Social Mobility: A Progress Report

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Early Childhood Interventions

The Early Childhood Interventions Network (ECI) investigates the early origins of inequality and its lifetime consequences.

Network Leaders:
Pia Britto | Flavio Cunha | James J. Heckman | Petra Todd

Identity and Personality

The Identity and Personality Network (IP) studies the reciprocal relationship between individual differences and economic, social, and health outcomes.

Network Leaders:
Angela Duckworth | Armin Falk | Joseph Kable | Tim Kautz | Rachel Kranton

Inequality: Measurement, Interpretation, & Policy

The Inequality: Measurement, Interpretation, and Policy Network (MIP) studies policies designed to reduce inequality and boost individual flourishing.

Network Leaders:
Robert H. Dugger | Steven N. Durlauf | Scott Duke Kominers | Richard V. Reeves

Family Inequality

The Family Inequality Network (FI) focuses on the interactions among family members to understand the well-being of children and their parents.

Network Leaders:
Pierre-André Chiappori | Flavio Cunha | Nezih Guner

Health Inequality

The Health Inequality Network (HI) unifies several disciplines into a comprehensive framework for understanding health disparities over the lifecycle.
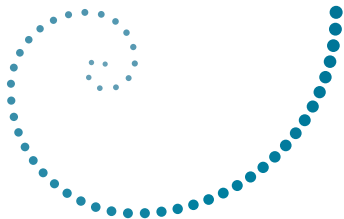
Network Leaders:
Christopher Kuzawa | Burton Singer

Markets

The Markets Network (M) investigates human capital financing over the lifecycle.

Network Leaders
Dean Corbae | Lance Lochner | Mariacristina De Nardi

CENTER FOR THE ECONOMICS
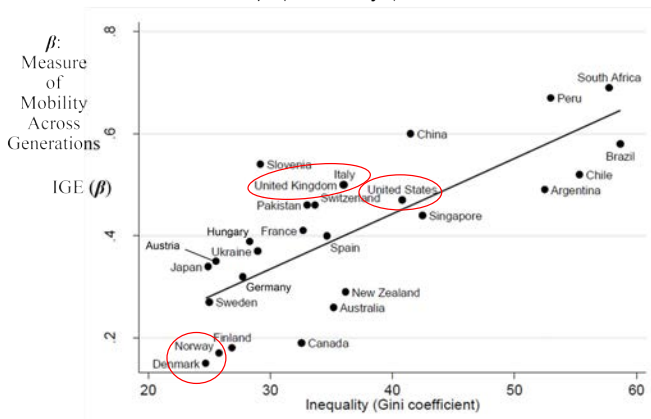OF HUMAN DEVELOPMENT
THE UNIVERSITY OF CHICAGO

Two Graphs that Dominate Current Discussions of Social Mobility

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

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

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

β: Measure of Mobility Across Generations

IGE (β)

South Africa
Peru
China
Brazil
Slovenia
Italy
United Kingdom
United States
Chile
Argentina
Pakistan
Switzerland
Singapore
Hungary
France
Austria
Ukraine
Spain
Japan
Germany
New Zealand
Sweden
Australia
Norway
Finland
Denmark
Canada

Inequality (Gini coefficient)

Note: Data points for Italy and the United Kingdom overlap.

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Figure 2: The Geography of Upward Mobility in the United States

Chances of Reaching the Top Fifth Starting from the Bottom Fifth by Metro Area

Denver 8.7%

Minneapolis 8.5%

Chicago 6.5%

Boston 10.4%

Washington DC 11.0%

San Jose 12.9%

Charlotte 4.4%

Atlanta 4.5%

Salt Lake City 10.8%

> 16.8%
12.9% - 16.8%
11.3% - 12.9%
9.9% - 11.3%
9.0% - 9.9%
8.1% - 9.0%
7.1% - 8.1%
6.1% - 7.1%
4.8% - 6.1%
< 4.8%
Insufficient Data

Note: Lighter Color = More Upward Mobility
Download Statistics for Your Area at www.equality-of-opportunity.org

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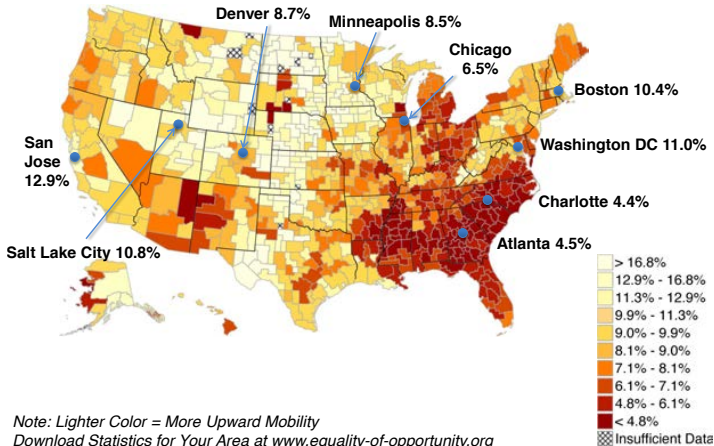
How to Interpret Any of These Relationships?

What Policies (If Any) Should Be Adopted to Promote Social Mobility? To Reduce Inequality?

Direction of Causality for Gatsby Curve

- Inequality $\uparrow \Rightarrow \beta \uparrow$?
- $\beta \uparrow \Rightarrow$ inequality $\uparrow$?
- Limited access to markets $\Rightarrow$ both $\beta \uparrow$ and inequality $\uparrow$?

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Understanding the Sources of Inequality and Social Immobility is Essential for Devising Effective Policies

Family? Schools? Neighborhoods? Peers?

Which Measure of Mobility to Use?

- Rank (positional) Mobility? (and in what distribution?)
- Absolute Mobility (child doing better than parent)?
- Mobility Within a Lifetime?

Recent Cohorts Doing Worse Than Previous Ones: Effects Concentrated Among Younger Entrants Within Cohorts

Figure 3: Percent of Children Earning More than their Parents By Parent Income Percentile
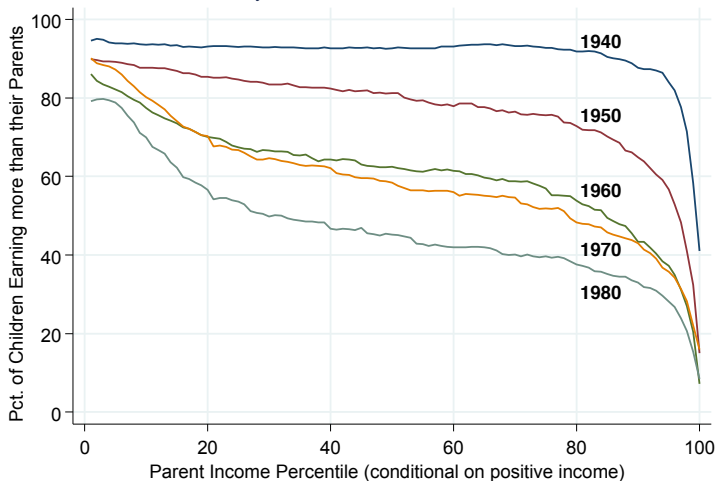
Source: Chetty et al. (2017)

Figure 4: Mean Rates of Absolute Mobility (Probability Children Do Better Than Parents) by Cohort
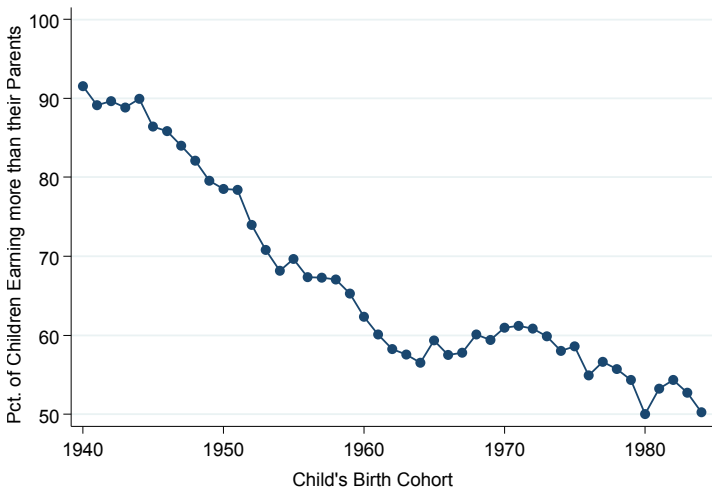
Source: Chetty et al. (2017)

Figure 5: Rising intergenerational elasticities (β)

Close Link Between Rise in Relative Wages of Skilled Labor and the IGE
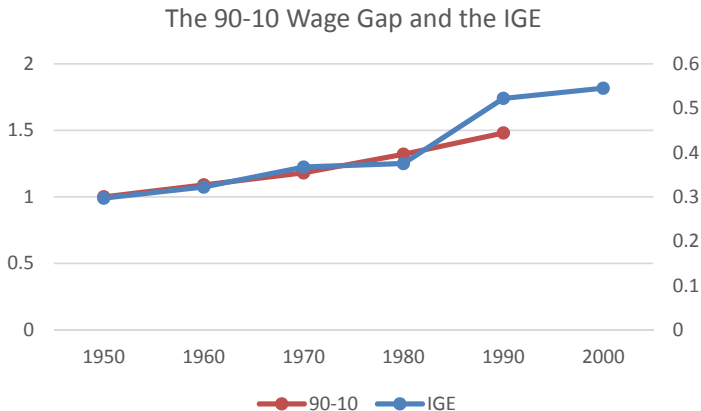
The 90-10 Wage Gap and the IGE

90-10 ● IGE ●

Figure 5: Rising intergenerational elasticities (β)

The Return to College and the IGE

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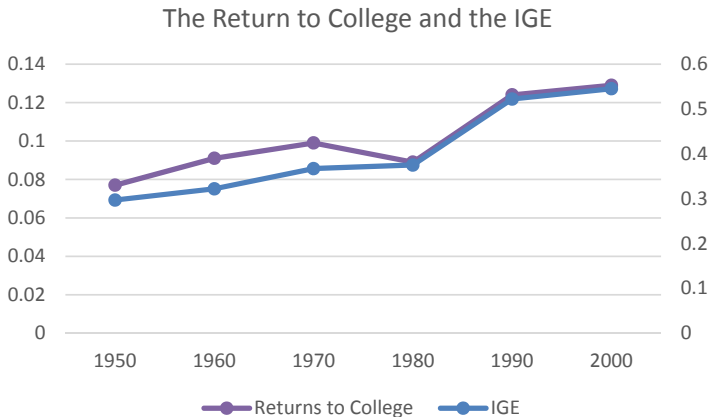
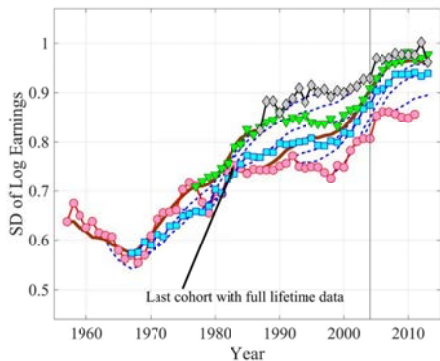## Figure 6: Median Lifetime Income by Cohort and Gender
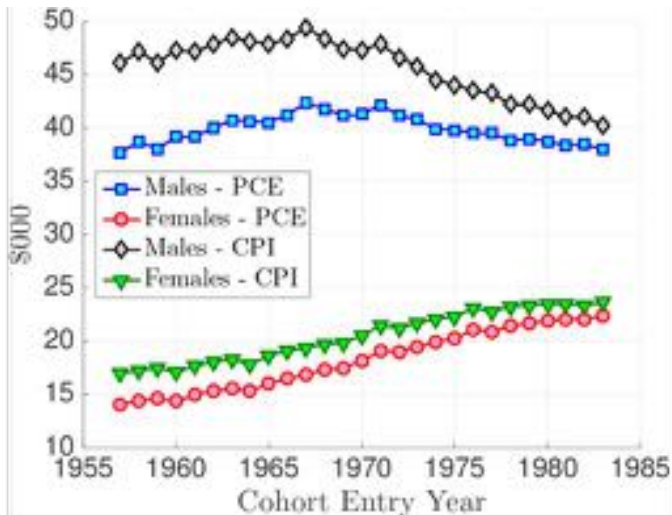
Source: Guvenen et al., 2017. "Lifetime Incomes in the United States over Six Decades."

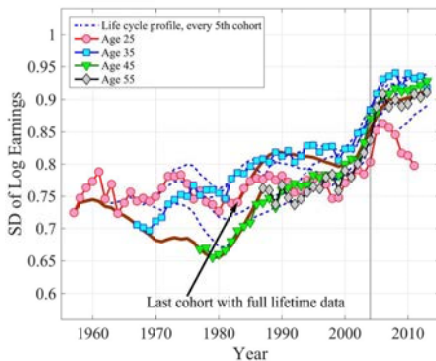Figure 7: Median Lifetime Income by Cohort (Across Males and Females)

Figure 8: Age Profiles of Cross-Sectional Inequality, by Cohort

(a) Std Dev. of logs, Men

(b) Std Dev. of logs, Women

Growth in Inequality is in Early Adult Years Across Cohorts

Figure 9: Qualified Military Available (QMA) Population, 17-24 Years Old (2013)

QMA I-IIIB: 13%

Not Qualified to Serve: 71%
Medical (including Overweight and Mental Health) 28% , Overlapping Reasons 31%, Drugs 8%, Conduct 1%, Dependents 2%, Aptitude 2%
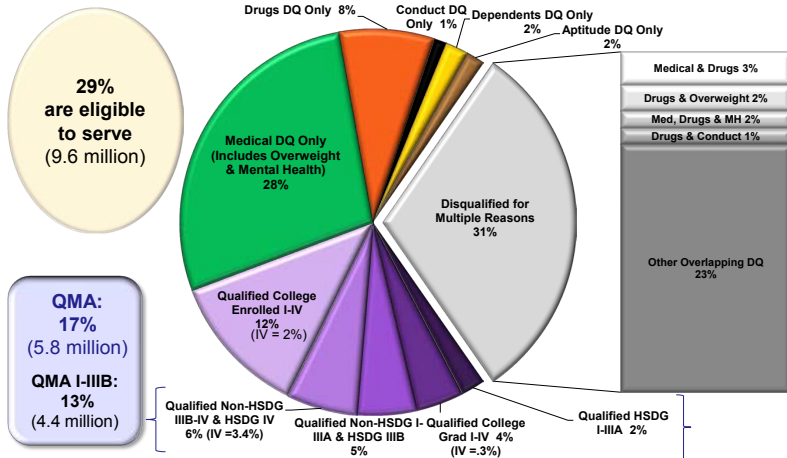
Qualified but not available due to college enrollment: 12%

Qualified and Available but score < 30th on the AFQT: 4%

Source: DoD QMA Study (2013).

