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EDUCATION SCORECARD

From Learning Recession to Learning Recovery:

Understanding the Sources of U.S. K-12 Improvement

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I. Introduction

We launched the Education Recovery Scorecard in 2022 to track the pace of post-pandemic recovery in local communities around the country. The hunger for comparable, timely estimates of local achievement trends was evident in the more than 5,000 media hits that the Scorecard received in its first four years. Last year, media outlets in 34 states wrote about the progress and struggles of students in their own communities. Now that the federal relief dollars are gone, we are dropping the "recovery" from our name, but we will continue to examine the national data to shed light on contemporary policy debates while also highlighting local districts that are leading the way forward.

In this report, we describe the "learning recession" that started in 2013, when math and reading improvement stalled and U.S. students' average test scores began declining. We explore factors affecting the recovery since 2022: federal pandemic relief, lingering student absenteeism, and federal school accountability. We also provide initial evidence on state-led early literacy reforms, by comparing state reading gains against their implementation of evidence-based reading reforms.

Specifically, we find:

- **The United States entered a "learning recession" in 2013, as student progress in math and reading stalled and achievement began to decline.** In reading, the average annual loss in achievement immediately before the pandemic (2017–19) was just as large as during the pandemic (2019–22). Grade 8 reading scores in NAEP are now at their lowest point since 1990 and Grade 4 is at pre-2003 levels.
- **The slowdown in learning coincided with a dismantling of test-based accountability and a rise in social media use.** It is not clear which was most influential. At the least, the phasing out of test-based accountability made the pre-pandemic losses harder to recognize.
- **Since 2022, the recovery has been "U-shaped," with larger improvements among the highest and the lowest income school districts in the country.** Middle income districts—with between 30 and 70 percent of students receiving federally subsidized lunches—have seen the least improvement on average. The recovery in achievement in the highest poverty districts seems largely due to the federal pandemic relief. Without federal relief, the average high-poverty district would have remained at 2022 levels of achievement.
- **After the pandemic, math achievement rebounded immediately, with the annual rate of improvement returning to pre-2013 levels in 2022–24. In reading, however, achievement continued to decline through 2024. In 2025, we see the beginnings of a turnaround in reading.** The incipient recovery in reading appears to be related to state early-literacy reforms. All of the states which improved in reading between 2022 and 2025 were implementing comprehensive "science of reading" reforms (Maryland, Louisiana, Tennessee, Kentucky, Indiana, Mississippi, Montana, District of Columbia). None of the states which had eschewed literacy reforms as of January 2024 improved in reading between 2022 and 2025 (Massachusetts, California, Washington, New Hampshire, Georgia, Wisconsin, Rhode Island,

New Jersey, Hawaii, South Dakota). Nevertheless, many states that were implementing multiple elements of science of reading reforms have yet to turn around (e.g., Florida, Arizona, and Nebraska). Evidence-based reading reform may be a necessary but insufficient path to improvement.

- **High student absenteeism continues to be a headwind for academic recovery.** If student absences had returned to pre-pandemic levels, the recovery would have been meaningfully larger (.03 to .05 grade equivalents) for districts at all income levels.
- **There has been dramatic variation in the pace of recovery even among districts with similar student characteristics.** As a result, we have identified 108 districts with large improvements in both subjects (and a total of 448 districts with large improvements in either subject). We highlight these "districts on the rise" in the hope that they can serve as examples of what is possible.

Recommendations

Our findings point to four recommendations for education leaders:

1. **Now that the federal pandemic relief has expired, states should consider schools' achievement losses since 2019 when identifying schools for comprehensive support and improvement.** The federal relief dollars were heavily concentrated in the lowest income districts (with more than 70 percent of students receiving federally subsidized lunches), while higher income districts (those with less than 30 percent of children receiving lunch subsides) had greater financial and social capital to draw on. But many middle-income school districts—those with 30–70 percent of students receiving federal lunch subsidies—received little federal aid and remain far behind 2019 levels of achievement.
2. **Lowering student absences remains a priority.** If absence rates had returned to pre-pandemic levels, recovery would have been meaningfully faster. Moreover, getting students back into the habit of reliable attendance will continue to pay off for years into the future.
3. **It is crucial to learn more about the factors that have led to declining scores and the potential different strategies hold for improving student performance.** To that end, the federal government should support research in three areas:
    a. **The Role of Social Media:** The decline in achievement which preceded the pandemic was likely partially due to social media exposure. In the next year, researchers around the country will be reporting on the impact of various cell phone bans. The federal government should coordinate efforts to reach consensus and reconcile any differences in findings. Early results suggest positive—but small—impacts on student achievement. If further research confirms this, we should be evaluating new approaches to reducing cell phone use in school and social media use outside of school.

b. **Early Literacy Reforms**: As of March 2026, 42 states and the District of Columbia have passed laws or policies related to evidence-based reading instruction—often referred to as the "science of reading" (Schwartz, 2026). But not every state's efforts are succeeding. The federal government should provide funding to evaluate specific aspects of state policies—such as literacy coaches or third grade retention policies—and share lessons learned.

c. **Lowering Absenteeism:** Although there is evidence on effective methods for lowering absenteeism, most of those effects are small. The federal government should support and evaluate new approaches to lowering absenteeism.

4. **We hope that states will pair each of the 108 "Districts on the Rise" with one or more similar districts in their state, to compare notes on recovery strategies.** A small investment, such as paying travel expenses for teams to visit in person in the fall, could yield large dividends if districts successfully share ideas for improvement.

II. Data

Achievement data: The achievement data in this report come from the **Stanford Education Data Archive** (Reardon et al., 2026a, 2026b), produced by the **Educational Opportunity Project at Stanford University**. SEDA includes district-level test score data from 2009 through 2025 in math and reading. The SEDA data for 2022-2025 rely on district-level achievement data collected by the Education Data Center (Education Data Center, 2025). The estimates are constructed by converting the shares of students in each state-defined proficiency category to estimates of the average test score in each district. Because tests and proficiency definitions differ across states and frequently shift within states over time (as states change their tests and proficiency definitions), SEDA uses the federal National Assessment of Educational Progress (NAEP) to align state test scores to a common scale. To make the scores more easily interpretable, they are rescaled to grade level equivalents, using the 2019 NAEP as a referent.[1] A one-grade level improvement is roughly equivalent to the average amount of improvement students make from one grade to another between 4th and 8th grade.

