



What We Know about Our Schools

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INTRODUCTION

K-12 education and preschool policies and practices—what some economists have called the technology of human capital formation—have not escaped the ideological divide cascading through politics and society as the United States approaches the 250th anniversary of the signing of its Declaration of Independence. Conservatives disagree with liberals, Republicans with Democrats, ultraconservatives with uber-progressives. This climate heightens tensions around long-standing policy debates, such as whether to pay teachers more or differently or to direct more government funds outside the traditional public system, as well as more straightforward empirical questions. Are racial, ethnic, and socioeconomic achievement gaps narrowing or widening? Are schools becoming more segregated?

Despite numerous ideological and partisan differences on these and many other questions, scholars and informed observers broadly agree or, at least, do not disagree strenuously on a broad range of facts, trends, and key policies. Without papering over differences, we delineate in this essay the research consensus among informed observers, though we do not ignore domains where convincing research is lacking. One of us leans toward the conservative side of the political spectrum, the other toward the liberal: we hope that by joining together we avoid a skewed interpretation of this consensus.

We organized this essay using a series of questions chosen to reflect what we anticipate would be of greatest interest to our readers; these questions cover many big topics but are not meant to be comprehensive. We exclude curricular and pedagogical topics, which are critical for the success of American education but are outside our areas of expertise. Further, these topics often raise value questions that cannot be resolved by scientific research. For the best objective information, we refer readers to the What Works Clearinghouse, a program operated under the aegis of the US Department of Education: it provides information on educational programs that have been evaluated according to rigorous statistical standards.

EDUCATION'S IMPORTANCE

HOW IMPORTANT ARE SCHOOLS FOR THE FORMATION OF HUMAN CAPITAL? WHAT ARE THE ECONOMIC AND SOCIAL BENEFITS OF EDUCATION TO INDIVIDUALS?

The Organization for Economic Co-operation and Development, an international organization of industrialized nations, defines human capital as “knowledge, skills, and other characteristics embodied in people that helps them be productive.” Similarly, Becker says it refers to “activities that influence future monetary and psychic income by increasing resources in people” (Becker 1964, 11). Families, communities, and many societal institutions contribute to the formation of human capital, but public schools are the principal governmental institution organized for this purpose in the United States.

Schooling is correlated with large economic and other benefits to the individual and to society more broadly. Some of this correlation is driven by underlying and often unobserved individual characteristics associated with success in school, the labor market, and civic society, but research shows that schooling is in part a cause of these benefits, independent of other individual characteristics. For example, an additional year of compulsory schooling is correlated with a 13 percent increase in weekly earnings (Oreopoulos and Salvanes 2009).

Education beyond the years of compulsory education also enhances human capital, although its value is not always appreciated. In 2024, 40 percent of the adult population said it was not “too important” or not “at all” important to have a college degree to get “a well-paying job.” Only 22 percent think it is worth the cost if one must take out a loan to complete a four-year degree. On average, those with a four-year degree in 2022 received an average annual income of \$77,000, up from about \$71,000 in 2000 (in 2022 dollars). Meanwhile, those with some college education, but no four-year degree, earned just \$50,000 annually, about the same as at the turn of the century. For those with only a high school diploma, earnings were about \$45,000, little more than in 2000 (in 2022 dollars). The decision to forego a four-year degree program in favor of technical training may make sense for some high school graduates, but it is undeniable that the income returns to additional years of higher education have risen throughout the twenty-first century.

Greater levels of education are associated with non-economic benefits to individuals, though it is challenging to determine the extent to which knowledge acquired in school. More highly educated people are more likely to exercise, have more nutritious diets, and secure needed healthcare. They are less likely to consume tobacco and narcotic drugs, commit crimes, be arrested, and endure incarceration. Educated women are less likely to bear a child as a single mother during their teenage years (Kearney 2023). They are more likely to vote, sign petitions, volunteer for civic organizations, and be socially engaged more generally.

Critically, the benefits of parents’ education are passed on to their children. Better educated mothers and fathers are more likely to have healthy, well-nourished children prepared to learn

at school. Even among parents with similar household incomes, the better educated are more likely to have children who themselves pursue further education, receive a four-year degree, and earn high salaries later in life (Oreopoulos and Salvanes 2009).

WHAT ARE THE CIVIC OR SOCIETAL RETURNS TO EDUCATION?

Beyond the monetary and social returns of education to the individual, there are civic or societal returns, often called spillover effects, that come with an increasingly educated workforce. Workers are more productive when the higher skills of better-educated colleagues complement those of each individual employee. Countries with a more educated populace are wealthier nations. A one-year increment in a country's average level of educational attainment is associated with an 0.37 percentage point increase in its gross domestic product (GDP), more than 10 percent of average annual growth in GDP (Barro 2001). In addition, the more students have learned in school, the greater the growth in GDP (Hanushek and Woessman 2008, 2011, 2012).

A well-educated society is more likely to experience less inequality, greater intergenerational mobility, less crime, less public corruption, greater protection of individual liberties, and more stable democratic practices (Lipset 1959). Oppression and authoritarian regimes are not unknown in well-educated societies, but the incidence is much greater in countries where education levels are low.

WHAT HAS BEEN THE IMPORTANCE OF EDUCATION FOR THE DEVELOPMENT OF THE UNITED STATES?

Americans have from the country's earliest years recognized the economic and civic value of a robust educational system. At the time of the Declaration of Independence, a large share of the population was thought to be literate enough to read, and popular broadsheets, including Thomas Paine's *Common Sense*, were distributed in taverns and other public places. John and Abigail Adams, Benjamin Rush, Thomas Jefferson, and other early patriots viewed an educated public as necessary for liberty, equality, and responsible citizenship. In 1785, Congress set aside for education the revenue from the sale of one of every sixteen sections of land in the Northwest Territories. After visiting the America heartland during the 1830s, French aristocrat Alexis de Tocqueville expressed astonishment at citizens' "exertions for the common weal," writing "I know of no people who have established schools so numerous and efficacious" (Peterson 2010, 31).

During the 1840s, Massachusetts educator Horace Mann led a campaign for statewide support for compulsory public education, sparking a movement that spread throughout the North prior to the Civil War and culminated in the creation of a US Office of Education in 1870. So widespread was the support for the "little red schoolhouse" that the United States became one of the first countries to complete a near-universal elementary educational system. It also led the world in the construction of comprehensive high schools that served more than a small elite. By the 1950s, the country became the first to build a well-developed system of higher education.

Decentralized state and local control of US schools facilitated rapid expansion and adaptation to local cultures and norms, but it also allowed major inequities in the provision of schooling. Before 1954, schools in the southern and border states were completely segregated by law, and those in many other parts of the country were also highly, if not completely, segregated. Immigrant children were freely admitted to public schools, but they were expected to learn in English, especially after World War I when German-language instruction was forbidden. Students with disabilities were excluded from many schools until a federal law mandating special education was passed in 1974. Resources available for instruction varied widely among districts, depending on the wealth of the community. Wide achievement gaps across ethnic and social groups persist to this day.

Despite these inequalities, early and rapid expansion of the US educational system contributed to the formation of human capital critical to the formation of a thriving industrial economy by the end of the late nineteenth century. US educational and economic strength was critical for the nation's well-being throughout the twentieth century, including its successful defense of that well-being during two world wars and a Cold War confrontation with a nuclear power.

ACHIEVEMENT

DID STUDENT ACHIEVEMENT IMPROVE IN THE DECADES BEFORE THE COVID-19 PANDEMIC?

The US National Assessment of Educational Progress (NAEP) and two international agencies regularly issue reports on trends in student achievement in the United States. Although these sources are not in perfect agreement, they paint a generally consistent and clear big picture. To facilitate comparisons of tests across agencies, we describe results in standard deviations (sd). To make results interpretable, we apply the generally accepted assumption that 0.3 sd reflects roughly one year's worth of learning (CREDO 2023).

When these tests are analyzed together, they show that student achievement has increased substantially since 1970 in both reading and math, but considerably more so in the latter. Achievement on the Main version of NAEP, which has data for representative samples from all 50 states, reaches its peak in 2013 and then begins to decline. This decline is moderate until 2019, after which achievement falls sharply after the onset of the COVID pandemic. According to the median estimate taken from all surveys, the increase in math achievement climbs from 1970 to 2015 by 0.95 sd, or about three years' worth of learning (Shakeel and Peterson 2022a). There is less change over time in reading, with gains of about two-thirds of a year of learning by 2015. After 2010, achievement progress in both subjects stalls (Gordon and Reber 2021) and then falls precipitously during the pandemic.

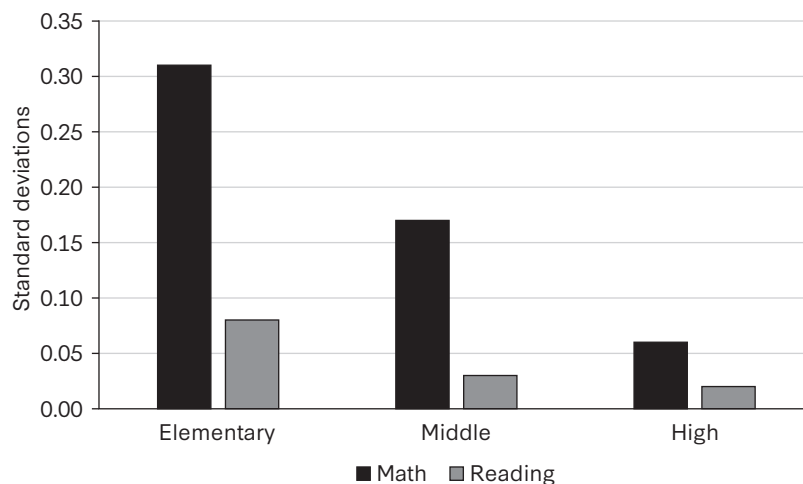
The trends vary by the age at which a student is tested. The largest improvements are observed when students are tested in elementary school; the upward shift is less steep when students are tested in early adolescence (ages thirteen to fifteen); when students are tested as they

reach the end of high school, gains are barely observed in math and not at all in reading. Over the entire period, achievement between 1970 and 2015 in elementary school rises by the equivalent of four years' worth of learning in math and by one and one-third years' worth in reading. For middle school students, about half that amount of achievement growth in achievement is measured over the same period. The amount of progress observed among students who are about to leave high school is still less: about a year's worth of learning in math and half that in reading (figure 1).

Racial and ethnic test-score gaps have diminished since the early 1970s (figure 2). When tests at all ages are considered, the Black-White and Hispanic-White test-score gaps narrowed by about one-half between 1970 and 2017. However, sizable gaps remained and showed no signs of closing further in the years before the pandemic (Gordon and Reber 2021). Asian performance improved sharply throughout the period, eventually surpassing that of White students. Among high school seniors, Black-White gaps and Asian-White gaps diminished. However, Hispanic-White gaps among high school seniors remained as large as they were at the beginning of the period (figure 2).

Socioeconomic achievement gaps also shrink between 1970 and 2015, especially when students are tested in elementary school, where they diminish by three years' worth of learning in reading and a year and one-third in math (figure 3). During that same period, socioeconomic gaps for middle school students close by less than half that amount; for students near the end of high school, the socioeconomic divide over time shrinks only slightly in math and widens marginally in reading (figure 3). These results are consistent with two other studies of trends in socioeconomic status (SES) differentials that track trends in temporally linked achievement

FIGURE 1 Changes in student achievement per decade in the United States, 1970-2017

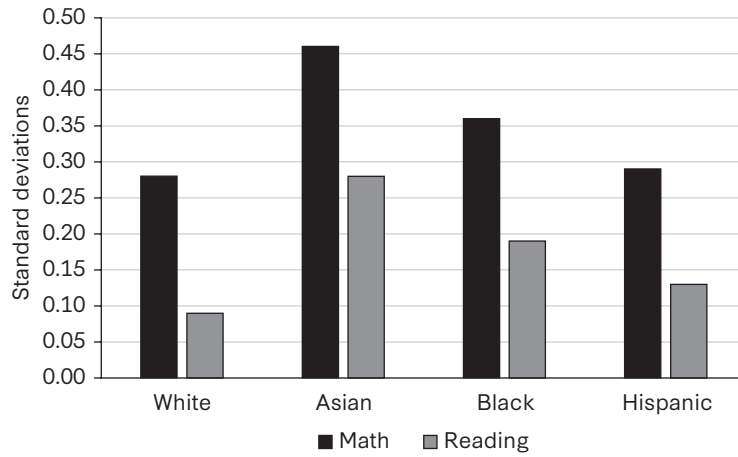


Note: Elementary refers to students tested in grade 4 (or at age 9); middle pertains to students tested in grade 8 (or at ages 13-15), and high pertains to students tested in grade 12 (or at age 17). The data are based on an analysis of seven million tests taken between 1971 and 2017.

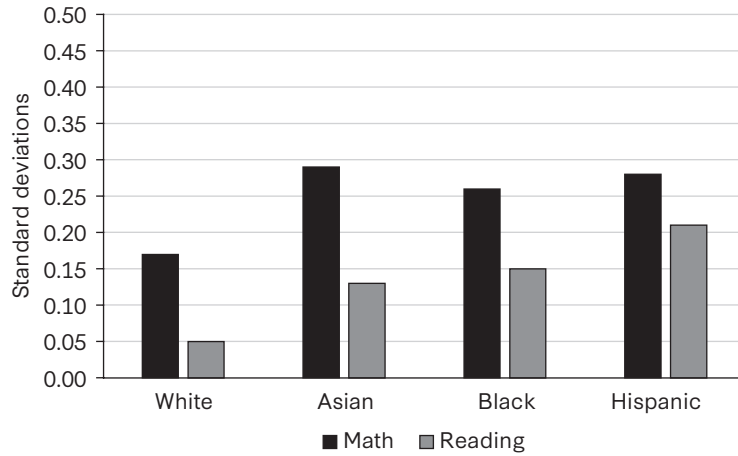
Source: Shakeel and Peterson (2022b).

