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Classrooms and Neighborhoods: Social Science Explores the Factors of Children's Future Success

Wearing a red and white striped tie, an American flag pinned to his lapel, President Barack Obama panned from left to right during his second State of the Union address. "In the 21st century, the best anti-poverty program around is a world-class education." He paused for the applause to die down. "And in this country, the success of our children cannot depend more on where they live than on their potential."

In recent decades, social scientists have been amassing a body of scholarship about the determinants of success—in school and in life. They have produced compelling insights about how to overcome underlying social currents that often seem at odds with the American Dream. Each carefully crafted study either generates a new base of knowledge or, through creative scholarship, draws fresh conclusions from an existing one, contributing to an ever deeper understanding of the factors that power our society and ensure our nation's progress.

The tools of social science enable researchers to address questions that once seemed unknowable—or at least unapproachable: Do the benefits of small classes for kids in grades K–3 extend to adulthood? Can good schools alone close the achievement gap? Do families living in poverty fare better when they've relocated to more affluent neighborhoods? Just how big are the gaps between rich and poor, black and white?

A landmark 1985 study called Project STAR (for Student Teacher Achievement Ratio) sparked modern interest in the investigation of these matters by posing a simple question of its own: Does class size matter when it comes to student performance? For 4 years the statewide Tennessee study randomly assigned a total of 11,500 kindergartners from about 80 schools to one of three types of classrooms: small (13 to 17 students), larger (22 to 25), or larger with a classroom aide.[1] Teachers and students represented the full spectrum of race, class, and teacher experience and ability in Tennessee. The students stayed together in cohorts—but had different teachers—and their progress was tracked through the third grade.

[1] Achilles, C. M., H. P. Bain, F. Bellott, J. Boyd-Zaharias, J. Finn, J. Folger, J. Johnston, and E. Word. 2008. Tennessee's Student Teacher Achievement Ratio (STAR) Project. https://dataverse.harvard.edu/dataset.xhtml?persistentId=hdl:1902.1/10766.

The results—as measured by end-of-year standardized math and reading tests—were unambiguous: the gains for the small-class group accumulated year by year. By the end of third grade, students in smaller classes were about half a school year ahead of their peers in reading and 3 months ahead in math. The impacts were of particular benefit to black students, whose gains about doubled those of white students.[2]

"A randomized experiment like STAR is the 'gold standard' of empirical research," asserts Jeremy Finn, an education professor at the State University of New York at Buffalo, who worked on the study. "It's the only research design that really demonstrates cause and effect between interventions and outcomes."

The scientific rigor displayed in the design of the experiment, a new benchmark in the field of education, empowered the U.S. Department of Education to reverse its stance that class sizes do not matter. By 2000, 35 states had passed legislation to shrink class sizes.[3]

However, within a few years class sizes started shifting upward again, due in part to the blow to school budgets resulting from the deep U.S. recession beginning in 2008. In addition, credible studies had begun to challenge the STAR results. The initial impacts on test scores seemed to fade, but the longer-term benefits persisted as the students aged and more kids from the smaller classes went on to graduate from high school.[4] Other studies showed comparatively modest—or no—benefits despite great taxpayer cost. In 2011, the Brookings Institution concluded that while very large reductions in class size—such as those demonstrated by STAR—do appear to produce significant long-term student gains, policy makers should weigh the benefits against the costs and consider alternative investments, such as raising teacher salaries.[5]

Around that time, Harvard University economist Raj Chetty decided to determine which, if any, benefits of small classes carried into adulthood. The children from Project STAR were in their mid- to late 20s by then, so Chetty could link STAR's data set to data from the participants' tax returns.

His study found the students in the small-class cohorts enjoyed higher rates of college attendance, marriage, and home ownership; had more robust retirement accounts; and lived in higher-income neighborhoods. Even more compelling, the students who were

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[2] American Youth Policy Forum. Raising Minority Academic Achievement. Class Size: Project STAR. Pp. 90–93. http://www.aypf.org/publications/rmaa/pdfs/ClassSizeSTAR.pdf.

[3] Finn, J. Class-Size Reduction in Grades K–3. National Education Policy Center. http://nepc.colorado.edu/files/Chapter02-Finn-Final.pdf.

