ANNENBERG
BROWN UNIVERSITY

EdWorkingPaper No. 23-774

Are Connections the Way to Get Ahead? Social Capital, Student Achievement, Friendships, and Social Mobility

Paul E. Peterson
Harvard University

M. Danish Shakeel
The University of Buckingham

Angela K. Dills
Western Carolina University

Chetty et al. (2022) say county density of cross-class friendships (referred to here as "adult-bridging capital") has causal impacts on social mobility within the United States. We instead find that social mobility rates are a function of county density of family capital (higher marriage rates and two-person households), community capital (community organizations, religious congregations, and volunteering), and mean student achievement in grades 3-8. Our models use similar multiple regression equations and the same variables employed by Chetty et al. but also include state fixed effects, student achievement, and family, community, school-bridging (cross-class high school friendships), and political (participation and institutional trust) capital. School-bridging capital is weakly correlated with mobility if adult-bridging is excluded from the model. R-squared barely changes when adult-bridging is incorporated into the model. When it is included, mobility continues to be significantly correlated with the achievement, family, and community variables but not with school-bridging and political ones. We infer that county mobility rates are largely shaped by parental presence, community life, and student achievement. To enhance mobility, public policy needs to enhance the lives of disadvantaged people at home, in school, and in communities, not just the social class of their friendships.

VERSION: May 2023

Suggested citation: Peterson, Paul E., M. Danish Shakeel, and Angela K. Dills. (2023). Are Connections the Way to Get Ahead? Social Capital, Student Achievement, Friendships, and Social Mobility. (EdWorkingPaper: 23-774). Retrieved from Annenberg Institute at Brown University: https://doi.org/10.26300/r1ic-xe67

Are Connections the Way to Get Ahead?

Social Capital, Student Achievement, Friendships, and Social Mobility

Paul E. Peterson (ppeterso@gov.harvard.edu)*
Program on Education Policy and Governance, Department of Government
Harvard University, USA
https://orcid.org/0000-0001-8073-5186

M. Danish Shakeel (danish.shakeel@buckingham.ac.uk)
E. G. West Centre for Education Policy, The University of Buckingham, UK
https://orcid.org/0000-0002-7700-8540
&

Angela K. Dills (akdills@email.wcu.edu)
School of Economics, Management, and Project Management,
Western Carolina University, USA
https://orcid.org/0000-0001-9527-9902

May 19, 2023

Word count: 13,424

*Corresponding Author (Phone: +1-617-495-7976). A prior version of this paper was presented before the 80th Annual Midwest Political Science Association Conference, April 13-16, 2023, Chicago. David Campbell, David Sikkink, Martin West, Raj Chetty, Scott Winship, and William Howell commented on earlier drafts of this paper. Michael Poor and Antonio Wendland provided administrative assistance. The Program on Education Policy and Governance at Harvard University supported the project through Walton Family Foundation grant #00107915. We own any remaining errors.

Disclosure statement

No potential conflict of interest was reported by the authors.

Author Bios

Paul E. Peterson is the Henry Lee Shattuck Professor of Government and Director of the Program on Education Policy and Governance at Harvard University, and a Senior Fellow at the Hoover Institution at Stanford University.

M. Danish Shakeel is a professor and director of the E. G. West Centre for Education Policy at the University of Buckingham, UK.

Angela K. Dills is Professor of Economics and the Gimelstob-Landry Distinguished Professor of Regional Economic Development at Western Carolina University.

Abstract

Chetty et al. (2022) say county density of cross-class friendships (referred to here as "adult-bridging capital") has causal impacts on social mobility within the United States. We instead find that social mobility rates are a function of county density of family capital (higher marriage rates and two-person households), community capital (community organizations, religious congregations, and volunteering), and mean student achievement in grades 3-8. Our models use similar multiple regression equations and the same variables employed by Chetty et al. but also include state fixed effects, student achievement, and family, community, school-bridging (cross-class high school friendships), and political (participation and institutional trust) capital. School-bridging capital is weakly correlated with mobility if adult-bridging is excluded from the model. R-squared barely changes when adult-bridging is incorporated into the model. When it is included, mobility continues to be significantly correlated with the achievement, family, and community variables but not with school-bridging and political ones. We infer that county mobility rates are largely shaped by parental presence, community life, and student achievement. To enhance mobility, public policy needs to enhance the lives of disadvantaged people at home, in school, and in communities, not just the social class of their friendships.

Keywords: social capital; achievement; mobility; SEDA; family

Social capital, a vital resource produced by exchanges among individuals (Coleman 1990), generates trust needed to solve common problems (Ostrom 1990), nurtures human capital formation (Coleman 1988), enhances human flourishing (Vanderweele 2017) and stimulates economic and political modernization (Fukuyama 1995; Inglehart 1997; Putnam 1993). Chetty et al. (2022), hereinafter Chetty et al. tell us that cross-class friendships create social capital that generates social mobility opportunities. The friendships, labelled "economic connectedness (EC)," are said to create an opportunity structure for those from low-income backgrounds. Specifically, they assert that: "areas with higher EC have large positive causal effects on children's prospects for upward mobility (p. 120)." After examining friendship patterns among 72 million Facebook users in 1,818 counties, they report that EC has a greater effect on mobility than does household income, racial and income segregation, or income inequality. In a model that controls for these variables, they show a large impact of EC on intergenerational mobility (p. 117).

The study has captured national attention *(*Economist 2022; Miller et al. 2022) and received favorable reviews (Jackson and McMillan 2022; Joseph 2022; Powell and Toppin 2022; Tropp and Naeem 2022). The New York Times (Miller et al. 2022) informed its readers that:

> an expansive new study, based on billions of social media connections, . . . helps explain why certain places offer a path out of poverty. For poor children, living in an area where people have more friendships that cut across class lines significantly increases how much they earn in adulthood.

A Brookings institution report summarizes the study as follows:

> The findings are striking and certain to have a profound impact on discussions of economic mobility. The headline finding is that at the community level, cross-class connections boost social mobility *more than anything else (their italics)*, including racial segregation, economic inequality, educational outcomes, and family structure (Reeves and Fall 2022).

The study has been well-received not only because it observes millions of Facebook friends and calls attention to the importance of social capital for intergenerational mobility but also for its policy implications. If Chetty et al. are correct, the best way to create more equal opportunities in an increasingly inegalitarian society is to break barriers to the formation of cross-class friendships. If such friendships are the primary determinant of social mobility for the disadvantaged, school and residential policies should encourage their formation. The research has major implications for school tracking, honors programs, merit scholarships, merit-based admissions to schools and colleges, neighborhood desegregation, zoning regulations, housing policy, and much more (Jackson and McMillan 2022; Reeves and Fall 2022).

But as well-received and significant as the Chetty et al.'s research has been, the findings do not survive a second look. In this paper we first replicate the Chetty cross-class friendship model, then show its limitations with subsequent models that include state fixed effects, student achievement, and four social capital variables—family, community, political and school-bridging capital. Our procedure uses the same county-level measures for all characteristics included in their main model, and, apart from adding the new variables, we use the same multiple regression equation to estimate effects on social mobility. We prefer unweighted observations to applying weights according to disadvantaged population size, as Chetty et al. prefer, but our findings emerge even more sharply when their preferred weights are applied.

We make several terminological adjustments. Most important, we refer to density of cross-class friendships as adult-bridging capital rather than EC, thereby highlighting Granovetter's (1973) theory that weak ties in social networks form bridges to opportunity for disadvantaged children.

When state fixed effects are added to the model the correlation between adult-bridging capital and mobility drops markedly. When student achievement and four additional social capital variables are also incorporated into the model, adult-bridging capital is shown to be no more highly associated with social mobility than family capital and only moderately more associated than community capital and student achievement. In other words, cross-class friendships of adult-bridging capital, far from being the major determinant of social mobility is, at best, one piece of the puzzle.

Theoretical questions arise as well. It is not at all clear whether cross-class friendships are the cause or the consequence of social mobility. It is entirely possible that connections may help one climb the social ladder, but social climbers are undoubtedly collecting new friends along the way. Chetty et al. observe both variables at the same time (the middle of the 2nd decade of the 21st Century), making it difficult to sort out which direction the causal arrow points. Recognizing the endogeneity problem, Chetty et al. propose as a solution the use of a measure of cross-class friendships in high school, a variable we refer to as school-bridging capital. They show a positive relationship between school-bridging and mobility but, surprisingly, do not substitute it for adult-bridging in their main analysis. We shed light on the potentially endogeneity of the relationship by estimating social mobility rates with models that exclude adult-bridging. We find a strong relationship between social mobility and family capital as well as significant relationships with community capital and student achievement. School-bridging capital has a positive but modest

correlation with mobility. This pattern persists when student achievement is measured by mean performance of disadvantaged students. Notably, R-squared for a model excluding adult-bridging capital comes within two percentage points of one that includes it. Cross-class adult friendships appear to be, at most, a partial moderator between other forms of social capital and social mobility.

Results cast doubt on claims that cross-class friendships are the primary cause of social mobility. Family and community capital, together with student achievement, not adult-bridging capital, are the primary determinants of social mobility for disadvantaged young people. School-bridging also seems to play a role in building social capital. If these relationships are causal, then equal opportunity is best realized by policies that strengthen families, schools, and communities. Cross-class friendships may be something worth encouraging but they are hardly enough.

This paper is organized in the following way: 1) Chetty et al. findings; 2) social capital literature; 2) data; 3) analytical strategy; 4) results, and 5) discussion.

Bridging Capital: Chetty's Case for Cross-Class Friendships

Chetty et al. define EC as "the extent to which different types of people (for example, high income versus low income) are friends with each other" (p. 109), an idea that builds on the work of Granovetter (1973, 1974, 1985, 1992) and Lizardo (2006) who theorize that "weak" ties within a social network offer a better bridge to the outside world than "strong" ties that bind individuals together within a cohesive but closed social network. Chetty et al. define intergenerational income mobility in relative terms as "children's chances of rising up the income distribution conditional on growing up in low-income families (p. 113)." The operational definition is "the average income percentile rank in adulthood of children who grew up in that county with parents at the 25th percentile of the national parental household income distribution

(p. 113).” High-quality data on income mobility rates within a county come from U. S. tax records (Chetty et al. 2014; Chetty et al. 2018; Chetty and Hendren, 2018). In their main model, Chetty et al. report a sizeable (0.53sd) correlation between county density of adult-bridging capital and income mobility rates within counties. [1]

The study makes use of 2018 “data on the social networks of 72.2 million users of Facebook aged between 25 and 44 years to construct . . . new measures of social capital for each [county and] ZIP code in the United States (p. 108).” Its key independent variable, density of adult cross-class friendships is measured by doubling the percentage of a below median socioeconomic (SES) background person’s friendships that are with users from above median SES backgrounds. Results remain much the same regardless of whether the county or ZIP code are the unit of analysis. We focus on the county-level data because Chetty et al. have made these data available to the research community and other county-level social capital indexes are available. We refer to social capital created by adult cross-class friendships as adult-bridging.