Unfortunately, the spring 2025 state test administrations used in this report fell between the 2024 and 2026 NAEP administrations. As a result, the 2025 state test scales cannot be linked to NAEP if the tests changed between 2024 and 2025 (e.g., Illinois, Kansas). Moreover, high opt-out rates in some states (e.g., New York, Colorado) make it impossible to compare the population of students taking state tests to the sample used for NAEP estimates. Additionally, some states do not publish sufficiently detailed data to enable the estimation of district-level average scores. Thus, the 2025 SEDA are limited to the 40 states where tests and proficiency levels were reportedly unchanged from 2024 and where adequate data were available (for more on the SEDA methodology, please see Fahle et al 2026a; 2026b). Next spring, when the 2026 NAEP is released, SEDA will add additional

1 Roughly speaking, we define one "grade level" as one-fourth the difference in average 4th and 8th grade NAEP scores in 2019. See Fahle et al., 2025 for details.

states and will include updated 2025 estimates to reflect the changes in state NAEP scores between 2024 and 2026.

Average days absent: To measure student absences, we rely on district-level chronic absenteeism rates collected by Nat Malkus at the American Enterprise Institute (AEI) for the school years 2016–17 through 2024–25.

Using data from two states which report both chronic absence and average absence rates, Massachusetts and Florida, we find a strikingly consistent linear relationship between the chronic absence rates and average absence rates measures. The same relationship holds both before and after the pandemic (see **Appendix B** for details). Each 10-point increase in chronic absence corresponds to a 1.8-point increase in average absence rates. Therefore, we use the chronic absence rates to estimate an average absence rate for each district. We also calculate the average number of days absent by multiplying by 180.

Federal Pandemic Relief: The first package of federal pandemic relief for schools (ESSER I, $13.2 billion) was to be obligated by districts by the end of September 2022. Because we are investigating achievement gains between spring 2022 and spring 2025, we focus on the second two packages, ESSER II ($54 billion) and the American Rescue Plan or ESSER III ($122 billion). We use the total district allocation under ESSER II/III as an estimate of the increase in spending in the district after spring 2022 and before spring 2025. The proxy may overstate the increase in spending if some of the ESSER II dollars may have been spent before spring 2022, or if local government offset some of the federal relief by reducing local revenues for education. (It could also understate spending if some districts had ESSER I dollars leftover in spring 2022.) The American Rescue Plan required states to maintain their grants to school districts.

Federal accountability: We used data reported by the U.S. Department of Education for the number of schools failing to make "adequate yearly progress" (AYP) under No Child Left Behind (NCLB) for the years 2002–2003 through 2004–2005. For 2005–2006 through 2010–2011, we relied on AYP data reported by the Center on Education Policy (CEP). CEP researchers originally collected this data through state department of education websites, direct communication with state education personnel, and State Consolidated Performance Reports submitted to the U.S. Department of Education. Note that for school years ending in 2003, 2006, 2007, and 2008, the precise number of schools failing to make AYP was not available. We instead estimate the number of schools failing to make AYP using reported percentages. For years 2011–2012 through 2014–2015, we used school improvement status data from EDFacts to get the number of schools failing to make AYP and schools otherwise designated for improvement under federal waivers.

To determine the number of schools designated for "comprehensive support and improvement" (CSI), "targeted support and improvement" (TSI), or "additional targeted support and improvement" (ATSI) under the Every Student Succeeds (ESSA) Act, we used data from EDFacts for 2018–2019 and 2019–2020. Unfortunately, EDFacts only reported such data for these two school years. Josh Bleiberg at the University of Pittsburgh generously provided us with data assembled from state education agencies, identifying schools designated for CSI or TSI for 2017–2018. Bleiberg also provided us with data on schools designated for CSI in 2021–2022 or 2022–2023, though data on

schools designated as TSI was not available for these years (note that we combine data from the 2021–2022 school year into the 2022–2023 school year, as improvement statuses for these two years were mutually exclusive). For data on the 2023–2024 school year, we received accountability data from the U.S. Department of Education.

Federal accountability designations are made at the school level. As a result, we calculated the percentage of all public school students in grades 3–8 who attend a school with the above accountability designations and use this percentage to study the expected district-level effects.

State early literacy policies: The Foundation for Excellence in Education (ExcelinEd) tracks state implementation of 18 elements of early literacy policies, such as training for K-3 teachers and administrators in evidence-based reading instruction, universal screeners to identify students with reading challenges, literacy coaches in elementary schools, and mandatory retention policies. We used the Internet Archive to download ExcelinEd's State-by-State Policy Implementation Reports for each state for January 2024. As a proxy for the comprehensiveness of a state's literacy reforms, we used the count of the number of policy elements that were either in full or partial implementation, as designated by ExcelinEd.

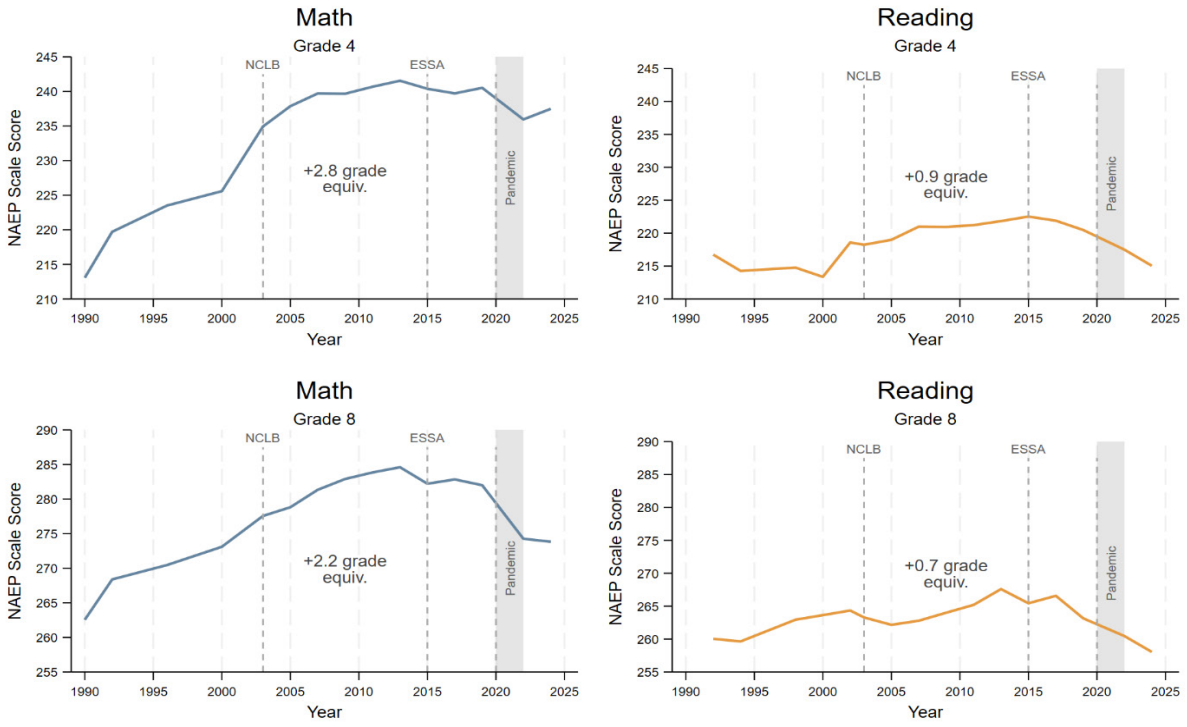
Pre-Pandemic Improvement and the Learning Recession

