Inequalities and Social Mobility

- **Income inequality**   *- flow*

- **Wealth inequality**   *- snapshot*

- **Social mobility**   *- dynamic*
  - Inequality can be high,
     but switching of who is rich/poor
  - Upward mobility
    - When upward without downward mobility?
      - Declining inequality over time
      - Poor immigrants

- **Resilience inequality**
  - People differ in their ability to bounce back
     after a shock
        see book: "The Resilient Society"

Social Mobility vs. Resilience

- **Social Mobility:**
  - Poor steadily move up
  - No ceiling

- **Resilience:**
  - Move up **after a negative shock**
  - Social capital (network, community …)
    is equally/more important for resilience?

Upward Mobility of US Immigrants

- Leah Boustan webinar
  - Immigrants today are upward mobile as in 1900-20
  - 2nd generations immigrants
  - Are there Facebook/Meta Connection
    btw immigrants & non-immigrants?

Poll

1. Which type of **social capital** is most strongly **associated with economic mobility**?

   a. Interaction across class lines   b. Rates of volunteering

   c. Density of civic organizations   d. The extent of "cliques"

3. How **networks help** low-income children to **escape poverty**?

   a. Shaping aspirations b. access to information   c. references

4. **Why** do low-income people have **fewer high-income friends?**

   a. Lack of exposure

   b. Lack of interaction given exposure   c. Both equally

5. **Where to befriend** a peer from a different social class?

   a. Workplaces   b. High schools

   b. Colleges   d. Religious Groups

Social Capital
and
Economic Mobility

8. Sept. 2022

Markus Brunnermeier
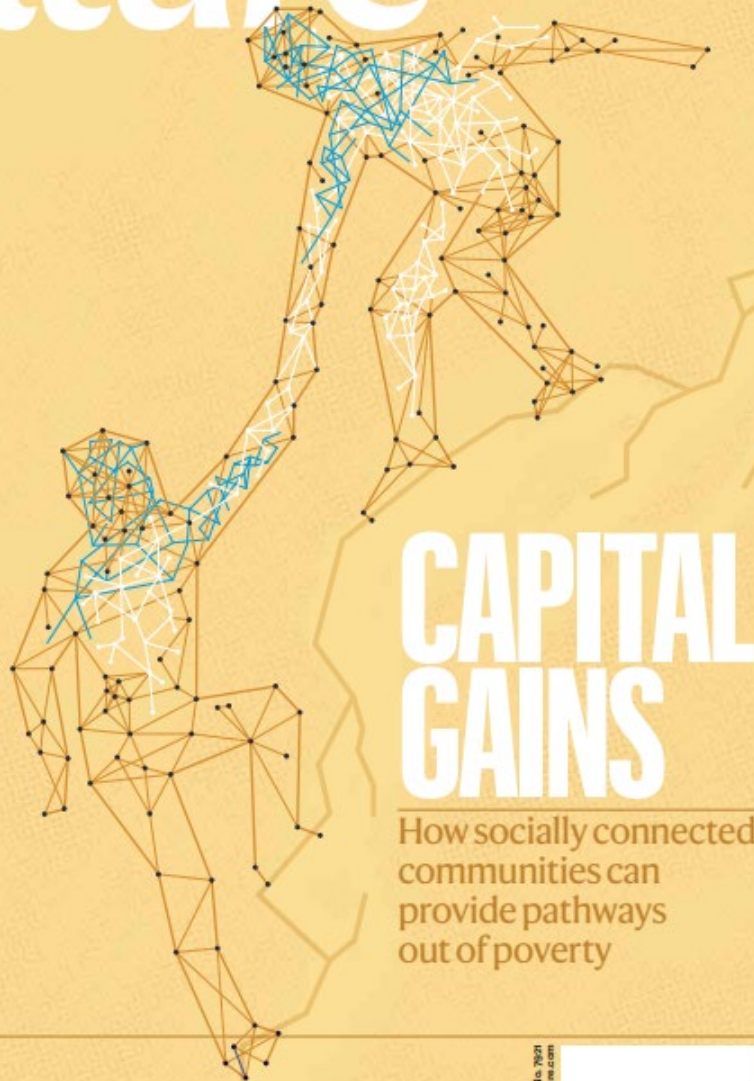
Social Capital and Economic Mobility

September 2022

Raj Chetty*, Matthew Jackson*, Theresa Kuchler*, Johannes Stroebel*
Nathan Hendren, Robert Fluegge, Sara Gong, Federico González, Armelle Grondin
Matthew Jacob, Drew Johnston, Martin Koenen, Eduardo Laguna-Muggenburg
Florian Mudekereza, Tom Rutter, Nicolaj Thor, Wilbur Townsend, Ruby Zhang
Mike Bailey, Pablo Barberá, Monica Bhole & Nils Wernerfelt

*Co-Principal Investigators and Corresponding Authors

The Geography of Upward Mobility in the United States

Mean Income Rank at Age 35 for Children whose Parents Earned $27,000 (25th percentile)
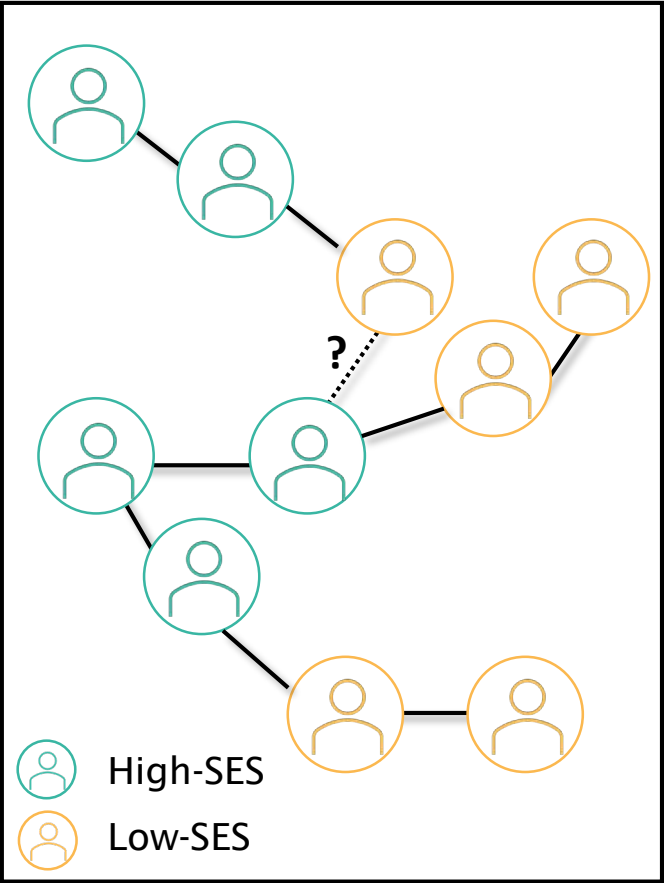

Legend:
- >51 ($44k)
- 42 ($33k)
- <36 ($27k)
- No Data
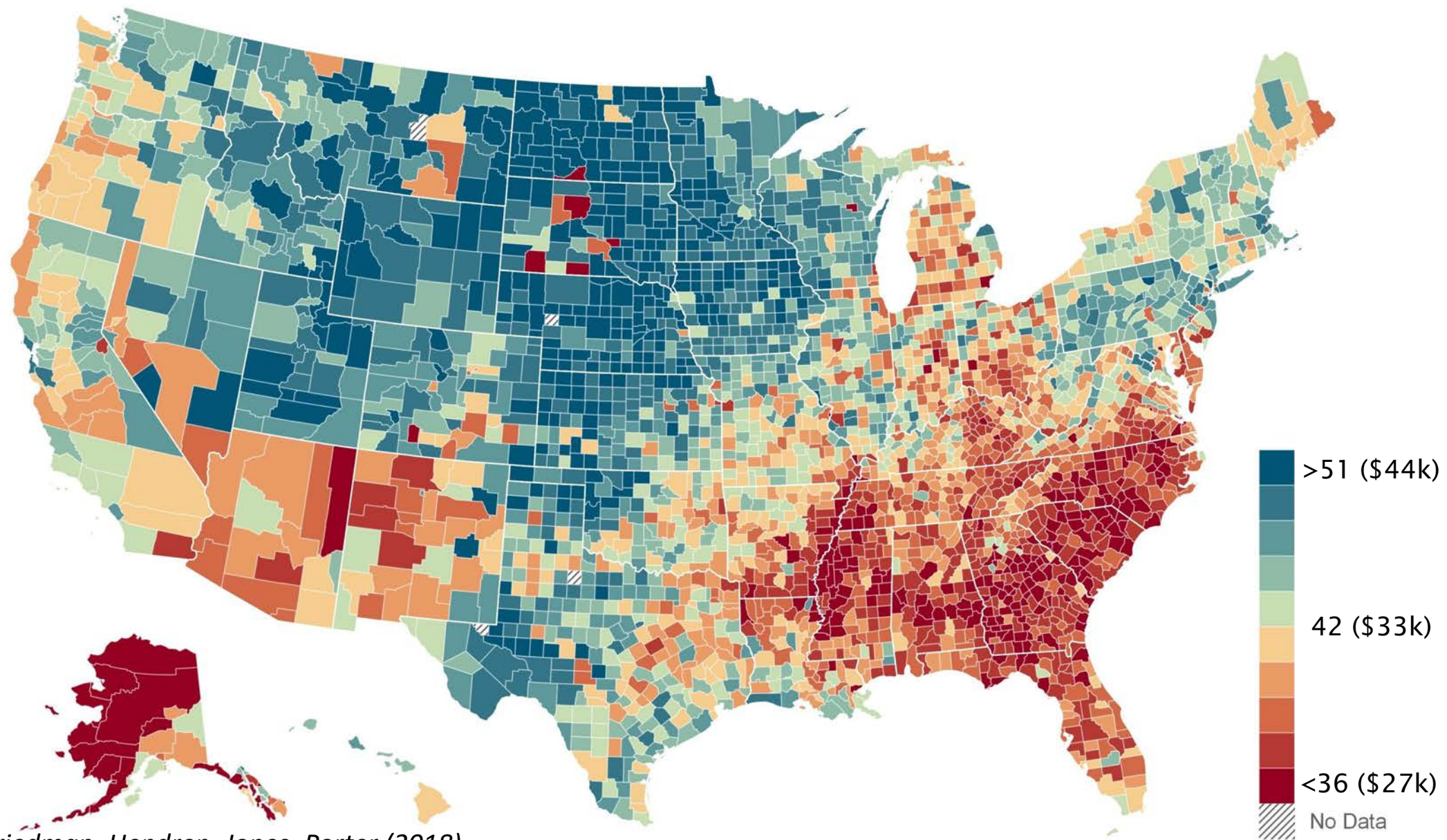
Source: Chetty, Friedman, Hendren, Jones, Porter (2018)

What are the Characteristics of High-Upward-Mobility Areas?

- Large literature has identified several strong predictors of variation in upward mobility across areas, including:

    - Lower poverty rates [Chetty, Hendren, Kline, Saez 2014]

    - School quality [Chetty, Hendren, Kline, Saez 2014]

    - Income inequality [Corak 2013, Krueger 2012, Durlauf et al. 2022]

    - Racial segregation, public goods [Cutler and Glaeser 1997, Derenoncourt 2022]

    - Family structure, father presence [Chetty, Hendren, Jones, Porter 2018]

    - Violence and crime [Sharkey and Torrats-Espinosa 2017, Manduca and Sampson 2019]

    - Pollution exposure [Colmer et al. 2021]

    - Historical redlining [Aaronson et al. 2021]

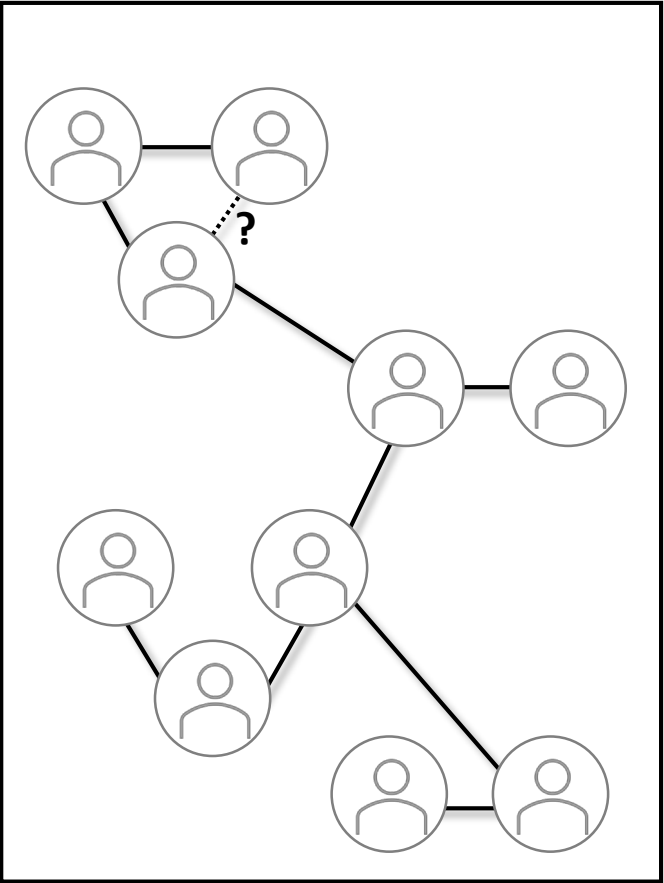- Potential importance of social capital? [e.g., Putnam 2016]

What is "Social Capital"? Three Concepts from the Prior Literature

Connectedness

High-SES

Low-SES

Loury 1977; Bourideu 1986;
Lin and Dumin 1986; Putnam 2016

Cohesiveness

Coleman 1988; Jackson et al. 2012

Civic Engagement

Putnam et al. 1994; Putnam 1995

This Project: Two Papers

Measure Social Capital Using Data from Facebook

Analyze Associations with **Economic Mobility**

Identify **Determinants** of Social Connections

Release Data to **Target Interventions**

Chetty, Jackson, Kuchler, Stroebel, et al. "Social Capital I: Measurement and Associations with Economic Mobility" *Nature* 2022
Chetty, Jackson, Kuchler, Stroebel, et al. "Social Capital II: Determinants of Economic Connectedness" *Nature* 2022

Measurement of
Social Capital

Association
with Economic
Mobility

Determinants
of Economic
Connectedness

Targeting
Interventions

Measuring Social Capital

Data and Sample Definitions

- Baseline analysis sample

  - U.S. Facebook users between ages 25–44 who are 30-day active with at least 100 friends in the U.S. as of May 28, 2022 (1978–1997 birth cohorts)

  - 72.2 million individuals, 21 billion friendships: **84% coverage** of 25–44-year-old population
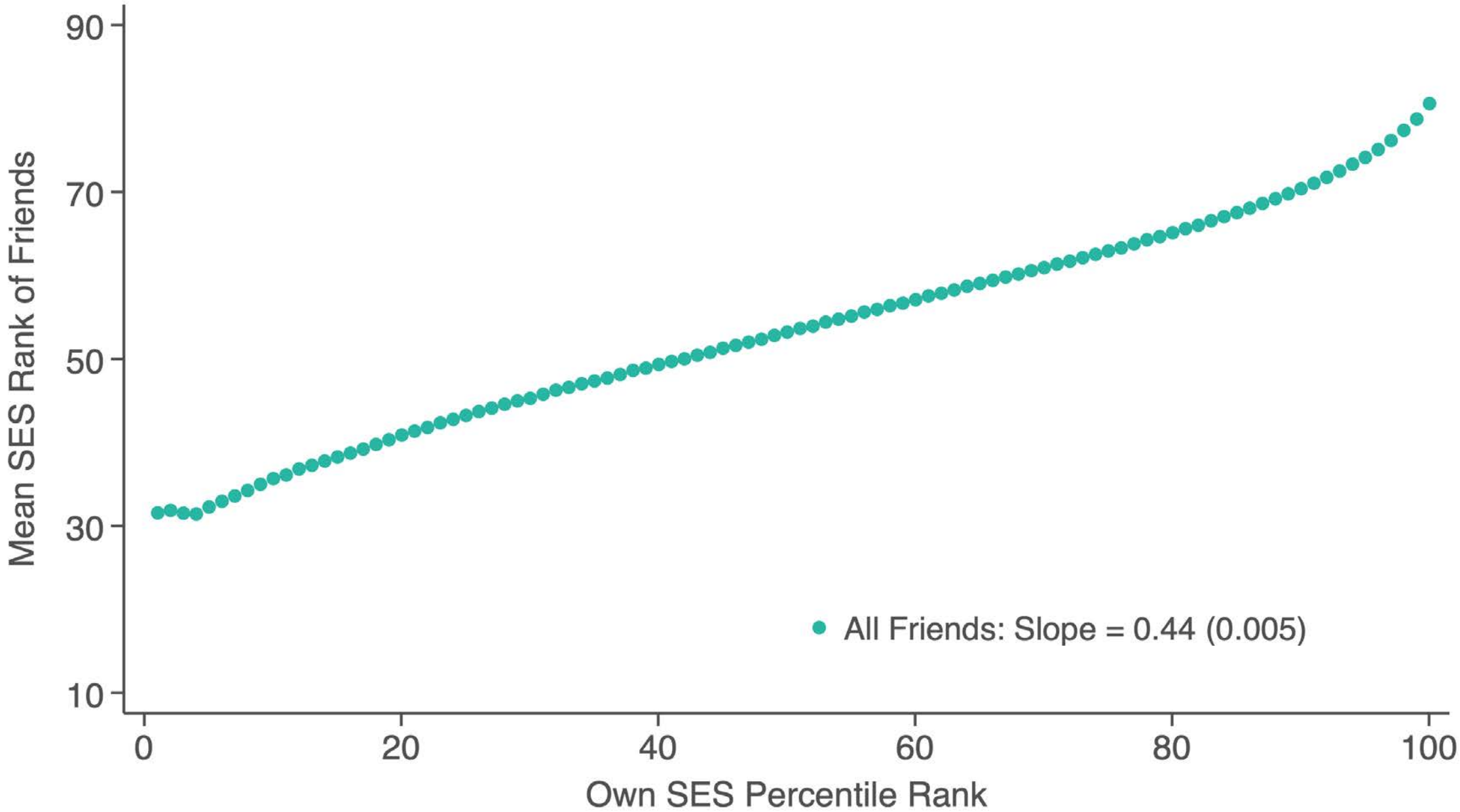
Economic Connectedness

- Begin by measuring **economic connectedness**: to what extent are individuals from low- vs. high-SES backgrounds friends with each other?