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Figure 10: Qualified Military Available (QMA): 2013 Estimates

29% are eligible to serve (9.6 million)

Drugs DQ Only 8%

Conduct DQ Only 1%

Dependents DQ Only 2%

Aptitude DQ Only 2%

Medical DQ Only (Includes Overweight & Mental Health) 28%

Disqualified for Multiple Reasons 31%

Medical & Drugs 3%

Drugs & Overweight 2%

Med, Drugs & MH 2%

Drugs & Conduct 1%

Other Overlapping DQ 23%

Qualified College Enrolled I-IV 12% (IV = 2%)

QMA: 17% (5.8 million)

QMA I-IIIB: 13% (4.4 million)

Qualified Non-HSDG IIIB-IV & HSDG IV 6% (IV =3.4%)

Qualified Non-HSDG I-IIIA & HSDG IIIB 5%

Qualified College Grad I-IV 4% (IV =.3%)

Qualified HSDG I-IIIA 2%

Source: DoD Qualified Military Available (QMA) Study 2013. Youth ages 17-24.
Note: Percentages may not sum due to rounding.

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Social Mobility

What are the Sources of Inequality and Immobility?

  I. Taxes and transfers?
 II. Skills? Skill Premia? (supply-based policy)
III. Macroeconomic trends and policies?
IV. Interactions?

**Role of Taxes and Transfers in Post Tax-Transfer Outcomes**

Figure 11: Inequality (Gini Coecient) of Market Income and Disposable (Net) Income in the OECD Area, Working-Age Persons, 2014
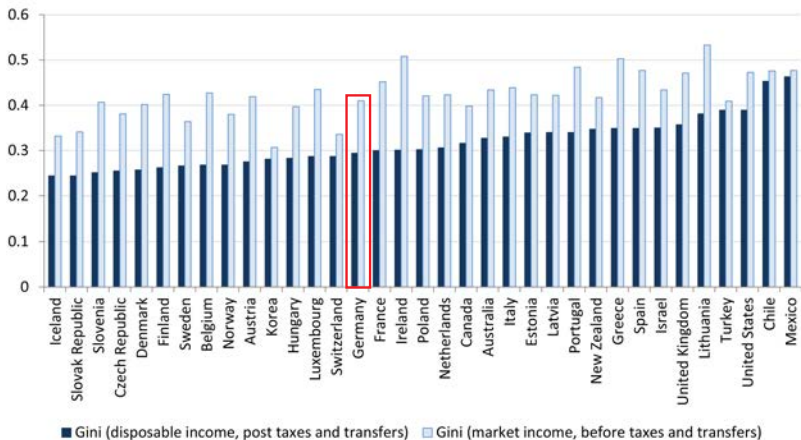
Sources of Growth in Inequality

Figure 12: OECD Inequality: Demographic changes were less important than labour market trends in explaining changes in household earnings distribution – Skills play an important role

Percentage contributions to changes in household earnings inequality, OECD average, mid-1980s to mid-2000s
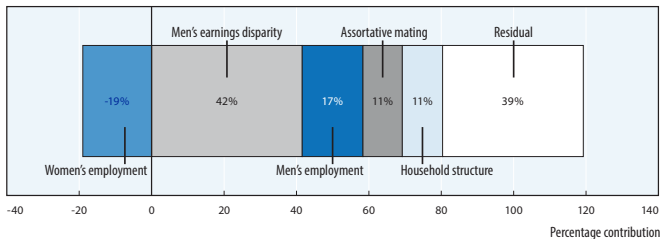
Note: Working-age population living in a household with a working-age head. Household earnings are calculated as the sum of earnings from all household members, corrected for differences in household size with an equivalence scale (square root of household size). Percentage contributions of estimated factors were calculated with a decomposition method which relies on the imposition of specific counterfactuals such as: "What would the distribution of earnings have been in recent year if workers' attributes had remained at their early year level?"
Source: Chapter 5, Figure 5.9, OECD (2013).

Figure 13: Estimated Average Annual Percentage Change in Various Inequality Measures Accounted for by Factor Components, US 1979–2007

	Gini	P90/P10
Actual	0.4	0.82
Household Structure	23%	33%
Men's Employment	5%	5%
Men's Earning Disparity	73%	50%
Women's Employment	-25%	-22%
Women's Earning Disparity	20%	29%
Assortative Mating	10%	11%
Other	-5%	-6%

Fostering Skills to Promote Social Mobility and Reduce Inequality?

A Comprehensive Approach to Skills-Oriented Social Policy: Efficient Redistribution to Promote Mobility Within and Across Generations

Modern Approach Recognizes:

(1) Fundamental importance of skills in modern economies
(2) Multiplicity of skills
(3) The multiple sources producing skills
    (a) Schools
    (b) Families
    (c) Neighborhoods and peers
    (d) Firms
(4) The importance of supporting and incentivizing all of these sources of skill
(5) Recent knowledge on effective targeting of skills
(6) Great need for evaluations accounting for costs and benefits measured in terms of social opportunity costs

A Skills-based Policy Tackles Many Aspects of Poverty, Inequality, and Social Mobility

A Unified Approach to Policy

Avoids Fragmented Solutions

- Current policy discussions have a fragmented quality.

Solves Problems As They Arise
**"The Squeaky Wheel Gets the Grease"**

Is Prevention Efficient? How Well Can We Target?

**Evidence on the Effectiveness of Early Targeting to Promote Skills (Including Character Skills)**

- 80% of adult social problems regarding health, healthy behaviors, crime and poverty are due to 20% of the population.
- Reliable indicators of these problems by age 5 (Caspi et al., 2016).

Childhood Forecasting of a Small Segment of the
Population with Large Economic Burden
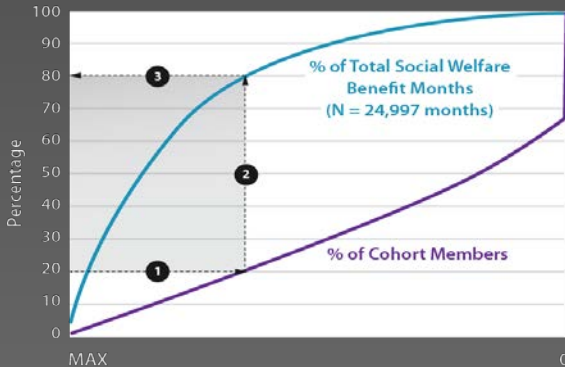Caspi, Moffitt, et al. (2017)
Nature Human Behaviour
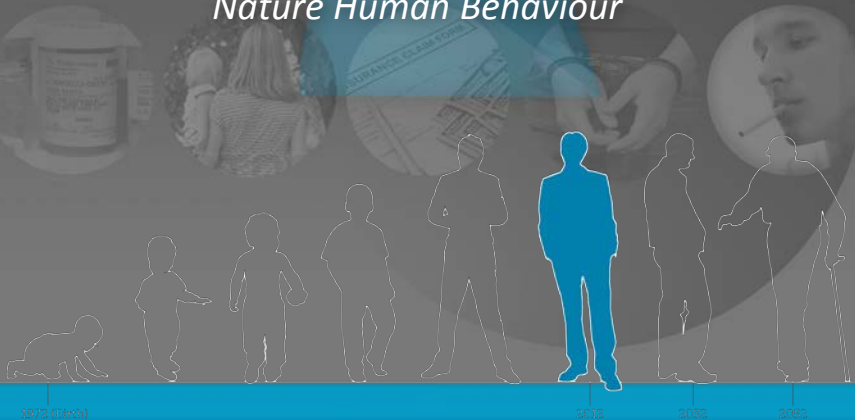
The Pareto Principle
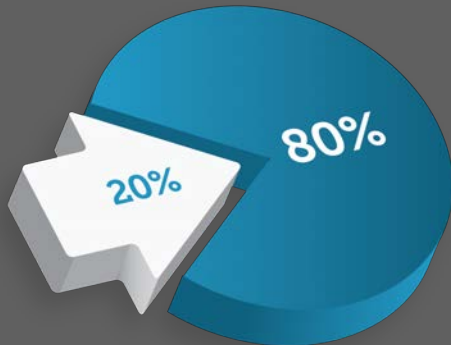
20% of the Actors Account for **80%** of the Results.
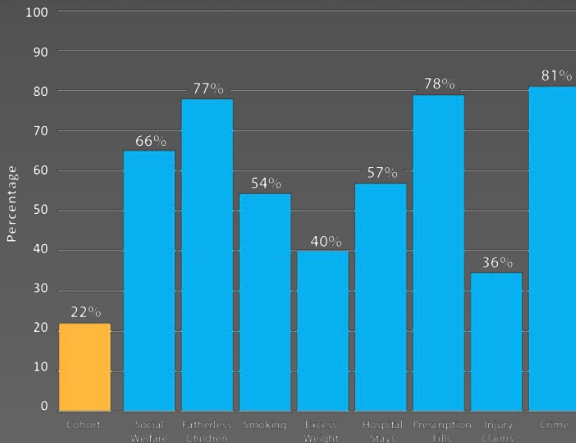
Vilfredo Pareto, 1848-1923

Social Welfare Benefit Months

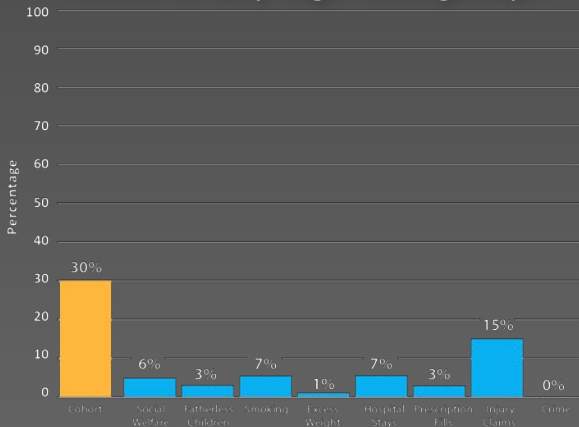20% of Cohort Members = 80% of Total Social Welfare Benefit Months

Link to Additional Caspi et al. Slides

The High-need/High-cost Group in 3 or more sectors: How many health/social services do they use?

Small Footprint of cohort members never in any high-cost group:

Childhood Risk Factors to Describe
High-cost Actor Groups:
Composites across ages 3, 5, 7, 9, 11

- IQ
- Self-control
- SES (socio-economic status)
- Maltreatment

Adam Smith Wrong: People at Age 8 Are Vastly Different in Skills

Summary of findings

- 20% of people contribute 80% of social/health problems.

- A high-need/high-cost population segment uses ~half of resources in multiple sectors.

- Most high-need/high-cost people in this segment share risk factors in the first decade of life;

- Prediction is stronger than thought; AUC approaches .90.

- Brain integrity in the first years of life is important.

Seen in this way, early-life risks seem important enough to warrant investment in early-years preventions.

Exploit Understanding That Skill Deficits Are An Important Source of Many Social Problems

Skill Development

The Importance of Cognition and Character

(a) Major advances have occurred in understanding which human capacities matter for success in life.

(b) Cognitive ability as measured by IQ and achievement tests is important.

(c) So are the **socio-emotional skills** – sometimes called character traits or personality traits:

- Motivation
- Sociability; ability to work with others
- Attention

- Self Regulation
- Self Esteem
- Ability to defer gratification
- Health and Mental Health

- **Beyond PISA scores**

Link to Report PDF
http://tinyurl.com/OECD-Report-2014

Cognitive and Socioemotional Skills Determine:

(a) Crime
(b) Earnings
(c) Health and healthy behaviors
(d) Civic participation
(e) Educational attainment
(f) Teenage pregnancy
(g) Trust
(h) Human agency and self-esteem

Skill Gaps Open Up Early

- Gaps in skills across socioeconomic groups open up very early:
    - Persist strongly for cognitive skills
    - Less strongly for noncognitive skills
- Skills are not set in stone at birth—but they solidify as people age. They have genetic components.
- Skills evolve and can be shaped in substantial part by investments and environments.

Figure 14: Mean Achievement Test Scores by Age by Maternal Education
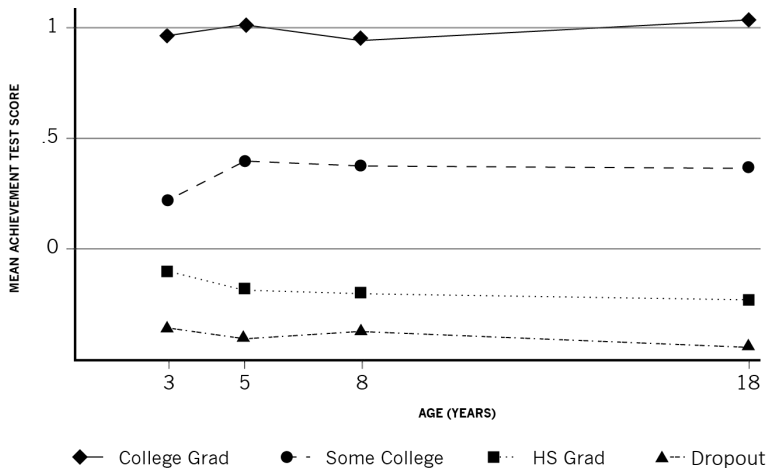
Figure 15: Gaps throughout life, by mother's level of education, Denmark
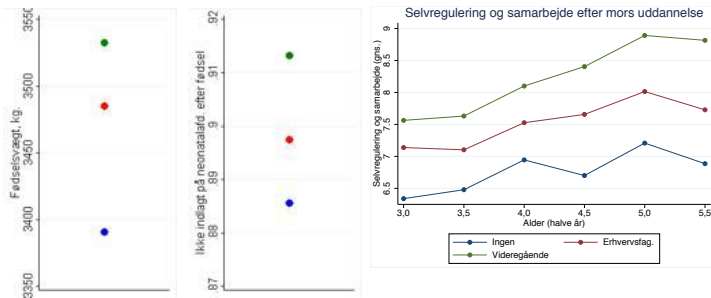
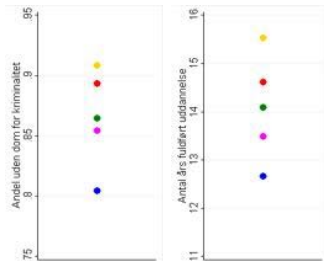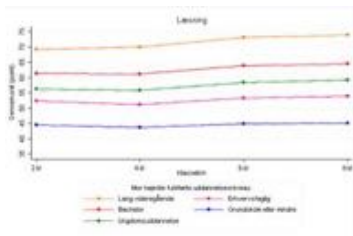| Age:	0 yrs	0 yrs	3–5 yrs
Outcome:	Birth weight	Not admitted to neo-natal ward	Score for self-regulation
Unit:	Gram	Fraction	Rating

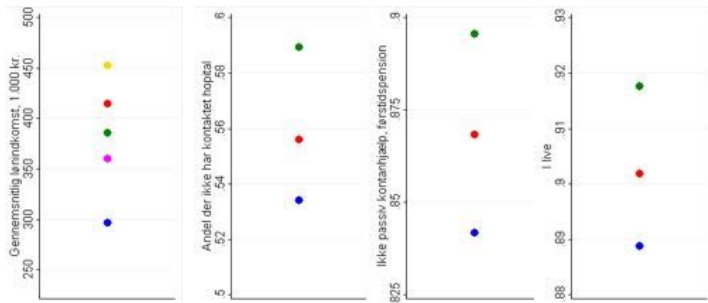Figure 15: Gaps throughout life, by mother's level of education, Denmark, Cont'd

Age:	8–14 yrs	25 yrs	30 yrs
Outcome:	Test scores, Danish in national tests	No criminal conviction	Years of schooling
Unit:	Test score	Fraction	Years

Figure 15: Gaps throughout life, by mother's level of education, Denmark, Cont'd

Age:	40 yrs	40–50 yrs	54 yrs	60 yrs
Outcome:	Wage earnings	Not contacted a hospital	In the labor force	Alive
Unit:	1.000DKK	Fraction	Fraction	Fraction

How to Interpret This Evidence

- Evidence on the early emergence of gaps leaves open the question of which aspects of families are responsible for producing these gaps.