There is a widespread belief that student outcomes in the United States have been unchanged for decades. However, that narrative is false. In **Figure 1**, we report the trend in scores on the NAEP in 4th and 8th grade math and reading between 1990 and 2024.[2] From the pre-No Child Left Behind Act (NCLB) minimum to the post-NCLB peak, mean math achievement in 4th and 8th grade improved by the equivalent of 2.8 grade equivalents and 2.2 grade equivalents, respectively. Many individual states, such as North Carolina, experienced even larger improvements.

Reading achievement also improved, although less than in math. Reading achievement on the NAEP improved by 9 points in 4th grade and 8 points in 8th grade, respectively, from the pre-NCLB period to the post-NCLB period, equal to almost a full grade equivalent.

2 The NAEP also reports mean 12th grade achievement in math and reading, which has been flat. However, because of the rise in high school graduation rates, more students who would have been dropouts in years past are taking the 12th grade test in recent years. As a result, 12th grade achievement likely understates progress. Doty et al. (2025) find that despite flat 12th grade scores, those born in states with large improvements in 8th grade math achievement enjoyed higher earnings and educational attainment and lower teen motherhood, arrests, and incarceration.

FIGURE 1. NATIONAL NAEP TRENDS, 1990 TO 2024



Note: Estimates are from National Center for Education Statistics. (n.d.). ***NAEP Data Explorer.*** U.S. Department of Education, Institute of Education Sciences. We convert the difference in pre-NCLB minimum to post-NCLB maximum using a grade equivalent of 10.25 for math and 10.625 for reading.

Skeptics have been concerned that the improvement in test scores in response to test-based accountability was a result of "teaching to the test," in which teachers focus on test-taking skills and strategies rather than students' content knowledge. However, such concerns would apply primarily to state tests used for school accountability, not the NAEP. The NAEP is a low-stakes test, and teachers generally do not know the content or format of NAEP tests (nor whether their students will be sampled and assessed in any NAEP wave).

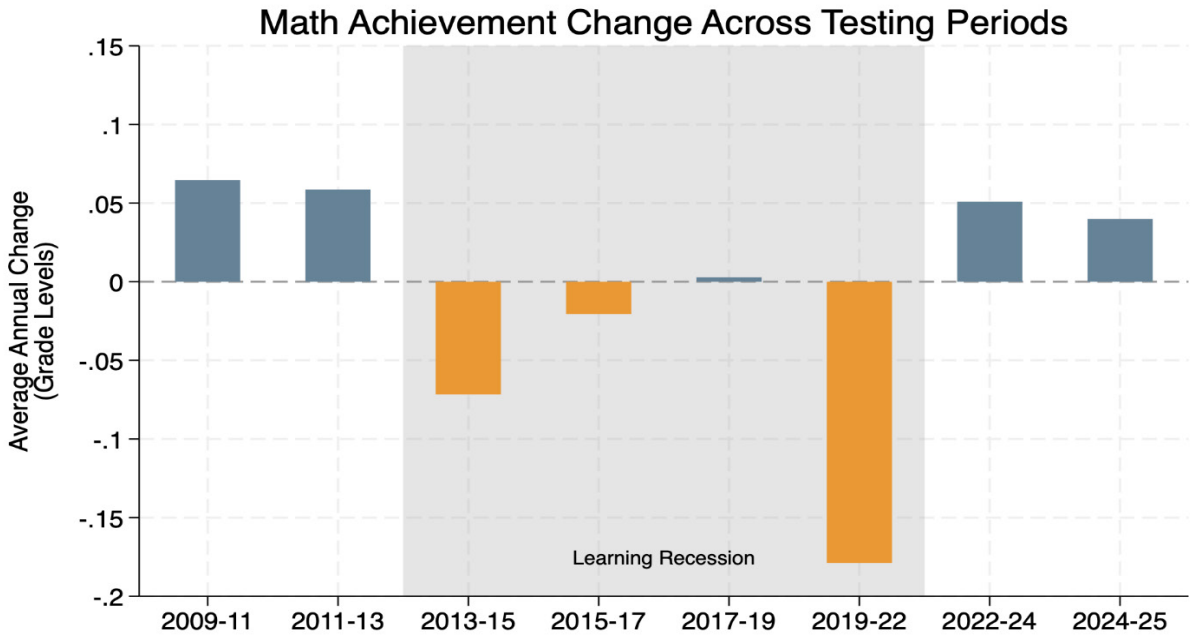
Moreover, Doty et al. (2025) find that those born in states with large increases in NAEP achievement had larger increases in earnings and educational attainment and bigger declines in teen motherhood and incarceration than those born in states with smaller increases. In fact, the differences were nearly as large as one would expect based on the prior research on the relationship between earnings and test scores. So, it would appear that improvements in NAEP scores reflected real student learning that benefited students in the long run, not just score inflation.