FIGURE 2 Changes in student achievement per decade in the United States, by race and ethnicity, 1971-2017

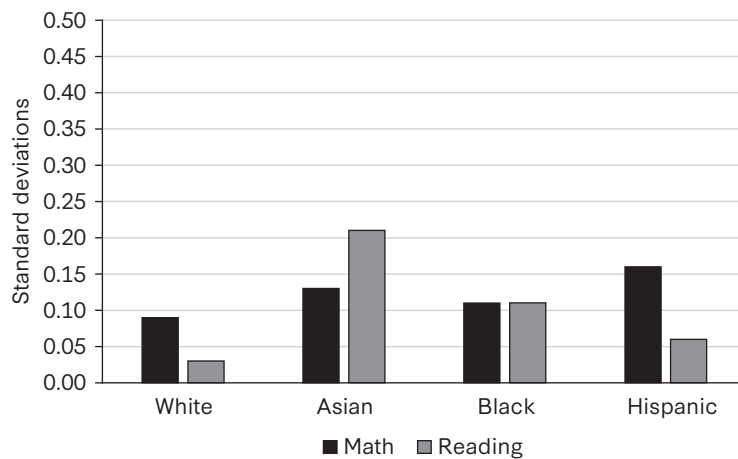
Panel a. Elementary



Panel b. Middle



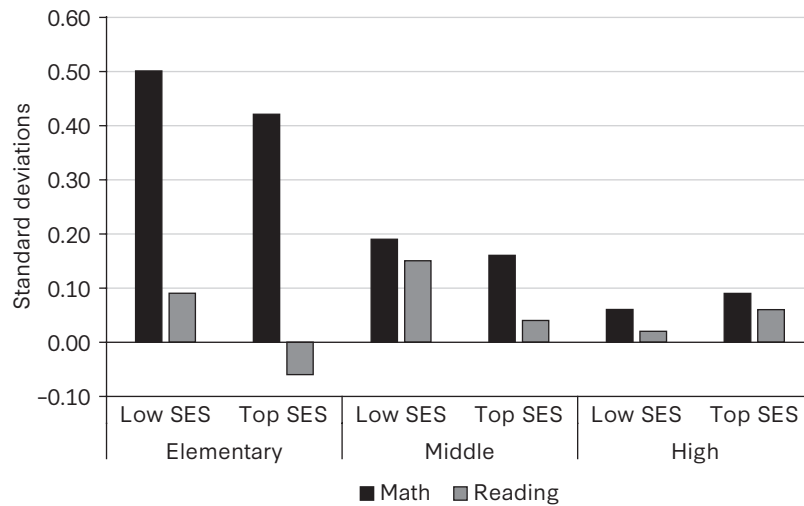
Panel c. High



Note: See figure 1.

Source: Shakeel and Peterson (2022b).

FIGURE 3 Changes in student achievement per decade in the United States, by socioeconomic status, 1971-2017



Note: See figure 1. Socioeconomic status is estimated through an index based on student reports of parent’s education and possessions in the home. Low is the bottom and high the top of the distribution.

Source: Shakeel and Peterson (2022b).

tests administered for students at the same age or grade (Hanushek et al. 2022; Hashim et al. 2022); an earlier study found increasing gaps but it relied on nontemporally linked tests (Reardon 2011).

Improved test performance between 1970 and 2015 of US elementary school students is likely due to a combination of factors. First, parental investments in children have likely increased in quantity and quality, due to increased average parental education, fewer children per family, and more parental time spent with children. Second, elementary schools may be more effective than ever before, consistent with higher education spending, smaller class sizes, reduced segregation, more equitable resource allocation, and the broader provision of ancillary services. Third, improved nutrition and healthcare have enhanced brain development during what is known as the golden period, the approximately one thousand days between conception and the age of two, a time when brains are rapidly developing. If babies receive needed nutrients both before and after they exit the womb, and if nutrients do not need to be used to counter contagious diseases or environmental insults, they will later enjoy greater capacity to reason with fluidity. Many of these factors are also likely contributors to the larger gains in academic performance by non-White students over much of that period.

Yet achievement gains are smaller when students are tested in middle and high school. Research has not established definitive explanations for the differential achievement trends at primary and secondary levels. Many programs and interventions have been shown to yield shorter-term improvements that “fade out” over time; in other words, students appear to learn more during some period associated with a particular intervention or more intensive resources, but when they are returned to a status quo educational setting, they return to

status quo achievement. Indeed, many of the education policy initiatives of recent decades have targeted younger students; test-based accountability, in particular, created incentives for districts to focus on preparing students before they reach the initial testing in third grade.

Changes in the cultural context may also have had adverse effects on adolescent learning. Growing skepticism about the value of education, increased cellphone usage, intensity of social media interactions, and changing ideas of what constitutes professional success and the extent to which education is needed for it could all be contributing to fade-out. More studies on these questions are needed because quality research on these topics is limited at best. Secondary achievement may also be hampered by a decline in the quality of the teaching force in secondary public schools. Secondary school teachers, relative to elementary school teachers, are paid 10 percent more in the private sector than the public sector. The below-market salaries paid to secondary teachers in the public sector has likely made it more difficult to recruit qualified secondary public school teachers during a period when women have better alternative occupational opportunities.

WHAT HAVE BEEN THE EDUCATIONAL AND FISCAL IMPACTS OF THE PANDEMIC?

Academic performance deteriorated markedly during the COVID pandemic. Between 2019 and 2022, NAEP math achievement fell by a half-year's worth of learning in fourth grade and two-thirds of a year in eighth grade. The loss is less in reading, about one-fourth of a year at both grade levels. During this period, instruction in many districts was provided in part or in full on online platforms for months or even for longer than a year, an instructional mode that proved to be markedly inferior when deployed on an emergency basis by untrained administrators and teachers (Goldhaber et al. 2022). Achievement also declined in districts that quickly restored in-person instruction, consistent with the pandemic's impacts beyond the schoolhouse. A World Bank estimate, averaging results from seven US studies, reports a drop in achievement of roughly a half-year's worth of learning (Patrinos, Vegas, and Carter-Rau 2022). Negative effects are larger for students who are socioeconomically or academically disadvantaged (Goldhaber et al. 2022).

A major increase in chronic student absenteeism—missing at least 10 percent of scheduled school days, or 18 days of a 180-day school year—occurred in the aftermath of the pandemic. Already a serious problem in 2018, chronic absenteeism increased in thirty-nine states by 75 percent (Malkus 2024). Educators are concerned that many students have begun to think of school as an option rather than a requirement.

The federal government responded by granting states and districts nearly \$200 billion in pandemic relief for K–12 education (Gordon, Junge, and Krvaric 2021), nearly four times more than the \$58 billion that the federal government spent on education programs in 2019 (Peterson and West 2024). The impact of those extra resources, which are being spent over several years, remains to be seen. Two early, unpublished studies show only small gains from the federal investment—recovering about 10 percent of the loss that had occurred—though some districts had much greater success (Dewey et al. 2024; Goldhaber and Falken 2024).

One of the more popular uses of the federal dollars, strongly endorsed by Secretary of Education Miguel Cardona, is to supply intensive tutoring, which small-scale experiments have shown to be effective in increasing achievement. Despite the promise of the intervention, districts have found it challenging to institute effective tutoring throughout the system, likely because finding capable tutors and scheduling them became increasingly difficult (Kraft, Schueler, and Falcon forthcoming). It remains to be seen to what extent affected cohorts of students will recover from pandemic learning losses, but it is clear that what happens within individual schools and districts is important for how quickly achievement recovers (Callen et al. 2024).

TEACHER QUALITY

Teachers constitute the publicly funded school resource with the largest impact on students' academic achievement. The effectiveness and quality of the classroom teacher demonstrably affect students' scores on standardized achievement tests. Year-to-year student achievement gains depend significantly on the educator present in the classroom (Goldhaber 2016). The benefits of more effective teachers extend beyond test scores to increased college-going and higher labor market earnings (Chetty, Friedman, and Rockoff 2014a, 2014b).

WHAT DO WE KNOW ABOUT TEACHER COMPENSATION, AND HOW DOES IT ALIGN WITH THEIR CONTRIBUTIONS TO STUDENT SUCCESS?

Despite the importance of teacher quality for student learning, teacher compensation systems are not well designed to attract or retain high-quality teachers. Instead, most districts pay public school teachers according to a "step and lane" schedule based on years of experience and educational attainment, as shown for New York City in table 1. These schedules are inefficiently rigid and poorly designed for retaining the most effective teachers in high-priority positions.

Pay for beginning teachers is set quite low and typically climbs only slowly in the first years of their careers: it then rises substantially after about ten years in the district (table 1). Rewarding experience in this way is inconsistent with the rate at which teacher effectiveness improves. The effectiveness of teachers, as measured by test-score performances of their students, shifts sharply upward between the first and second year, with clear additional gains over the next four years of teaching. After five years of teaching, little achievement gain from another year of experience in the classroom is observed (Chingos and Peterson 2011; Kane, Rockoff, and Staiger 2008). Thus, standard step-and-lane schedules do not reflect the teacher productivity profile, instead saving the steeper salary increases for teachers who have more than five years of experience (table 1). Pension benefits are also highly skewed toward long-term employees. Teachers who have worked in a district for fewer than five years are typically not eligible for a pension (Podgursky 2003). The slow growth in monetary rewards for teachers may contribute to a high teacher turnover rate: as many as half of teachers leave a school district within five years (Ingersoll 2001), a concern given that more experienced teachers may make valuable contributions to the overall climate of the school and children's social and emotional well-being.

TABLE 1 SALARY SCHEDULE FOR TEACHERS WITH BACHELOR’S AND MASTER’S DEGREES, NEW YORK CITY PUBLIC SCHOOLS, EFFECTIVE JANUARY 18, 2025

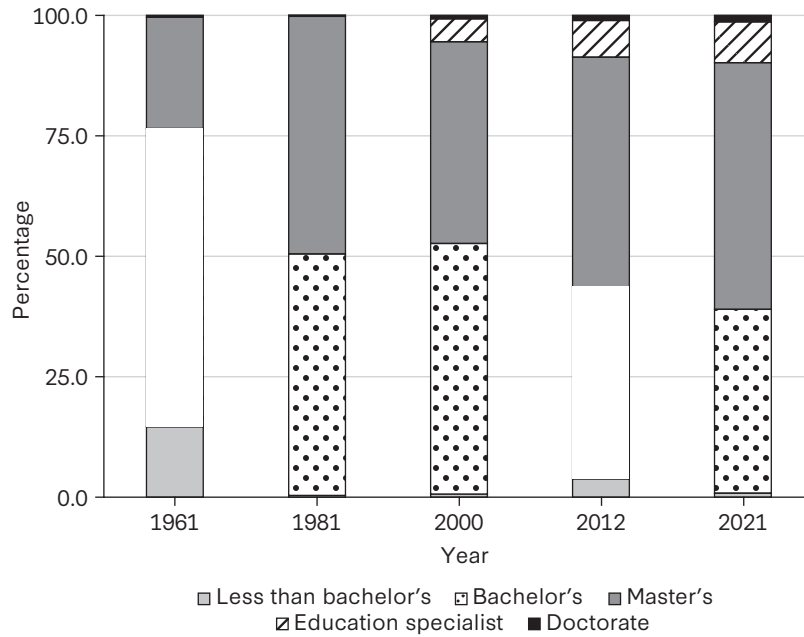
Teaching experience	Bachelor’s degree	Master’s degree	Master’s degree + 30 credits or professional development
1	\$66,733	\$75,017	\$83,300
2	68,060	76,344	84,627
3	68,622	76,906	85,189
4	69,616	77,900	86,173
5	70,475	78,759	87,042
6	71,399	79,683	87,966
6.5	72,710	80,944	89,277
7	74,655	82,939	91,222
7.5	79,212	87,496	95,779
8	83,473	91,757	100,040
8.5	88,536	96,820	105,103
8.5+L5	89,942	98,226	106,509
8.5+L10	94,281	102,565	110,848
8.5+L13	97,236	105,520	113,803
8.5+L13	103,472	111,756	120,039
8.5+L18	105,110	113,394	121,677
8.5+L20	117,210	125,494	133,777
8.5+L22	124,021	132,305	140,588

Note: The actual salary schedule comprises eight categories depending on the teacher’s qualifications, years of experience, and engagement with professional development. This table shows the three most important categories. The salaries increase with each six months of additional teaching experience after six years; hence, we have rows 6 and 6.5. The schedule distinguishes between years of teaching experience (at NYC Public Schools or elsewhere) and years of service (only at NYC Public Schools). Employees are entitled to longevity increases with 5, 10, 13, 15, 18, 20, and 22 years of service in the district. Those increases are \$1,406, \$5,745, \$8,700, \$14,936, \$16,574, \$28,674, and \$35,485, respectively. Although the L5 could be claimed at any time between 6 and 8.5 years, this table shows it being claimed only after 8.5 years.