Chetty et al. also construct a clustering indicator by ascertaining the share of overlapping friendships (e. g., how often two of a person’s friends are also friends with each other), a civic organization indicator based upon the number of Facebook pages per 1000 users in a county with a title or category that is classified as “public good,” and a volunteering indicator based upon the percentage of Facebook users who say they are a member of a volunteering or activist group. They also use the Penn State index discussed below. In a bivariate analysis, counties with a greater share of adult bridging capital are shown to be highly correlated (0.65) with counties in

[1] Chetty et al. contains multiple findings, but the model shown in Figure 5b (p. 117) constitutes the core result. Only here does Chetty report the effects of EC controlling for six other plausible determinants of social mobility. Elsewhere in the paper, estimates are made from either univariate or bivariate regressions or from equations that do not include important demographic characteristics. Chetty et al. present their core results graphically in Figure 5b; we present them in tabular form in Table 3, model 1.

which Facebook users have experienced greater upward mobility (Figure 3a, p. 114, while insignificant and weak relationships are observed between mobility and clustered friendships (-0.00sd), community organizations density (0.06sd), volunteerism (0.18sd), and the Penn State index (0.12sd). As Chetty et al. put it, "the incremental R-square of including EC conditional on all the other social capital measures is an order of magnitude larger than the incremental R-square of including any of the other measures (p. 115)."

If the relationship between adult-bridging capital and income mobility is noteworthy, questions about potential endogeneity arise. When adult friendships and upward mobility are measured at about the same point in time, it's not clear in which direction the causal arrow points. Although connections with higher status individuals may provide opportunities for social mobility, upwardly mobile people can be expected to associate with those in circumstances resembling their own. To put it bluntly, many social climbers can be expected to disconnect from old friends as they acquire higher status ones along the way.

For a less endogenous measure of bridging capital, Chetty et al. use Facebook data to construct an indicator of cross-class friendship patterns in high school (which we label school-bridging capital). They estimate parents' socio-economic status of the five closest high school friends of a substantial share of Facebook users. The bivariate relationship between income mobility and density of school-bridging capital is substantial (0.41), though weaker than the one with adult-bridging capital (0.65). Chetty et al. nonetheless rely upon adult-bridging capital for their main estimation of causal effects presented in Figure 5b (p. 117).

Their figure, replicated here in tabular form in Table 3, model 1, provides an estimate of substantial adult-bridging effects (0.54sd) on mobility after controlling for six county-level

socio-economic characteristics – median household income, racial segregation, percent black, income inequality (Gini coefficient), 3rd grade math score, and share of single parent households. But despite the size of the adult-bridging coefficient, and the size of the change in R-squared induced by its inclusion in a model, Chetty et al.'s claim raises methodological concerns. It assumes a causal impact of a relationship between bridging capital and income mobility that even the authors concede may be endogenous. Models do not include state fixed effects, which are needed to avoid mis-attributing to adult-bridging capital mobility effects that are a function of unobserved inter-state factors. Neither does the study estimate the effects of family capital nor discuss the sizeable (-0.37sd) negative relationship between income mobility and the density of single-parent households shown in Figure 5b. Finally, the equation does not control simultaneously for background characteristics and other forms of social capital when estimating the effect of adult-bridging capital.

These issues need to be addressed before taking Chetty et al.'s findings as a guide to social action. But before introducing new variables into the analysis, we consider the rich, multi-disciplinary literature on social capital.

Overview of Social Capital Theory

Social capital is hardly a new idea, though terminology has shifted over the millennia. Traditional societies incorporated their understanding of its importance into their religious beliefs and rituals. It was of special significance to the great Egyptian civilization, which, to survive, required mutual co-operation and trust as its people migrated from the rich black soil adjacent to the Nile to the red desert hills when the river flooded, returning to their farmland after the water departed. According to Egyptologists John Darnell and Colleen Darnell (2022: 18, 191), the pharaoh, a divine figure, "brought about *maat"* for his people, a word Egyptians

understood as "encompassing morality, justice and universal equilibrium" a concept that closely resembles what today's social scientists refer to as social capital. It was the pharaoh's duty to "maintain *maat*" by performing "appropriate rituals" so the "sun might … rise," the Nile flood, and the world remain intact (pp. 159, 174). So holy was the substance, *Maat* had a divine manifestation. When Akenaten offended *Maat* by replacing a pantheon of Egyptian gods with Aten, the one and only sun god, his polytheistic successors canceled his name from temples, palace walls, and tombs (p. 46). Belief in *maat* glued together a system of social capital—norms, obligations and trust—that remained more or less intact for three millennia or more.

Contemporary writers do not imbue social capital with mystical significance, but its power remains immense. Some say it is foundational for economic, social, and political modernization (Fukuyama 1995; Inglehart 1997; Putnam 1993). For others, it furthers the development of human capital (Coleman 1988), and human flourishing (Vanderweele 2017). Social capital's forms, manifestations, and connections remains a work in progress (Claridge 2020; Durlauf and Fafchamps 2005), but important contributions to the literature have been made by sociologists, political scientists, government agencies, and economists.

Sociology

The pioneering work on social capital is generally credited (Foley and Edwards 1999: 143), to University of Chicago sociologist, James S. Coleman (1988), though antecedents may be found in the work of Bourdieu (1985), Durkheim (1893/1984); Loury (1977, 1981), and others (Portes, 1988). In Coleman's view, social capital emerges out of the "obligations and expectations" that arise from the relationships among individuals. It is a function of the "trustworthiness of the social environment, information-flow capability of the social structure,

and norms accompanied by sanctions" (Coleman 1998: S119, as quoted by Jackman and Miller 1998: 48-49).

Early in his career, Coleman, in *The Adolescent Society* (1961), reported that students at school care more about peers and friendships than they do about teachers, grades, and coursework. Young people celebrate community unifiers, such as cheerleaders and sports stars, not community dividers, such as honors recipients and Ivy League prospects, who "raise the curve" for everyone else. Shortly after this work was published, the U. S. Department of Education asked Coleman to direct a study of equal educational opportunity authorized by the Civil Rights Act of 1964. His unexpected findings captured national attention: School resources—dollars spent, class size, teacher salaries, library resources—had little impact on inequalities across racial groups after one controlled for family background (Coleman et al. 1966). As New York Senator Daniel Patrick Moynihan (1996: 377), summarized the findings, it's "all family." Not quite. The Coleman team, recognizing the importance of peer groups, found higher levels of black achievement if the share of white students enrolled in a school was greater. This finding provided the scholarly underpinning for a desegregation movement that began to advance at a much faster pace than it had during the first decade following the *Brown* decision (Rivkin and Welch 2006).

Coleman was subsequently asked by the U. S. Department of Education to study high school student achievement at both public and private schools. Once again, Coleman's research team astounded the research community when it showed the performances of students at Catholic schools exceeded those of public school students from similar backgrounds (Coleman, Hoffer, and Kilgore 1982a; 1982b). Since Catholic schools did not have more material resources (expenditures, class size, teacher salaries, etc.), the researchers attributed the difference to the

greater social capital at Catholic schools. Later, Bryk, Lee and Holland (1993) conducted an in-depth set of case studies that detailed dense social relationships among teachers, students, and families in a Catholic setting, leading them to a Colemanesque conclusion: "Catholic schools benefit from a network of social relations, characterized by trust, that constitute a form of 'social capital.'. . . Trust accrues because school participants, both students and faculty, choose to be there (p. 314)."

Subsequently, Coleman (1988, S109-S113) argued that financial, human, and social capital each contributed to the academic development of the child. A family's financial capital, as indicated by its household income, affects its capacity to purchase educational resources. The parents' education provides the human capital. Social capital refers to the relationships between parents and children that further affect a child's skill acquisition. For example, Amadeus Mozart became a superior violinist (and composer) because he, from a very early age, played in string quartets with his father and friends. Duets played with his sister, Marianne, fostered his keyboard skills. In other words, the human capital the two young musical geniuses enjoyed was enhanced by musically relevant social capital produced by relations among parents and siblings.

Similarly, educationally relevant social capital is generated when devoted fathers read to their children and committed mothers help them with their fractions. Relationships are fostered by propinquity, so Coleman treats family structure (presence or absence of both parents within the home) as an indicator of social capital. He shows that dual parenting reduces high school drop-out rates even after adjustments for household income and parental education. Close relationships among families, teachers and schools can also be educationally productive, as is indicated by the lower drop-out rates at Catholic than public schools (Coleman 1988: S114-S116). However, critics said the study was confounded by unobserved differences between

students attending public and Catholic schools (Alexander and Pallas 1983; Goldberger and Cain 1982).

The importance of homes and neighborhoods for student achievement remains a major theme in sociological research (Duncan and Murnane 2011; Jencks and Peterson 1991; Jencks and Phillips 1998; Kwon, Heflin, and Ruef 2013; Lim and Putnam 2010). In an influential study, Wilson (1987) showed the ways in which male unemployment, racial barriers, and concentrated poverty in urban neighborhoods contributed to persistent intergenerational impoverishment by isolating young people from supportive social networks provided by appropriate adult role models and stable, two-parent families. Similarly, Murray (2013) identified a discouraging pattern of increasing spatial separation of social classes within white America.

In sum, sociologists have provided the tools for analyzing the relationship between family and community sources of social capital and important societal outcomes, such as student achievement and intergenerational mobility. But sociologists have yet to analyze connections among these variables for representative samples of geographical units within the United States.

Political science

Social capital gained the attention of political scientists seeking to explain differences in the rate of political development across nations and regions (Fukuyama 1995; Inglehart 1997; and Putnam 1993, 1995a, 1995b, 2000, 2016). In an influential study, Harvard political scientist, Robert Putnam (1993), argued that higher levels of social capital in northern Italy—its choirs, sports leagues, and other voluntary organizations—propelled its economic and political development. Meanwhile, the family-centered, isolative culture of southern Italy hobbled community co-operation, political trust, and democratic institutions. Putnam (1995b: 664-65) defined social capital as the "features of social life—networks, norms, and trust—that enable

participants to act together more effectively to pursue shared interests." Similarly, Inglehart (1997: 188, as quoted by Jackman and Miller 1998), said social capital arises out of "a culture of trust and tolerance, in which extensive networks of voluntary associations emerge" in his global report of declining of social and political trust in industrial democracies.

Putnam (1995a, 2000) tracks deterioration in trust and community co-operation in the United States, which he attributes to a decline in the number, size, and density of local voluntary associations and other forms of social engagement. In *Our Kids* (2016), Putnam, like sociologists Wilson (1997) and Murray (2013), lamented the disappearance of dense social networks that once linked residents across class lines and provided the social capital that fostered the education and well-being of the next generation. The departure of the upper middle class to socially exclusive settings left once healthy neighborhoods with fewer voluntary associations and widening achievement gaps (Reardon 2011, but see Shakeel and Peterson 2022).

Putnam and other political scientists shifted social capital research away from families and intimate relationships at religious schools toward neighborhoods and civic organizations, citizen participation, and trust in government. Although their research built on Coleman's understanding of social capital as the byproduct of norms, institutions, and trustworthy relationships, political scientists broadened the horizon by shifting attention toward organizations, political culture, and political practice.

