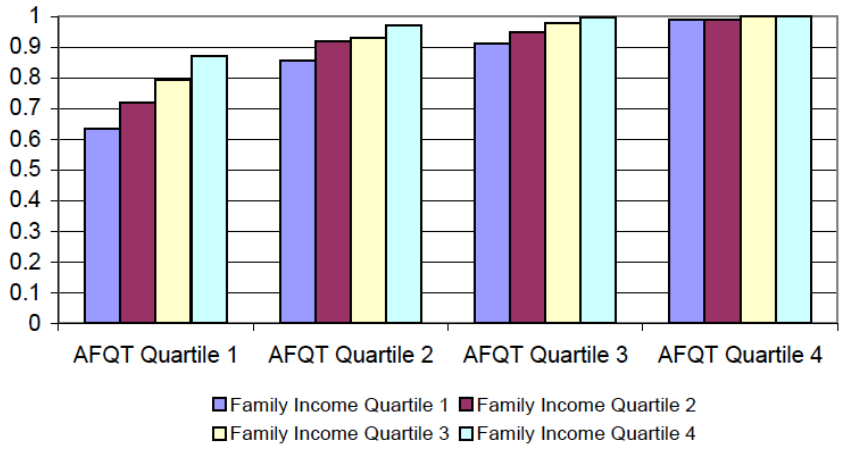
    a. Average income of father or household around age 35 (traditionally used)
    b. Lifetime resources (value function) (valuing uncertainty; leisure; accounting for credit constraints)
    c. A huge contributor to lifetime welfare—the public sector provision of services—is often overlooked
    d. Does this then lead to an overstatement of inequality and mobility?

The talk will cover four points:

1. Inequality across the life cycle
2. Within-country differences
3. Educational mobility
4. Intergenerational dependence in lifetime resources

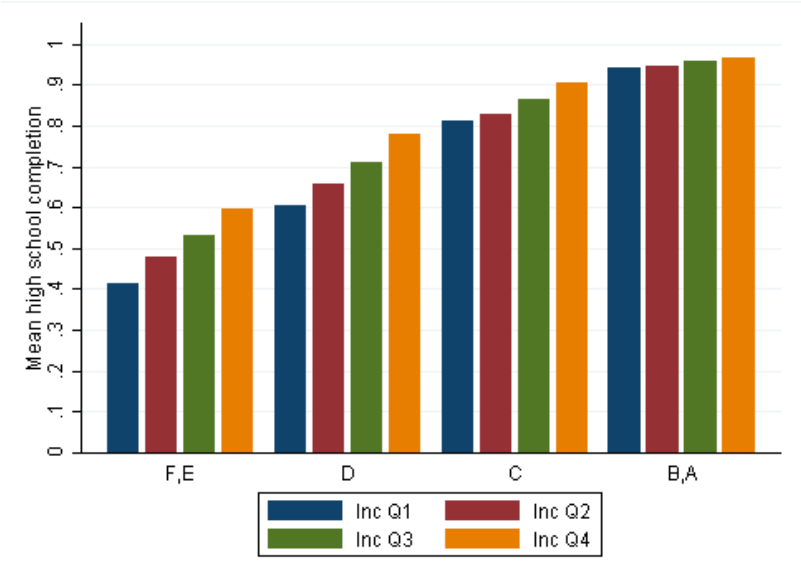
Similarity of Denmark and the U.S.

High School Completion U.S.



U.S.: Belley and Lochner (2007)

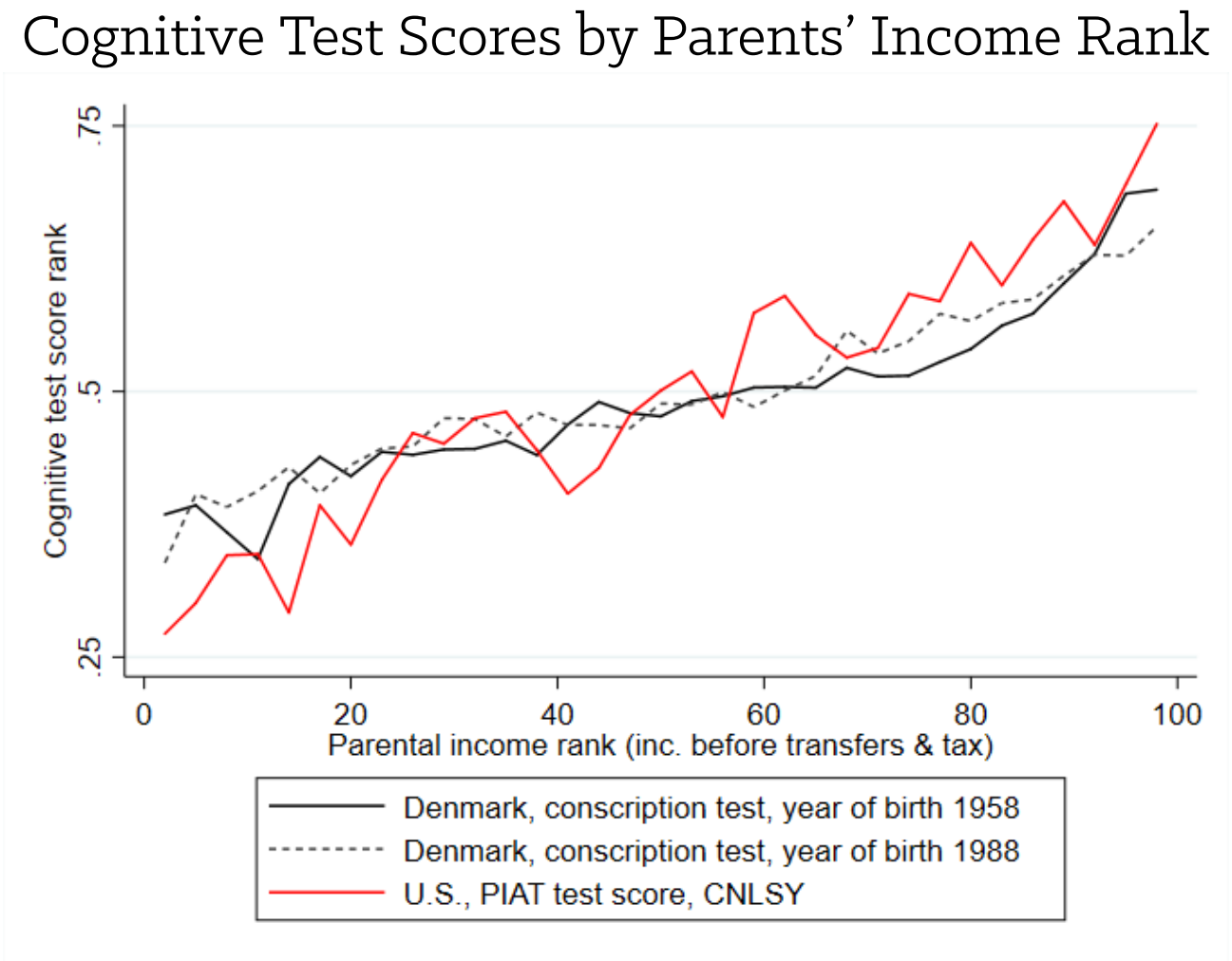
High School Completion Denmark



Denmark: Landersø and Heckman (2017)

Relationships between Child Test Scores and Parental Income About the Same in the Two Countries

Figure 2: Cognitive Test Scores by Parental Background, Year of Birth, and Country



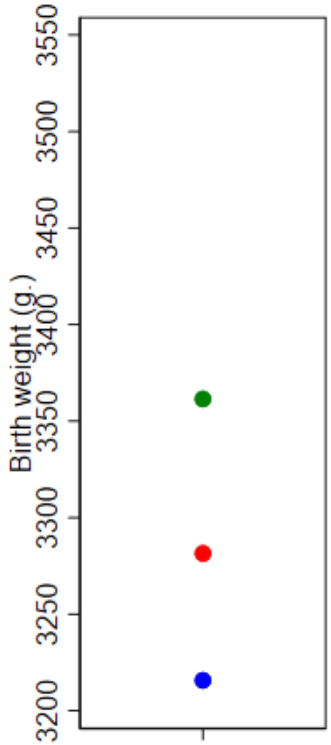
Substantial Gaps in Life Outcomes across Children with Mothers with Different Education Levels

U.S. is Very Much Like Denmark

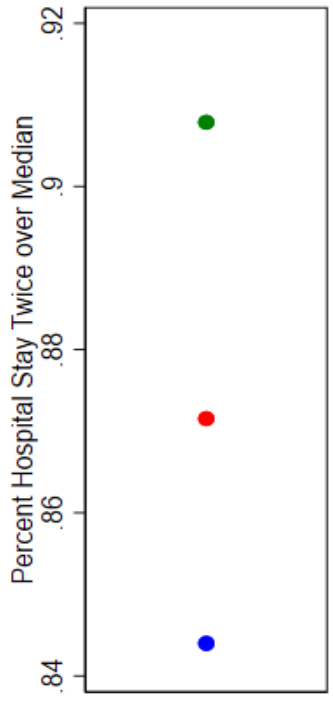
Gaps in the U.S.

Gaps by Mother's Education

Birth weight

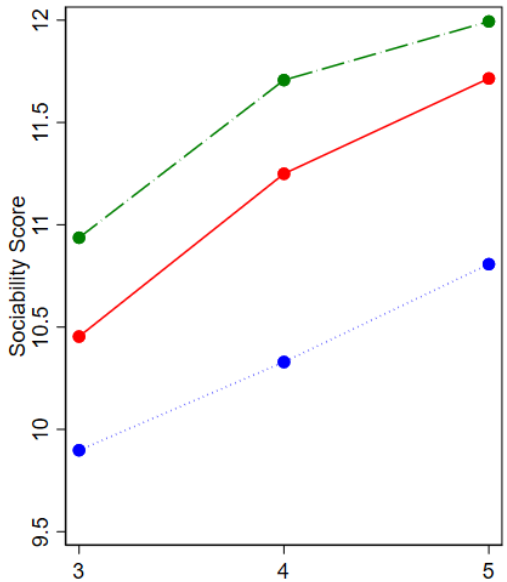


Not admitted to neonatal unit



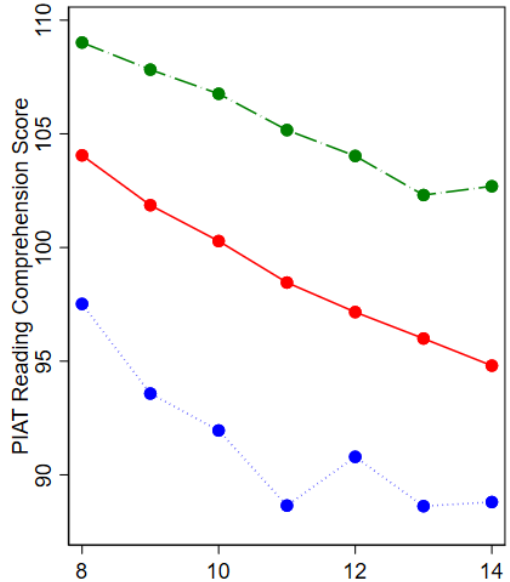
- Green: College educated
- Red: High school
- Blue: Less than high school

Sociability



3–5

Language



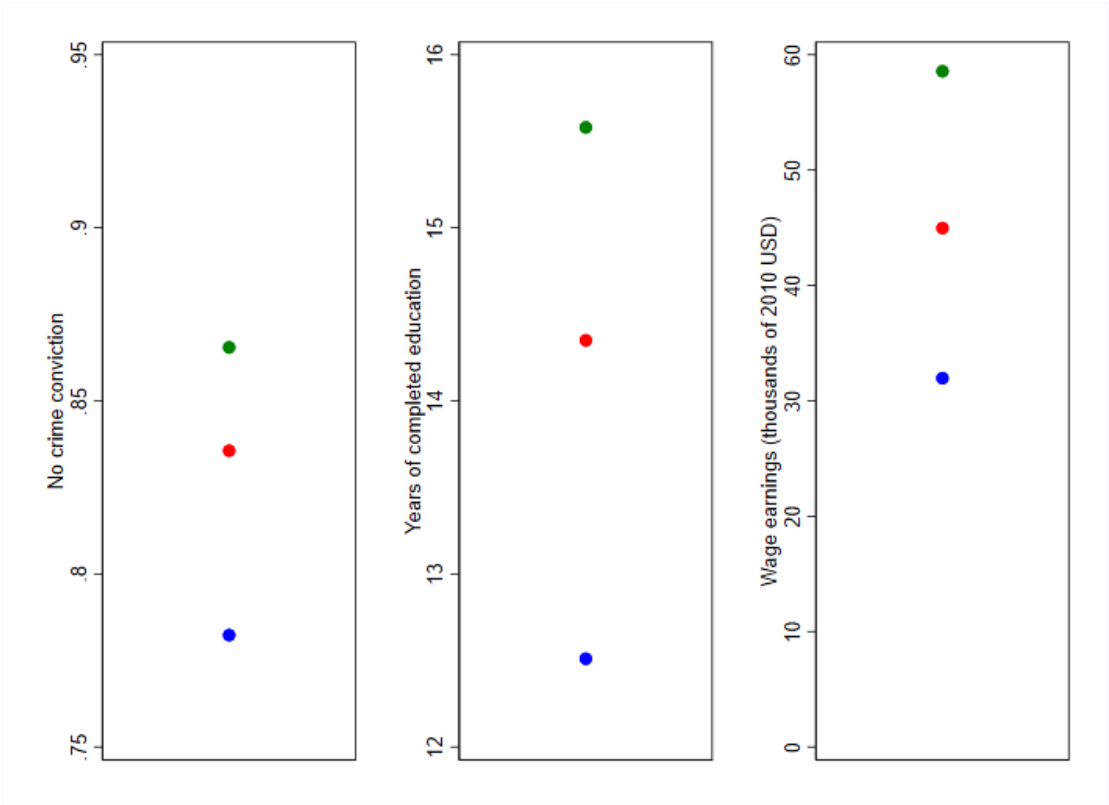
8–14

- Green: College educated
- Red: High school
- Blue: Less than high school

No crime conviction

Years of schooling

Wage earnings



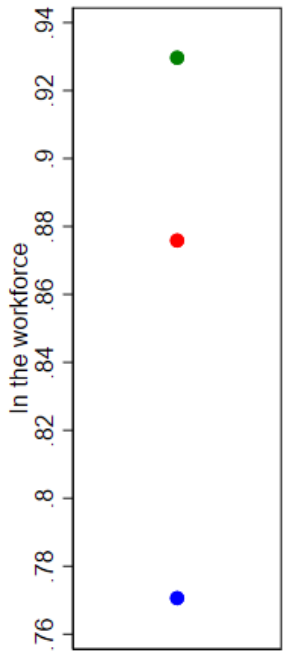
25

30

40

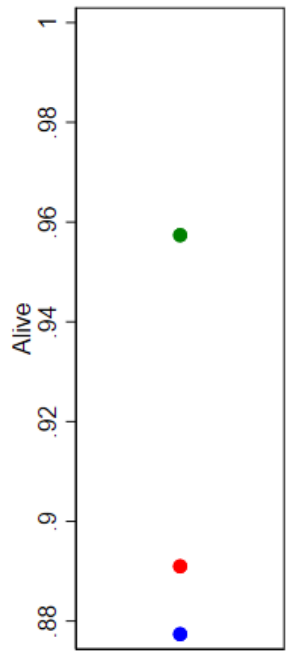
- Green: College educated
- Red: High school
- Blue: Less than high school

In the workforce



54

Alive



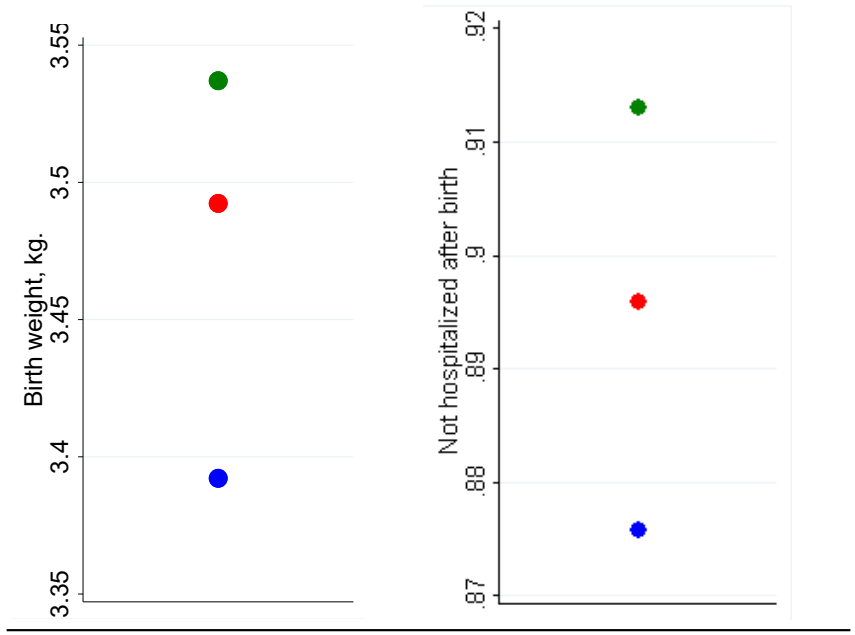
60

- Green: College educated
- Red: High school
- Blue: Less than high school

Danish Counterparts

0 yrs
Birth weight

0 yrs
Not admitted
to neonatal ward



- Green: College educated
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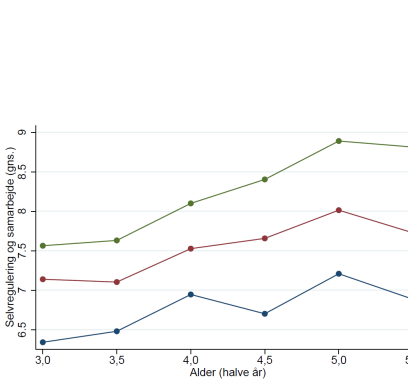
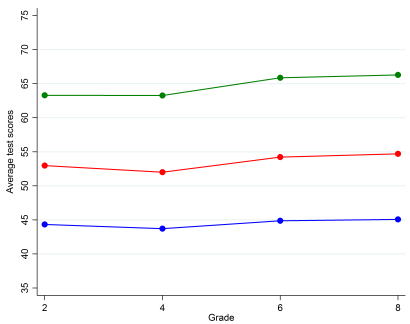
- Blue: Less than high school

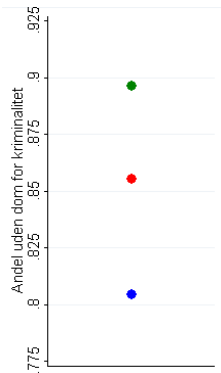
Notes: Landersø (2018).