Source: New York City Department of Education (2024).

Providing increased pay for teachers who earn additional educational credentials has even less research support. The share of teachers who hold a master’s degree or higher more than doubled from 1960 to 2020, rising from less than one-quarter of all teachers to more than one-half during that period (figure 4). Even though earning this degree does little, if anything, to enhance teachers’ abilities to lift student performance, most districts reward those with advanced degrees. According to a 2019 survey of the hundred largest districts

FIGURE 4 Percentage of public school teachers in the United States by highest degree earned in the United States, 1961-2021



Note: Data for 1961 and 1981 were taken from *Digest 2010*, table 73. Data for subsequent years were obtained from *Digest 2022*, table 209.10. Education specialist degrees are generally awarded for a year's work beyond the master's level. Before 1986, they were included in the master's category.

Sources: *Digest 2010*, table 73 and *Digest 2022*, table 209.10.

in the country, together with the twenty-four largest districts within each state, “on average, a teacher with a master’s degree earned \$5,285 more than a teacher with only a bachelor’s degree.” All but 8 percent of the districts either paid teachers a flat salary increase or a bonus for the advanced degree or else they embedded the increase in step-and-lane schedules (Nittler 2019). Teachers who earned advanced degrees incurred the time and expense of obtaining the degree, often while teaching full-time. It took teachers in the typical large district about eight years to break even on their investment in a master’s degree; in five large districts, 40 percent broke even within five years (Nittler 2019).

Other pay distortions may be more serious. The pay schedule is uniform across fields, but teacher shortages are concentrated in certain areas: for example, in math and science, where potential educators have more remunerative alternatives, and in special education and English taught as a second language, fields that require specialized competence. Shortages in these fields are larger in schools that have high concentrations of low-income students; this problem is worsened by the rule that gives senior teachers the first choice of positions when they become available. They tend to migrate away from high-poverty schools, leaving them with more first-year teachers (García and Weiss 2019).

Nor does the standard salary scale allow districts to provide higher-performing teachers additional compensation. It has proven extremely challenging to implement performance-based

pay both because it is difficult to measure teacher effectiveness and because teachers and teacher organizations strongly oppose “merit pay” (Peterson, Henderson, and West 2014). A short-lived Dallas reform rewarding effective teachers in low-performing schools increased levels of achievement in those schools; after it was terminated, many of those teachers left their schools, and test scores fell (Morgan et al. 2023). A well-designed performance pay plan in the District of Columbia provoked controversy when introduced. Even though it has had a positive impact on student performance (Dee and Wyckoff 2015; Dotter, Chaplin, and Bartlett 2021), other districts have been reluctant to adopt similar policies. When performance-pay plans are mandated by states, they are so poorly designed and financially supported they have little, if any, impact on student achievement (Bleiberg et al. 2023).

WHAT IS THE EFFECT OF TEACHER PREPARATION PROGRAMS ON STUDENT PERFORMANCE?

States are responsible for determining requirements for licenses or certification to teach in public schools. To obtain a license, one must hold a bachelor’s degree and, in most cases, have received a certificate granted on completion of thirty course hours in the field of education, roughly equivalent to one year’s worth of instruction. The specific set of required courses varies, depending on the grade level and subject content the individual plans to teach. Podgursky (2005, 29) reported that “260 different certificates and endorsements (171 vocational, 89 nonvocational)” were issued in Missouri that year and that “most other states have equally Byzantine systems for teacher licensing.” Only eight states acknowledge the validity of teaching licenses obtained from other states; some others agree to reciprocal recognition of each other’s licenses if teachers fulfill additional obligations (Goldhaber, Grout, and Holden 2017; Northcote 2020). Districts are increasingly hiring either temporary teachers or those who plan to be certified while teaching, a pathway known as alternative certification; one of every four new teachers in 2021 entered the profession through this route (Kraft and Lyon 2024).

Although a college degree and an informed assessment of a candidate’s suitability for the classroom are sensible basic requirements for entering the teaching profession, state licensing laws go far beyond these basics in ways that are hard to justify. Most studies show little benefit from being taught by certified rather than uncertified teachers (Chingos and Peterson 2010; Kane, Rockoff, and Staiger 2008; Koedel et al. 2015), though a North Carolina study found benefits for students from teacher preparation programs in that state (Clotfelter, Ladd, and Vigdor 2010). Explanations for the inadequacy of existing teacher preparation programs point to their focus on topics like educational philosophy and educational history rather than on the academic content they will be teaching or the skills instruction (curriculum development, classroom management, practice teaching) that can prepare beginning teachers to hit the ground running.

Teacher effectiveness in raising student achievement increases substantially between a teacher’s first and second year (Chingos and Peterson 2010; Kane, Rockoff, and Staiger 2008; Koedel et al. 2015). This pattern suggests that teachers encounter a steep learning curve during their first year, which is strong evidence that preservice and in-service training should

be modeled on practices that occur within the workplace. Boyd and colleagues (2009) found that teacher preparation that “focuses more on the work of the classroom and provides opportunities for teachers to study what they will be doing as 1st-year teachers” produces more effective teachers. Some new teacher preparation programs, such as the online Relay Graduate School of Education, focus on skill-based instruction taking place simultaneously with practice teaching. Matching student teachers with experienced classroom teachers is as good an idea as it sounds.

WHAT ARE THE CONSEQUENCES OF COLLECTIVE BARGAINING AGREEMENTS?

Thirty-five states and the District of Columbia require districts to bargain with their teacher employees. Public-sector collective bargaining differs from that in the private sector because employees can influence outcomes not only by direct negotiations but also by affecting the electoral chances of those with whom they negotiate. Ninety-three percent of school districts are governed by an elected school board, with most of the remainder, including Boston, Philadelphia, and New York City, appointed by a mayor (Ballotpedia 2024). In elections for board members and mayors, teacher organizations endorse candidates, contribute to campaigns, and mobilize their membership to vote and help turn out the vote of supporters on Election Day (Hartney 2022; Moe 2011).

Unions have generally been successful in fighting deviations from the standard step-and-lane salary schedule, precluding compensation based on teacher performance, the grade level of students, the subject matter taught, or the social composition of the school. Unions also oppose efforts to eliminate the job security of “tenure” or to make it harder to obtain. In California, state law requires that tenure be given before the end of the second year of teaching. Collective bargaining agreements typically mandate that districts follow complex procedures before dismissing a tenured teacher for low performance or for other reasons (Hartney 2022). If a tenured teacher belongs to the union, it provides legal representation if their job is in jeopardy.

Wisconsin law now allows districts to set teacher pay schedules without collective bargaining. Shortly after the law was passed in 2011, about half the districts adopted more flexible schedules that gave higher salaries to teachers whose students earned higher scores on standardized tests under their tutelage. The new policy led to increases in student achievement, in part because more effective teachers moved from seniority-based pay districts to ones with more flexible pay (Biasi 2021).

Research based on a large number of states and long historical periods has identified a mix of union impacts on district policies and student achievement. One study shows that males, especially those who are Black or Hispanic, earn less later in life if collective bargaining was introduced in the schools they attended (Lovenheim and Willén 2019). Another study shows that strong unions are effective in ensuring that additional funding from states to local districts is allocated for salaries, rather than to lower local tax rates or hire additional personnel (Brunner, Hyman, and Ju 2020).

FISCAL FEDERALISM AND EDUCATION

HOW DO EACH OF THE THREE TIERS OF THE FEDERAL SYSTEM CONTRIBUTE TO SCHOOL REVENUES?

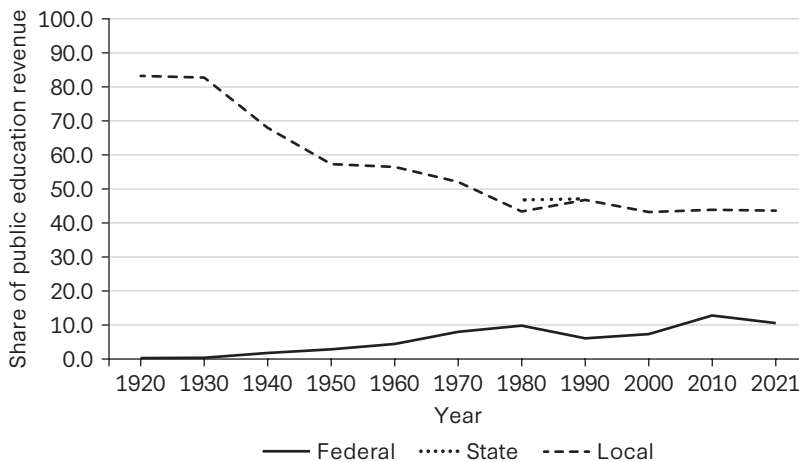
Each tier of the federal system plays a distinctive role in education. At the local level, school districts operate schools and raise much of their own revenue. States provide the legal framework within which school districts must operate, and they distribute state revenues to districts. The federal government plays a smaller role, although its regulations can have an impact. The share of revenue derived from state sources grew over the twentieth century as the local share diminished. In 2021 school districts received 44 percent of their funds from local sources, 46 percent from state sources, and 11 percent from the federal government (figure 5).

Local Government

Local school districts exercise direct control over school operations. Local school boards, on the advice of their superintendents, hire principals, teachers, and other personnel. They set salary schedules; sign contracts for school construction and renovation; purchase books, desks, and other supplies; bear the responsibility for the maintenance of physical and real property; and engage in collective bargaining when that is required. That arrangement dates to the beginning of the nineteenth century. The number of school districts in the United States has decreased from nearly 120,000 in 1940 to less than 15,000 in 2022 (figure 6). Most of this decline was driven by the consolidation of small, rural districts into larger units, which was encouraged by state consolidation subsidies (Berry and West 2008).

School districts raise most of their local revenue by levying taxes on district commercial and residential property. They also collect fees for food services, extracurricular programs, and

FIGURE 5 Local, state, and federal share of public education revenue, 1920–2021



Note: The local share includes revenue from property taxes, other public revenue, and private revenue, such as revenue from gifts and tuitions and fees from patrons.

Source: *Digest* 2023, table 235.10.

FIGURE 6 Number of public school districts in the United States, 1940–2022



Source: *Digest 2022*, table 214.10.

other ancillary activities. The amount of local revenue available to districts varies widely both within and across states, contributing to large disparities in the quality and quantity of services that students receive (although service quality, as previously noted, is driven by other factors as well). Locally raised revenues usually help cover each district’s expenditures, but some states, including Texas and New Jersey, ask districts with higher property values to distribute some of their locally generated revenue to districts with lower property values.

States

In 1971, the California Supreme Court ruled that variations in district expenditures per pupil within the state violated the equal protection clause of the California and US Constitutions (*Serrano v. Priest*, 1971). Two years later, the US Supreme Court held, in response to a similar lawsuit filed in Texas, that the US Constitution did not require equal expenditures within a state (*San Antonio Independent School District v. Rodriguez*, 1973). The California court then revised its initial decision but still maintained that the California constitution required equality of expenditure. Subsequently, numerous other state constitutions have been similarly interpreted. In 1989, the legal context shifted again when the Kentucky Supreme Court ruled that expenditure levels within the state be “adequate” (Hanushek and Lindseth 2009; Peterson and West 2007). Equity or adequacy lawsuits, or a combination thereof, have been filed in nearly every state. According to one analysis (Hanushek and Joyce-Wirtz 2023), plaintiffs have won a favorable final decision almost half the time. School financing became more equitable after 1970 (Card and Payne 2002), and by 1980 states’ contributions to school revenues moved upward from 40 percent to 46 percent, the level it was still at in 2021 (figure 5).

Today, state dollars are usually distributed according to a per-pupil formula, which in some cases is weighted to account for the potentially higher cost of educating specific groups of students, such as those from low-income households or those who need special education. Other state aid is directed toward a specific purpose like transportation, vocational

education, or school construction. Districts may pare back their own funding levels when state aid increases. The pattern differs by state, because each has its own needs, historical practices, political proclivities, and legislative and gubernatorial leaders. Research has been unable to identify an ideal structure and level of state financing, which depends on state-specific information, district size and structure, population density, and other factors.

Federal Government

Historically, the federal government was not involved with running or regulating schools. The US Constitution has been interpreted by the courts as forbidding any direct orders to states and districts other than those issued in compliance with the equal protection and due process clauses of the Fourteenth Amendment. The first federal education programs were thus limited to collecting information on school enrollment, personnel, expenditures, and other statistics, a practice that continues today under the direction of the National Center for Education Statistics. The most consequential direct orders of the US Department of Education involve the interpretation and application of those constitutional clauses and of congressional legislation that form the legal basis for federal efforts to desegregate schools and monitor and enforce (via the US Department of Justice) civil rights and civil liberties protections in education. The federal government also funds programs administered by school districts and states. One of the most significant ways that the federal government influences school operations is to stipulate that state and local authorities must comply with federal regulations governing a specific federal program if they accept the federal monies used to fund it.

Before the pandemic, federal funding hovered around 10 percent of all government support for public schools (figure 5). The funds are distributed through a variety of funding streams or programs, each with its own complicated, opaque funding formula, which typically depends on district enrollments, poverty levels, other demographic characteristics, and historical precedents.