[4] Finn, J. D., S. B. Gerber, and J. Boyd-Zaharias. 2005. Small Classes in Early Grades, Academic Achievement, and Graduating from High School. *Journal of Education Psychology* 97(2):214–223.

[5] Whitehurst, G. J., and M. M. Chingos. 2011. Class Size: What Research Says and What It Means for State Policy. Washington, DC: Brookings Institution. https://www.brookings.edu/research/class-size-what-research-says-and-what-it-means-for-state-policy.

randomly assigned to more experienced or effective kindergarten teachers—as measured by end-of-year exams—had higher college attendance rates and higher average earnings at age 27.[6]

The latter finding suggested that class size isn't the only factor that matters and highlighted the importance of generating new inquiries.

In 2010, Harvard economists Will Dobbie and Roland Fryer launched an effort to answer the long-debated question of whether quality schools alone can close the racial achievement gap or if it is necessary to blend good schooling with community programs that provide a positive out-of-school environment.

Dobbie and Fryer's study put a historic Civil Rights–era report to the test. In 1966, working during President Lyndon Johnson's administration, University of Chicago sociologist James Coleman published a landmark report that found, among other things, that schools alone cannot treat the problem of underperforming students in urban settings.[7]

To test this conclusion, Dobbie and Fryer narrowed their focus to a single, highly resourced school with a specific population in a specific city. They found an apt laboratory in the Harlem Children's Zone (HCZ), a widely celebrated nonprofit in New York City that offers a host of community services (karate, dance, parenting classes, nutrition coaching, etc.) and so-called "no excuses" charter schools, providing what they termed a "cradle-to-career" pipeline for low-income kids. The Zone makes up a 97-block area in central Harlem.

Their study exploited two attributes. First, the HCZ's K–12 schools—called Promise Academy—employ a random lottery system to fill seats, granting the researchers a control group in the lottery losers. By comparing these two groups, Dobbie and Fryer found that the Promise Academy's elementary school could erase the gap between whites and blacks in reading by third grade and its middle school could close the gap in math.

Second, the Promise Academy is open to students across Greater New York City, not just Harlem. So the researchers compared data of students who lived close to the schools, and were likely to take advantage of HCV's community programs, against those who lived farther away and were less likely to take advantage. They found no significant difference in test scores between those groups.

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[6] Chetty, R., J. N. Friedman, and N. Hilger, E. Saez, D. Whitmore Schanzenbach, and D. Yagan. 2011. How Does Your Kindergarten Classroom After Your Earnings?: Evidence from Project STAR. National Bureau of Economic Research. NBER Working Paper No. 16381. *The Quarterly Journal of Economics* 126(4):1593–1660.

[7] Coleman, J. S. 1966. Equality of Educational Opportunity. U.S. Department of Health, Education, and Welfare and the Office of Education. http://files.eric.ed.gov/fulltext/ED012275.pdf.

Based on this small but well-controlled case study, Dobbie and Fryer claim that high-quality schools—which they defined as places that give frequent teacher feedback, use data to guide instruction, schedule a longer school day, and provide intensive tutoring—are sufficient to eliminate the racial achievement gap. "Community programs appear neither necessary nor sufficient," they wrote.[8]

But do communities have any impact on academic success? Another historic randomized experiment attempted to explore that question. In the mid-1990s, the U.S. Department of Housing and Urban Development (HUD) set out to examine the hotly contested question of whether living in certain zip codes can directly shape a child's destiny.

Called Moving to Opportunity, HUD's 4-year social experiment provided vouchers by lottery that enabled 4,600 low-income families to relocate from rundown neighborhoods to more desirable ones in five major U.S. cities.

The initial results were disappointing. While parents in selected families saw improvements in their health and happiness, their children demonstrated no measurable academic gains relative to those who lost the lottery and remained in the poorer neighborhoods. This helped fuel a perception that place doesn't have much influence on a child's academic performance. The program withered.

But in 2016, Chetty—now at Stanford University—updated the well-formed HUD data set by looking at life outcomes after high school. Once again, he tracked the lottery winners and losers using federal income tax data.