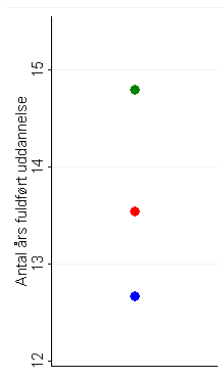
Figure 3: Years of Schooling

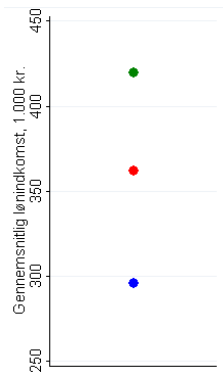
3–5 yo. Assessed skills	*8–14 yo.* Test scores, reading	*25 yo.* No crime conviction	*30 yo.* Years of Schooling	*40 yo.* Income









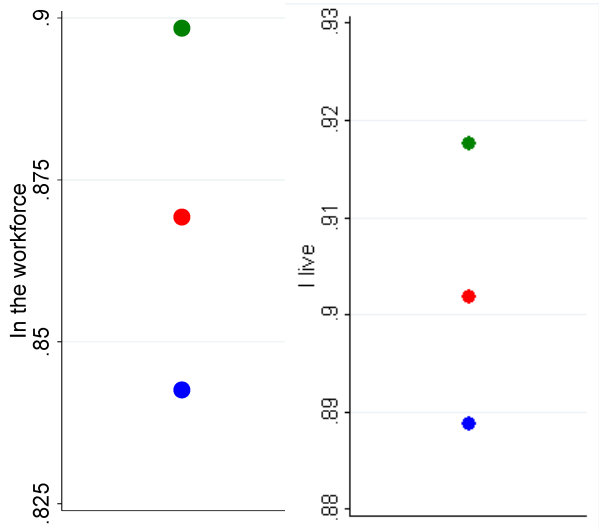


- Green: College educated
- Red: High school
- Blue: Less than high school

Note: Figure shows average outcomes by mother's highest completed education. In the figures with three levels, mother's education is defined as: BLUE, only compulsory schooling; RED, high school; GREEN, college.

54 yo. In the labor force

60 yo. Alive



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Why Do These Gaps Arise in a Generous Welfare State?

Lower Income Inequality and Greater Social Mobility in Terms of Income Is Not Skills-Based

Rather, It Is Tax and Transfer System–Based Equality

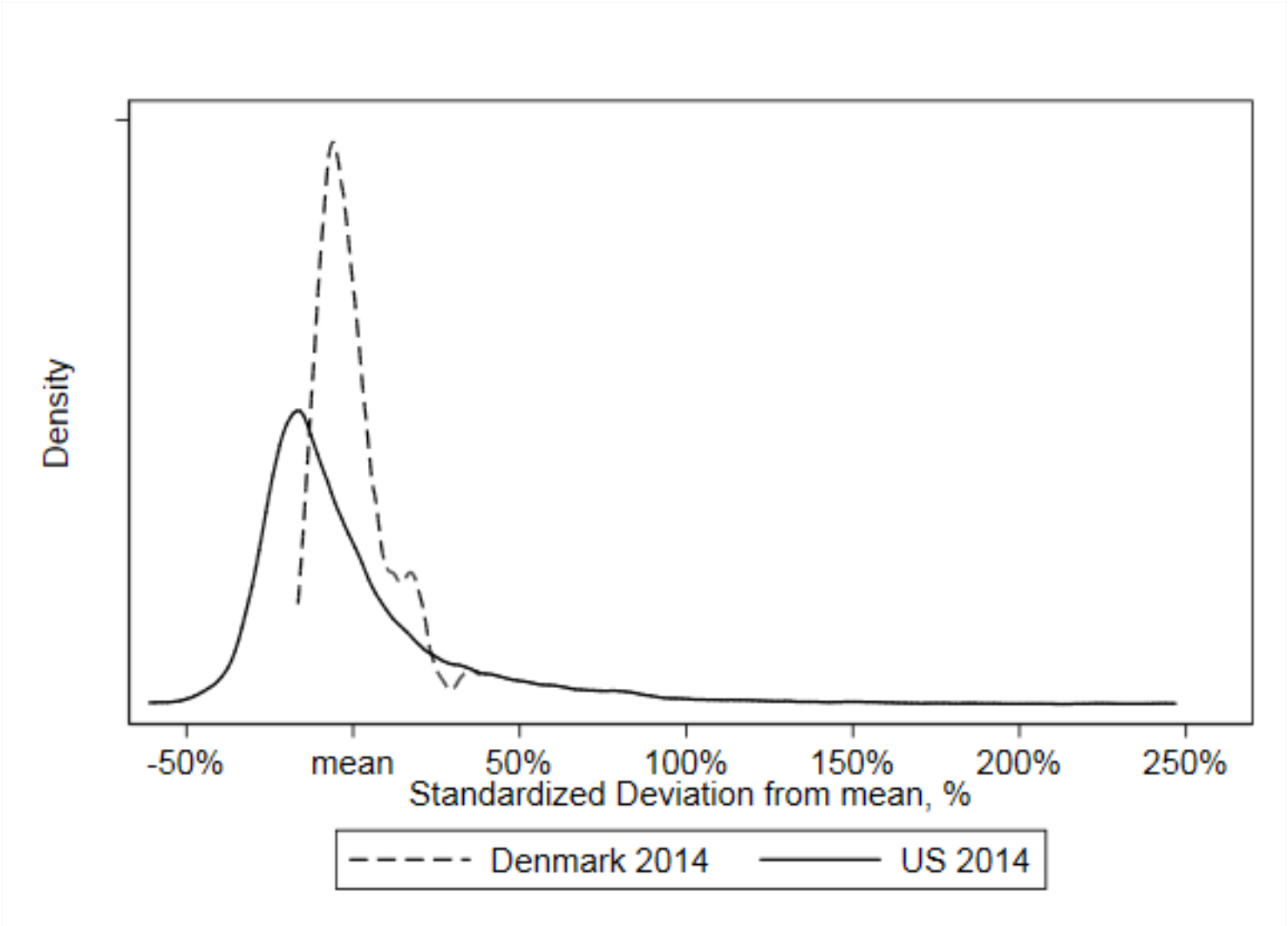
Greater Income Mobility Is Largely Due to the Highly Progressive Danish Tax-Transfer System, Not Because Denmark Is Better at Producing Child Skills

A Major Contributor to Inequality:

Sorting by Income and Education: Endogenous Neighborhoods

- Outcomes by family background in Denmark suggest that something else besides public expenditure is at work in producing inequality and strongly so, despite near equality of public expenditure.
- **Equalizing expenditure is not enough to reduce gaps.**

Figure 4: School Expenditure



Neighborhoods Have Received a Lot of Attention in Recent Research

American Neighborhood Effects on Social Mobility Have Been Heavily Featured in the Press (e.g., Atlas of Opportunity) and in Recent Policy Proposals

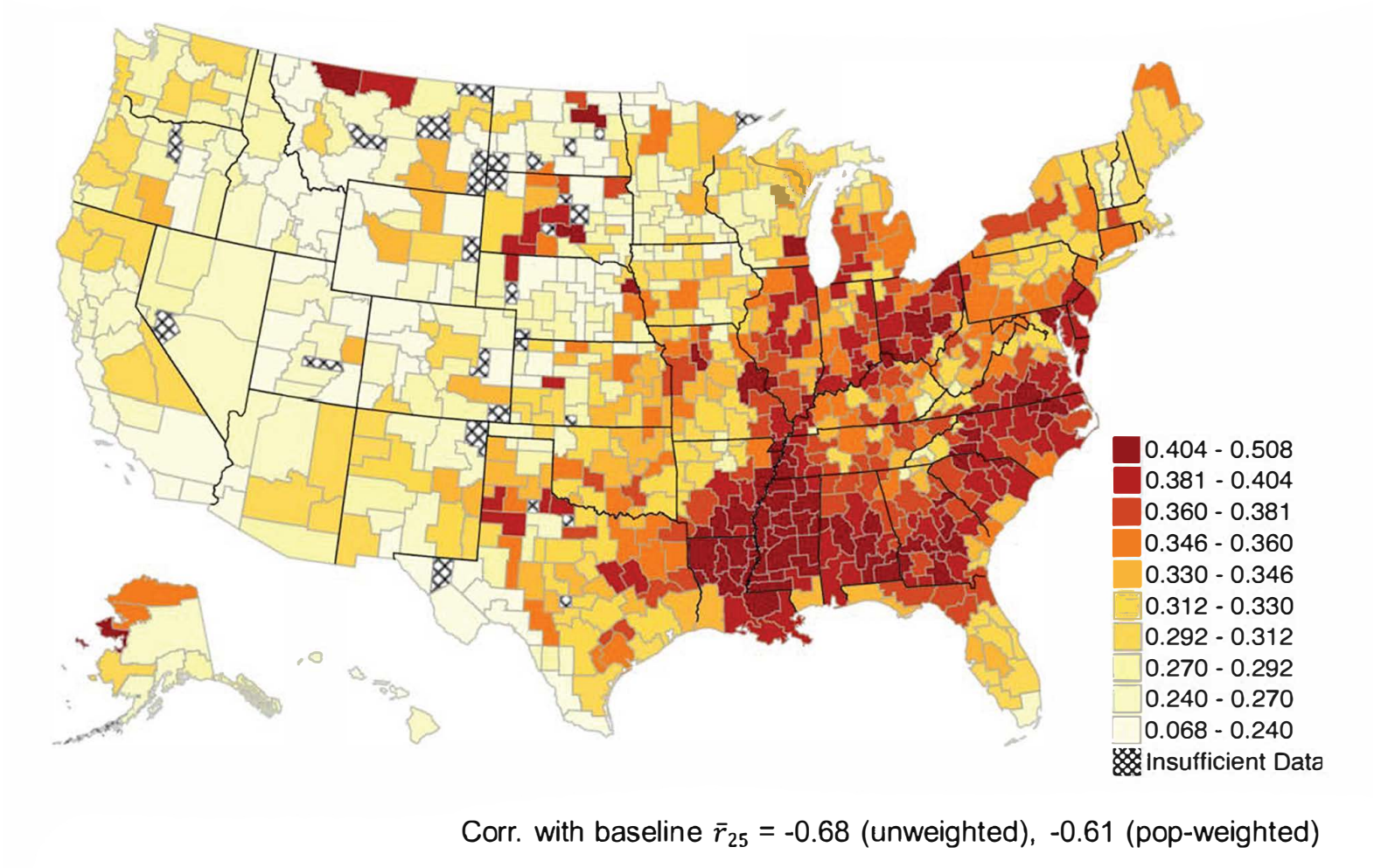
Power of Place?

Figure 5: The Geography of Income Mobility in the United States

$$\underbrace{\mathbb{R}_1}_{\substack{\text{income rank}\\ \text{of child}}} = \alpha + \boldsymbol{\beta_{RR}} \underbrace{\mathbb{R}_0}_{\substack{\text{parent}\\ \text{income}\\ \text{rank}}} + \varepsilon$$

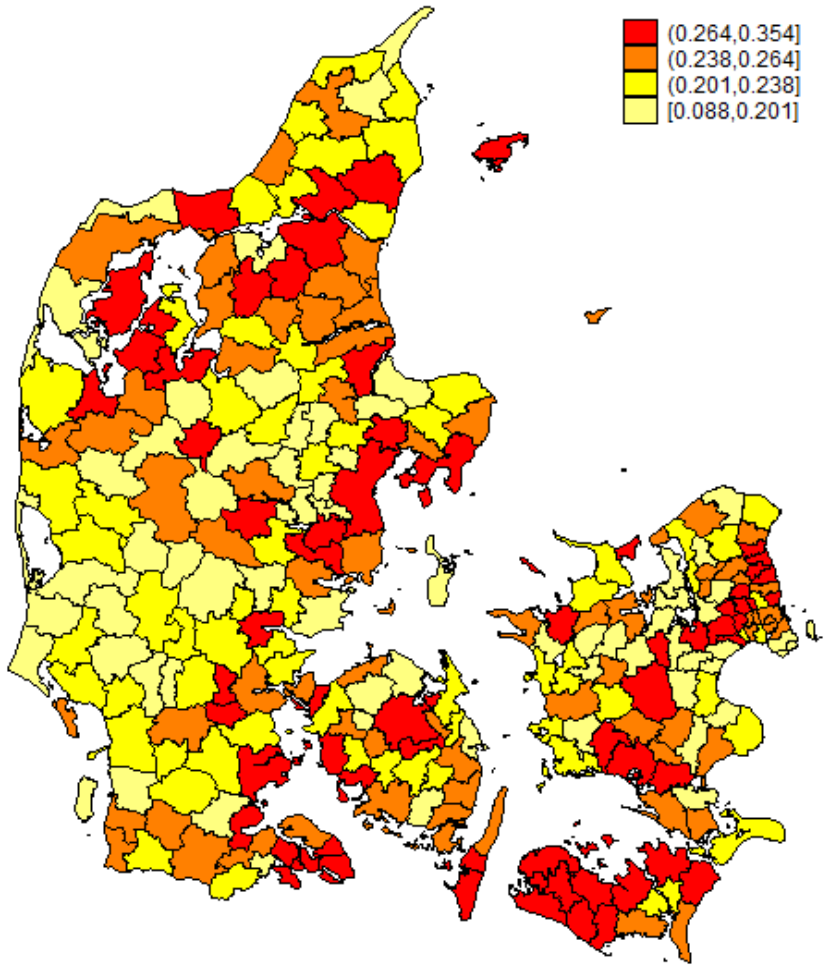
$$\boldsymbol{\beta_{RR}} \uparrow, \text{ Mobility} \downarrow$$

Relative Mobility: Rank-Rank Slopes $(r_{100} - r_0)/100$ by CZ



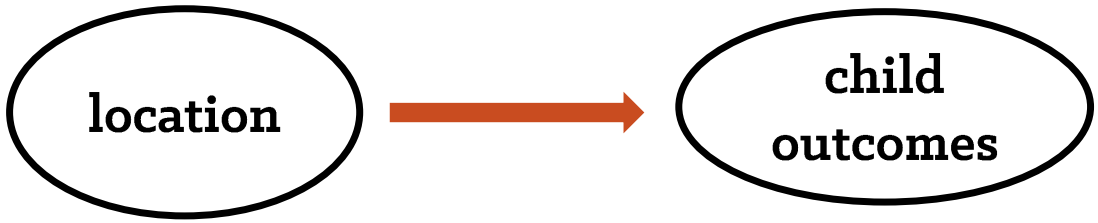
Source: Chetty et al. (2014)

Figure 6: The Geography of Income Mobility in Denmark, Rank-Rank Estimates by Municipality



Source: Own calculations based on data from Statistics Denmark.