The two largest formula-based funding streams are compensatory education via Title I of the Elementary and Secondary Act of 1965 and the Individuals with Disabilities Education Act (IDEA, or “special education”), initially enacted in 1974. A much smaller stream is directed toward the instruction of students learning English. The many small programs include ones to help pay the costs of vocational education and the startup costs of charter schools. At times, there are also small but influential competitive (as opposed to categorical) grants, such as the highly publicized Race to the Top initiative of the Obama administration, which tried—with middling success—to spur innovation at the district level (Bleiberg et al. 2023; Peterson 2016). During the pandemic, the federal government made large temporary grants to help districts operate and to offset “learning loss.” Early evidence suggests that these grants had positive but relatively small effects on student achievement (Dewey et al. 2024; Goldhaber and Falken 2024); this body of research will surely grow in the coming years.

The compensatory education program (also known as Title I) directs federal dollars to districts with concentrations of low-income households; currently, it is the largest federal funding stream. Researchers have found that the additional funding it provides to districts often does

not translate into lasting increases in school resources experienced by students—or, unsurprisingly, to changes in student outcomes (Gordon 2004; Matsudaira, Hosek, and Walsh 2012). Historically, impacts of Title I on spending and the dropout rates of White students were identified in southern states (Cascio, Gordon, and Reber 2013). The largest impacts of Title I likely come from policy changes that states or districts must make to be eligible for the funds. The federal program helped induce school desegregation in southern schools in the late 1960s (Cascio et al. 2010). In 2002, the legislative vehicle for Title I (originally the Elementary and Secondary Education Act of 1965) was reauthorized as the No Child Left Behind Act (NCLB, which we discuss later), which required all states receiving Title I dollars to implement test-based accountability systems.

For generations, many children across the country were excluded from public schools on the grounds that they could not benefit from a public education. That changed when Congress funded the special education program in 1974 in response to lawsuits that successfully argued that children excluded from public education because of their disability were being denied equal educational opportunity. Stipulations attached to this funding stream require that states provide a free and appropriate public education, based on an individualized education program. The law authorizes federal expenditures up to 40 percent of each state’s special education costs, but as is the case with many federal programs, appropriation levels fall far short of authorized levels. Currently, approximately 15 percent of the public school population is identified as in need of special education (*Digest* 2023), an increase from 8 percent in 1978 (Pendharkar 2023).

The most common disability within the framework of the legislation is a category called “specific learning disability,” which itself encompasses multiple conditions. Deafness, blindness, traumatic brain injury, autism, and emotional disturbance are some other disabilities within the framework of the legislation. Special education specialists disagree over whether the special designation is assigned too frequently or not often enough and whether classification varies in a biased way, depending on students’ race and ethnicity. They also disagree as to whether and when students are best served in a “mainstream” classroom with students who have no identified disabilities or in separate settings that allow for instruction appropriate to their condition. Research has yet to offer authoritative guidance on these questions as on so many other matters in the complicated world of special education. Further, the answers surely vary across states and districts.

It is particularly hard for researchers to conduct credible and practice-relevant research on special education. Because all students who are eligible legally should receive it, there is no good control group. Further, receiving “special education” means receiving an individualized educational program (IEP); many practice-relevant questions lie within the black box of the IEP, which is often unobservable to the researcher. But the inadequacy of research on the topic should not be taken as evidence that special education programs are not useful or cost effective. No significant group argues for a return to the days when schools denied some children an education on the grounds that they could not benefit from it. Yet we are a long way from knowing the best way to design the educational experience for those who face special learning challenges and to ensure it is provided. More research is badly needed.

SPENDING

HOW MUCH DO WE SPEND ON SCHOOLS? WHY HAS SCHOOL SPENDING INCREASED OVER TIME?

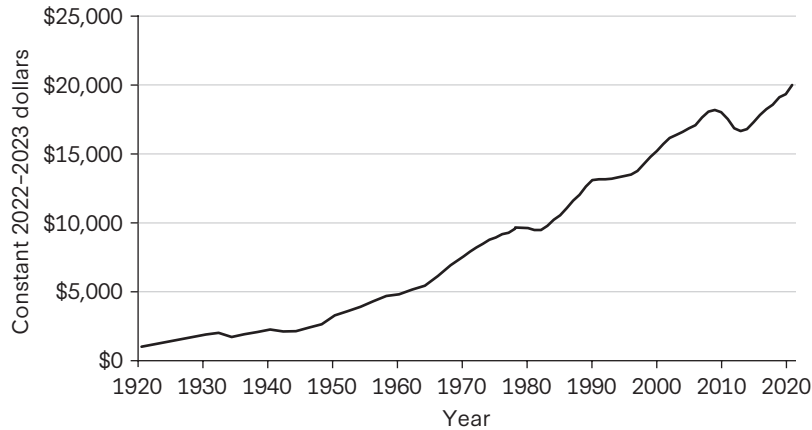
Determining how much is spent on average for a student in the US K-12 system seems straightforward but actually depends on choices made by those reporting it. Does the number consider total spending, which includes current expenditures, interest payments, and debt outlays, or solely current expenditures? Total spending is more relevant from a fiscal perspective, whereas current spending is more relevant for those seeking to understand the resources experienced by current students. And is the denominator all students who were enrolled in school (by a set date) or the average daily attendance? The largest per-pupil spending estimate will come from total expenditures (larger numerator) per student in daily attendance (smaller denominator); in fiscal year 2021, this was \$17,561. Current expenditure per enrolled student will correspondingly always be a lower figure and was \$14,295 in that year (*Digest 2023*, table 236.55).

Given the multiple ways of calculating expenditures, comparisons that use the same metric to show how expenditures have changed over time and across space are the most informative. For example, it is of interest to know that nominal total expenditures per enrolled pupil in the United States in fiscal year 2021 were \$16,345 (*Digest 2023*, table 236.55). But that number masks wide variation both across and within states, most of which is not explained by geographic differences in the cost of living. Total expenditures in New York, the highest-spending state, were \$28,261 per pupil; the lowest-spending state was Utah, at \$10,802.

By any measure school expenditures have increased dramatically over the course of the past century. Figure 7 shows total expenditures per student in daily attendance (the largest of the spending metrics) over time, with all figures adjusted for inflation to reflect constant 2022-23 dollars. A multiplicity of factors contribute to the twenty-fold increase. The pupil-teacher ratio has declined from 28 in 1950 to 15 in 2021 (figure 8), adding substantial costs for additional classroom personnel and space. Public schools have expanded their services and staff, with more guidance counselors, nurses, psychiatrists, eye and ear examinations, extracurricular programming (band, theater, multiple sports offerings, and so forth), specialized language programs, free transportation, free or reduced-price breakfasts and lunches for low-income students, and specialized educational and medical services for those with a broad range of disabilities. School districts now employ a larger number of administrative and service-delivery employees to coordinate and staff this increasingly complex service-delivery system. Between 1950 and 2000, the number of staff per pupil increased much more rapidly than the number of teachers per pupil (figure 8). That trend continued into the twenty-first century. Between 2002 and 2020, nonteaching staff increased by 20 percent, but teaching staff only by 7 percent, the latter no more steeply than enrollment growth (Smith, Campbell, and Barnard 2024, tables 13-15).

Another source of increasing expenditures is known as the “Baumol effect,” which describes how the need for all personnel to be paid at a level commensurate with the price of (similarly qualified) labor elsewhere in society. Baumol and Bowen (1966) make this point with the

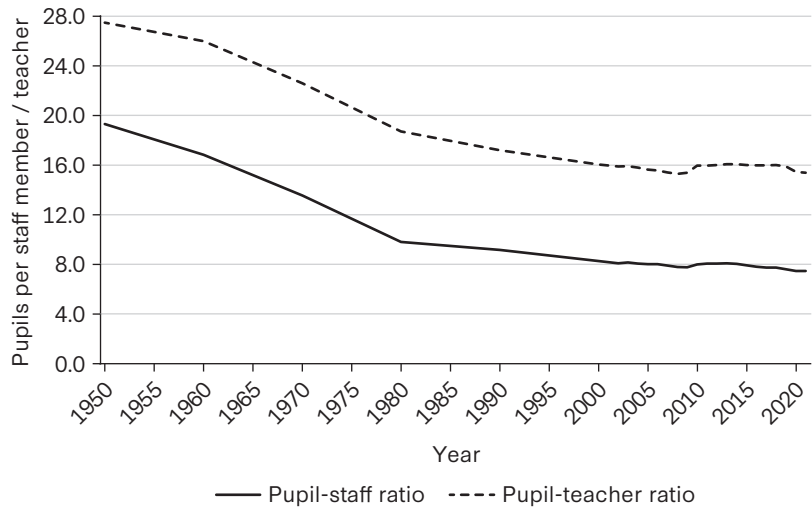
FIGURE 7 Total expenditures per pupil in constant 2022–2023 US dollars in the United States, 1920–2021



Note: Total expenditures are shown per daily pupil attendance. Constant dollars are based on the Consumer Price Index, prepared by the Bureau of Labor Statistics. Total expenditures exclude “Other current expenditures,” such as community services, private school programs, adult education, and other programs not allocable to expenditures per pupil at public schools. Data for 1981–88 are estimated. Data for 2020 and 2021 include funds from the Coronavirus Aid, Relief, and Economic Security (CARES) Act, Coronavirus Response and Relief Supplemental Appropriations (CRRSA) Act, and American Rescue Plan (ARP) Act.

Source: *Digest* 2023, table 236.55.

FIGURE 8 Pupil-staff ratio and pupil-teacher ratio in the United States, 1950–2021



Source: *Digest* 2022, table 213.10.

elegant example of musicians performing a Schubert quartet: they collectively spend forty-eight minutes on this performance, whether in 1824 or 2024. But violinists demand much higher salaries in 2024 than two hundred years earlier (even in inflation-adjusted dollars) simply because alternative employment, though perhaps less desirable, yields a greater financial dividend due to technological advances. The beauty of the concert may be enhanced for those who think musicians are more accomplished or contemporary instruments are an

improvement on those built by Stradivarius, but the price of tickets increases regardless of the quality of the audience’s experience. This “Baumol effect” also has an impact on education (Peterson 2010, 149–54). If the number of employees per student does not decline, the rising price of educational personnel will drive expenditures upward even when wages for school employees relative to other occupations remain constant. School expenditures rose steeply because teacher salaries climbed and were not offset by reductions in the size of the workforce—as happened in agriculture, manufacturing, and most other sectors.

DO INCREASES IN SPENDING ENHANCE STUDENT ACHIEVEMENT?

Early research found little correlation between higher levels of school expenditure and student achievement (Coleman et al. 1966; Hanushek 1996). Those studies were not dispositive, however, because both spending and achievement can correlate with other community factors, including family demographics like parental income and education, as well as public spending beyond education (such as on healthcare).

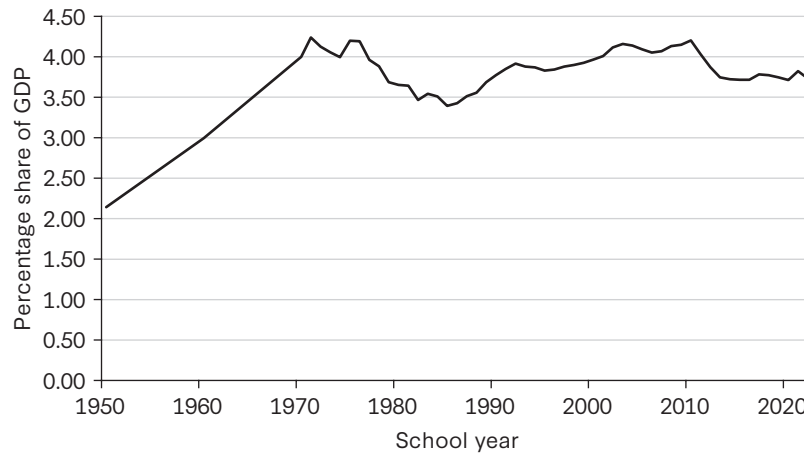
Recent research has moved beyond those earlier studies by estimating the causal impact of additional expenditures. It does so by examining the effects of expenditure “shocks”—unanticipated jumps in fiscal resources as the result of legislative responses to court orders to rectify equity and adequacy deficiencies in school funding. These court-ordered funds tended to be allocated in ways that reached the classroom (higher salaries, smaller classes). The new work finds positive effects of this spending on the test-score performance of disadvantaged students, with somewhat larger effects on high school graduation and college-going (Brunner, Hyman, and Ju 2020; Jackson, Johnson, and Persico 2016; Jackson et al. 2020; Jackson and Mackevicius 2024; Lafortune, Rothstein, and Schanzenbach 2018). Some question the generalizability of these findings; others believe that any additional funding increases are likely to come via similar mechanisms, so findings can be generalized to similar settings in the future. These results are not necessarily a useful guide for predicting how more major (“out of sample”) funding changes—say, doubling per-pupil spending or reallocating resources in a major way—would affect students.

While researchers have reached a general consensus that increased expenditures, when put to effective use, enhance educational outcomes, the best way of using fiscal resources and the size of the impact on student outcomes remains unknown territory for future exploration. It would be especially beneficial to be able to compare the cost effectiveness of additional education expenditure with other policy options that benefit children.

BY HOW MUCH HAS THE SHARE OF THE ECONOMIC RESOURCES THAT THE UNITED STATES COMMITS TO ITS SCHOOLS INCREASED SINCE 1950? HAS THE SHARE DECLINED IN THE PAST DECADE? WHAT SHARE OF THOSE RESOURCES DO THEY NEED TO COMMIT IN THE FUTURE?