- Genes? Eugenics?

- Parenting and family investment decisions?

- Family environments? Neighborhood, peer, and sorting effects?

- The evidence from a large body of research demonstrates an important role for investments and family and community environments in determining adult capacities above and beyond the role of the family in transmitting genes.

- The quality of home environments by family type is highly predictive of child success.

- Home environments can be strengthened in a voluntary fashion.

**Genes, Biological Embedding of Experience,
and Gene-Environment Interactions**

Genes Do Not Explain Time Series Trends or Intercountry Differences

Link to Image of DNA Methylation

Family Environments and Child Outcomes

- In the USA, children enter school with "meaningful differences" in vocabulary knowledge.

1. Emergence of the Problem

In a typical hour, the average child hears:

Family Status	Actual Differences in Quantity of Words Heard	Actual Differences in Quality of Words Heard
Welfare	616 words	5 affirmatives, 11 prohibitions
Working Class	1,251 words	12 affirmatives, 7 prohibitions
Professional	2,153 words	32 affirmatives, 5 prohibitions

2. Cumulative Vocabulary at Age 3

Cumulative Vocabulary at Age 3	
Children from welfare families:	500 words
Children from working class families:	700 words
Children from professional families:	1,100 words

Child Home Environments are Compromised:
A Growing Trend World-wide

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Figure 16: Children Under 18 Living in Single Parent Households by Marital Status of Parent
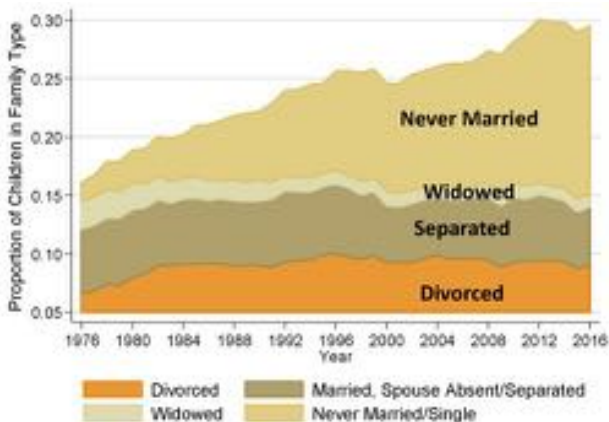
Note: Parents are defined as the head of the household. Children are defined as individuals under 18, living in the household, and the child of the head of household. Children who have been married or are not living with their parents are excluded from the calculation. Separated parents are included in "Married, Spouse Absent" Category.
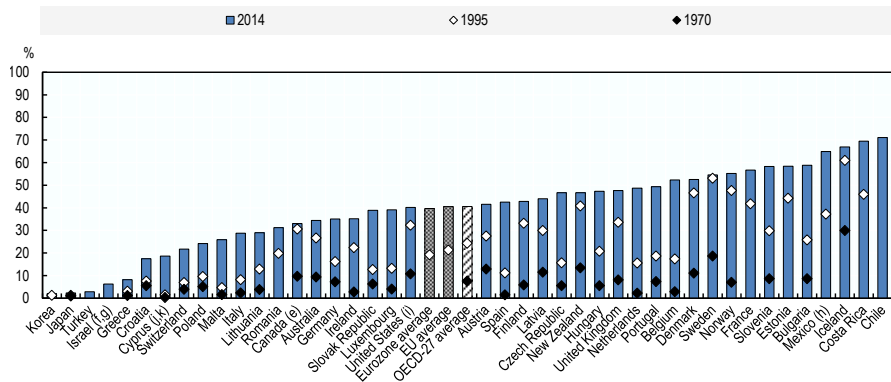Source: IPUMS March CPS 1976-2016.

Figure 17: Proportion of Live Births Outside Marriage
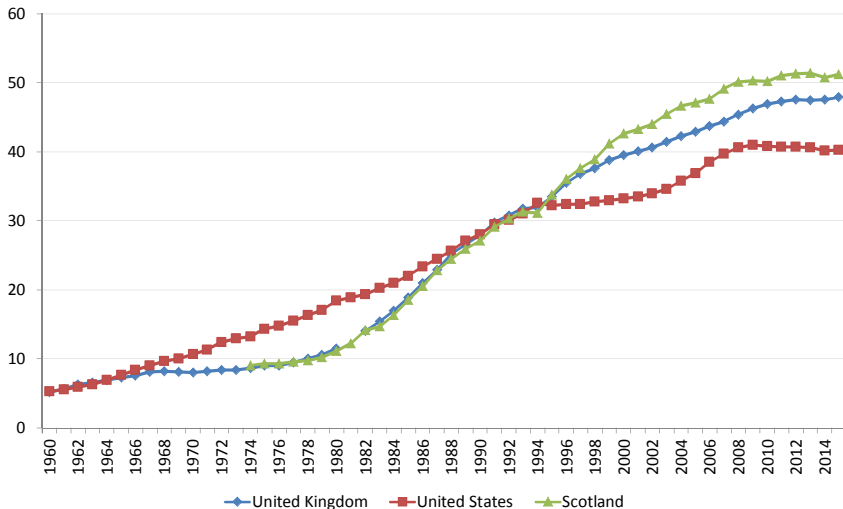
*Source*: Eurostat, CDC and National record of Scotland.

Figure 18: Share of births outside of marriage, 1970[a], 1990[b] and 2014 or latest available year[c] — Proportion (%) of all births where the mother's marital status at the time of birth is other than married[b]
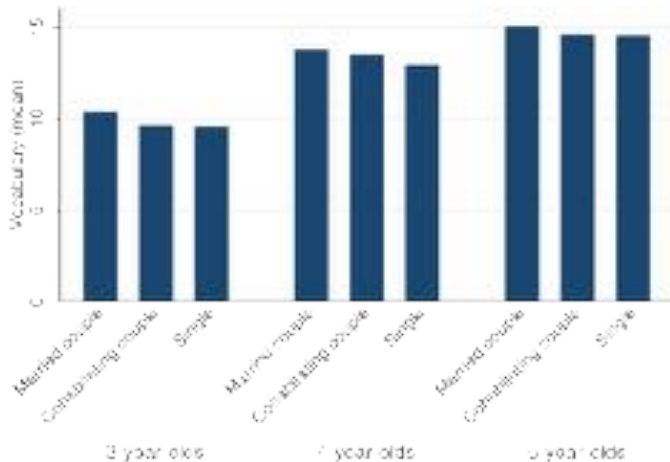
Source: OECD Family Database

Consequences of Cohabitation

Figure 19: Self-Regulation and Cooperation by Family Status
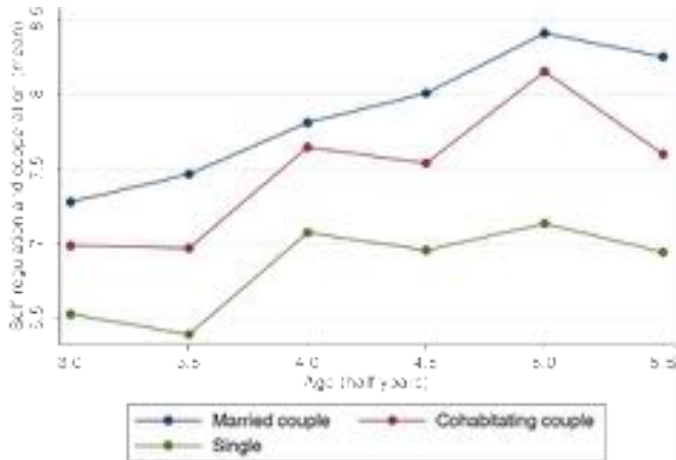
Figure 20: Vocabulary by Family Status

Link to Additional Figures

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Figure 21: Empathy by Family Status
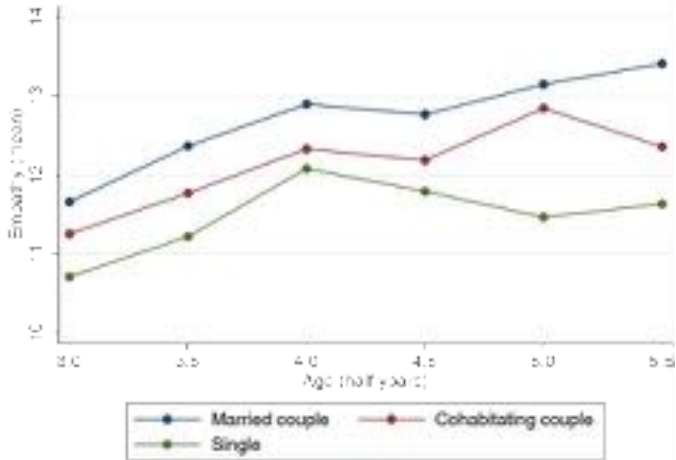
Source: 'Daycare of the Future', Bleses and Jensen (2017)

These Relationships Remain Strong Even After Controlling for Parental Income and Education and Other Measures of Skills
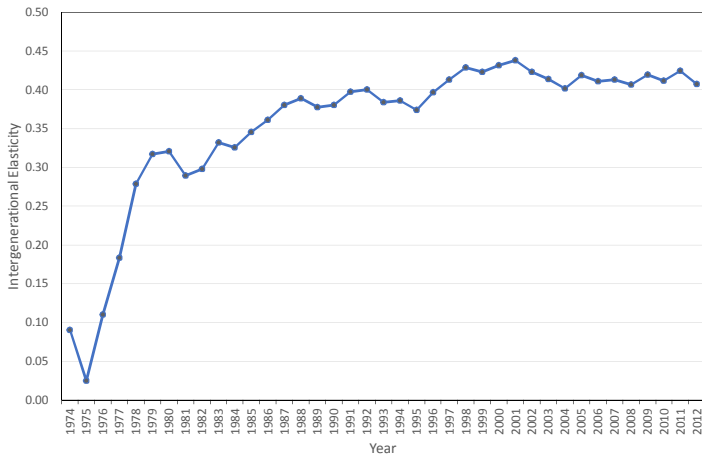
Link to Additional Figures (Children from Denmark)

Is Family Influence Just About Money?

Alms to the Poor? The Traditional Approach

Great Society Programs Tried This to End Intergenerational Poverty

Figure 22: Trends in the Intergenerational Correlation of Welfare Participation

Source: Hartley et al. 2016
Note: Welfare participation includes AFDC/TANF, SSI, Food Stamps and Other Welfare.

Welfare Subsidized Poverty Enclaves – Detached The Poor from Society

**The Dynamics of Skill Formation:
Two Notions of Complementarity**

Static Complementarity

- The productivity of investment greater for the more capable.
  - **High returns for more capable people: Matthew Effect**
  - **Does this justify social Darwinism?**
  - On grounds of economic efficiency, should we invest primarily in the most capable?
  - **Answer: It depends on where in the stage of the life cycle we consider the investment.**

Dynamic Complementarity

- If we invest today in the base capabilities of disadvantaged young children, there is a huge return.
- Makes downstream investment more productive.
- **No necessary tradeoff between equality and efficiency goals**.
- Augmenting this investment by public infrastructure and schools gives agency to people and enhances economic and social functioning.

- Both processes are at work.
- No necessary contradiction.
- Investing early creates the skill base that makes later investment productive.
- Effective targeting.

Skills Beget Skills

Social-emotional Skills ➡ **Cognitive Skills, Health**

(sit still; pay attention; engage in learning; open to experience)

Health ➡ **Cognitive Skills, Noncognitive Skills**

*(fewer lost school days; ability to concentrate)*

Cognitive Skills ➡ **Produce better health practices; produce more motivation; greater perception of rewards.**

(child better understands and controls its environment)

Outcomes: increased productivity, higher income, better health, more family investment, upward mobility, reduced social costs.