    - Many reasons that economic connectedness might matter for outcomes: information, influence on aspirations and preferences, job referrals [e.g., Loury 1977, Bourdieu 1986; Case and Katz 1991, Glaeser, Sacerdote, Scheinkman 1996, Pallais 2014, Burks et al. 2015, Putnam 2016, …]
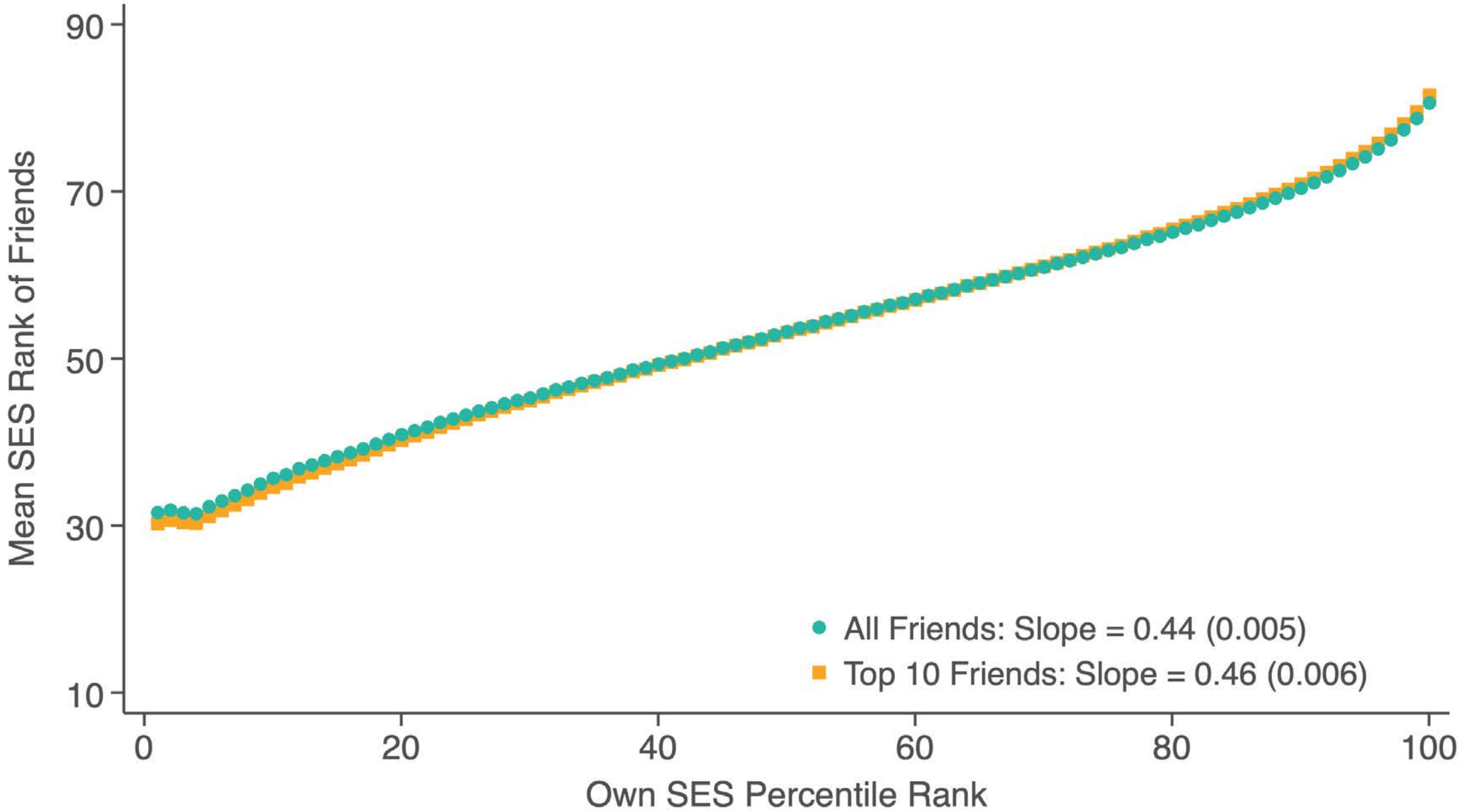
Measuring Socioeconomic Status

- Construct an index of socioeconomic status (SES) by combining several proxies: ZIP code, college, phone model price, …

- Baseline measure: combination that best predicts median household income in block group (available for a subset of users) using a machine learning model

- Rank users in the **national** income distribution based on their predicted SES ranks

- SES measures are highly correlated with public data on income distributions by high school, college, and ZIP code

- Also obtain similar results when using ZIP code median income or simple weighted averages of standardized proxies
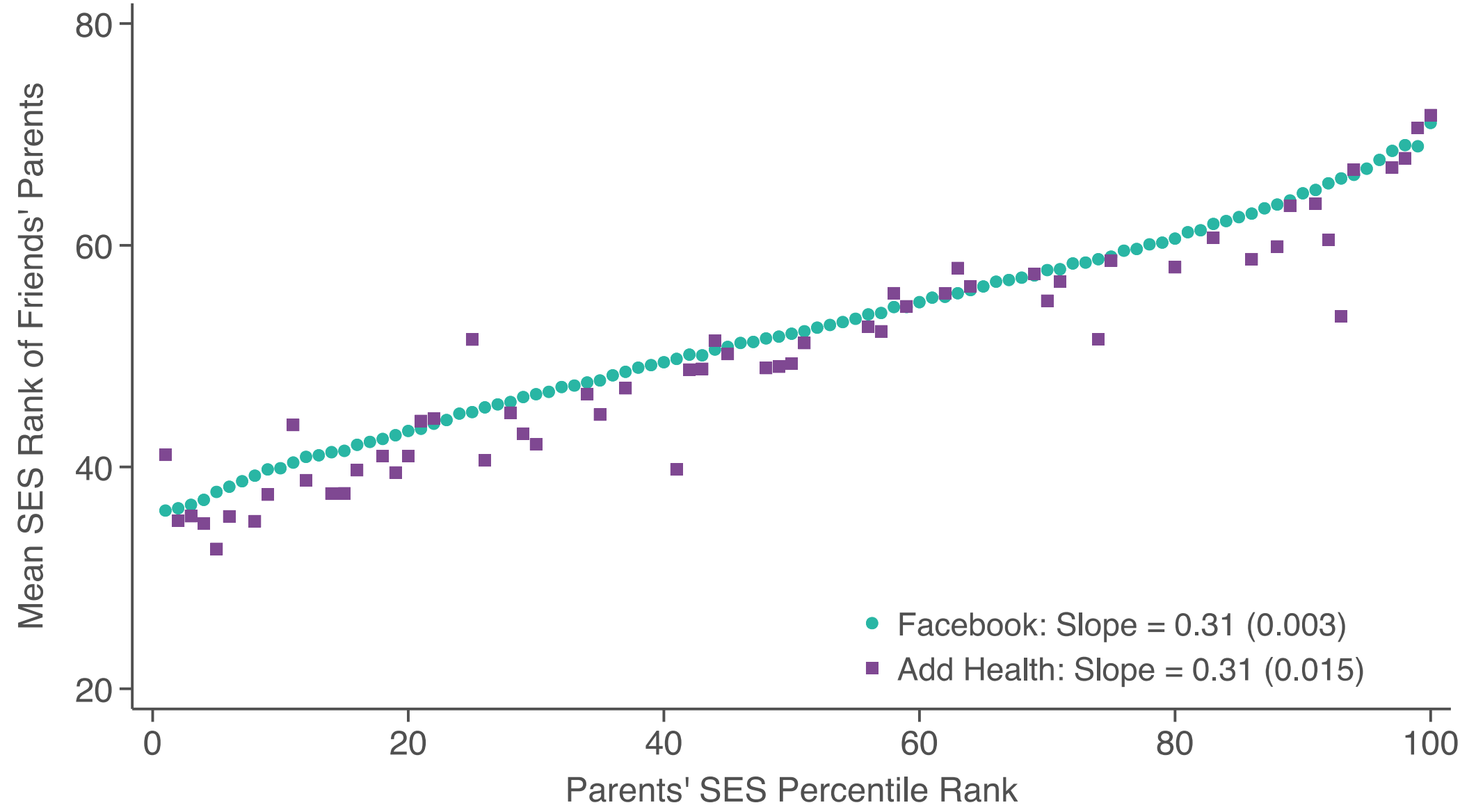
Mean Friend SES Rank vs. Own SES Rank

All Friends: Slope = 0.44 (0.005)

Mean Friend SES Rank vs. Own SES Rank

Mean SES Rank of Friends (y-axis): 10, 30, 50, 70, 90

Own SES Percentile Rank (x-axis): 0, 20, 40, 60, 80, 100

All Friends: Slope = 0.44 (0.005)
Top 10 Friends: Slope = 0.46 (0.006)

Homophily by SES in Facebook Data vs. Add Health Survey Data
Mean Parents Rank of Five Best Friends in High School vs. Own Parents' Rank

Legend:
- Facebook: Slope = 0.31 (0.003)
- Add Health: Slope = 0.31 (0.015)

X-axis: Parents' SES Percentile Rank

Y-axis: Mean SES Rank of Friends' Parents

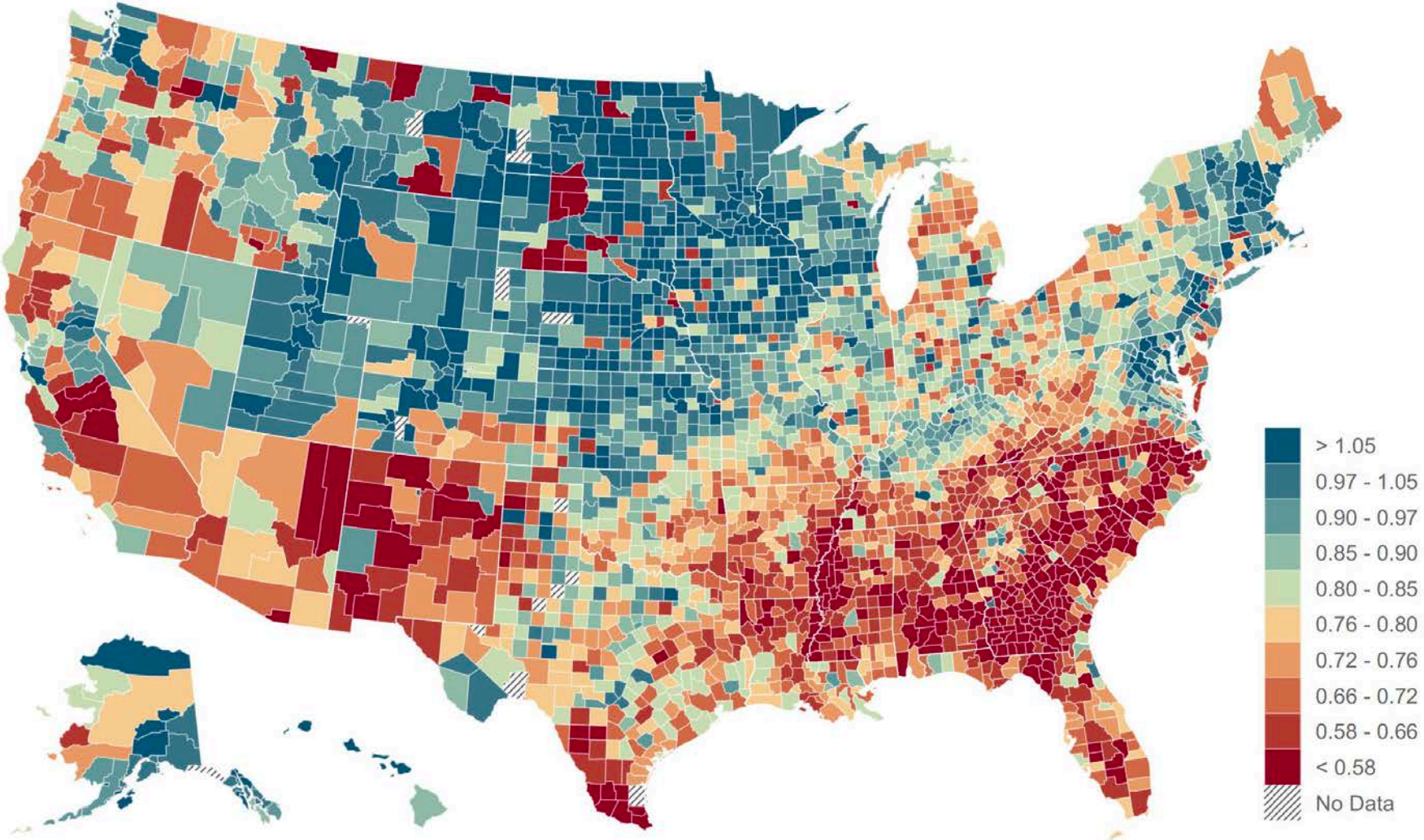# Measuring Economic Connectedness Across Subgroups

- Facebook data have sufficiently large samples to allow us to disaggregate across subgroups (ZIP codes, high schools, colleges, etc.)

- Summarize the degree to which low-SES people in a given group are connected to high-SES people using the following statistic:

$$EC = \frac{\text{Number of friends with above}-\text{median SES}}{\text{Total number of friends}} / \frac{1}{2}$$

- Mean EC nationally = 0.78: **22% under-representation** of high-SES friends relative to random-friending benchmark

Economic Connectedness of Low-SES Individuals by County
Normalized Share of Above-Median Friends Among Below-Median People

Legend:
- > 1.05
- 0.97 - 1.05
- 0.90 - 0.97
- 0.85 - 0.90
- 0.80 - 0.85
- 0.76 - 0.80
- 0.72 - 0.76
- 0.66 - 0.72
- 0.58 - 0.66
- < 0.58
- No Data

Note: see the Social Capital Atlas (www.socialcapital.org) for an interactive version of this map and downloadable data

Economic Connectedness vs Share Above Poverty Line, by County

Correlation: 0.61

Economic Connectedness (y-axis)

Share Above Poverty Line (%) (x-axis)
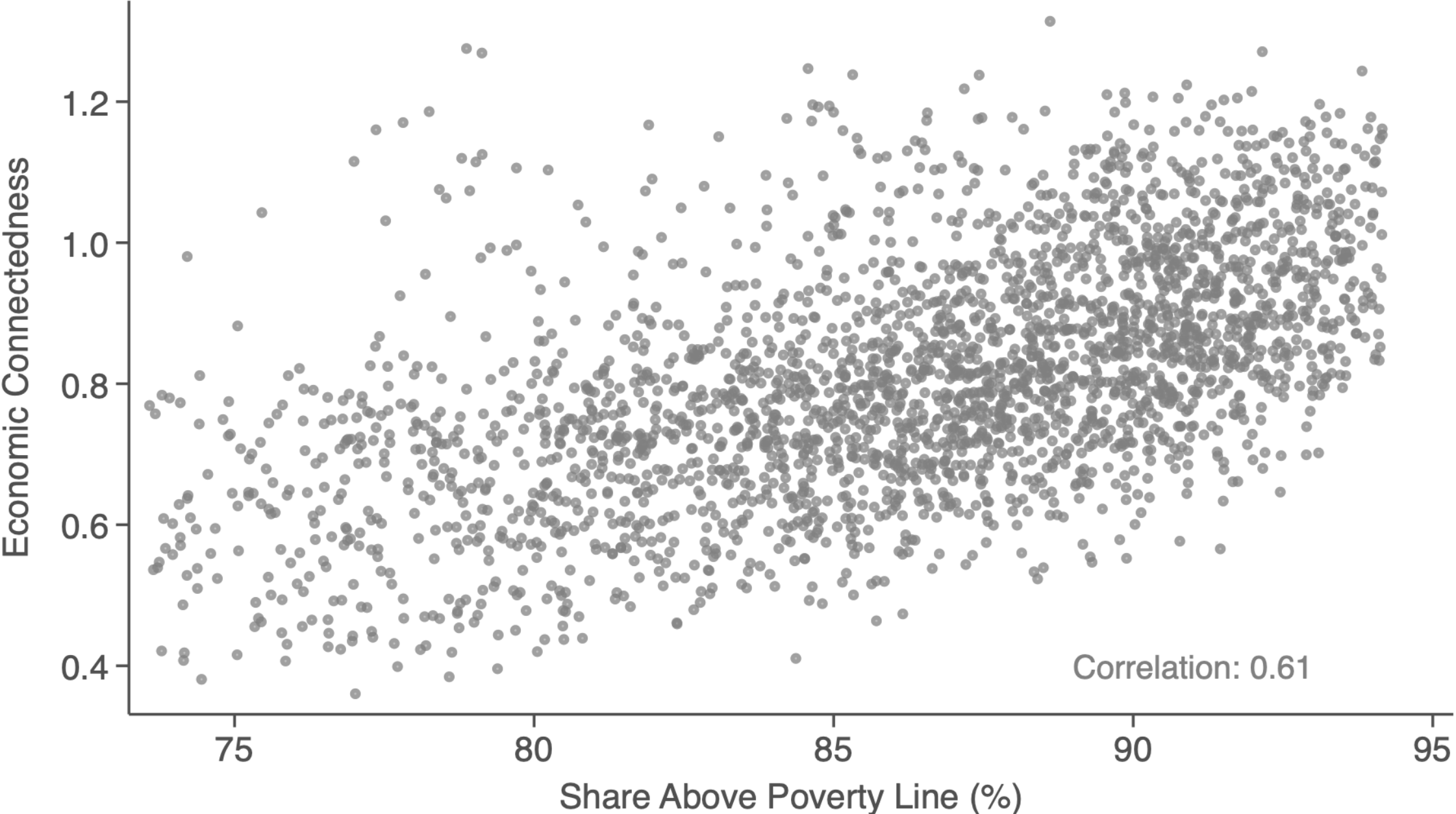
Correlation Matrix of County-Level Social Capital Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Economic Connectedness (EC)	1.00								
(2) Language Connectedness	0.10	1.00							
(3) Age Connectedness	-0.45	0.17	1.00						
(4) Clustering	0.01	0.38	0.51	1.00					
(5) Support Ratio	-0.25	0.30	0.50	0.64	1.00				
(6) Spectral Homophily	-0.09	-0.37	-0.49	-0.61	-0.51	1.00			
(7) Penn State Index	0.31	0.08	-0.04	0.39	0.28	-0.25	1.00		
(8) Civic Organizations	0.27	0.16	0.05	0.37	0.23	-0.33	0.67	1.00	
(9) Volunteering Rate	0.46	0.28	-0.04	0.30	0.23	-0.35	0.44	0.46	1.00