In 1950, 2.1 percent of GDP was expended on K-12 public education (figure 9). Over the course of the next two decades, that percentage doubled to reach a peak of 4.2 percent

FIGURE 9 Public expenditure on all primary and secondary schools as a percentage share of GDP in the United States, 1950–2022



Source: *Digest* 2022, tables 106.10 and 106.20.

in 1971, an extraordinary increase given a steeply growing economy over the period. The increase was driven in good part by a postwar baby boom, though spending per pupil more than doubled as well. Between 1950 and 1970, the number of school-age children grew from around 35 million to over 46 million, the steepest recorded growth in enrollment in US history (figure 15). Apparently, the public, which included a disproportionately large share of parents of school-age children, was prepared to tax itself to supply the necessary resources.

After 1971, the percent of GDP allocated to K–12 education first reached a plateau; by 1985, it had declined to less than 3.4 percent, despite growth in the school-age population to about 50 million children. During these years, economic growth was slowing, and a more conservative perspective on public expenditure took hold. The change was not simply a matter of national politics, given that expenditure decisions were mainly a matter of state and local policy.

Between 1985 and 2000, the trend reversed, moving back up to more than 4 percent of GDP, and then climbed further to 4.2 percent by 2010, reaching its former 1971 high. All this happened at a time when the school-age population was increasing only marginally. The renewed commitment to education may have been inspired by the report, *A Nation at Risk*, which helped move schools toward the top of state and local agendas. Also, southern states were making special efforts to catch up educationally with the rest of the country.

Between 2010 and 2022, the share of GDP allocated to schools slipped by 0.5 percent to 3.7 percent. This may reflect in part the impact of the 2007–9 recession on state revenue. Per-pupil expenditures in constant dollars returned to their 2006 level by 2015 (figure 7) the allocation of educational resources was shifting from teachers to other school staff (figure 8). Whether this indicates a shift in educational priorities is a question ripe for future research.

DESEGREGATION

WHAT IS THE ROLE OF THE COURTS IN SCHOOL DESEGREGATION?

Government efforts to minimize racial separation have ebbed and flowed over the seventy years since the Supreme Court found segregation unconstitutional in its 1954 decision, *Brown v. Board of Education*. Periods of significant and sustained progress toward integration in the past were driven by clear legal mandates accompanied by litigation-based enforcement. For a decade after the court ruling, southern states, which previously had been operating so-called dual systems that were fully segregated by race, were able to resist judicial efforts to force any more than token desegregation of a few Black students in otherwise predominantly White schools. The pace picked up after court appointment of federal monitors of judicial decisions and the passage of the Civil Rights Act of 1964, the Elementary and Secondary Education Act of 1965, and the Voting Rights Act of 1965. Over the next decade and one half, segregation decreased markedly in hundreds of school districts across the South as they were placed under court supervision (Welch and Light 1987).

In more recent decades, the Supreme Court has shown increasing reluctance to compel further desegregation. In its 1974 decision, *Milliken v. Bradley*, it ruled that states and districts outside the South, where legal, de jure segregation had never existed, were not required to take action to reduce segregation that had occurred, if the segregation was between school districts. This type of segregation had increased when Whites migrated from central cities to suburban areas as Black Americans moved from the South to the industrial North. In the South, the court monitors appointed in the 1970s were withdrawn on the grounds that the segregated “dual systems” had been dismantled and district compliance with court orders was sufficient, even if not perfect (*Freeman v. Pitts*, 1992).

In 2007, the Supreme Court told school boards that, in the absence of previous de jure segregation, distinctions among students could not be based on racial identification. The decision in *Parents Involved in Community Schools v. Seattle School Dist. No. 1* declared unconstitutional the use of race as a tiebreaker in school assignments. However, those school boards that wanted to facilitate school desegregation by using socioeconomic criteria for assigning students to schools could modify school zoning policies or encourage voluntary parental choice programs.

The reluctance of the courts to compel school integration, as well as district policies that produce school composition reflective of residential patterns, has resulted in a highly uneven distribution of racial and ethnic groups across communities within metropolitan areas, often called “zip code” segregation (Urban Institute 2018). For decades, realtors and banks practiced redlining, refusing to show properties to prospective Black homebuyers or finance their loans if they attempted to purchase housing in “Whites only” neighborhoods. The Supreme Court ruled in 1948 that redlining was unconstitutional; yet Blacks’ access to predominantly White communities remains impeded by zoning practices, such as requirements to have large lots or only single-dwelling units, that exclude lower-cost housing, as well as by the legacy effects of a host of past institutions and policies. In sum, court decisions seldom

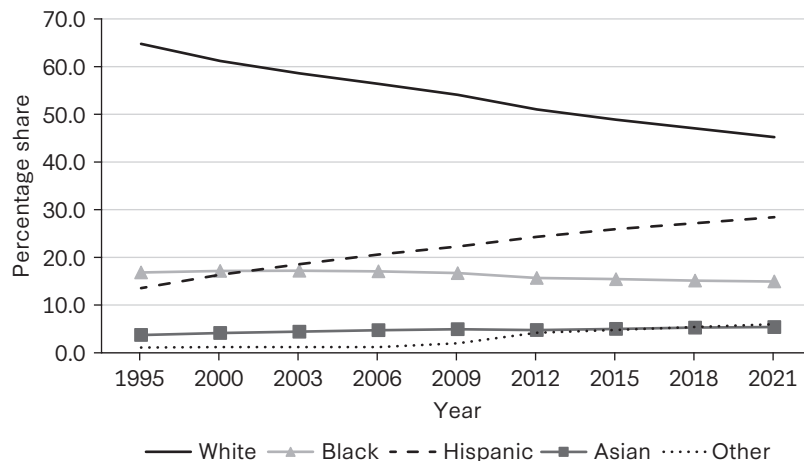
were designed to achieve any specific degree of school integration in the North, as was the case in the South when many districts were placed under the supervision of court monitors to dismantle a legally segregated dual system of education.

WHAT ARE RECENT TRENDS IN THE RACIAL AND ETHNIC COMPOSITION OF SCHOOLS AND THE DEGREE OF SCHOOL SEGREGATION?

The distribution of students across schools and school districts has been shaped in recent decades not only by the changing legal context but also by changes in the racial and ethnic composition of the school-age population. Earlier data collections focused simply on Black and White students; demographic data on more categories are now routinely collected. In this section, we describe historical trends with greater detail across five broad categories: White, Black, Hispanic, Asian and “other,” which includes mainly those of mixed heritage and the small population of Native American and Alaskan Native students.

Over the past quarter-century, the racial and ethnic composition of American students has changed dramatically. The share of White students in public schools fell from 65 percent in 1995 to 45 percent in 2021, while the percentage of Black students remained relatively constant, declining modestly from 17 percent to 15 percent (figure 10). Meanwhile, the percentage of Hispanic students doubled from 14 percent to 28 percent, the percentage of Asian students climbed from 4 percent to 5 percent, and the percentage of “other” students rose from 1 to 6 percent.

FIGURE 10 Racial and ethnic percentage distribution of enrollment in public schools in the United States, 1995-2021



Note: We use the classifications provided in the *Digest* for the racial groups. “Other” includes Native Americans, Alaska Natives, biracial and multiracial people, and Pacific Islanders. Pacific Islanders were counted as Asians from 1995 to 2007. Imputations for nonreported kindergarten enrollment in California are included in the data for 2019 and 2021. The same is done for Oregon in the data for 2020 and 2021.

Source: *Digest* 2022, table 203.50.

Two types of measures have been used to track changes in how these groups are spread across schools. The first set of measures identifies the extent to which a group, such as Black students, are “exposed” to another group (e.g., White students). These measures are designed to answer such questions as what is the percentage of White students at the school attended by the average Black student: the higher the percentage, the greater the exposure. Such measures of exposure or isolation can show the degree of separation for each group of students but are less satisfactory for tracking the consequences of government policies for trends in group separation over time. This is because they are mechanically affected by demographic shifts in the composition of enrollment overall, such as the decline in the White share of enrollment and an increase in the Hispanic share of enrollment.

The share of students located in districts in which their own group comprises at least 75 percent of the population is 45 percent for White students, 31 percent for Hispanic students, 23 percent for Black students, 4 percent for Asian students, and 19 percent for American Indian/Alaska Native students. These rates reflect a decline in district-level segregation for students who are Black, Hispanic, or White from 2014–15 to 2021–22; there was no change for students who are Asian and a small increase for American Indian/Alaska Native students (US Government Accountability Office 2022).

The second type of measure, an index of dissimilarity, identifies the extent to which the distribution of two groups within subunits, such as schools, is similar to the distribution of these same groups within a larger unit, such as the school district. This measure varies between 1.0 (apartheid) and 0.0 (a uniform distribution throughout the larger unit). It has the advantage of adjusting for changes in the demographic composition of the larger unit when estimating the evenness of the distribution among subunits. But when considering only two groups at a time, as is typical with the dissimilarity index, the picture it paints varies according to which groups are considered. For example, does it measure how evenly spread Black and White students are across schools or the spread of non-White versus White students?

Dissimilarity measures generally show declines in segregation when the courts were actively issuing desegregation orders, followed by recent stable levels of segregation when courts have been reluctant to do so. On this index, Black–White segregation declined from 0.81 to 0.71 between 1968 and 1980, a time when legal action was effective in desegregating southern schools. It edges down slightly to 0.66 by 2012 (Rivkin 2016).

Monarrez, Kisida, and Chingos (2022) track trends from 1998 to 2018 with a more comprehensive dissimilarity index. They estimate trends in segregation within school districts, municipalities, counties, and metropolitan areas and calculate the degree of segregation of Blacks and Hispanics versus all other categories, Blacks versus others, Whites versus others, and Asians versus others. The authors summarize their findings as follows: “Regardless of which racial or ethnic grouping one focuses on, national trends in school segregation have been essentially flat over the last 20 years” (310). There are two exceptions to the general pattern: (1) segregation has increased somewhat for Asian students, and (2) segregation of Blacks from others within metropolitan areas has declined (the index fell from 0.31 to 0.23).

These findings are generally consistent with other studies of recent changes in the degree of segregation (Owens et al. 2022; Reardon and Owens 2014; Whitehurst et al. 2017). More segregation takes place across district boundaries than within them, so the index shows higher rates of segregation for metropolitan areas and counties than for school districts. In other words, more school segregation comes from which districts students live in, rather than which schools they attend within districts (Owens et al. 2022).

WHAT ARE THE IMPACTS OF DESEGREGATION ON STUDENT ACHIEVEMENT?

The weight of the evidence suggests positive effects of desegregation on the performance of Black students and little, if any, effect on the achievement of White students or those in other ethnic groups. The federally mandated study of school desegregation carried out in 1966 (often labeled the Coleman Report) was the first to report positive effects of racially mixed classrooms on Black student achievement but no significant effect on that of White students. Although this finding is correlational, its results have been largely confirmed by more methodologically rigorous research. A quasi-experimental study of the composition of classrooms in the state of Texas found positive effects of classroom-level desegregation for Black students, with little effects on either White or Hispanic ones (Hanushek, Kain, and Rivkin 2009). Guryan (2004) relied on the timing of court orders to identify desegregation-induced reductions in high school dropout rates for Black males, with no adverse impacts for White males. Anstreicher, Fletcher, and Thompson (2022) found that court-ordered desegregation improved educational attainment and labor market outcomes for Black students, with no impact for White students; their study showed that changes produced by the court decisions occurred in the South but not in other regions. Importantly, the mechanisms by which desegregation influences achievement are not certain.

REGULATION AND ACCOUNTABILITY

WHAT ROLES DO US STATES PLAY IN REGULATING EDUCATION? HOW DO STATES HOLD SCHOOLS ACCOUNTABLE?

Authority in the US federal system is divided between the national government and state governments, with the Supreme Court the ultimate authority on which tier has control in specific situations. Local school districts, although subject to rules and regulations promulgated by the state, have direct responsibility for school operations.

State rules and regulations have increasingly shaped the actions taken by districts as the share of school revenues coming from state grants has risen to a level roughly equal to that coming from local tax revenues. Every state requires all children (other than homeschoolers) to attend a public or private school for at least the ages between eight and sixteen (Francies and Perez 2020). All states specify the hours per day and days per year that public schools must be in session. They all require that, except in special circumstances, teachers have or are in the process of obtaining a license in their field. Many state boards of education identify the permissible books and other curricular materials that districts may use. School construction projects

must abide by an array of state requirements. At least thirty-three states require districts to engage in collective bargaining with teacher organizations (Lovenheim and Willén 2019).

Perhaps the most controversial extension of state authority over school districts has been the enactment of school accountability laws, an area traditionally left to districts. Historically, teachers held students accountable by giving grades and determining whether they would pass to the next grade and whether they had enough course credits to graduate. Principals and districts supervised teacher practice. Then, in 1983, *A Nation at Risk*—a report issued by a national commission appointed by the US secretary of education—asserted that educational standards and expectations had fallen. In response, many states decided to hold schools and districts accountable by publishing aggregate performance results of students at each school on state-designed tests. A number of states rewarded or penalized districts based on their performance on these tests. In extreme cases, known as “takeovers,” states assumed responsibility for operating schools and districts. State takeovers of local schools are found to reduce corruption and enhance fiscal efficiency but, in the aggregate, have a negligible impact on achievement (Schueler and Bleiberg 2022).

