Social Capital and Economic Mobility

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)

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**


**Cohesiveness**

- Coleman 1988; Jackson et al. 2012

**Civic Engagement**

- Putnam et al. 1994; Putnam 1995; Glaeser, Laibson, Sacerdote 2002
This Project: Two Papers

- Measure Social Capital Using Data from Facebook
- Analyze Associations with Economic Mobility
- Identify Determinants of Social Connections
- Release Granular Data to Inform Interventions

Measuring Social Capital

- Measurement of Social Capital
- Association with Economic Mobility
- Determinants of Economic Connectedness
- Targeting Interventions
Data and Sample Definitions

- Baseline analysis sample
  - U.S. Facebook users between ages 25–44 as of May 28, 2022
  - 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?

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 distribution based on their predicted SES ranks relative to others in their cohort
<table>
<thead>
<tr>
<th>Setting</th>
<th>Benchmark</th>
<th>Facebook SES Measure</th>
<th>Correlation with % Above-Median SES in Facebook Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZIP Codes</td>
<td>% of individuals with household income above the national median (ACS)</td>
<td>Own SES</td>
<td>0.88</td>
</tr>
<tr>
<td>High Schools</td>
<td>% of students not eligible for free or reduced lunch (NCES)</td>
<td>Parental SES</td>
<td>0.85</td>
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<tr>
<td>Colleges</td>
<td>% of students with parental household income in the top two quintiles of the national distribution (tax data)</td>
<td>Parental SES</td>
<td>0.91</td>
</tr>
</tbody>
</table>
Mean Friend SES Rank vs. Own SES Rank

All Friends: Slope = 0.44 (0.005)
Mean Friend SES Rank vs. Own SES Rank

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

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

\[
EC = \frac{\text{Number of friends with above−median SES}}{\text{Total number of friends}} / \frac{1}{2}
\]

- 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

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
## Correlation Matrix of County-Level Social Capital Measures

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
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<tr>
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<td>(3) Age Connectedness</td>
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<td>(4) Clustering</td>
<td>0.01</td>
<td>0.38</td>
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<td>1.00</td>
<td></td>
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<tr>
<td>(5) Support Ratio</td>
<td>-0.25</td>
<td>0.30</td>
<td>0.50</td>
<td>0.64</td>
<td>1.00</td>
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<tr>
<td>(6) Spectral Homophily</td>
<td>-0.09</td>
<td>-0.37</td>
<td>-0.49</td>
<td>-0.61</td>
<td>-0.51</td>
<td>1.00</td>
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<tr>
<td>(7) Penn State Index</td>
<td>0.31</td>
<td>0.08</td>
<td>-0.04</td>
<td>0.39</td>
<td>0.28</td>
<td>-0.25</td>
<td>1.00</td>
<td></td>
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<tr>
<td>(8) Civic Organizations</td>
<td>0.27</td>
<td>0.16</td>
<td>0.05</td>
<td>0.37</td>
<td>0.23</td>
<td>-0.33</td>
<td>0.67</td>
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<tr>
<td>(9) Volunteering Rate</td>
<td>0.46</td>
<td>0.28</td>
<td>-0.04</td>
<td>0.30</td>
<td>0.23</td>
<td>-0.35</td>
<td>0.44</td>
<td>0.46</td>
<td>1.00</td>
</tr>
</tbody>
</table>
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

- Economic Connectedness
- Language Connectedness
- Age Connectedness
- Clustering
- Support Ratio
- Spectral Homophily
- Penn State Index
- Civic Organizations
- Volunteering Rate

Magnitude of Pop-Wtd. Univariate Correlation with Upward Mobility across Counties

- Positive
- Negative
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 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

Slope = 9.8 (1.4)
Signal Correlation = 0.44 (0.06)
Growing up in a higher-EC area has a causal effect on upward mobility through a childhood exposure effect.