Figure 23: Life Cycle Developmental Framework
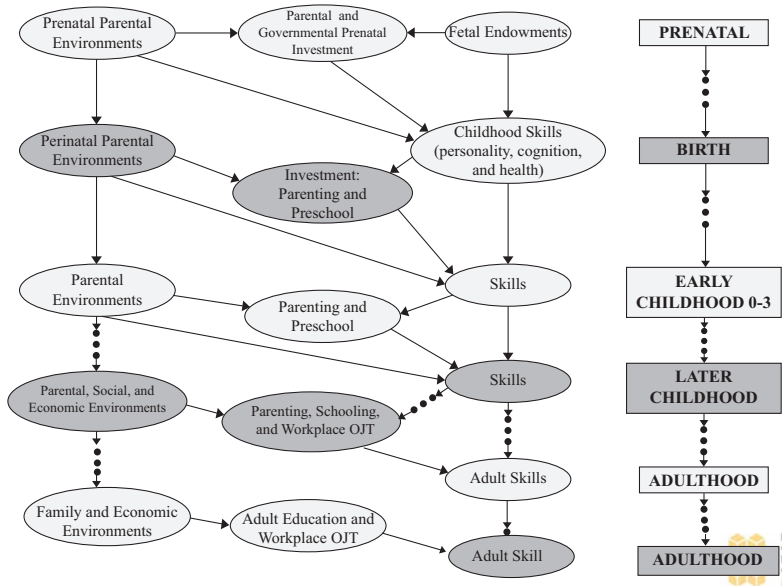
Modern Understanding of the Dynamics of Skill Formation Causes Us to Rethink Traditional Distinctions in Philosophy and Political Science

Raises Question of How and When Merit Acquired?
Merit vs. Chance vs. Effort Distinctions Currently Used in
Philosophy and Political Science Literature Are Without Much
Empirical Content

50% of Inequality in Lifetime Earnings Due to Factors in Place by Age 18
Cunha et al. (2005)

- John Roemer (2017) Reports a Similar Estimate

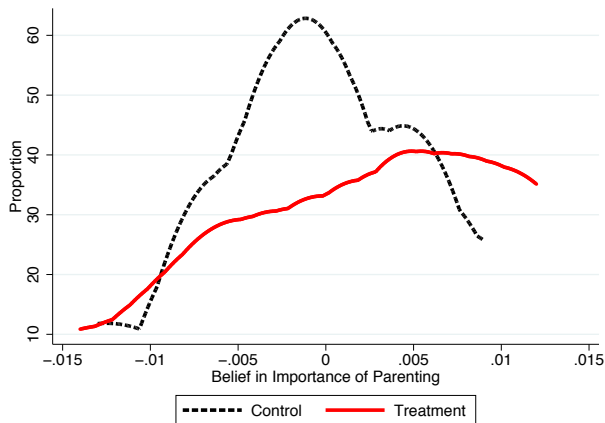## Powerful Evidence For Effectiveness of Targeted Interventions Across the Life Cycle

- Contradicts The Eugenics Argument

Perry Preschool Project

Starts at Age 3
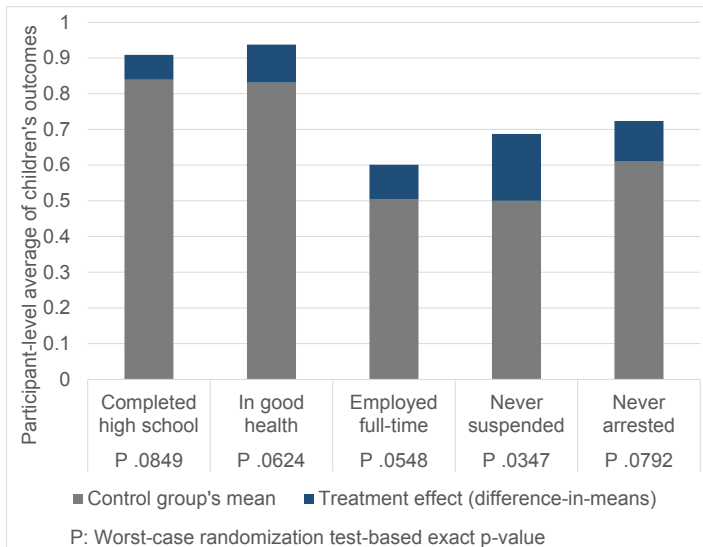**2 hrs a Day – Two Years 10% Rate of Return Per Dollar Invested**

Enriches Home Lives of Children Outside of Childcare Center
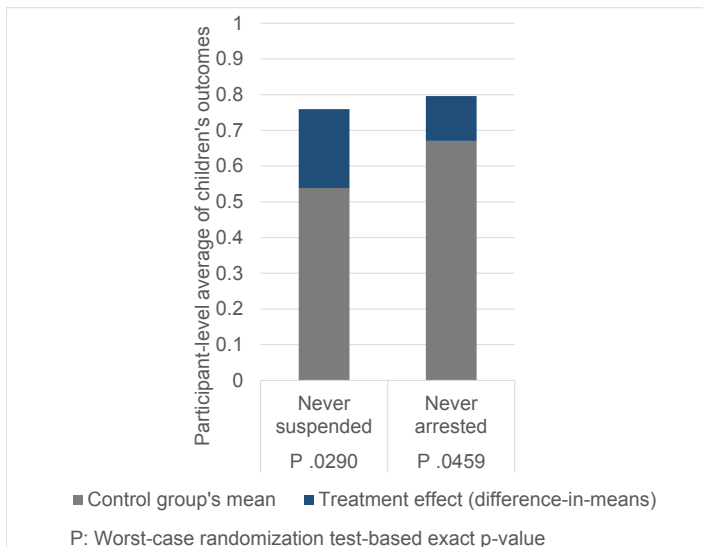Keeps Parental Engagement Active Long After the Children Leave Pre-K

Intergenerational Effects of Perry Program

Selected Outcomes for All Children of the Perry Participants
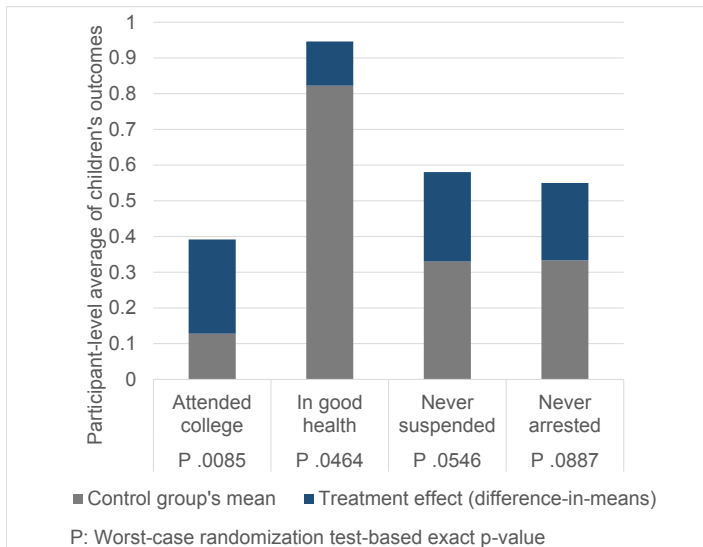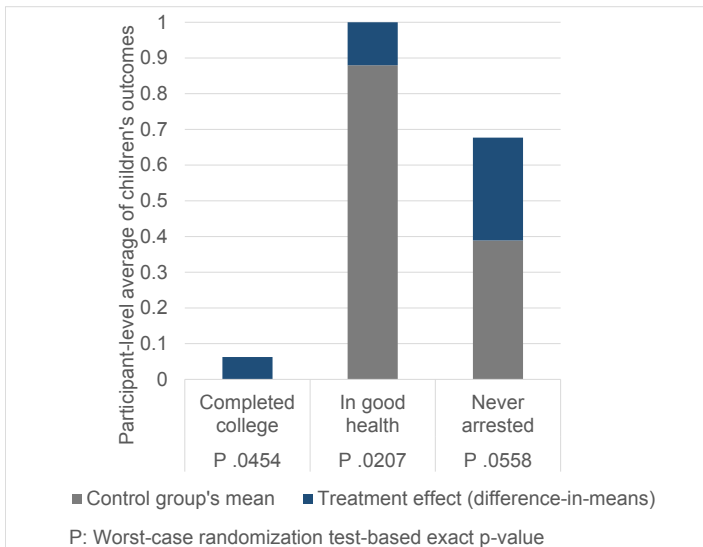
Selected Outcomes for Male Children of the Perry Participants

Selected Outcomes for Male Children of the Male Participants

Selected Outcomes for Male Children of the Female Participants

Y-axis: Participant-level average of children's outcomes (0 to 1)

Categories:
- Attended college — P .0205
- Never suspended — P .0593

Legend: ■ Control group's mean ■ Treatment effect (difference-in-means)

P: Worst-case randomization test-based exact p-value
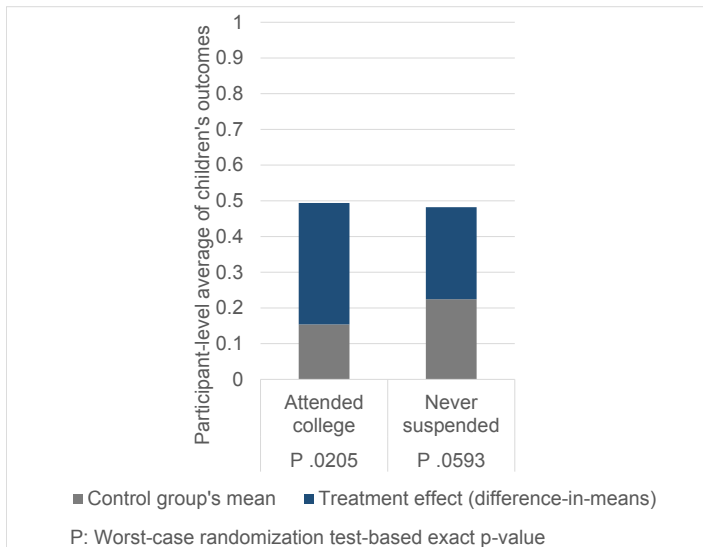
The Carolina Abecedarian CARE Project
Starts at Birth
Foundation for Educare

Figure 24: Abecedarian Project, Health Effects at Age 35 (Males)

	Treatment Mean	Control Mean	Treatment p-value
Systolic Blood Pressure	125.79	143.33	0.018
Diastolic Blood Pressure	78.53	92.00	0.024
Pre-Hypertension	0.68	0.78	0.235
Hypertension	0.10	0.44	0.011
HDL Cholesterol	53.21	42.00	0.067
Cholesterol/HDL-C	3.89	4.69	0.057
Abdominal Obesity	065	0.87	0.136
Metabolic Syndrome	0.00	0.25	0.009

Source: Campbell, Conti, Heckman, Moon, Pinto, Pungello, and Pan (2014).

Substantial Lifetime Benefits

Figure 25: Net Present Value of Main Components of the Cost/benefit Analysis Over the Life-cycle, ABC/CARE Males and Females

Per−annum Rate of Return: 13% (s.e. 5%). Benefit−cost Ratio: 5.6 (s.e. 2.39)
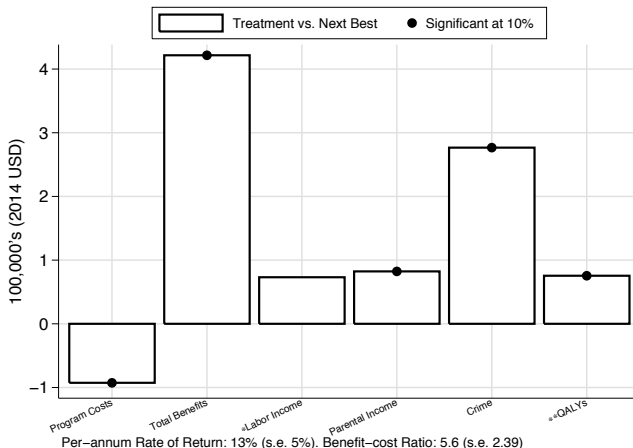
- Overall: 13.7% per annum
- Males: 14% per annum
- Females: 10% per annum

Enhances Parent-Child Engagement
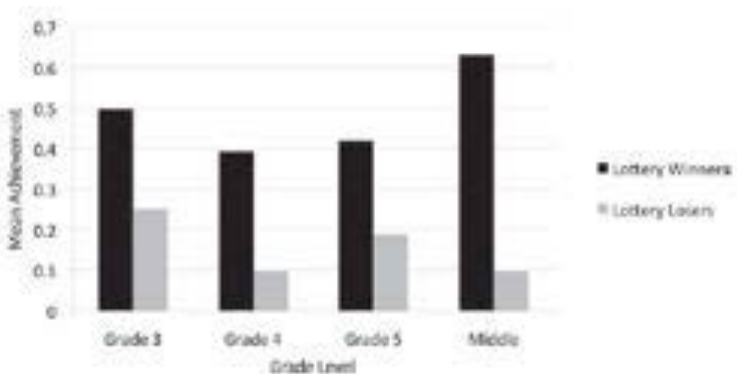
Home Visiting Programs
Enhance Parent-Child Interactions

The Jamaica Study:
Grantham-McGregor et al.
Low Cost and Effective

Preparing For Life (PFL, 2016)
Home Visiting in Ireland – Orla Doyle

Enriched Charter Schools Starting at Age 4
Feature Mentoring Through Elementary School

Figure 26: Achievement Test Results by Grade (UCCS)

Source: Hassrick, E. M., Raudenbush, S. W., & Rosen, L. S. (2017)

**Organizational Change Coupled With Substantial Mentoring
and Personalized Education Account for Success of UCCS**

Beneficial Causal Outcomes of Education
(Heckman, Humphries, and Veramendi, 2016)

1. Self-reported health
2. Voting
3. Trust
4. Employment
5. Wages
6. Participation in welfare
7. Depression
8. Self-esteem
9. Incarceration
10. Health related work limitations
11. Smoking
12. White-collar employment

Strength of Effect Differs by Grade Attained and Varies Over Outcomes

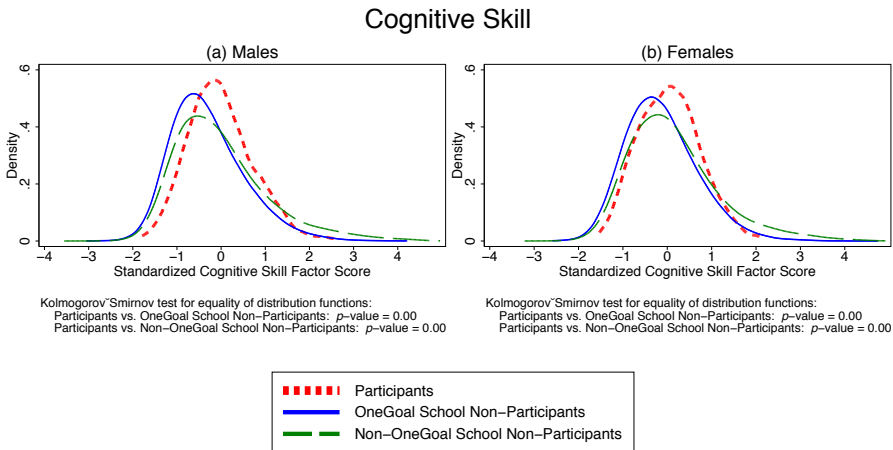### Work Experience and On-the-Job Training

- Learning-by-doing (and sometimes failing) is a major source of learning
- Learning by imitation

The policies that are effective for adolescents provide mentoring and often integrate schooling and work. At the core of effective mentoring is what is at the core of effective parenting: attachment, interaction, and trust. Effective policies focus on developing social and emotional skills, teaching conscientiousness.