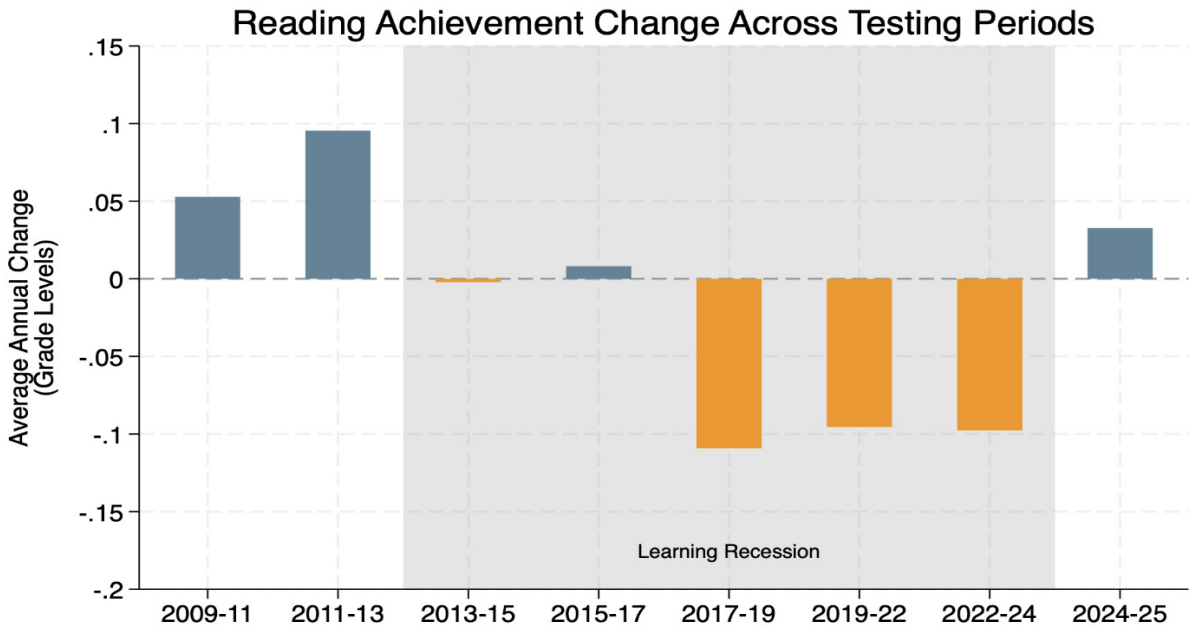
Annual Rates of Improvement

In Figure 2, we report the annual rate of improvement at the district level during different periods. Like a price index, the NAEP measures the level of student knowledge at a point in time. However, the annual rate of improvement in achievement is more analogous to GDP growth. As with the economy, when the rate of growth in learning shifts from positive growth to negative growth, it implies we have entered a "learning recession."

Between 2009–11 and 2011–13, for instance, math and reading achievement in grades 3–8 improved by .05 to .1 grade equivalents per year on average. At that rate, students would have improved between a half and a full grade level over a decade. However, as reported in Figure 2, there was a sharp downturn in the rate of improvement after 2013. Between 2013 and 2015, the rate of improvement became negative in mathematics and was essentially zero in reading. Although the pandemic seemed to hasten the decline in math, the annual rate of decline in reading was similar in the period before the pandemic (2017–19), during the pandemic (2019–22), and after the pandemic (2022–24).

FIGURE 2. ANNUAL RATE OF IMPROVEMENT IN ACHIEVEMENT 2009–2025





Note: District level average annual change in math and reading achievement using data from the Stanford Education Data Archive.

Explanations and Correlates of the Learning Recession

There are two potential explanations for the deceleration in achievement beginning in 2013: a decline in test-based accountability and the rise in social media. We discuss each below.

The role of test-based accountability in pre-pandemic trends

Prior research (Carnoy and Loeb, 2002; Hanushek and Raymond, 2005; Dee and Jacob, 2011) has found that achievement improved faster in states that had begun implementing test-based accountability during the 1990s and early 2000s. The improvements continued after the federal No Child Left Behind Act extended test-based accountability nationally in 2003.

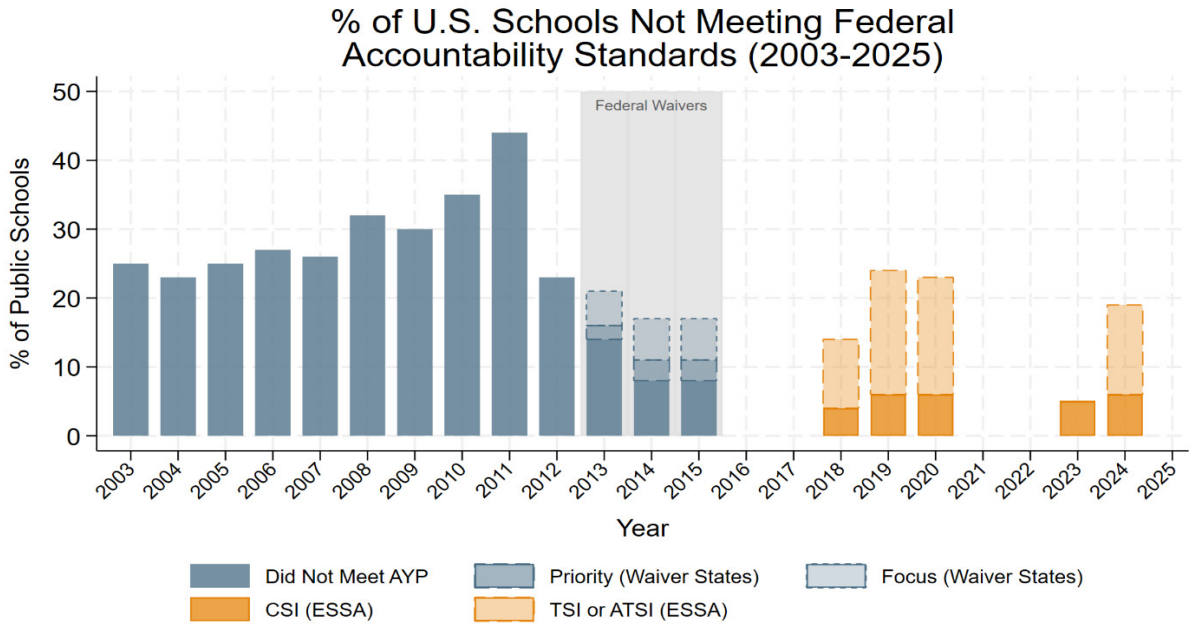
In the top panel of Figure 3, we report the number of schools identified for intervention under federal accountability requirements between 2003 and 2025. Between 2003 (the start of federal accountability under NCLB) and 2007, about 25 percent of schools were identified annually as failing to meet "adequate yearly progress" (AYP). Schools that failed to make AYP faced escalating sanctions for each year that they remained in that status, the most extreme being replacement of school leadership, conversion to a charter school, or state takeover.

NCLB envisioned that states would reach 100% proficiency by 2014 and most states backloaded their improvement goals closer to 2014 (Center on Education Policy, 2008) . This led to the thresholds for adequate progress rising over time. As a result, the percentage of schools failing to make AYP rose from 25 percent in 2007 to over 40 percent in 2011.