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

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

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

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**

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Upward Mobility (Mean Income Rank at Age 35 for Children with Parents at 25th Percentile)</th>
<th>Upward Mobility for Black Individuals</th>
<th>Upward Mobility for White Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Across Counties</td>
<td>Across ZIP Codes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Income Inequality (Gini coefficient)</td>
<td>-0.449*** (0.084)</td>
<td>-0.204*** (0.057)</td>
<td>-0.250*** (0.018)</td>
</tr>
<tr>
<td>Share Black</td>
<td>0.577*** (0.063)</td>
<td>0.468*** (0.083)</td>
<td>0.631*** (0.027)</td>
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<tr>
<td>Observations</td>
<td>2,741</td>
<td>11,147</td>
<td>24,020</td>
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<tr>
<td>R-squared</td>
<td>0.207</td>
<td>0.042</td>
<td>0.063</td>
</tr>
</tbody>
</table>

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
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

- 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

- 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  
High-SES  
Low-SES

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

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

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**: \( 1 - (\text{Share high-SES friends made in } g)/(\text{Share high-SES members of } g) \)
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

Proportion of Friends Made in Setting Relative to National Average

SES Percentile Rank

College
Friendship Shares by Setting vs. Socioeconomic Status

All Settings
Exposure to Above-Median SES Peers By Setting

Low-SES People

Exposure to Above-Median-SES Peers

- Neighborhood: 0.82
- Workplace: 0.96
- College: 1.25
- High School: 0.94
- Rec. group: 0.93
- Rel. group: 0.87
Friending Bias for Low-SES People, By Setting

- Neighborhood: 0.163
- Workplace: 0.054
- College: 0.049
- High School: 0.041
- Rec. group: 0.025
- Rel. group: -0.035
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
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
- Equate Friending Rates: 0.910
- Equate Friending Rates, Exposure & Bias: 1.534
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
Equate Friending Rates: 0.910
Equate Friending Rates & Exposure: 1.209
Average High-SES Individual: 1.534
Equate Friending Rates, Exposure & Bias: 1.539

Economic Connectedness (EC)
Interventions to Increase Connectedness

Measurement of Social Capital
Association with Economic Mobility
Determinants of Economic Connectedness
Targeting Interventions
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%
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, …
- Friending bias is also shaped by institutions and policy choices…
Friending Bias in High Schools vs. School Size

The graph illustrates the relationship between the number of students per cohort and the percentage of friending bias among low-SES students. As the number of students per cohort increases, the percentage of friending bias among low-SES students also increases. The trend shows a curve, indicating a non-linear relationship.
Friending Bias in High Schools vs. Gifted and Talented Program Share

![Graph showing the relationship between Friending Bias among Low-SES Students and Share in Gifted & Talented Program (in %).]
Friending Bias in High Schools vs. Share of High-SES Students
Friending Bias in High Schools vs. Racial Diversity

![Graph showing the relationship between Friending Bias among Low-SES Students (%) and Racial Diversity (Herfindahl-Hirschman Index). The graph indicates a positive correlation, with Friending Bias increasing as Racial Diversity increases.]
Berkeley High School Initiatives to Reduce Friending Bias

THE DAILY CALIFORNIAN
SUNDAY, MAY 14, 2017

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)

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.

During Stage III, students form relationships with clients from opposite socioeconomic backgrounds, bridging social capital, and creating a dynamic support network.
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 measured and shaped by policy
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](http://www.socialcapital.org)) can be used to target such interventions and better understand the determinants and impacts of social capital.
Friending Bias vs. Exposure to High-SES Students, by College
Among Low-SES Students in 1990-2000 Birth Cohorts
Difference in Friending Bias Exhibited in Other Groups vs. Religious Groups

Members of Religious Groups

Friending Bias of Low-SES People in Setting Minus Friending Bias in Religious Groups (%)

- High school
- College
- Workplace
- Rec. group
- Neighborhood
Selection on Race: Upward Mobility vs. EC in Counties with >90% White Residents

Correlation = 0.68
## Associations between Friending Bias, Exposure, and Upward Mobility across Counties and ZIP Codes

