Social Data Science

Soc 114
Winter 2026

Economic Opportunity Measured by Predictability

Learning goals for today

By the end of class, you will be able to

- reason about economic opportunity
- reason about equal opportunity
- connect these to a data science idea: prediction

What does economic opportunity mean to you?

Economic opportunity: Two definitions

absolute mobility	out-earning your parents
relative mobility	out-ranking your parents

Absolute upward mobility: Out-earning your parents

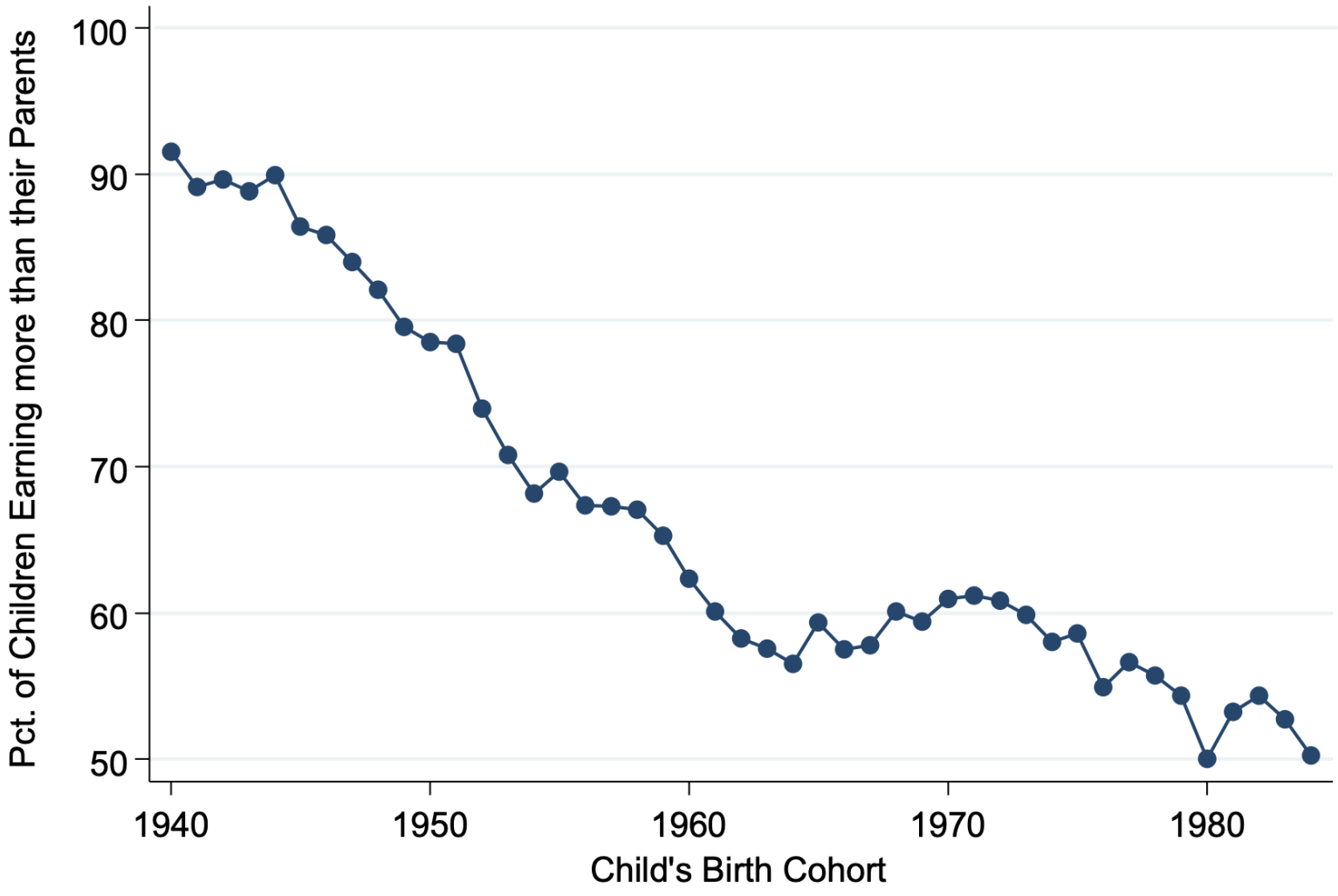
Chetty et al. 2017

What proportion earn more than their parents at age 30?

- among those born in 1940
- among those born in 1984

Absolute upward mobility: Out-earning your parents

Chetty et al. 2017



Absolute upward mobility: Out-earning your parents

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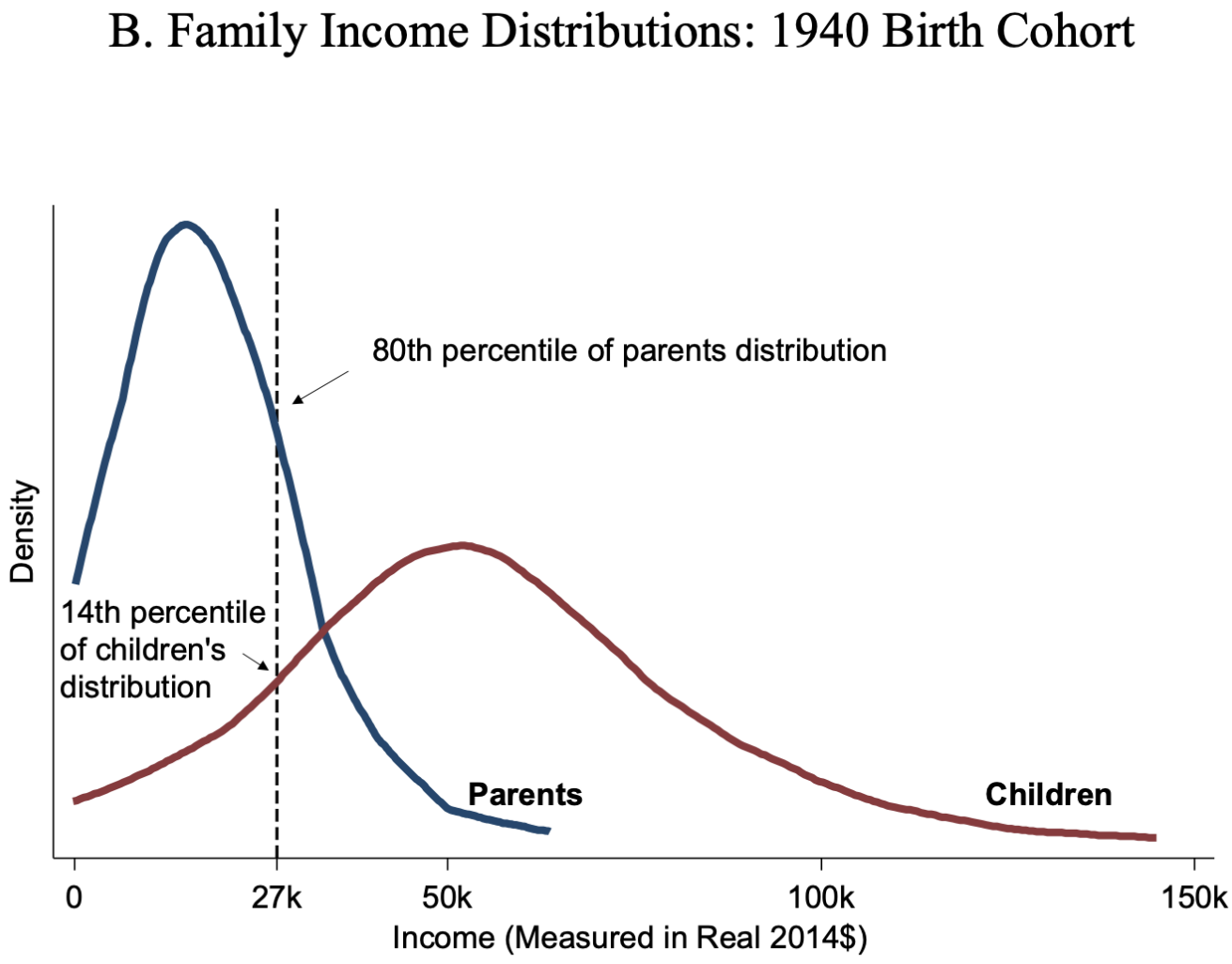