Association with Economic Mobility

Upward Mobility vs. Economic Connectedness, by County
200 Largest Counties

Correlation (all counties) = 0.65 (0.04)
Correlation (200 largest counties) = 0.58 (0.08)
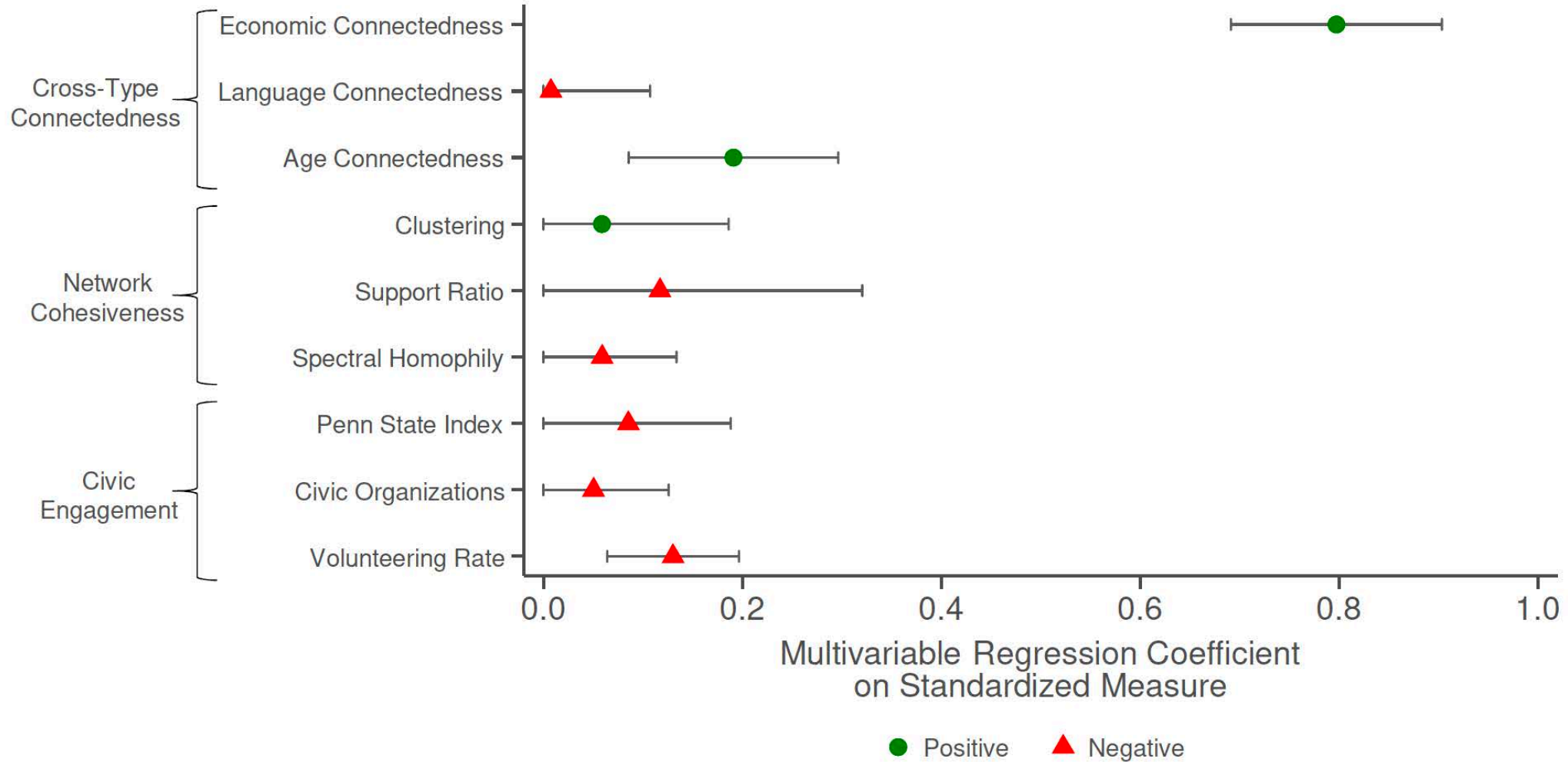Slope (200 largest counties) = 16.4 (2.1)
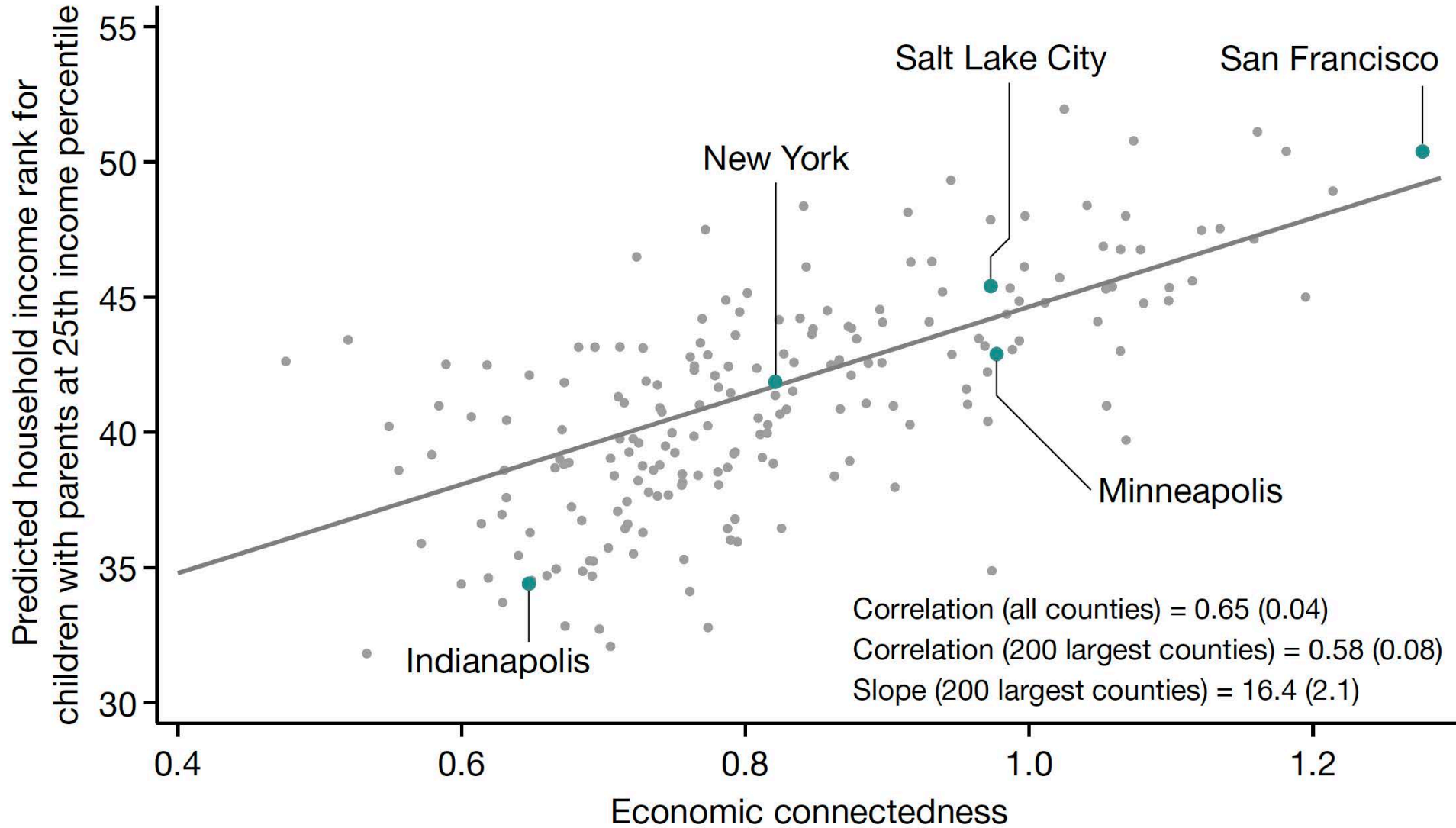
Correlations between Upward Mobility and Measures of Social Capital
County-level Univariate Correlations
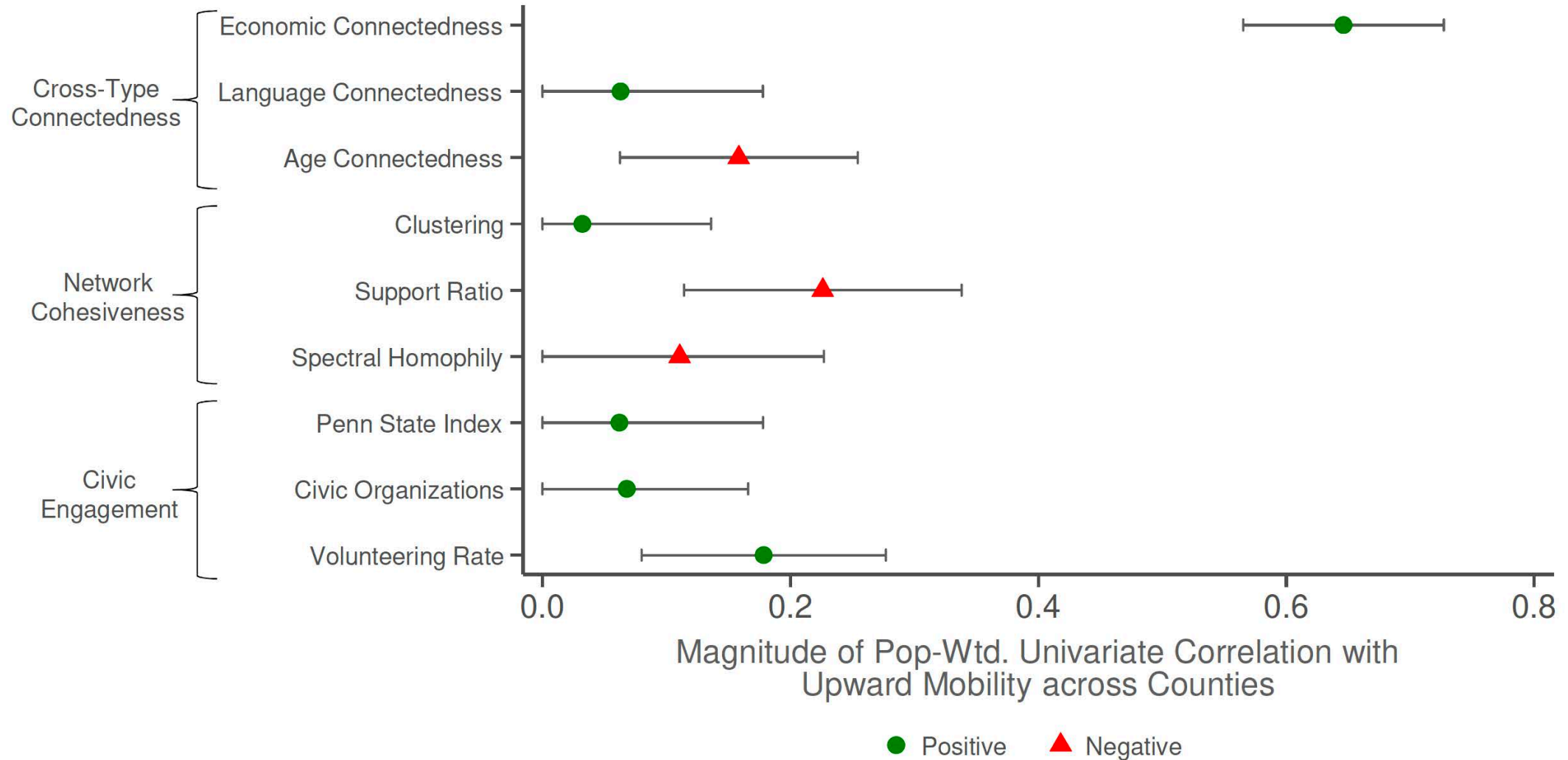
Correlations between Upward Mobility and Measures of Social Capital
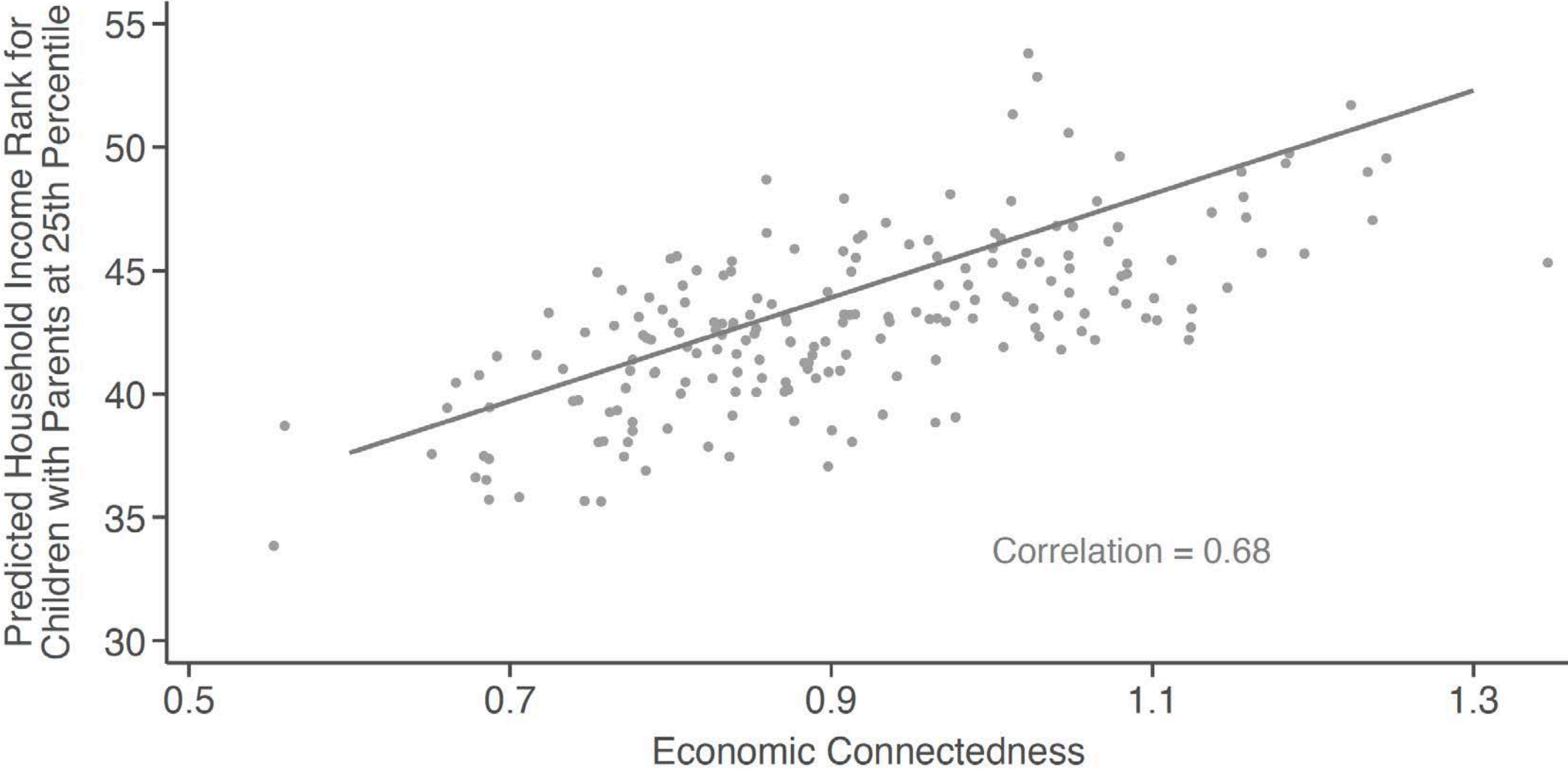Coefficients from County-level Multivariable Regression

Cross-Type Connectedness
- Economic Connectedness
- Language Connectedness
- Age Connectedness

Network Cohesiveness
- Clustering
- Support Ratio
- Spectral Homophily

Civic Engagement
- Penn State Index
- Civic Organizations
- Volunteering Rate

Multivariable Regression Coefficient
on Standardized Measure

● Positive   ▲ Negative

Why is Economic Connectedness Related to Upward Mobility?

- Economic connectedness may have a causal effect on upward mobility through many mechanisms (e.g., aspirations, information, referrals)

- But EC may be correlated with mobility even in the absence of a causal effect for three other reasons:

  1. Reverse causality: upward mobility leads to higher EC in adulthood

  2. Selection: people who live in high-EC areas differ on other dimensions (e.g., race)

  3. Other neighborhood characteristics: high-EC neighborhoods have other features (e.g., better schools) that generate high upward mobility

Reverse Causality

- To address reverse causality, examine friendships made **before** individuals enter labor market, based on **parental** SES

    - Pre-determined relative to ex-post SES, so cannot be mechanically affected by rates of upward mobility

- Two approaches to measuring childhood EC: high school friends, parental SES of Facebook users and current day Instagram users aged 13-18

- Childhood EC remains strongly correlated with upward mobility

    - Correlation of 0.44 using Facebook subsample linked to parents and 0.62 using Instagram full sample

Selection on Race: Upward Mobility vs. EC in Counties with >90% White Residents

Predicted Household Income Rank for Children with Parents at 25th Percentile vs. Economic Connectedness

Correlation = 0.68

Selection vs. Causal Effects

- To evaluate importance of selection on other dimensions, examine association between estimated **causal effects** of counties on upward mobility and EC

- Ideal experiment: randomly assign children to different counties while growing up and test if those assigned to counties with higher EC earn more as adults

- Instead, use causal effect estimates from Chetty and Hendren (2018), identified using a quasi-experimental **movers design**

  - Analyze earnings in adulthood of 7 million children whose parents moved to a different county while they were growing up

  - Identification assumption: age at move between a given pair of areas is orthogonal to potential outcomes conditional on parental income

  - Identify causal effect of spending a year of childhood in each county by comparing children who moved that county earlier vs. later [Chetty, Hendren, Katz 2016, Chyn 2018, Deutscher 2019, Alesina et al. 2020, Laliberte 2021]

Counties' Causal Effects on Upward Income Mobility vs. Economic Connectedness

County-Level Causal Effect (Percentile Change in Earnings Rank, From Birth)

Economic Connectedness

Slope = 9.8 (1.4)
Signal Correlation = 0.44 (0.06)
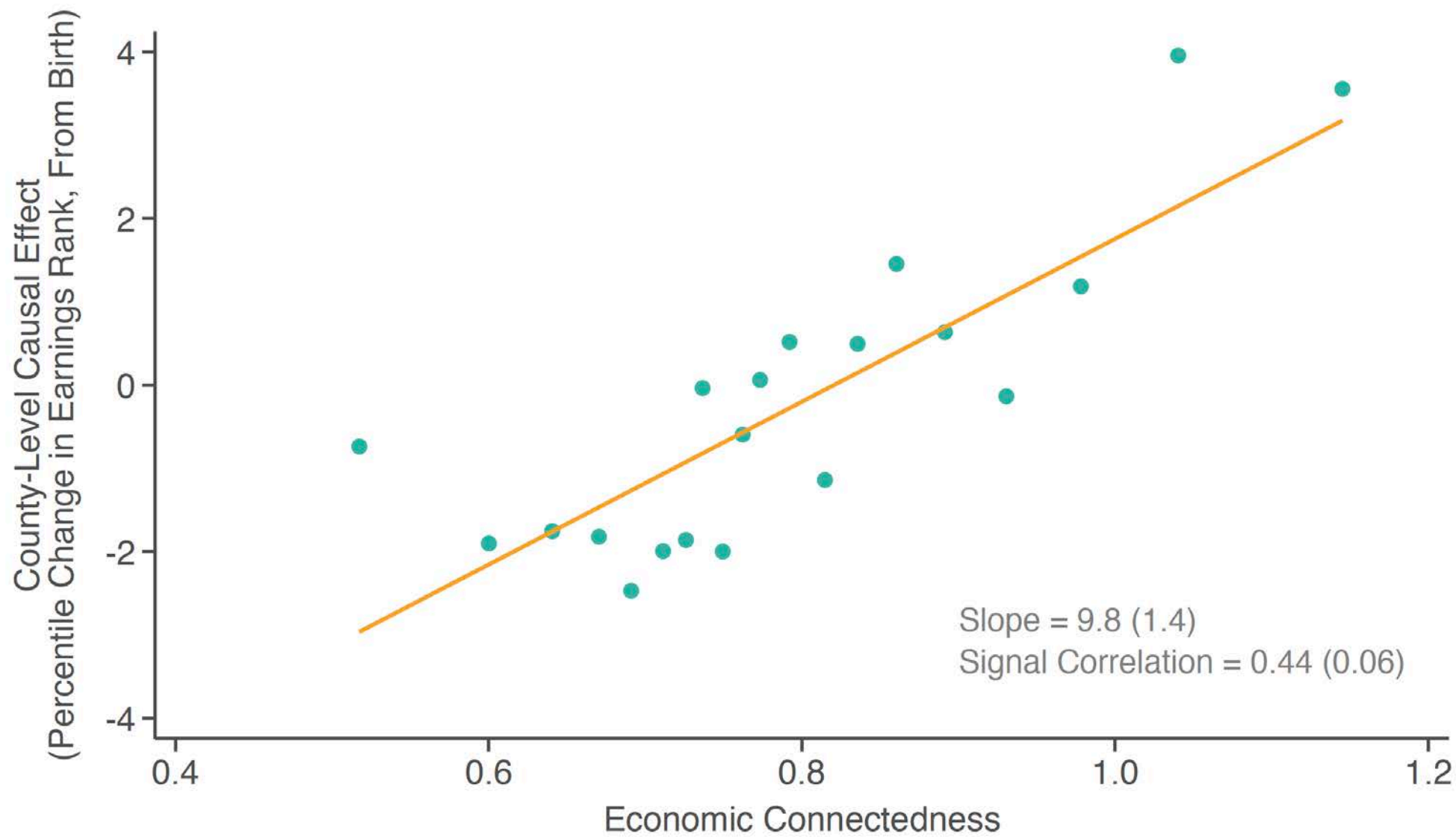
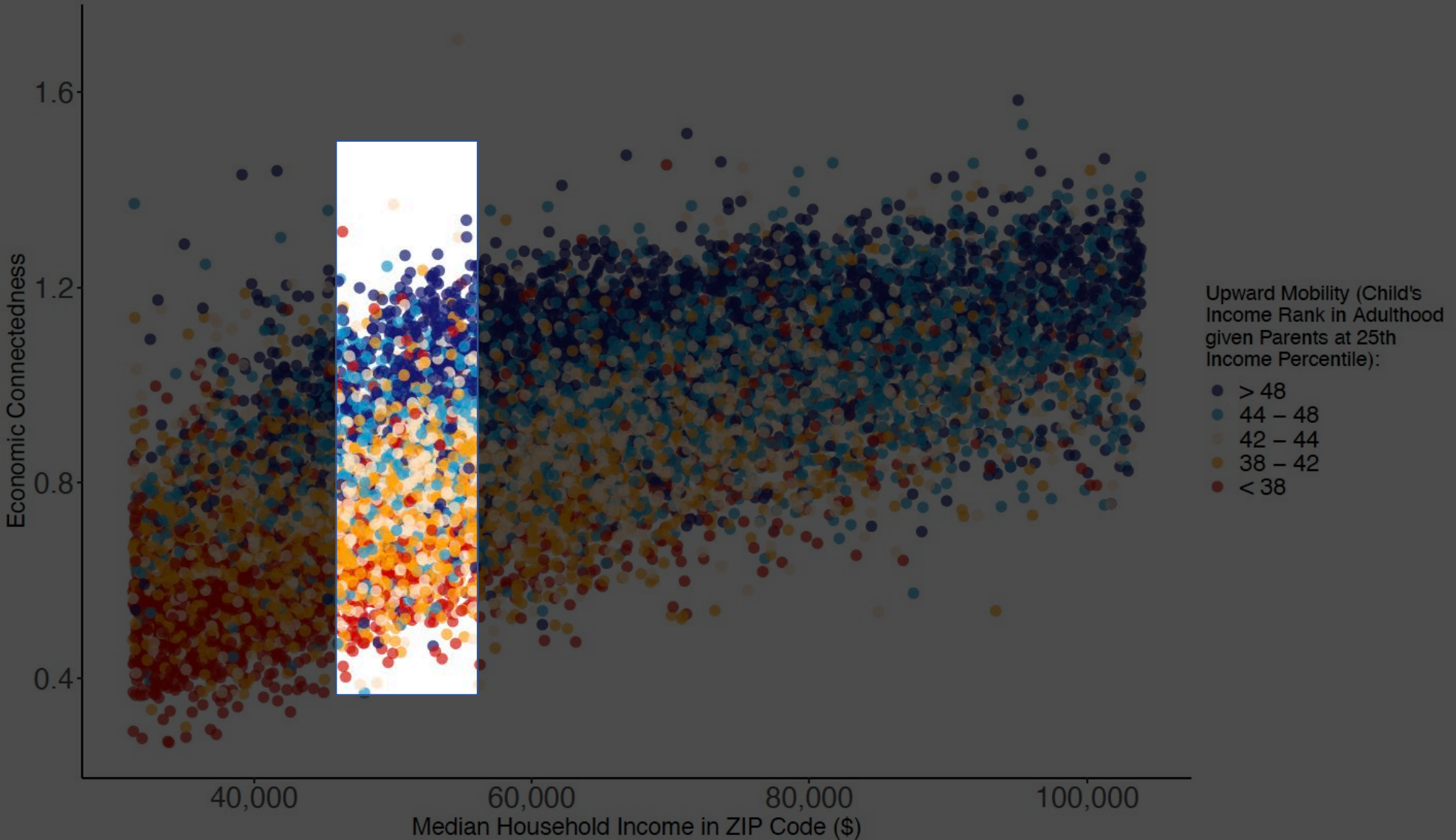# Economic Connectedness vs. Other Neighborhood Characteristics

- Moving to a higher-EC area earlier in childhood has a causal effect on upward mobility

- Is this because of connectedness itself or other characteristics of high-EC neighborhoods?

