NBER | NATIONAL BUREAU of ECONOMIC RESEARCH

The Digest

April 2025

In This Issue

Economic Growth, Cultural Traditions, and Declining Fertility

When nations experience rapid economic modernization, traditional family values can clash with new social realities and result in sharply declining birth rates. This insight helps to explain why some developed countries have much lower current fertility rates than others, despite having had higher rates in the recent past.

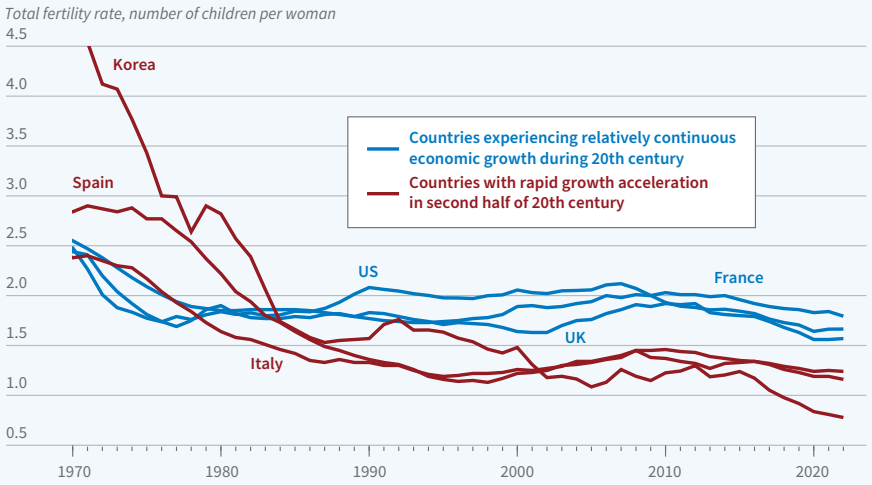
In Babies and the Macroeconomy (NBER Working Paper 33311), Claudia Goldin examines fertility patterns across 12 developed nations. She divides the countries into two groups: one, comprising Denmark, France, Germany, Sweden, the UK, and the US, that experienced relatively steady economic growth throughout the twentieth century, and the other, Greece, Italy, Japan, Korea, Portugal, and Spain, that underwent extremely rapid economic development after 1950.

The countries in the first group have maintained moderate fertility rates, starting around 2.5 children per woman in the 1970s and then ranging from 1.5 to 2 children from the 1980s until the 2020s. Countries in the second group had higher initial fertility rates in the 1970s (ranging from 2.5 to 4.5 children) but experienced dramatic declines in subsequent decades. These countries have seen fertility rates plummet to "lowest-low" levels below 1.3 children per woman after 2000, reaching as low as less than 1.0 child per woman. While fertility rates have declined for the first group countries, their post-2000 levels remain considerably higher than those of the second group.

Goldin suggests that rapid economic change can create both generational and gender conflicts that affect fertility decisions. In countries that undergo sudden economic modernization, men often remain attached to traditional family structures while women embrace new economic opportunities. This can result in tension over fertility choices. Goldin explains that "what women require of men's time to raise a family and be members of a modern labor market may exceed the time their more tradition-bound spouses, or future spouses, are willing to offer." The speed of economic growth per se is potentially less important than the societal transformations that go with it, as nations that are communal, tradition bound, and rural become more urban and better connected.

Time-use data support this hypothesis. In countries in the second group, women perform at least 2.5 hours more unpaid household and care work per day than men, compared with 0.8 to 1.7 hours of such labor for women in the first group of countries. This gender disparity in domestic labor exhibits a strong negative correlation with fertility rates. For example, Japan and Italy show gender differences of about 3 hours in unpaid work and have fertility rates of 1.36 and 1.27, respectively, while Sweden's 0.8-hour difference corresponds with a higher 1.7 fertility rate.