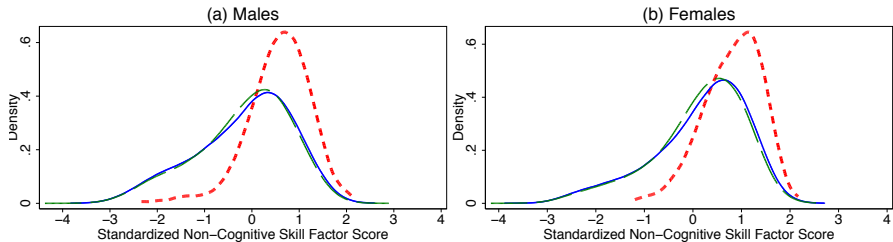# Mentoring: Age-Adjusted Parenting

One Goal: Adolescent Mentoring

Figure 27: Distribution of Cognitive and Non-Cognitive Skills for OneGoal Participants and Non-Participants

Cognitive Skill

(a) Males

(b) Females

Kolmogorov~Smirnov test for equality of distribution functions:
   Participants vs. OneGoal School Non–Participants: *p*–value = 0.00
   Participants vs. Non–OneGoal School Non–Participants: *p*–value = 0.00

Kolmogorov~Smirnov test for equality of distribution functions:
   Participants vs. OneGoal School Non–Participants: *p*–value = 0.00
   Participants vs. Non–OneGoal School Non–Participants: *p*–value = 0.00

- Participants
- OneGoal School Non–Participants
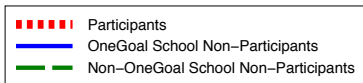- Non–OneGoal School Non–Participants

Source: Kautz and Zanoni (2014)

Figure 27: Distribution of Cognitive and Non-Cognitive Skills for OneGoal Participants and Non-Participants, Cont'd
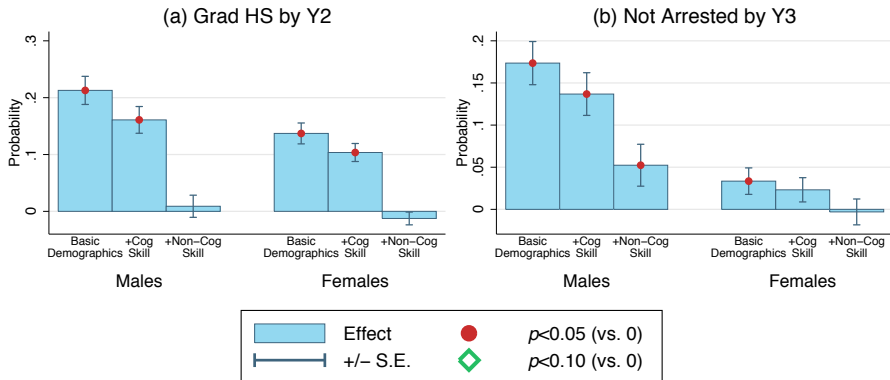

Non–Cognitive Skill

Source: Kautz and Zanoni (2014)

Figure 28: Treatment Effects for Main Outcomes

Figure 28: Treatment Effects for Main Outcomes, Cont'd

Figure 28: Treatment Effects for Main Outcomes, Cont'd
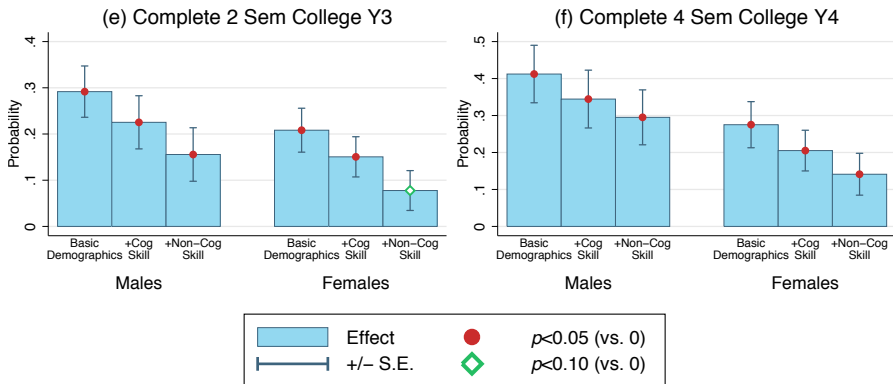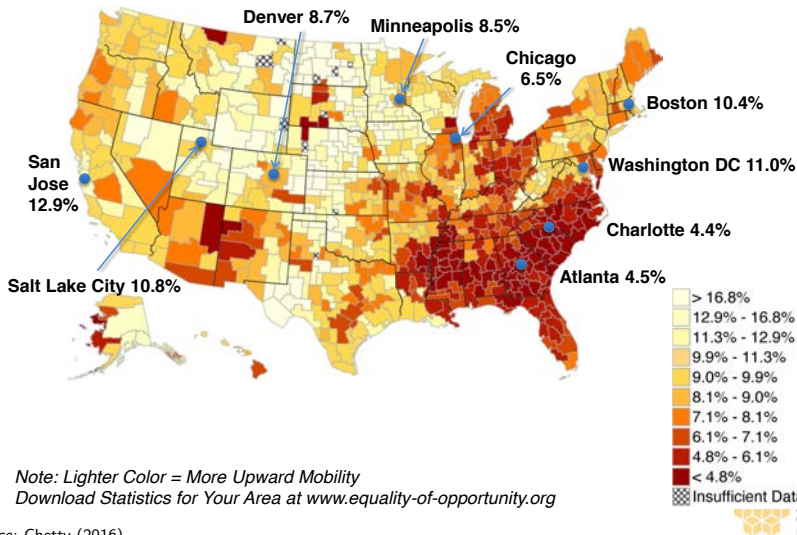
Universal Ingredient in Effective Interventions that Produce Skills:
Parenting – Mentoring – Love

Power of Place?

Figure 29: The Geography of Upward Mobility in the United States

Chances of Reaching the Top Fifth Starting from the Bottom Fifth by Metro Area

Denver 8.7%
Minneapolis 8.5%
Chicago 6.5%
Boston 10.4%
Washington DC 11.0%
San Jose 12.9%
Charlotte 4.4%
Salt Lake City 10.8%
Atlanta 4.5%

> 16.8%
12.9% - 16.8%
11.3% - 12.9%
9.9% - 11.3%
9.0% - 9.9%
8.1% - 9.0%
7.1% - 8.1%
6.1% - 7.1%
4.8% - 6.1%
< 4.8%
Insufficient Data

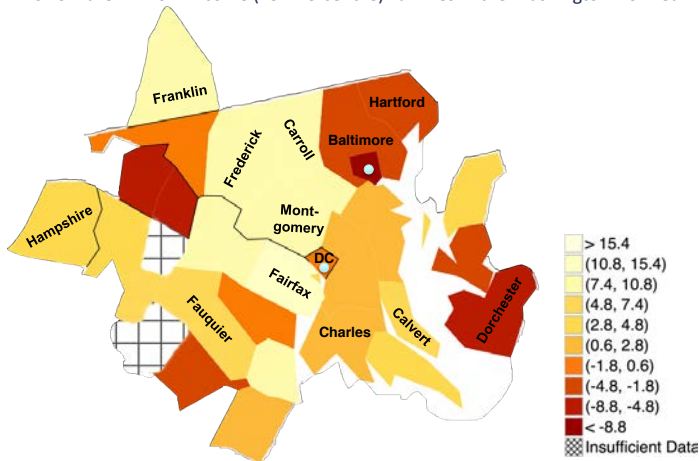*Note: Lighter Color = More Upward Mobility*
Download Statistics for Your Area at www.equality-of-opportunity.org

Source: Chetty (2016).

Figure 30: Causal Effects of Growing up in Different Counties on Earnings in Adulthood

For Children in Low-Income (25th Percentile) Families in the Washington DC Area

Note: Lighter colors represent areas where children from low-income families earn more as adults

Figure 31: The Geography of Intergenerational Mobility

A. Absolute Upward Mobility: Mean Child Rank for Parents at 25th Percentile $(\bar{r}_{25})$ by CZ

Legend:
- 52.0 - 65.0
- 48.5 - 52.0
- 45.9 - 48.5
- 44.6 - 45.9
- 43.3 - 44.6
- 42.0 - 43.3
- 40.8 - 42.0
- 39.2 - 40.8
- 37.3 - 39.2
- 26.0 - 37.3
- Insufficient Data

Source: Chetty et al. (2014)

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Figure 32: The Geography of College Attendance by Parent Income Gradients

B. College Attendance Rates for Children with Parents at the 25th Percentile by CZ

> 55.6
49.3 - 55.6
45.7 - 49.3
42.9 - 45.7
40.9 - 42.9
39.1 - 40.9
37.4 - 39.1
35.4 - 37.4
32.4 - 35.4
< 32.4
Insufficient Data

Corr. with baseline r_{25} = 0.71 (unweighted), 0.53 (pop-weighted)
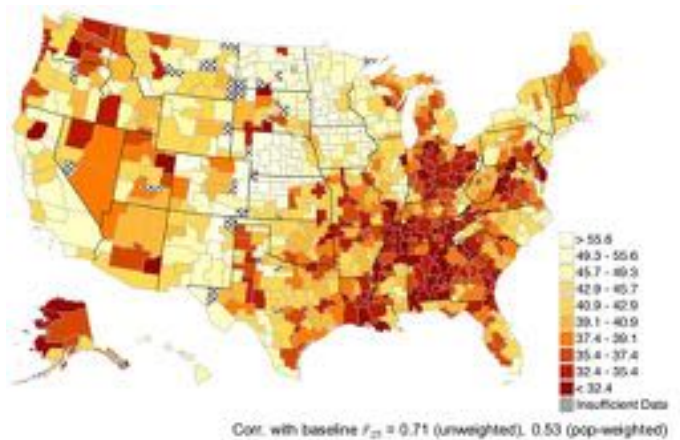
Source: Chetty et al. (2014)

Figure 33: The Geography of Teenage Birth by Parent Income Gradients

B. Teenage Birth Rates for Children with Parents at the 25th Percentile by CZ
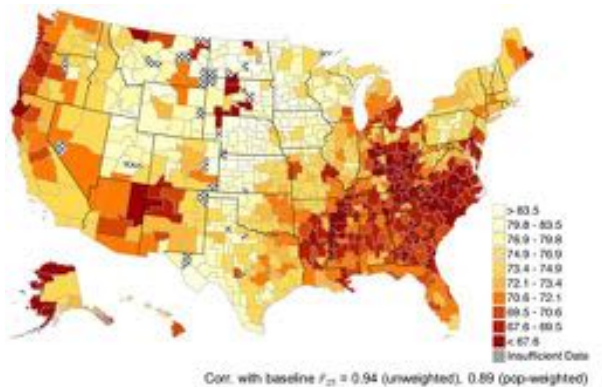

Legend:
- \> 29.4
- 27.6 - 29.4
- 26.4 - 26.4
- 25.4 - 26.4
- 23.7 - 25.4
- 21.9 - 23.7
- 19.9 - 21.9
- 17.8 - 19.9
- 15.2 - 17.8
- < 15.2
- Insufficient Data

Corr. with baseline r_{25} = -0.61 (unweighted), -0.64 (pop-weighted)

Source: Chetty et al. (2014)

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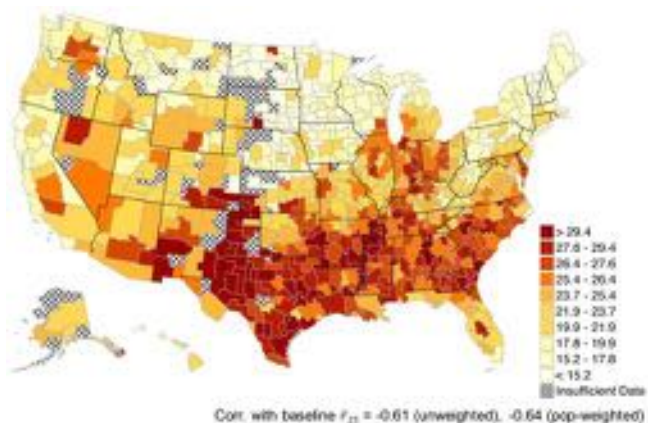
What Aspects of Place Account for These Correlations? Family? Schools? Peers? Social Norms?

Determinants of Correlations Not Yet Known
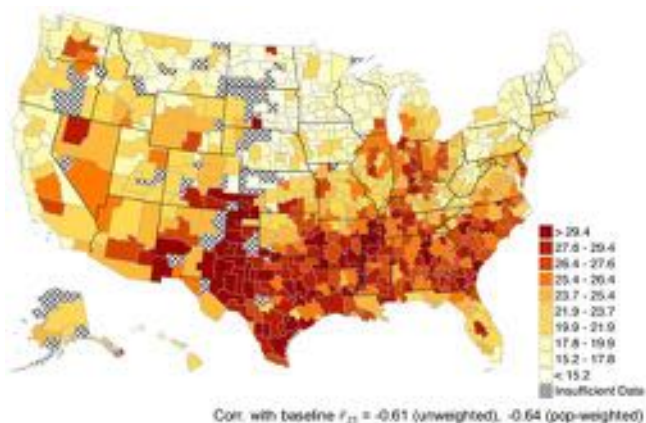
Figure 34: Alternative Measures of Upward Mobility

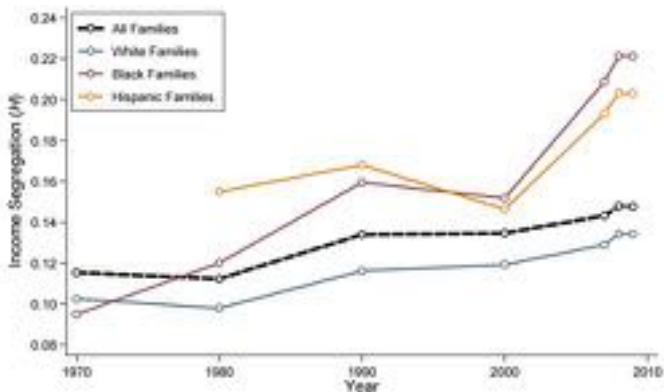**C. Fraction of Children Above Poverty Line Given Parents at 25th Percentile**

Cor. with baseline r_{25} = 0.94 (unweighted), 0.89 (pop-weighted)

Source: Chetty et al. (2014)

B. Teenage Birth Rates for Children with Parents at the 25th Percentile by CZ

Corr. with baseline r_{25} = -0.61 (unweighted), -0.64 (pop-weighted)

Source: Chetty et al. (2014)

Figure 36: Trends in family income segregation, by race

Figure 37: Spatial variation in per capita public school expenditure
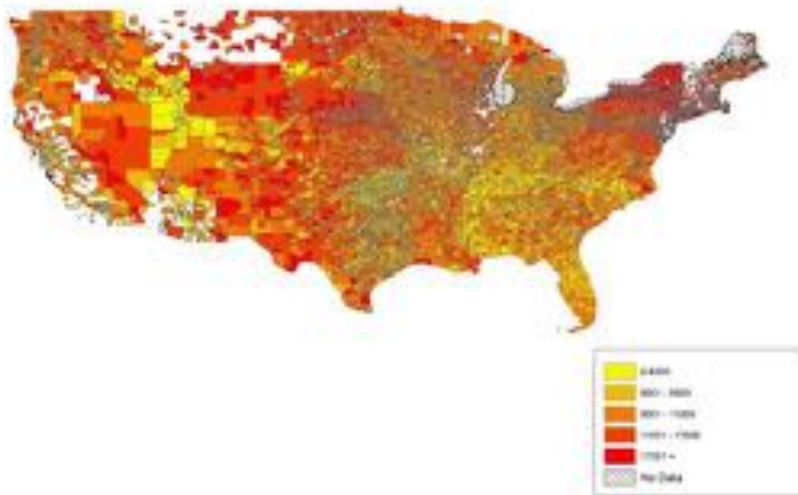
Figure 38: Exposure to violent crime
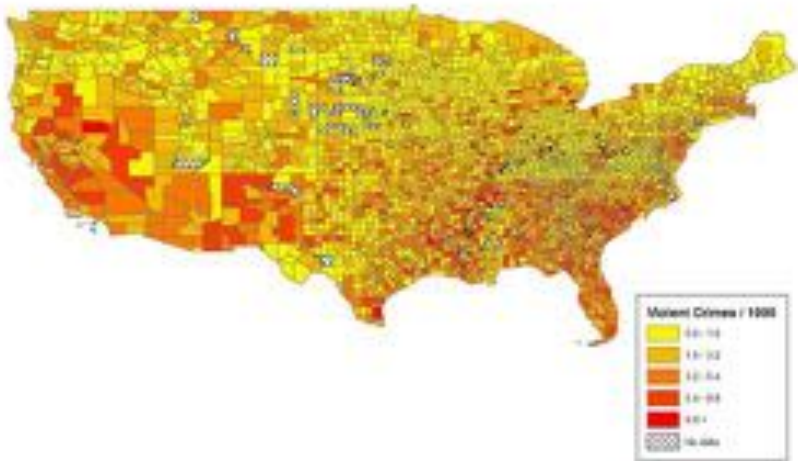
Source: Uniform Crime Reporting Program.
Note: Violent crimes per thousand people, 2012.