- Compare explanatory power of strongest predictors identified in prior work (poverty rates, inequality, racial segregation, …) vs. economic connectedness

  - Start by examining role of average neighborhood incomes, currently the most widely used marker of "high opportunity" areas (e.g., Moving to Opportunity, Opportunity Zones)

Economic Connectedness vs. Household Median Income, by ZIP Code
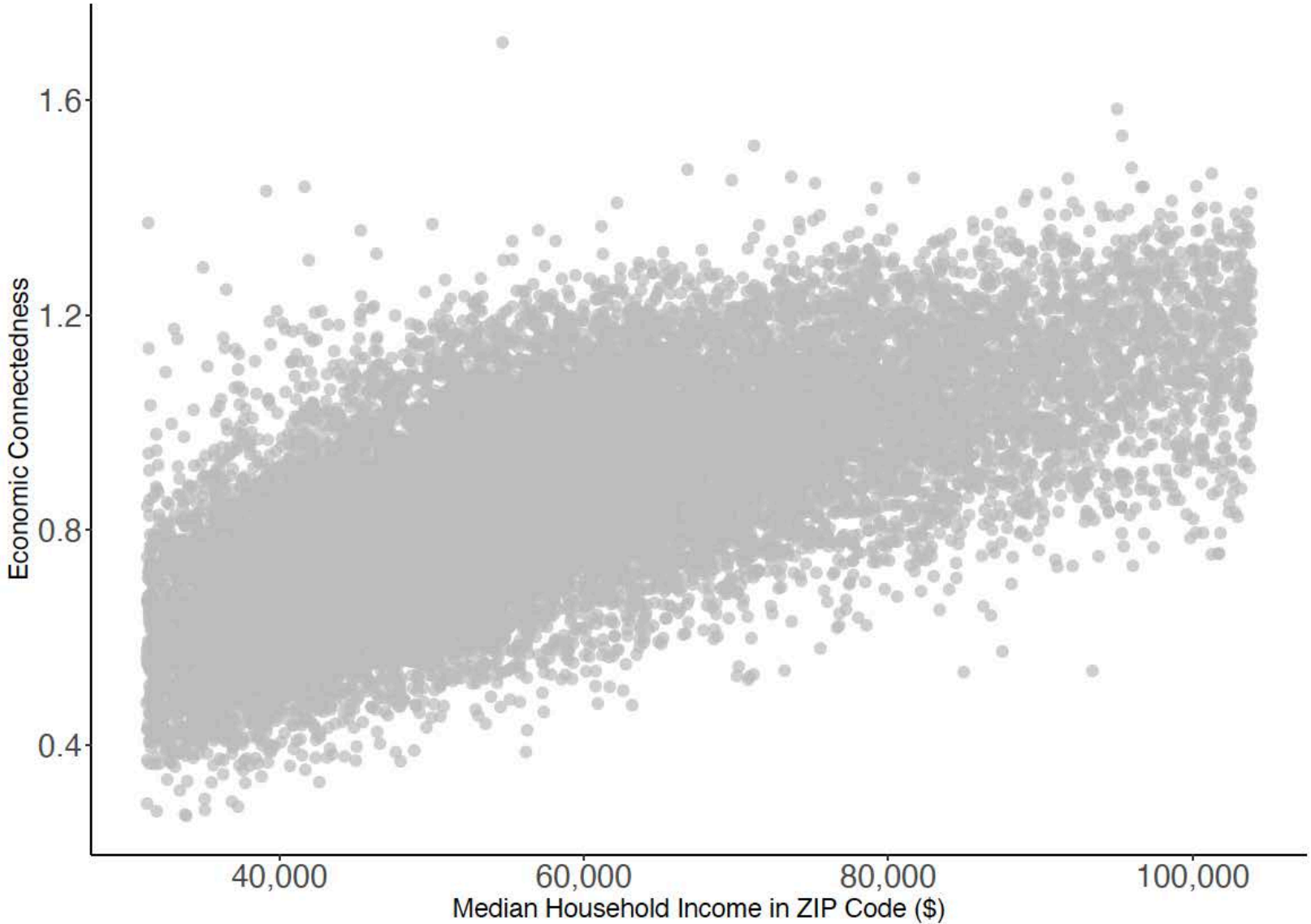
Economic Connectedness vs. Household Median Income, by ZIP Code
Colored by Rate of Upward Mobility

Economic Connectedness

1.6

1.2

0.8

0.4

Median Household Income in ZIP Code ($)

40,000   60,000   80,000   100,000

Upward Mobility (Child's
Income Rank in Adulthood
given Parents at 25th
Income Percentile):

> 48
44 − 48
42 − 44
38 − 42
< 38

Economic Connectedness vs. Household Median Income, by ZIP Code
Colored by Rate of Upward Mobility
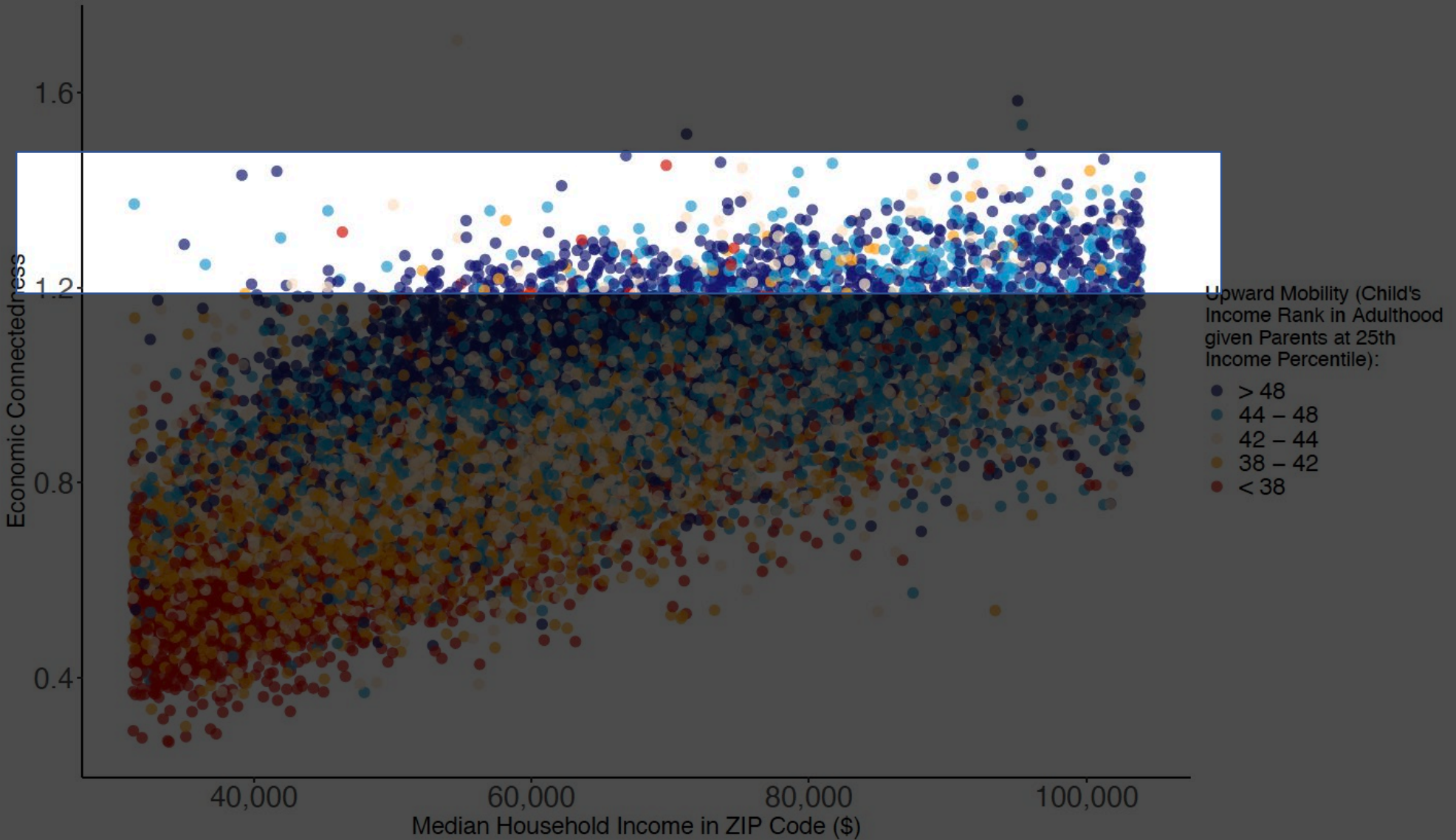
Upward Mobility vs. Economic Connectedness, Inequality, and Segregation
OLS Regression Estimates, Across Counties and ZIP codes

Dependent Variable:	Upward Mobility (Mean Income Rank at Age 35 for Children with Parents at 25th Percentile)	
	Across Counties	
	(1)	(2)
Income Inequality (Gini coefficient)	−0.449***	-0.103
	(-0.084)	(-0.091)
Share Black		
Economic Connectedness		0.577***
		(0.063)
Observations	2,741	2,741
R-squared	0.207	0.424

Connectedness explains the link between inequality and mobility
(Great Gatsby Curve) [Corak 2013, Krueger 2016]

Upward Mobility vs. Economic Connectedness, Inequality, and Segregation
OLS Regression Estimates, Across Counties and ZIP codes

Dependent Variable:	Upward Mobility (Mean Income Rank at Age 35 for Children with Parents at 25th Percentile)		Upward Mobility for Black Individuals		Upward Mobility for White Individuals	
	Across Counties		Across ZIP Codes			
	(1)	(2)	(3)	(4)	(5)	(6)
Income Inequality (Gini coefficient)	−0.449***	-0.103				
	(-0.084)	(-0.091)				
Share Black			-0.204***	-0.014	-0.250***	0.035*
			(0.057)	(0.071)	(0.018)	(0.018)
Economic Connectedness		0.577***		0.468***		0.631***
		(0.063)		(0.083)		(0.027)
Observations	2,741	2,741	11,147	11,147	24,020	24,020
R-squared	0.207	0.424	0.042	0.224	0.063	0.380

Cutler and Glaeser (1997): "segregation is extremely harmful for blacks, but we do not have an exact understanding of why this is true."

Lack of connectedness provides a (statistical) explanation

Connectedness and Outcomes for High-SES Families

- Greater economic connectedness is strongly associated with better outcomes for low-income families, but does this come at the expense of outcomes for the rich?
  [see also Rao 2019, Londono-Velez 2022, Burzstyn et al. 2022]

Economic Mobility vs. Cross-SES Connectedness for Low- vs. High-SES Individuals
County-Level

Predicted Household Income Rank for Children w/ Parents at 25th or 75th Pctile

Cross-SES Connectedness

● 25th Percentile: Slope = 18.2 (1.2)
■ 75th Percentile: Slope = -8.6 (1.0)
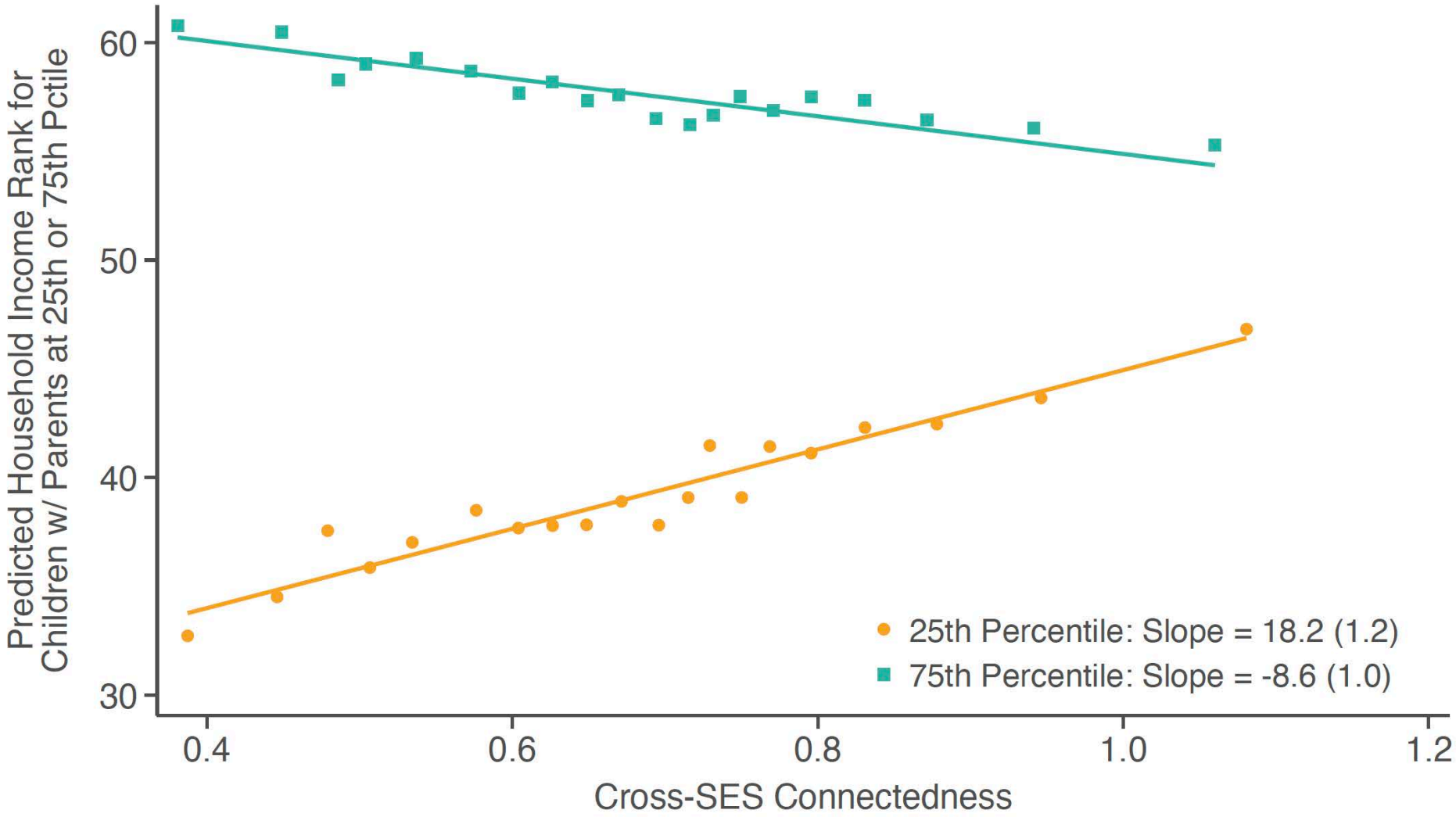
Economic Mobility vs. Cross-SES Connectedness for Low- vs. High-SES Individuals
County-Level, Controlling for Share of High-SES Residents
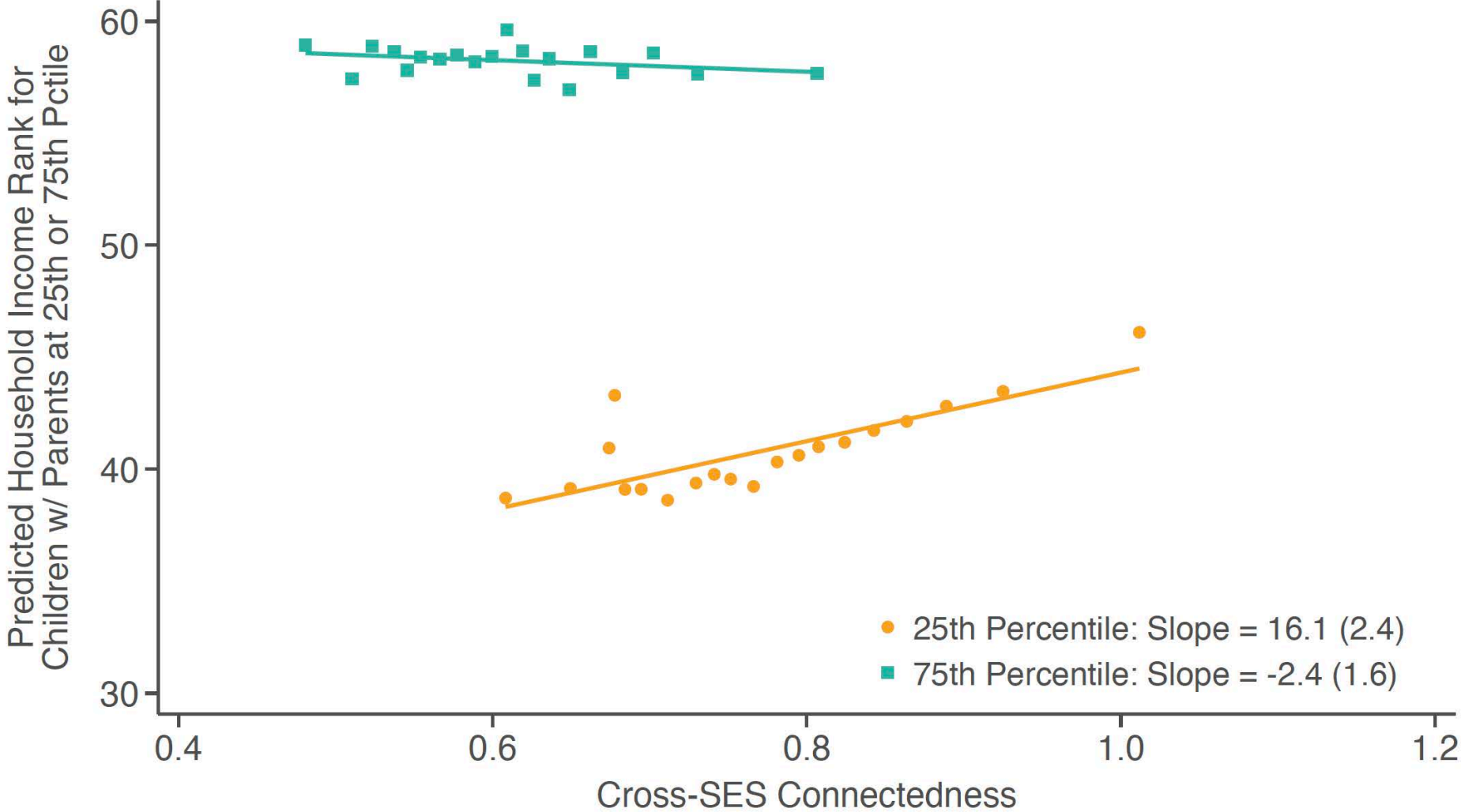
Predicted Household Income Rank for Children w/ Parents at 25th or 75th Pctile

Cross-SES Connectedness

● 25th Percentile: Slope = 16.1 (2.4)
■ 75th Percentile: Slope = -2.4 (1.6)

Determinants of Economic Connectedness

Why Do Low-Income People Have Fewer High-SES Friends?

Exposure
Segregation by Income

vs.