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>log(Uptward Mobility)</th>
<th>log(Causal Upward Income Mobility)</th>
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<tbody>
<tr>
<td></td>
<td>ZIP Codes (1)</td>
<td>Counties (5)</td>
</tr>
<tr>
<td></td>
<td>ZIP Codes (2)</td>
<td>Counties (6)</td>
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<tr>
<td></td>
<td>ZIP Codes (3)</td>
<td>Counties (7)</td>
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<td>log (Economic Connectedness)</td>
<td>0.236*** (0.01)</td>
<td>0.272*** (0.02)</td>
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<td>log (High-SES Exposure)</td>
<td>0.248*** (0.01)</td>
<td>0.224*** (0.02)</td>
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<td>log (1 - Friending Bias)</td>
<td>0.185*** (0.03)</td>
<td>0.236*** (0.04)</td>
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<td>County FEs</td>
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<td>Observations</td>
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<tr>
<td>R-squared</td>
<td>0.42</td>
<td>0.71</td>
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Relationship between Clustering and Upward Mobility
Across ZIP Codes for Four Counties in Ohio
Relationship between Clustering and Upward Mobility Across ZIP Codes for Four Counties in Ohio
Relationship between Clustering and Upward Mobility Across ZIP Codes for Four Counties in Ohio
Relationship between Clustering and Economic Connectedness Across ZIP Codes for Four Counties in Ohio
Relationship between Upward Mobility and Economic Connectedness
Across ZIP Codes for Four Counties in Ohio
Distributions of ZIP Code-Level Correlations between Upward Mobility and Social Capital Measures across Counties
Different Types of Social Capital Matter for Different Outcomes

- Economic connectedness may predict upward mobility because it provides “bridging” social capital useful for “getting ahead” [Putnam 2000]

- But important to recognize that it is not necessarily the “best” measure of social capital in general
  - Illustrate by looking at correlations with other outcomes, such as life expectancy by income
Correlations between Social Capital and Life Expectancy at Age 40 for Bottom-Income-Quartile Men

Univariate County-level Correlations

- Cross-Type Connectedness
  - Economic Connectedness
  - Language Connectedness
  - Age Connectedness
  - Clustering
  - Support Ratio
  - Spectral Homophily
- Network Cohesiveness
  - Penn State Index
- Civic Engagement
  - Civic Organizations
  - Volunteering Rate

Magnitude of Pop-Wtd. Univariate Correlation with Life Expectancy for Q1 Males

- Positive: Green circle
- Negative: Red triangle
Correlations between Social Capital and Life Expectancy at Age 40 for Bottom-Income-Quartile Men
Cohesiveness vs. Life Expectancy

Life Expectancy for Bottom-Income-Quartile Men vs. Clustering Coefficient, by County

Life Expectancy for Bottom-Income-Quartile Men vs. Support Ratio, by County
Friending Bias in High Schools vs. Gifted & Talented Enrollment

Bias Measured using Parental SES
Friending Bias in High Schools vs. Share of White Students
Bias Measured using Parental SES

![Graph showing the relationship between the share of white students and friending bias among low-parental-SES students. The graph indicates a curve where bias is minimal when the share of white students is around 50% and increases at both extremes.]
Friending Bias in High Schools vs. AP Enrollment

Bias Measured using Own SES
Friending Bias in High Schools vs. Share of White Students

Bias Measured using Own SES
Correlations with High School Completion Rate for Children with Parents at 25th Percentile
Correlations with Teen Birth Rate for Women with Parents at 25th Percentile

- Economic Connectedness
- Language Connectedness
- Age Connectedness
- Clustering
- Support Ratio
- Spectral Homophily
- Penn State Index
- Civic Organizations
- Volunteering Rate

Magnitude of Pop-Wtd. Univariate Correlation with Teen Birth Rate across Counties

- Positive
- Negative

[Graph showing correlations with various indicators, with some indicators showing positive correlations and others showing negative correlations.]
Stability of County-Level Economic Connectedness Across Cohorts