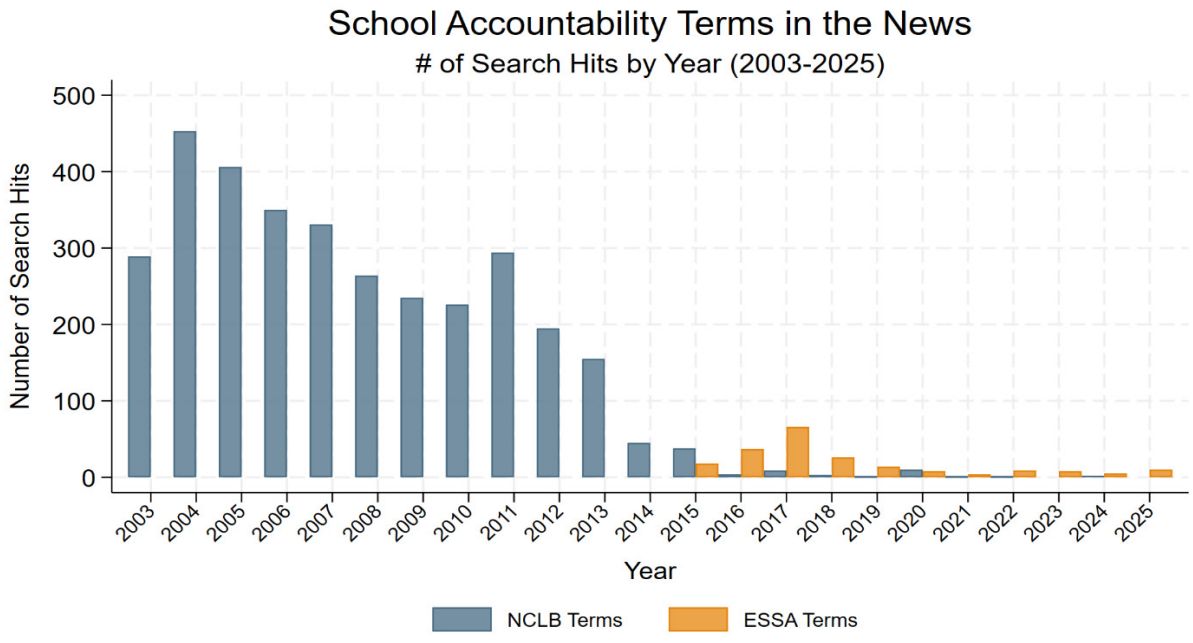
Beginning with the 2012–13 school year, the Obama administration began granting waivers to states, allowing them flexibility from NCLB accountability requirements in exchange for state adoption of approved reform plans. Although the waivers were not official until 2012–13, many states stopped identifying schools not making AYP in 2012, in anticipation of the waivers. Thirty-eight (38) states received waivers for the 2012–13 school year, with six more states receiving waivers in the next two years. As a result, the number of schools identified as failing to meet "adequate yearly progress" declined to less than 10 percent of schools by 2014. Le Floch et al. (2025) showed that the lion's share of the decline was in the states receiving NCLB waivers. The states with waivers started identifying low-performing schools as "focus" or "priority" schools, but the combination of schools not making AYP or being designated as focus and priority schools settled at roughly 15 percent of schools, far lower than in 2011 or before.

In December of 2015, U.S. Congress replaced the No Child Left Behind Act with the Every Student Succeeds Act (ESSA). While AYP designations had been based on achievement scores alone, states were required to design their own accountability measures , combining test-based measures with non-test-based measures, such as chronic absenteeism, survey measures of school climate and student engagement, and postsecondary enrollment.

FIGURE 3: TRENDS IN SCHOOL ACCOUNTABILITY SANCTIONS AND MEDIA COVERAGE



Note: Federal waivers from 2013–2015 allowed states to opt out of AYP requirements in exchange for alternative accountability systems. Schools not meeting alternative requirements under waivers are included in this percentage.



Note: Based on Factiva searches of 84 major news publications/sites. An example search term for NCLB is "adequate yearly progress" and for ESSA is "comprehensive support and improvement."

States were not required to report accountability designations in the 2015–16 or 2016–17 school years, as they transitioned from NCLB to ESSA. When accountability resumed in 2017–18, the number of schools identified for the most serious interventions, "comprehensive support and improvement" (CSI), was roughly 5 percent of schools, with another 10 percent designated for "targeted support and improvement" (TSI).[3] (Additionally, states were given more flexibility on the consequences of being designated CSI or TSI) (Meyers et al., 2023).

During the beginning of the pandemic, every state suspended its school accountability systems as state testing was cancelled in spring 2020. Thirty-one states resumed identifying CSI, TSI, and ATSI schools in the 2021–22 school year (based on spring 2021 scores). The remaining states began their second cycle of federal designations in the 2022–23 school year.[4] About 5 percent of schools were identified for CSI, while about 15 percent of schools were identified as TSI or ATSI by 2023.

The number of schools identified for intervention may have declined after the NCLB waivers began, but the public salience of test-based accountability declined even more. In the bottom panel of Figure 3, we report the number of news articles mentioning federal accountability designations (AYP or CSI, TSI, or ATSI) in major U.S. news publications and websites. While the annual number of schools identified for intervention under federal accountability declined by about 30% from 2003–2012 to 2018–2024 (from 28,320 per year to 19,871 per year for years in which we have complete data), the number of mentions in major news outlets declined by even more (97%) during that time period (from about 304 per year to 11 per year).

Thus, the decline in student achievement in the United States corresponded with a decline in the number of schools identified for intervention under federal test-based accountability as well as a decline in the public prominence of test-based accountability, as reflected in major news media.

However, it is difficult to establish a direct connection between the decline in achievement and the de-emphasis of test-based accountability. The decline in achievement after 2013 was similar in the states that had not received waivers from NCLB as in the states receiving them. While the waivers may have reduced pressure on schools to raise student achievement, accountability was also breaking down in the states where NCLB remained in place. One reason for the breakdown was that under NCLB, schools were expected to have 100 percent of students proficient in math and reading by 2013–14. When nearly every school would be designated a failing school, failure had lost its stigma.

Moreover, the most serious consequences of failing AYP did not start until schools had failed for multiple years. Had expectations for schools remained at the same level as in 2010—and not escalated to the levels required by No Child Left Behind—and if the Obama administration had not granted waivers to states to reduce test-based accountability pressures, it is possible that the rate of improvement would have continued beyond 2013. However, that hypothetical has never been tested.

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3 The five percent designated for CSI was no more nor less than ESSA required.