Friending Bias
Interaction Conditional on Exposure

School A

School B

School A

School B

High-SES

Low-SES
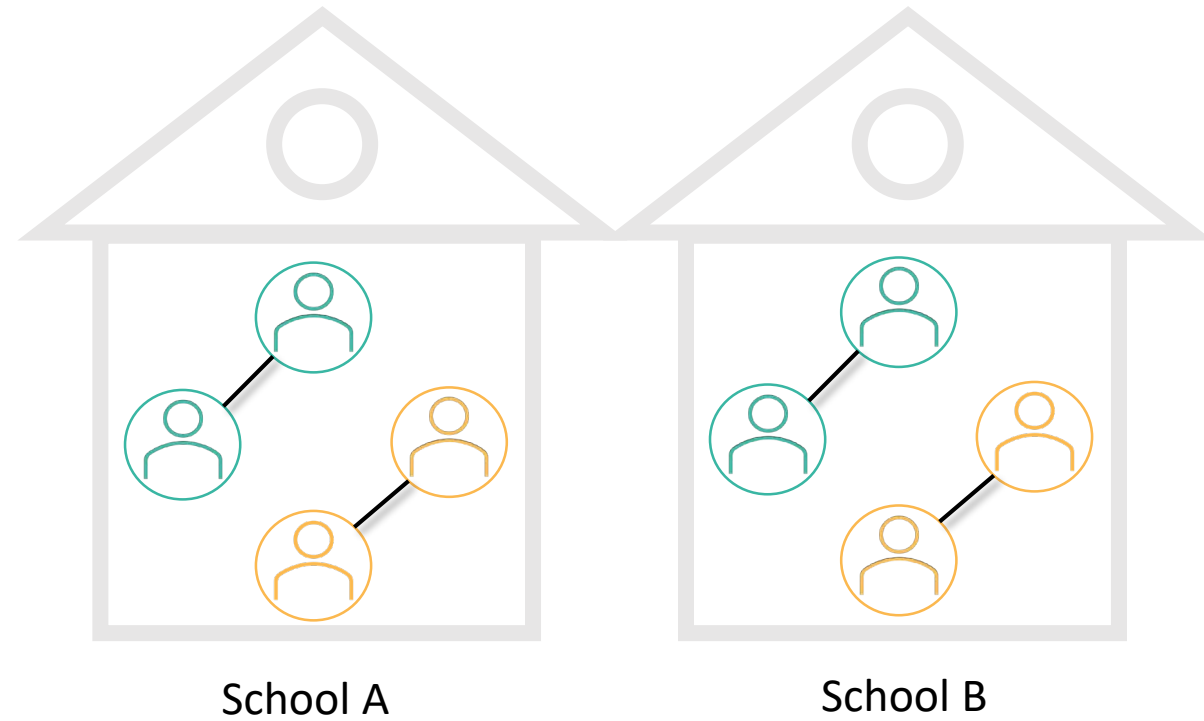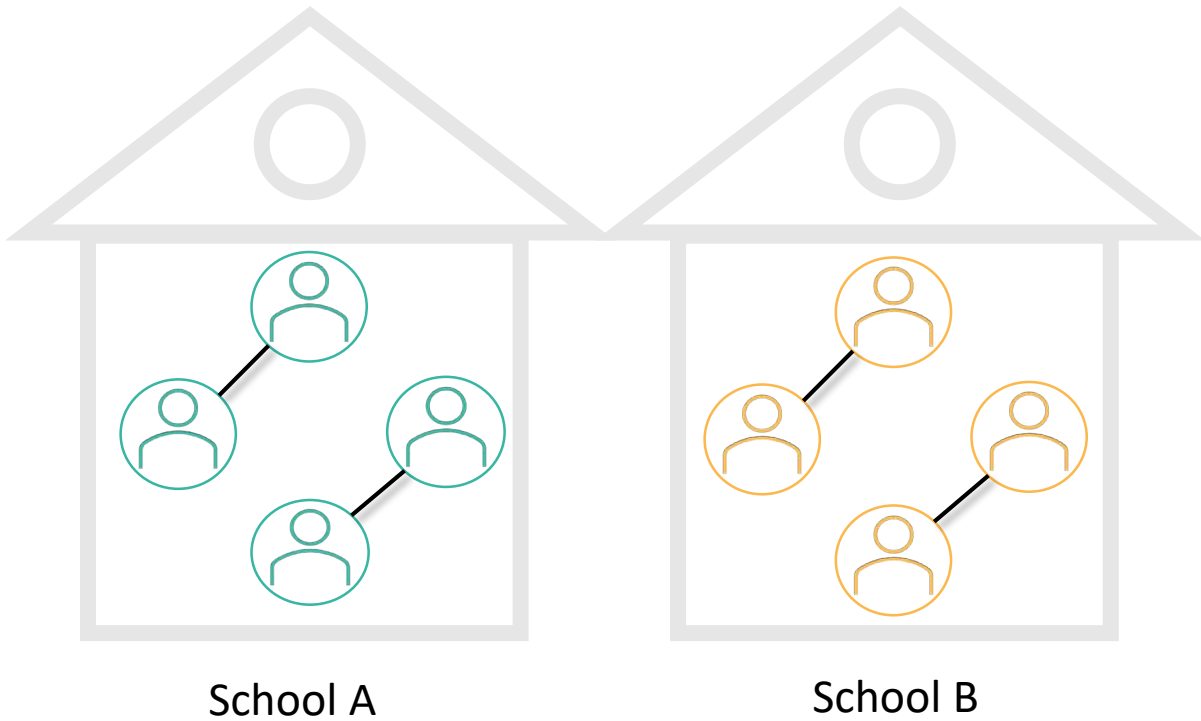
Measuring the Importance of Exposure vs. Friending Bias

- We decompose economic connectedness (EC) for a given person into the sum of three components across the groups where she makes friends:

$$\text{EC} = \sum_{g \in G} \text{Friend Share}_g \times \text{Exposure}_g \times (1 - \text{Friending Bias}_g)$$

1. **Friend Share:** Share of friends made in group g

2. **Exposure:** Share of members of group g who are high-SES

3. **Friending Bias:** 1 - (Share high-SES friends made in g)/(Share high-SES members of g)

Exposure vs. Friending Bias

- Demarcation between exposure and friending bias depends on how we define the groups where people interact

    - Friending bias within schools may itself arise from differences in exposure (e.g., across classrooms)

→ Distinction is **policy-dependent** rather than conceptual

    - School-level grouping has policy relevance: many efforts to integrate schools, neighborhoods, etc.

Assign Friendships to One of Six Settings Where They are Formed

High Schools

Colleges

Workplaces

Recreational Groups

Religious Groups

Neighborhoods

Friendship Shares by Setting vs. Socioeconomic Status
Colleges
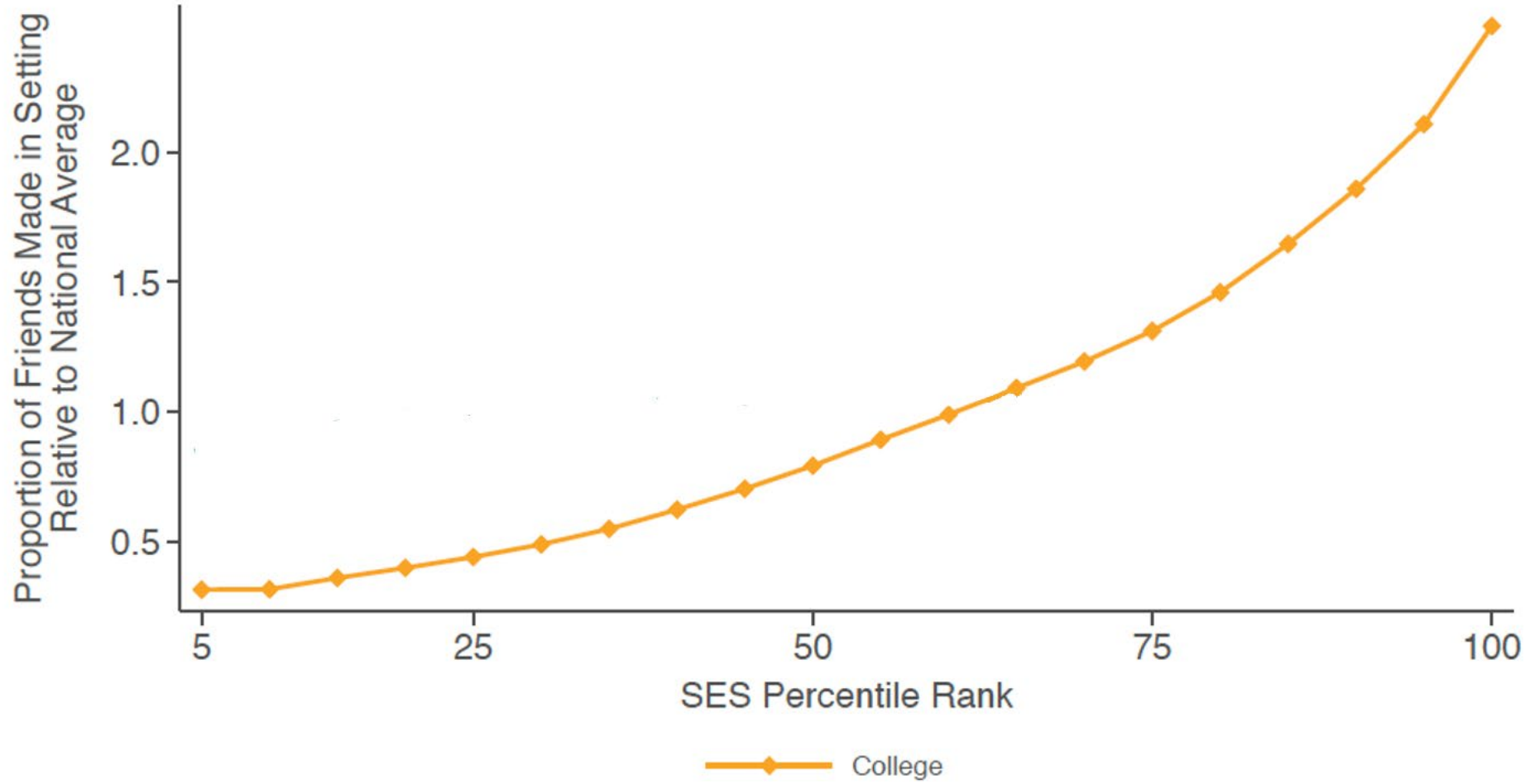
Friendship Shares by Setting vs. Socioeconomic Status
All Settings

Proportion of Friends Made in Setting Relative to National Average (y-axis)

SES Percentile Rank (x-axis)

Legend:
- High School
- College
- Workplace
- Recreational Group
- Religious Group
- Neighborhood
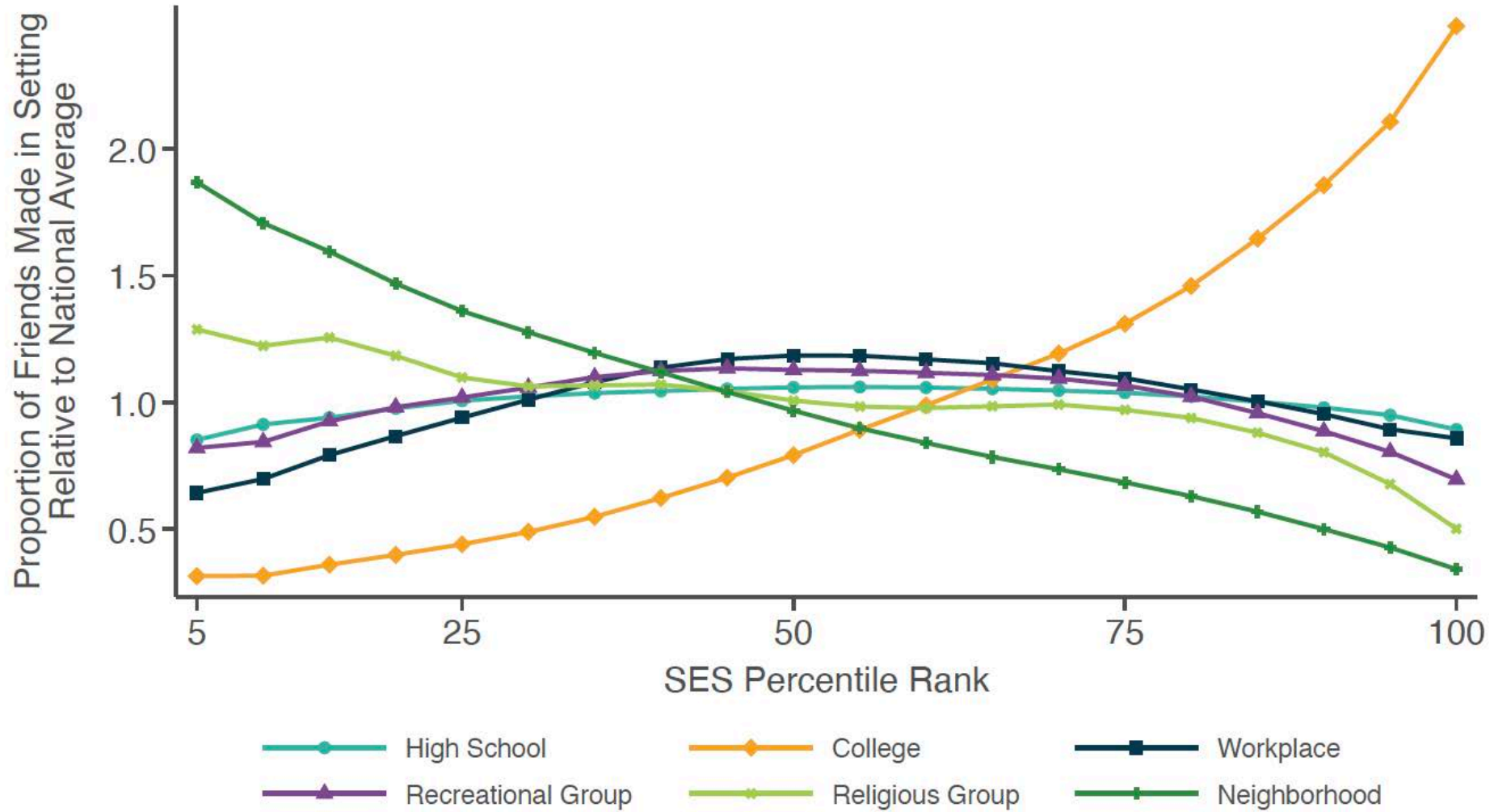
Exposure to Above-Median SES Peers By Setting
Low-SES People
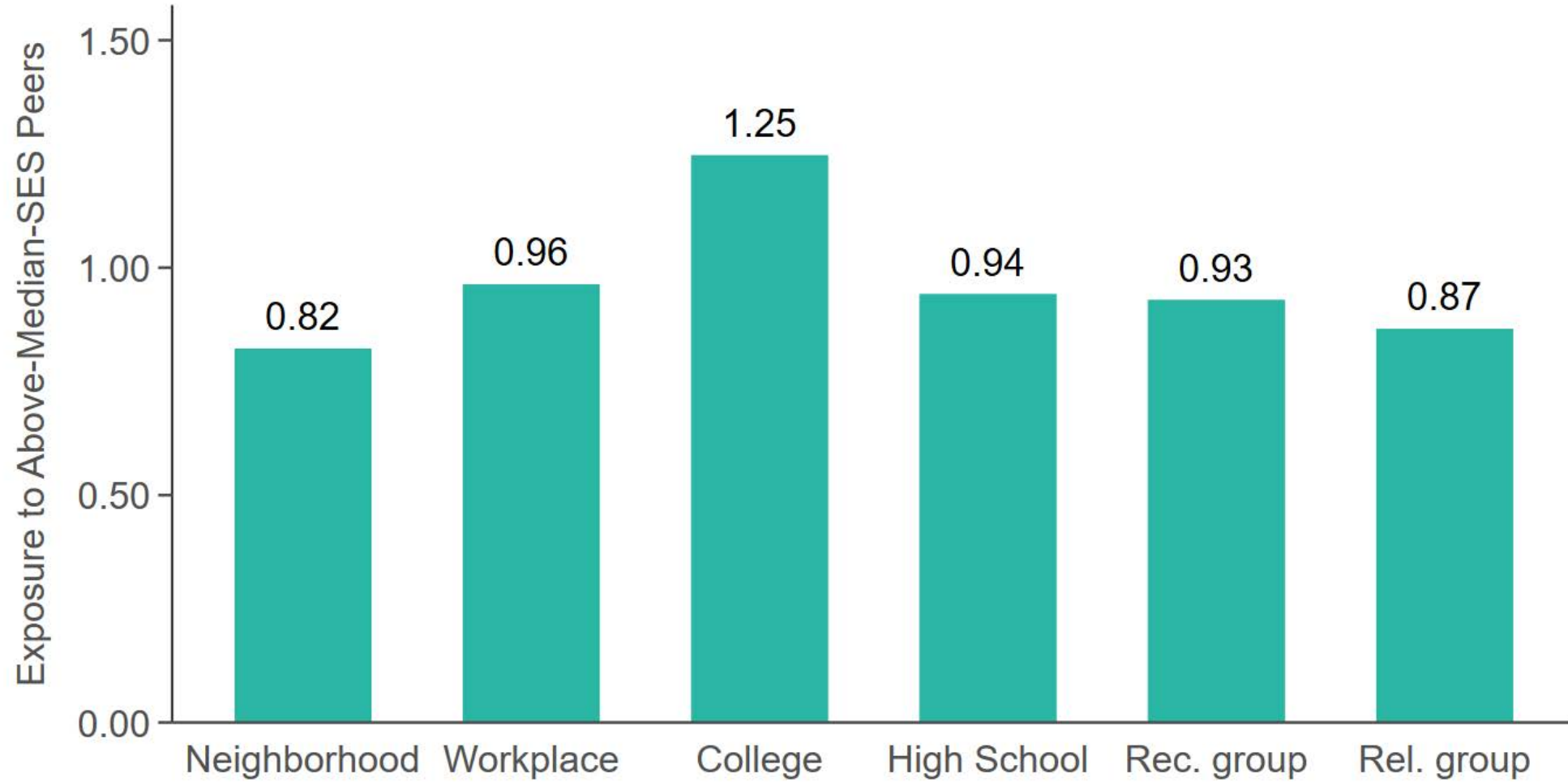
Friending Bias for Low-SES People, By Setting
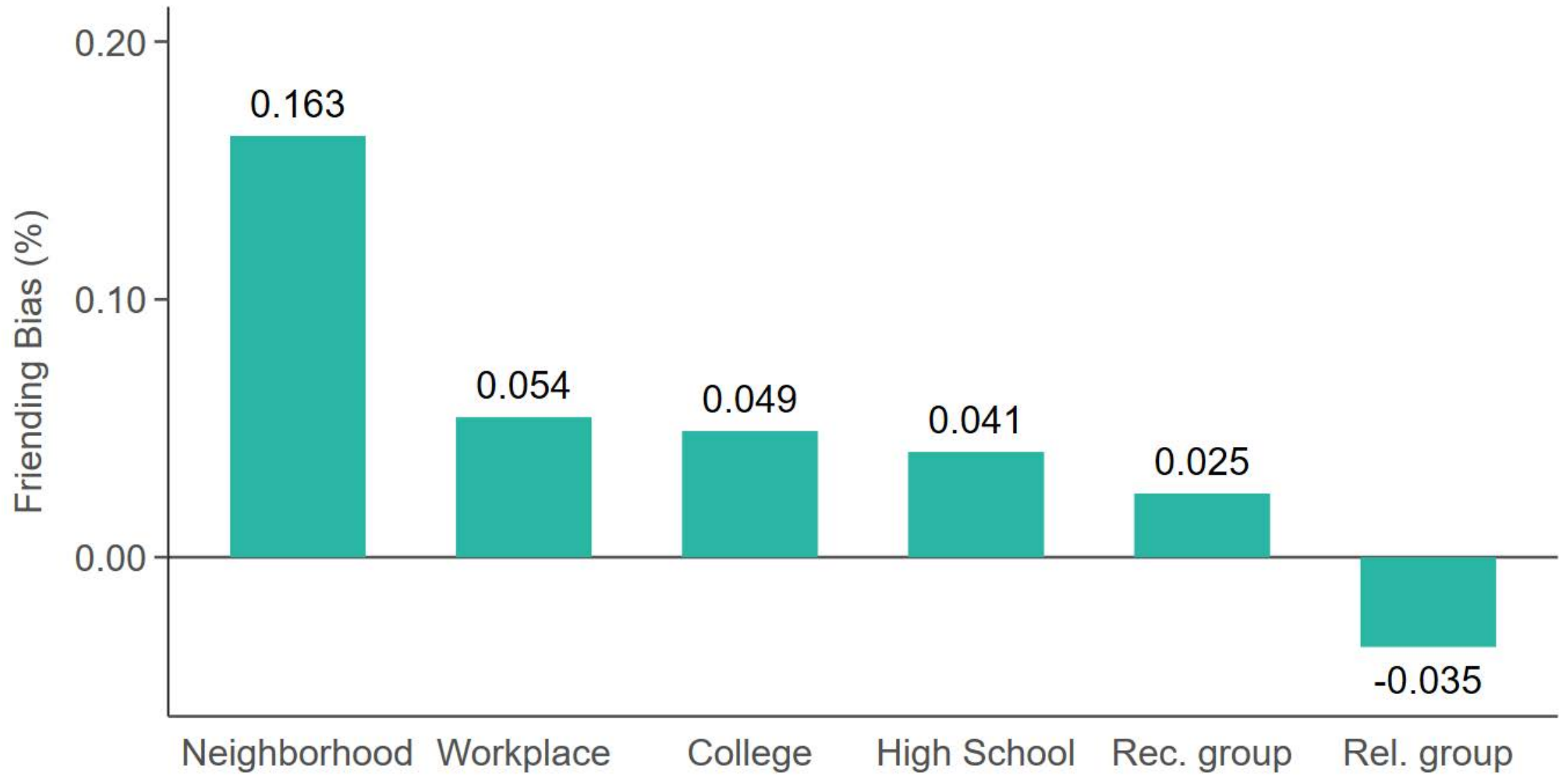
Difference in Friending Bias Exhibited in Other Groups vs. Religious Groups
Members of Religious Groups
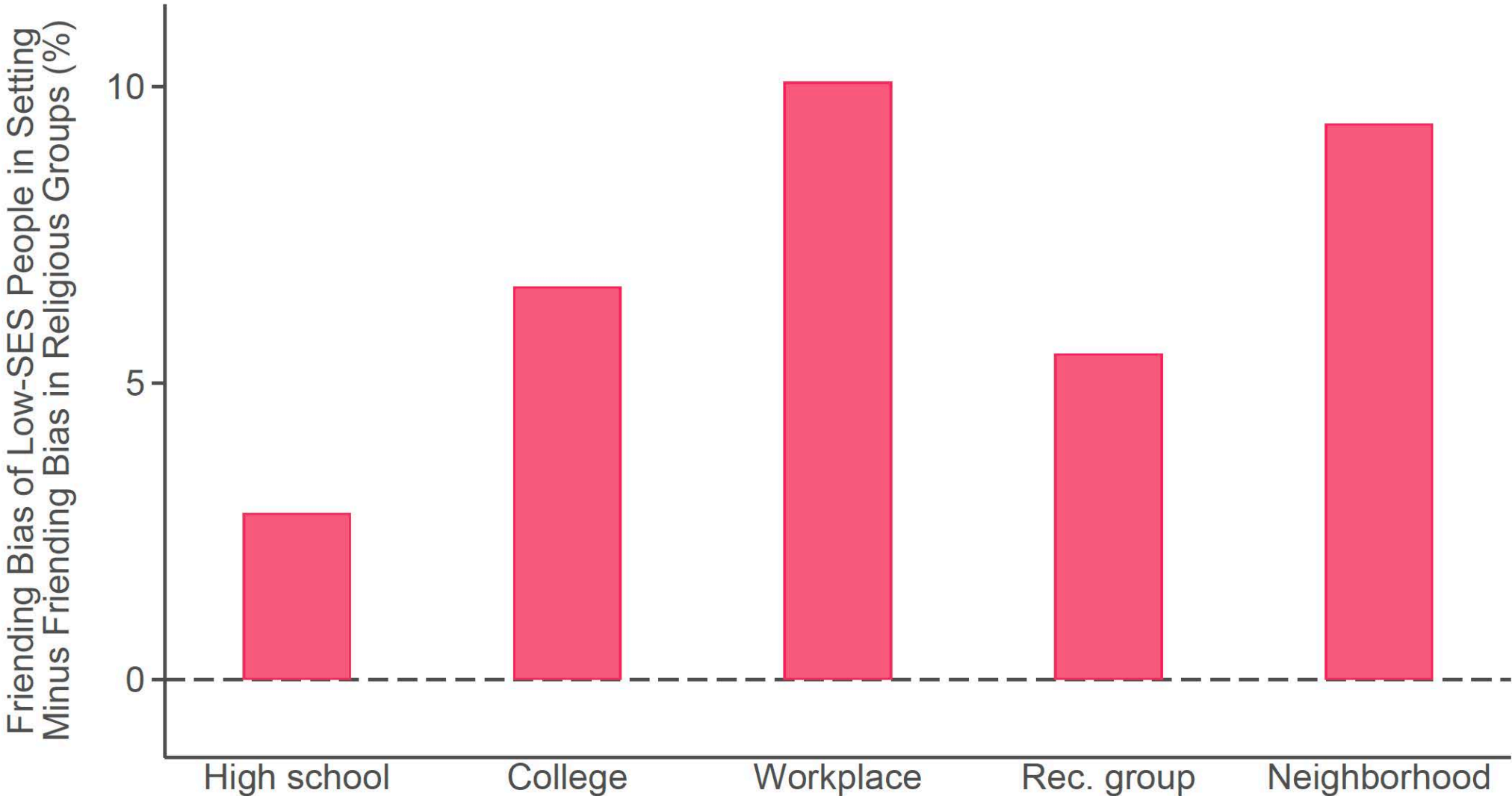
Measuring the Importance of Exposure vs. Friending Bias