Absolute upward mobility: Out-earning your parents

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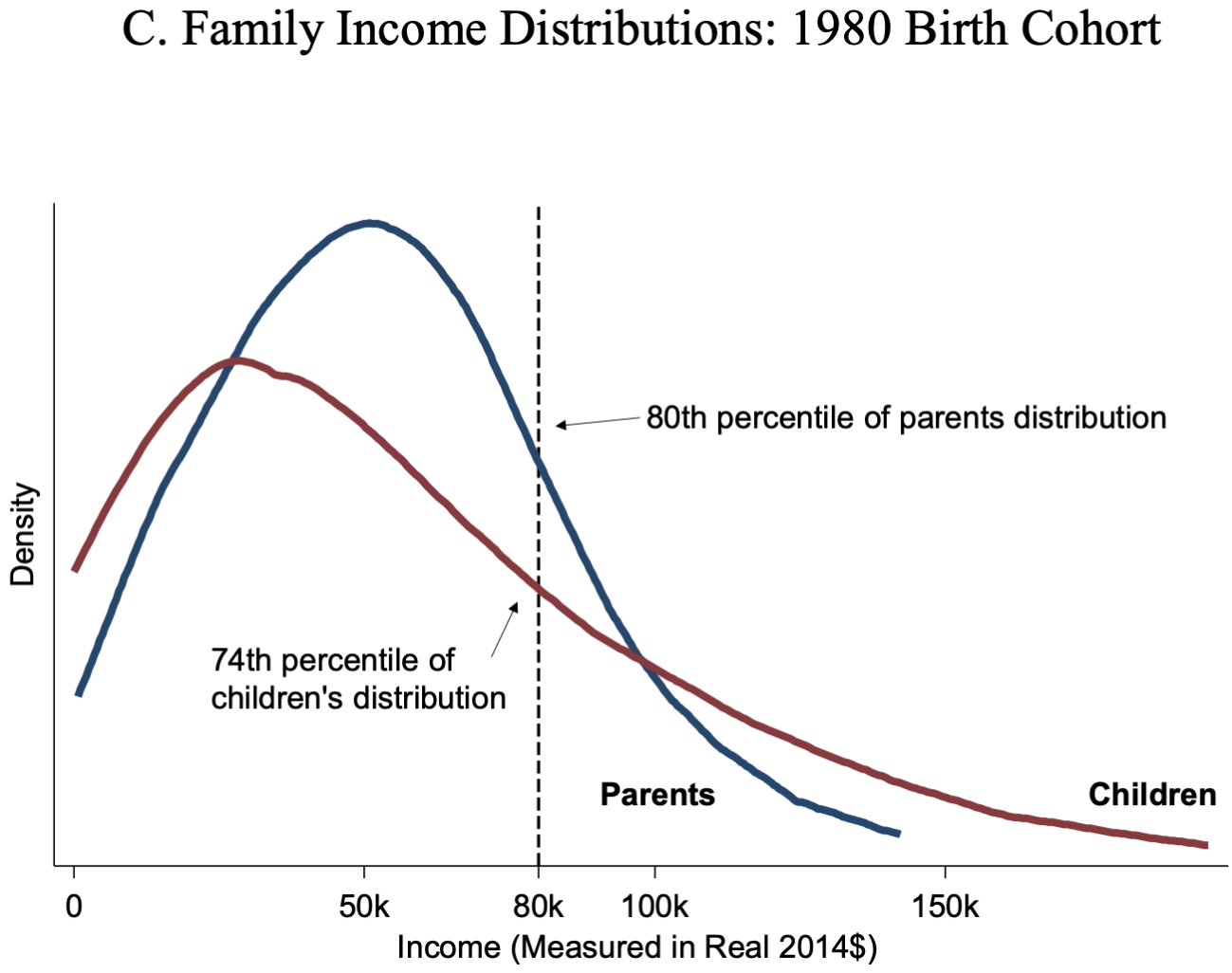
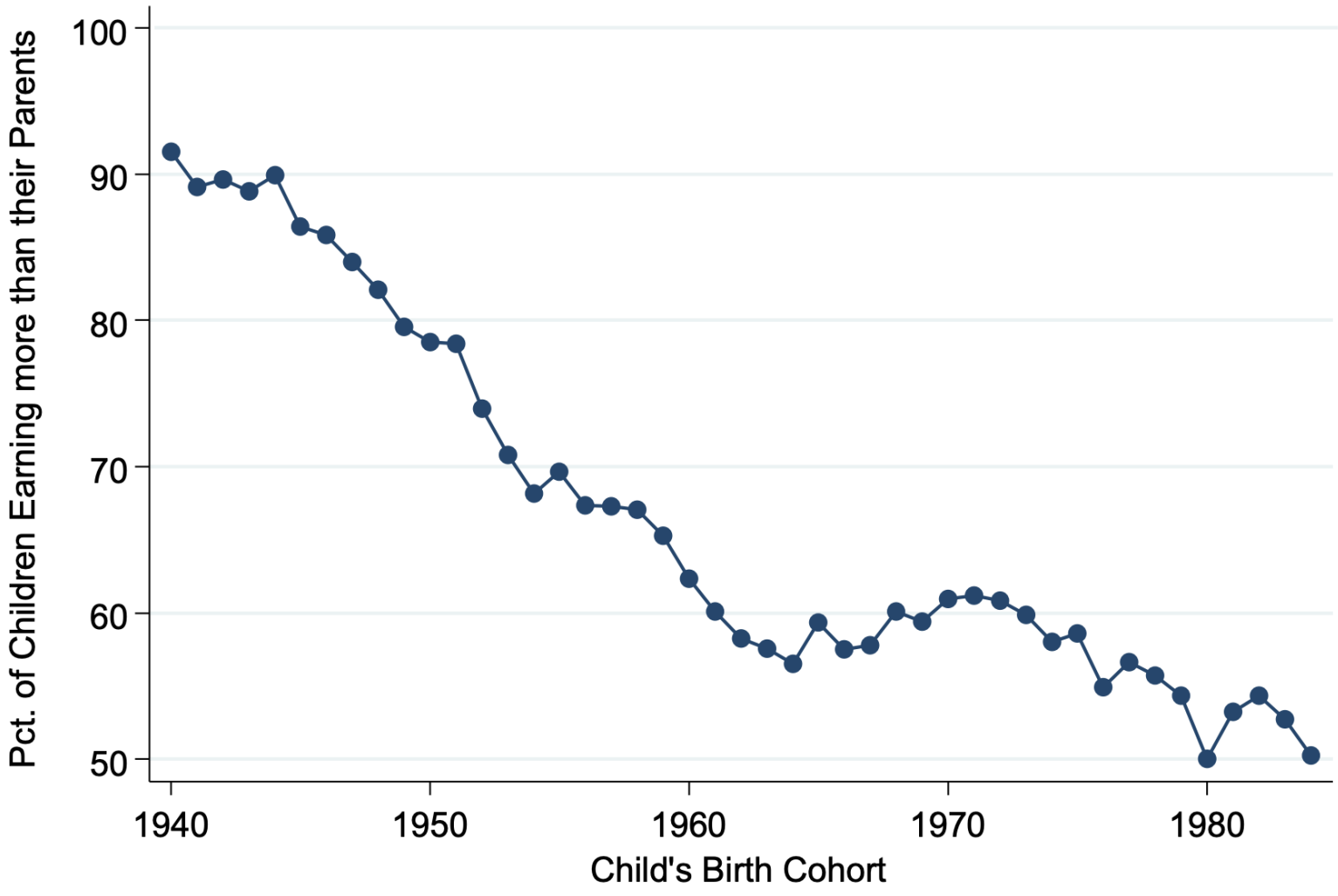


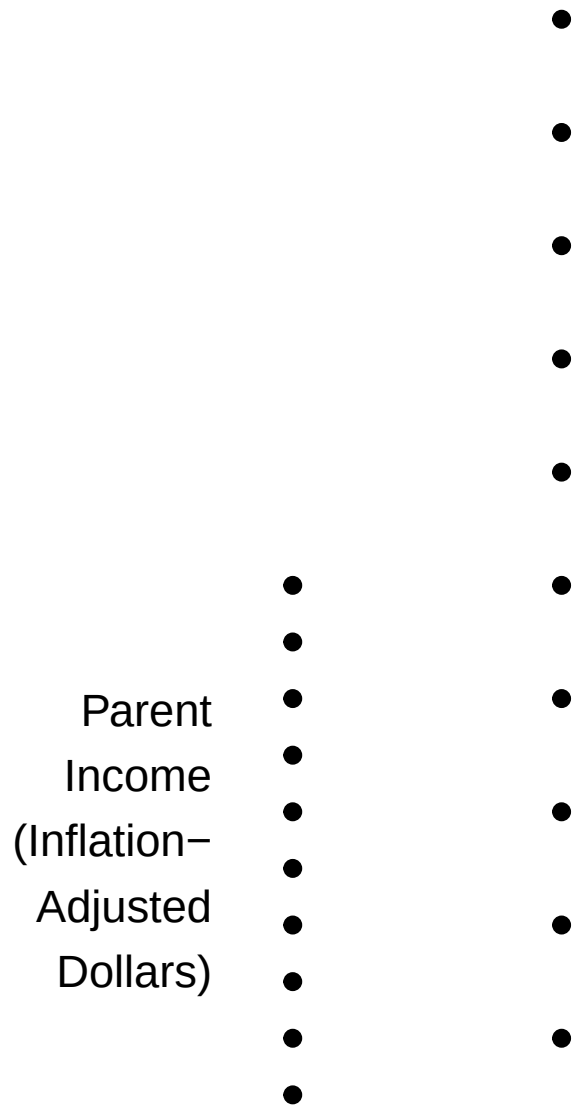
Absolute upward mobility: Out-earning your parents