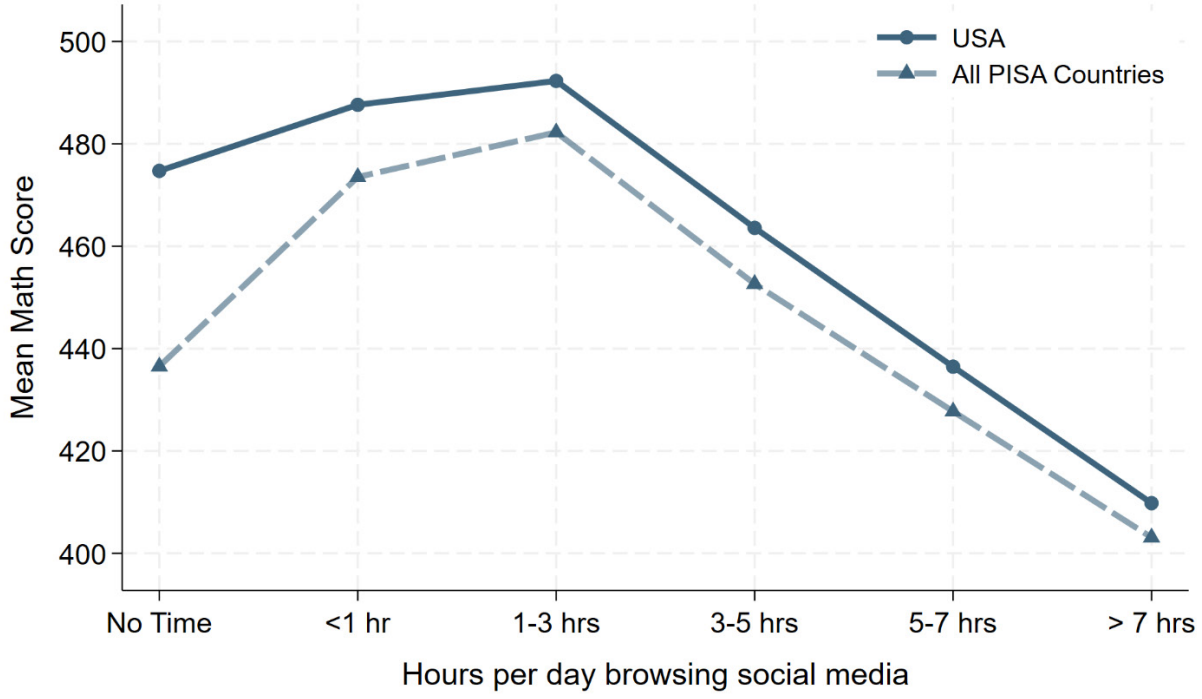
4 The U.S. Department of Education required all states to begin identifying CSI/TSI/ATSI schools in the 2022–23 school year based on spring 2022 assessments. Forty-one states received waivers to delay or modify their accountability designations in the 2021–22 school year (Ujifusa, 2021).

The role of social media in pre-pandemic trends

Another hypothesis to account for the learning slowdown after 2013 is the rise of social media. The most prominent proponent of the connection between social media use and academic achievement is Jonathan Haidt of New York University. In his book ***The Anxious Generation*** and in public presentations, he argues that the timing of the decline in achievement in 2013–15 corresponds with a sharp rise in teen social media use. According to the Pew Research Center, the share of U.S. teens aged 13 to 17 reporting that they were online "almost constantly" increased from 24 percent in 2014–15 to 46 percent by 2022 (Pew Research Center, 2022).

Other than timing, there are at least two additional pieces of evidence which suggest that social media may have played a role in the learning recession in the United States. First, the losses were concentrated among lower achieving students, who are the heaviest users of social media. In Figure 4, we report the average score on the Programme for International Student Assessment (PISA) math exam for students reporting different amounts of time browsing social media per day. For the 8 percent of U.S. students self-reporting to browse social media for more than seven hours per day, mean achievement on the PISA test was 80 points below (.8 standard deviations) those of students browsing for 1–3 hours per day. The relationship is similar in other PISA participating countries. The fact that heavy users of social media are lower scoring is not necessarily causal. However, if social media does have a negative impact, we would expect it to impact lower-achieving students more. It is telling, then, that is where the decline occurred.

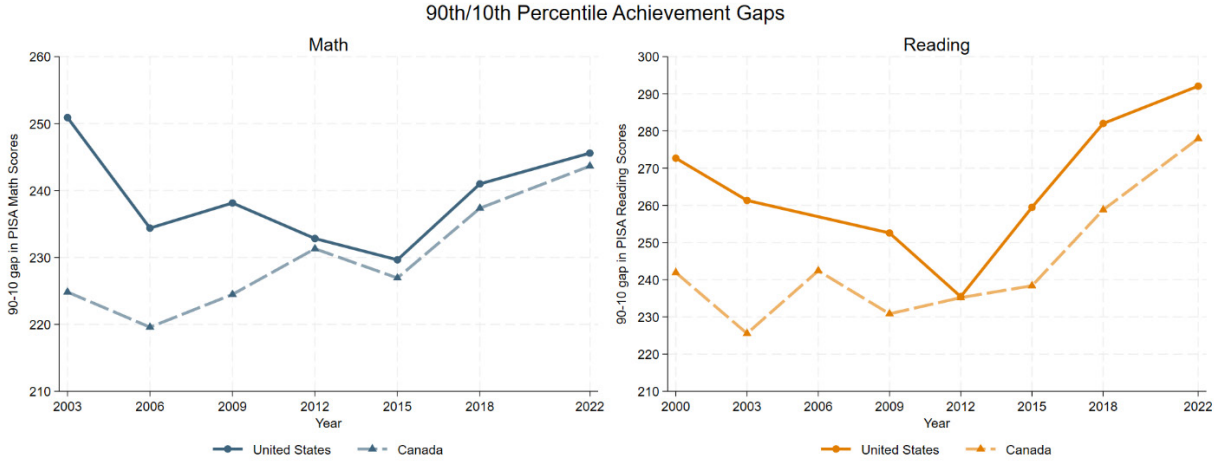
FIGURE 4. SOCIAL USE IS MORE PREVALENT AMONG LOWER-SCORING STUDENTS



Note: Based on authors' tabulation of the 2022 Programme for International Student Assessment. In the PISA sample, 7% of students reported no time browsing social media, 20% less than an hour, 36% 1–3 hours, 21% 3–5 hours, 10% 5–7 hours and 7% more than 7 hours. The percentages were similar in the United States.

Second, the gaps between 90th and 10th percentile students on the PISA exam started expanding in other countries around the same time as in the United States. In Figure 5, we report the trend in the gap between students at the 90th and 10th percentile in the United States and Canada. In the United States, math achievement gaps were narrowing prior to 2012, while gaps were essentially unchanged in Canada. In reading, the U.S. gap was narrowing through 2015, while growing slightly in Canada. However, after 2015, achievement gaps were widening in both countries. Especially in reading, the same widening between top and bottom scorers was occurring in many industrialized countries, including Austria, Finland, Denmark, Germany, Korea, the Netherlands, and Sweden. It would be hard to argue that the widening in Netherlands was due to the decline in test-based accountability in the United States.