- We just measured the mean values of three components that determine connectedness: friend shares, exposure, and friending bias by setting and SES

- Now use these parameters to quantify the contribution of each channel in explaining why low-SES people have fewer high-SES friends

Why do Low-SES People Have Fewer High-SES Friends than High-SES People?

## Decomposition Analysis: Group Importance, Exposure, and Friending Bias
Low-SES vs. High-SES Individuals

Average Low-SES Individual — 0.826

Average High-SES Individual — 1.534
Equate Friending Rates, Exposure & Bias

Economic Connectedness (EC)

0.6   0.9   1.2   1.5   1.8
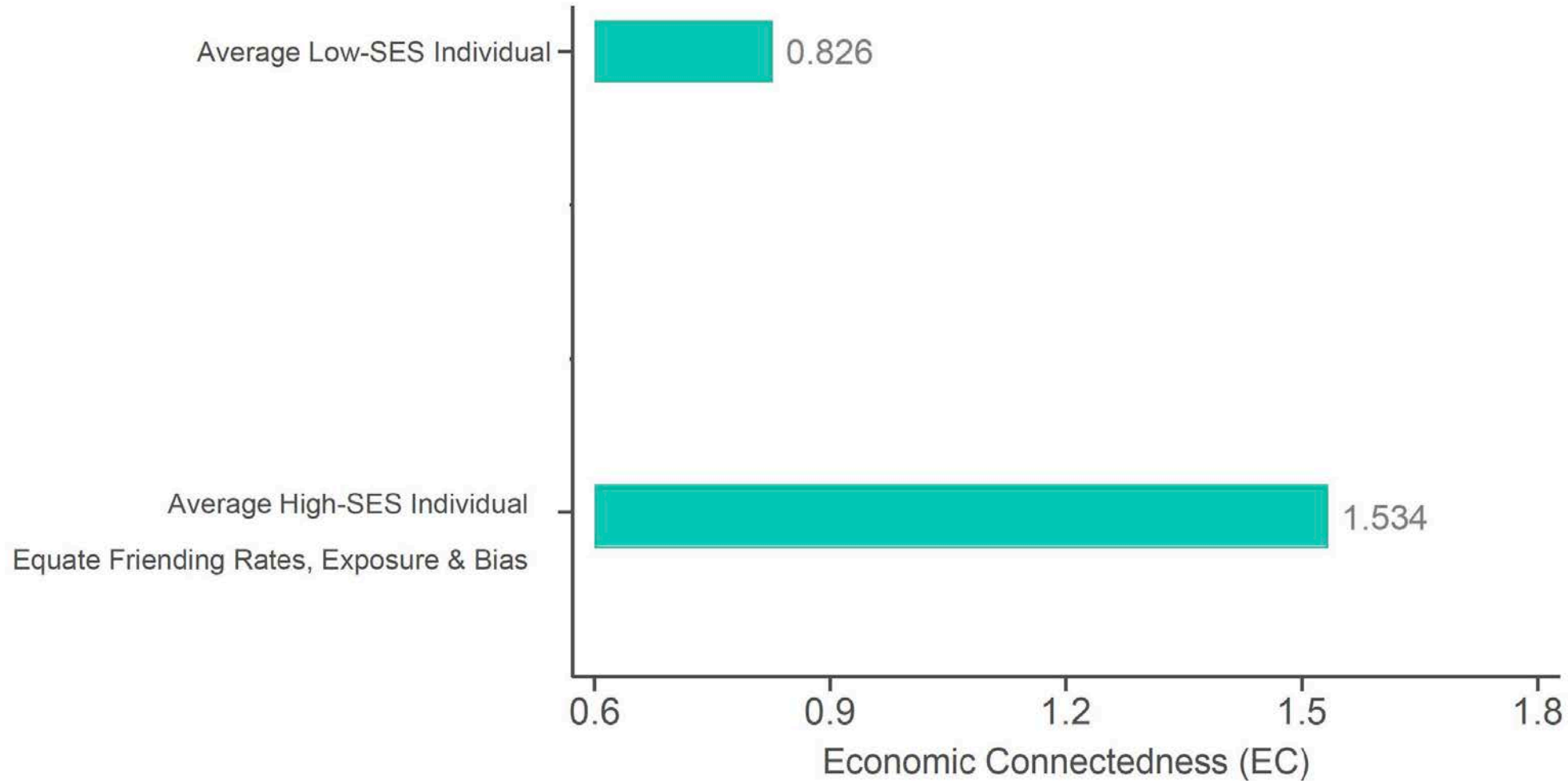
Why do Low-SES People Have Fewer High-SES Friends than High-SES People?

Decomposition Analysis: Group Importance, Exposure, and Friending Bias
Low-SES vs. High-SES Individuals

Why do Low-SES People Have Fewer High-SES Friends than High-SES People?
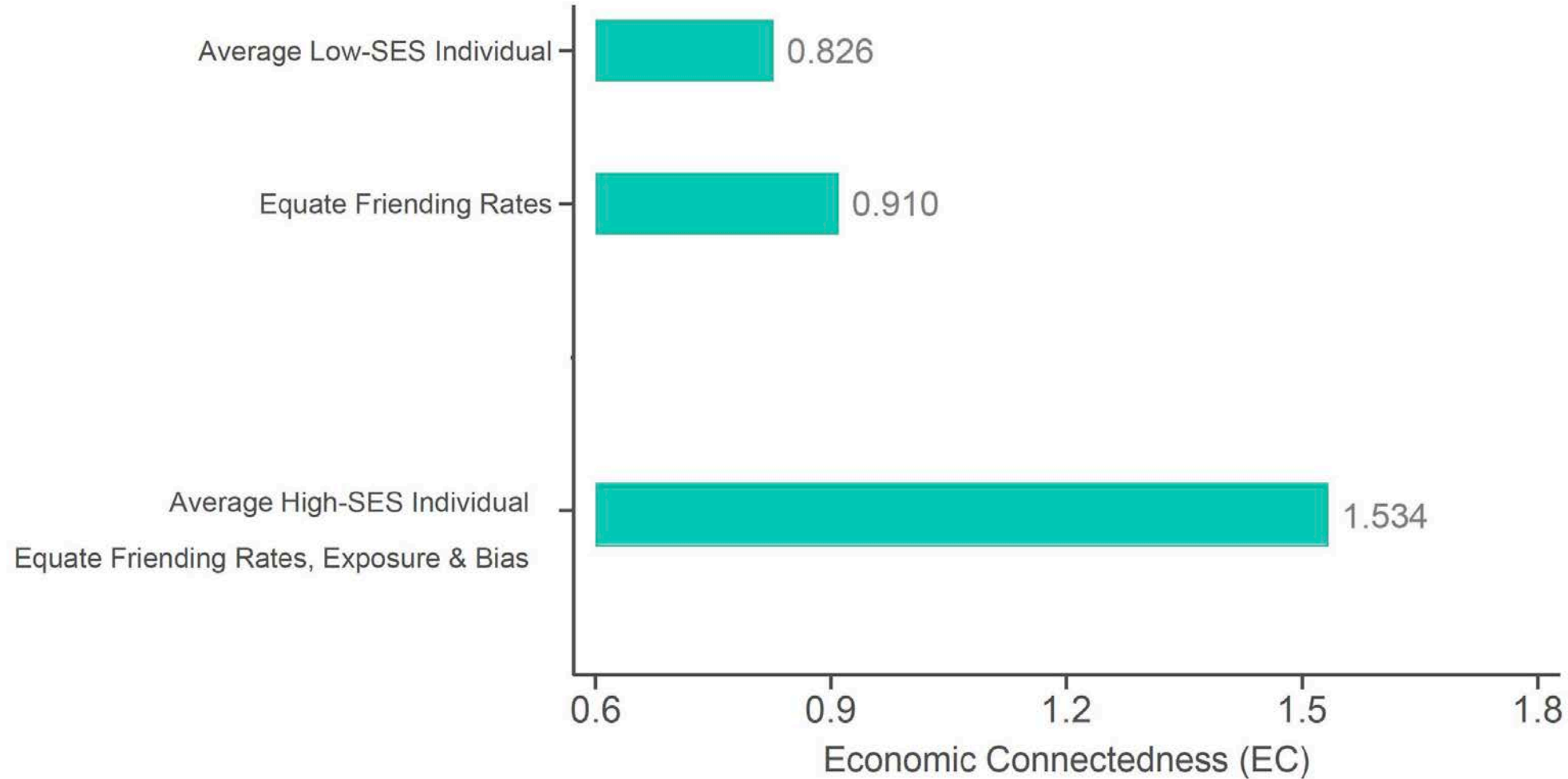
Decomposition Analysis: Group Importance, Exposure, and Friending Bias
Low-SES vs. High-SES Individuals
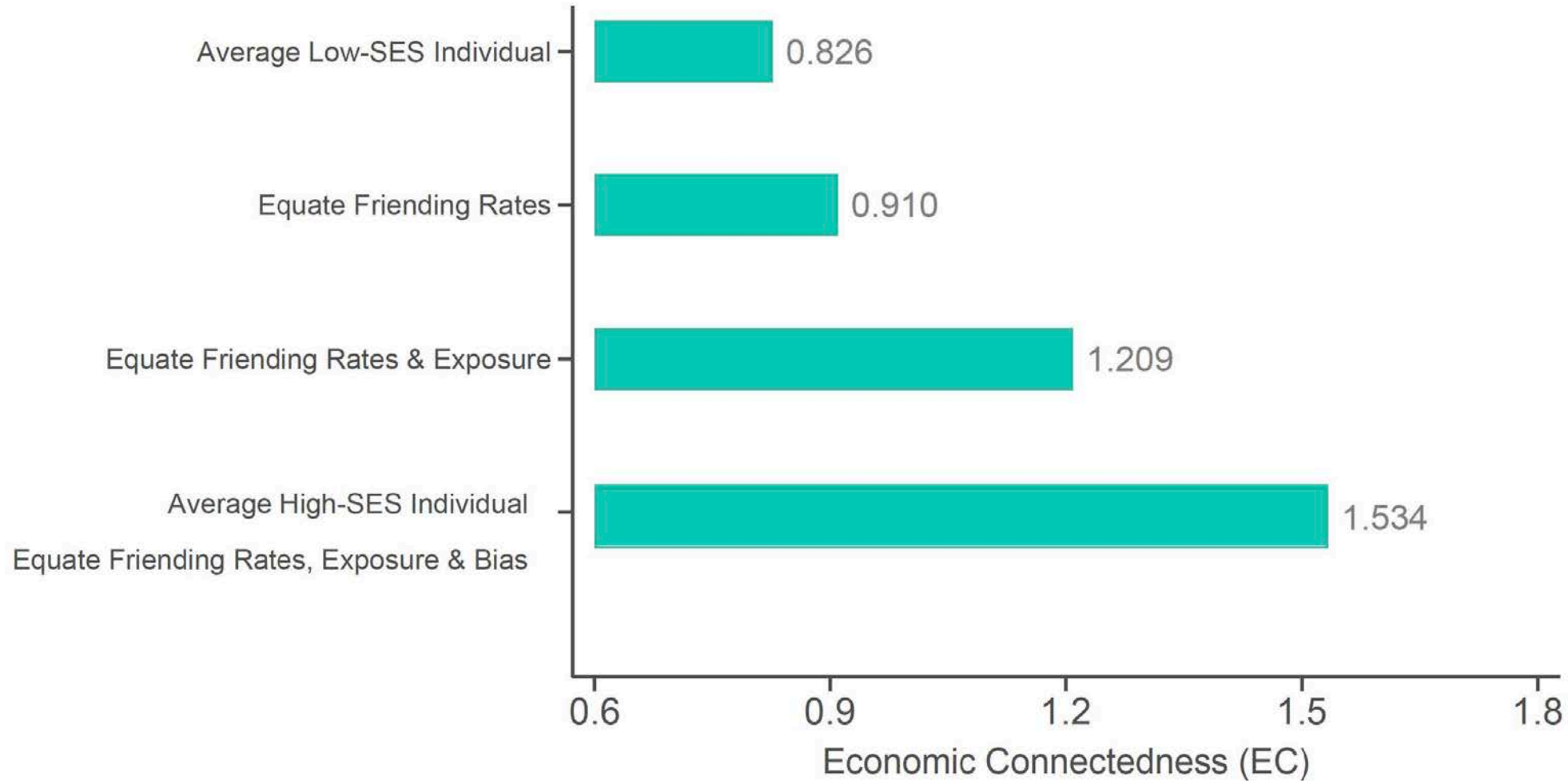
# Associations between Friending Bias, Exposure, and Upward Mobility across Counties and ZIP Codes

Dependent Variable:	log(Upward Mobility)						log(Causal Upward Income Mobility)
	ZIP Codes				Counties		Counties
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
log (Economic Connectedness)	0.236***		0.227***		0.272***		
	(0.01)		(0.01)		(0.02)		
log (High-SES Exposure)		0.248***		0.224***		0.286***	0.116***
		(0.01)		(0.02)		(0.02)	(0.02)
log (1 - Friending Bias)		0.185***		0.236***		0.142*	0.339***
		(0.03)		(0.04)		(0.08)	(0.07)
County FEs	No	No	Yes	Yes	No	No	No
Observations	24,200	24,200	24,200	24,200	2,986	2,986	2,136
R-squared	0.42	0.43	0.71	0.71	0.38	0.39	0.03

Variation in Exposure and Friending Bias Across Groups within Settings

- Friending bias and exposure vary not just between settings but across groups within settings