Fertility Rates and Economic Development, 1970–2022



Source: Researcher's calculations using data from Gapminder and the World Bank Group.

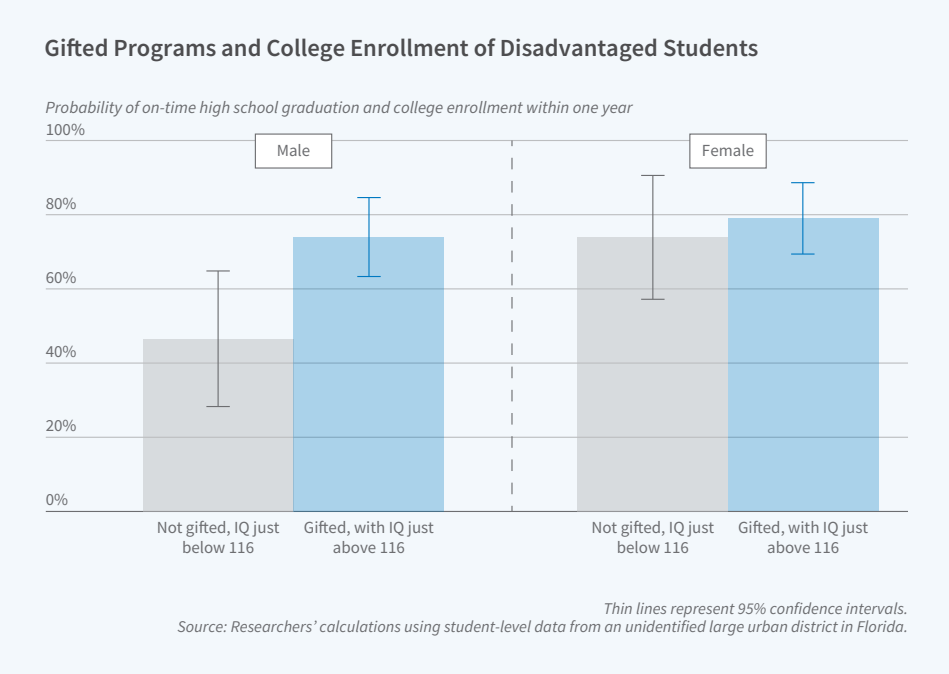
Cross-country evidence shows that rapid economic growth coupled with persistent traditional gender roles can result in sharp fertility declines, particularly when women disproportionately supply unpaid domestic labor.

Gifted Education Boosts Achievement of Disadvantaged Boys

Girls are more likely to go to college than boys. One explanation for this pattern is that boys have weaker noncognitive skills, such as self-discipline, than girls. In Can Gifted Education Help Higher-Ability Boys from Disadvantaged Backgrounds? (NBER Working Paper 33282), David Card, Eric Chyn, and Laura Giuliano examine the impact of gifted education on boys from low-income or non-English speaking families, focusing on noncognitive skill development and college enrollment.

The researchers study a gifted program in a large Florida school district. Gifted students receive an education plan with curricular and social/emotional goals aimed at maintaining engagement in school. They meet with a specialist every two years and at the transitions to middle and high school for additional guidance. In 4th and 5th grades, gifted students are assigned to separate classrooms taught by teachers with specialized training in gifted education. All these features could contribute to noncognitive skill development.

The study focuses on English language learners and students who qualify for free or reduced-price lunches — indicators used by the state to proxy for a disadvantaged background. To qualify as gifted, these students must score at least 116 points on an IQ test — roughly the 84th percentile of the score distribution. The researchers identify 5th grade enrollees in the district who scored between 106 and 124 on an IQ test. Among this narrow set of students, those with scores just above 116 points have a much higher probability of entering the gifted program than those scoring just below. They then use a regression discontinuity approach to compare schooling outcomes between these two groups of students, isolating the effects of gifted status on "complier" students whose entry to the program depends on having an IQ score above 116.