Chetty et al. 2017



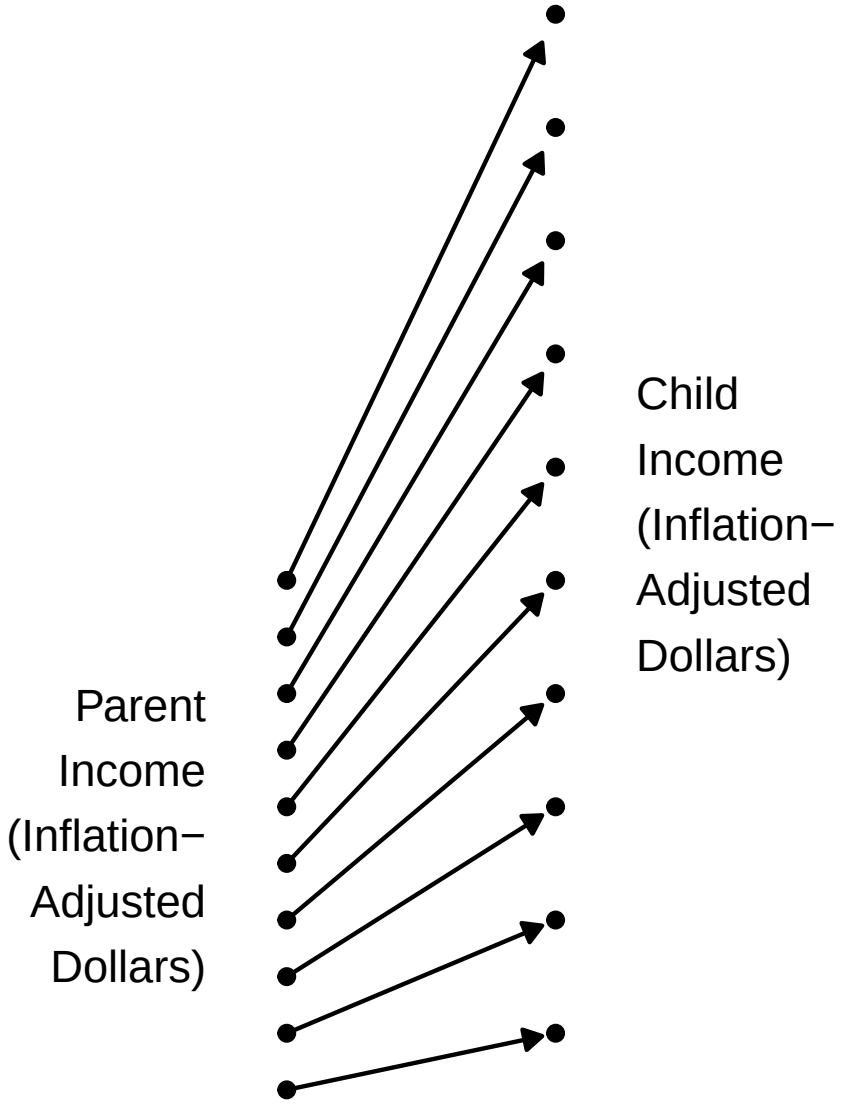
Economic opportunity: Two definitions

absolute mobility	out-earning your parents	has fallen
relative mobility	out-ranking your parents	



absolute upward mobility

landing higher than your parents in dollars



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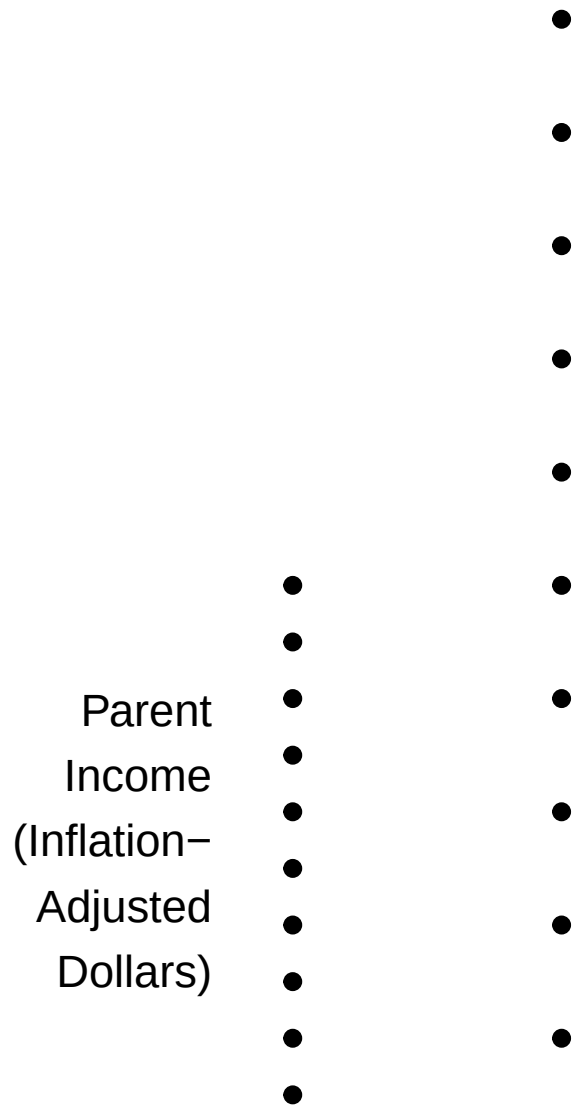

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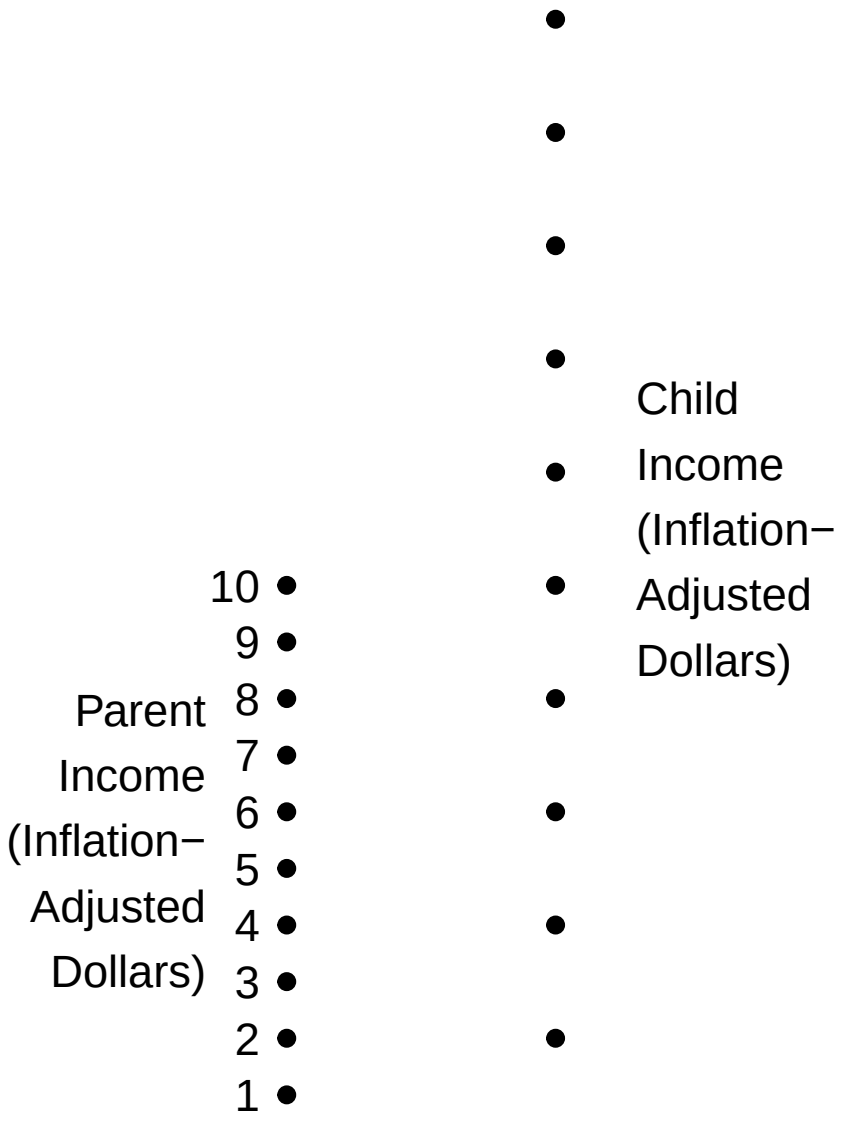
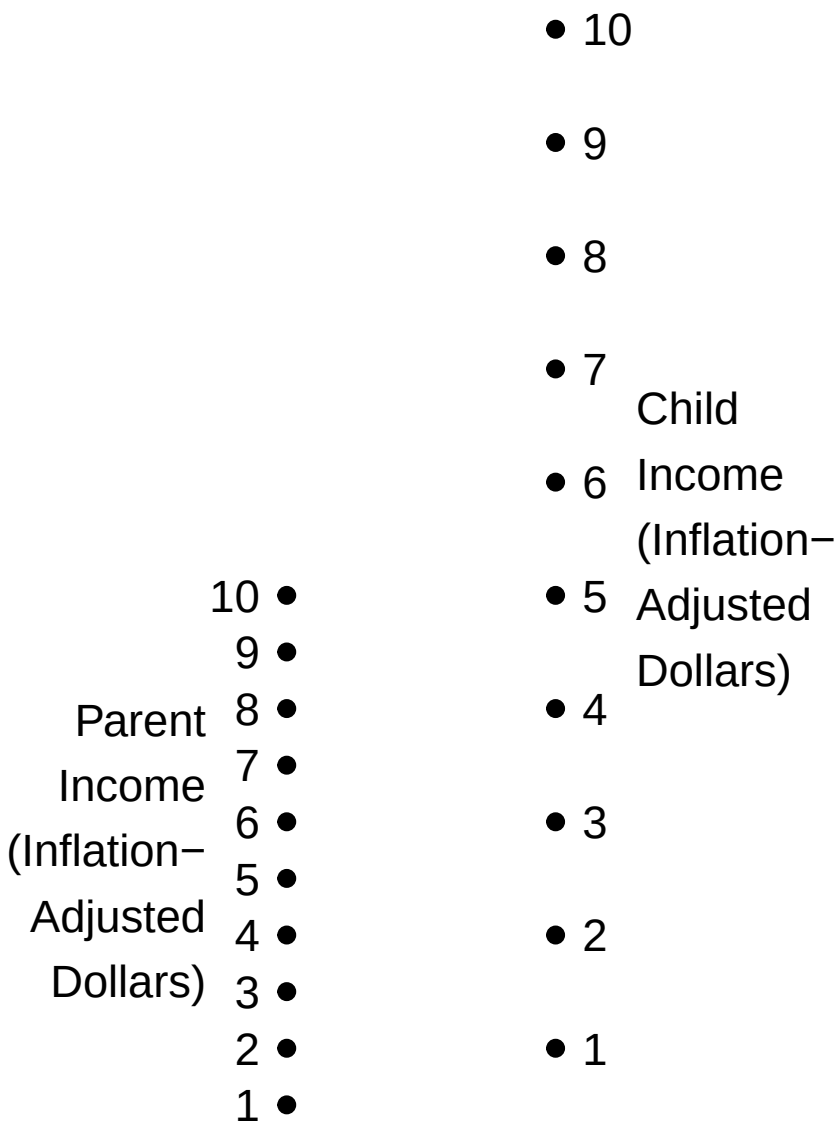