In the 1980s, these accountability reforms were introduced in southern states, a region where student performance had been low. Black citizens were voting in increasing numbers, and states were under political pressure to increase support for their schools. North Carolina, South Carolina, Florida, Tennessee, Arkansas, and Texas helped lead the drive for accountability (Peterson and West 2003). The accountability movement broadened to the national level when the governors of Arkansas and Texas incorporated accountability into their successful presidential campaigns. President Clinton signed a bill in 1995 that encouraged states to test their students, and President George W. Bush in 2002 signed the No Child Left Behind (NCLB) Act, which formulated a detailed accountability system for all schools (Rudalevig 2003).

The devil of any accountability system is in the details: how proficiency in a subject is defined, the consequences for falling below the proficiency standard, and the supports provided for school improvement. NCLB had a thousand pages full of details covering such topics. It required annual testing in grades three through eight to be publicly reported out at the school level for all students and for specific groups of students, including those defined by race and ethnicity, economic disadvantage, English-language proficiency, and disability. The detail that would prove to be most devilish was its utopian rule that all students must be proficient by 2014, a goal toward which schools had to make “adequate yearly progress” each year, both in the aggregate and for each “subgroup” of students identified by law. Initially, this rule mainly affected schools with low levels of student performance—often those that served low-income students. By demanding “adequate yearly progress” toward full proficiency by 2014, the law identified an increasing number of schools as failing schools with every passing year. When high-income suburban schools were deemed failing, parents asked their children not to participate in tests they said were meaningless, unfair, and unrelated to the school’s curriculum (Levy and Edelman 2016). As the law became increasingly unworkable and Congress could not agree on an alternative, the Obama administration granted waivers to enforcing NCLB to those states that agreed to implement alternative reforms. Finally, in 2015, Congress revised NCLB, enacting, in its place, the Every Student Succeeds Act (ESSA). The new law eliminated

“adequate yearly progress” and many other rules but still required states to continue annual testing and to report overall results and by designated groups to receive federal funds.

WHAT ARE THE EFFECTS OF ACCOUNTABILITY ON STUDENT ACHIEVEMENT?

Many questions have arisen about the value of state standardized tests. A survey of teachers finds they spend two weeks preparing students to take them (Robelen 2016). The focus on math and reading shifts time away from and lowers student performance on nontested subjects, such as science and social studies (Arold and Shakeel 2021). Administrators boost test scores by providing meals within the classroom on test day (Imberman and Kugler 2014). Some teachers have been found to manipulate responses on student answer sheets (Jacob and Levitt 2003).

Concerns about testing practices must be balanced against accountability benefits for student achievement. Overall, accountability laws appear to have had positive effects on student achievement in their initial years, which is also when localities took their guidelines most seriously. States that enacted accountability legislation prior to NCLB showed larger gains in NAEP performance than those without an accountability system (Carnoy and Loeb 2002; Hanushek and Raymond 2005). In states that had accountability policies (but not otherwise), increases in expenditure mandated by state court decisions yielded positive impacts on student achievement (Buerger, Lee and Singleton 2021). States that adopted an accountability system for the first time after NLCB was enacted showed larger test-score gains on NAEP than those where the rules had not changed materially (Dee and Jacob 2011).

In sum, the nation’s multidecade experiment in the use of state and federal power to hold school districts accountable has had mixed results. Some gains have been realized, but the undertaking failed to realize the anticipated wholesale improvements in American education. On the other hand, it has not disastrously interfered with local school operations in ways that its harshest critics feared (Dee and Jacob 2011). Accountability is not a silver bullet on its own, nor is it sufficient for major school improvements. Also required are changes in how we regulate, finance, and deliver education. Accountability can provide incentives to focus on student achievement, but educators may still find their hands tied in important ways that prevent real progress. At the same time, school systems, as presently constituted, are unlikely to make major improvements in the absence of accountability systems. Most educational policies and practices are implemented at the local level, with considerable and unavoidable discretion on the ground. In such a context, with the quality of key inputs often unobservable from the outside, the logic of accountability for educational outcomes is compelling.

CHOICE

WHAT ARE THE VARIOUS FORMS OF SCHOOL CHOICE? WHAT IS THE IMPACT OF CHOICE ON STUDENT ACHIEVEMENT?

There is no official count of US students across all sectors of American K-12 education. According to a 2021 poll of parents, 76.5 percent of all Americans ages five to seventeen

attended district-operated traditional public schools, 7.2 percent attended charter schools, 9.7 percent attended private schools (1 percent with vouchers, tax credits, or some other government assistance), and 6.6 percent were homeschooled (Henderson, Houston, Peterson, and West 2022).

Zip Code Choice

Traditional public schools are operated by geographically defined districts governed by school boards. When families select their place of residence, they simultaneously choose a neighborhood school attendance zone within a district to which their children will be assigned by the administrative staff appointed by the school board. Residential choice is a function not only of preferences related to schooling, housing, and location but also the constraints of household economic resources. The greater the household income and wealth, the wider the range of residential and school choices the family enjoys. Residential choice, often referred to as “zip code” choice (but reflecting geographic catchment areas determined politically that are not generally coincident with zip codes), is inequitable: linking residential location to the right to attend a given school or district means that families must be able to pay the rent or mortgage and taxes associated with the residence in the assigned school zone. Further, school quality is capitalized into property values, making homes less affordable in places with high-quality schools (Kane, Riegg, and Staiger 2006). Higher property values generate the same amount of property tax revenue at lower rates because the base is higher.

Residential requirements are sometimes modified for specific educational programming, which may be restricted to certain students: consider vocational education, gifted and talented education, and programs for students with particular disabilities. In the 1970s, “magnet” schools with specialized, high-quality programming were created to attract students from all racial and social backgrounds. Congress subsequently established a small Magnet School Assistance Program; in recent years, nearly 7 percent of all students attended schools that are identified as magnet schools (Lake 2020; Polikoff and Hardaway 2017). The magnet school idea has been expanded to apply to all schools in what are referred to as “portfolio” districts. Here, families have a choice among most district schools, subject to rules that determine access to oversubscribed ones. Portfolio districts include New York, Boston, Miami, Denver, and parts of Los Angeles. A few states allow families to select schools in other districts, provided “receiving” districts are willing to accept applicants from outside their boundaries.

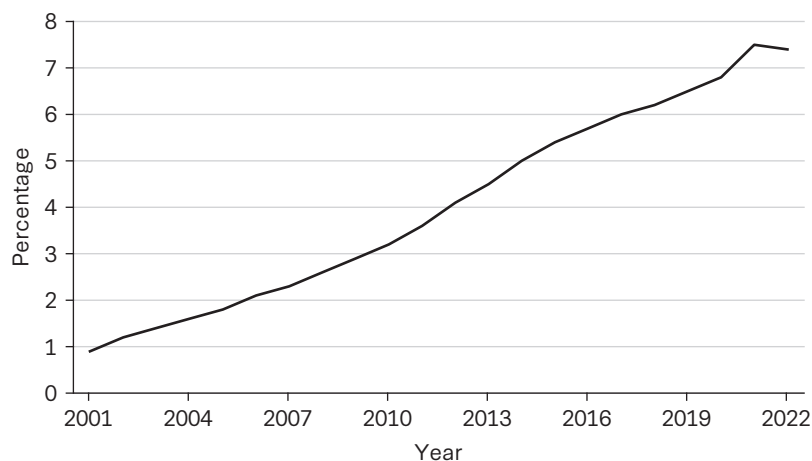
Effects on student achievement of these policy innovations are mixed. A modest, positive association of magnet school attendance and test-score performance is generally observed, but results vary (Betts et al. 2015; Wang, Herman, and Dockterman 2018). Effects of the portfolio model have been estimated experimentally in Boston and New York City; these studies find no detectable academic benefits and that both students and districts bear large transportation costs required by this approach (Angrist et al. 2022). Interdistrict school choice programs suffer from the reluctance of most districts to accept students from outside their boundaries. In a review of a small number of studies, Lake (2020, 8) concludes, “There is little evidence of improved access to higher-performing schools and little evidence of academic gains.” Schooling and housing are interrelated policy areas in the context of primarily residentially

based school assignment. Unfortunately, housing policy comes with its own challenges. The Moving to Opportunity study looked at the consequences of a court order that gave randomly chosen families the opportunity to move from a predominantly Black public housing complex to predominantly White communities. Moving had little, if any, effects on student performance (Gennetian et al. 2012).

Charter Schools

Charter schools were first proposed in 1990 as public-private partnerships that could spur innovation within the public sector (Nathan 1996). They are mainly financed by state and local governments but operate under the direction of nonprofit boards authorized by a government agency. The first such school opened its doors in Minnesota in 1991; since then, charter schools have spread to all but four states. The percentage of public school students attending charters has increased from about 2 percent in 2002 to about 7 percent in 2022 (figure 11). In 2022, 48 percent of charter school students were in elementary schools, 23 percent in middle schools, and 29 percent in high school (*Digest* 2023). Depending on the calculation’s timing and database, somewhere between more than one-fifth to one-third of all charter students are estimated to be enrolled in schools that are part of networks of three or more schools, approximately another 20 percent attend charter schools operated by for-profit firms, and the rest attend “stand-alone” nonprofit schools (Peterson and Shakeel 2023; Xu and Zarate 2023). The racial and ethnic composition of those enrolled at charter schools in 2018 was 32 percent White, 26 percent Black, 33 percent Hispanic, and 4 percent Asian (Shakeel and Peterson 2020). The percentage eligible for free and reduced lunch ranged from around 55 percent in the South and West to 65 percent in the Midwest to 73 percent in the Northeast (Egalite 2020, 9). Overall, students who are economically disadvantaged, Black, or Hispanic are overrepresented in the charter population, while White students are underrepresented.

FIGURE 11 Charter school enrollment as a percentage share of total public enrollment in the United States, 2001-21



Source: White (2023).

Although charters were originally proposed as laboratories of innovation, they became increasingly seen as schools that compete with district schools for students. Advocates argued that charters would improve outcomes not only for students who attend them but also for those attending district schools with which they compete for enrollments. Critics claimed that the competition would not help students but would instead leave districts with students who are more expensive to serve, while reducing fiscal resources available for districts.

Research offers some answers to these questions. A comprehensive study of charter students in twenty-nine states plus the District of Columbia for the period 2015–19 finds that charter students, on average, gain sixteen more days of learning per year in reading and six more days in math than those at nearby district schools (CREDO 2023). The charter advantage is considerably larger for Black and Hispanic students, as well as for those from low-income households and in urban areas. There is no difference between the two sectors for Asian students. White, multiethnic, and Native American students achieve similar yearly gains across the two sectors in reading but make smaller yearly gains in math when they attend charter schools. These patterns are affected by both the performance of students at charters and at the district schools with which they are being compared.

The 2023 CREDO report just described reverses the direction of findings in a 2013 CREDO report with a qualitatively similar design, which found average charter student performance was *below* that of comparable students in nearby district schools (CREDO 2013). That 2013 finding was consistent with other early research that found little or no impact on achievement for the students who attend charters *on average* nationally, although charters did have positive achievement impacts for their students in urban districts, for students of color, and for low-income students (Betts and Tang 2019; Cohodes 2018). The differences between earlier and more recent studies imply improvement over time within the charter sector. A nationwide study of NAEP trends also shows greater achievement gains in the charter than the district sector between 2005 and 2017 (Shakeel and Peterson 2020), as does a study of trends on state tests in Texas (Baude et al. 2020).

Experimental research on longer-term outcomes is limited to oversubscribed schools that conduct lotteries for enrollment; these in-demand schools are likely to be higher performing, so results may not be generalizable. Experimentally generated estimates of impacts on high school graduation and college enrollment are generally positive (Angrist et al. 2016; Demers et al. 2023; Sass et al. 2016), as are effects on reducing rates of incarceration and teenage pregnancy for a New York City charter (Dobbie and Fryer 2015).

Charter schools that are part of charter management organizations (CMOs) consistently produce the strongest results, outperforming district schools in both math and reading; the average stand-alone charter outperforms traditional public schools in reading but not in math performance (CREDO 2023, 7). Higher-quality schools may grow into networks, or schools within networks may benefit from the shared experience, suggesting that learning may be enhanced by sharing best practices and warnings of pitfalls to be avoided. CMOs operating with the “no-excuses” model have a particularly strong record in increasing test scores

and favorable long-term outcomes (Angrist et al. 2016; Demers et al. 2023). However, the model has been subject to criticism (and applause) for practices such as requiring phonics instruction, rote learning, school uniforms, and, especially, strict classroom discipline (Pondiscio 2019): supporters view these practices as effective classroom management, whereas critics describe them as overly rigid and racialized (e.g., Golann, 2021). Not all CMOs perform well, however: those that offer their services online yield achievement results well below those at district brick-and-mortar schools (Ahn and McEachin 2017; CREDO 2015).

This is not to say that positive impacts of charters are limited to those that use the “no-excuses” pedagogy. A recent study of non-urban charter schools in Massachusetts looked at their impact on college enrollment and persistence through to graduation (Cohodes and Pineda 2024). These schools served a somewhat higher-performing middle-class clientele and eschewed the no-excuses model. Earlier research found that student performance on state standardized tests was well below that of their peers at the traditional public schools they would otherwise have attended. The recent research confirms these findings and shows that students also had lower SAT scores and passed fewer AP exams but were more likely to enroll in college and receive a four-year degree than those at traditional public schools.