In a large Florida school district, being classified as "gifted" led to a 25–30 percent increase in on-time high school graduation and college entry rates for disadvantaged boys.

They show that entry to the gifted program raises the probability that disadvantaged boys graduate high school on time and enter college the next fall from a rate of only 50 percent if they miss the gifted threshold to 75 percent. For disadvantaged girls with scores near 116 points, in contrast, the program has little effect: their rate of on time college entry is about 75 percent regardless of entering the gifted program or not. In other words, entry to the gifted program closes the gender gap in on-time college entry, enabling boys to achieve about the same rate as girls with similar IQs.

The researchers find that participation in the gifted program had no effect on the standardized test scores or PSAT exam scores of boys or girls, suggesting that gifted services do not increase the cognitive abilities of students. However, they find relatively large effects for boys on course selections and course grades — outcomes that are often interpreted as indicators of noncognitive skill when cognitive ability is held constant. Marginally eligible boys were more likely to enroll in advanced tracks in middle school math and language arts and to take Algebra I before 9th grade. They also took almost twice as many Advanced Placement courses in high school. These effects were large enough that boys' rates caught up to those of girls with similar IQs. Despite having a more challenging curriculum and higher-achieving classmates, gifted boys earned substantially higher course grades in high-school mathematics — narrowing (but not fully closing) a large gender gap — and did not experience any negative impacts on their grades in other subjects.

— Greta Gaffin

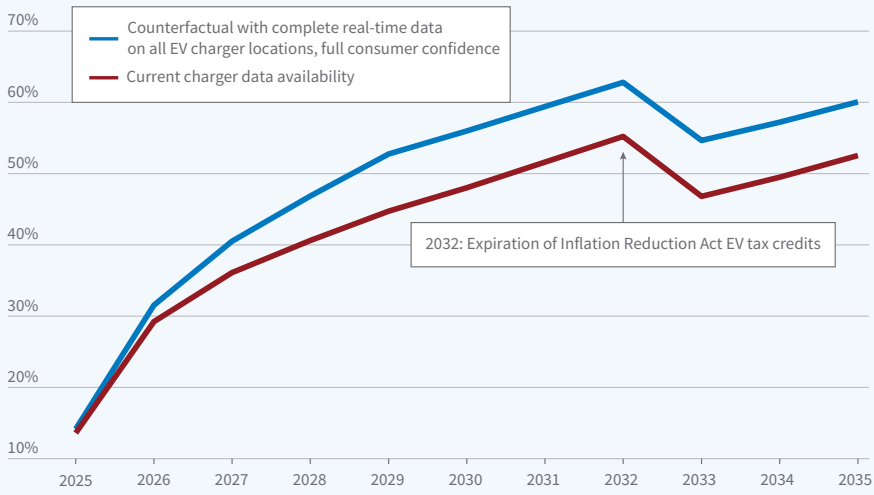
The research reported here was supported by the Institute of Education Sciences, US Department of Education, through grant R305C200012 to the National Center for Research on Gifted Education.

Real-Time Charging Data Could Accelerate Electric Vehicle Adoption

Charging infrastructure reliability and accessibility remain significant impediments in the transition to electric vehicles (EVs). While the Bipartisan Infrastructure Law included substantial investments to expand the charging network, potential EV buyers often struggle to determine whether chargers are functioning and available when needed. In Charging Uncertainty: Real-Time Charging Data and Electric Vehicle Adoption (NBER Working Paper 33342), researchers Omar Isaac Asensio, Elaine Buckberg, Cassandra Cole, Luke Heeney, Christopher R. Knittel, and James H. Stock examine how improving real-time charging data availability could affect EV adoption rates.

The researchers analyzed real-time charging data from fast chargers along six major US interstates between March and August 2024. These highways represent 27.7 percent of the interstate system. The researchers found that only 32.9 percent of charging stations provided real-time status information through PlugShare, a major charger-finding application. Data deserts exacerbate the problem, with stretches of up to 1,308 miles without status information. Tesla and Electrify America, the two largest fast charging providers, do not share real-time data to central apps, though they operate approximately half of the charging stations along the studied highways.