Government agencies

Government agencies have rarely engaged in an official measurement of social capital. The World Bank has analyzed how various forms of social capital could be associated with developmental outcomes at different societal levels (Dasgupta and Serageldin 2000; Grootaert et

al. 2004), but its report does not include subnational indexes of the variables. However, in 2017, the professional staff of the Joint Economic Committee (JEC), a joint Senate and House committee of the U. S. Congress, released under the auspices of the Republican members of the committee, a report on social capital containing indexes of various forms of social capital (U. S. Congress, Joint Economic Committee, 2017, hereinafter JEC). Its assessment of trends in the United States is as pessimistic as Putnam's (JEC 2017: 38, 40):

> What we do together has become more circumscribed than it used to be. . .. We may be materially richer than in the past. But with atrophied social capabilities, with a diminished sense of belonging to something greater than ourselves, and with less security in our family life, we are much poorer for doing less together.

Economics

In his classic work, The Wealth of Nations, Adam Smith ([1776] 1976: 298-99) defined the fixed capital of a society as its "provisions, materials, and finished work" not "reserved for immediate consumption." He said circulating (or what may be called financial) capital as necessary for fixed capital to have value but was otherwise worth nothing more than the paper on which it is printed.

Smith also said that capital included "the acquisition of "the useful abilities of all . . . members of the society" produced by "the acquirer's . . . education, study, or apprenticeship." These talents, says Smith, "make a part of his fortune, [and] so do they likewise … that of the society to which he belongs. The improved dexterity of a workman may be considered in the same light as a machine. . . which, though it costs a certain expense, repays that expense with a profit." Modern economists also define human capital as the product of the quantity and quality

of education and on-the-job training an individual has received. Mincer (1957) estimates the returns to human capital investment by calculating the wage return of additional years of education. Accordingly, Hanushek and Woessmann (2011) estimate human capital by estimating student performance on standard tests. Although these researchers recognize the importance of families, the focus remains on the "acquirer's education, study or apprenticeship," not the social capital upon which the individual may be drawing. However, Becker develops a broader concept of human capital formation by defining it as "activities that influence future monetary and psychic income by increasing resources in people" (Becker 1964: 11; also, see Rees 1965; Solow 1965).

Building on these insights, behavioral economists have incorporated the social sources of individual choice into economic theory. Most people, self-interested or not, act on limited information, they say. Economic actors are myopic, subject to nudges and suggestions, and otherwise responsive to social contexts. These ideas have served as preambles to the use of social capital as an economic concept (Bowles and Gintis 2002; Durlauf and Fafchamps 2003). Chetty et al., with its focus on friendship patterns and social mobility, is by far the most important study to emerge from this disciplinary development. But before accepting the study's policy implications, we need to consider insights and indices drawn from the broader social capital literature.

Concepts and Data

Indicators we use to predict social mobility come either from Chetty et al. or from publicly available sources. Student achievement indicators come from the Stanford Education Data Archive (Fahle et al. 2021; Reardon et al. 2021), and JEC provides our indicators of family,

community, and political capital. We standardize all variables to have a mean of zero and a variance of one (Table 1).

[insert table 1 here]

Social mobility

Social mobility can be defined in either absolute or relative terms. When defined absolutely, most indicators show steep upward trends in SES mobility. College graduation rates have increased from 8% in 1960 to 38% in 2020 (Statista 2022). Eighty-four percent of all adult children earned (after adjusting for inflation) more income between 2000 and 2008 than their parents had by a similar age. For those born into the lowest quintile of all households, that percentage was 93% (Urahn et al. 2012; also see Gramm, Ekelund and Early 2022: 119-164).

Though it is generally agreed that absolute social mobility is pervasive in the United States (but see Opportunity Insights, 2023), there is less consensus with respect to relative mobility. Zhou (2019: 459) finds that increasing college graduation rates "is unlikely to boost intergenerational mobility among college graduates." Some report less mobility in the United States (Beller and Hout 2006), while others report roughly equivalent rates across Europe and the United States (Breen and Meuller 2020; Winship 2018). Relative mobility, it is to be noted, is a zero-sum game. For every step upward in SES ranking a person takes, another person must take a step downward. Unlike absolute mobility, where in principle everyone in the current generation can be better off than their ancestors, there must always be both winners and losers on a scale that measures relative social mobility.

Relative mobility can vary from none to completely random shifts in the SES distribution from one generation to the next. No nation would prefer either extreme. If social mobility were

zero, then all children would hold the same SES rank as their parents, a rigid caste system that would leave a nation unable to make full use of citizen talents. But if SES distributions changed at random from one generation to the next, nations would suffer from under-investment, as parents would have less incentive to invest in their children's human capital.

Chetty et al.'s estimates of intergenerational mobility, taken from U. S. tax records, is the best available county-level indicator of relative social mobility in the United States. It estimates the percentile of the income distribution of those born into households at or below the 25th percentile of the income distribution. Notice that the index captures the mobility of the disadvantaged segment of the population, not the mobility of the county's total population. The index tells us what kinds of counties provide the greatest opportunity for those born into low-income households to achieve higher relative income levels.

Student Achievement

We use data available at the Stanford Education Data Archive (SEDA) for our measures of mean county-level student test performances in math and reading in grades 3 through 8 for the school years between 2008/2009 and 2017/2018 (Fahle et al. 2021; Reardon et al. 2021). The archive provides information on state tests required by the 2002 federal law, No Child Left Behind. Every school district administers tests in math and reading annually to students in grades 3 through 8 and again in high school. Each state administers its own set of tests, but a common metric is provided by the National Assessment of Educational Progress (NAEP), which is administered bi-annually to a representative sample of 4th and 8th grade students in each state. SEDA uses NAEP to provide a common scale that facilitates cross-state comparisons. We make use of county mean performances of all students in these grades as well as mean performance of

students from disadvantaged backgrounds, as indicated by eligibility for participation in the federal free and reduced lunch program.

Student performance on standardized tests in math and reading has proven to be an informative predictor of important life outcomes. It predicts high school graduation, college attainment, future earnings, teenage pregnancy rates, physical and mental health, and political participation (Borghans et al. 2016; Chetty, Friedman, and Rockoff 2014). Also, nations that show higher average levels of student achievement enjoy faster rates of economic growth (Barro 2001; Hanushek and Woessmann 2008, 2012).

Our main analysis estimates the connection between math performance and social mobility, as prior research suggests the returns to math skills are larger than those to reading skills (Hanushek and Woessmann, 2008, 2011, 2012). However, we show in Table A2 very similar estimates if reading rather than math performances are used for our preferred social mobility estimate.

We prefer the achievement indicators available from SEDA, which take the average performance of students over eleven years for six grade levels to Chetty et al.'s measure of 3rd grade math achievement taken from the Global Report Card (Greene and McGee 2012). Though SEDA and the Global Report Card both rely on state proficiency tests required by federal law, but the former is better documented and is currently accessible.

Family capital

Following JEC, we construct a county-level family capital index by extracting the first principal component from a matrix of the following variables: a) share of births in the past year to women who were unmarried, b) share of women ages 35-44 who are currently married and not

separated, and c) share of own children living in a single parent home.[2] The weights of the three variables load on the first principal component at 0.52, 0.62, and 0.58, respectively. The first principal component captures 74.8% of the variance.

Like Coleman (1988), we assume that two parents in the home will, on average, be able to provide more parental support to their children than one, though, obviously, there are numerous exceptions to that rule. The benefits of a two-parent household can be expected to spill-over into neighborhoods and communities. Potential two-parent households, as indicated by marriage rates, can also be expected to have beneficial effects. Prior research generally finds positive effects of dual parent households on achievement, attainment, and other life outcomes (Coleman 1988; Krein and Beller 1988), though some scholars have found little independent effect once controls have been introduced for income and other background characteristics (Manning and Lamb 2003). At the aggregate level, an increase in the percentage of single parent homes has been found to be a driver of increased income inequality in the U.S. (Martin 2006; Haskins and Sawhill 2016). Similarly, Chetty et al. 2014: 1616 (also see Chetty and Hendren 2018), using county-level data, say that "the fraction of children living in single-parent households is the single strongest correlate of upward income mobility among all the variables we explored."

Community capital

Most measures of community capital are available only at the national level (Alesina and Ferrara 2000; Lee and Kim 2013; Legatum Institute Foundation 2017; National Conference on Citizenship 2006), but JEC has complied several county-level indices. For our measure of

[2] The American Community Survey provides data on these three variables. We use the 5-year county-level estimates for 2006-2010 in the index. See Table A1 for more details.

community capital, we use JEC's community health index. The index is comprised of indicators of a county's density of religious congregations, its density of non-religious non-profit organizations, and a state-index of participation rates in a variety of community activities. See table A1 for more detailed information. Kwon, Heflin, and Rauf (2013: 890) find that "the benefits of social trust and organization membership accrue not just to the individual but to the community at large" by creating networks that facilitate opportunities for self-employment. The literature suggests community capital will have a positive relationship with social mobility.

Political capital

The Penn State index, developed at Pennsylvania State University, estimates the political well-being of a county (Rupasingha, Goetz, and Freshwater 2006). Chetty et al. (Extended Data Table 2) shows a 0.06sd bivariate correlation between the Penn State index and social mobility. As our measure of political capital, which measures citizen assessments of and relationships to mainly government institutions, we use a relative of the Penn State Index compiled by JEC as their index of institutional health. It measures county-level citizen participation in elections and responsiveness to census data requests as well as a state-level index of trust school districts, corporations, and the media. See table A1 for details. Given prior work (Putnam 1995b; Putnam and Campbell 2012; Rupashingh, Goetz, and Freshwater, 2006), we expect to find a positive relationship between political capital and social mobility.

Adult-bridging capital

As mentioned, Chetty et al. measure adult-bridging capital by doubling the average percentage of friendships of a Facebook user from below median socioeconomic (SES) backgrounds in the county who are with users from above median SES backgrounds.

School-bridging capital

The literature gives us no reason to have prior expectations for the likely effect of school-bridging capital on social mobility. Chetty et al. report a positive relationship between the two variables, but Coleman (1961) doubts whether peer friendships are beneficial to learning. Friends are chosen for their popularity, not necessarily for their scholastic success. Likewise, Ogbu (2003), Ferguson, Ludwig, and Rich (2001) and Fryer (2006) say peer group culture in minority communities undermines student achievement. On the other side, Cook and Ludwig (1998) report high-performing minority students are as likely as comparable white students to regard themselves as "popular" with their classmates. Given the inconsistencies in the literature, we are agnostic.

County-level analysis

Data availability dictates that we estimate relationships at the county level, but there are also substantive reasons to prefer a county-level analysis. Social capital is an amorphous substance that probably spills across adjacent spaces, making larger units more appropriate for analysis than zip codes or census tracts (Durlauf and Fafchamps, 2005). Still, estimates at the county level may be imprecise and perhaps biased when counties are large and diverse, though it is not clear whether they are biased upward or downward.