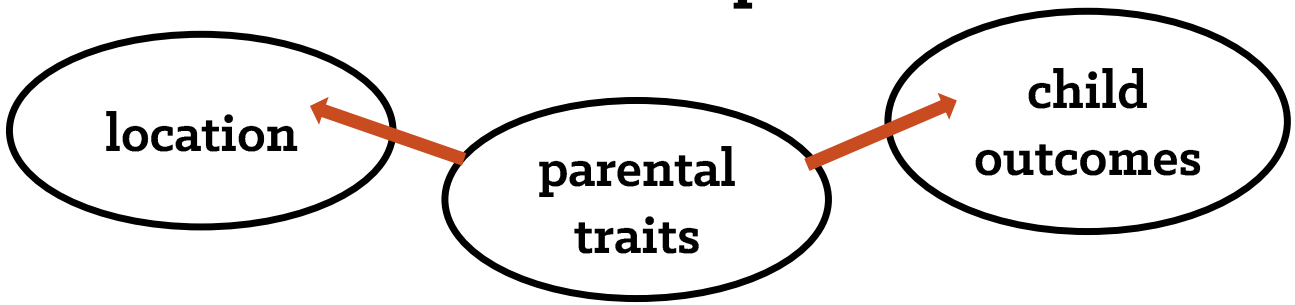
I. Widely Accepted Interpretation



"Power of Place"

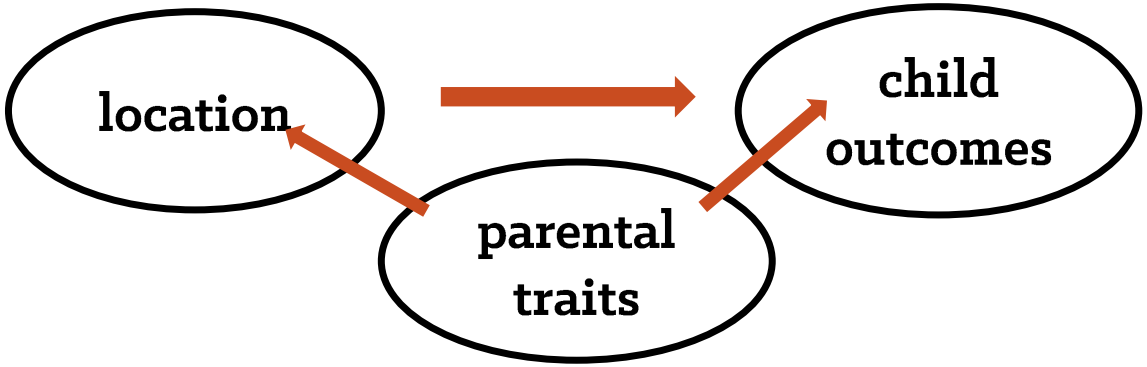
Policy: Relocate People Across Neighborhoods

II. Another Interpretation



Policy: Invest in Families and Persons

III. Evidence Shows



But in What Strength and in What Proportion?

What is Location?

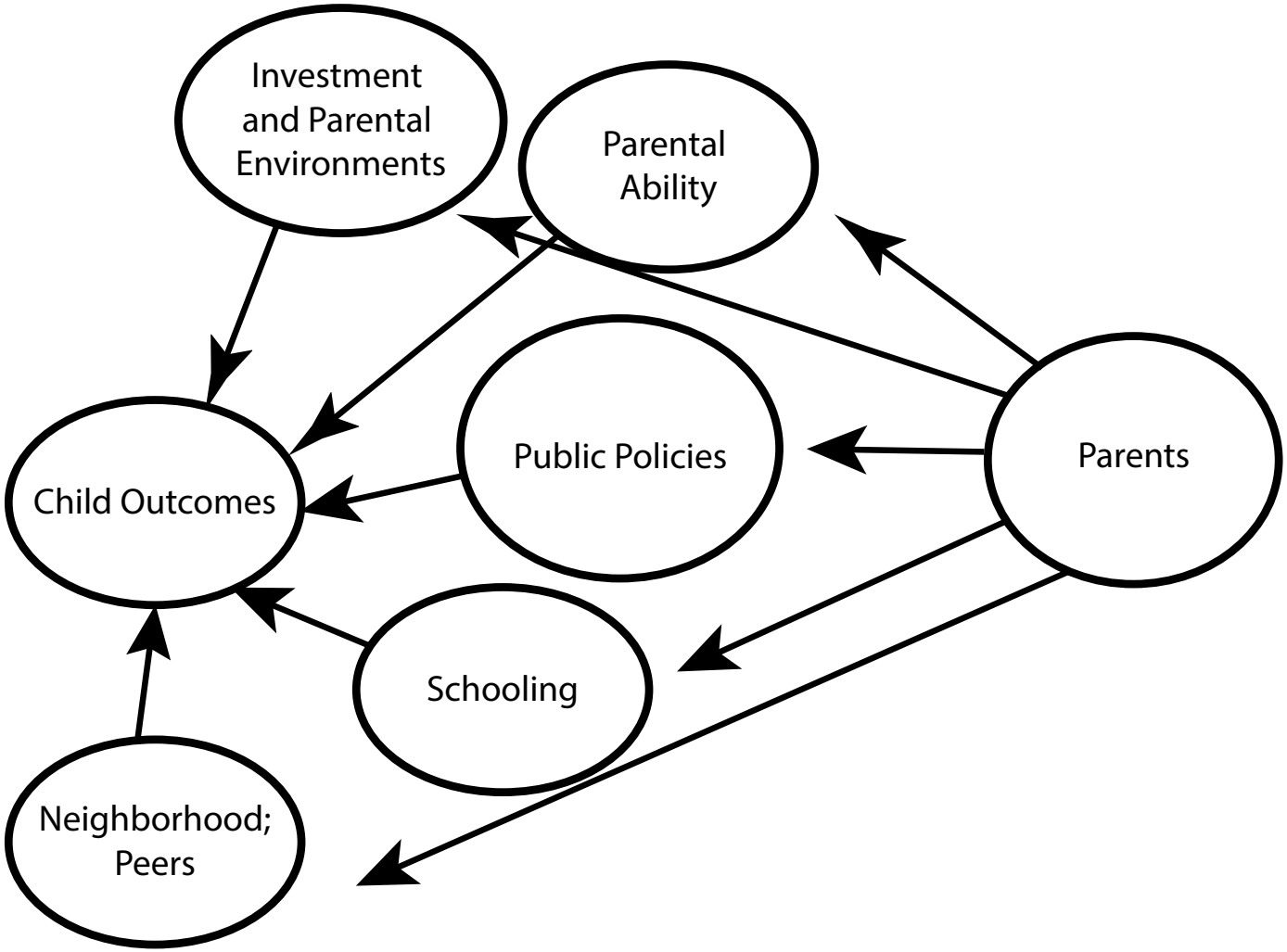
(a) School quality

(b) Peers

(c) Amenities

Sources of Parental Influence

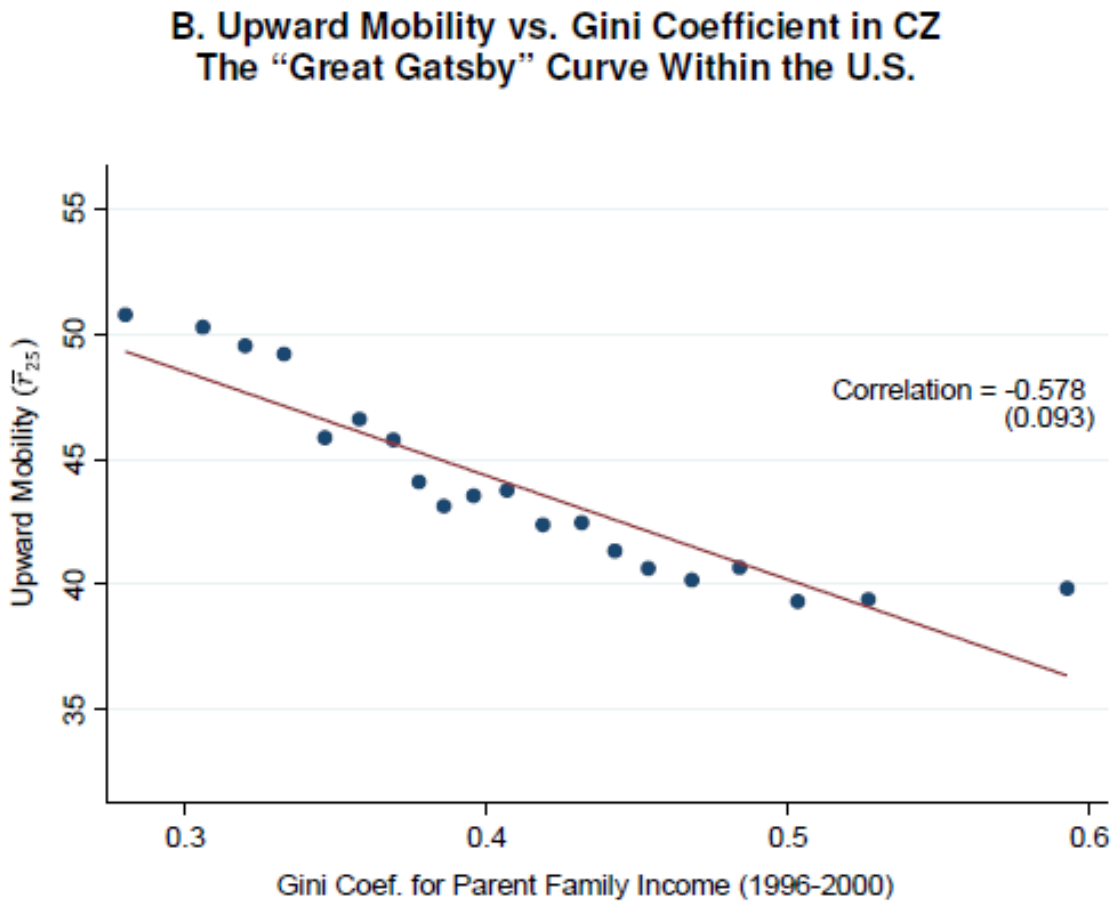
Channels of Family Influence



Parents Pick Neighborhoods

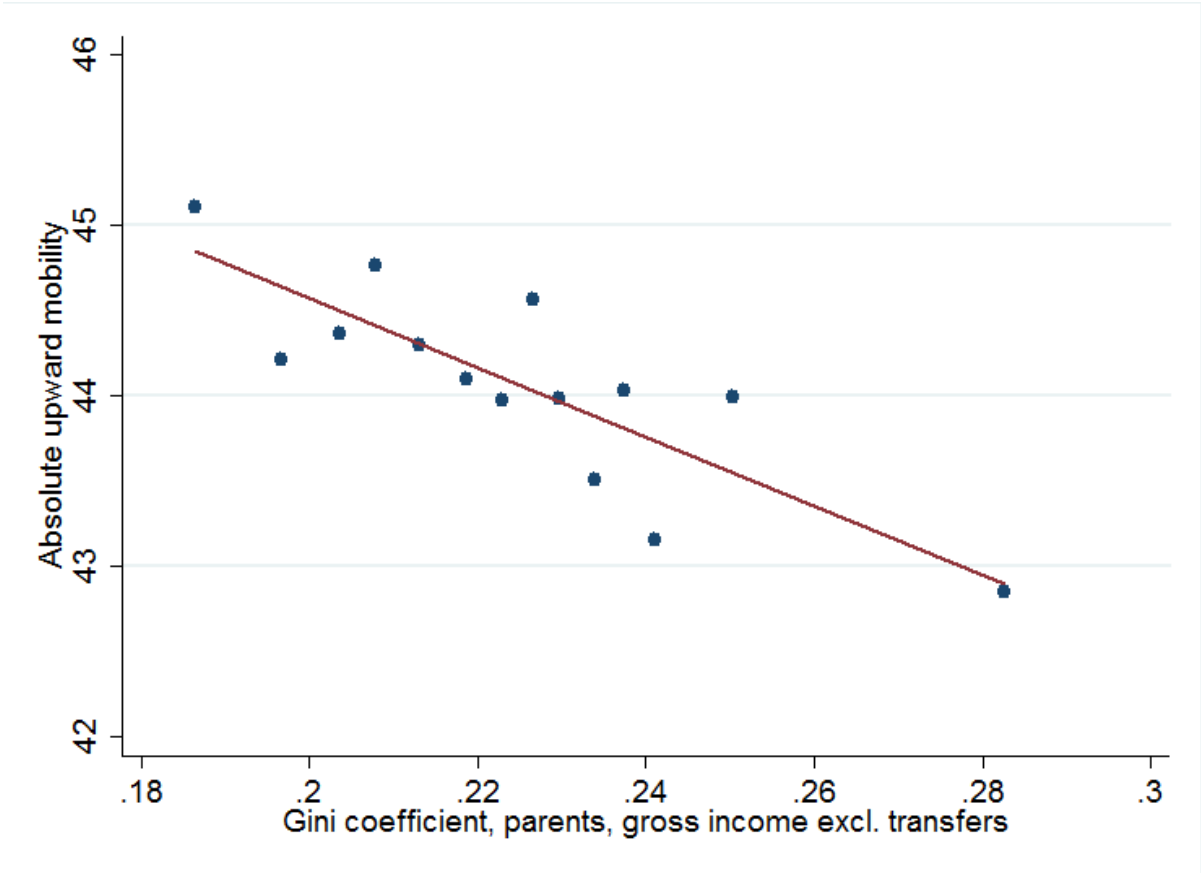
American Neighborhood Effects Have Been Heavily Featured in the Press (e.g., Atlas of Opportunity)

Figure 7: The Great Gatsby Curve, within the U.S.



Source: Chetty et al. (2014).
Note: $\bar{r}_{25}$ is the relative mobility in rank at the 25th percentile.

Figure 8: The Great Gatsby Curve in Denmark Across Municipalities



Note: Birth cohorts 1971–1976 (parental income measured as 9-year averages during child generations; childhood; children's income measured at ages 35–37,...,40–42 depending on cohort). Figure shows a scatter plot of "absolute upward mobility" (defined as the expected child rank at parents' 25th percentile, where ranks are defined in terms of gross income excluding transfers in full population) across municipality-specific Gini coefficients. 15 bins of 6.67% of municipalities.

Evidence on Neighborhood Effects in Denmark

Estimating Neighborhood-level Mobility

- Estimate neighborhood-specific intercepts and slopes (with no controls)

$$y_{in}^{c} = \alpha_n + \beta_n^{IGE} y_{in}^{p} + u_{in}$$

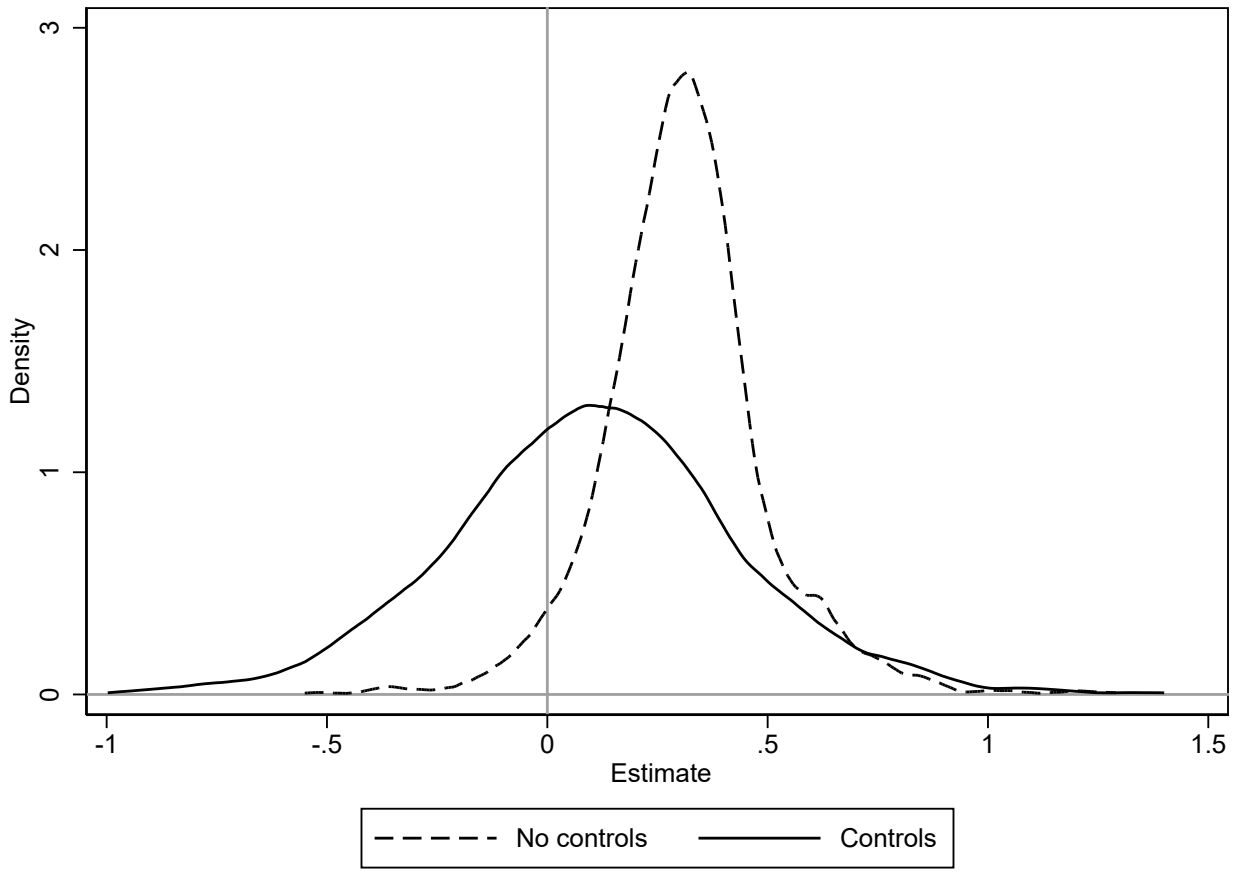
using market income (labor earnings and capital income), before transfers and taxes, of children and parents.