- Illustrate by focusing on high schools

Friending Bias vs. Exposure to High-SES Students, by High School

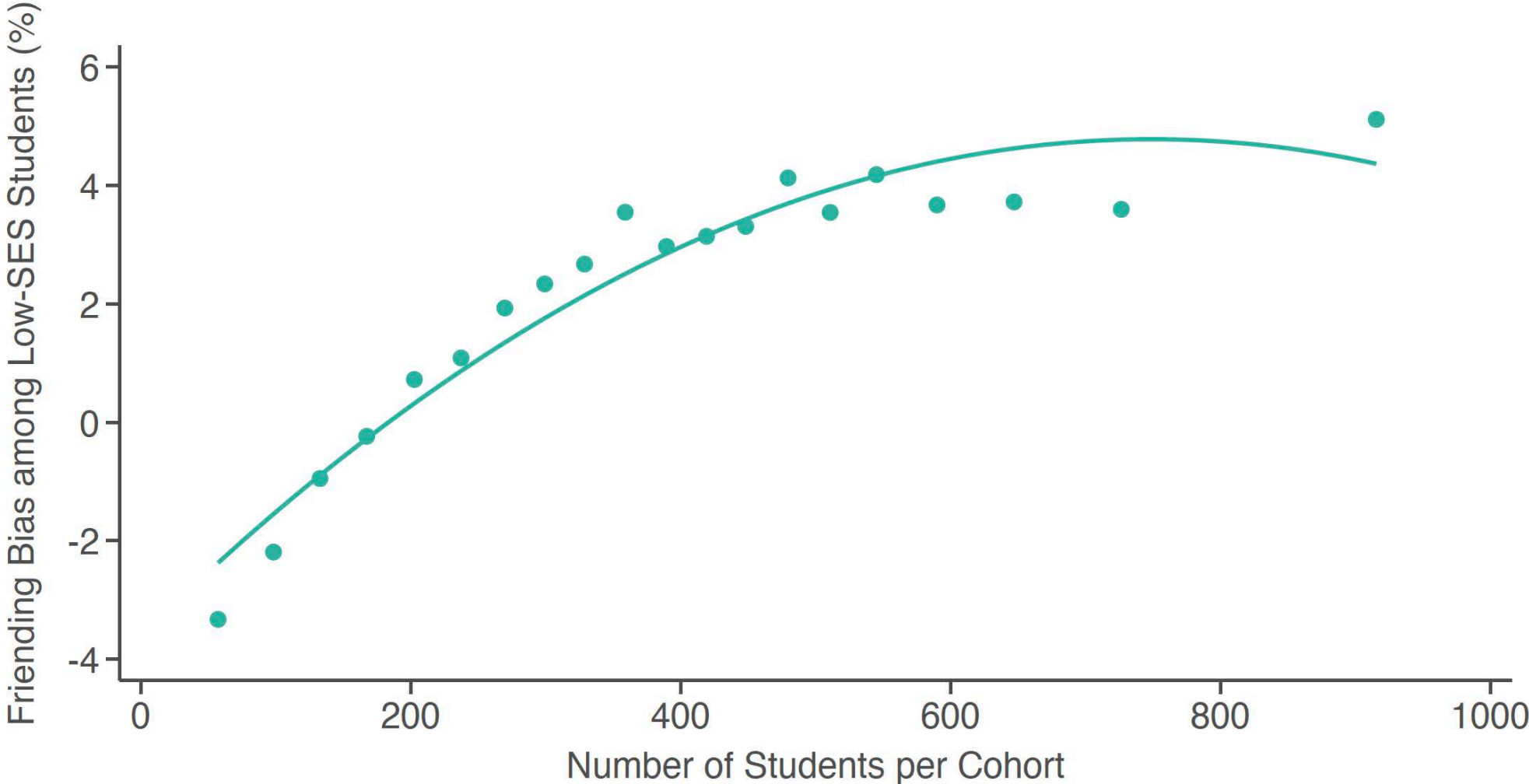Among Low-SES Students in 1990-2000 Birth Cohorts
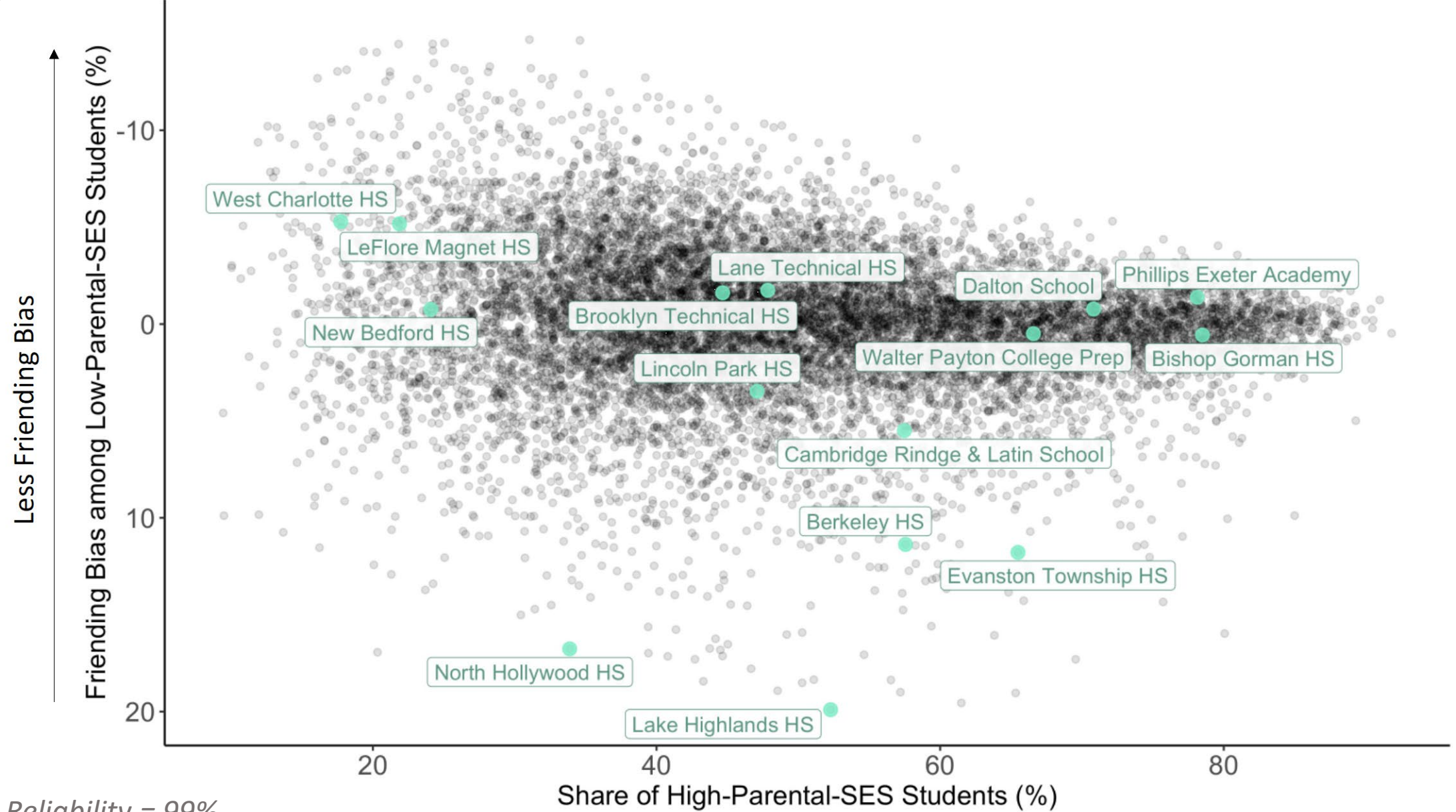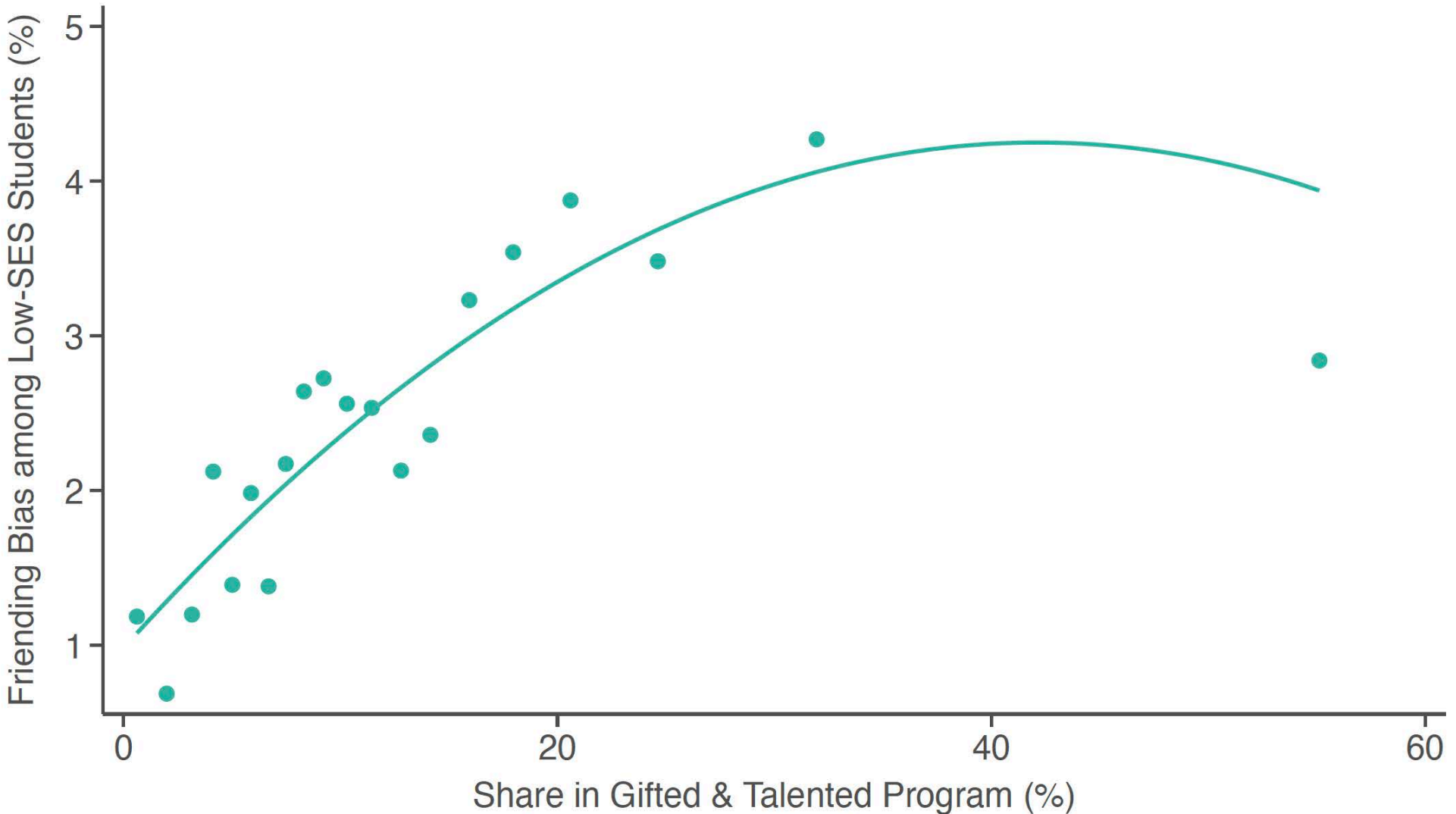

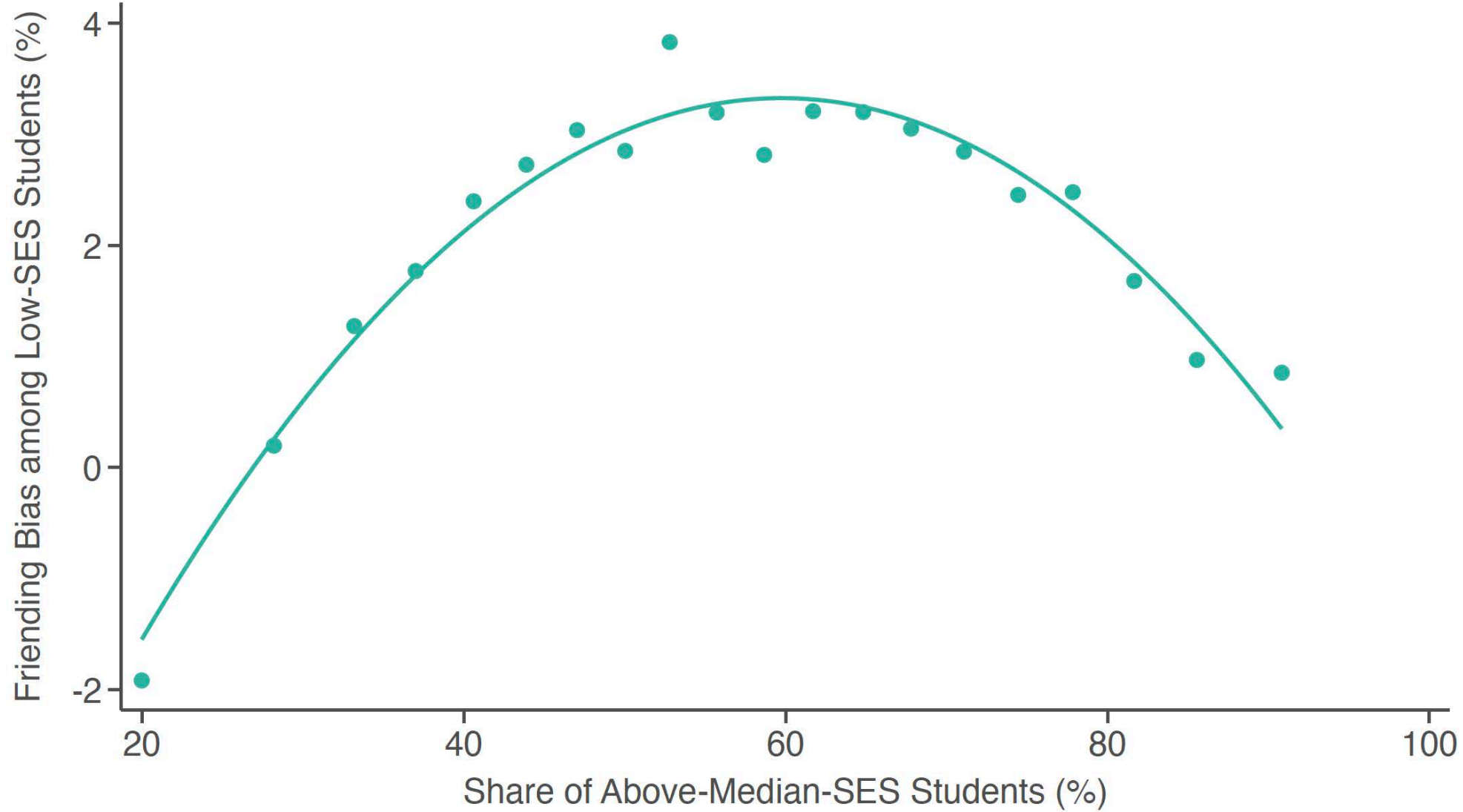*Exposure Reliability = 99%*
Friend Bias Reliability = 58%

Friending Bias in High Schools vs. School Size

Friending Bias in High Schools vs. Gifted and Talented Program Share

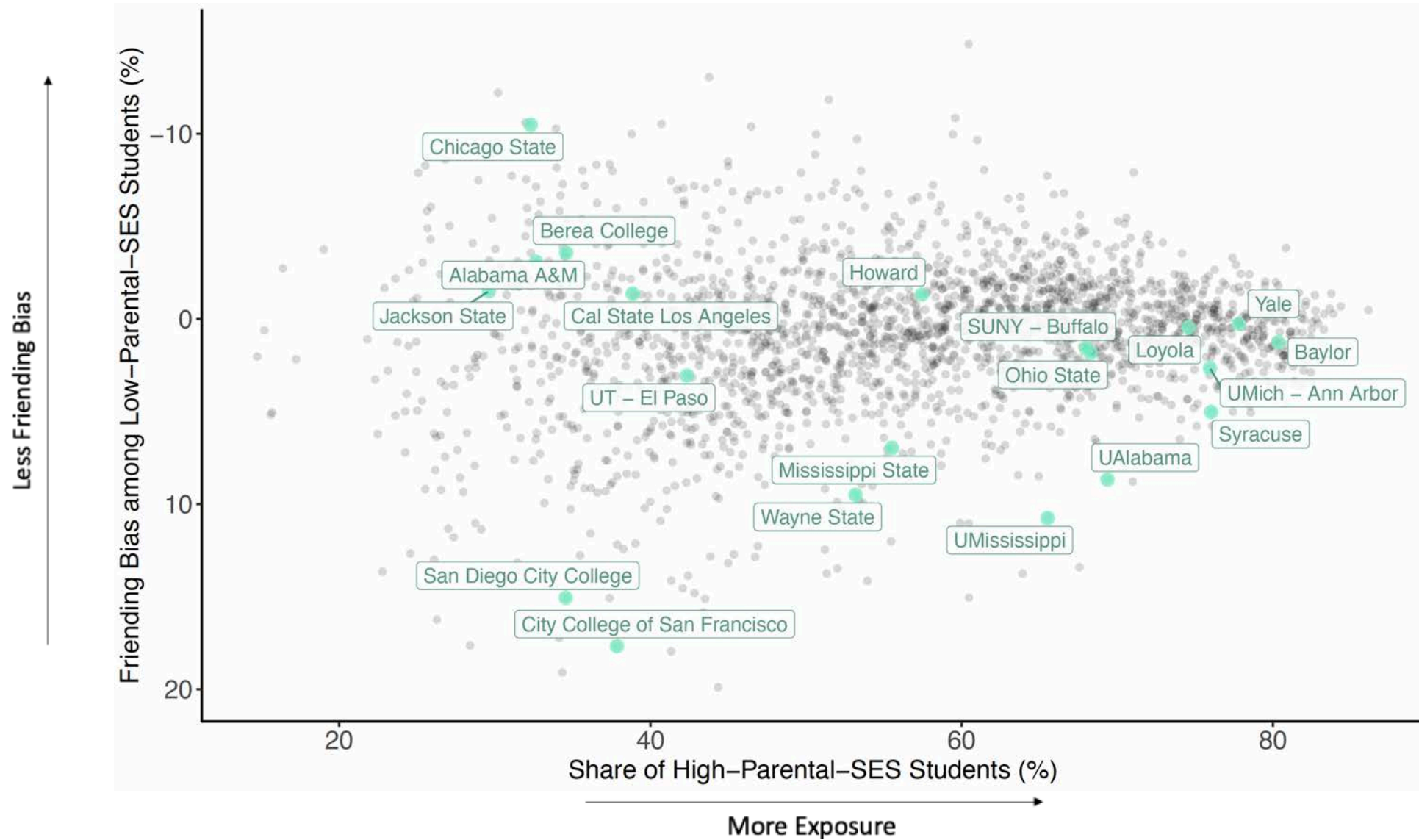# Friending Bias in High Schools vs. Share of High-SES Students

Friending Bias in High Schools vs. Racial Diversity

Friending Bias among Low-SES Students (%) vs. Racial Diversity (Herfindahl-Hirschman Index)
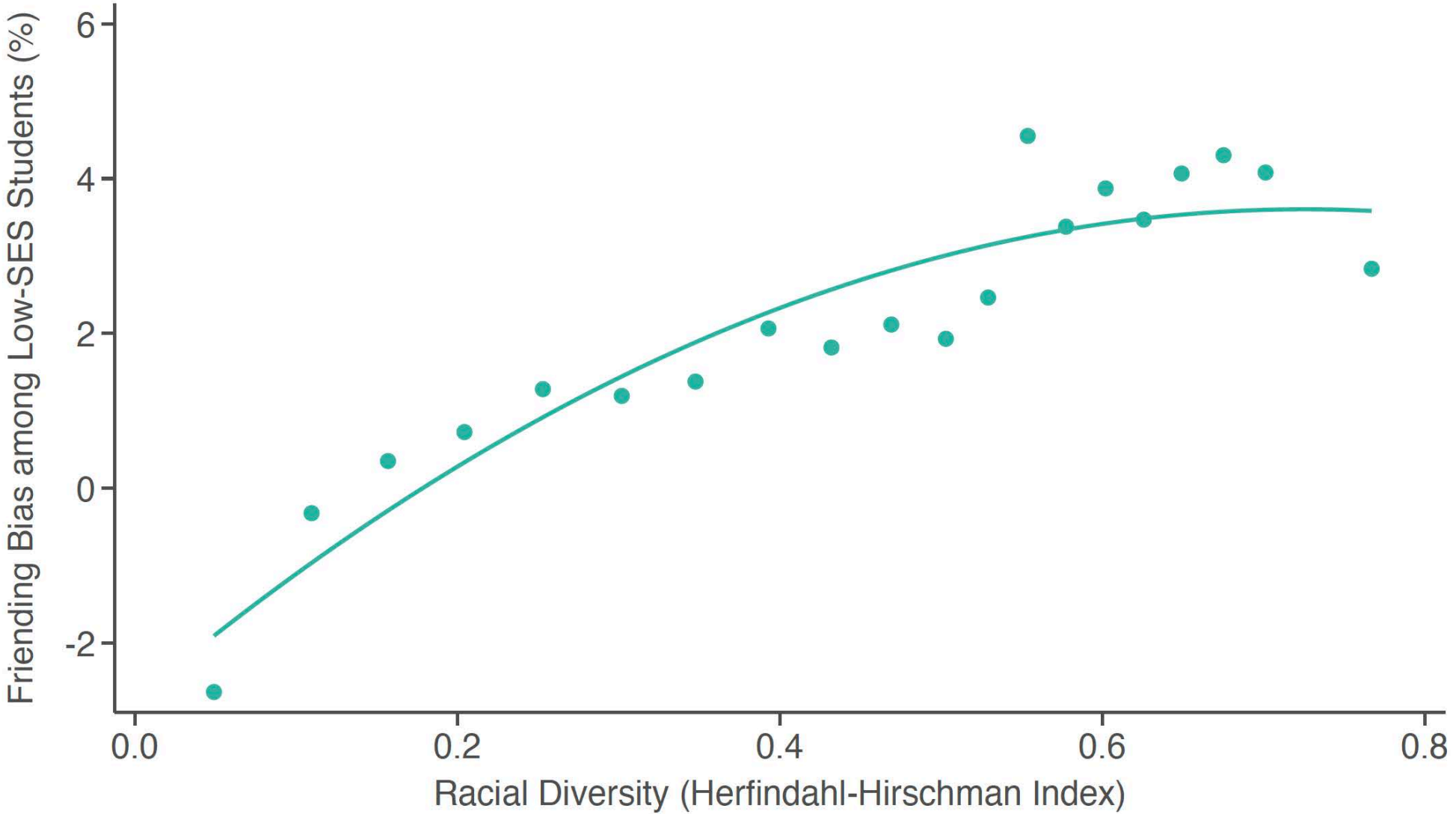
Friending Bias vs. Exposure to High-SES Students, by College

Among Low-SES Students in 1990-2000 Birth Cohorts

Determinants of Exposure and Friending Bias

- Well known that exposure is shaped by policies such as zoning laws and school boundaries

  - Extensive literatures on segregation in neighborhoods (zoning, tipping), school integration (busing, school choice), college access, …

- Here, we see that friending bias is also shaped by institutions and policy choices

  - Group size, tracking, uniforms, architecture, clubs, etc.