To assess consumer attitudes, the researchers surveyed current EV owners and prospective buyers about their confidence in charger reliability. Even when real-time data indicated a charger was working and available, prospective EV buyers assigned only a 65 percent probability of successful charging. Current EV owners, who probably had more experience with visiting charging stations that were supposed to be available, were more pessimistic at 59 percent. Both groups expressed even lower confidence in chargers without real-time status information: 52 percent for prospective buyers and 41 percent for EV owners.



Source: Researchers' calculations using data from PlugShare and researchers' surveys.

Universal real-time charging data availability combined with improved reliability could increase EV market share by up to 8 percentage points by 2030.

Using these findings, the researchers modeled three scenarios for universal real-time data implementation, which could be achieved by charging providers posting status data either voluntarily or though policy mandates. With 100 percent real-time data availability by 2029 but no other changes, they forecast that the EV share of new vehicle sales would increase by 1.1 percentage points in 2030. If universal real-time data reporting improves charger uptime to 97 percent, the EV sales share could rise by 2.7 percentage points. If universal real-time data and improved reliability raise consumer confidence in chargers, the EV sales share could increase by 8.0 percentage points, the researchers forecast. This would expand the total EV fleet by 13.2 percent.

Accelerating EV adoption has important implications for carbon emissions. In the high scenario, the researchers project a reduction of 22.5 million metric tons in 2030, compared to the emissions if the status quo level of information on charger availability persisted through that year. This reduction amounts to more than one-quarter of the emissions reductions expected from the EV provisions in the Infrastructure Investment and Jobs Act and the Inflation Reduction Act, yet at zero fiscal cost.

The researchers are grateful to the Harvard Salata Institute for Climate and Sustainability and MIT CEEPR for funding this project.

Distance to College Contributes to Educational Disparities

Proximity to a community college impacts college enrollment and degree completion, particularly for minority and low-income students. Consequently, disparities in geographic access to higher education contribute to educational attainment gaps across demographic groups.

In Distance to Degrees: How College Proximity Shapes Students' Enrollment Choices and Attainment Across Race-Ethnicity and Socioeconomic Status (NBER Working Paper 33337), Riley K. Acton, Kalena Cortes, Lois Miller, and Camila Morales analyze administrative data covering all Texas public high school graduates from 2013 to 2017. They focus on "community college deserts" — areas where students must travel for at least 30 minutes to reach the nearest public two-year college.

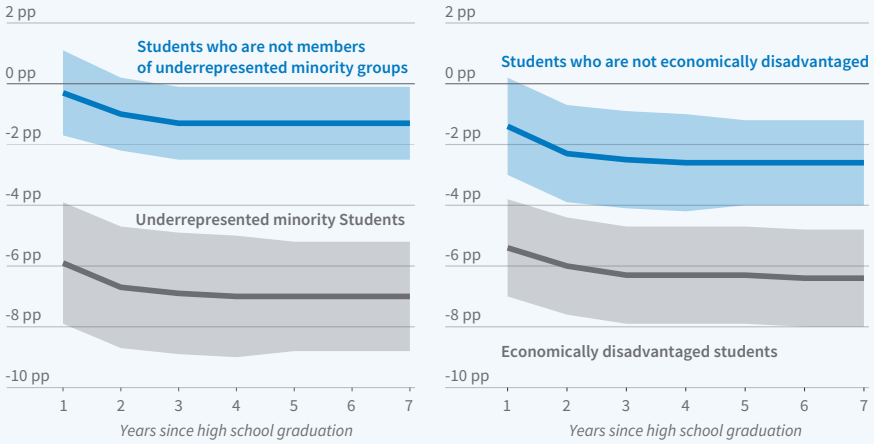
The researchers link student records with driving distances between Texas high schools and college campuses to examine relationships between distance to college and postsecondary outcomes. Their comprehensive dataset, which also includes information on student demographics, academic preparation, and high school characteristics, allows them to track enrollment patterns, credit accumulation, and degree completion for up to eight years after high school graduation.