These results generated new understanding. Contrary to the original study's conclusions, children who moved to higher-income neighborhoods had better adult outcomes—so long as they were under age 13 at the time of the move. Chetty and his colleagues discovered that by their mid-20s, the young adults who had moved as children had higher college attendance rates, were less likely to become single parents, earned more, and lived in more affluent areas than their peers who did not win the lottery. Meanwhile, children who moved to more desirable zip codes *after* age 13 enjoyed no such gains and in fact lost some ground, likely owing to the social disruption caused by the move.[9]

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[8] Dobbie, W., and R. G. Fryer. 2011. Are High-Quality Schools Enough to Increase Achievement Among the Poor?: Evidence from the Harlem Children's Zone. *American Economic Journal: Applied Economics* 3(3). http://scholar.harvard.edu/fryer/publications/are-high-quality-schools-enough-increase-achievement-among-poor-evidence-harlem-c.

[9] Chetty, R., N. Hendren, and L. F. Katz. 2015. The Effects of Exposure to Better Neighborhoods on Children. Harvard University and National Bureau of Economic Research. http://scholar.harvard.edu/files/hendren/files/mto_paper.pdf.

Chetty's reexamination helped shape policy. HUD officials pointed to it when touting a plan to expand the federal agency's housing voucher program to better enable low-income families to move to their neighborhood of choice.[10]

While randomized studies conducted with Project STAR, the HCZ, and HUD are optimal for identifying how specific, controlled circumstances can influence academic achievement and success later in life, some social scientists—like Sean Reardon—seek out broader patterns and connections.

Reardon, a professor of poverty and inequality in education at Stanford, approaches statistical questions around the size and nature of gaps in achievement between different demographic groups. In an era of high-stakes standardized testing, his team employed innovative techniques to investigate sweeping patterns in education inequality. How do test scores vary by race within and between districts? And how wide, exactly, is the chasm between high- and low-income schools?

Using an immense data set that included the state accountability math and reading exams taken by every American public school student in grades 3 to 8—amounting to some 215 million test scores—Reardon applied new statistical methods that led to eye-opening results.

For instance, of the U.S. school districts enrolling at least 100 black students in each grade, there are fewer than 2 percent whose black students' average test scores are at or above the national average. Also, sixth graders in the lowest-income areas of the United States are, on the whole, a full four grade levels behind their peers in the highest-income areas.[11]

But this approach has also turned up hopeful findings. And there have been measurable gains. Even as income inequality in the United States continues to worsen, a 2016 study co-authored by Reardon indicates that the achievement divide by both race and class—though still wide on both counts—has recently begun to narrow, after three decades of moving in the wrong direction.[12] "Poverty is not destiny," Reardon writes. "Inequality is not inevitable."

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[10] Office of Policy Development and Research (PD&R) U.S. Department of Housing and Urban Development Secretary Julián Castro. Investing in People and Places for Upward Mobility. https://www.huduser.gov/portal/investing_people.html.

[11] Reardon, S. F. 2016. School District Socioeconomic Status, Race, and Academic Achievement. https://assets.documentcloud.org/documents/3127408/Stanford-School-District-Ses-and-Achievement.pdf.

[12] Reardon, S. F., J. Waldfogel, and D. Bassok. 2016. The Good News About Educational Inequality. *The New York Times*. http://www.nytimes.com/2016/08/28/opinion/sunday/the-good-news-about-educational-inequality.html.

All told, the knowledge that comes from studies by social scientists has begun to untangle the coil of social determinants for success in a child's life. Controlled experiments provide compelling evidence that being assigned to a small class early in school, having a good kindergarten teacher, and moving to a better neighborhood as a preteen all lead to long-term benefits that extend into adulthood. Social science has demonstrated that quality schools can be enough to close the achievement gap, and has shed light on how large the gap still is.

Just as we rely on electricity to power our lives, the knowledge generated by these studies can power progress. With each advance in understanding, we can enhance and refine policies that better position children for lifelong success. Ideally, the achievement gap will continue to close, even as academic performance rises for all, empowering more and more children to enjoy productive, fulfilling lives.

This article was written by Rob Kuznia for *From Research to Reward*, a series produced by the National Academy of Sciences. This and other articles in the series can be found at www.nasonline.org/r2r. The Academy, located in Washington, DC, is a society of distinguished scholars dedicated to the use of science and technology for the public welfare. For more than 150 years, it has provided independent, objective scientific advice to the nation.