A. Autocorrelation of Economic Connectedness Across Counties by Cohort

B. Correlation between Upward Mobility for 1978-83 Cohorts and Cohort-Specific EC
Incremental R-Squared of Predictors

C. Additional R-Squared for Social Capital Measures

D. Additional R-Squared Incl. Other Nbhd. Characteristics
Correlations between Upward Mobility and Measures of Social Capital

ZIP-level Univariate Correlations
Correlations between Upward Mobility and Measures of Social Capital
Coefficients from ZIP-level Multivariable Regression

- Economic Connectedness
  - Cross-Type Connectedness
  - Language Connectedness
  - Age Connectedness
  - Network Cohesiveness
    - Clustering
    - Support Ratio
  - Civic Engagement
    - Civic Organizations
    - Volunteering Rate

Multivariable Regression Coefficient on Standardized Measure
- Positive
- Negative

[Graph showing correlations with data points for each measure]
Relationship between Upward Mobility and EC
ZIP-level Regression

![Graph showing the relationship between Economic Connectedness and Predicted Household Income Rank for Children with Parents at 25th Pctile. The graph includes a linear trend line with a slope of 18.3 (0.6) and a correlation of 0.69 (0.02).]
Relationship between Upward Mobility and EC
ZIP-level Univariate Correlations

Magnitude of Pop-Wtd. Univariate Correlation with Upward Mobility across ZIP Codes

- Positive
- Negative
Relationship between Upward Mobility and EC
Coefficients from ZIP-level Multivariate Regression
Associations between Race-Specific Upward Income Mobility and Economic Connectedness
Racially Homogeneous Areas

<table>
<thead>
<tr>
<th>Upward Mobility for:</th>
<th>White Individuals</th>
<th>Black Individuals</th>
<th>Hispanic Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Counties (1)</td>
<td>ZIP Codes (2)</td>
<td>ZIP Codes (3)</td>
</tr>
<tr>
<td></td>
<td>ZIP Codes (4)</td>
<td>ZIP Codes (5)</td>
<td>ZIP Codes (6)</td>
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<tr>
<td>Economic Connectedness</td>
<td>0.68*** (0.04)</td>
<td>0.69*** (0.02)</td>
<td>0.61*** (0.13)</td>
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<tr>
<td>Sample</td>
<td>&gt;80% White</td>
<td>&gt;80% White</td>
<td>&gt;80% Black</td>
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<tr>
<td></td>
<td>&gt;90% White</td>
<td>&gt;90% Black</td>
<td>&gt;90% Hispanic</td>
</tr>
<tr>
<td>Observations</td>
<td>1,955</td>
<td>16,087</td>
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</tr>
<tr>
<td></td>
<td>1,427</td>
<td>12,058</td>
<td>105</td>
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<tr>
<td>Focal Race Share in Sample</td>
<td>90%</td>
<td>91%</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>95%</td>
<td>95%</td>
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<td></td>
<td>95%</td>
<td>94%</td>
<td>94%</td>
</tr>
</tbody>
</table>
C. Univariate Correlations between Upward Mobility and Social Capital

D. Univariate Correlations between Upward Mobility and Other Neighborhood Characteristics
Regression of Counties’ Causal Effects on Upward Mobility on Social Capital
Multivariable Regression Coefficients

- Economic Connectedness
- Language Connectedness
- Age Connectedness
- Clustering
- Support Ratio
- Spectral Homophily
- Penn State Index
- Civic Organizations
- Volunteering Rate
Regression of Counties’ Causal Effects on Upward Mobility on Social Capital Incremental R-Squared

- Economic Connectedness
- Language Connectedness
- Age Connectedness
- Clustering
- Support Ratio
- Spectral Homophily
- Penn State Index
- Civic Organizations
- Volunteering Rate
Upward Mobility, EC, and Income Levels across Counties

Median Household Income vs. Upward Mobility

A. Upward Mobility vs. Median Income, by County

B. Upward Mobility vs. Median Income Controlling for EC, by County
Upward Mobility, EC, and Income Levels across Counties