The researchers find differences related to race, ethnicity, and socioeconomic status in how students respond to living in community college deserts. White and Asian students who live far from community colleges tend to substitute by enrolling in four-year universities instead. When these students attend a high school in a community college desert, they are 4.4 percentage points more likely to enroll in a public four-year college and at least 1.3 percentage points more likely to complete a bachelor's degree compared to their peers who live within 30 minutes of a community college.

In contrast, Black and Hispanic students living in community college deserts are less likely to pursue any higher education: they exhibit 5.9 percentage point lower overall college enrollment rates and 1.1 percentage point lower bachelor's degree completion rates. Similarly, economically disadvantaged students show a 5.4 percentage point reduction in college enrollment and a 2.6 percentage point drop in degree completion.

The effects persist over time and remain significant even after controlling for academic preparation. Living in a community college desert reduces overall degree completion by 16.9 percent for Black and Hispanic students and 15.7 percent for economically disadvantaged students, compared to their peers who do not live in community college deserts. Approximately half of this effect stems from reduced initial enrollment in college, while the remainder reflects lower persistence and completion rates among those who do enroll.

College Enrollment and Community College Proximity



Students live in community college deserts if there is no public two-year college within a 30 minute drive of their high school.
Source: Researchers' calculations using data from the University of Texas at Dallas Education Research Center.

In Texas, disadvantaged students often forgo college entirely when far from a community college while more advantaged students substitute towards four-year colleges.

Institutional support was provided by Miami University, the University of South Carolina, the University of Texas at Dallas, Texas A&M University, and Stanford University.

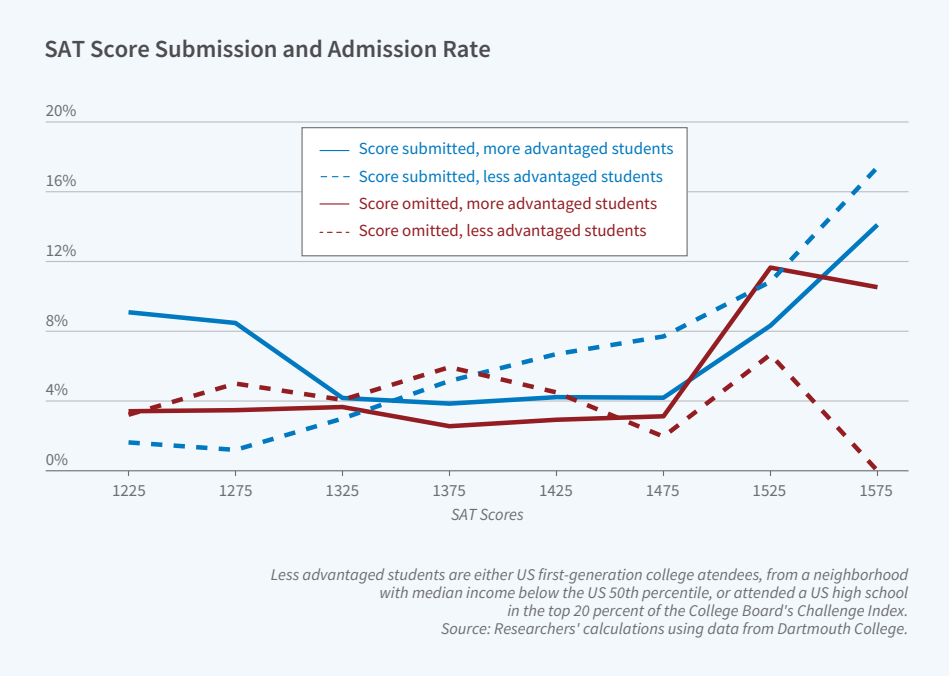
Test-Optional Policies and Disadvantaged Students