Representativeness and weighting

Our analysis is based upon the sample of counties for which data is available from Chetty et al. (Appendix p. 3). Their sample consists of 1,818 counties because they cannot reliably estimate racial and income segregation for counties with less than 20,000 people or with only one Census tract. Given our focus on replicating their analysis, we use a substantially similar sample of 1,812 counties. The six county difference is due to omitted information on school

bridging (one county), political capital (two counties), and achievement for disadvantaged students (three counties). This sample is substantially less than the 3,143 counties in the United States. Our analysis should thus be seen as one that estimates relationships for counties with populations above 20,000 which have more than one census tract.

As this is a study of county social capital, not an individual-level analysis, we prefer not to weight the data for the number of economically disadvantaged residents or any other variable. In Table A3 we estimate social mobility using the same weights as Chetty et al. In our preferred Model 4, only family and student achievement affect social mobility. When adult-bridging is included (Model 3), its coefficient is smaller than the one for family capital. In other words, findings shift when weights are applied, but they do so in a direction opposite to what Chetty et al. posit.

State fixed effects

Use of state fixed effects minimizes attribution to social capital of unobserved inter-state differences that could be affecting intergenerational mobility. Inclusion of state fixed effects focuses the analysis on cross-county differences in social mobility within states. Their inclusion excludes social capital consequences that spill across state lines. In table A4 we report our preferred model but exclude state fixed effects.

Descriptive analysis

The ideal way to estimate effects of social capital on social mobility, were it ethical, would be to assign subjects randomly to alternative social capital settings. Falling far short of that ideal, we, like other social capital researchers, instead offer descriptive findings. Still, our models require outcomes to be subsequent to determinants. Student achievement in elementary and middle school may be affected by family, community, and political capital but cannot be a

function of bridging capital in high school or as an adult. School-bridging capital may be affected by family, community, and political capital and by student achievement, but not by adult-bridging capital. Adult-bridging capital may be affected by family, community, political, and school-bridging capital, and, in one model, it may serve as a moderator that connects the prior forms of social capital to social mobility. However, we exclude adult-bridging from our preferred model predicting social mobility, as the two variables are likely endogenous.

Sticky social capital

The literature tells us that social capital resembles an ancient forest. It takes generations to come to fruition, is self-sustaining, but can be ruined by predation. No one makes these points better than Putnam (1993: 137-162), who attributes modern differences between northern and southern Italy to differential practices that have their origins at least as early as the 18th Century. In northern Italy, church choirs, Masonic lodges, and drinking clubs created vibrant communities, which facilitated economic, social, and political development. In the South, authoritarian institutions left the region less able to adapt to modernity. But it is easier to squander social capital than to build it: Modern communications, mass media, and isolative forms of entertainment are said to be gradually undermining civic life (Putnam 1995a, 1995b, 2000; JEC, 2017). Contemporary commentators wonder whether the Covid pandemic has ravaged the country's educationally relevant social capital (Brooks 2020, 2022).

If social capital is self-perpetuating and erodes only gradually except in times of crisis, then the precise moment it is measured is not particularly consequential. Putnam tracks trends in social capital across centuries, not changes from one year to the next. The Penn State and JEC

indexes are built with variables that span nearly a decade.[3] Chetty uses a generation of Facebook users (those aged 25-44) for its county-level indicators of bridging capital.

We, too, assume that social capital is sticky, that a county's social capital changes only slowly over time. Upward economic mobility is measured for those born between 1978 and 1983 (Chetty et al. 2018); they become adult members of the work force by 2010. Family capital is measured in the first decade of the 21st century; political and community capital in the second decade of the 21st Century. School Facebook friendships are measured for those who were age 15 between 1993 and 1998. Elementary and middle-school achievement is measured for the period 2009 to 2018. Adult-bridging capital is measured in 2022. If county social capital, student achievement, and upward mobility vary significantly over a relatively short period of time, we are likely under-estimating relationships among these variables.

Analytic models

In our preferred estimate of the determinants of social mobility (Table 3, Model 5) we regress social mobility on county-level indices of mean student achievement and four forms of social capital: family, community, political, and school-bridging. In this model we control for the vector X of the same background characteristics included in the main Chetty et al. model displayed in their Figure 5b: income, racial segregation, % black, and Gini coefficient, an indicator of inequality. Preferred estimates are unweighted and include state fixed effects, c_s. In our preferred model, standard errors are clustered by state. Table 3, Model 4 displays results from the following equation:

[3]The JEC social capital index and Putnam's index correlate across states at the 0.81 level, despite the fact that Putnam's data comes from the second half of 1970s through the first half of 1990s and the JEC index comes from 21st century data (see table 4 in Social Capital Project p. 32).

$$social\ mobility_{is} = \beta_1 adult\ bridging_{is} + \beta_2 school\ bridging_{is} + \beta_3 achievement_{is} + \beta_4 family_{is} + \beta_5 community_{is} + \beta_6 political_{is} + X'\gamma + c_s + \varepsilon_{is} \quad (1)$$

Model 5, our preferred model, is identical except that we do not include the endogenous adult-bridging variable. Model 6 is identical to Model 5 except the achievement variable is for economically disadvantaged students. In subsequent tables, we estimate the determinants of adult-bridging, school bridging, and student achievement with the following equations:

$$adult\ bridging_{is} = \beta_1 school\ bridging_{is} + \beta_2 achievement_{is} + \beta_3 family_{is} + \beta_4 community_{is} + \beta_5 political_{is} + X'\gamma + c_s + \varepsilon_{is} \quad (2)$$

$$school\ bridging_{is} = \beta_1 achievement_{is} + \beta_2 family_{is} + \beta_3 community_{is} + \beta_4 political_{is} + X'\gamma + c_s + \varepsilon_{is} \quad (3)$$

$$achievement_{is} = \beta_1 family_{is} + \beta_2 community_{is} + \beta_3 political_{is} + X'\gamma + c_s + \varepsilon_{is} \quad (4)$$

Results

Table 1 displays the maximum and minimum values for variables included in the analysis, and Table 2 shows a matrix of their inter-correlations. Multiple regression estimates of relationships with dependent variables are given in Tables 3-6. We round results to two decimal places in the text, but the tables contain results up to three decimal places.

[insert table 2 here]

[insert table 3 here]

Adult-bridging and social mobility

Table 3, Model 1 is a tabular replication of Chetty et al.'s Figure 5b (p. 117). Notice the correlation of mobility with adult-bridging (0.54sd) and the single-parent family (-0.37sd) indicators. In model 2, we show the same model but use unweighted observations. The size of the adult-bridging coefficient increases (0.63sd), and single-parent family one drops (-0.28sd), exhibiting small changes in a direction supportive of Chetty et al.'s argument.[4] Model 3 shows results when state fixed effects are introduced. The negative coefficient for single-parent households jumps upward (-0.45sd), as the positive coefficient for adult-bridging falls to 0.33sd. Unobserved differences among states apparently account for much of the variation Chetty et al. ascribe to adult-bridging capital. We avoid that confusion by applying state fixed effects to all subsequent specifications.[5]

Model 4 shows results when student achievement and four indicators of social capital—family, community, political, and school-bridging—are added. With their inclusion, the apparent effect of adult-bridging capital slips to 0.26sd and family capital (0.23sd) becomes an equivalent predictor of social mobility. Community capital (0.14sd) and achievement (0.07sd) also correlate significantly with social mobility. Neither political nor school-bridging capital show a significant relationship with social mobility.

Inasmuch as adult-bridging capital is likely endogenous, we exclude this term from an otherwise identical equation in Model 5, our preferred model. Now, the results show a somewhat larger connection with social mobility for family (0.27sd) and community (0.16sd) capital as well as for student achievement (0.13sd). School-bridging (0.09sd), too, has a modest positive

[4] See Table A3 for our preferred model weighted by the population under the median income.
[5] See Table A4 for results from our preferred model with and without state fixed effects.

association with social mobility. Estimates change only slightly in Model 6 which includes achievement of disadvantaged students as a predictor. Political capital's relationship to social mobility remains insignificant in both Models 5 and 6. The R-squared of 0.81 for Model 5 is virtually the same as the 0.83 value shown for Model 4, which includes adult-bridging capital. In other words, Chetty et al.'s main analytical variable adds very little to a better-specified equation that incorporates antecedent forms of social capital. Cross-class adult friendships seem to act, at best, as no more than a moderator of other forms of social capital. If the estimated relationships are causal, earlier life experiences are much more significant for mobility than connections made as an adult.

Adult-bridging capital

In Table 4, adult-bridging capital is treated as a dependent variable. Not surprising, it is well correlated with school-bridging capital (0.40sd). This relationship is partly mechanical. School friends are only identified as such if Facebook users are currently identifying each other as friends. The other coefficients in this table are of greater interest. Adult-bridging capital seems to be a function of student achievement (0.24sd), family capital (0.16sd), community capital (0.10sd) and political capital (0.10sd). In short, all the forms of social capital included in our analysis prove to be antecedents of adult-bridging capital.

[insert table 4 here]

School-bridging capital

The picture changes somewhat when school-bridging capital is predicted. As might be expected, family capital (0.14sd) and student achievement (0.15sd) both predict friendship relationships in high school (Table 5, Model 1). But the achievement of disadvantaged students has no effect on high school friendship patterns (Model 2), a result consistent with earlier studies

of friendship patterns in high school (Ferguson, Ludwig, and Rich 2001; Fryer 2006; Ogbu 2003). Unexpectedly, community (-0.07sd) capital, far from facilitating friendships in high school, displays a small but still significant, negative relationship. The minus sign persists whether one measures achievement of all students or just disadvantaged ones. Community organizations seem to be more important for adult friendships than for those made in school.

[insert table 5 here]

Student achievement

Family capital is the dominant predictor of both the achievement of all (0.27sd) students and that of disadvantaged (0.26sd) ones. Community capital has little effect, a surprise for scholars, like Putnam (2016), who associate the decline in community organizations with widening achievement gaps. It must be kept in mind, however, that these tests are administered to students in elementary and middle school. Community organizations—whether they be scouts, sports teams, or choirs, may be more important for outcomes in high school and later in life. Meanwhile, another result runs contrary to expectations. Political capital, though shown to have no significant connection to social mobility or to school-bridging capital, turns out to have a sizeable (0.21sd) relationship with the achievement of all students, though not with that of disadvantaged ones. This surprisingly strong association between political capital and the school performances of all students could be endogenous. County residents may be more trusting of institutions and more willing to participate in political life if schools are more effective. But it is also possible that a politically active, supportive community enhances school quality.

[insert table 6 here]

Discussion

We summarize our results, discuss their implications, identify limitations to the analysis, and reach final conclusions.

Summary

Figure 1 summarizes and organizes the apparent direct and indirect effects of various forms of social capital on social mobility, as estimated by our preferred model. A tabular summary is provided in Table 7. Although relationships among the variables have not been shown to be causal, Figure 1, presented for didactic purposes, clarifies the descriptive connections among the variables. The diagram assumes that family, community, and political capital are independent of one another, political capital affects achievement, not the reverse, and high-school bridging capital is a function of elementary and middle school achievement, not the opposite. In other words, the estimated relationships in the diagram assume a causal flow from left to right.