Parent Income (Inflation−Adjusted Dollars)
10
9
8
7
6
5
4
3
2
1
Child Income (Inflation−Adjusted Dollars)


Parent Income (Inflation−Adjusted Dollars)
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9
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2
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Child Income (Inflation−Adjusted Dollars)
10
9
8
7
6
5
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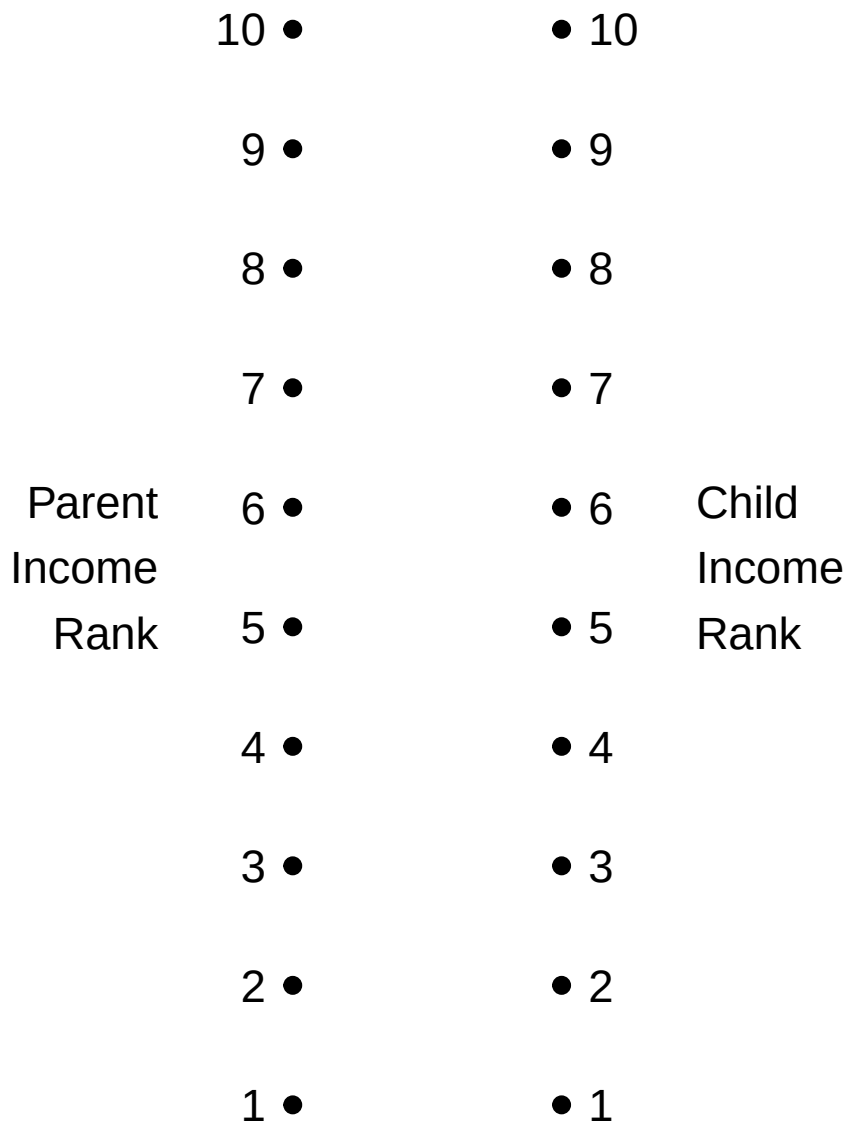
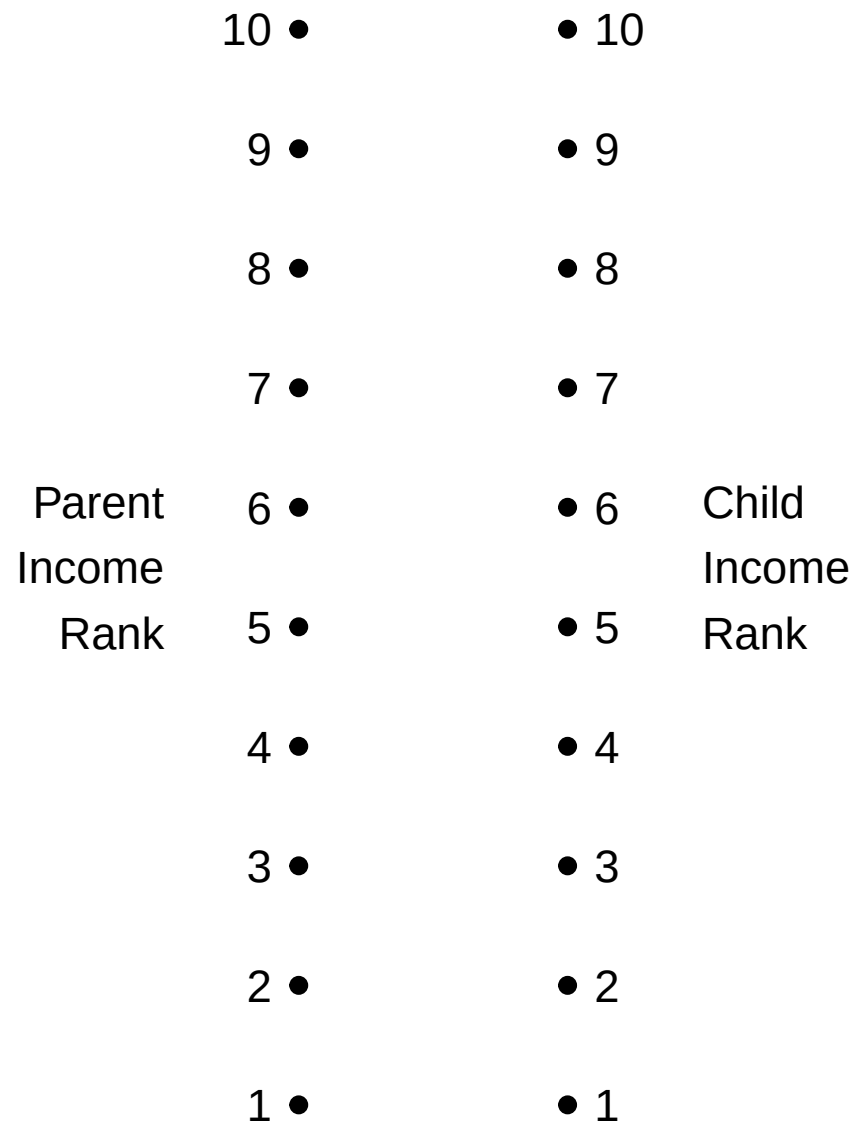
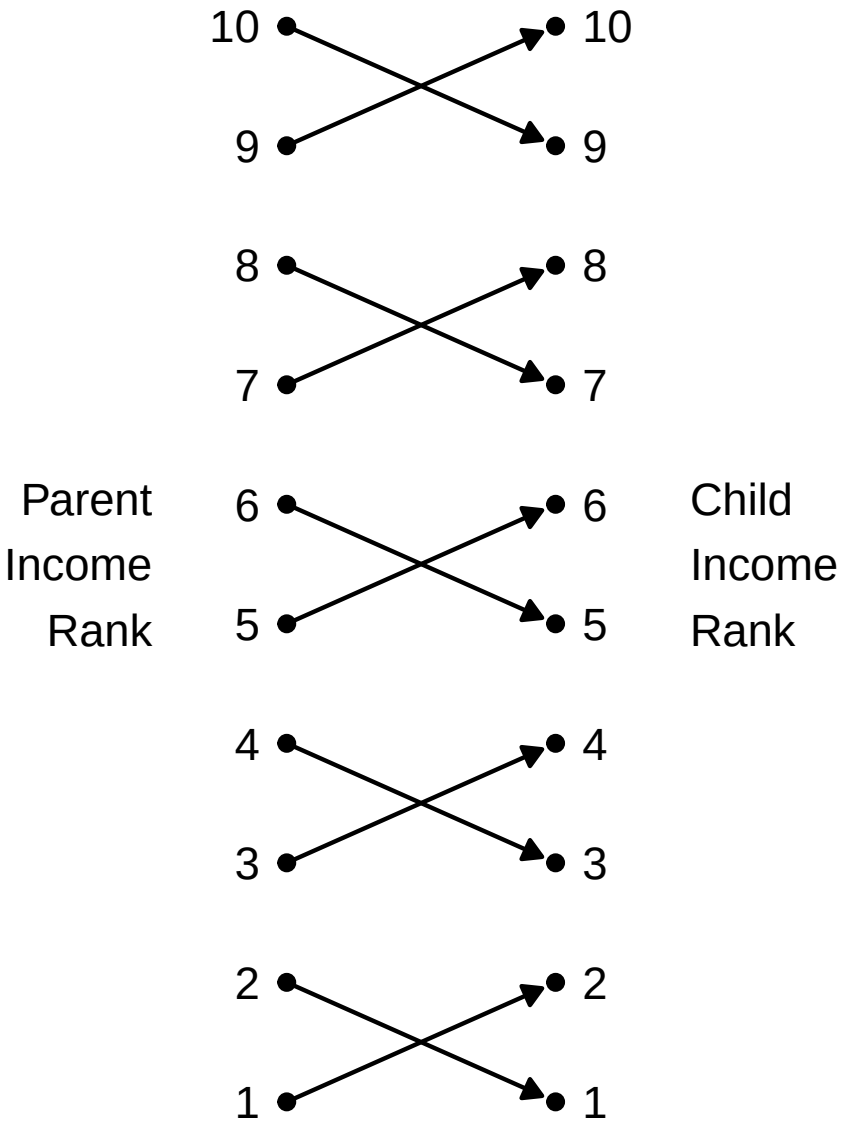
3
2
1