The role of standardized tests in college admissions has been a subject of intense discussion and evolving policies for some time. While proponents argue that test scores are vital indicators of academic preparedness, others believe they perpetuate inequality because of differential access to test preparation and the potential for cultural bias in test content. This debate led some colleges and universities to adopt test-optional policies. Then, during the COVID-19 pandemic the vast majority of American colleges and universities stopped requiring standardized test scores, as the tests stopped being administered in much of the country. Many schools are currently reevaluating if and how they should use standardized tests as part of admissions moving forward.

In How Test-Optional Policies in College Admissions Disproportionately Harm High Achieving Applicants from Disadvantaged Backgrounds (NBER Working Paper 33389) Bruce Sacerdote, Douglas O. Staiger, and Michele Tine examine the impact of test-optional policies at Dartmouth College. The researchers show that test optional policies are detrimental to high achieving, disadvantaged students because under such policies high achieving disadvantaged students submit scores at too low a rate, thereby lowering their chances of admission.

The researchers' study two test-required admissions years (2017 and 2018) and two test-optional years (2021 and 2022). During the test-optional years, some students submitted their test scores when taking the exam but later requested that the scores not be used in admissions. The researchers were able to see the "hidden scores", which allowed them to compare the probability of admissions for students who had the same SAT score but where one student revealed that score to admissions and the other did not.

They find that test-optional policies reduce the probability of admissions for high achieving disadvantaged students. Specifically, the authors find



Less advantaged students are either US first-generation college atendees, from a neighborhood with median income below the US 50th percentile, or attended a US high school in the top 20 percent of the College Board's Challenge Index.
Source: Researchers' calculations using data from Dartmouth College.

Disadvantaged students with SAT scores above 1400 can substantially boost their probability of college admission by submitting their scores.

that disadvantaged students with an SAT score above 1400 (out of a possible 1600) were more than three times as likely to receive an admissions offer if they submitted their score than if they did not. A disadvantaged student with a score of 1550 increases their chance of admission by 10 percentage points by submitting their score. Despite this benefit, not all disadvantaged students with high scores chose to submit them. The increase in admission probability associated with submitting a high score is much smaller for students from more advantaged backgrounds. This suggests Admissions officers can more readily interpret their applications due to familiarity with their high schools' reputations and academic standards.

Importantly, Admissions officers consider applicants within the context of their neighborhood and school, meaning a student from a disadvantaged background with a high SAT score will receive greater attention for their score than a student from an environment where high scores are common. For example, a high score is a more positive signal for a student from a high school where 1200 is the 75th percentile score than for a student attending a school where the 75th percentile score is 1400.

The researchers note that the way in which scores are used in context is not always clear to applicants. Students from disadvantaged backgrounds are unlikely to realize that their score may have a higher potential impact on their likelihood of admission than on that of a more advantaged applicant with the same score.