The direct and indirect relationships among key variables displayed in Fig. 1 reveal the central role played by family-generated social capital. The combined direct and indirect relationship between families and mobility is 0.32sd, the strongest relationship observed (Table 7). Admittedly, this coefficient comes from a county-level analysis, is based on observational data, and the causal arrow is not indisputable. Yet it is difficult to escape the conclusion that locales which encourage the formation and retention of dual-parent households are places where intergenerational mobility is also fostered. Research discussed above suggests the overlap can hardly be a coincidence. Where marriages and two-parent families thrive, disadvantaged young people are more likely to obtain the skills and develop the capacities that gives them the opportunity to enjoy more prosperous lives.

[insert Figure 1 here]

[insert Table 7 here]

The relationship between mobility and community capital, having a total effect of 0.15sd, about half that of family capital, is also significant. That effect is not mediated by student achievement or school-bridging capital. It appears instead that community organizations create opportunities for mobility as a young person emerges from school and enters the broader community. Effects of student achievement on income mobility (0.14sd) are also mainly direct rather than mediated through school-bridging capital. If one acquires the needed skills in school, one is better equipped for a college or a career. However, friendships in high school may also play a small role, if we presume popularity with higher status students lifts student achievement. Political capital is of little consequence for mobility.

Figure 1, built on our preferred model, ignores the potential role adult-bridging capital might play. Models in columns 4, 5, and 6 in Table 7 assume adult-bridging capital moderates connections with mobility generated by other forms of social capital. As it turns out, substantive results do not depend on whether adult-bridging is assumed to be a moderator or that it plays no significant role whatsoever. When adult-bridging is included in the estimation, total (direct and indirect), estimates of the impact on mobility of student achievement, family capital, community capital, and school bridging all become slightly larger than in columns 1, 2, and 3 in Table 7, which implies adult-bridging does not moderate these connections.

Several analytical decisions account for the differences between the findings reported by Chetty et al. and those presented here. Unlike the earlier study, 1) we estimate results with a state fixed effects model, which holds constant inter-state differences in culture and institutions; 2) we

include family social capital in our preferred estimation rather than treating it as a control variable in a regression that ignores all forms of social capital except adult-bridging; 3) we replace the Facebook measure of community capital with JEC's indicator, which measures the density of civic organizations and religious congregations; and 4) we use a well- documented measure of student achievement. We also do not weight our counties by the population under the median income but treat each county as an equivalent observation. Were we to weight them as Chetty et al. do, our findings would emerge even more sharply.

Implications

Chetty et al.'s study of social capital is an astonishing achievement both technically and substantively. It connects a massive amount of information on adult-bridging capital to the best available measure of relative social mobility. By linking these impressive data sets, Chetty et al. connect the social capital literature to important questions of social mobility and social equity. They make a seemingly persuasive case that bridges built across class lines are the key to equal opportunity. If the findings are correct, they make a strong case for public policies that encourage residential and school desegregation across social and racial lines. But the study contains a hidden, disquieting message as well. They discourage efforts to build social capital in homes, schools, and neighborhoods in favor of getting connections with the right people. Playgrounds and basketball courts appear to be more valuable than school libraries, honors assemblies, scouting programs and engaged parents.

A second look suggests any such policy recommendations are premature, however. Adult friendships appear to be the consequence of social mobility rather than its cause. We find very little evidence to support the major conclusion reached by the Chetty team that cross-class friendships, as observed on Facebook, are the form of social capital that creates the conditions

for intergenerational mobility within a county. Instead, we find that a county's density of family and community capital, together with the performance of its students, are the best predictors of its social mobility. When these variables are included in the model, the size of the adult-bridging variable declines dramatically. When the adult-bridging variable is excluded, the amount of variance in social mobility that is explained is nearly as large. Very likely, adult friendships that cross class boundaries are mainly a consequence, not a cause, of social mobility.

Limitations

A causal direction cannot be definitively established when observations are made at approximately the same point in time, an inherent problem for us as well as for Chetty et al. Relations among observed variables may be endogenous, though causal impacts of a county's level of social mobility on the density of two-parent households, student achievement, and density of community organizations are likely to be somewhere between small and nil. The relationships among trust in institutions, school-bridging capital and student achievement could well be endogenous, but these inter-actions play only a marginal role in this analysis. Variation in unobserved characteristics could be confounding our estimates, though we use the same controls as Chetty et al. Estimations are made on the assumption that social capital resembles putty, as our observations are not always made at the time when their effect is best measured.

Both our estimates and those made by Chetty et al. describe relationships among counties, not individuals. More could be learned were individual-level data available, though social capital is inherently a product of social exchanges that take place in spatial settings. We limit the analysis to county-level variation within each state. This approach ensures that we do not exaggerate the effects of any form of social capital by attributing it to factors that could be

caused by unobserved inter-state differences, but it ignores potential spill-over effects across state lines.

Future studies need to move beyond description. This can be accomplished by event study analyses that estimate the impact of social capital shocks. The Covid-19 shock—and differential political responses to these shocks—might be exploited for this purpose, as the events seems to have had major but not uniform effects on social relationships, academic performance, and socio-emotional well-being. Wars, natural disasters, economic change, and political shifts all could provide other opportunities for observing differential shifts in various forms of social capital.

Given its limitations, this study should be seen as a building block that links the earliest research on social capital—which focused on specific forms of social capital—to future research which may causally identify the ways in which social capital, in its many manifestations, affects multiple dimensions of social life. Results suggest that capacities, habits, and character formed in the home, house of worship, the community, and the school influence intergenerational social mobility. Working at different paces and having impacts at various times, these institutions and spaces create ladders of opportunity in a society. Cross-class connections may play a role as well, but this form of social capital hardly dominates the others. One achieves a more egalitarian society by sustaining a society's social capital, or *maat,* in multiple ways, something ancient Egyptians well understood. Very likely, it's not who you know, but who you have come to be, that counts most of all.

REFERENCES

Alesina, Alberto, and Eliana La Ferrara. 2000. “Participation in Heterogeneous Communities.” *The Quarterly Journal of Economics* 115(3): 847-904.

Alexander, Karl L., and Aaron M. Pallas. 1983. "Private Schools and Public Policy: New Evidence on Cognitive Achievement in Public and Private Schools." *Sociology of education* 56(4): 170-182.

Barro, Robert J. 2001. “Human Capital and Growth.” *American Economic Review* 91(2): 12-17.

Becker, Gary S. 1964. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago, IL: University of Chicago press.

Beller, Emily, and Michael Hout. 2006. “Intergenerational Social Mobility: The United States in Comparative Perspective.” *The Future of Children* 16(2): 19-36.

Bourdieu, Pierre. 1985. “The Forms of Capital.” Pp. 241-258 in *Handbook of Theory and Research for the Sociology of Education,* edited by J. G. Richardson. New York, NY: Greenwood.

Borghans, Lex, Bart H. Golsteyn, James J. Heckman, and John Eric Humphries. 2016. “What Grades and Achievement Tests Measure.” *Proceedings of the National Academy of Sciences* 113(47): 13354-13359.

Bowles, Samuel, and Herbert Gintis. 2002. “Social Capital and Community Governance.” *The Economic Journal* 112(483): F419-F436.

Breen, Richard, and Walter Müller. 2020. *Education and Intergenerational Social Mobility in Europe and the United States*. Stanford, CA: Stanford University Press.

Brooks, David. 2020. "America is Having a Moral Convulsion." (*The Atlantic*, 5 October). (https://www.theatlantic.com/ideas/archive/2020/10/collapsing-levels-trust-are-devastating-america/616581/).

Brooks, David. 2022. "Brooks and Capehart on Zelensky's Visit to Washington." (*PBS News Hour*, 23 December). (https://www.pbs.org/video/brooks-capehart-1671831313/).

Bryk, Anthony S., Valerie E. Lee, and Peter B. Holland. 1993. *Catholic Schools and the Common Good*. Cambridge, MA: Harvard University Press.

Chetty, Raj, Matthew O. Jackson, Theresa Kuchler, Johannes Stroebel, Nathaniel Hendren, Robert B. Fluegge, Sara Gong, Federico Gonzalez, 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, and Nils Wernerfelt. 2022. "Social capital I: Measurement and Associations with Economic Mobility." *Nature* 608(7921): 108-121.

Chetty, Raj, John N. Friedman, Nathaniel Hendren, Maggie R. Jones, and Sonya R. Porter. 2018. "The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility." NBER Working paper No. 25147. (https://doi.org/103386/w25147).

Chetty, Raj, John N. Friedman, and Jonah E. Rockoff. 2014. "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood." *American Economic Review* 104(9): 2633-2679.

Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez. 2014. "Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States." *The Quarterly Journal of Economics* 129(4): 1553-1623.

Chetty, Raj, and Nathaniel Hendren. 2018. "The Impacts of Neighborhoods on Intergenerational Mobility II: County-Level Estimates." *The Quarterly Journal of Economics* 133(3): 1163-1228.

Claridge, Tristan. 2020. "Current Definitions of Social Capital. Academic Definitions in 2019." Institute for Social Capital. (https://www.socialcapitalresearch.com/current-definitions-of-social-capital/).

Coleman, James S. 1961. *The Adolescent Society: The Social Life of the Teenager and Its Impact on Education*. Glencoe, IL: The Free Press of Glencoe.

Coleman, James S., Thomas Hoffer, and Sally Kilgore. 1982a. "Cognitive Outcomes in Public and Private Schools." *Sociology of education* 55(2): 65-76.

Coleman, James S., Thomas Hoffer, and Sally Kilgore. 1982b. *High School Achievement: Public, Catholic, and Private Schools Compared*. New York City, NY: Basic Books.

Coleman, James S. 1988. "Social Capital in the Creation of Human Capital." *American Journal of Sociology*, 94: S95-S121.

Coleman, James S. 1990. *Foundations of Social Theory*. Cambridge, MA: Harvard University Press.

Coleman, James S., Ernest Q. Campbell, Carol J. Hobson, James McPartland, Alexander M. Mood, Frederick D. Weinfield, and Robert L. York. 1966. *Equality of Educational Opportunity*. Washington, DC: U.S. Government Printing Office.

Cook, Phillip J., and Jens Ludwig. 1998. "The Burden of "Acting White": Do Black Adolescents Disparage Academic Achievement?" Pp. 375–400 in *The black-white test score gap*, edited by C. Jencks and M. Phillips. Washington, DC: Brookings Institution.

Darnell, John, and Colleen Darnell. 2022. *Egypt's Golden Couple: When Akhenaten and Nefertiti Were Gods on Earth*. New York City, NY: St. Martin's Press.

Dasgupta, Partha, and Ismail Serageldin, eds. 2000. *Social Capital: A Multifaceted Perspective.* Washington, DC: The World Bank.

Duncan, Greg J., and Richard J. Murnane, eds. 2011. *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances.* New York, NY: Russell Sage Foundation Press.