FIGURE 5. ACHIEVEMENT GAPS IN THE UNITED STATES AND CANADA WIDENED AFTER 2013



Source: Programme for International Student Assessment.

Much of the research on exposure to social media has focused on student mental health outcomes rather than test scores (Arenas-Arroyo et al., 2022; Braghieri et al., 2022; Churchill & Johnson, 2026; Donati et al., 2025; Golin, 2022; McDool et al., 2020; Pugno, 2025). In reviewing research from the United States and Europe, Pugno (2025) concludes that social media does have negative impacts on mental health, especially among teenagers. It seems plausible that the decline in mental health spilled over to a decline in academic achievement as well. In one of the few studies focusing on achievement directly, Jain and Stember (2025) tracked academic achievement as 3G cellular rolled out in 82 countries around the world and found that math achievement declined as children gained access to broadband cellular services.

One way social media could impact student achievement is by distracting students in class. Thus, if achievement were to rise sharply following a cell phone ban, it would imply that social media had played a role in the original decline, operating through distractions in class. However, thus far, we have little evidence on the effect of cell phone bans. Beland and Murphy (2016) identified high schools in four English cities that had implemented cell phone bans and found a modest improvement in achievement (about one-fifth of a grade equivalent) for those schools

implementing bans, primarily among lower-scoring students. Using a similar research design with high schools in Sweden, however, Kessel et al. (2020) found no impact of cell phone bans on student achievement or GPA, even for lower-achieving students. Abrahamsson (2024) found that cell phone bans in Norway had positive impacts on student grade point averages (GPA), but only for girls. The impacts were generally insignificant for boys.

In the United States, at least 37 states and the District of Columbia have restricted the use of cell phones in schools as of 2026. So far, there are two major studies of the impact of cell phone bans in the United States. Figlio and Ozek (2025) found positive effects of a cell phone ban on student test scores in a large Florida district. However, the effects were quite small—roughly one-tenth of a grade equivalent—and did not appear until the second year after implementation.[5] The authors also reported an unintended consequence: a rise in disciplinary actions for African American students in the first year of the ban. The second study's estimates are largely consistent: Allcott et al. (2026) found that disciplinary incidents rose when a national sample of schools implemented cell phone bans using lockable pouches (Yondr bags). Although disciplinary incidents subsequently fell, they found no impact on student achievement or attendance.

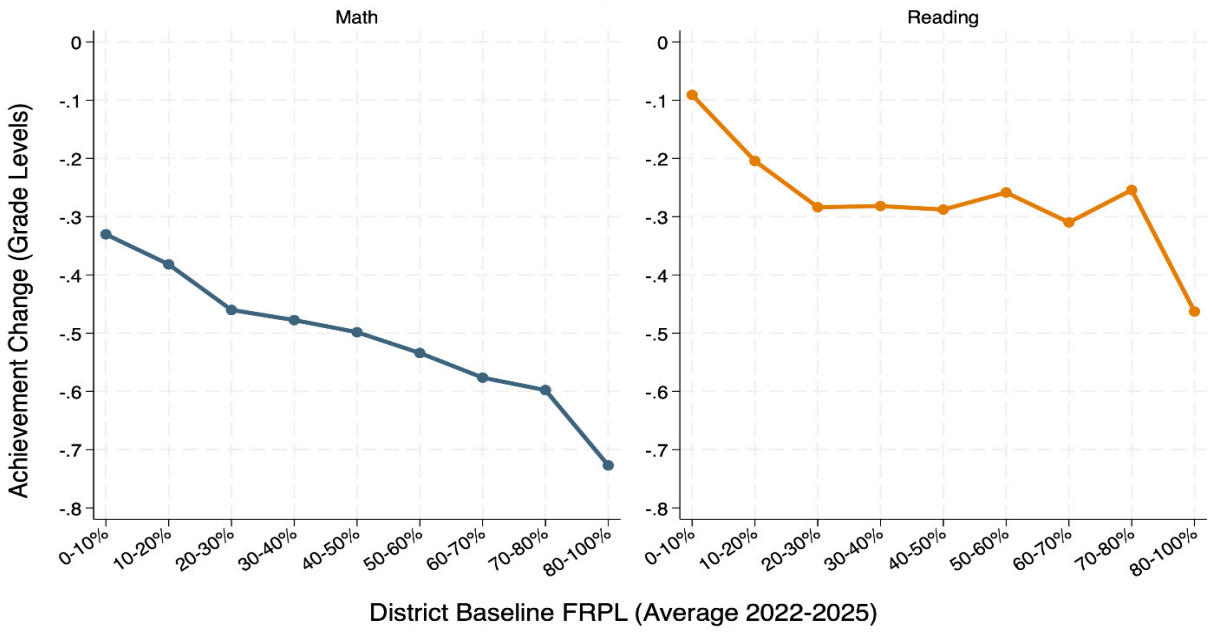
Thus, while the timing of the decline in achievement corresponded with a decline in test-based accountability and a rise in social medial use, there is still no direct evidence that either was the cause of the decline in U.S. achievement after 2013. Moreover, if social media did play a role, it seems likely that the mechanism was not just through students being distracted by cell phones during instructional time, but a combination of factors, including interrupting students' sleep, reducing reading time outside of school, increasing social anxiety, weakening executive function, et cetera.

Poverty and Academic Recovery 2022–25: The U-Shaped Recovery

In Figure 6, we describe average pandemic achievement losses in math and reading by district poverty status. Even in the districts with the lowest poverty rates, those with less than 10 percent of students eligible for federal subsidized lunch, the average student lost .3 grade equivalents in math and .1 grade equivalents in reading over the course of the pandemic. However, the losses were roughly twice as large for the highest poverty districts. In districts with more than 80 percent of students eligible for federal subsidized lunches, the average loss was more than .7 grade equivalents in math and .4 grade equivalents in reading.

5 Figlio and Ozek (2025) report an effect of .622 percentiles on a nationally normed test of math and reading achievement. We converted to standard deviation units by dividing by 21.06 (the factor used to convert standard deviation units into normal curve equivalents). The result, .029 standard deviations, is roughly one tenth of a grade equivalent.