- Let $n \in \mathcal{N}$ index neighborhoods: Danish parishes
  - Parishes are administrative units from the Church of Denmark
  - On average, home to 2,500 residents (comparable to a small U.S. Census tract or small zip code area)
- For much of the presentation, assign children to the parish they spent the longest time during childhood (ages 0-17)
  - However social, neighborhood mobility estimates are robust when accounting for exposures to different neighborhoods during childhood
- Let y_{in}^{c}: log of long-run average income between ages 30-45; y_{in}^{p} is log of child's family when they are 0-17
- Main measure of income: market income (labor earnings and capital income). We use alternative measures from register data: before or after transfers and taxes
- We also use PDV of disposable income

Link to Sample Construction

Figure 9: Empirical distribution of $\hat{\beta}_n^{IGE}$

(a) Distribution of $\hat{\beta}_n^{IGE}$ with and without family controls



More Advantaged Families associated with Lower Neighborhood IGEs

Sorting and Segregation Substantial and Increasing

- Segregation: How similar are families who live in the same neighborhood?
  - Can be measured in many different ways
  - Different dimensions of segregation: native/immigrant (binary), education (discrete), income (continuous)
  - Different definitions of areas
- Measure of segregation in income in neighborhoods: Theil (1972), Reardon and Bishoff (2011), can be used to form a scale from 0–1:
  - 0 is no income segregation; 1 is full income segregation.
  - 0: All income percentiles equally represented in all neighborhoods.
  - 1: Each neighborhood consists of families from same part of income distribution.

In the U.S., Sorting Is High at Both Ends of the Income Distribution and Sorting Increasing

Figure 10: Income Segregation Patterns in the U.S.

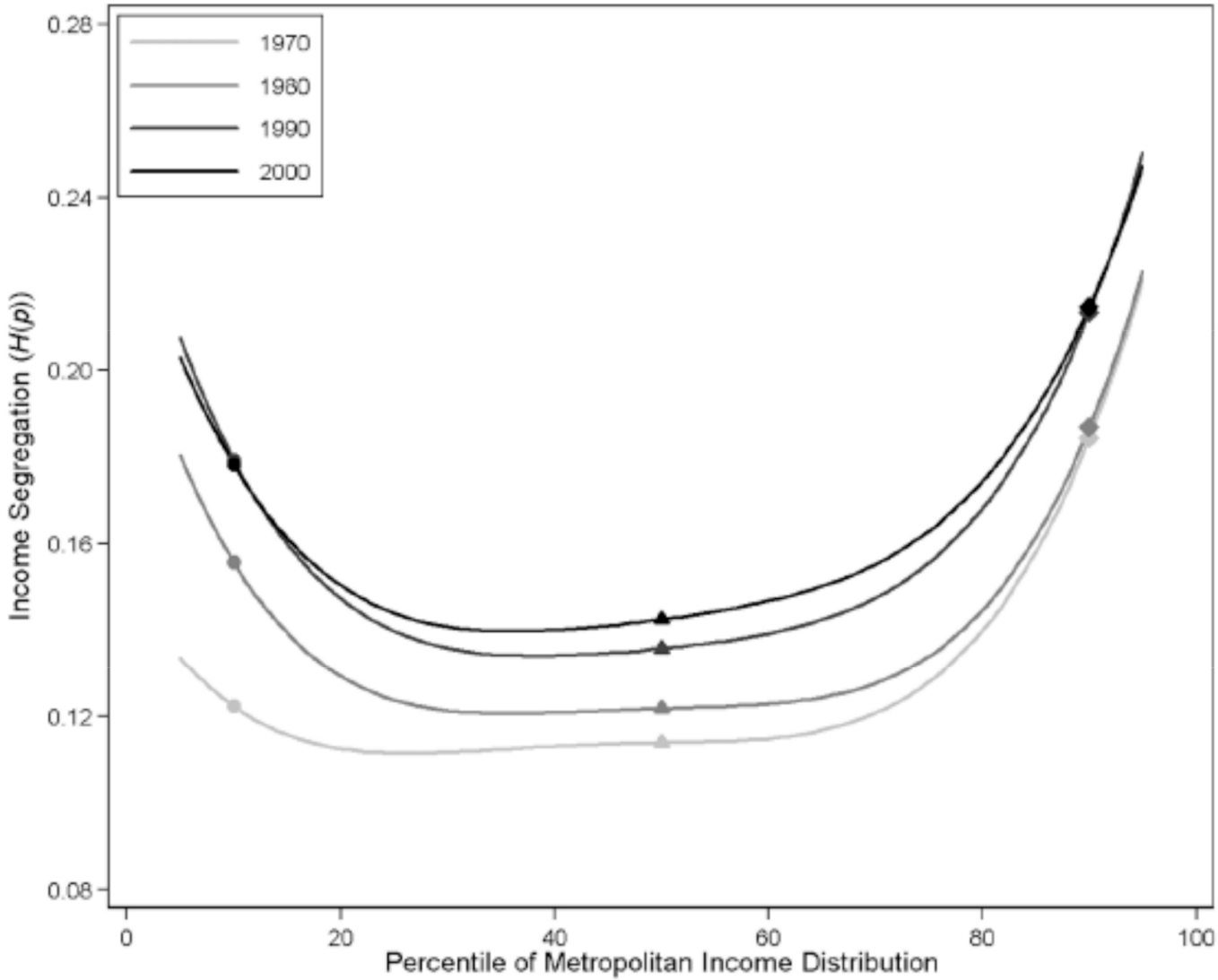


Figure 11: Income Segregation by Gross Income Excluding Transfers across Primary School Catchment Areas by Year, Denmark

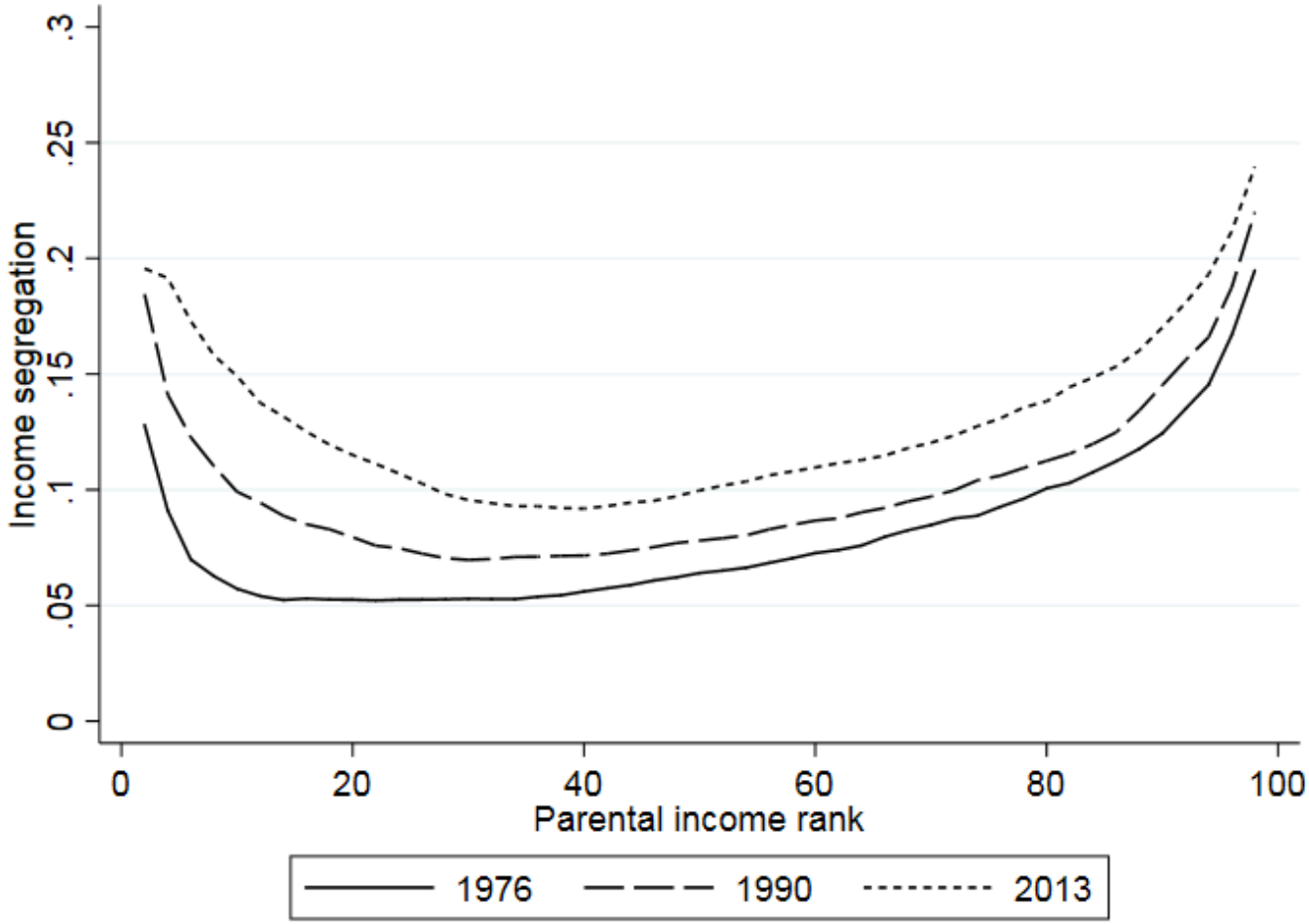
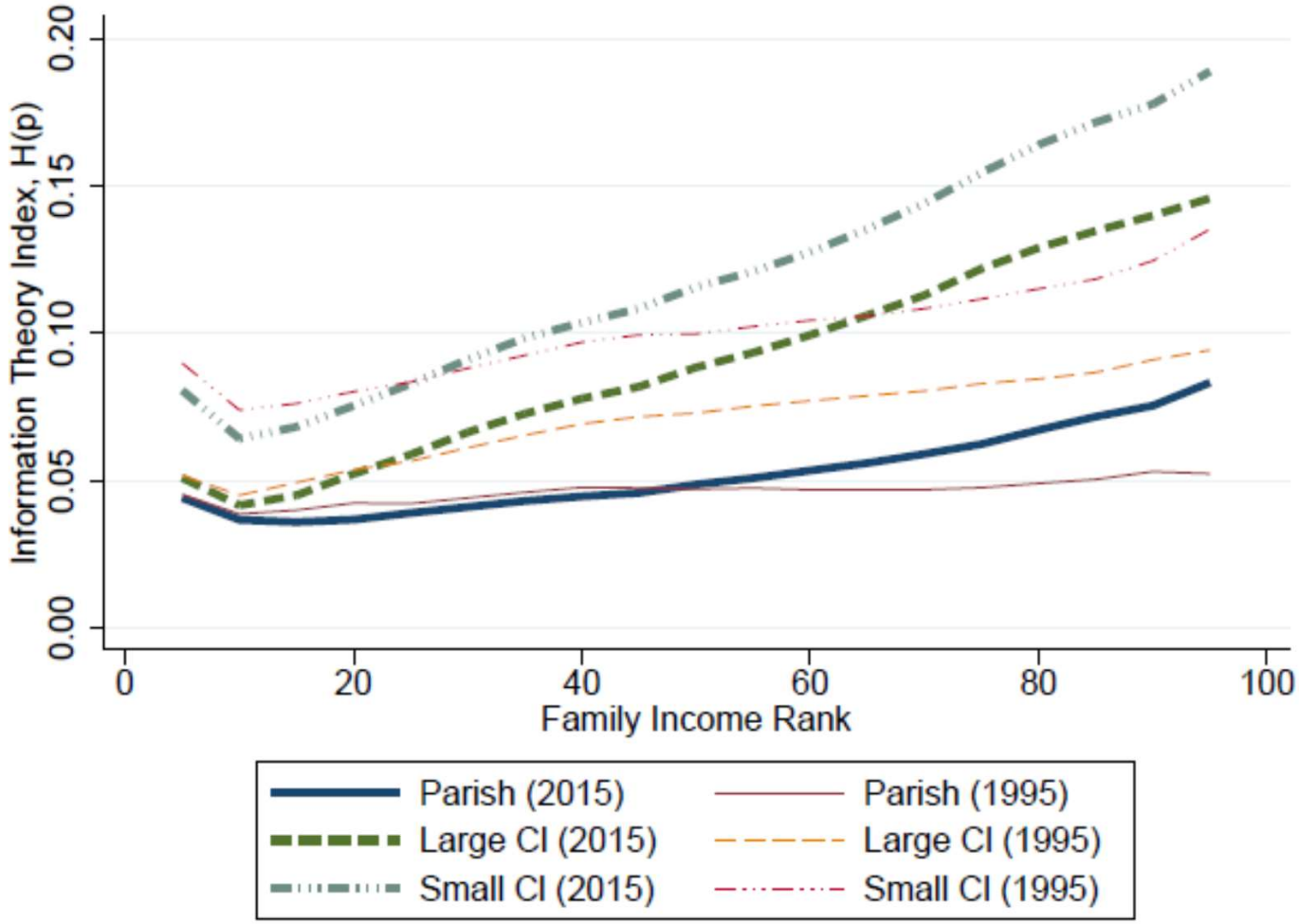


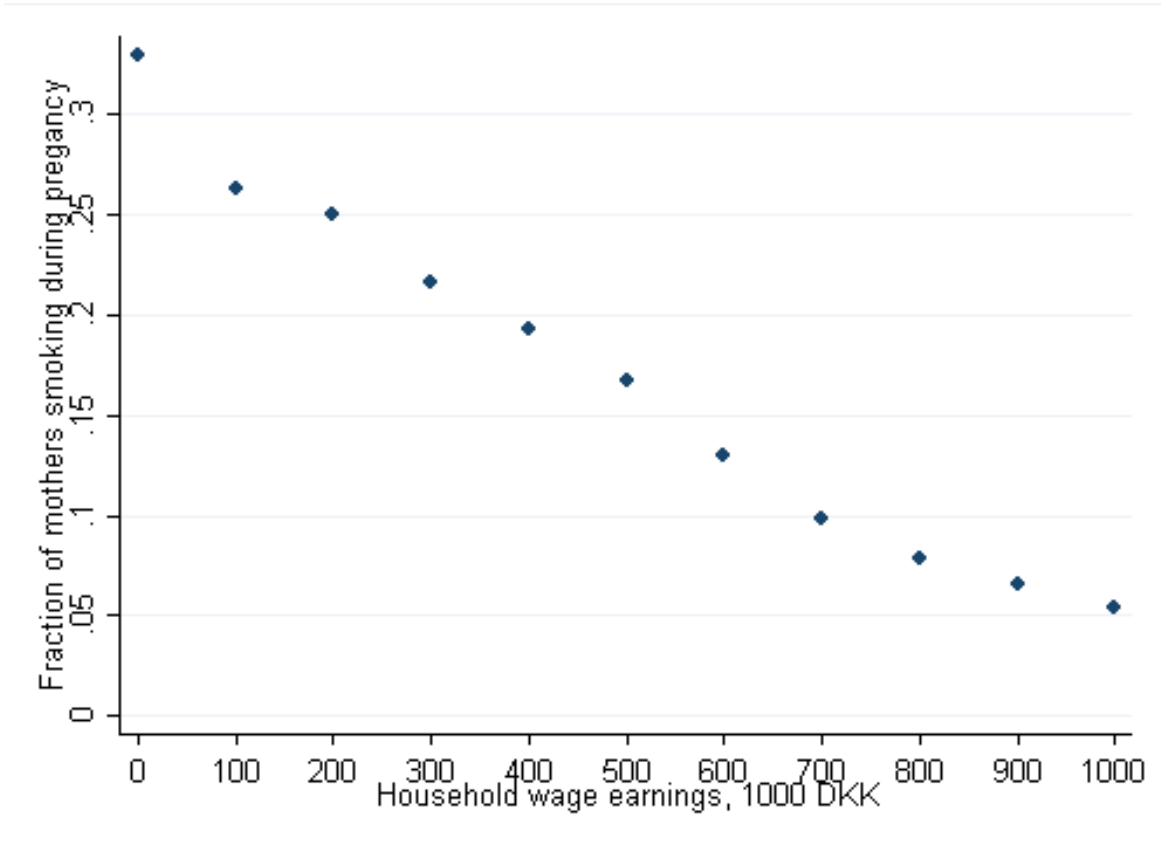
Figure 12: Segregation **Increasing** in Disposable Income at All Levels of Aggregation: Parish, Large NBH, Small NBH



Source: Eshaghnia, Heckman, and Razavi (2022).