**Interventions That Shift Children Across Places:
The Impacts of Neighborhoods on Economic Opportunity**
MTO (2016)

**Effects of Moving to a Different Neighborhood
on a Child's Income in Adulthood by Age at Move**
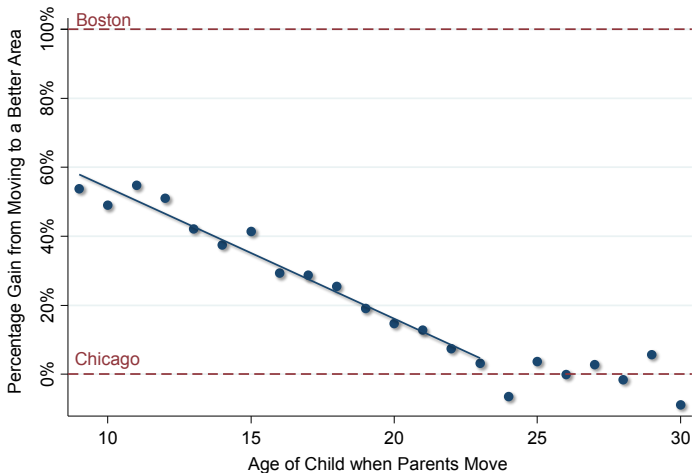
Source: Chetty (2016)

Figure 39: Impacts of MTO on Children Below Age 13 at Random Assignment (Age 24-28)

Individual Earnings (ITT)
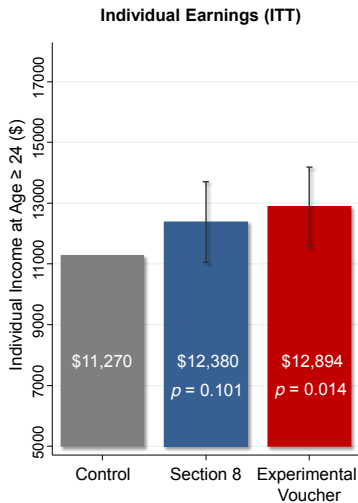
Source: Chetty et al. (2015)

Figure 40: Impacts of MTO on Children Below Age 13 at Random
Assignment

(a) College Attendance (ITT)

College Attendance, Ages 18-20 (%)

- Control: 16.5%
- Section 8: 17.5%, p = 0.435
- Experimental Voucher: 19.0%, p = 0.028

(b) College Quality (ITT)

Mean College Quality, Ages 18-20 ($)

- Control: $20,915
- Section 8: $21,547, p = 0.014
- Experimental Voucher: $21,601, p = 0.003

Source: Chetty et al. (2015)

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OPPORTUNITY
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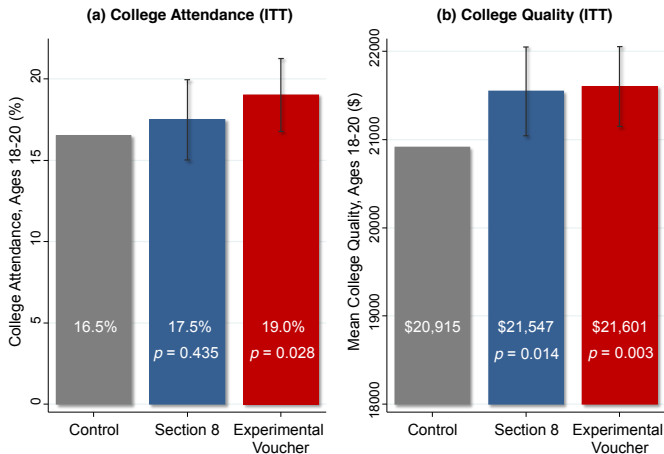
Figure 41: Impacts of MTO on Children Below Age 13 at Random Assignment

(a) ZIP Poverty Share in Adulthood (ITT)

Zip Poverty Share (%)

Control: 23.8%
Section 8: 22.4%, p = 0.047
Experimental Voucher: 22.2%, p = 0.008

(b) Birth with no Father Present (ITT)
Females Only

Birth with no Father on Birth Certificate (%)

Control: 33.0%
Section 8: 31.7%, p = 0.610
Experimental Voucher: 28.2%, p = 0.042

Source: Chetty et al. (2015)

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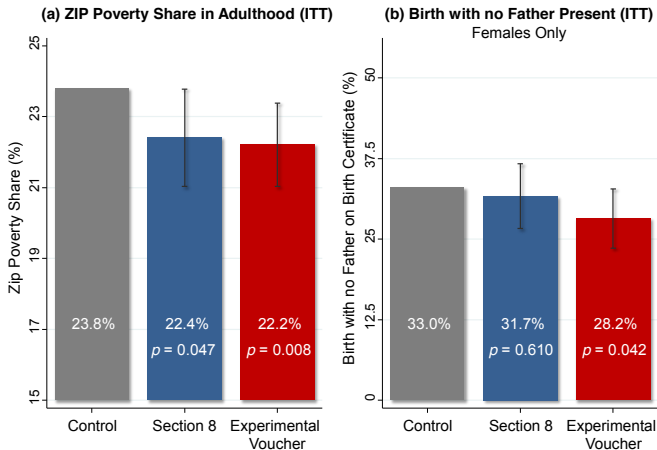
Figure 42: Impacts of MTO on Children Age 13-18 at Random Assignment

Individual Earnings (ITT)
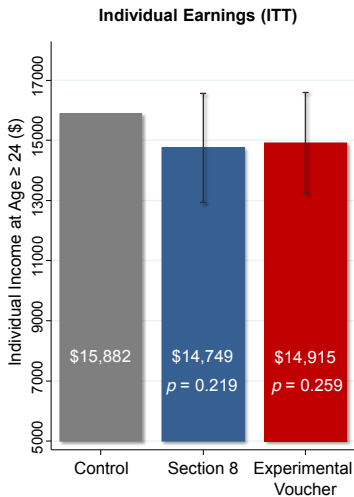
Source: Chetty et al. (2015)

Figure 43: Impacts of MTO on Children Age 13-18 at Random Assignment

(a) College Attendance (ITT)

Control	Section 8	Experimental Voucher
15.6%	12.6%	11.4%
	$p = 0.091$	$p = 0.013$

y-axis: College Attendance, Ages 18-20 (%)

(b) College Quality (ITT)

Control	Section 8	Experimental Voucher
$21,638	$21,041	$20,755
	$p = 0.168$	$p = 0.022$

y-axis: Mean College Quality, Ages 18-20 ($)

Source: Chetty et al. (2015)

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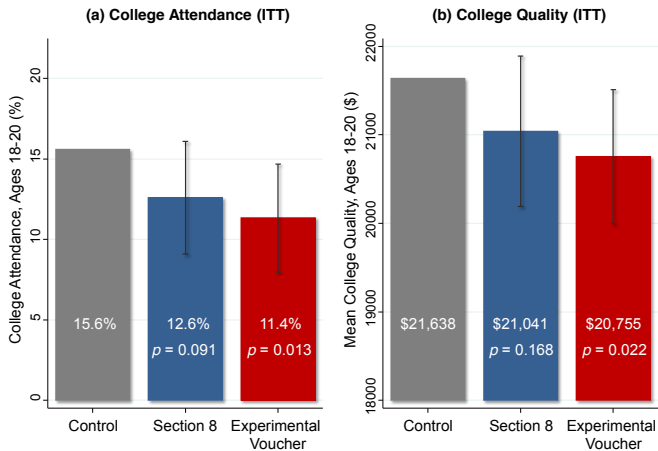
Figure 44: Impacts of MTO on Children Age 13-18 at Random Assignment

(a) ZIP Poverty Share in Adulthood (ITT)

Zip Poverty Share (%)

Control	Section 8	Experimental Voucher
23.6%	22.7% p = 0.184	23.1% p = 0.418

(b) Birth with no Father Present (ITT)
Females Only

Birth No Father Present (%)

Control	Section 8	Experimental Voucher
41.4%	40.7% p = 0.857	45.6% p = 0.242
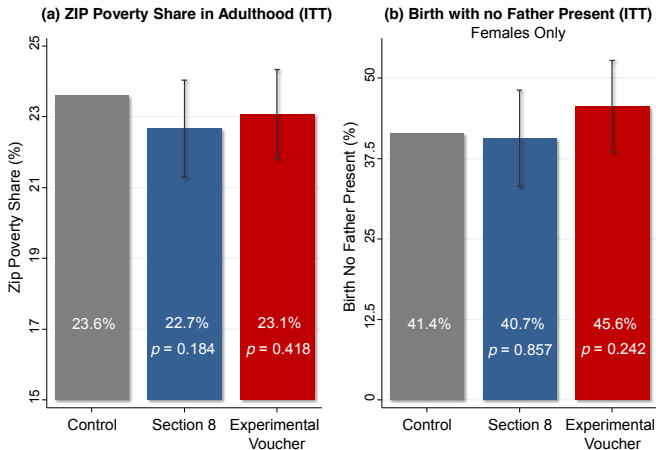
Sources of These Effects are Unclear
What Is It About Neighborhoods That Produce the
Geographic Correlations?

(a) **Schools?**

(b) **Parents?**

(c) **Peers?**

(d) **Group norms?**

General Equilibrium Effects Not Accounted For
(Recall response to bussing in 1960s and 1970s vacated entire neighborhoods)

Analytical Models of Neighborhood Effects
Durlauf and Sheshadri (2017)

1. Labor market outcomes for adults are determined by the human capital that they accumulate earlier in life.

2. Human capital accumulation is, along important dimensions, socially determined. Local public finance of education creates dependence between the income distribution of a school district and the per capita expenditure on each student in the community. Social interactions, ranging from peer effects to role models to formation of personal identity, create a distinct relationship between the communities in which children develop and the skills they bring to the labor market.

3. In choosing a neighborhood, incentives exist for parents to prefer more affluent neighbors. Other incentives exist to prefer larger communities. These incentives interact to determine the extent to which communities are segregated by income in equilibrium. Permanent segregation of descendants of the most and least affluent families is possible even though there are no poverty traps or affluence traps, as conventionally defined.

4. Greater cross-sectional inequality of income increases the degree of segregation of neighborhoods. The greater the segregation the greater are the disparities in human capital between children from more and less affluent families, which creates the Great Gatsby Curve.

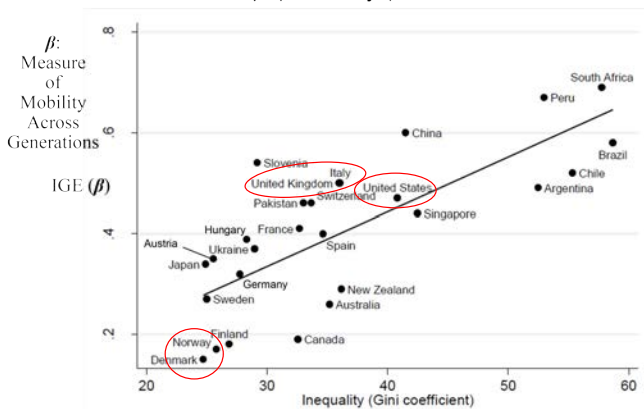**Putting It All Together: Redistribution and Importance of Incentives**

A Case Study of Denmark/U.S.

Denmark the Garden of Eden?

Figure 45: Intergenerational Mobility and Inequality: The Great Gatsby Curve

$$\underbrace{\ln Y_1}_{\substack{\text{income of}\\\text{child}}} = \alpha + \underbrace{\beta}_{\text{IGE}} \underbrace{\ln Y_0}_{\substack{\text{income of}\\\text{parent}}} + \varepsilon$$
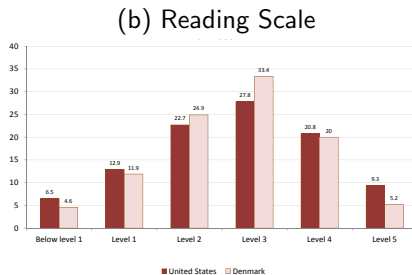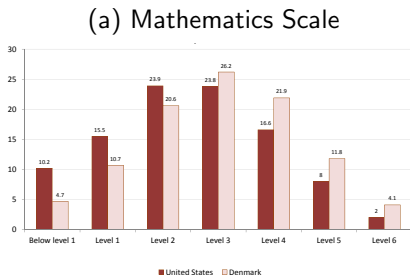
$\beta \uparrow$, Mobility $\downarrow$

Denmark Spends Generously on Public Education Equalizes Expenditure By Design

**Produces Better Test Score Distributions than U.S.**

Figure 46: Percentage of Students at Each Proficiency Level, PISA 2003

(a) Mathematics Scale

(b) Reading Scale

Source: OECD (2003) Learning for Tomorrow's World, First Results from PISA (2003).