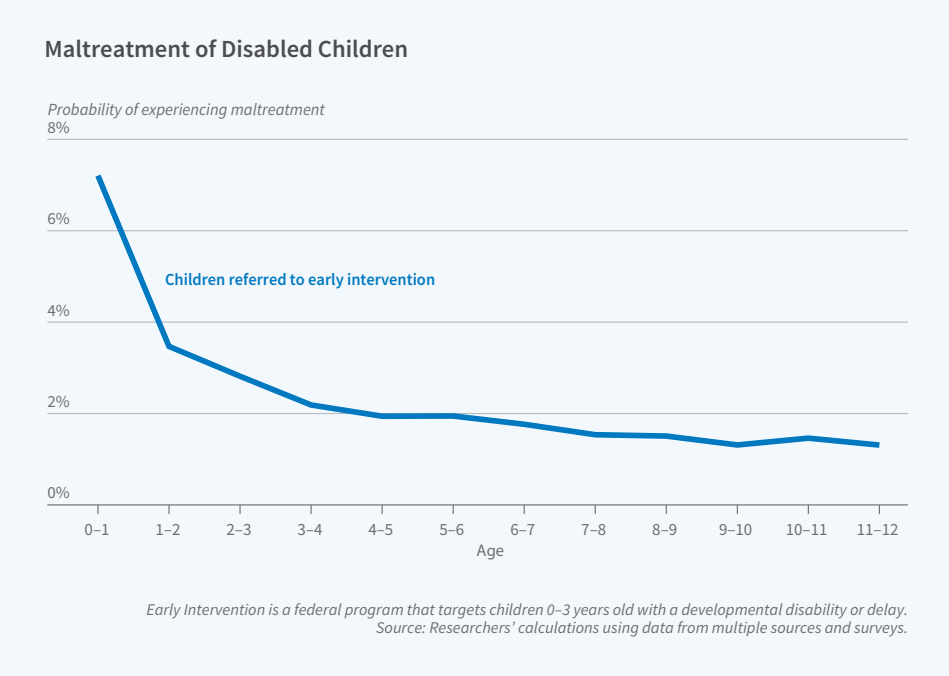
The researchers also show that the switch to a test score optional policy did not increase the demographic diversity of the applicant pool and that test scores predict academic success in a similar way regardless of student background. In contrast, other aspects of the application, like guidance counselor recommendations, are less predictive of academic success in college and tend to favor higher-income students.

— Greta Gaffin

Vulnerable Children and the Federal Early Intervention Program

Children with disabilities are three and a half times more likely to suffer from maltreatment. The federal Early Intervention (EI) program, which serves 3.7 percent of children under three, supports families in meeting the developmental needs of children who have, or are at risk for, developmental delays or disabilities. In Can Early Intervention Reduce Future Child Maltreatment? (NBER Working Paper 33341), Anna Aizer and Emilia Brito Rebolledo examine whether EI participation reduces the risk of future maltreatment. EI differs from traditional prevention programs in that the stated purpose is not necessarily to reduce maltreatment, it targets at-risk children rather than parents, operates through a cooperative model that engages families as partners, and intervenes at an earlier stage.

The researchers analyze administrative data from Rhode Island, linking EI participation records from 2010–19 with child maltreatment data through 2023. They control for a rich set of pretreatment characteristics and compare children who received EI services in their first year of life with children who were evaluated but found ineligible for EI. Their results indicate that early receipt of EI services significantly reduces substantiated neglect after age 3 by 3.3 percentage points, a 45 percent reduction, and lowers the likelihood of foster care placement by 2 percentage points. Smaller effects of the same sign are observed for those receiving EI later.



Early Intervention is a federal program that targets children 0–3 years old with a developmental disability or delay.
Source: Researchers' calculations using data from multiple sources and surveys.

Early intervention services provided in a child's first year reduce maltreatment risk by 3.3 percentage points.

In the Rhode Island data, children in the EI program come from more disadvantaged backgrounds, with mothers more likely to be single, younger, less educated, and reliant on Medicaid than those in the general population. The researchers suggest that in light of these risk factors, the reduction in maltreatment they observe is likely a lower-bound estimate of EI's protective effect.

The findings contribute to the literature on early investments in child wellbeing and the role of public programs in reducing maltreatment. They align with evidence from the Nurse-Family Partnership, which also shows protective effects through early, cooperative engagement with families. Given the high costs of child maltreatment — which some estimates put at $230,000 per case — the researchers note that a reduced number of maltreatment cases generates savings that could offset a substantial fraction of the costs of EI expansion.

— Abigail Hiller

This research was supported by the Population Studies and Training Center at Brown University through the generosity of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (P2C HD041020).