Danish Family Environments Fundamentally Unequal across the Income Distribution

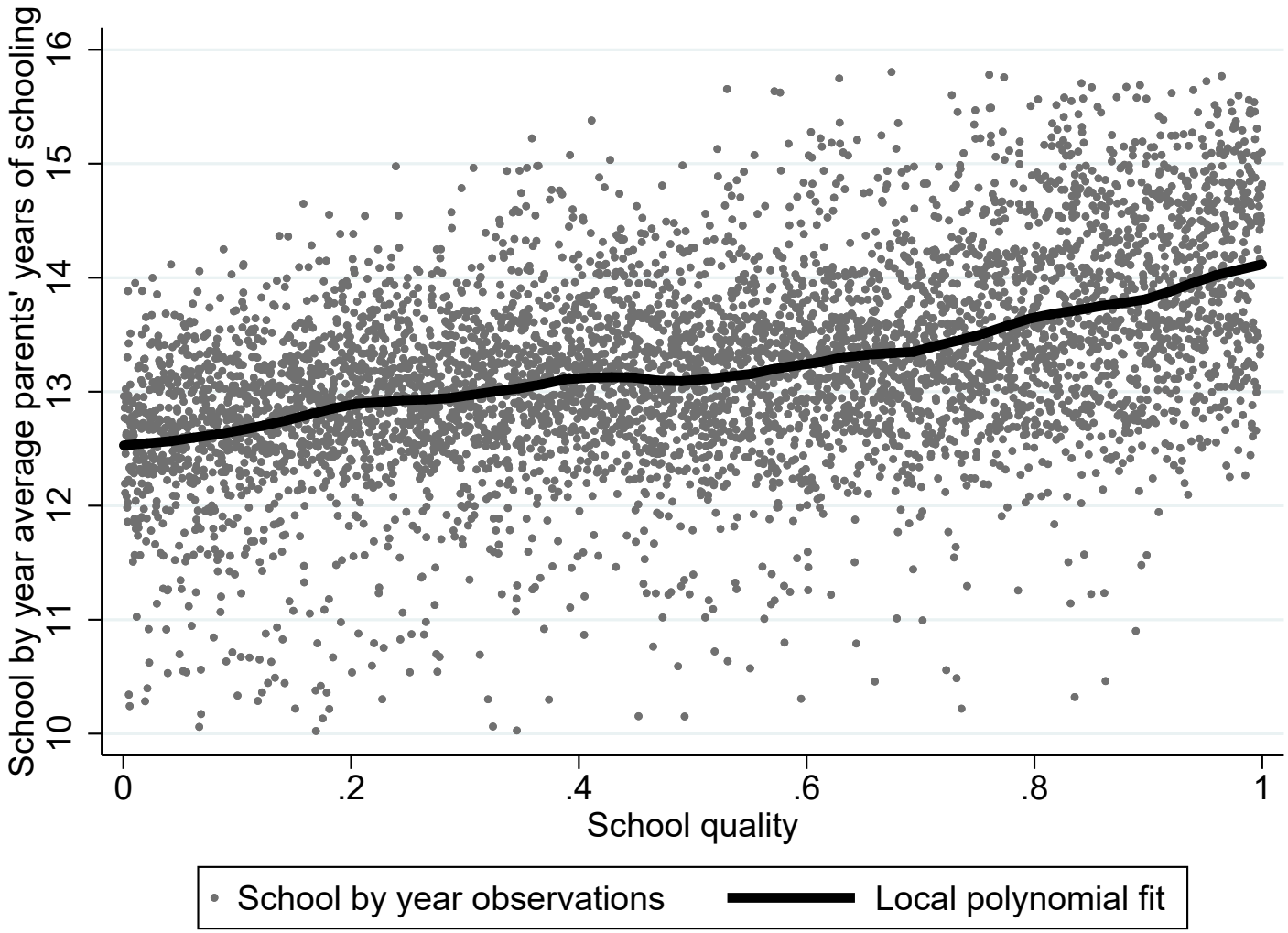
Figure 13: Fraction of Mothers Who Smoke during Pregnancy by Household Wage Earnings Year prior to Childbirth



Sorting by Teacher Quality across Neighborhoods

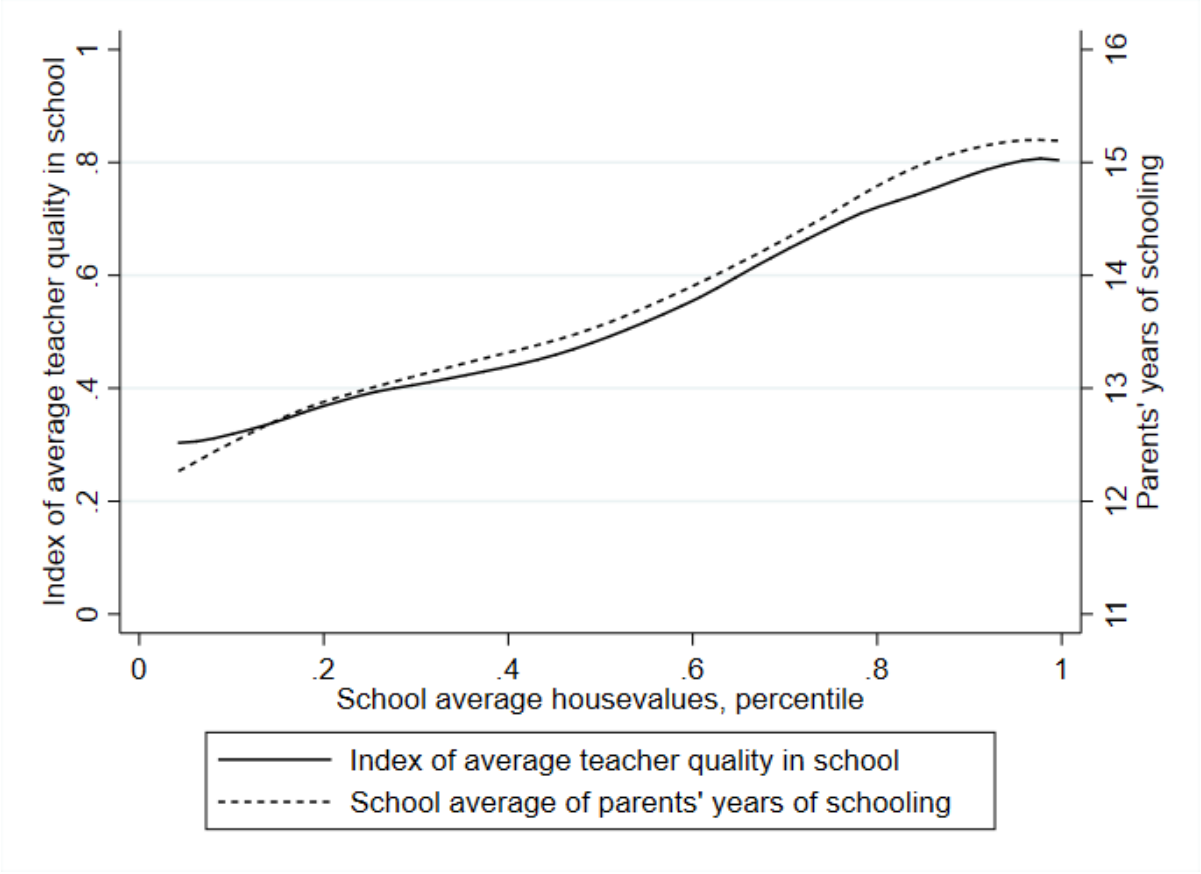
- Teachers are more or less paid the same in all neighborhoods.
- Non-price allocation mechanism at work $\Longrightarrow$ sorting by student quality.
- Sorting is a non-price mechanism. Best teachers sorted to best neighborhoods through their own choices.
- Parents (through school boards) also have say on hires.

Figure 14: Parents' Years of Schooling by Average Teacher Quality in Schools



Source: Gensowski et al. (2020).

Figure 15: Average Teacher Quality in Schools and Parents' Education, by Housing Values



Source: Gensowski et al. (2020).

How Much Danes Pay for School Quality

	Log House Price	Log House Price	Log House Price
	(1)	(2)	(3)
Standardized Teacher Quality (School-Level)	0.016***		0.008***
	(0.003)		(0.003)
Standardized Average Scores (School-Level)		0.026***	0.010***
		(0.002)	(0.003)
HH Years Schooling (at School Level)			0.022***
			(0.005)
Share Foreigners (at School Level)			-0.078
			(0.049)
Share non-Westerners (at School Level)			0.011
			(0.065)
Log HH Gross Income (at School Level)			0.116***
			(0.024)
Share Married HH (at School Level)			0.085***
			(0.025)
Share Non-Intact HH (at School Level)			-0.041**
			(0.020)
Adjusted R^2	0.503	0.498	0.504

Source: Eshaghnia, Heckman, and Razavi (2022).

School Quality and Later Life Outcomes

	Baseline	Controls	Nbhd. FE	HH FE	HH & Cont.	School FE	Sch. & Cont.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) College Completion	0.0768***	0.0241***	0.0293***	0.0165***	0.0071*	0.0094***	0.0029***
	(0.0014)	(0.0014)	(0.0016)	(0.0039)	(0.0040)	(0.0016)	(0.0011)
(2) Market Income	0.0995***	0.0574***	0.0768***	0.0543***	0.0402*	0.0244***	0.0133**
	(0.0063)	(0.0069)	(0.0081)	(0.0203)	(0.0208)	(0.0065)	(0.0057)
(3) Disposable Income	0.0153***	0.0104***	0.0127***	0.0048	-0.0030	0.0049***	0.0026*
	(0.0020)	(0.0019)	(0.0022)	(0.0070)	(0.0066)	(0.0016)	(0.0014)
(4) Employment	0.0111***	0.0066***	0.0100***	0.0052	0.0044	0.0042***	0.0024**
	(0.0012)	(0.0013)	(0.0015)	(0.0039)	(0.0041)	(0.0011)	(0.0010)
(5) Homeownership	0.0019	0.0096***	0.0096***	0.0031	0.0006	0.0039***	0.0023**
	(0.0015)	(0.0014)	(0.0016)	(0.0042)	(0.0044)	(0.0014)	(0.0011)
(6) Crime	-0.0395***	-0.0126***	-0.0178***	-0.0158***	-0.0069*	-0.0061***	-0.0025***
	(0.0013)	(0.0013)	(0.0015)	(0.0040)	(0.0039)	(0.0012)	(0.0010)
(7) Teenage Birth	-0.0021***	-0.0013***	-0.0016***	-0.0006**	-0.0008*	-0.0006***	-0.0004*
	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0005)	(0.0002)	(0.0002)
(8) Age at First Birth	0.2346***	0.1019***	0.1016***	0.1580**	0.1307*	0.0293***	0.0182 *
	(0.0127)	(0.0133)	(0.0172)	(0.0803)	(0.0787)	(0.0110)	(0.0103)

Source: Eshaghnia, Heckman, and Razavi (2022).

Purposive Choice of Neighborhood to Raise Children by Education of Mother

Quality of Neighborhood for Child Rearing Improves with Education of the Mother

Figure 16: Average Income in Area of Residence and Moving Pattern, by Time to/from Birth of First Child

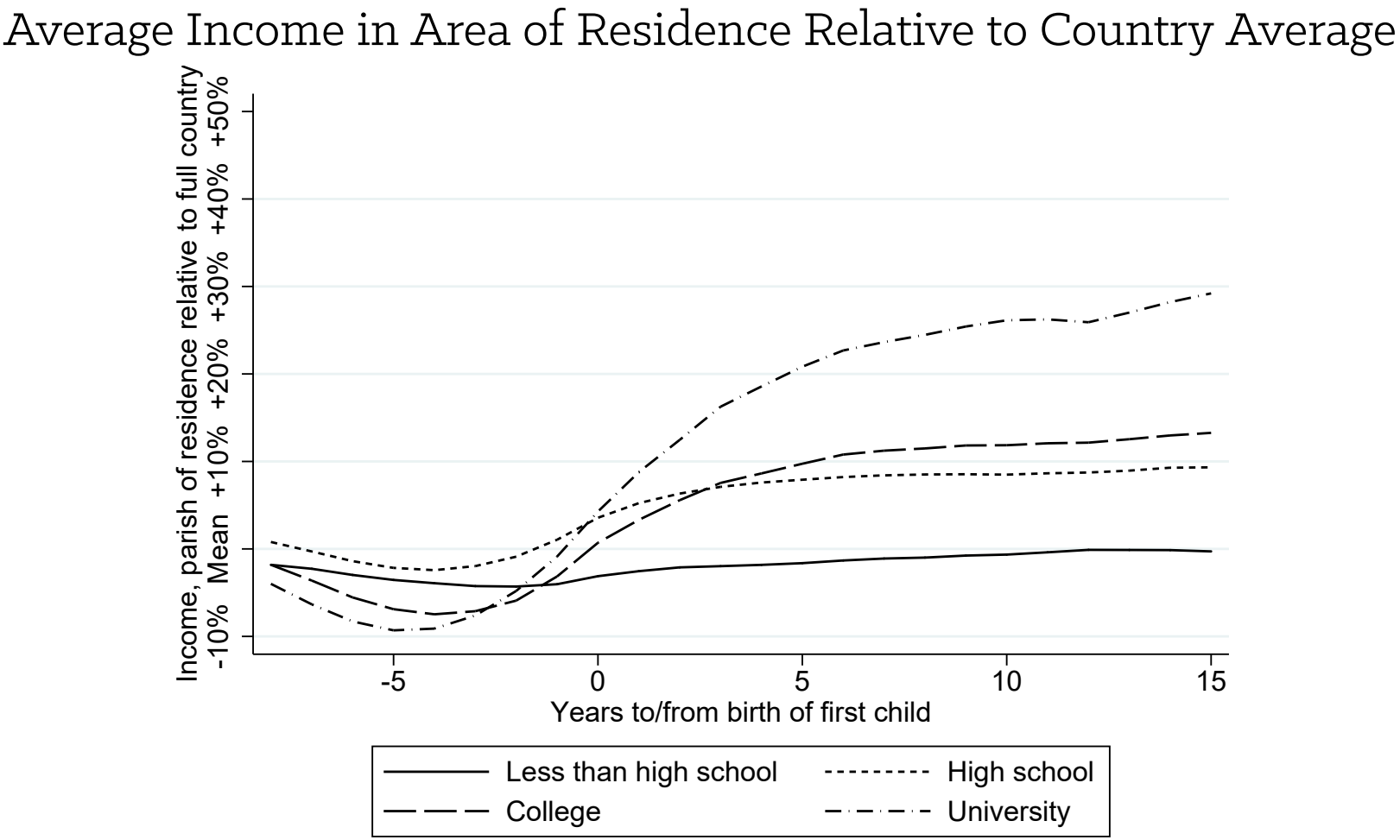


Figure 17: Family Moves to New Parish, by Time to/from Birth of First Child

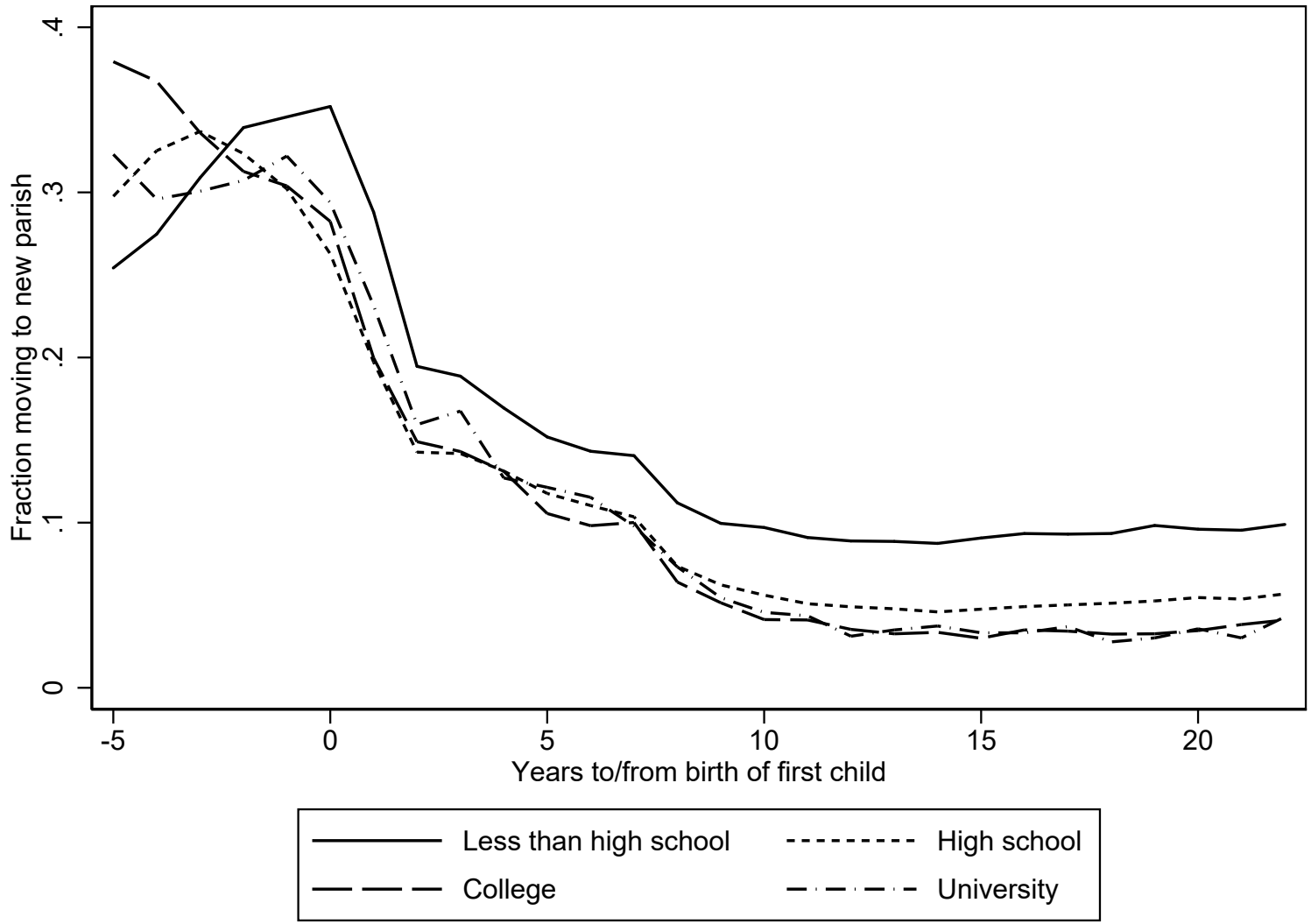


Figure 18: Move to New Parish, by Time to/from Birth of First Child (Conditional on Move during First Child's Childhood)