Charters appear to have positive impacts on overall student learning in school districts if they serve more than 5 percent of a district’s total enrollment (Chen and Harris 2023). Most of the gain comes from higher performance at charter schools, but their presence in substantial numbers also lifts achievement modestly at district schools, either by providing exemplary models, giving families the opportunity to find a school that better matches the needs of their child, or creating increased competitive pressure. The last-mentioned explanation is the most likely, because low-performing charter and district schools are more likely to close when charter enrollment is relatively high. Positive effects persist until charter enrollments reach 15 percent, after which no further gains from a larger charter presence are observed.

Charter schools generally have less public revenue per pupil than district schools. Data for 27 states available from the US Department of Education for school years 2007-19 indicate that charters in these states received about 20 percent less in revenue per pupil than district schools from government sources (Xu and Zarate 2023). The amount received varies widely by state, and charter schools, like district schools, can and do raise revenue from private sources (DeAngelis et al. 2020). In addition, charter schools, which are relatively new entities, do not have the legacy costs (such as pension liabilities) that pose strenuous fiscal burdens on most school districts. However, unlike districts, they typically fund their capital costs for buildings and grounds out of operating revenues and private sources.

The impact of a sizable charter presence on a district’s per pupil revenues varies with state law and district practice. One review concludes, “Typically, charter schools receive whatever base level of support the state would have allocated for the student to be educated in a district school and none of the local revenue generated from property taxes or bond measures” (Egalite 2020, 14). Districts highly dependent on state revenue (such as in California) will lose revenues in amounts roughly proportional to the change in their number of pupils

(Bruno 2019), unless, as in Massachusetts, the state “protects” districts from revenue losses (Ridley and Terrier 2018). Districts that receive little in state aid may enjoy a higher share of revenue per pupil when students leave the district for a school of their choice, as was the case in Milwaukee (Aud 2007).

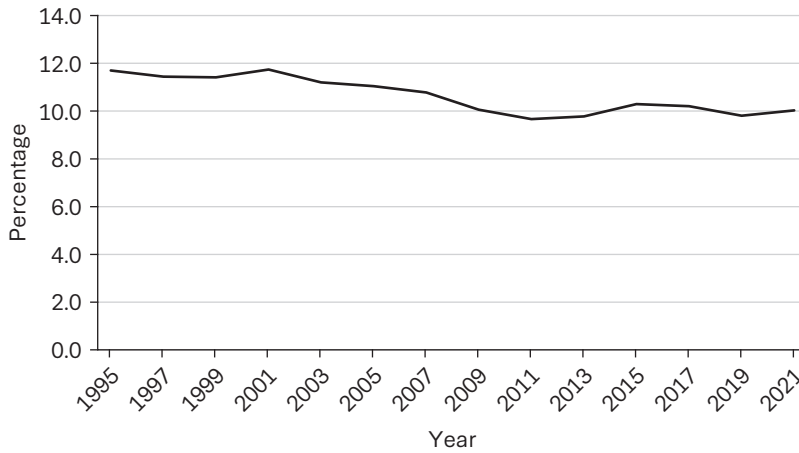
Using revenues per pupil as the appropriate measure of charter fiscal impact assumes that districts’ total financial needs vary with enrollments (Cohodes and Parham 2021). But some district costs are fixed; that is, they are not easily reduced even when enrollments decline. Although staff salaries are the largest share of school costs and therefore are variable in the medium term (long-term contracts can be balanced to some extent by attrition), a significant portion of districts’ budgets is fixed, including maintenance of school facilities (for buildings that remain open), administrative costs, pension liabilities, and medical coverage for retired teachers. Charter impact on district financial well-being thus depends in part on whether district enrollments are growing or declining more generally. The concern about fiscal impacts is much greater in cities of the Northeast and Midwest and in California, places that are losing populations, than they are in the mountain states and many parts of the South, which are experiencing enrollment stability or increases. This may help account for the greater expansion in recent years of charter school presence in growing rather than in declining parts of the country. Districts with declining enrollments and large legacy costs suffer the most from an increasing charter presence, which may help explain increasing resistance to charters in these communities.

Private Schools

Roman Catholics built an alternative school system in the nineteenth century, but their efforts to secure public funding were usually stymied by stout Protestant opposition. In Oregon, for example, voters enacted legislation requiring all students to attend public school (Jorgenson 1987). The Society of Sisters of the Holy Names of Jesus and Mary sued, and in 1925, the Supreme Court guaranteed parental rights to send their child to a private school (*Pierce v. Society of Sisters*). In the twentieth century, private school enrollments reached their peak in 1958 when 15 percent of those in school were attending nonpublic institutions (Murnane et al. 2018), but by 1995 the percentage had declined to 12 percent of students, falling further to 10 percent by 2021 (figure 12). The largest drop occurred in the Catholic sector: its share of the private school market decreased from 45 percent in 1995 to 33 percent in 2021 (figure 13). The percentage of students attending conservative Christian schools has remained at about 15 percent over the period, but other religious and secular schools have each increased from around 20 percent to 25 percent of private school enrollments.

One reason for the decline in private school enrollment is the rising price of private school tuition; this is particularly true for Catholic schools, which now hire lay rather than clerical teachers who take oaths of poverty (Murnane and Reardon 2018). To enhance greater access for low-income students, some states now provide vouchers or scholarships that may be used to offset partially or wholly the cost of attending a private school. Others provide tax credits to businesses or individuals who donate to foundations that provide scholarships to disabled or disadvantaged students. Recently, thirteen states established education savings

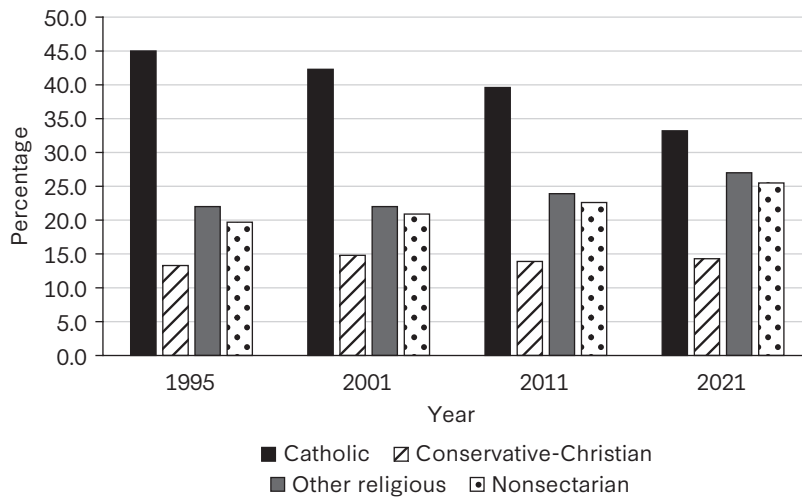
FIGURE 12 Total private enrollment as a percentage share of total enrollment in the United States, 1995-2021



Note: Figure includes enrollment in prekindergarten through grade 12 in schools that offer kindergarten or higher grades.

Source: *Digest* 2023, table 205.10.

FIGURE 13 Percentage distribution of students enrolled in private schools in the United States, by school orientation, 1995-2021



Note: The percentages are expressed in terms of total private enrollment. Enrollment in prekindergarten through grade 12 in schools that offer kindergarten or higher grade is included. Data for 1995 and 2001 are taken from *Digest* 2012, table 68. Data for 2011 and 2021 are from *Digest* 2023, table 205.20.

Source: *Digest* 2012, table 68, and *Digest*, 2023, table 205.20.

accounts that give tax credits to individuals to cover the cost of tuition. About 1 percent of all children (or a little over 10 percent of all private school students) were attending private school with this type of government assistance in the 2021 school year (Wolf 2020, 4; see also Bedrick and Tarnowski 2021).

Educational returns to a private education are difficult to estimate because many private schools do not participate in surveys of student achievement or attainment. While students from private schools that participate in NAEP perform at a higher level than public school students, the differences could well be explained by the backgrounds of students in the two sectors. Studies of the impact of small-scale vouchers and tax credit programs on the performance of participants have detected positive outcomes for disadvantaged students, especially for high school graduation rates and college attainment (Cheng and Peterson 2021; Chingos, Monarrez, and Kuehn 2019; Chingos and Peterson 2015; Wolf, Witte, and Kisida 2019), but larger statewide interventions in Indiana and Louisiana show zero or even negative achievement benefits (Abdulkadiroglu, Pathak, and Walters 2015; Mills and Wolf 2017; Waddington and Berends 2018).

School voucher and tax credit programs have both advocates and opponents. They have been praised for providing access to private schools to those who otherwise could not afford them. Opponents note that these programs remove resources from public systems, a critique that mirrors that made of charter schools, and that they direct public dollars to schools that are not subject to the same accountability requirements of public schools. What happens in practice depends on the design of the government program. If vouchers and tax credits are limited to those who are of low income, as has been the case with most voucher interventions, then the program is likely to broaden the social base of private schooling. But if government subsidies are offered to everyone, as has recently been done in Florida, Arizona, and West Virginia under the label of education savings accounts, then those of higher income can be expected to make greater use of this opportunity.

Homeschooling

Unlike most other industrial societies, all US states allow parents to provide K-12 instruction at home. Regulations in some states are highly permissive, but others ask parents to follow detailed procedures with respect to the manner and content of home instruction. Official statistics on the extent of homeschooling do not account for the many parents who do not notify districts that they are homeschooling their children. A survey administered by the US Department of Education in 2019 reports that 3 percent of all US students were being homeschooled in 2019, up from less than 2 percent when the survey was conducted in the 1990s. A 2022 survey indicates that the percentage doubled to around 6 percent during and after the pandemic (Houston, Peterson, and West 2023), but that estimate is not precise and the increase may be temporary. Governments historically have not subsidized homeschooling practices, but thirteen states have recently enacted education savings accounts that allow families of children who do not attend public school to deduct from their state taxes the money they spent on educational purposes, such as computers, curricula, and internet access (Hendrie 2023). Little is known about the effectiveness of homeschooling, because most states do not require students who are homeschooled to participate in standardized testing for accountability purposes. Advocates point to higher scores of homeschoolers on the SAT and ACT, but participation in these tests is voluntary and highly selective.

EARLY CHILDHOOD EDUCATION

HOW COMMON IS FORMAL EARLY CHILDHOOD EDUCATION?

Support for preschool education spread quickly as the percentage of women entering the workforce increased. The percentage of children aged three to five in either a public or private preschool program climbed from 38 percent in 1970 to a high of 64 percent in 2000, remaining nearly at that level in the decades since (figure 14).

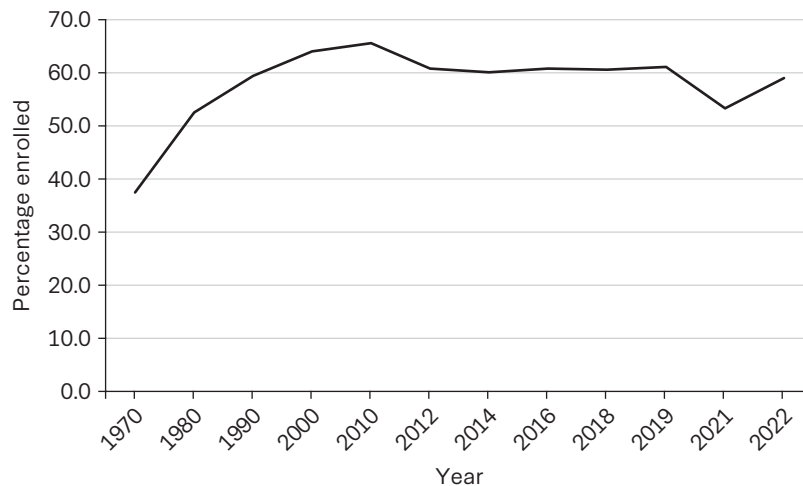
WHAT SOCIOECONOMIC DISPARITIES EXIST IN CHILDREN'S EDUCATIONAL PREPARATION? WHAT PROGRAMS HAVE BEEN DESIGNED TO MITIGATE THEM?

Socioeconomic differences in family background drive large differences in student achievement, which are evident long before a child reaches school (Duncan and Murnane 2011; Jencks and Phillips 1998; Magnuson and Duncan 2016). To help mitigate social disparities, a federally funded program, Head Start, provided publicly funded preschool, along with a bundle of other social services, to low-income households as part of the Johnson administration's War on Poverty. Public school districts, at times with state support or mandates, also sometimes provide prekindergarten education in elementary schools.

HOW EFFECTIVE IS EARLY CHILDHOOD EDUCATION?

Heckman (2006) argues that early childhood programs are more effective mechanisms for rectifying socioeconomic inequalities than ameliorative policies implemented later, positing

FIGURE 14 Percentage of three- to five-year-olds enrolled in (pre)school programs in the United States, 1970–2022



Note: Preschool programs include kindergarten and preschool (or nursery school) programs. Data for 2020 are missing. In 1994, a new data collection procedure was implemented; thus, data may not be comparable to earlier years. Data for 1970–2000 are from *Digest*, 2019, table 202.10. Data for 2010 are from *Digest* 2022, table 202.20. Data for 2012 and subsequent years are from *Digest* 2023, table 202.20.

Sources: *Digest* 2019, table 202.10, *Digest* 2022, table 202.20, and *Digest* 2023, table 202.20.

that the earlier the point in the life cycle at which the intervention occurs, the more likely it will alter a child's future trajectory. To support his thesis, he cites two experimental studies of small, high-quality preschool interventions that found long-term income, educational, and social benefits for low-income students (Besharov et al. 2011; Campbell et al. 2002; Gramlich 1986). A sizable research industry has since estimated the short-term and long-term impact of Head Start and other large-scale preschool programs.