Durkheim, Emile. [1893] 1984. *The Division of Labor in Society*. Glencoe, IL: Free Press.

Durlauf, Steven N., and Marcel Fafchamps. 2003. "Empirical Studies of Social Capital: A Critical Survey." Unpublished manuscript.

Durlauf, Steven N., and Marcel Fafchamps. 2005. "Social Capital." Pp. 1639-1699 in *Handbook of Economic Growth, edition 1, volume 1, chapter 26*, edited by P. Aghion & S. N. Durlauf. The Netherlands: Elsevier.

Economist. 2022. "A New Study Shows How Much Social Capital Matters?" (*Economist*, 1 August). (https://www.economist.com/graphic-detail/2022/08/01/a-new-study-shows-how-much-social-capital-matters).

Fahle, Erin M., Belen Chavez, Demetra Kalogrides, Benjamin R. Shear, Sean F. Reardon, and Andrew D. Ho. 2021. "Stanford Education Data Archive: Technical Documentation (Version 4.1)." (http://purl.stanford.edu/db586ns4974).

Ferguson, Ronald F., Jens Ludwig and Wilbur Rich. 2001. “A Diagnostic Analysis of Black-White GPA Disparities in Shaker Heights, Ohio.” Pp. 347–414 in *Brookings papers on education policy 2001*, edited by D. Ravitch. Washington, DC: Brooking Institution Press.

Foley, Michael W., and Bob Edwards. 1999. “Is it Time to Disinvest in Social Capital?” *Journal of public policy* 19(2): 141-173.

Fryer, Roland G. 2006. “"Acting White": The Social Price Paid by the Best and Brightest Minority Students.” *Education Next* 6(1): 52-60.

Fukuyama, Francis. 1995. *Trust: The Social Virtues and the Creation of Prosperity*. New York, NY: Free Press.

Goldberger, Arthur S., and Glen G. Cain. 1982. “The Causal Analysis of Cognitive Outcomes in the Coleman, Hoffer, and Kilgore Report.” *Sociology of Education* 55(2): 103-122.

Gramm, Phil, Robert Ekelund, and John Early. 2022. *The Myth of American Inequality: How Government Biases Policy Debate*. Lanham, MD: Rowman & Littlefield.

Granovetter, Mark S. 1973. “The Strength of Weak Ties.” *American Journal of Sociology* 78:1360-1380.

Granovetter, Mark S. 1974. *Getting a Job: A Study of Contacts and Careers*. Cambridge, MA: Harvard University Press.

Granovetter, Mark S. 1985. "Economic and Social Structure: The Problem of Embeddedness." *American Journal of Sociology* 91:481-510.

Granovetter, Mark S. 1992. "Economic Institutions as Social Constructions: A Framework for Analysis." *Acta Sociologica* 35(1), 3-11.

Greene, Jay P., and Josh B. McGee. 2012. "When the Best is Mediocre: Developed Countries Far Outperform our Most Affluent Suburbs." *Education Next* 12(1), 34-40.

Grootaert, Christiaan, Deepa Narayan, Veronica N. Jones, and Michael Woolcock. 2004. "Measuring Social Capital, An Integrated Questionnaire." World Bank Working Paper, 18. (https://documents1.worldbank.org/curated/ru/515261468740392133/pdf/281100PAPER0Measuring0social0capital.pdf).

Hanushek, Eric A., and Ludger Woessmann. 2008. "The Role of Cognitive Skills in Economic Development." *Journal of Economic Literature* 46(3): 607–668.

Hanushek, Eric A., and Ludger Woessmann. 2011. "The Economics of International Differences in Educational Achievement." Pp. 89-200 in *Handbook of the Economics of Education, (Vol. 3)*, edited by E. A. Hanushek, S. Machin, and L. Woessmann. The Netherlands: North Holland.

Hanushek, Eric A., and Ludger Woessmann. 2012. "Do Better Schools Lead to More Growth? Cognitive Skills, Economic Outcomes, and Causation." *Journal of Economic Growth* 17(4): 267-321.

Haskins, Ron, and Isabel V. Sawhill. 2016. "The Decline of the American Family: Can Anything be Done to Stop the Damage?" *The ANNALS of the American Academy of Political and Social Science* 667(1): 8-34.

Inglehart, Ronald. 1997**.** *Modernization and Postmodernization: Cultural, Economic, and Political Change in 43 Societies*. Princeton, NJ: Princeton University Press.

Jackman, Robert W., and Ross A. Miller. 1998. "Social Capital and Politics." *Annual Review of Political Science* 1(1): 47-73.

Jackson, Reggie, and Bo McMillan. 2022. "How Social Capital Research Can Help Redress Segregation." *Poverty and Race Research Action Council* 31(2). (https://www.prrac.org/prrac-update-reflections-on-raj-chettys-2022-social-capital-studies-dec-2022/).

Jencks, Christopher, and Paul E. Peterson, eds. 1991. *The Urban Underclass*. Washington, DC: Brookings Institution Press.

Jencks, Christopher, and Meredith Phillips, eds. 1998. *The White-Black Test Score Gap*. Washington, DC: Brookings Institution Press.

Joseph, Mark L. 2022. "The Chetty Team's Social Capital Findings: A Timely Boost for Mixed-Income Development." *Poverty and Race Research Action Council* 31(2). (https://www.prrac.org/prrac-update-reflections-on-raj-chettys-2022-social-capital-studies-dec-2022/).

Krein, Sheila Fitzgerald, and Andrea H. Beller. 1988. "Educational Attainment of Children From Single-Parent Families: Differences by Exposure, Gender, and Race." *Demography* 25(2): 221-234.

Kwon, Seok-Woo, Colleen Heflin, and Martin Ruef. 2013. "Community Social Capital and Entrepreneurship." *American Sociological Review* 78(6): 980-1008.

Lee, Chul-Joo, and Daniel Kim. 2013. A Comparative Analysis of the Validity of US State- and County-Level Social Capital Measures and Their Associations with Population Health. *Social indicators research* 111(1): 307–326.

Legatum Institute Foundation. 2017. "The Legatum Prosperity Index 2017." (http://www.prosperity.com/about/resources).

Lim, Chaeyoon, and Robert D. Putnam. 2010. Religion, Social Networks, and Life Satisfaction. *American Sociological Review* 75(6): 914-933.

Lizardo, Omar. 2006. "How Cultural Tastes Shape Personal Networks." *American Sociological Review* 71(5): 778-807.

Loury, Glenn C. 1977. "A Dynamic Theory of Racial Income Differences." Pp. 153–186 in *Women, Minorities, and Employment Discrimination*, edited by P. A. Wallace and A. M. La Mond. Lexington, MA: Lexington Books..

Loury, Glenn C. 1981. Intergenerational Transfers and the Distribution of Earnings. *Econometrica: Journal of the Econometric Society* 49(4): 843-867.

Manning, Wendy D., and Kathleen A. Lamb. 2003. Adolescent Well-Being in Cohabiting, Married, and Single-Parent Families. *Journal of Marriage and Family* 65(4): 876-893.

Martin, Molly A. 2006. "Family Structure and Income Inequality in Families With Children, 1976 to 2000." *Demography* 43(3): 421-445.

Miller, Claire Cain, Josh Katz, Francesca Paris, and Aatish Bhatia. 2022. "Vast New Study Shows a Key to Reducing Poverty: More Friendships Between Rich and Poor." (*New York Times,* 1 August). (https://www.nytimes.com/interactive/2022/08/01/upshot/rich-poor-friendships.html).

Mincer, Jacob. 1957. "A Study on Personal Income Distribution." PhD dissertation, Faculy of Political Science, Columbia University, New York City, NY.

Moynihan, Daniel Patrick. 1996. "In Memoriam James S. Coleman (1926–1995); Speeches Given at the Memorial Service, 19 May 1995, in the Rockefeller Memorial Chapel, Chicago." P. 377 in *James S. Coleman*, edited by J. Clark. Mahwah, NJ: Routledge.

Murray, Charles. 2013. *Coming Apart: The State of White America,* 1960-2010. New York, NY: Random House.

National Conference on Citizenship. 2006. "Broken Engagement: America's Civic Health Index." (https://www.ncoc.org/wp-content/uploads/2015/04/2006BrokenEngagementCHI.pdf).

Ogbu, John U. 2003. *Black American Students in An Affluent Suburb: A Study of Academic Disengagement*. Mahwah, NJ: Routledge.

Opportunity Insights. 2023. "Opportunity Insights." (https://opportunityinsights.org/).

Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, UK: Cambridge University Press.

Portes, Alejandro. 1998. "Social Capital: Its Origins and Applications in Modern Sociology." *Annual Review of Sociology* 24(1): 1-24.

Powell, John, and Eloy Toppin. 2022. "Social Capital and Economic Connectedness." *Poverty and Race Research Action Council* 31(2). (https://www.prrac.org/prrac-update-reflections-on-raj-chettys-2022-social-capital-studies-dec-2022/).

Putnam, Robert D. 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, NJ: Princeton University Press.

Putnam, Robert D. 1995a. "Bowling Alone: America's Declining Social Capital." *Journal of Democracy* 6(1): 65-78.

Putnam, Robert D. 1995b. "Tuning In, Tuning Out: The Strange Disappearance of Social Capital in America." *PS: Political Science & Politics* 28(4): 664-683.

Putnam, Robert D. 2000. *Bowling Alone: The collapse and Revival of American Community*. New York City, NY: Simon and schuster.

Putnam, Robert D. 2016. *Our Kids: The American Dream in Crisis.* New York City, NY: Simon & Schuster.

Putnam, Robert D., and David E. Campbell. (2012). *American Grace: How Religion Divides and Unites Us*. New York City, NY: Simon & Schuster.

Reardon, Sean F. (2011). "The Widening Academic Achievement Gap between the Rich and the Poor: New Evidence and Possible Explanations." Pp. 91–115 in *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances*, edited by G. J. Duncan and R. J. Murnane. New York, NY: Russell Sage Foundation.

Reardon, Sean F., Andrew D. Ho, Benjamin R. Shear, Erin M. Fahle, Demetra Kalogrides, Heewon Jang, and Belen Chavez. 2021. "Stanford Education Data Archive (Version 4.1)." (http://purl.stanford.edu/db586ns4974).

Rees, Albert. 1965. "Review of Gary Becker's Human Capital." *American Economic Review* 55: 958–960.

Reeves, Richard V., and Coura Fall. 2002. "Seven Key Takeaways from Chetty's New Research on Friendship and Economic Mobility." (*Brookings,* 2 August).

(https://www.brookings.edu/blog/up-front/2022/08/02/7-key-takeaways-from-chettys-new-research-on-friendship-and-economic-mobility/).

Rivkin, Steven, and Finis Welch. 2006. "Has School Desegregation Improved Academic and Economic Outcomes for Blacks?" Pp. 1019–1049 in *Handbook of the Economics of Education* (2nd ed.), edited by E. A. Hanushek and Finis Welch. The Netherlands: Elsevier.