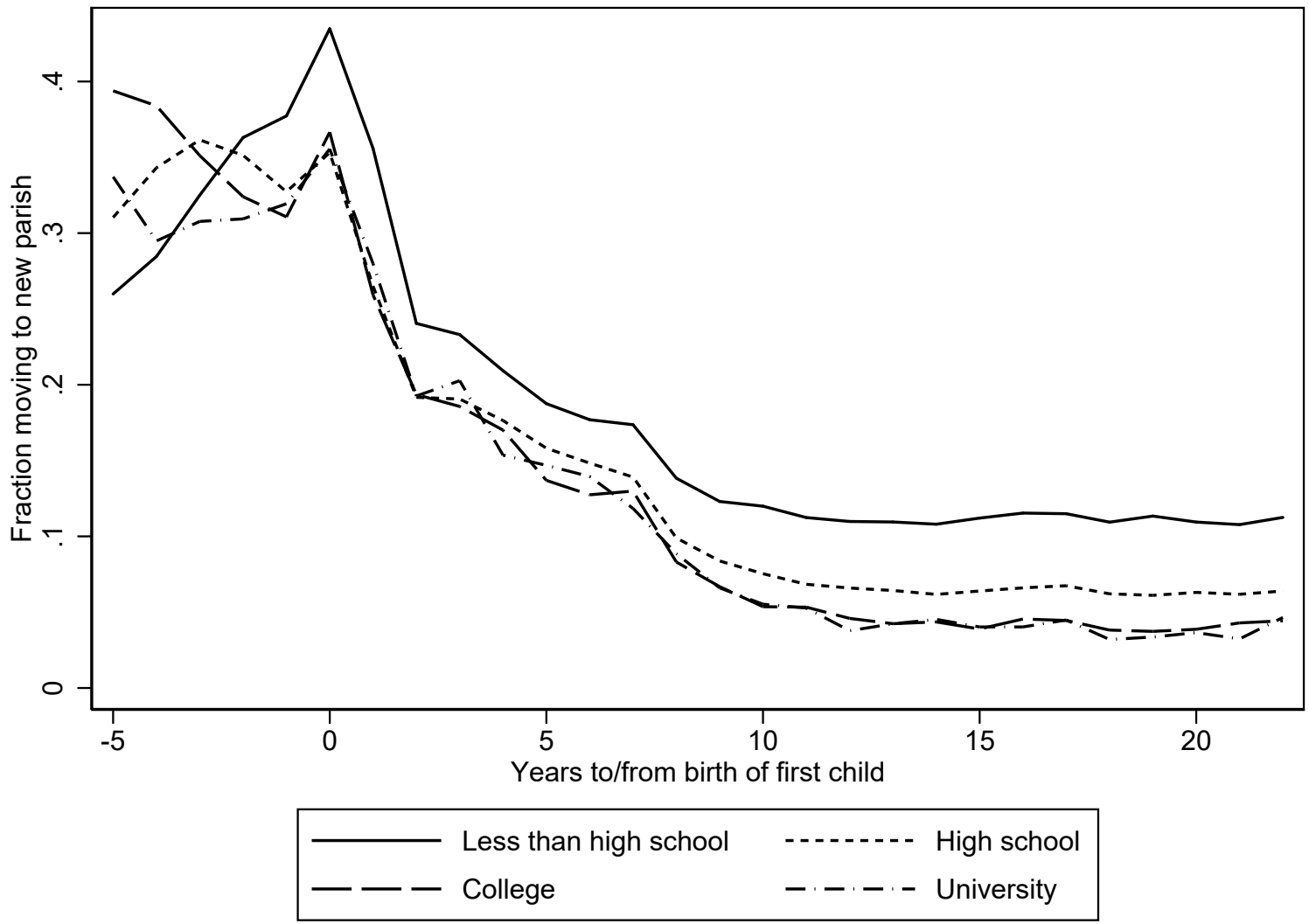
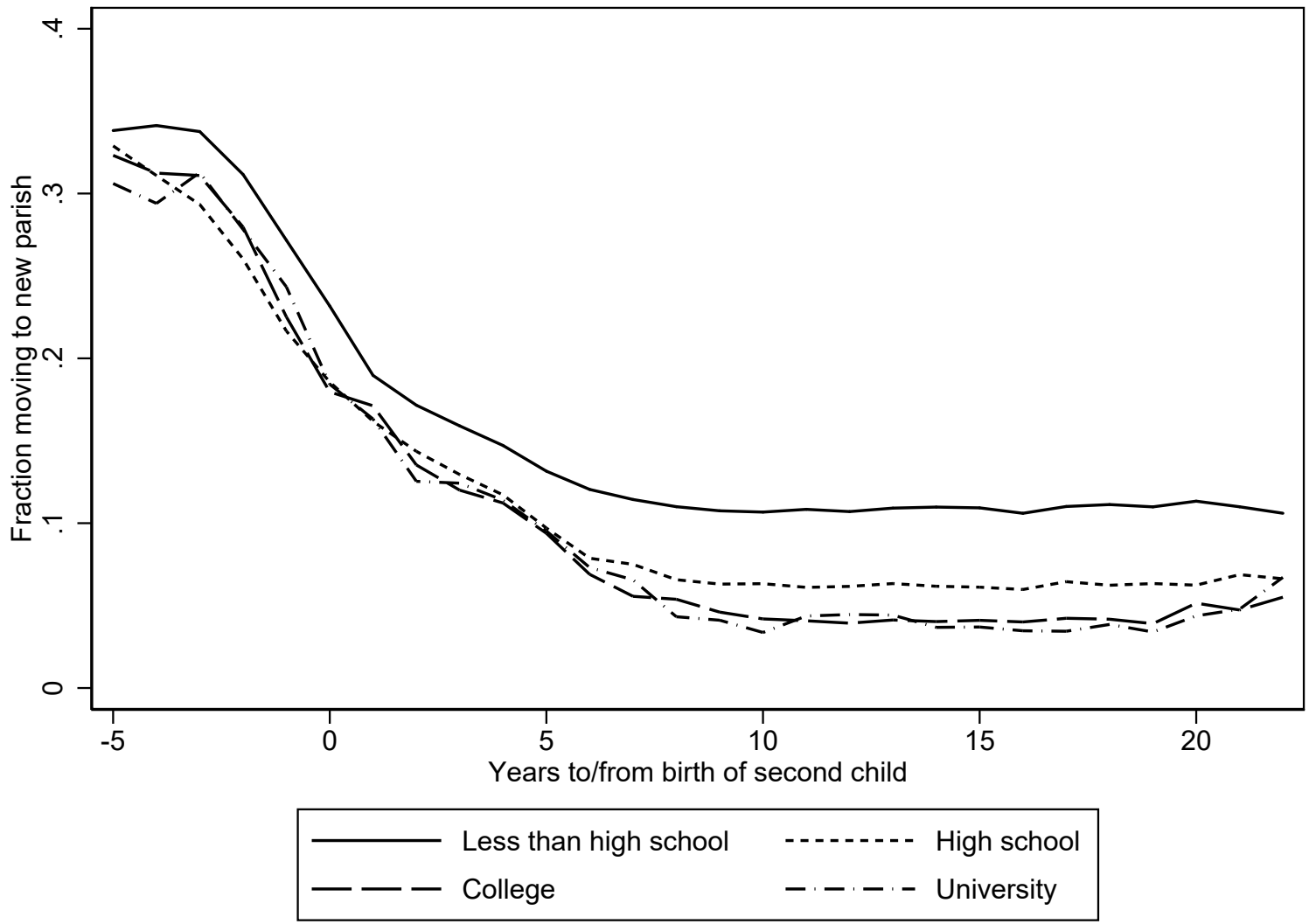


Figure 19: Move to New Parish, By Time to/from Birth of Second Child (Conditional on Move during First Child's Childhood)



Location Choice

1. Most moves made by young parents prior to the start of school.
2. Gaps in neighborhood quality remain large and persist during adolescence.

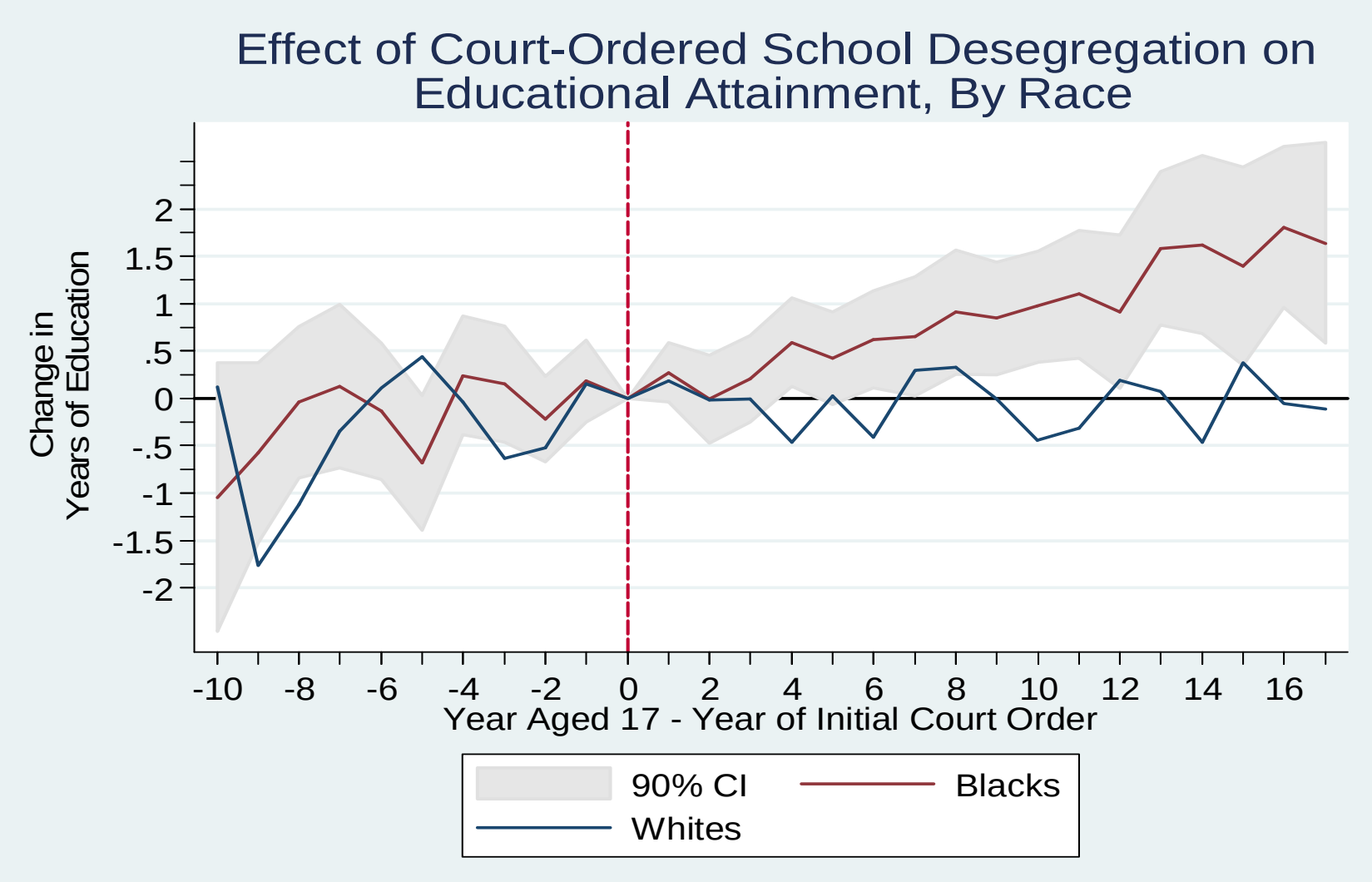
Family Moves Not Random

Should We Break Up Neighborhoods?

Busing? Forced Relocation?

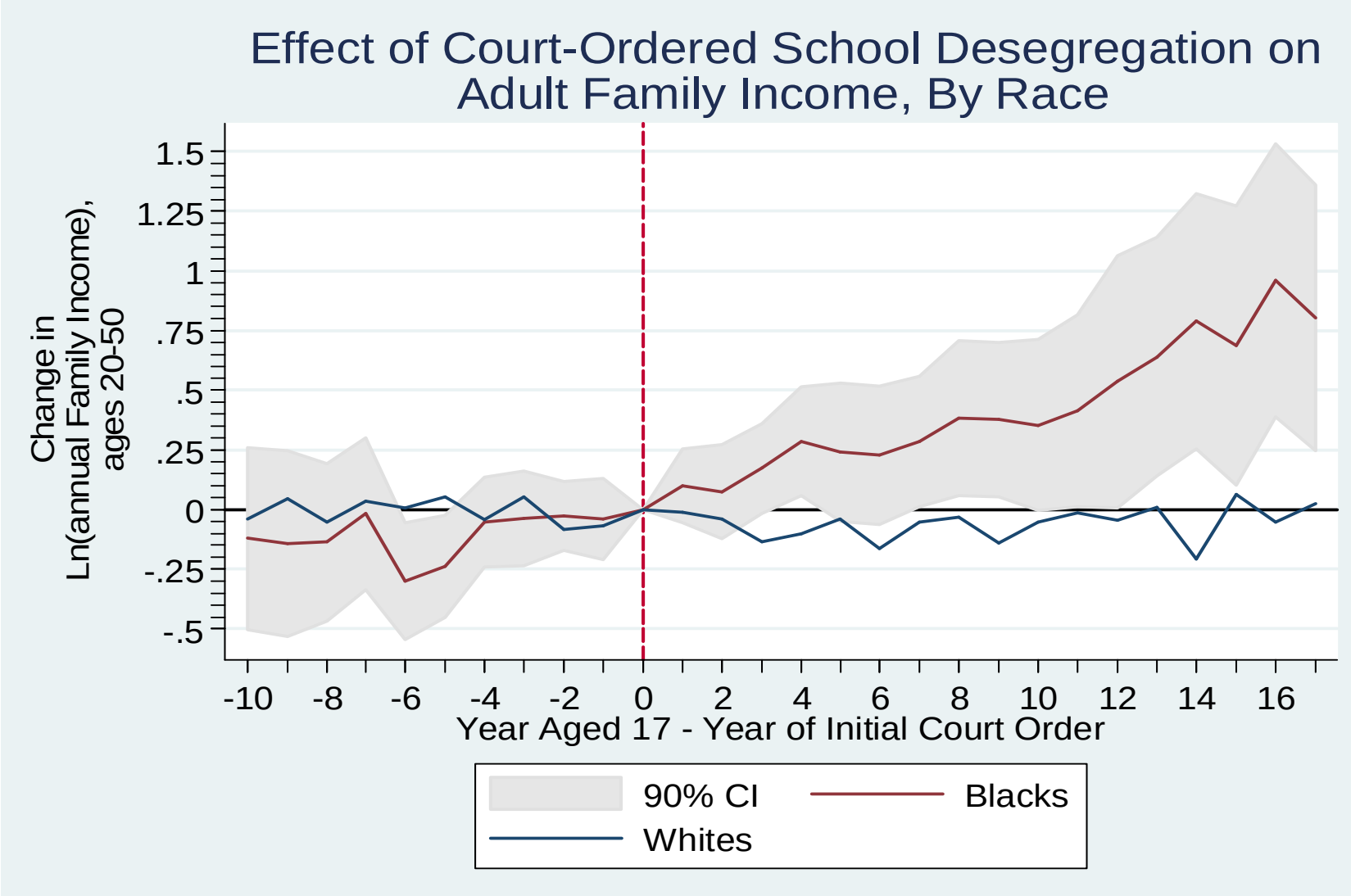
U.S. Data on Busing African Americans Ambiguous

Figure 20



Source: Johnson (2011).

Figure 21



Source: Johnson (2011).

Busing in Denmark: Migrants' Children

	Math Test Score	*Distress*
Effect of Busing	-0.220**	0.239*
	(0.096)	(0.132)
Source:	Table 6	Table 8

in Damm, Mattana, and Nielsen (2021).

Evidence on Vouchers for Mobility Is Mixed and Contested (For Both Children and Adults)

Educational Mobility

Universality Helps Children from Better Family Backgrounds (Karlson and Landersø, 2021)

- A strong disconnect between the expansion of the welfare state from the 1960s onwards and when educational mobility peaked in Denmark.
  - Denmark saw massive expansion of education in the bottom from 1940s–mid 1960s cohorts. This led to high mobility. Lower tail expansion driven by those from low-resource families.
  - Expansion in college and university from cohorts born during the 1970s onward led to lower mobility.
  - Upper tail expansion driven by those from affluent families.