10
9
8
7
6
5
4
3
2
1
Parent Income Rank
10
9
8
7
6
5
4
3
2
1
Child Income Rank



relative upward mobility

landing higher than your parents in ranks

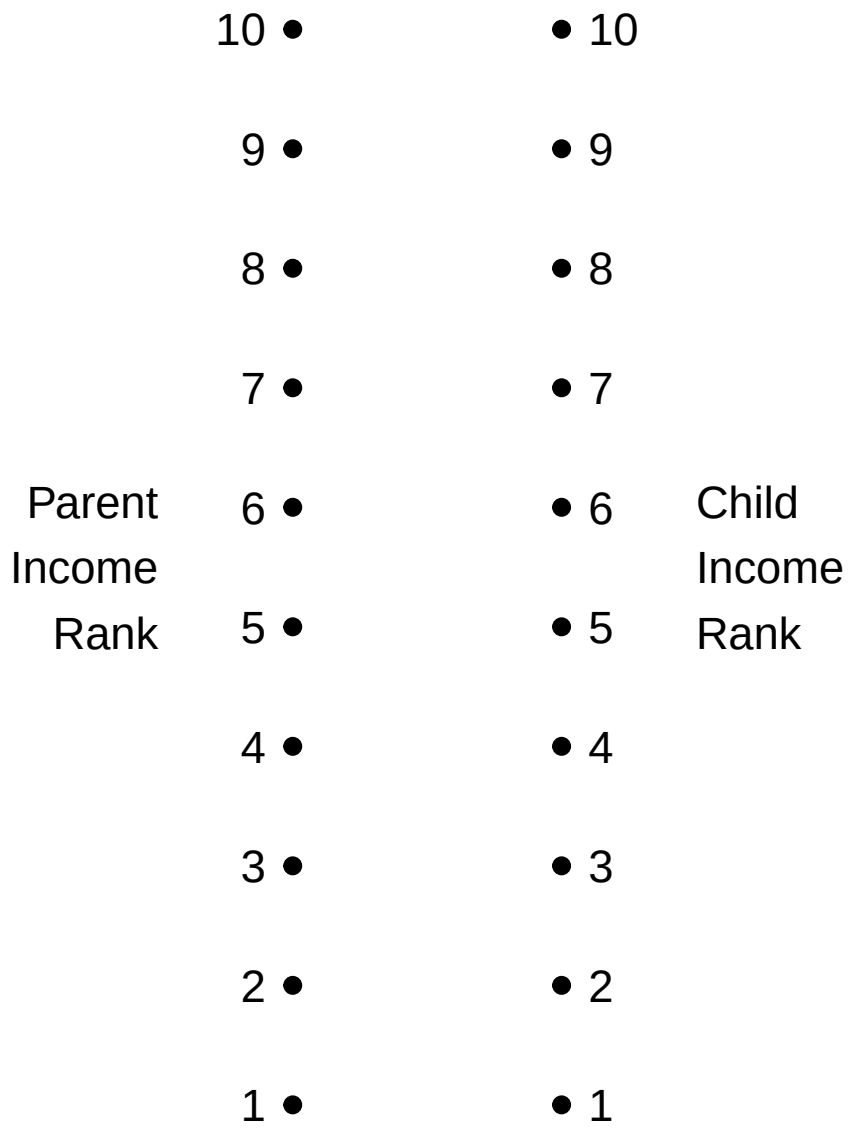


relative upward mobility

landing higher than your parents in ranks

example

half move up
half move down

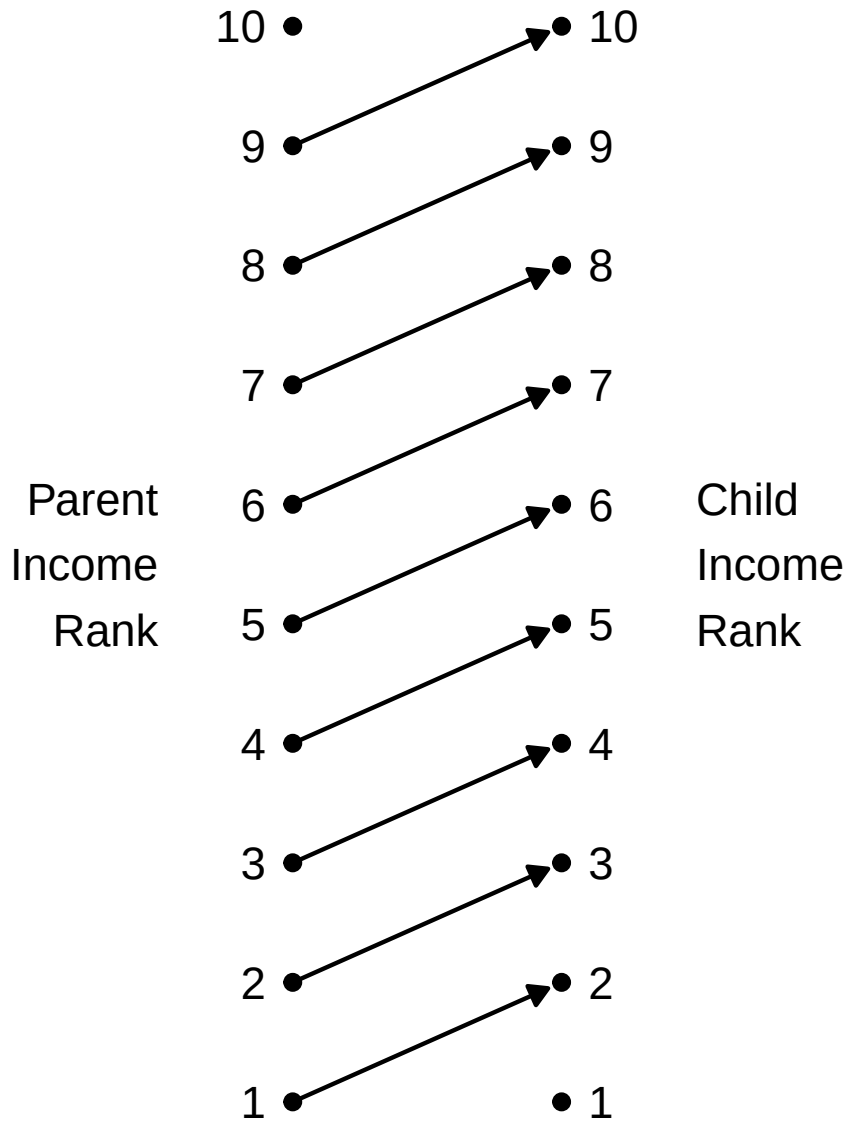


relative upward mobility

landing higher than your parents in ranks

example