Poverty Rate vs. Upward Mobility

C. Upward Mobility vs. Poverty Rate, by County

D. Upward Mobility vs. Poverty Rate Controlling for EC, by County
Upward Mobility, EC, and Income Levels across ZIPs
Median Household Income vs. Upward Mobility

A. Upward Mobility vs. Median Income, by ZIP Code

B. Upward Mobility vs. Median Income Controlling for EC, by ZIP Code
Upward Mobility, EC, and Income Levels across ZIPS

Poverty Rate vs. Upward Mobility

C. Upward Mobility vs. Poverty Rate, by ZIP Code

D. Upward Mobility vs. Poverty Rate Controlling for EC, by ZIP Code
Upward Mobility, EC, and Inequality and Segregation across Counties

Income Segregation vs. Upward Mobility

A. Upward Mobility vs. Income Segregation, by County

B. Upward Mobility vs. Income Segregation Controlling for EC, by County
Upward Mobility, EC, and Inequality and Segregation across Counties
Racial Segregation vs. Upward Mobility

C. Upward Mobility vs. Racial Segregation, by County

D. Upward Mobility vs. Racial Segregation Controlling for EC, by County
Upward Mobility, EC, and Inequality and Segregation across Counties
Gini Coefficient vs. Upward Mobility

E. Upward Mobility vs. Gini Coefficient, by County

F. Upward Mobility vs. Gini Coefficient Controlling for EC, by County
Upward Mobility, EC, and Share of Black Residents across ZIPs
Black Share vs. Upward Mobility for White Individuals

A. Upward Mobility for White Individuals vs. Black Share, by ZIP Code

B. Upward Mobility for White Individuals vs. Black Share Controlling for EC, by ZIP Code
Upward Mobility, EC, and Share of Black Residents across ZIPS
Black Share vs. Upward Mobility for Black Individuals

C. Upward Mobility for Black Individuals vs. Black Share, by ZIP Code

D. Upward Mobility for Black Individuals vs. Black Share Controlling for EC, by ZIP Code
Distribution of ZIP-level Incomes in Facebook Data vs. ACS
Ages 25 to 44
Distribution of ZIP-level Incomes in Facebook Data vs. ACS
Ages 45 to 64
County-level Correlations for Top 25% of Counties by FB Coverage Rates
Social Capital vs. Upward Mobility
County-level Correlations for Top 25% of Counties by FB Coverage Rates
Neighbourhood Characteristics vs. Upward Mobility

Economic Connectedness
Median HH Income
Share Above Poverty Line
Income Segregation
Racial Segregation
Share Black
Income Inequality (Gini coefficient)
Jobs Within 5 Miles
Job Growth 2004–2013
2000 Employment Rate
Mean 3rd Grade Math Score
Share College Grad.
Share Hispanic
Share Single Parent HH

Magnitude of Pop-Wtd. Univariate Correlation with Upward Mobility across Top 25% of Counties in terms of Coverage

- Positive
- Negative
Relationship Between Friends’ and Own SES on Instagram

Slope = 0.50 (0.008)
Predictors of Friending Bias across Settings
Friending Bias vs. Group Size

![Graph showing the relationship between Friending Bias and Group Size across different settings. The graph includes data points and trends for High School, College, Workplace, Recreational Group, Religious Group, and Neighborhood.](image)
Predictors of Friending Bias across Settings
Friending Bias vs. High-SES Exposure

The graph illustrates the relationship between Friending Bias and the share of Above-Median-SES individuals in various settings. Different markers and lines represent different settings: High School, College, Workplace, Recreational Group, Religious Group, and Neighborhood. The graph shows a trend where Friending Bias decreases as the share of Above-Median-SES individuals increases across all settings.
Friending Bias vs. Exposure to High-SES Students, by High School Among Low-Own-SES Students in 1990-2000 Birth Cohorts
Friending Bias vs. Exposure to High-SES Students, by College
Among Low-Own-SES Students in 1990-2000 Birth Cohorts
Friending Bias in Colleges vs. School Cohort Size
Bias Measured using Parental SES
Friending Bias in Colleges vs. Exposure
Bias Measured using Parental SES
Friending Bias in Colleges vs. Racial Diversity
Bias Measured using Parental SES
Friending Bias in Colleges vs. Share White Bias Measured using Parental SES
Mary Barr: sociologist who attended Evanston Township HS

BARR: Interracial friendships that had been building and blossoming, even though it was more difficult, beginning in the elementary schools, and then really flourishing in the middle school, just sort of come to an abrupt halt.