- **Nonetheless, there are steep gradients of children's education in parental education, income, and wealth in both the U.S. & Denmark.**
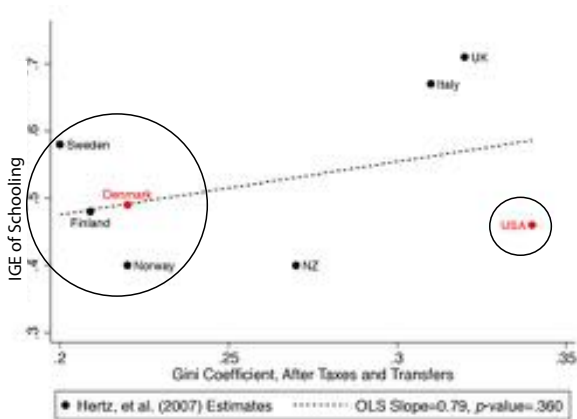
Figure 47: Language Test Scores in Grade 2–8, by Mother's Education
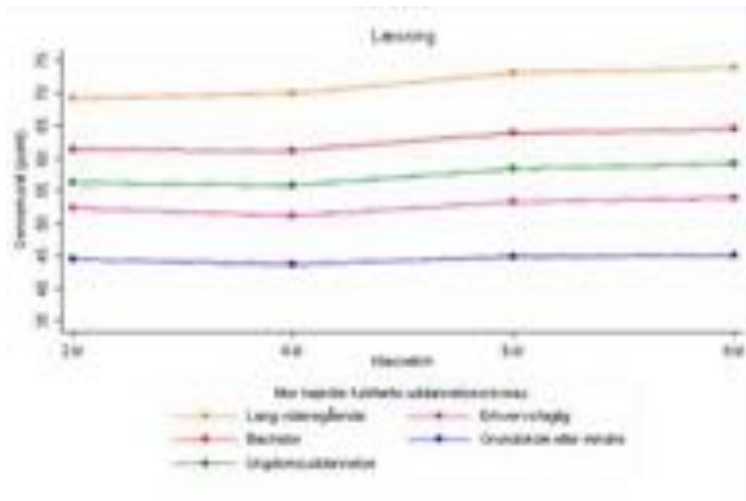
Figure 48: Intergenerational Educational Mobility and Inequality

$$\underbrace{YOS}_{\substack{\text{years of} \\ \text{schooling} \\ \text{child}}} = \alpha + \underbrace{\beta}_{\substack{\text{IGE} \\ \text{education}}} \underbrace{YOS}_{\substack{\text{years of} \\ \text{schooling} \\ \text{parents}}} + \varepsilon$$

- Hertz, et al. (2007) Estimates ⋯⋯⋯ OLS Slope=0.79, *p*-value=.360

Source: Setzler (2015).

Strong Sorting by Family Background Status

Scandinavia invests heavily in child development and boosts the test scores of the disadvantaged (though not to full equality), but undermines these beneficial effects by providing weak labor market incentives.

Returns to skills

Percent increase in hourly wages for a standard deviation increase in numeracy
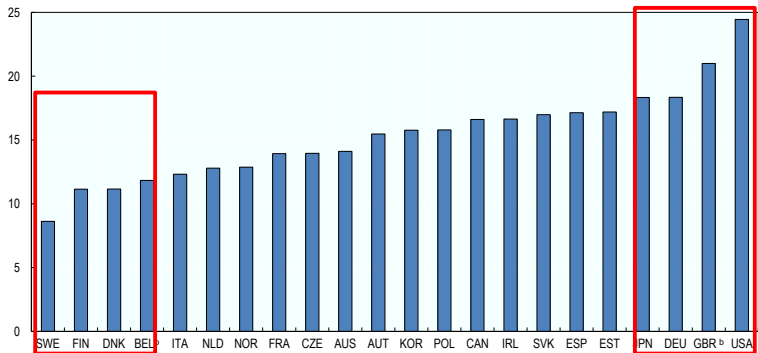
Coefficients on numeracy scores from country-specific OLS regressions of log hourly wages on proficiency scores standardised at the country level

Tax and Transfer Policy the Main Engine of Scandinavian Reduced Inequality and Enhanced Social Mobility

Summary

- What can we say about the Inequality and Social Mobility?
- What are the facts? What are the causes?
- What are effective social policies?
- Skills are important.
- But what are effective strategies for shaping skills?
- At what age and with what interventions?
- Early years are important in shaping skills, but not the full story.
- Interventions in adolescence and adulthood are effect.
- Neighborhoods play a role, but which aspects remain to be sorted out.
- Love, mentoring and care matter.

- Incentives built into tax and transfer policy: can undermine effective policies.
- More generally, labor market rewards and structure play an important role.
- Role for macro policy and policies that encourage firms to hire and mentor workers (macro growth becoming more unevenly distributed).

Traditional Redistribution Less Effective Than Policies That Promote and Reward Skills

**Redistribution is Ineffective for Promoting in the Long-Run
Social Mobility
With Improper Incentive Can Cause Harm**

Thank You For Your Attention

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Early Childhood Interventions

The Early Childhood Interventions Network (ECI) investigates the early origins of inequality and its lifetime consequences.

Network Leaders:
Pia Britto | Flavio Cunha |
James J. Heckman | Petra Todd

Inequality: Measurement, Interpretation, & Policy

The Inequality: Measurement, Interpretation, and Policy Network (MIP) studies policies designed to reduce inequality and boost individual flourishing.

Network Leaders:
Robert H. Dugger |
Steven N. Durlauf |
Scott Duke Kominers |
Richard V. Reeves

Health Inequality

The Health Inequality Network (HI) unifies several disciplines into a comprehensive framework for understanding health disparities over the lifecycle.

Network Leaders:
Christopher Kuzawa |
Burton Singer

Identity and Personality

The Identity and Personality Network (IP) studies the reciprocal relationship between individual differences and economic, social, and health outcomes.

Network Leaders:
Angela Duckworth |
Armin Falk |
Joseph Kable | Tim
Kautz | Rachel Kranton

Family Inequality

The Family Inequality Network (FI) focuses on the interactions among family members to understand the well-being of children and their parents.

Network Leaders:
Pierre-André Chiappori |
Flavio Cunha | Nezih Guner

Markets

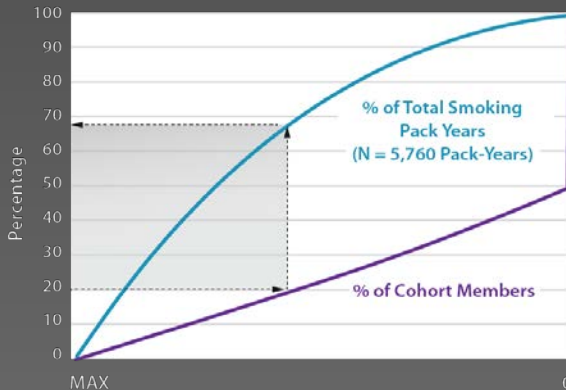The Markets Network (M) investigates human capital financing over the lifecycle.

Network Leaders
Dean Corbae |
Lance Lochner |
Mariacristina De Nardi
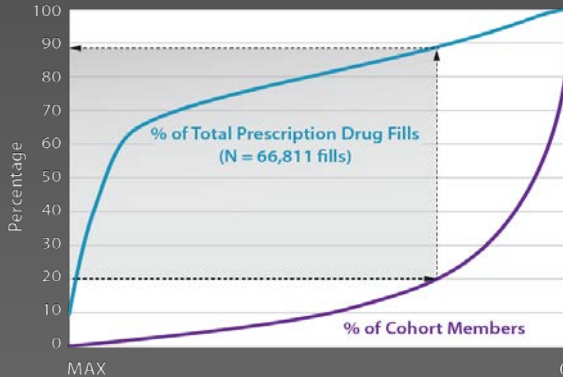
Additional Caspi et al. Slides

Cigarette Smoking Pack-Years

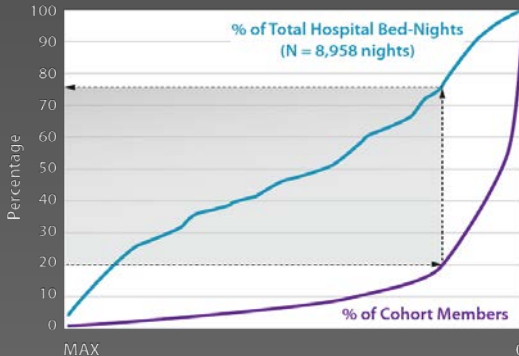20% of Cohort Members = 68% of Total Tobacco Smoking Pack-Years

Prescription Drug Fills

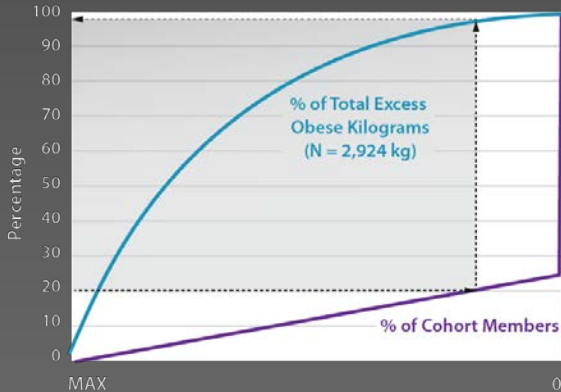20% of Cohort Members = 89% of Total Prescription Drug Fills

Hospital Bed-nights

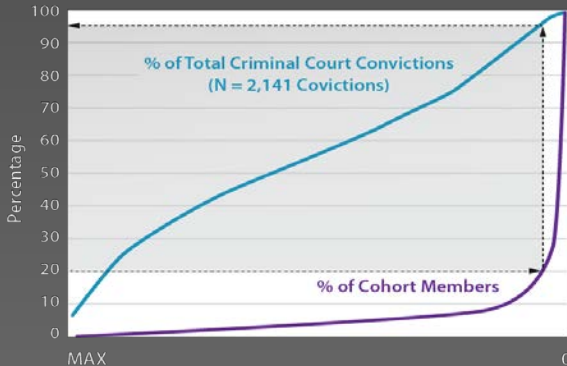20% of Cohort Members = 77% of Total Hospital Bed-Nights

Excess Weight in Kilograms

20% of Cohort Members = 98% of Total Excess Obese Kilograms

Criminal Court Convictions

20% of Cohort Members = 97% of Total Criminal Court Convictions

[Return to main text](#)

Additional Doyle (2016) Slides

Table 1: Cognitive Development

	M_{HIGH} (SD)	M_{LOW} (SD)	IPW-p*	IPW-step p*	Effect Size (Cohen's D/Odds Ratio)
BAS Subscales: T-Scores					
Pattern Construction	49.51 (12.82)	41.75 (10.88)	0.001	0.002	0.65
Copying	45.93 (9.84)	41.92 (10.00)	0.002	0.012	0.40
Early Number Concepts	48.27 (8.41)	43.24 (8.99)	0.001	0.001	0.61
Picture Similarities	51.51 (9.39)	49.59 (7.74)	0.077	0.077	0.22
Teacher Reported Numeracy Skills					
S-EDI Basic Numeracy Skills	2.64 (2.56)	1.85 (2.26)	0.041	0.041	0.33
S-EDI Basic Numeracy Skills 'Not on Track' %	38%	56%	0.025	0.025	2.06*

Preparing for Life (Doyle et al., 2016).
*IPW-adjusted permutation tests with 100,000 replications controlling for gender. One tailed (right-sided) test.

Table 2: Language Development

	M$_{high}$ (SD)	M$_{low}$ (SD)	IPW-p*	IPW-step p*	Effect Size (Cohen's D/Odds Ratio*)
BAS Verbal Ability					
Verbal Ability Standard Score	98.60 (13.08)	90.28 (12.33)	0.002	0.003	0.65
Verbal Ability Below Average	25.7%	45.7%	0.017	0.017	2.44*
Verbal Ability Above Average	24.6%	7.9%	0.017	0.025	3.81*
BAS Verbal Ability Subscales: T-Scores					
Naming Vocabulary	53.29 (11.20)	45.95 (11.24)	0.002	0.003	0.65
Verbal Comprehension	44.66 (6.78)	42.13 (8.84)	0.022	0.022	0.37

Preparing for Life (Doyle et al., 2016).
*IPW-adjusted permutation tests with 100,000 replications controlling for gender. One tailed (right-sided) test.

Table 3: Approaches to Learning

	M_{HIGH} (SD)	M_{LOW} (SD)	IPW-p*	IPW-step p*	Effect Size (Cohen's D/Odds Ratio*)
Tasks for Controlling Attention and Impulsive Behaviour					
Day/Night Task Total Score	21.95 (6.38)	19.17 (5.90)	**0.023**	**0.037**	0.45

Preparing for Life (Doyle et al., 2016).
*IPW-adjusted permutation tests with 100,000 replications controlling for gender. One tailed (right-sided) test.

Table 4: Physical Wellbeing

	M_treat (SD)	M_low (SD)	IPW-p*	IPW-step p*	Effect Size (Cohen's D/Odds Ratio*)
Hospital Service Use					
No. of Initial Visits to Hospital	4.2 (2.9)	5.2 (4.3)	0.150	0.150	0.28
No. of Follow-up Services Used	2.2 (2.4)	4.8 (7.3)	**0.039**	**0.066**	0.46
Total No. of Hospital Services Used	6.4 (5.1)	10.2 (10.8)	**0.048**	**0.064**	0.45
Hospital Departments Attended					
% any ED visits	97%	96%	0.700	0.700	0.74*
No. of ED visits	3.5 (3.2)	4.6 (4.5)	**0.094**	**0.094**	0.30
% any ED Clinic visits	16%	24%	0.196	0.376	1.61*
No. of ED Clinic visits	0.2 (0.4)	0.5 (1.1)	**0.045**	**0.093**	0.35

Preparing for Life (Doyle et al., 2016).
*IPW-adjusted permutation tests with 100,000 replications controlling for gender. One tailed (right-sided) test.