90% move up

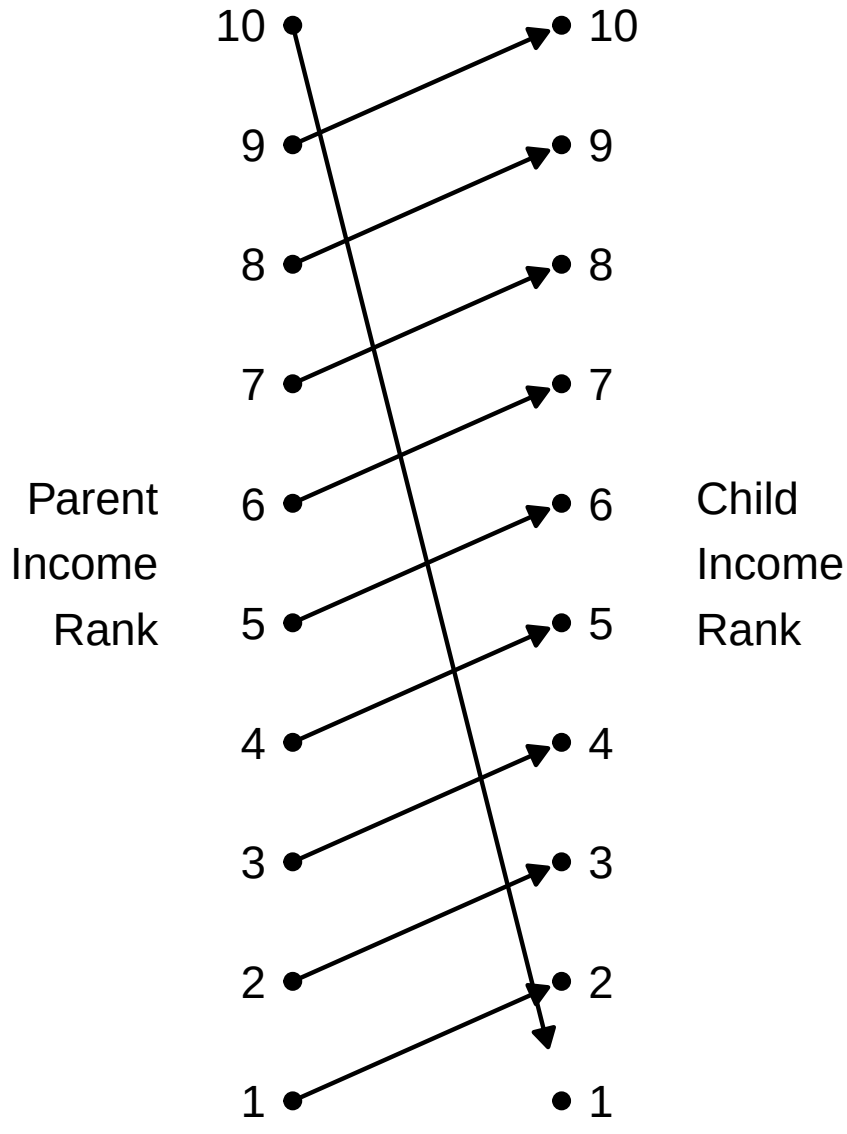


relative upward mobility

landing higher than your parents in ranks

example

90% move up



relative upward mobility

landing higher than your parents in ranks

example

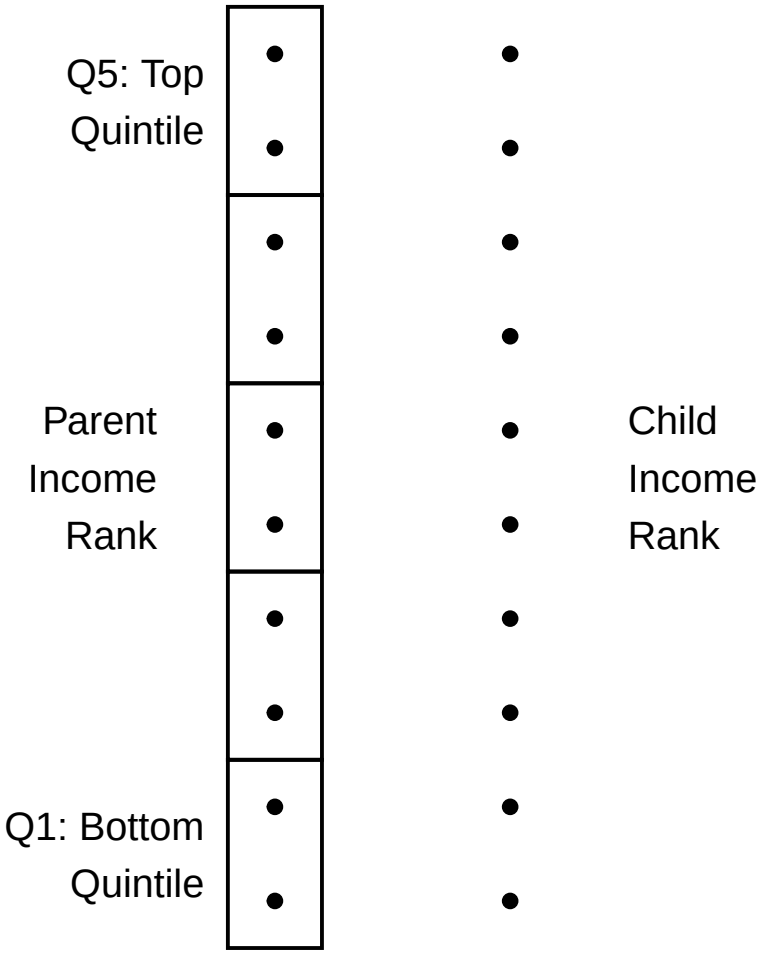
90% move up

Relative upward mobility: Reaching the top

Chetty et al. 2014

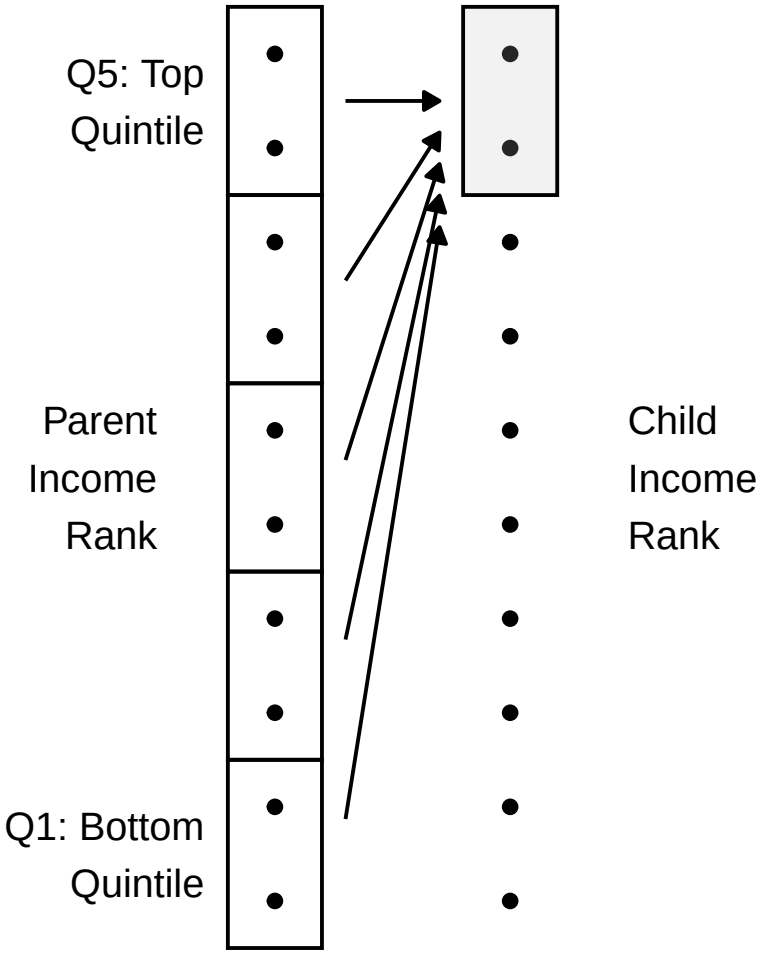
Relative upward mobility: Reaching the top