- Since friending bias accounts for as much of the cross-class disconnection as exposure, reducing bias may warrant as much attention as increasing diversity

Interventions to Increase Connectedness

Targeting Interventions to Increase Connectedness

- Relative importance of reducing bias vs. increasing exposure differs across schools

- School-level statistics can be useful in predicting impacts of marginal efforts to increase integration vs. reduce friending bias

- To illustrate, estimate causal effects of marginal integration on social interaction

  - Use quasi-experimental variation in share of high-SES (top quintile) classmates across cohorts within high schools [Hoxby 2001, Sacerdote 2011]
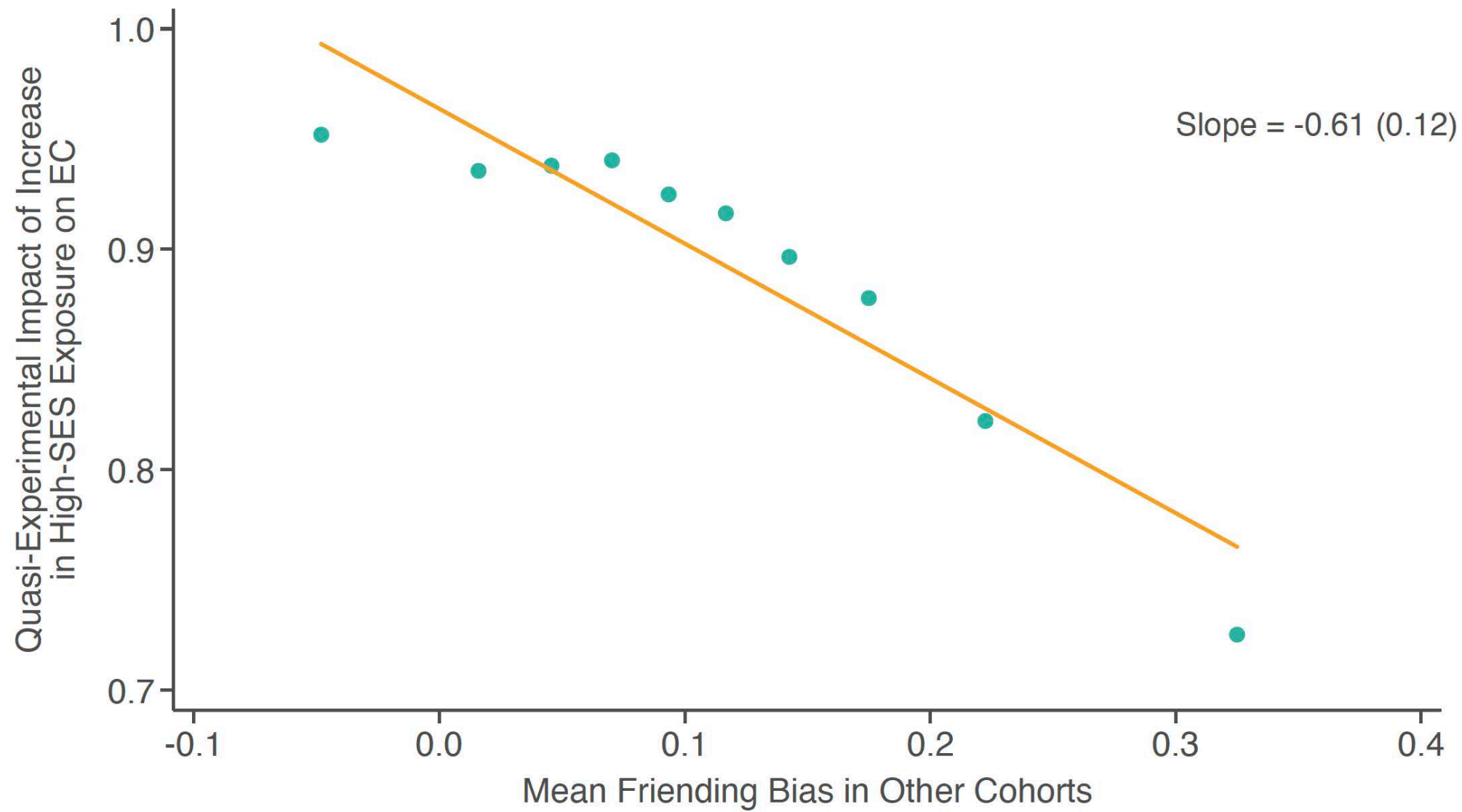
Causal Effects of Integration on Connectedness
Cohort-level Changes in EC vs. Changes in Exposure
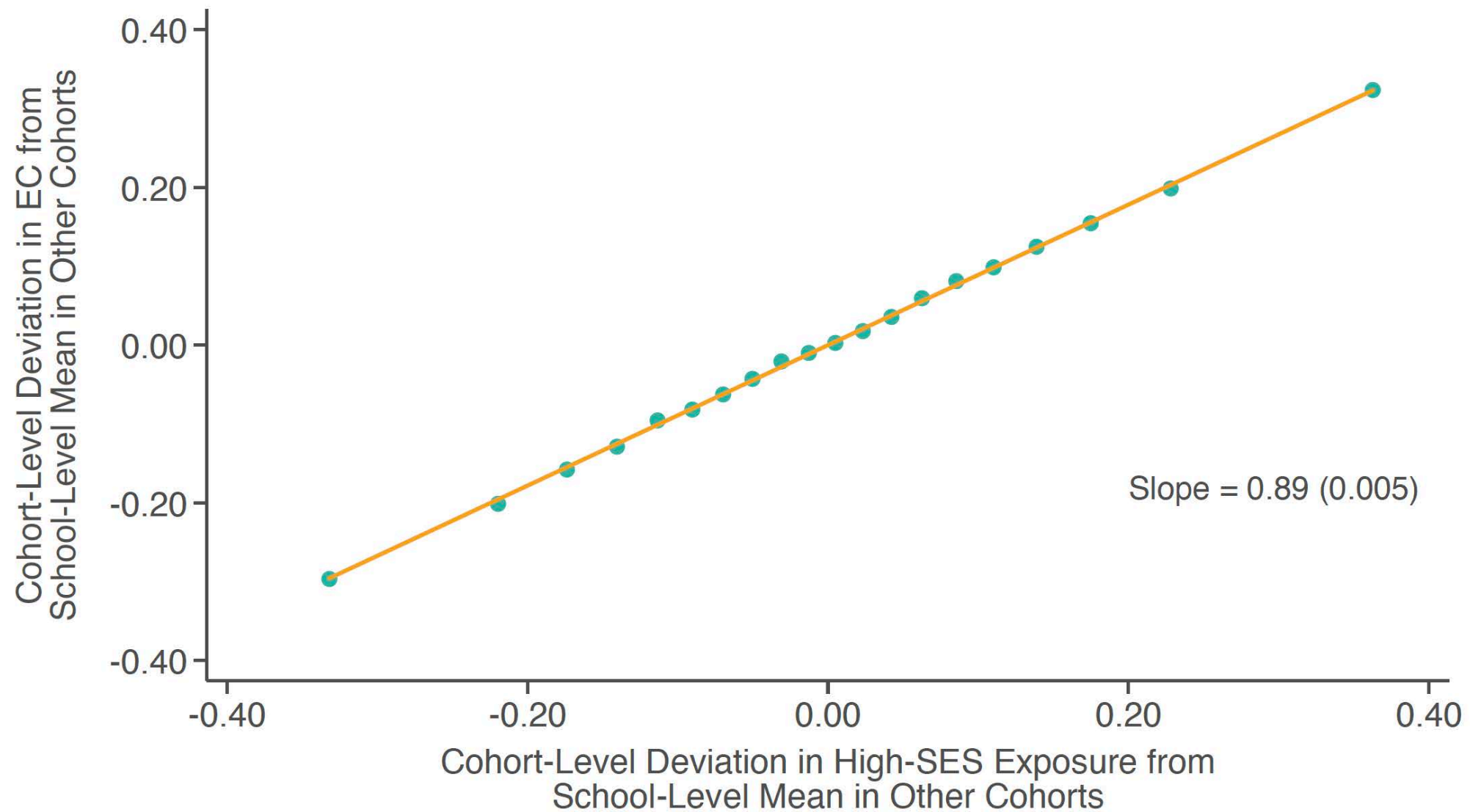
Causal Effects of Integration on Connectedness:
Causal Impacts of High-SES Share on Connectedness, by Level of Friending Bias

Slope = -0.61 (0.12)

Quasi-Experimental Impact of Increase in High-SES Exposure on EC

Mean Friending Bias in Other Cohorts

Friending Bias vs. Exposure to High-SES Students, by High School

Among Low-SES Students in 1990-2000 Birth Cohorts
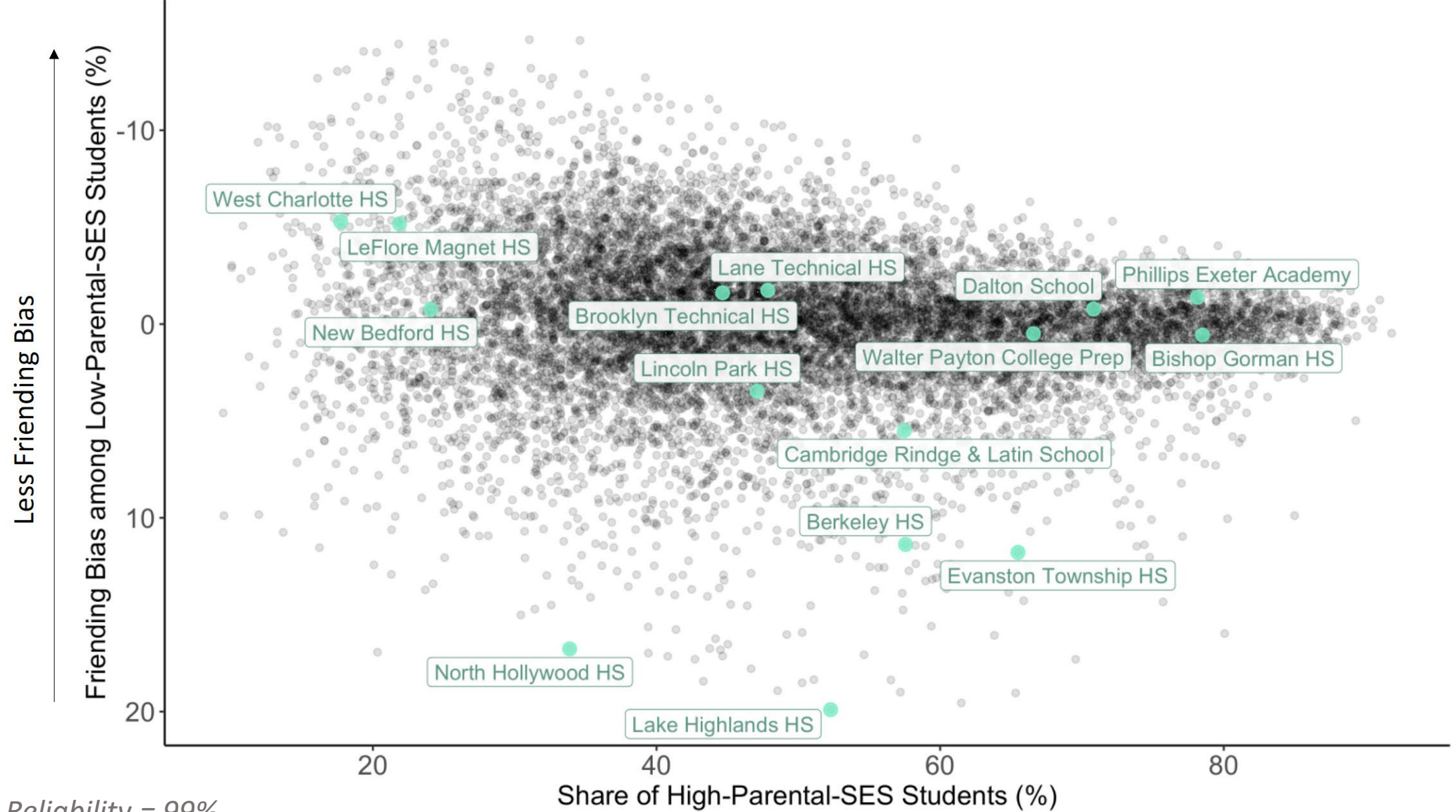
Exposure Reliability = 99%
Friend Bias Reliability = 58%

Berkeley High School Initiatives to Reduce Friending Bias

A structure of division: Berkeley High School attempts to tackle segregation on campus

Today, Berkeley High is split into five learning communities, with two larger schools — Berkeley International High School, or BIHS, and Academic Choice, or AC — and three smaller schools — the Academy of Medicine and Public Service, Arts and Humanities Academy, or AHA, and Communication Arts and Sciences, or CAS.

Though the movement toward a small program structure was meant in part to address racial achievement gaps and improve outcomes for students of color, many students feel it has created a segregated school and fueled racist attitudes.

An intervention

To attempt to address this divisive climate, Berkeley High's Design Team has proposed the creation of a ninth grade that places incoming students into intentionally diverse communities. Under a universal ninth grade, students would begin their time at Berkeley High in one of various houses, rather than in one of the five learning communities.

A Gym in Boston Works to Reduce Friending Bias

Inner City Weightlifting (ICW)

STAGE III SOCIAL CAPITAL

During Stage III, students form relationships with clients from opposite socioeconomic backgrounds, bridging social capital, and creating a dynamic support network.

At ICW, through our career track in personal training, we help create economic mobility for people in our program as they begin earning $20-$60 per hour training clients from opposite socio-economic backgrounds. More importantly, this flips power dynamics, bridges social capital, and creates a genuine form of inclusion that disrupts the system of segregation, isolation, and racism that leads to the streets. **The people in our program gain access to new networks and opportunities, while our clients gain new insights and perspectives into complex social challenges.**

Conclusions

- Two broad takeaways:

    1. Social capital as measured by **economic connectedness** appears to be a key mediator of economic mobility

    2. Economic connectedness is shaped by segregation (exposure) and friending bias (interaction), both of which can be shaped by policy

Conclusions

- More generally, social connections appear central in many recent programs that have shown promise in increasing upward mobility

  - Ex: Creating Moves to Opportunity (neighborhoods) and YearUp (job training)
    [Bergman, Chetty, DeLuca, Hendren, Katz, Palmer 2020; Katz, Roth, Hendra, Schaberg 2020]

→ Designing policies going forward to provide not just economic resources but relevant socioeconomic connections may be valuable for expanding opportunity

  - Data released publicly here (available for download at www.socialcapital.org) can be used to target such interventions

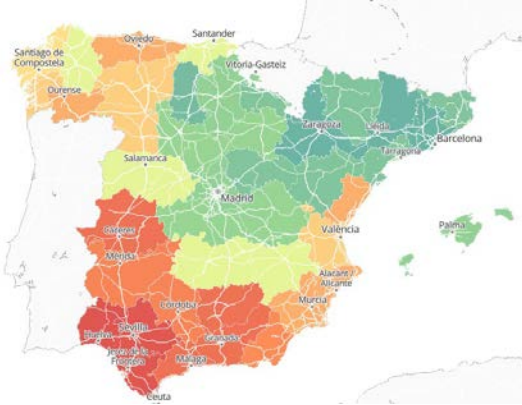# The Geography of Economic Opportunity Around the World
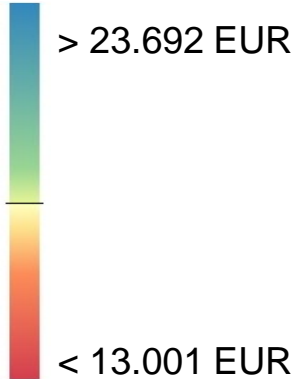
Sweden
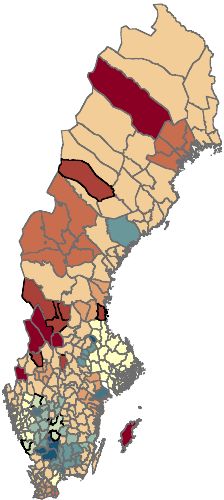
Annual Individual Income at Age 32-34 (2010)

> 255,000 SEK

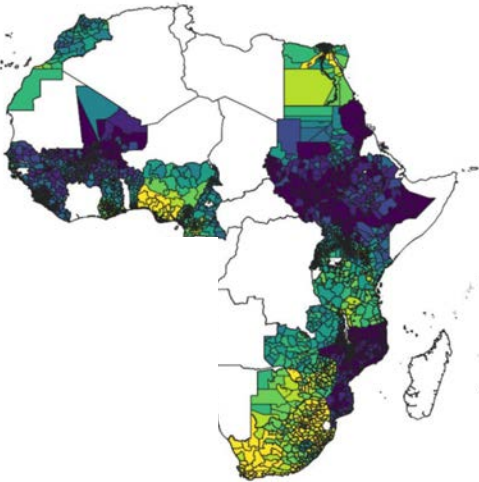< 235,000 SEK
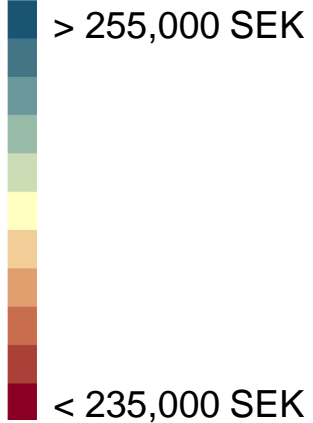
Source: Heidrich 2017

Spain

Median Income at Age 31 for Children from Low-Income Households

> 23.692 EUR

< 13.001 EUR

Source: Atlas de Oportunidades 2020

Africa

Upward Mobility

- 0.00 - 0.06 *(lowest)*
- 0.06 - 0.12
- 0.12 - 0.18
- 0.18 - 0.28
- 0.28 - 0.38
- 0.38 - 0.50
- 0.50 - 0.60
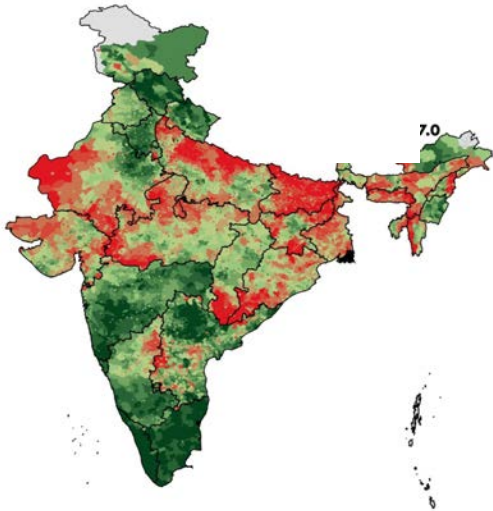- 0.60 - 0.70
- 0.70 - 0.78
- 0.78 - 1.00 *(highest)*
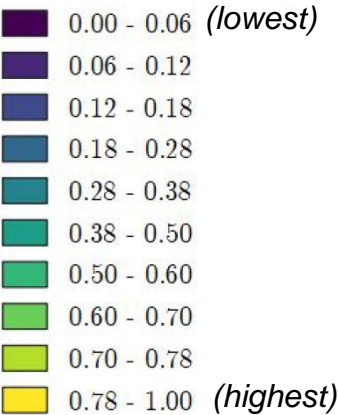
Source: Alesina, Hohmann, Michalopoulos, Papaioannou 2021

India

Mean Education Rank of Sons with Below-Median Fathers

58.0

27.0

Source: Asher, Novosad, and Rafkin 2020

For Further Information

Research papers:

- Social Capital I: Measurements and Associations with Economic Mobility.
  Nature 608 (7921): 108-121, 2022

- Social Capital II: Determinants of Economic Connectedness.
  Nature 608 (7921): 122-134, 2022

Data: www.socialcapital.org

Questions: info@opportunityinsights.org

OPPORTUNITY INSIGHTS