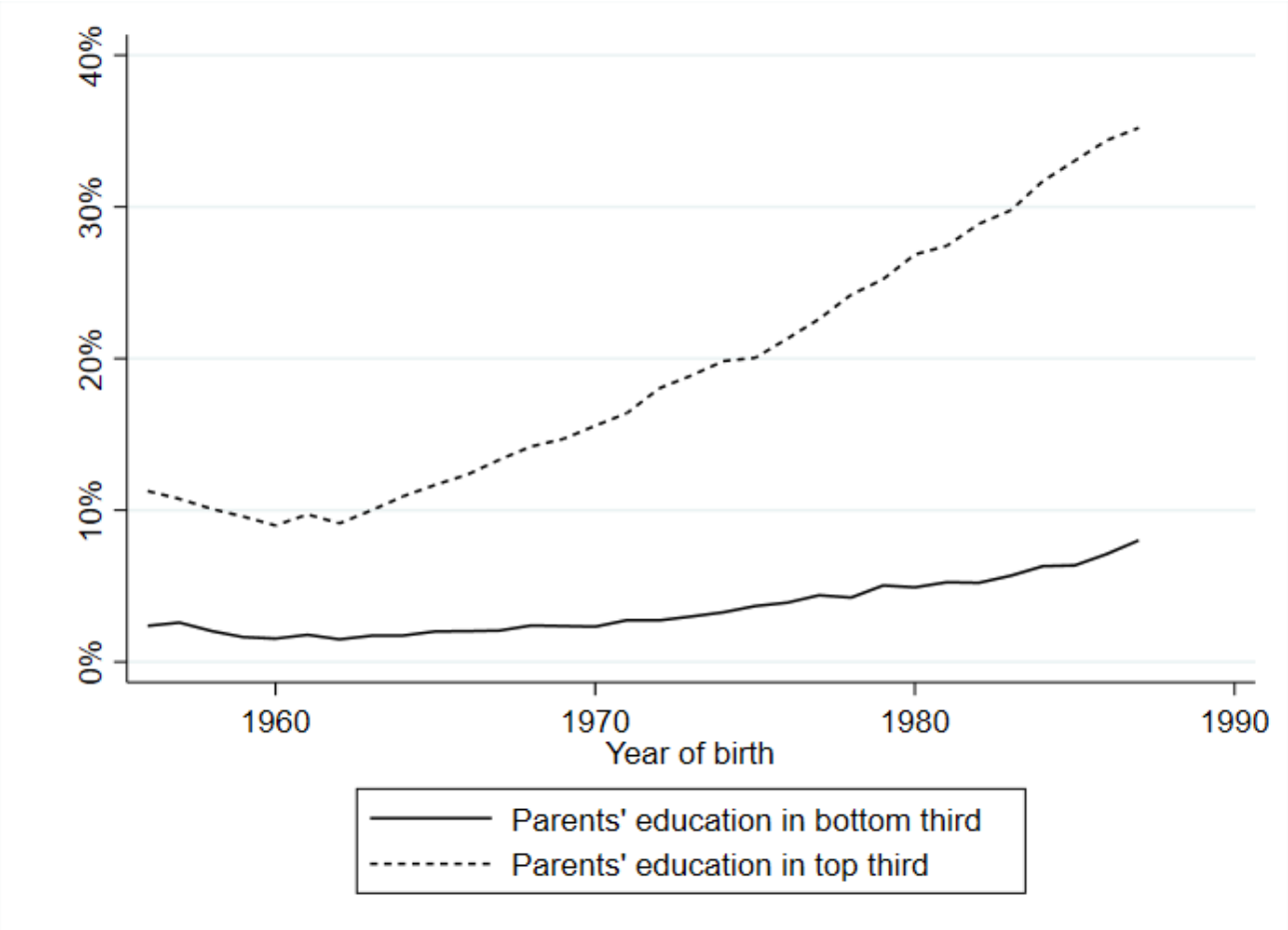
Compulsory School Reforms Increased Educational Mobility

Universality: Helps Children From Better Family Backgrounds Relatively More

Figure 22: Equal Access Is Not the Same as Equal Utilization 1—the Strongest Reap the Benefits: Education Support by Parents' Income Percentile

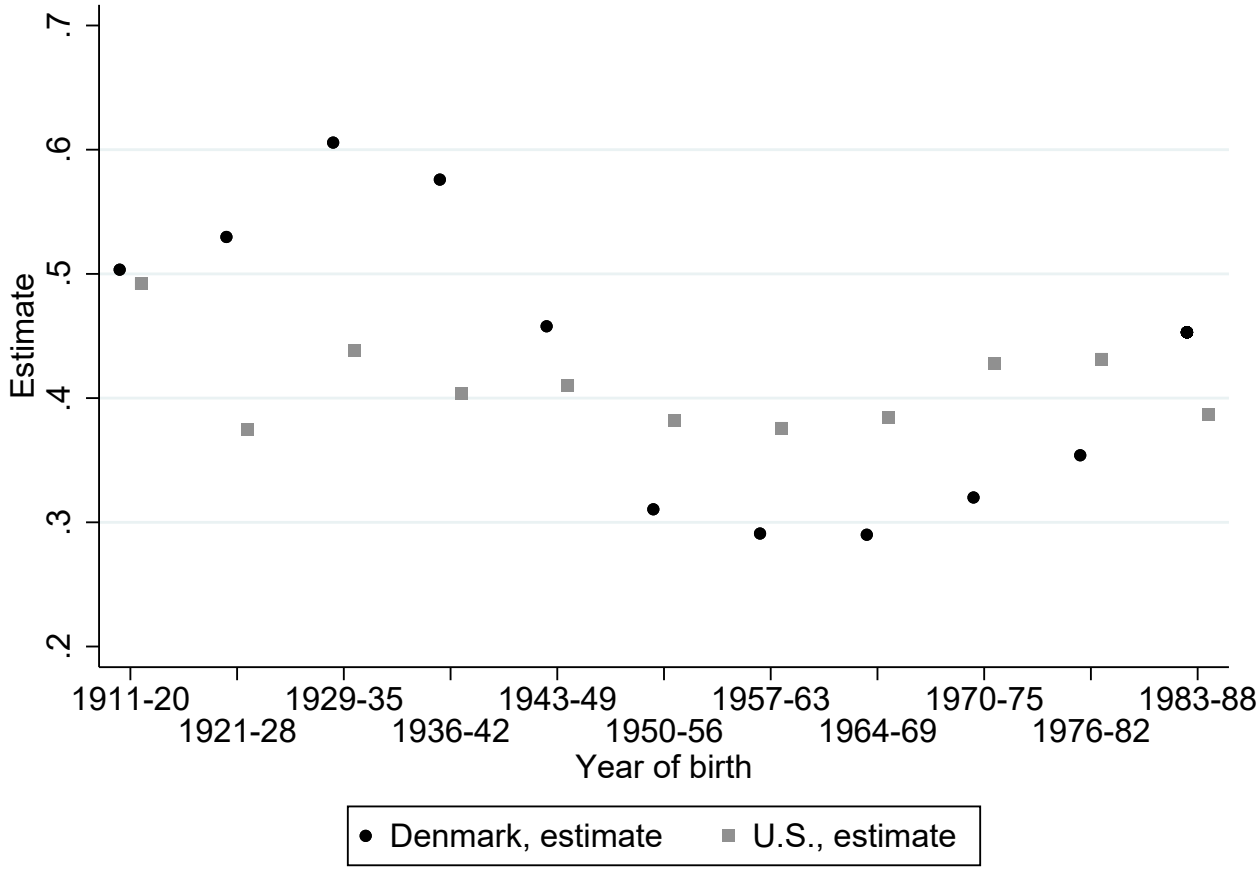
Source: Karlson and Landersø (2021).

Figure 23: Equal Access Is Not the Same as Equal Utilization 1—the Strongest Reap the Benefits: University Completion by Parents' Education



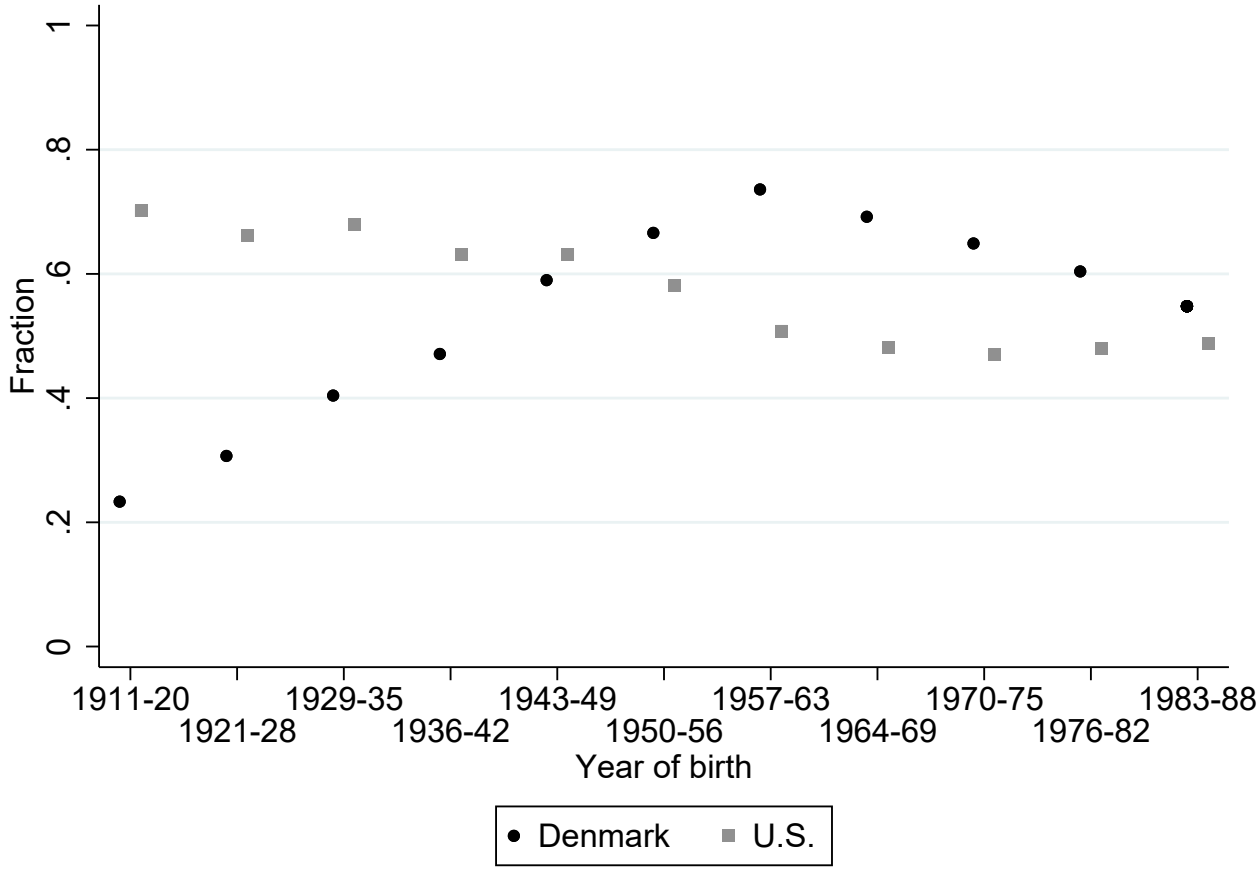
Source: Karlson and Landersø (2021).

Figure 24: Children's Years of Schooling Regressed on Parents' Years of Schooling: DK and US



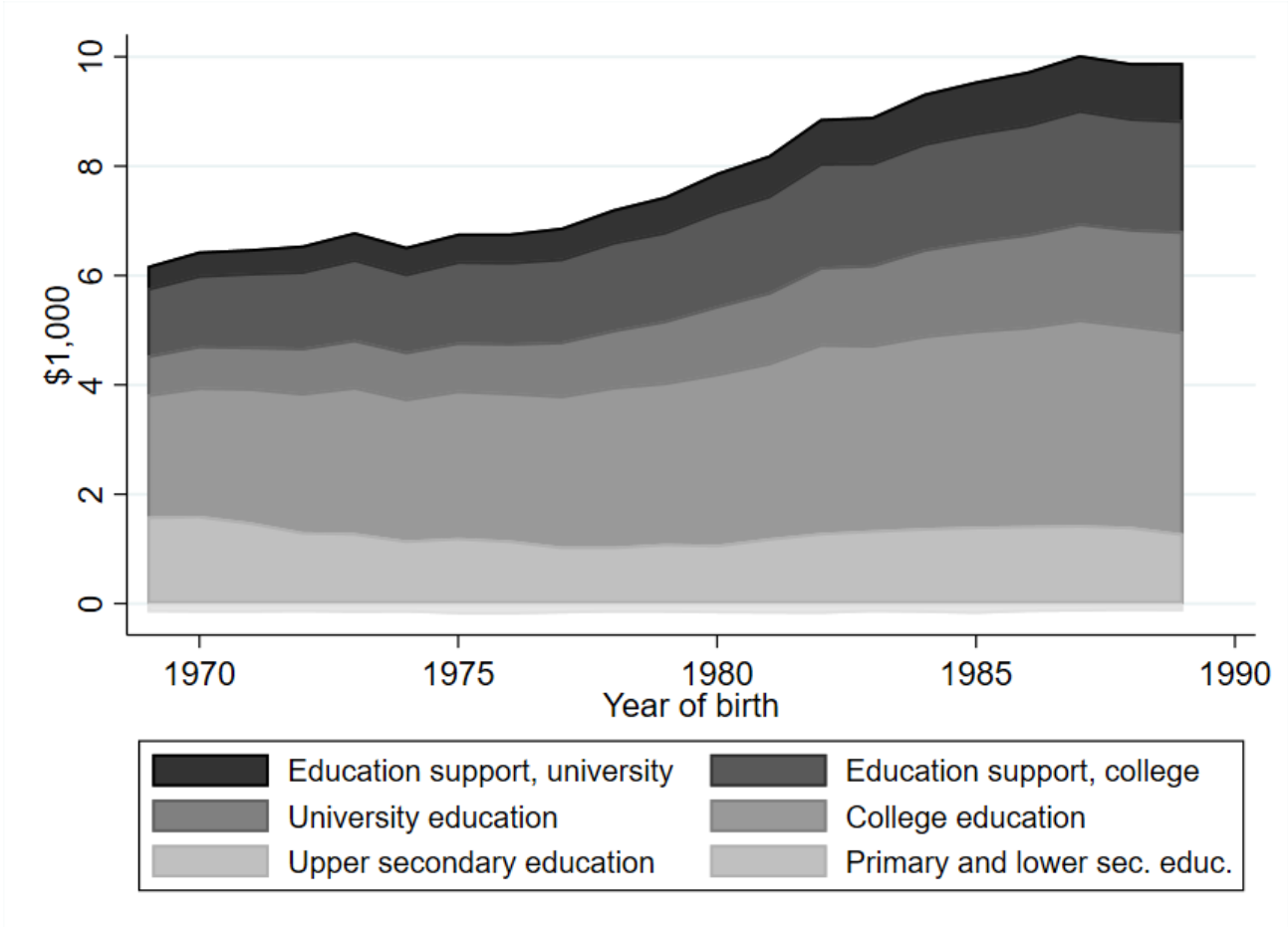
Source: Karlson and Landersø (2021).

Figure 25: Fraction of Children with Higher Education than Their Parents: DK and US



Source: Karlson and Landersø (2021).

Figure 26: Public Expenses to Education When Parents' Years of Schooling ↑ by 1 Year, Denmark



- College: 3 years postgrad
- University: 5 years

Source: Karlson and Landersø (2021).

Universal access and education support implies that the public sector dedicates expenditures to those who enroll into educations $\Longrightarrow$ an increasing proportion of public expenditures are dedicated to children from advantaged families.

A child born in 1989 could expect around $30,000 higher public expenditures on her education if her parents had college degrees compared to a child whose parents had high school degrees ≈ total tuition costs for a 4-year degree in a public institution in the U.S.

Policies aimed at inequality early in education ladder have most potential to reduce inequality in completed education and education expenses

Association between parents' years of schooling and children's years of schooling and education expenses in three policy scenarios, 1989 cohort:

		Policy simulations		
	(1) Actual estimate	(2) Increasing compulsory schooling to vocational training	(3) Changing aca. HS completion for children w. low-educ. parents	(4) Changing col. completion for children w. low-educ. parents
A) Years of schooling schooling	0.464	0.399	0.383	0.457
B) Public expenses	9.95	9.31	8.41	9.80

$$S_C = \alpha + \beta S_P + U$$

Source: Karlson and Landersø (2021).

Targeting Disadvantaged Children Yields the Highest Benefits

- Elango et al. (2016): Early Childhood Interventions most effective for disadvantaged.
- Kline and Walters (2016) show effects of Head Start for disadvantaged.
- Havnes and Mogstad (2011): Introduction of universal daycare in Norway: program effects are biggest for most disadvantaged.
- Dustmann et al. (2017) study an expansion of childcare in Germany and find similar results.
- Walters (2018) shows similar evidence for choice of charter schools.