Chetty et al. 2014



Relative upward mobility: Reaching the top

Chetty et al. 2014



Relative upward mobility: Reaching the top

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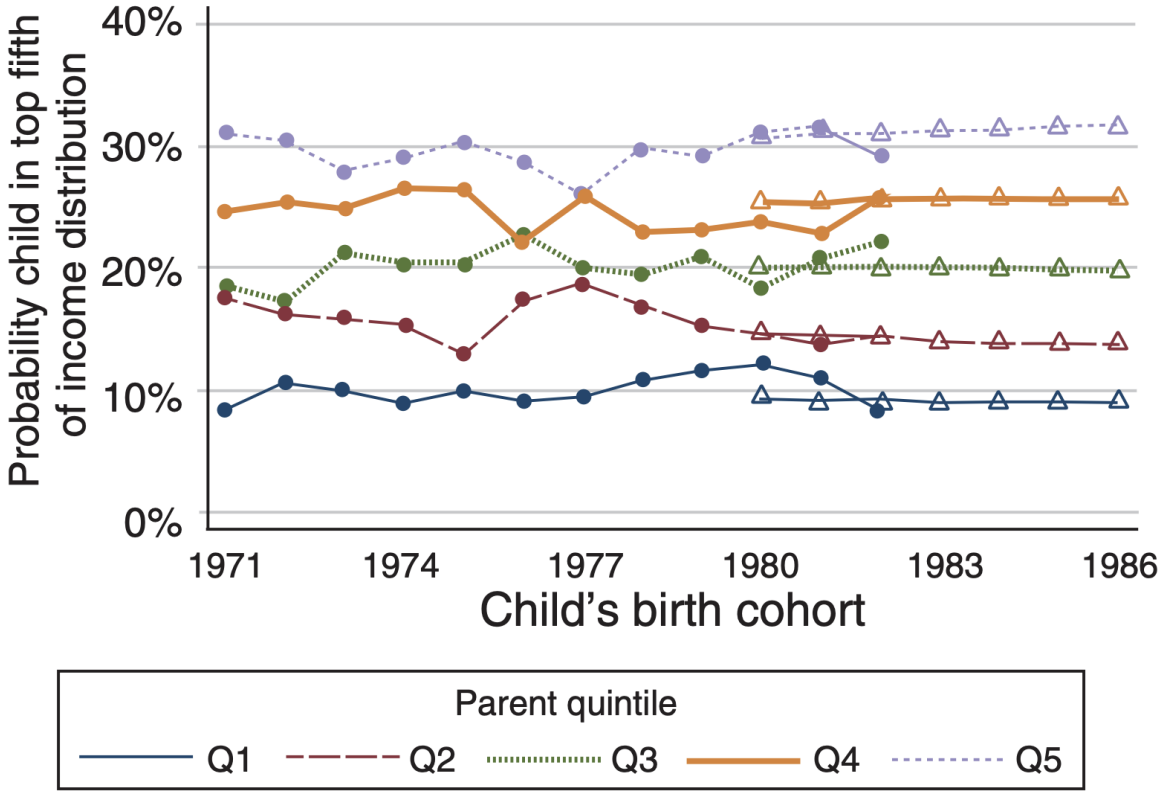

FIGURE 3. PROBABILITY OF REACHING TOP QUINTILE AT AGE 26 BY BIRTH COHORT

Economic opportunity: Two definitions

absolute mobility	out-earning your parents	has fallen
relative mobility	out-ranking your parents	roughly constant

What does **equal** opportunity mean to you?

Now, the premise that we're all created equal is the opening line in the American story. And while we don't promise equal outcomes, we've strived to deliver equal opportunity – the idea that success doesn't depend on being born into wealth or privilege, it depends on effort and merit.

— Barack Obama, Remarks on the Economy, Dec 2013. [Video]

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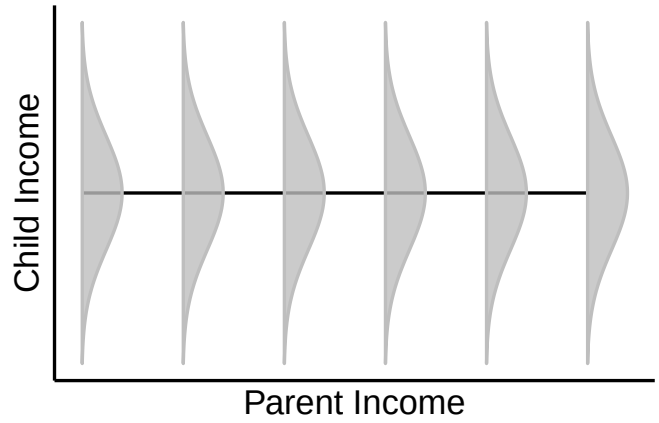
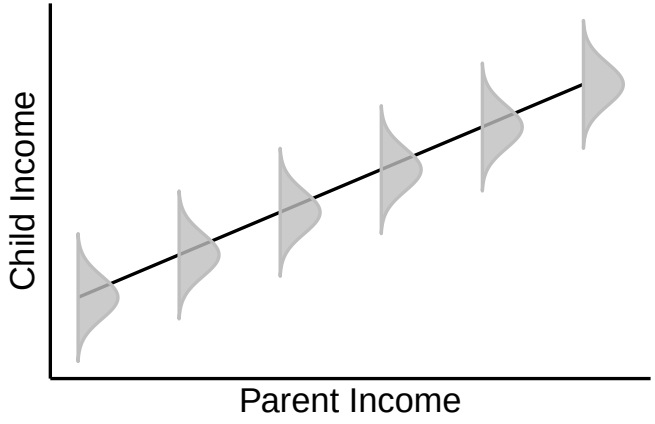
How would you quantify opportunity using data science?