The process of social segregation began again in high school, reinforced by academic tracking that guided white students towards an academic focus and black students to a vocational focus. Some of that tracking came through the school itself; some from families.

BARR: This is where our friendship ended. I think that it wasn't... when we think about tracking, we think about "college bound," right? The gifted group, the AP classes, or the remedial or vocational courses. And that's where all of my black friends ended up.
Friending Bias in High Schools vs. AP Enrollment
Bias Measured using Parental SES
Friending Bias in High Schools vs. School Size
Bias Measured using Parental SES

![Graph showing the relationship between Friending Bias among Low-Parental-SES Students and the number of students per cohort. The graph indicates a curve where the bias increases as the number of students decreases.]
Friending Bias in High Schools vs. Socioeconomic Diversity
Bias Measured using Parental SES

![Graph showing the relationship between the share of above-median parental SES students and friending bias among low-parental SES students.](image-url)
Friending Bias in High Schools vs. Racial Diversity
Bias Measured using Parental SES

![Graph showing the relationship between racial diversity and friending bias among low-parental-SES students. The x-axis represents racial diversity (Herfindahl-Hirschman Index), and the y-axis represents friending bias among low-parental-SES students (%). The data points are scattered across the graph, with a trend line indicating an increasing bias as racial diversity increases.]
Friending Rates by Setting
Correcting for Underreporting of Group Memberships

![Graph showing friending rates by setting, corrected for underreporting of group memberships. The x-axis represents SES percentile rank, ranging from 5 to 100. The y-axis represents the proportion of friends made in each setting relative to the national average. Different lines represent various settings: High School, College, Workplace, Recreational Group, Religious Group, and Neighborhood.](image-url)
Decomposing EC
Correcting for Underreporting of Group Memberships

- Average Low-SES Individual: 0.885
- Equate Friending Rates: 0.921
- Equate Friending Rates & Exposure: 1.245
- Equate Friending Rates & Friending Bias: 1.128
- Average High-SES Individual: 1.525

Economic Connectedness (EC)
Autocorrelation of EC by Birth Cohort
Across High Schools

A. High Schools: Own SES

B. High Schools: Parental SES
Autocorrelation of EC by Birth Cohort Across Colleges

C. Colleges: Own SES

D. Colleges: Parental SES
Causal Effects of Changes in Socioeconomic Integration on Economic Connectedness in High Schools: Sensitivity Analysis Using First Differences

A. Cohort-Level Changes in Connectedness vs. Changes in Share of High-SES Students, Using First-Differences

B. Causal Impact of High-SES Share on Connectedness by Level of Friending Bias, Using First-Differences
Causal Effects of Changes in Socioeconomic Integration on Economic Connectedness in High Schools: Sensitivity Analysis Using Neighboring Cohorts

C. Cohort-Level Changes in Connectedness vs. Changes in Share of High-SES Students, Using Neighboring Cohorts

D. Causal Impact of High-SES Share on Connectedness by Level of Friending Bias, Using Neighboring Cohorts

Cohort-Level Deviation in EC from Mean of Two Neighboring Cohorts

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

Slope = 0.89 (0.007)

Slope = -0.69 (0.15)
Balance Tests for RD Design

Number of Friends and Share Female

A. Number of Friends

B. Share Female

- Lowest Friending Bias Quartile
- Highest Friending Bias Quartile
Causal Effects on Exposure on EC
Histogram of RD Estimates, Varying Bandwidth Around School Entry Cutoff