Head Start

A federally mandated, experimental, nationwide study of Head Start found the program produced short-term gains in school readiness, but that benefits “faded out” relatively quickly in elementary school once the children left Head Start (Puma et al. 2012). Quasi-experimental studies report improvements in high school and college completion (Bailey, Sun, and Timpe 2021) and declines in criminal justice involvement for African Americans (Garces, Thomas, and Currie 2002). New research finds benefits of Head Start for the children of participants, who were more likely to graduate from high school, were less likely to be engaged in the criminal justice system, and had a lower incidence of teen childbearing, compared to those whose parents lacked access to Head Start (Barr and Gibbs 2022).

The difference in the results from the various studies could be due to differing methodologies, but they are not necessarily at odds with one another. Children could learn cognitive and social skills in Head Start that nonparticipants soon learn in the early elementary grades, thus eliminating the Head Start lead. But Head Start participants might benefit in unmeasured ways, both socially and academically, that are critical for success later in life. One must also keep in mind that these are average effects, which may mask wide variation in the quality of Head Start programs across locations (Morris et al. 2018). That variation underlines the importance of taking into account the site-specific quality of the Head Start services and the quality of alternatives to Head Start available to potential participants.

Public Prekindergarten

Most US states now provide some funding for prekindergarten education, but they vary in whether it is offered universally (to all who are age eligible) or is limited to low-income or otherwise disadvantaged students. Universal pre-K eases parental access to the workforce, provides opportunities for learning in socially diverse settings, and enhances the political base of support for preschool education. But do children from higher-income families benefit educationally and socially from publicly provided preschools? In a quasi-experimental study, Cascio (2023) finds that students from low-income families in states with publicly funded prekindergarten programs show test-score gains in the short run, whereas students from middle-income families do not. She also finds that children in low-income families show greater test-score gains in states with universally accessible pre-K than in states with targeted programs.

An experimental evaluation of a universal preschool program in Tennessee also detected immediate social and academic benefits from preschool education but found that these

benefits evaporated by third grade. By sixth grade most outcomes had even turned negative (Durkin et al. 2022). One potential explanation for this perhaps unintuitive result comes from prior research establishing that spending time in “large group activities with passive children learning in teacher-led instruction,” in contrast to active, play-based engagement, is standard practice in many pre-K classrooms and is predictive of poor outcomes in language, math, and executive function skill acquisition (Hirsh-Pasek et al. 2022). Another explanation is that children’s alternative experiences at prekindergarten age (about age four)—including but not limited to care at home, in private preschools, or in Head Start—have strengths that are difficult to replicate in large-scale, state-funded programs.

In sum, almost all studies find at least short-term social and academic gains from preschool programs. Quasi-experimental research and small-scale experimental studies find that many of these gains persist beyond the conclusion of the program. Large-scale, experimental studies show that these gains are not sustained through third or sixth grade and do not yet include analyses of adult outcomes.

A LOOK FORWARD

ARE US SCHOOLS ON THE VERGE OF A TIPPING POINT?

By many metrics, public education has been a growth industry throughout US history. The number of children enrolled in school increased in nearly every decade on record, excluding only the 1940s, a consequence of the fertility bust during the Depression years. Per-pupil expenditures have risen twentyfold since the 1920s (figure 7). The share of GDP allocated to K-12 public expenditure nearly doubled from just over 2 percent in 1950 to over 4 percent in 1970, after which it slithered down and up until it eventually returned to a high of over 4 percent in 2010 (figure 9). From 1970 to the early 2010s, math and reading achievement levels moved upward, and racial and ethnic gaps narrowed (figures 1 and 2). Of course, even as they improved, American schools never served all students equally well. Some disparities based on race, ethnicity, and economic disadvantage are frequently in the spotlight. Far less attention is paid to others, such as how American Indian students or students with disabilities fare in our schools. And even among schools serving similar student populations, some schools are just much better than others at generating achievement growth (Reardon 2019).

American education continues to face its long-standing challenges, exacerbated by the pandemic and, in many places, the context of troubling long-term enrollment trends. Even though K-12 spending per pupil increased with federal pandemic relief, these expenditures as a share of GDP fell to 3.7 percent by 2022, 12 percent below its level in 2010 (figure 9). Families are increasingly choosing alternatives to district-operated schools, both with and without government assistance (Houston, Peterson, and West 2022). Math and reading achievement experienced major setbacks, and there is no swift recovery in sight, due partly to troubling increases in chronic absenteeism that also threaten the efficacy of further investments. Fertility rates are headed downward; by 2031 the federal government projects that public schools will enroll just 46.9 million students, down from 49.3 million in 2021, which

FIGURE 15 The population of five- to seventeen-year-olds (in thousands) in the United States, 1880–2020



Source: *Digest 2022*, table 201.10.

translates into a drop of about 5 percent (*Digest 2022*, table 203.10). Fewer students mean greater fixed costs per pupil, and districts will increasingly find themselves grappling with the political and logistical challenges of closing schools.

Human capital is central to our democracy, economic growth, and social mobility. Giving up—that is, accepting the status quo and its current trajectory—is not an option, even though the path forward is not clear. Political leaders and the public at large must therefore vigorously renew their commitment to invest and experiment toward a productive, egalitarian system of education.

Research shows there is still hope. Improvements in student data systems and data processing systems have facilitated major advances in the amount, sophistication, and credibility of education research. Now, it is time for policymakers at all levels and the public to pay attention not just to the research on “what works” but also to what it takes to implement these practices on the ground. Tutoring programs only work if you can hire tutors; “evidence-based” curricula only work if teachers understand and embrace them in the classroom. Though the state and federal roles in American education have grown, the local context remains of the utmost importance for implementation. While political battles rage on the topics of various top-down mandates about how schools run, practically speaking such mandates are simply unlikely to work because of the importance of local implementation.

Throughout this essay, we noted where a consensus has emerged on key issues. We conclude by emphasizing that many of the big questions in education policy will have different answers in different places. Yet, education research should reduce the need for districts to reinvent the wheel. The goal is to spread knowledge generated from the varied policy landscape, rather than dictating solutions with no regard for the local context.

Local experimentation and autonomy naturally raise concerns about how to ensure adequate and equitable outcomes, much less excellent ones. Despite resistance from vested interests and ossified institutions, we anticipate continued public demand for high-quality schools and educational equity. But for that demand to be met, the public needs to be informed in greater detail both on how monies are allocated across programs, schools, and districts and on specific educational outcomes, as measured by standardized tests, student and teacher absenteeism rates, student well-being, and other critical indicators. No matter how unpopular, measurement of what is happening and transparency about outcomes are crucial for assessing the best way forward.

APPENDIX: METHODOLOGICAL CONSIDERATIONS

DO STANDARDIZED TESTS PROVIDE USEFUL INFORMATION ABOUT STUDENT LEARNING?

The psychometricians who design standardized tests administered by states and other agencies assume that the responses to the test items yield a reliable and valid estimate of the knowledge and skills acquired by the population being tested. Tests are designed to produce a normal distribution of responses that enhances reliability and facilitates comparisons across tests. Reliability is indicated by the consistency of responses across test items and across multiple administrations of the test. Validity is supported by correlations between test performance and life outcomes, such as graduation rates from high school and college and earnings received as an adult (Chetty, Friedman, and Rockoff 2014a, 2014b). A test result may not be either reliable or valid for any one individual, but errors at the individual level tend to cancel one another out when results are aggregated for large groups. When tests are administered to hundreds and thousands of students, aggregate results are quite consistent from one test administration to the next and predict life outcomes, as well as outcomes based solely on family background characteristics (Jencks 1979).

The correlation between test performance and future education and earnings is statistically significant but moderate in magnitude, leaving much unexplained and demonstrating the importance of other dimensions of human capital. Tests do not measure artistic or musical talent or athletic prowess or the ability to write creatively and imaginatively. They do not measure health, social skills, self-discipline, character, patience, emotional well-being, or many other valuable attributes. However, the question is not whether tests measure everything but whether they are useful for measuring some important things, such as the ability to read and interpret written material, calculate numerical relationships, analyze information, and understand scientific principles. If tests can tell us how well the next generation is mastering those basic skills, they are probably useful measures of what might be expected from schooling and may serve as reasonable proxies for longer-term life outcomes.

WHAT IS THE EVIDENCE USED TO ASCERTAIN WHAT WE KNOW?

Much of the information in this essay describes educational trends and practices. For information about causes and effects, we draw on experimental, quasi-experimental, and descriptive analyses that control for observed characteristics.

Randomized experiments are the gold standard for making causal estimates in physical, medical, social science, and all other research: when we write “experimental research” we refer to research relying on randomization. When two randomly assigned groups are compared, a treatment given to one group, but not to the other, is the probable cause of a downstream outcome. Causes are estimated from treatments given to groups of individuals drawn from a specific population, which raises the question whether treatment works in the same way in other populations. For example, a lottery study of a charter school (the treatment) may

show that its students were more likely to graduate from college than those who lost the lottery (the untreated), but does that finding apply to other charter schools? An experimentally designed study of a preschool program may show that participants (the treated) subsequently have higher lifetime earnings than those who were randomly excluded (the untreated), but can this result be generalized to other preschool programs?

Quasi-experimental research seeks to identify causal relationships that occur in the absence of random assignment of individuals to two groups. These “quasi-experiments” may have the advantage of affecting large groups as the result of real-world events. For example, a school may have a rule that says no child shall be taught in a class with more than 24 pupils. If the number of students at a school increases from 48 to 49, then the school will divide pupils into three classes of 16 to 17 each (the treated) instead of two classes of 24 (the untreated). The two situations may include pupils who are on average no different in their ability to learn, which may allow the observer to estimate the effects of a reduction in class size. But there is no certainty that the students in the two situations are in fact identical in all other ways than the size of the class they attend. In a study of pay bonuses given only to teachers deemed highly effective (the treated), there may be no difference at the boundary between teachers deemed highly effective and those said to be merely effective (the untreated). Any subsequent changes in teacher retention or teacher impact on students can be attributed to the bonus, but one cannot be sure that teachers at the boundary line between the treated and untreated are identical in all other respects.

Despite the limitations of both experiments and quasi-experiments, we nonetheless give them greater weight than descriptive studies that draw causal conclusions from differences between different groups of students after making statistical adjustments for observed differences between them. For example, school districts in the South were much more likely to be affected by court orders to desegregate their schools than school districts in other parts of the country. Subsequently, Black achievement (the treated), adjusted for other student characteristics, rose more rapidly in southern states than in other parts of the country (the untreated). That might have been due to desegregation of schools in the South, but other factors occurring at the same time—such as the invention of air conditioning, the reduction in contagious diseases, or the extension of suffrage to Black Americans—may have been responsible as well. In contrast, a standard quasi-experimental approach to this same research question involves comparing changes in student outcomes associated with the district-specific timing of court orders within the South. That approach provides a better chance of accurately describing a causal impact of desegregation.

Generally, descriptive studies are less able to rule out other possible causes than experimental or quasi-experimental studies. However, descriptive studies can observe large changes in broad populations and provide suggestive, if not conclusive, information. They are valuable when other research strategies are unavailable. In sum, what we know about our schools is always probabilistic and open to change as more research is undertaken, but some things are known with greater certainty than others, and experimental and quasi-experimental studies are to be given greater weight than descriptive ones.

ARE FINDINGS FOR US SCHOOLS SUPPORTED BY RESEARCH IN OTHER COUNTRIES?

Our findings are based on research conducted largely within the United States. High-quality research has been conducted on education policies in many other countries, but a comprehensive review of that literature is beyond the scope of this essay. The effects of policies vary with the great diversity in economic, social, political, and institutional settings across the globe. Any inferences of studies of relationships in other countries for the United States must be made cautiously, and vice versa. We recommend that a comprehensive review of what can be learned from studies of schools worldwide be undertaken, preferably by an international team of scholars.

WHAT IS THE IMPACT OF BRINGING INTERVENTIONS TO SCALE?

The external validity of experimental and quasi-experimental research is dependent in part on the scale of the intervention. If education experiments are conducted on a relatively small scale for the very good reason that they can be executed at a reasonable cost, generalization to a large-scale intervention assumes that more inputs of equally high quality can be obtained. This assumption is often problematic. For example, a well-known experiment conducted in Tennessee found positive educational returns from class-size reduction for children entering kindergarten and first grade. Though the study included a sizable number of subjects in many schools, it was still a fairly small-scale intervention. When California enacted legislation that mandated class-size reduction throughout the state, the policy affected millions of students. No positive effects were observed. Investigators argued that the implementation of the policy at large scale required the recruitment of many new teachers, thereby reducing the quality of the teaching force.

In this essay we occasionally mention scaling issues, but we do not comprehensively discuss the multiple issues involved when interventions are brought to scale. Studies of scaling are still limited in number, and the nature of individual programs or interventions determines the particular challenges they pose for scale. These challenges are often logistical, such as staffing, space, scheduling, and transportation. This is a promising area for future research.

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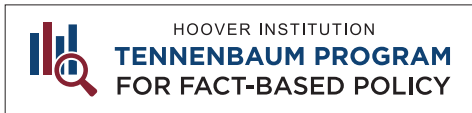
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