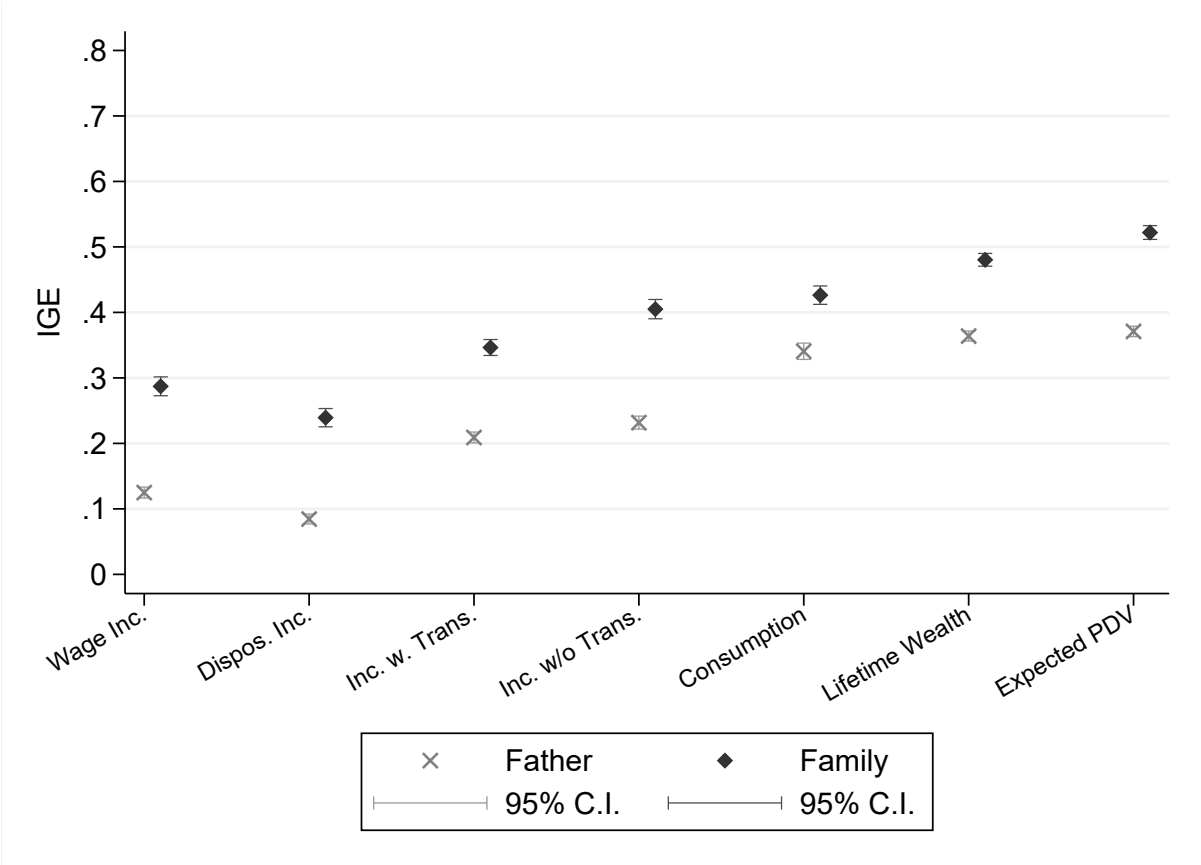
Intergenerational Transmission of Well-Being: Toward Lifetime Measures of Family Influence

- The traditional literature on intergenerational mobility focuses on matching the income of father to that of son over certain windows of age.
- It sometimes matches income of child's family income with family income of parent.
- We construct **lifetime measures** (both on individuals and on families).
- Investment in child skills is the outcome of a lifetime investment strategy by parents which we model.
- Long-term factors accounts for
  - (i) Age of marriage and cohabitation
  - (ii) Onset of fertility
  - (iii) Timing and spacing of births
  - (iv) Divorce

Lifetime Measures

- Measures of lifetime resources show a stronger link across generations than traditional measures.
- Compared to measures of father's income, family resources better predict child outcomes.
- Lifetime resources have a closer connection to economic decisions (e.g. investments in children) than resources averaged over a short panel.
- Lifetime measures paint a different picture of income mobility in Denmark: mobility is significantly lower than previously thought.
- Education is a major mediator.

Figure 27: Log-Log Estimates of Dependence across Generations

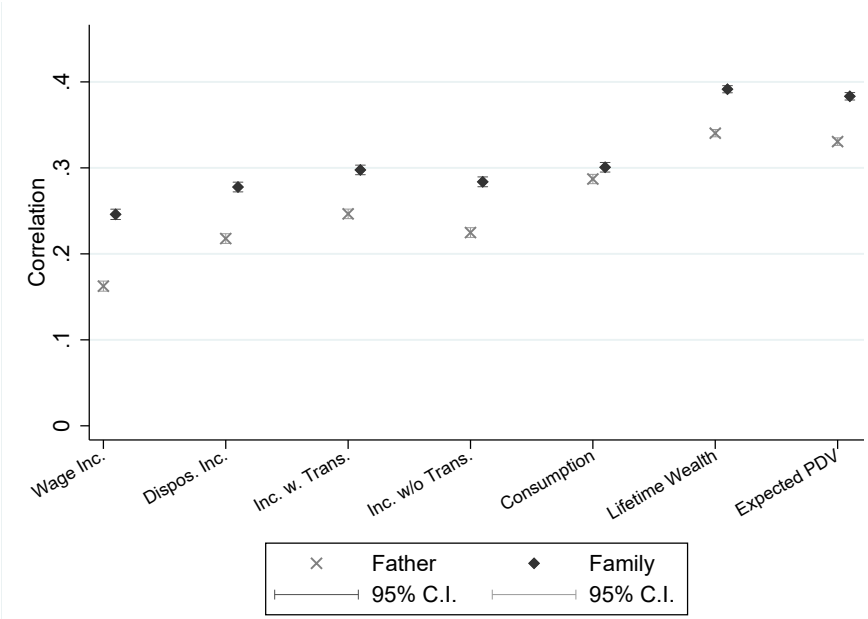


Source: Eshaghnia et al. (2022).

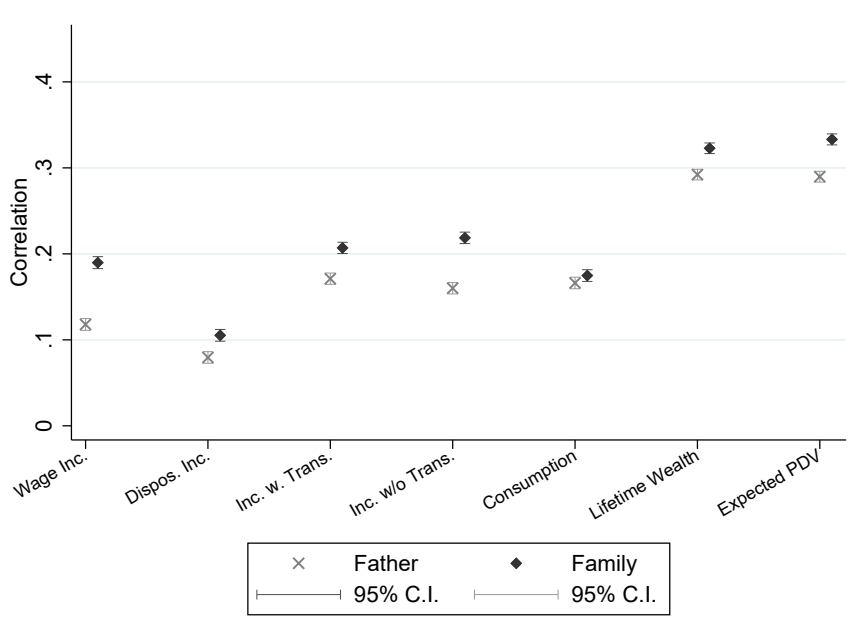
Same result for correlations, rank-rank estimates, etc.

Figure 28: Correlation between Parents' Resources and Child Outcomes

(a) Math Test Scores



(b) College Completion



Source: Eshaghnia et al. (2022).

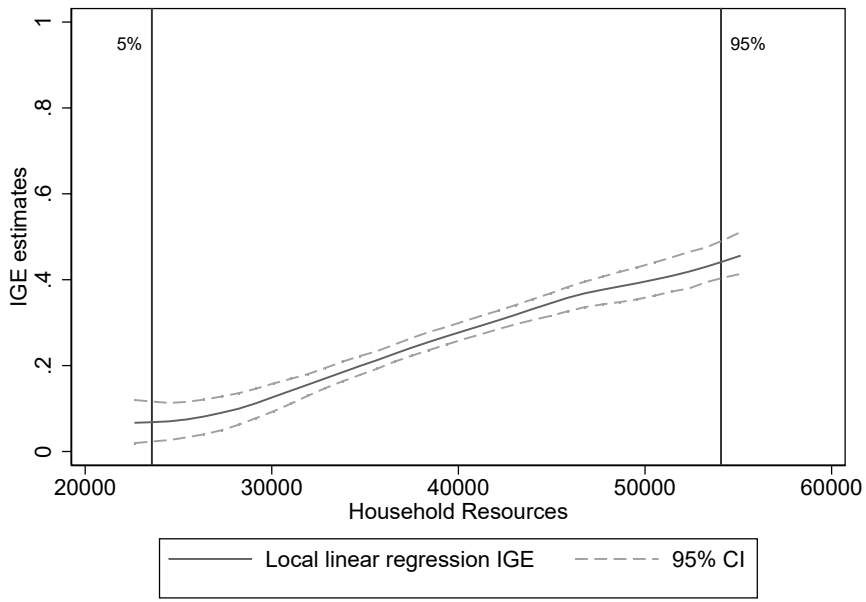
Same result when we consider test scores of other domains, years of schooling, crime, teen pregnancy, etc.

Lifetime measures manifest a much tighter link between parents and children than the snapshot measures of income that are currently used in the literature on intergenerational income mobility.

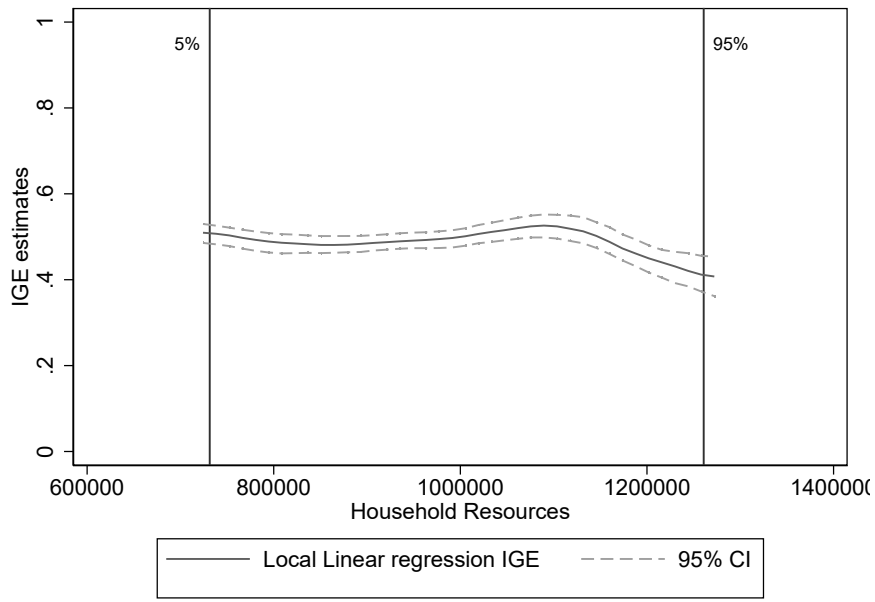
Not only do we overestimate mobility: **We mainly do so for children from affluent backgrounds.**

Figure 29: Non-Linear Intergenerational Income Elasticities

(a) Disposable Income Age 30–35

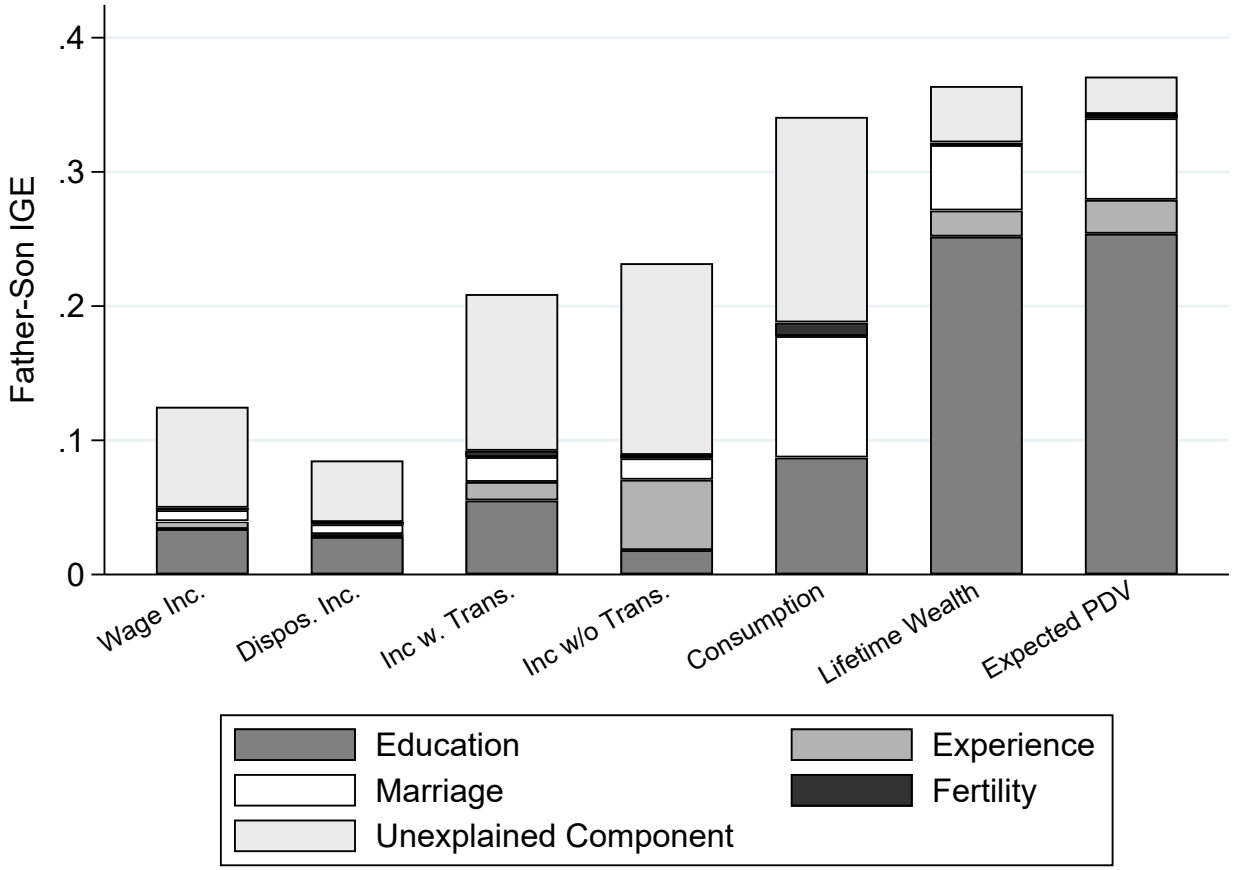


(b) Lifetime Wealth



Source: Eshaghnia et al. (2022).

Figure 30: What Explains the Lifetime Measures? Linking Back to Previous Results on Lifetime Measures and Establishing the Importance of Education



Source: Eshaghnia et al. (2022).

Summary

- Denmark is widely perceived to be a Garden of Eden by many politicians, public figures, and "informed" citizens around the world.
- Danish policies have been widely advocated.

- Our studies of Danish policy and evidence.
  - (a) For Denmark: less inequality and greater social mobility, in terms of income.
  - (b) Equality in earnings and IGE in earnings is a consequence of tax and transfer policy.
  - (c) Equalizes income and at the same time reduces the incentives of children to acquire skills.
  - (d) This equality is not a result of education and skills policies.
  - (e) Policies are generous and offered equally to all:
    - (i) Universal pre-K
    - (ii) Equal pay and financial resources for all schools everywhere
    - (iii) Extensive job training and retraining associated with its carrot-and-stick policy for unemployment insurance
    - (iv) Universal health care
    - (v) Free college
    - (vi) Generous work leaves for parents with newly-born children.

- Gaps in skills and lifetime outcomes (e.g., earnings, health, and crime) of children of the less educated and the more educated mothers about the same for the U.S. and Denmark, both quantitatively and qualitatively.

- We find strong evidence of sorting of families on income and education
- Advantages from universal access to services are reaped relatively more by the affluent rather than by the disadvantaged (Matthew Effects)
- "Power of place" is due to family sorting
  - Family **choice** of neighborhoods
  - Timing of choices not random (in contrast to influential claims otherwise)
  - Sorting patterns comparable to U.S.

- Sorting by teachers into more advantaged districts
- Despite equal wages for teachers; payment is in quality of students taught
- Neighborhood effects large through parental choices, not some intrinsic property of an address

- A life cycle–human wealth approach to measuring family influence and captures demographic changes across generations.
- Long-term measures of family income (value functions) much more predictive of child outcomes than currently used measures.
- Measures of Social Immobility higher for life cycle measures of family resources than traditional sources.

- The family plays an essential role in creating child skills and social immobility.
- The family operates through multiple channels.
- The goal of social policy should be to nourish and support parental love and desire to support its children.
- At the same time, recognize that this promotes inequality.
- Solution: **Target** disadvantaged children to promote equality of opportunity at early ages.

Sample construction for empirical analysis:

Analysis	Neighborhood	Permanent Inc.
Source	Danish registers	registers/survey
Sample	birth cohorts 1973/83	birth cohorts 1981/82
Years	1980-2018	1980-2018
Unit	family	father/family
Age: -Child	30 onward (up to 45)	30-35
-Parent	0-17 of child	0-17 of child

Return to main text