Rupasingha, Anil, Stephan J. Goetz, and David Freshwater. 2006. "The Production of Social Capital in US Counties." *The Journal of Socio-Economics* 35(1): 83-101.

Schultz, Theodore W. 1961. "Investment in Human Capital." *American Economic Review* 51(1): 1-17.

Shakeel, M. Danish, and Paul E. Peterson. 2022. A Half Century of Progress in US Student Achievement: Agency and Flynn Effects, Ethnic and SES Differences. *Educational Psychology Review* 34(3): 1255-1342.

Smith, Adam. [1776] 1976. *The Wealth of Nations*. Chicago, IL: University of Chicago Press.

Statista. 2022. "Educational Attainment in the U.S. 1960-2021." (https://www.statista.com/statistics/184260/educational-attainment-in-the-us/).

Social Capital Project. 2018. "The Geography of Social Capital in America, SCP report no. 1-18." (https://www.jec.senate.gov/public/_cache/files/e86f09f7-522a-469a-aa89-1e6d7c75628c/1-18-geography-of-social-capital.pdf).

Solow, Robert M. 1965. Human Capital. Gary S. Becker. *Journal of Political Economy 73*(5): 552–553.

Tropp, Linda R., and Mohammed Naeem. 2022. "Examining Economic Connectedness Through the Lens of Intergroup Contact Theory and Research." *Poverty and Race Research Action Council* 31(2). (https://www.prrac.org/prrac-update-reflections-on-raj-chettys-2022-social-capital-studies-dec-2022/).

Urahn, Susan K., Erin Currier, Diana Elliott, Lauren Wechsler, Denise Wilson, and Daniel Colbert. 2012. "Pursuing the American Dream: Economic Mobility Across Generations." The PEW Charitable Trusts. (http://www.pewtrusts.org/~/media/legacy/uploadedfiles/wwwpewtrustsorg/reports/economic_mobility/PursuingAmericanDreampdf.pdf).

United States Congress, Joint Economic Committee—Republicans (JEC). 2017. Social Capital Project. (https://www.jec.senate.gov/public/index.cfm/republicans/republicans).

VanderWeele, Tyler J. 2017. "On the Promotion of Human Flourishing." *Proceedings of the National Academy of Sciences* 114(31): 8148-8156.

Wilson, William Julius. 1987. *The Truly Disadvantaged: The Innercity, the Underclass, and Public Policy*. Chicago, IL: University of Chicago Press.

Winship, Scott. 2018. "Economic Mobility in America a State-of-the-Art Primer. Part 2: The United States in Comparative Perspective." (https://www.archbridgeinstitute.org/wp-content/uploads/2018/12/Archbridge-Economic-Mobility-primer-part2-US-in-perspective.pdf).

Zhou, Xiang. 2019. "Equalization or Selection? Reassessing the "Meritocratic Power" of a College Degree in Intergenerational Income Mobility." *American Sociological Review* 84(3): 459-485.

Table 1: Summary Statistics

Variables	Mean	St. Dev.	Min	Max
Relative social mobility	0.41	0.04	0.31	0.61
Adult bridging	0.80	0.17	0.36	1.36
Average math, all students	-0.02	0.25	-0.94	0.73
Average math, ECD students	-0.28	0.19	-0.97	0.29
Family	-0.03	1.20	-5.96	3.27
Community	-0.41	0.61	-1.67	4.12
Political	-0.02	0.94	-3.86	2.81
School bridging	0.85	0.22	0.26	1.61
Racial segregation	0.11	0.07	0.01	0.52
Percent single parents	0.27	0.06	0.10	0.60
Third grade math scores	3.25	0.70	0.48	6.58
Median household income	39,146	9,952	16,785	85,724
Percent black	0.10	0.13	0.00	0.70
Gini coefficient	0.29	0.06	-0.06	0.57

Note: These are unweighted estimates. ECD: economically disadvantaged students (i.e., those eligible for free- or reduced-price lunch). N=1,812.

Table 2: Matrix of Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Relative social mobility	1.00													
(2) Adult bridging	0.73	1.00												
(3) Average math, all students	0.52	0.69	1.00											
(4) Average math, ECD students	0.43	0.45	0.85	1.00										
(5) Family	0.65	0.69	0.66	0.52	1.00									
(6) Community	0.40	0.35	0.23	0.20	0.16	1.00								
(7) Political	0.36	0.55	0.54	0.33	0.39	0.40	1.00							
(8) School bridging	0.49	0.68	0.54	0.21	0.52	0.06	0.43	1.00						
(9) Racial segregation	-0.26	-0.28	-0.24	-0.33	-0.37	-0.21	-0.14	-0.10	1.00					
(10) Percent single parents	0.64	0.59	0.63	0.55	0.88	0.09	0.32	0.43	-0.39	-1.00				
(11) Third grade math scores	0.40	0.57	0.86	0.78	0.55	0.23	0.47	0.40	0.24	-0.53	1.00			
(12) Median household income	0.32	0.60	0.55	0.19	0.49	-0.04	0.51	0.79	-0.04	-0.43	-0.42	-1.00		
(13) Percent black	-0.60	-0.50	-0.48	-0.47	-0.69	-0.25	-0.15	-0.22	-0.32	-0.70	-0.42	-0.17	1.00	
(14) Gini coefficient	-0.59	-0.62	-0.54	-0.43	-0.64	-0.30	-0.47	-0.43	-0.33	-0.67	-0.48	-0.44	-0.56	1.00

Note: See Table 1 and A1.

Table 3: Predictors of Social Mobility

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Social mobility					
Adult-bridging	0.538***	0.633***	0.326***	0.260***		
	(0.053)	(0.035)	(0.036)	(0.036)		
Mean achievement				0.070**	0.131***	0.150***
				(0.033)	(0.043)	(0.038)
Family				0.232***	0.274***	0.265***
				(0.042)	(0.046)	(0.044)
Community				0.135***	0.161***	0.171***
				(0.040)	(0.043)	(0.045)
Political				-0.011	0.015	0.026
				(0.045)	(0.049)	(0.047)
School-bridging				-0.012	0.092*	0.126***
				(0.048)	(0.048)	(0.041)
Racial segregation	0.211**	0.089***	0.010	-0.004	-0.032	-0.020
	(0.089)	(0.023)	(0.020)	(0.023)	(0.020)	(0.021)
Percent single parents	-0.365***	-0.281***	-0.448***			
	(0.082)	(0.033)	(0.052)			
Third grade math scores	-0.041	-0.108***	-0.001			
	(0.070)	(0.023)	(0.030)			
Median household income	-0.094	-0.204***	-0.169***	-0.079	-0.074	-0.045
	(0.066)	(0.038)	(0.044)	(0.060)	(0.067)	(0.067)
Percent black	-0.326***	-0.141***	0.043	-0.102*	-0.090	-0.086
	(0.051)	(0.028)	(0.056)	(0.057)	(0.061)	(0.061)
Gini coefficient	0.105*	-0.099***	0.004	-0.101***	-0.112***	-0.101***
	(0.063)	(0.029)	(0.031)	(0.027)	(0.029)	(0.027)
State fixed effects?	no	no	yes	yes	yes	yes
All or disadvantaged?				all	all	ECD
R-squared	0.804	0.692	0.652	0.829	0.811	0.800

Note: See Tables 1 and A1. In Column (1), observations are weighted by the population under the median income. In columns (2)-(6), observations are unweighted. In columns (1) and (2), standard errors are clustered by commuting zone. In the remaining columns, standard errors are clustered by state. *** p<0.01, ** p<0.05, * p<0.1. N= 1,812.

Table 4: Predictors of Adult-Bridging

	(1)	(2)
Variables	Adult-bridging	
Mean achievement	0.237***	0.153***
	(0.054)	(0.044)
Family	0.162***	0.177***
	(0.021)	(0.021)
Community	0.100***	0.117***
	(0.034)	(0.033)
Political	0.100**	0.131***
	(0.041)	(0.042)
School-bridging	0.399***	0.452***
	(0.046)	(0.042)
Racial segregation	-0.106***	-0.097***
	(0.014)	(0.015)
Median household income	0.017	0.065
	(0.058)	(0.056)
Percent black	0.046	0.023
	(0.034)	(0.033)
Gini coefficient	-0.040	-0.024
	(0.033)	(0.030)
All or disadvantaged?	all	ECD
R-squared	0.842	0.837

Note: See Tables 1 and A1. Specifications include state fixed effects. Observations are unweighted. Standard errors are clustered by state. *** p<0.01, ** p<0.05, * p<0.1. N= 1,812.

Table 5: Predictors of School-Bridging

	(1)	(2)
Variables	School-bridging	
Mean achievement	0.149***	-0.042
	(0.045)	(0.035)
Family	0.144***	0.195***
	(0.024)	(0.025)
Community	-0.070**	-0.063**
	(0.028)	(0.025)
Political	0.035	0.070
	(0.045)	(0.043)
Racial segregation	-0.078***	-0.088***
	(0.024)	(0.024)
Median household income	0.557***	0.597***
	(0.063)	(0.054)
Percent black	0.129***	0.081***
	(0.027)	(0.027)
Gini coefficient	0.020	0.026
	(0.034)	(0.033)
All or disadvantaged?	all	ECD
R-squared	0.804	0.799

Note: See Tables 1, 4, and A1.

Table 6: Predictors of Achievement

	(1)	(2)
Variables	Mean achievement	
Family	0.271***	0.257***
	(0.031)	(0.041)
Community	0.054	-0.006
	(0.033)	(0.045)
Political	0.206***	0.092
	(0.045)	(0.061)
Racial segregation	-0.040**	-0.096***
	(0.019)	(0.022)
Median household income	0.290***	-0.079
	(0.045)	(0.051)
Percent black	-0.246***	-0.265***
	(0.031)	(0.042)
Gini coefficient	0.049*	-0.034
	(0.028)	(0.038)
All or disadvantaged?	all	ECD
R-squared	0.763	0.639

Note: See Tables 1, 4, and A1.

Table 7. Total Social Capital and Achievement Relationships with Social Mobility (excluding and including Adult-Bridging)

	Adult-bridging excluded			Adult-bridging included		
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Direct	Indirect	Total	Direct	Indirect	Total
Family	0.27	0.05	0.32	0.23	0.11	0.34
Community	0.16	-0.01	0.15	0.14	0.02	0.16
Political		0.03	0.03		0.06	0.06
Achievement	0.13	0.01	0.14	0.07	0.08	0.15
School-Bridging	0.09		0.09		0.10	0.10
Adult-Bridging				0.26		0.26

Note: See Figure 1. Estimates of direct effects are the coefficients directly linking variables to mobility. Indirect estimates are the sum of the interactions between variables in the other pathways (for example, in column 2 based on Figure 1 the indirect effect of family on social mobility 0.05 = (0.15*0.09) + (0.27*0.13) + (0.27*0.15*0.09)). Figure 1 shows pathways when adult-bridging capital is excluded. Pathways including adult-bridging are not shown but can be calculated from results reported in tables 3-6.