RD Estimates of Causal Effect of Increase in Exposure on EC

- Low-Friending-Bias Schools
- High-Friending-Bias Schools
Proportion of Friendships by SES Percentile Rank
Proportion of Friends by SES Percentile Rank for Individuals in the Upper Tail

![Graph showing the proportion of friendships by SES percentile rank for individuals in the upper tail. The graph plots the percentage of friends against the friends' SES percentile rank. Three distinct distributions are shown: one for individuals at the 90th SES percentile, another for individuals at the 95th SES percentile, and the third for individuals at the 100th SES percentile. The distributions indicate a higher proportion of friendships for individuals in the upper SES percentiles.](image-url)
Correlations between Upward Mobility and Neighborhood Characteristics

County-level Univariate Correlations

- Economic connectedness
- Median HH income
- Share above poverty line
- Income segregation
- Racial segregation
- Share of Black individuals
- Income inequality (Gini coefficient)
- Jobs within 5 miles
- Job growth 2004–2013
- 2000 employment rate
- Mean third grade mathematics score
- Share of college graduates
- Share of Hispanic individuals
- Share of single-parent HH

Magnitude of population-weighted univariate correlation with upward mobility across counties

Positive
Negative
Correlations between Upward Mobility and Neighborhood Characteristics

County-level Multivariable Regression Coefficients

- Economic connectedness
- Median HH Income
- Racial segregation
- Share of Black individuals
- Income inequality (Gini coefficient)
- Mean third grade mathematics score
- Share of single-parent HH

Multivariable regression coefficient on standardized measure

- Positive
- Negative
EC By Setting
Low-SES vs. High-SES People

[Bar chart showing economic connectedness for High school, College, Workplace, Rec. group, Rel. group, and Neighborhood, comparing Low-SES and High-SES people.]
Exposure By Setting
Low-SES vs. High-SES People
Friending Bias By Setting
Low-SES People

[Friendship Bias Chart]

- High school
- College
- Workplace
- Rec. group
- Rel. group
- Neighborhood

Low-SES people
Friending Bias By Setting
Low-SES vs. High-SES People

[Bar chart showing the comparison between Friending Bias of Low-SES and High-SES people across different settings: High school, College, Workplace, Rec. group, Rel. group, and Neighborhood.]
Friending Bias of Low-SES Individuals by County
Share of above-median-SES friends of below-median-SES people, conditional on exposure
Why Does Economic Connectedness Vary Across Areas?
Low-EC vs. High-EC ZIP Codes

- Average Low-EC ZIP Code: 0.520
- Equate Friending Rates: 0.597
- Equate Friending Rates & Exposure: 1.080
- Equate Friending Rates & Friending Bias: 0.680
- Average High-EC ZIP Code: 1.222
Determinants of Economic Connectedness

<table>
<thead>
<tr>
<th>Exposure</th>
<th>vs.</th>
<th>Friending Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segregation by Income</td>
<td></td>
<td>Interaction Conditional on Exposure</td>
</tr>
</tbody>
</table>

| 50%                       |                          | 50%                                   |

“Every time I walked across Eutaw Street, I witnessed the exchange of realities. As I grew older, I’ve come to learn that this was how Baltimore works. Millionaires could live on one side of a street, and the projects could be on the other side. Those two worlds would never cross, never make friends, never acknowledge each other. Everybody was OK with it, especially the rich.

- Carmelo Anthony (2021), Where Tomorrows Aren’t Promised
Causal Effects of Integration on Connectedness:
Regression Discontinuity
Changes in EC Around School Entry Cutoffs, by Friending Bias

EC Jump in Low-Bias Schools = 0.39 (0.01)
EC Jump in High-Bias Schools = 0.33 (0.01)
Causal Effects of Integration on Connectedness: Regression Discontinuity
Impacts of Exposure on EC, by Friending Bias

\[ \text{Slope in Low-Bias Schools} = 0.94 (0.02) \]
\[ \text{Slope in High-Bias Schools} = 0.80 (0.01) \]