Figure 49: Distribution of BAS GCA Cognitive Scores at School Entry
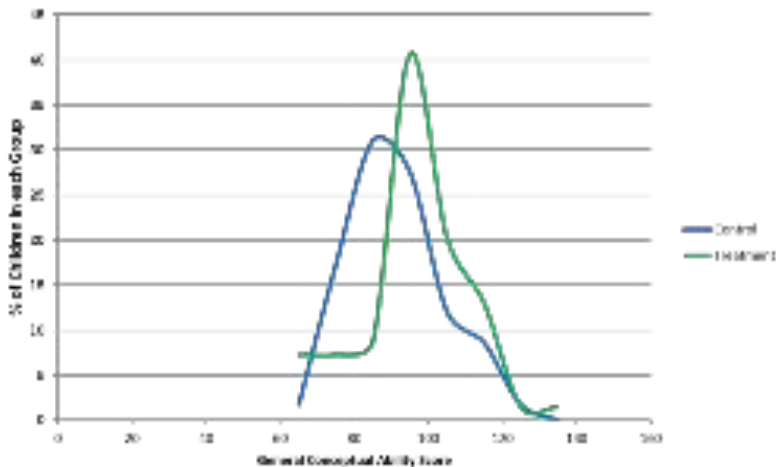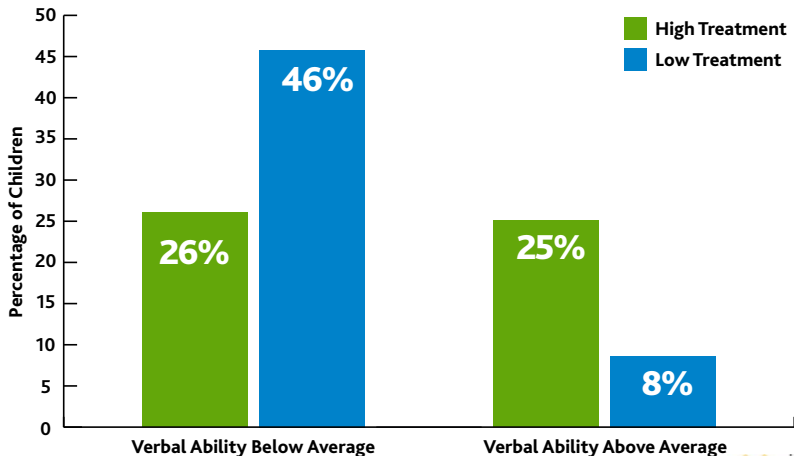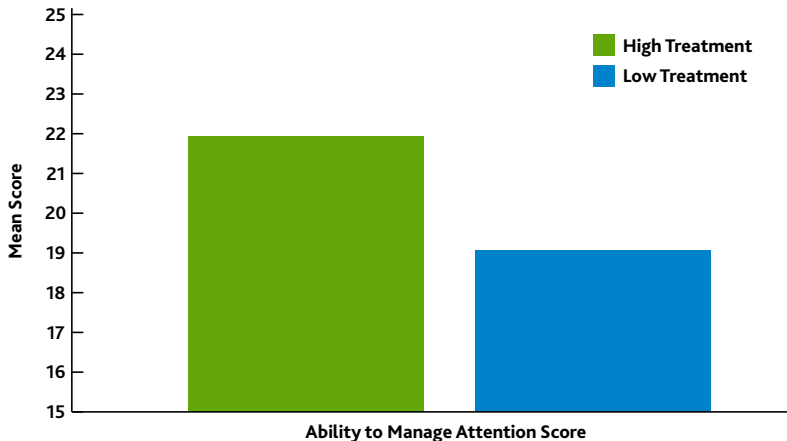
Figure 50: Percentage of Children Scoring Above and Below Average in Verbal Ability At School Entry
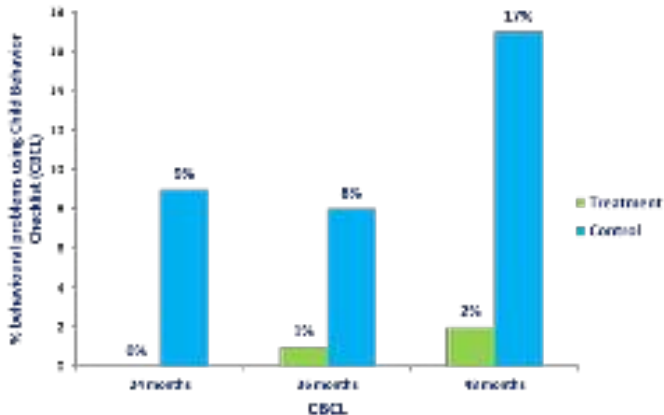
Source: PFL Evaluation Team at the UCD Geary Institute for Public Policy (2016).

Figure 51: Mean Scores of Children on Ability to Manage Attention Task At School Entry

Source: PFL Evaluation Team at the UCD Geary Institute for Public Policy (2016).
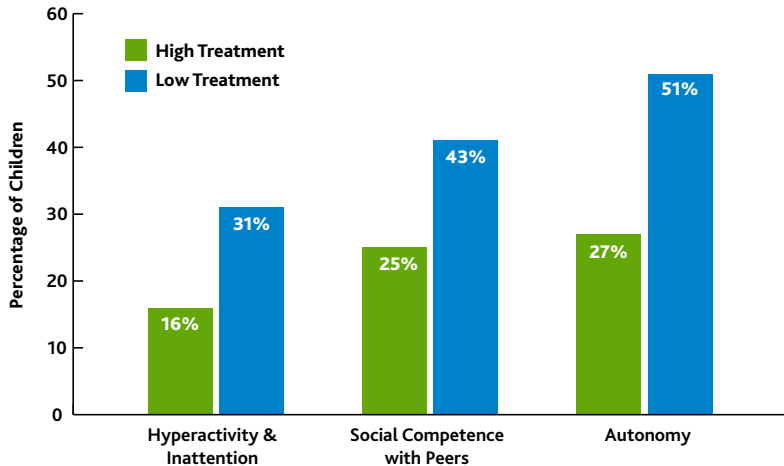
Figure 52: Behavioural Problems*
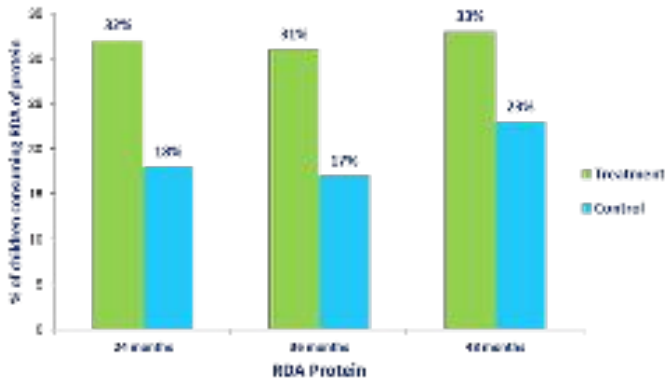

Preparing for Life (Doyle et al., 2016).
*IPW-adjusted permutation tests with 100,000 replications controlling for gender. One tailed (right-sided) test.

Figure 53: Percentage of Children 'Not on Track' on Measures of Social and Emotional Development At School Entry

Source: PFL Evaluation Team at the UCD Geary Institute for Public Policy (2016).
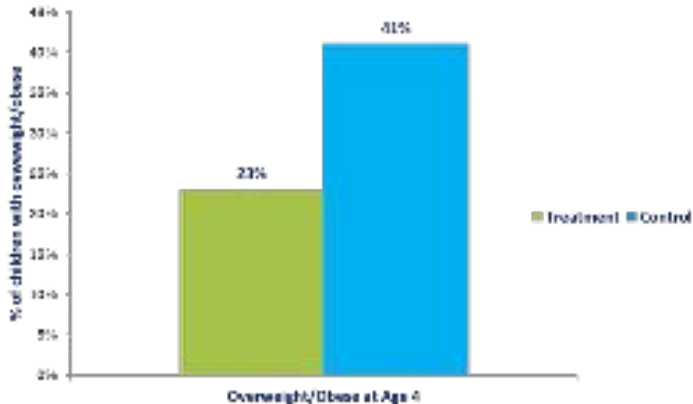
Figure 54: Protein Intake*

Preparing for Life (Doyle et al., 2016).
*IPW-adjusted permutation tests with 100,000 replications controlling for
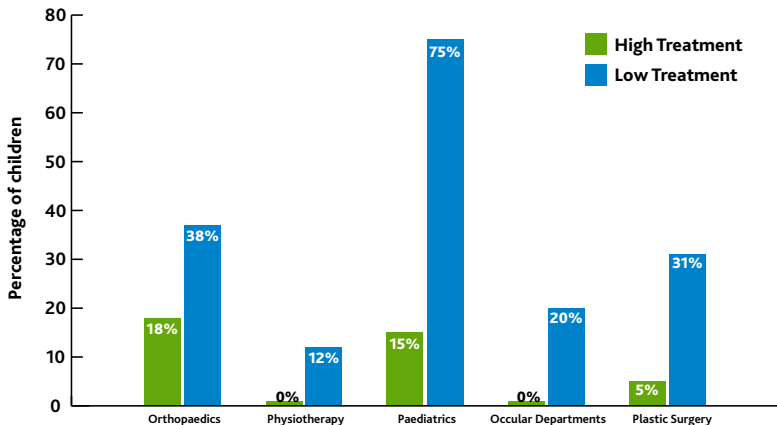gender. One tailed (right-sided) test.

Figure 55: Body Mass Index at Age 4*

Preparing for Life (Doyle et al., 2016).
*IPW-adjusted permutation tests with 100,000 replications controlling for
gender. One tailed (right-sided) test.

Figure 56: Percentage of Outpatient Children who ever visited Outpatient Departments At School Entry

Source: PFL Evaluation Team at the UCD Geary Institute for Public Policy (2016).

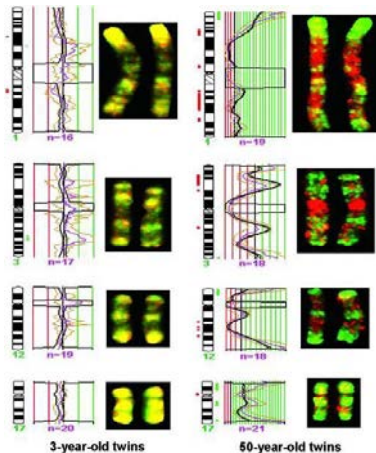Figure 57: Mean Scores of Children on Physical Wellbeing and Motor Development At School Entry
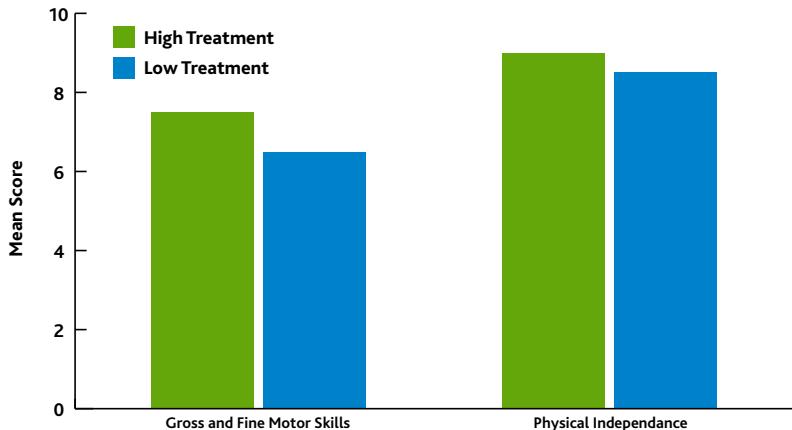
Source: PFL Evaluation Team at the UCD Geary Institute for Public Policy (2016).

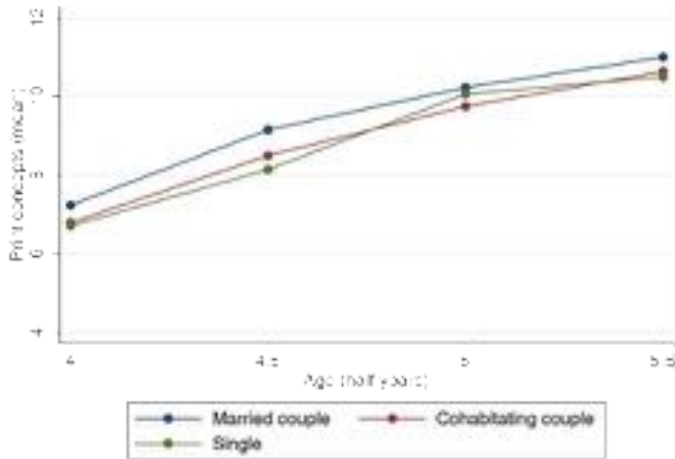[Return to main text](#)

DNA Methylation

Figure 58: DNA Methylation and Histone Acetylation Patterns in Young and Old Twins

3-year-old twins   50-year-old twins
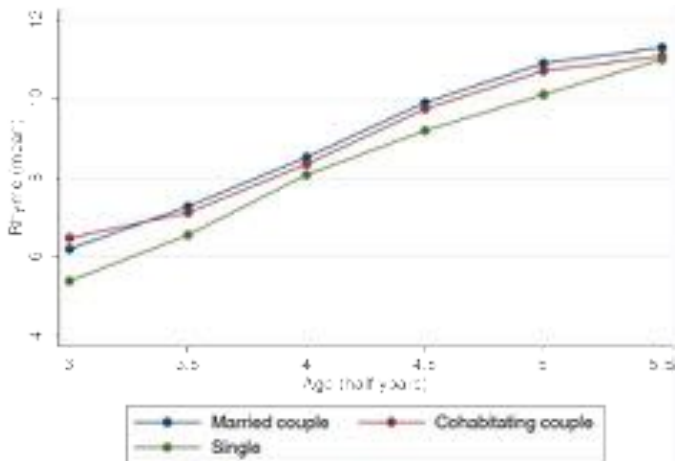
Source: Fraga, Ballestar et al. (2005)

Figure 59: Print Concepts by Family Status

Figure 60: Rhyme by Family Status

Source: 'Daycare of the Future', Bleses and Jensen (2017)

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Table 5: Estimated coefficients from regressions of child outcomes on family status, controlling for age and mothers education. Sample of 3-5 year old children from Denmark.

	TEAM Geometry	TEAM Numbers	SEAM Empathy	SEAM Self-Regulation & Cooperation
Cohabitating couple	-0.064	-0.332***	-0.445***	-0.252**
Single	-0.125*	-0.405***	-0.712***	-0.649***
	(0.072)	(0.130)	(0.166)	(0.116)
Controls				
Age intervals	X	X	X	X
Mother's education	X	X	X	X
Observations	5218	5196	5571	5572

Notes: Child outcomes: mathematical skills and socio-emotional skills. Married couple is reference category. Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: 'Daycare of the Future,' Bleses and Jensen (2017).

Table 6: Estimated coefficients from regressions of child outcomes on family status, controlling for age and mothers education. Sample of 3-5 year old children from Denmark.

	Language Rhyme	Language Print Concepts	Language Vocabulary	Language Comprehension
Cohabitating couple	0.003	-0.466***	-0.333**	-0.098
(0.107)	(0.151)	(0.163)	(0.088)	
Single	-0.350***	-0.209	-0.206	-0.100
(0.124)	(0.169)	(0.187)	(0.102)	
Controls				
Age intervals	X	X	X	X
Mother's education	X	X	X	X
Observations	4284	3003	4803	4933

Notes: Child outcomes: language skills (four subscales). Married couple is reference category. Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: 'Daycare of the Future,' Bleses and Jensen (2017).

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