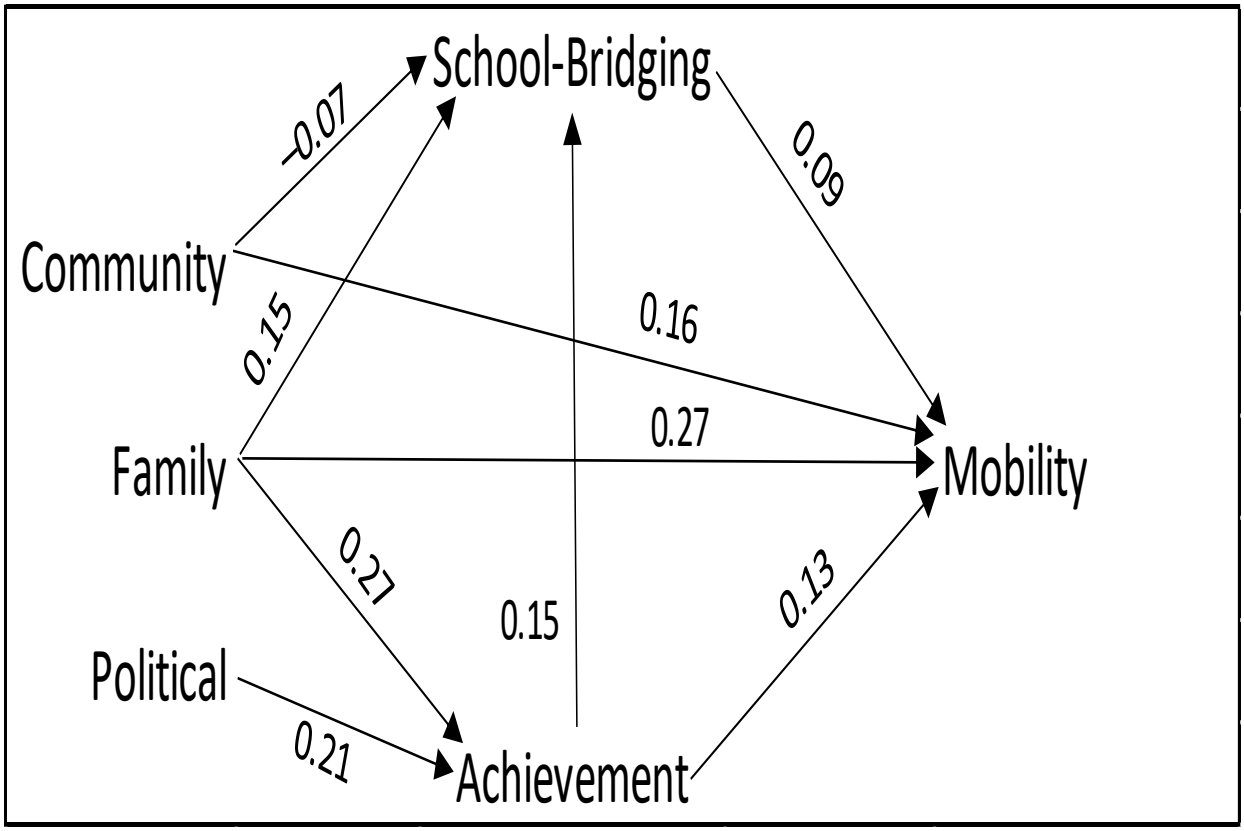

Figure 1. Total Social Capital and Achievement Relationships with Social Mobility (excluding adult-bridging)

Note: Estimations are taken from Tables 3, 4, 5, and 6. Insignificant estimates are ignored. Figure assumes that family, community, and political capital are independent of one another and none are caused by any other variable. It also assumes school-bridging is a function of achievement, with school-bridging forming one of the links to mobility.

Appendix

Table A1. Social Capital measures

Variable	Definition
Family	This index uses three county-level measures from the American Community Survey's five-year estimates for 2006 to 2010. We use the first principal component of three indicators: the share of births to unmarried women (ACS table B13010), the percent of children living with one parent (ACS table B23008), and the percent of women aged 35-44 married (ACS table B12002). We reverse the sign of the first principal component so that higher values reflect more family capital. Married includes spouse present and spouse absent. Unmarried includes never married, widowed, and divorced.
Community	This variable is the county-level community health subindex from the Joint Economic Commission. That index is constructed using the first principal component of the following indicators: county-level measure of registered non-religious non-profits per 1,000 in 2015; county-level measure of religious congregations per 1,000 in 2009-2011; and a state index of informal civil society. The state index of informal civil society is the first principal component of six survey measures: the share of adults in the past year who report having volunteered for a group (CPS Sept 2015), attended a public meeting re. community affairs (CPS Sept 2015), worked with neighbors to fix/improve something (CPS Sept 2015), served on a committee or as an officer of a group (CPS Nov 2013), attended a meeting where political issues were discussed (CPS Nov 2008), and took part in march/rally/protest/demonstration in past year (CPS Nov 2008). CPS: Current Population Survey.
Political	This variable is the county-level institutional health subindex from the Joint Economic Commission. That index is constructed using the first principal component of the following indicators: county-level average (over 2012 and 2016) of votes in the presidential election per citizen age 18+ (except for Alaska; Alaska's is the state-level average); the mailback response rate for the 2010 Census; and their state-level Confidence in Institutions sub-index. The Confidence in Institutions sub-index in the first principal component of three survey measures from the November 2013 CPS. Those measures are the share of adults reporting some or great confidence in corporations to do what is right, in the media to do what is right, and in public schools to do what is right.
School-bridging	"Childhood economic connectedness: two times the share of high parental-SES friends among low-parental-SES individuals averaged over all low-parental-SES individuals in the county, calculated using only individuals' high school friends." (Chetty et al. 2022, Codebook p. 4). This variable is child_ec_county from the publicly available dataset furnished by Chetty et al. (2022).
Adult bridging	Baseline definition of economic connectedness: two times the share of high-SES friends among low-SES individuals, averaged over all low-SES individuals in the county. (Chetty et al. 2022 Codebook pg. 3). This variable is ec_county from the publicly available dataset furnished by Chetty et al. (2022).

Table A1. (Cont'd)

Table A1. (Cont'd)

Variable	Definition
Relative social mobility	"Mean income percentile in adulthood of a child born to parents at or below the 25th percentile of the income distribution, from Chetty et al. (2018)." This variable is kfr_pooled_pooled_p25 from the publicly available dataset furnished by Chetty et al. (2022).

Table A2: Mean Reading Achievement and other predictors of Social Mobility

	(1)	(2)
Variables	Social mobility	
Mean achievement	0.117**	0.143***
	(0.049)	(0.041)
Family	0.275***	0.262***
	(0.046)	(0.045)
Community	0.155***	0.164***
	(0.042)	(0.044)
Political	0.014	0.021
	(0.049)	(0.046)
School-bridging	0.088*	0.119***
	(0.052)	(0.042)
Racial segregation	-0.030	-0.016
	(0.021)	(0.023)
Median household income	-0.074	-0.043
	(0.066)	(0.066)
Percent black	-0.093	-0.089
	(0.064)	(0.063)
Gini coefficient	-0.116***	-0.106***
	(0.031)	(0.028)
All or disadvantaged?	all	ECD
R-squared	0.661	0.799

Note: See Tables 1 and A1. RLA: Reading & Language Arts. Observations are unweighted. Specifications include state fixed effects with standard errors clustered by state. *** p<0.01, ** p<0.05, * p<0.1. N= 1,812.

Table A3: Predictors of Social Mobility: Weighted Estimates

	(1)	(2)	(3)	(4)	(5)
Variables	Social mobility				
Adult-bridging	0.538***	0.258***	0.239***		
	(0.053)	(0.046)	(0.056)		
Mean achievement			0.173***	0.276***	0.307***
			(0.056)	(0.068)	(0.059)
Family			0.304***	0.319***	0.267***
			(0.046)	(0.056)	(0.056)
Community			-0.018	0.009	0.058
			(0.056)	(0.061)	(0.061)
Political			-0.117	-0.107	-0.025
			(0.101)	(0.103)	(0.083)
School-bridging			-0.195***	-0.143*	-0.050
			(0.065)	(0.081)	(0.077)
Racial segregation	0.211**	0.041	0.028	-0.013	0.023
	(0.089)	(0.049)	(0.058)	(0.053)	(0.053)
Percent single parents	-0.365***	-0.567***			
	(0.082)	(0.059)			
Third grade math scores	-0.041	0.122*			
	(0.070)	(0.070)			
Median household income	-0.094	-0.139**	0.070	0.091	0.139
	(0.066)	(0.053)	(0.077)	(0.088)	(0.091)
Percent black	-0.326***	0.047	-0.156**	-0.114	-0.139*
	(0.051)	(0.058)	(0.070)	(0.072)	(0.070)
Gini coefficient	0.105*	0.036	-0.079	-0.101*	-0.111*
	(0.063)	(0.047)	(0.052)	(0.056)	(0.061)
Include state fixed effects?	no	yes	yes	yes	yes
Clustered?	cz	state	state	state	state
all or disadvantaged?			all	all	ECD
R-squared	0.804	0.637	0.837	0.813	0.800

Note: See Tables 1 and A1. Models in this table are identical to those in Table 3 but all models included the weights used in Model 1, which is identical to Model 1 in Table 3. cz = commuting zone. Observations are weighted by the population under the median income. *** p<0.01, ** p<0.05, * p<0.1. N= 1,812.

Table A4: Predictors of Social Mobility (with and without State Fixed Effects)

	(1)	(2)	(3)	(4)
Variables	Social mobility			
Mean achievement	0.131***	0.150***	0.023	0.054*
	(0.043)	(0.038)	(0.033)	(0.029)
Family	0.274***	0.265***	0.263***	0.255***
	(0.046)	(0.044)	(0.033)	(0.033)
Community	0.161***	0.171***	0.210***	0.212***
	(0.043)	(0.045)	(0.028)	(0.028)
Political	0.015	0.026	0.029	0.022
	(0.049)	(0.047)	(0.034)	(0.034)
School-bridging	0.092*	0.126***	0.399***	0.403***
	(0.048)	(0.041)	(0.046)	(0.045)
Racial segregation	-0.032	-0.020	0.076***	0.082***
	(0.020)	(0.021)	(0.023)	(0.024)
Median household income	-0.074	-0.045	-0.257***	-0.248***
	(0.067)	(0.067)	(0.065)	(0.066)
Percent black	-0.090	-0.086	-0.248***	-0.241***
	(0.061)	(0.061)	(0.031)	(0.032)
Gini coefficient	-0.112***	-0.101***	-0.156***	-0.153***
	(0.029)	(0.027)	(0.026)	(0.026)
Clustered se?	state	state	cz	cz
State fixed effects?	yes	yes	no	no
All or disadvantaged?	all	ECD	all	ECD
R-squared	0.811	0.800	0.610	0.612

Note: See Tables 1 and A1. Observations are unweighted. Columns (1) and (2) are replicated from Table 3, columns (5) and (6). cz = commuting zone. *** p<0.01, ** p<0.05, * p<0.1. N= 1,812.