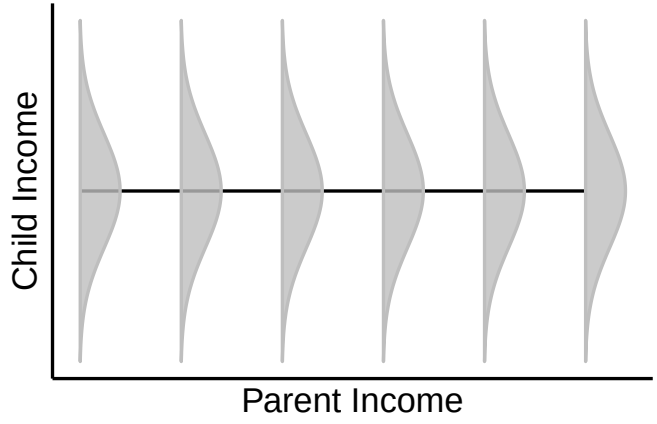
Equal Opportunity



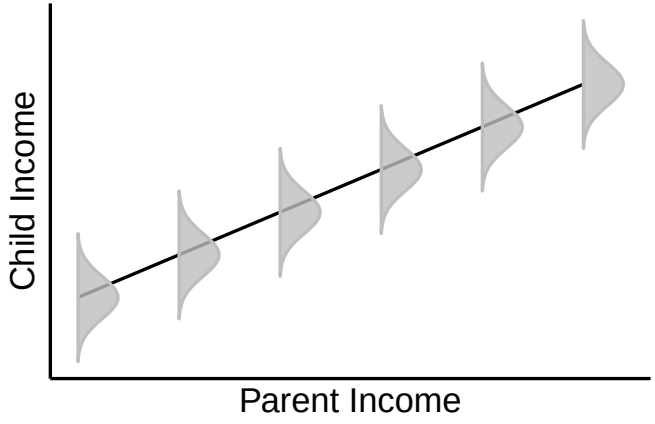
Unequal Opportunity



Equal Opportunity

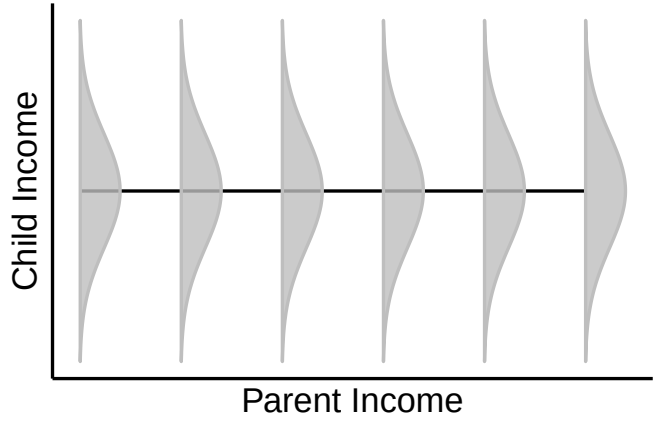


Unequal Opportunity

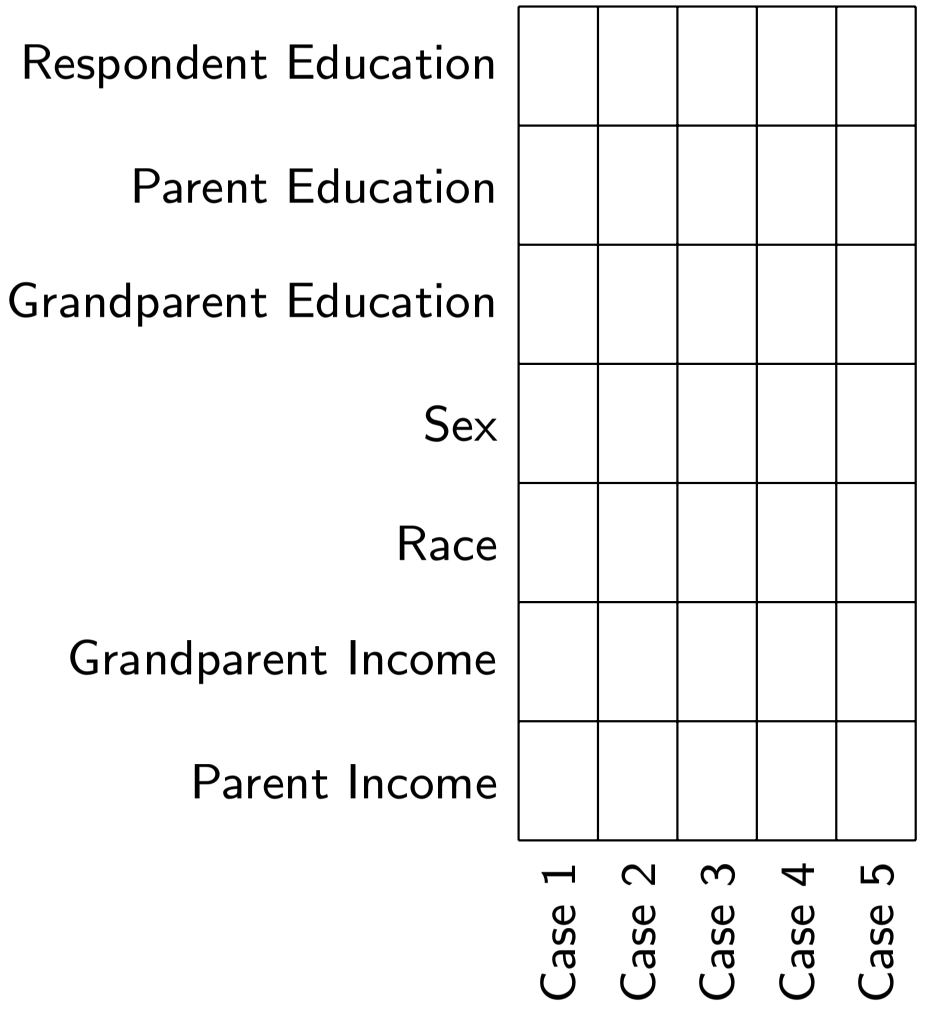


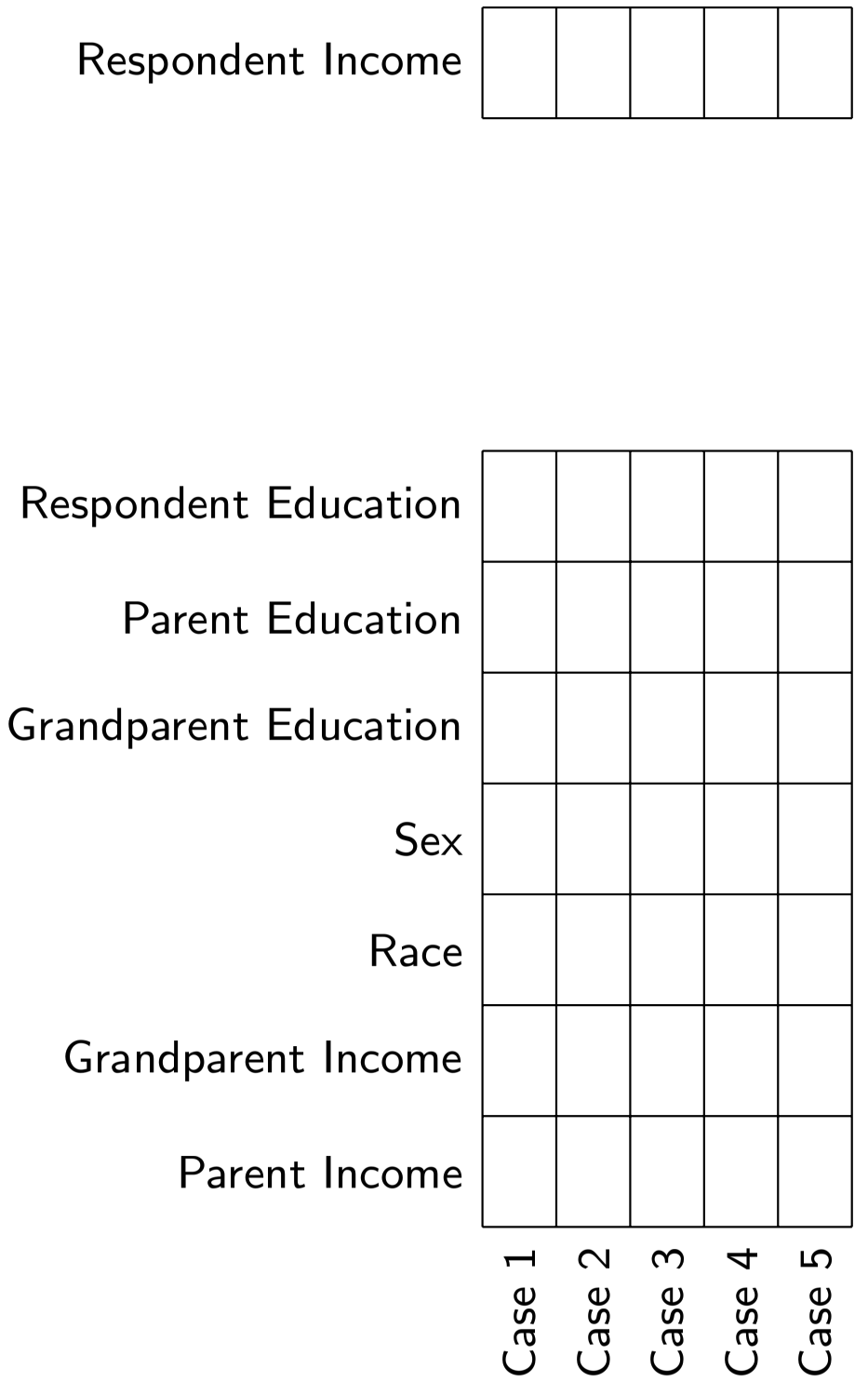
Child outcomes are **predictable** given family background

Equal Opportunity



Child outcomes are **unpredictable** given family background


Respondent Education
Parent Education
Grandparent Education
Sex
Race
Grandparent Income
Parent Income
Case 1
Case 2
Case 3
Case 4
Case 5


Respondent Income
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Parent Education
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Case 1
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Case 5

Parent Income
Grandparent Income
Race
Sex
Grandparent Education
Parent Education
Respondent Education
Case 1
Case 2
Case 3
Case 4
Case 5
Learn a prediction function
Respondent Income

Parent Income
Grandparent Income
Race
Sex
Grandparent Education
Parent Education
Respondent Education
Respondent Income
Case 1
Case 2
Case 3
Case 4
Case 5
Case 6
Case 7
Case 8
Learn a prediction function
?
?
?

Parent Income
Grandparent Income
Race
Sex
Grandparent Education
Parent Education
Respondent Education
Respondent Income
Case 1
Case 2
Case 3
Case 4
Case 5
Learn a prediction function
Case 6
Case 7
Case 8
Predict for new cases
?
?
?

Parent Income
Grandparent Income
Race
Sex
Grandparent Education
Parent Education
Respondent Education
Respondent Income
Learning Set
Case 1
Case 2
Case 3
Case 4
Case 5
Learn a prediction function
Holdout Set
Case 6
Case 7
Case 8
Predict for new cases
?
?
?

The challenge

How well can you predict respondent incomes?

Get started here

Learning goals for today

By the end of class, you will be able to

- reason about economic opportunity
- reason about equal opportunity
- connect these to a data science idea: prediction