FIGURE 6. LOSS IN ACHIEVEMENT BY DISTRICT POVERTY: 2019–2022



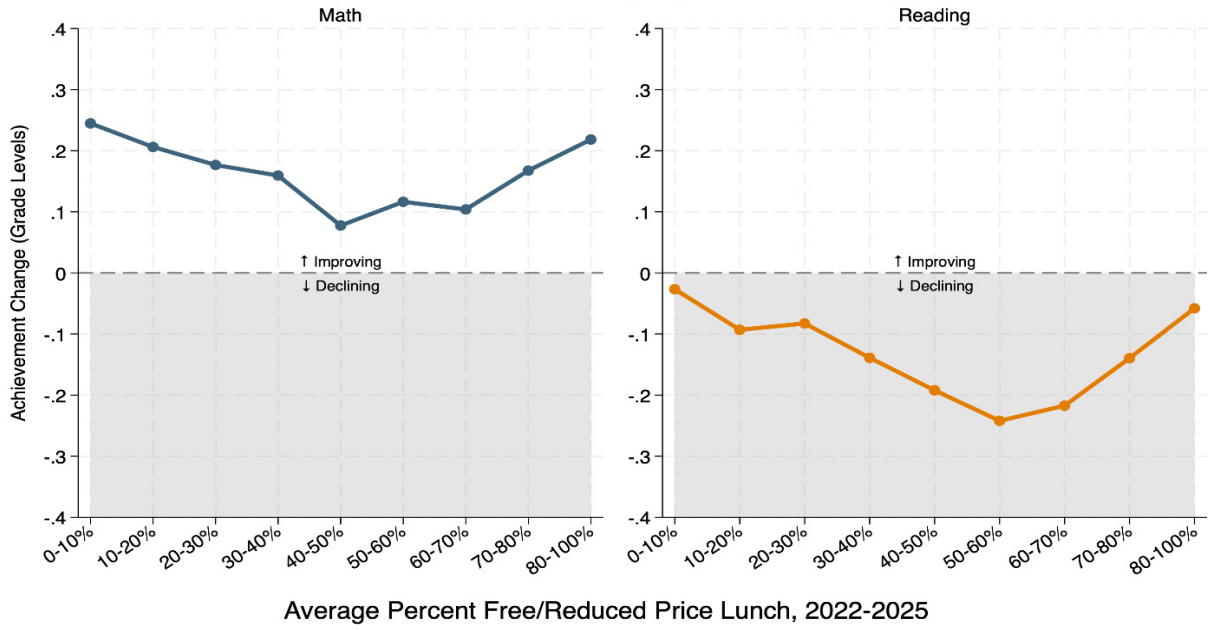
Note: Mean change in achievement from the Stanford Education Data Archive, weighted by district enrollment size.

In previous reports, we found that losses were larger in districts with longer school closures (especially when combined with high poverty rates) and in communities with larger disruptions in economic and social activities (Fahle et al., 2025).

For the remainder of the paper, we focus on the factors shaping the academic recovery between 2022 and 2025. Figure 7 reports the average change in achievement between 2022 and 2025 in math and reading by school poverty. In the average high-income district—those with fewer than 10 percent of students receiving federally subsidized lunches—average math achievement improved by .25 grade equivalents between 2022 and 2025.[6] Their reading achievement did fall between 2022 and 2025, but by less than middle income districts, only falling by .02 grade equivalents.

6 Since these are smaller in absolute value than the losses in Figure 4, the average high-income district would still be below 2019 levels.

FIGURE 7. CHANGE IN AVERAGE ACHIEVEMENT BY DISTRICT POVERTY, 2022–25 VS. 2022–24



Note: Mean change in achievement from the Stanford Education Data Archive, weighted by district enrollment size.

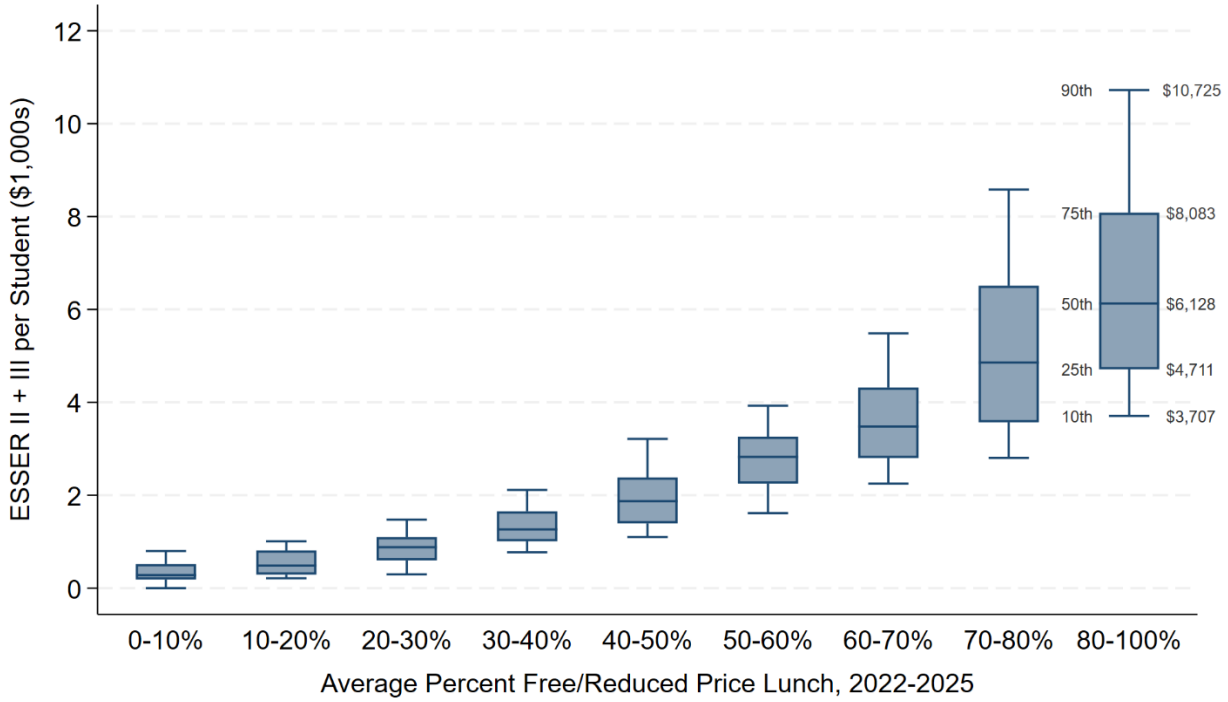
The changes were similar at the other end of the income distribution. The highest poverty districts—those with more than 80 percent of students eligible for federal subsidized lunches—improved by over .2 grade equivalents in math and lost only .05 grade equivalents in reading. The middle poverty districts—districts between 30% and 70% FRPL—saw the least improvement in both subjects. The same "U-shaped" pattern of recovery is evident in math and reading.
We investigate three potential drivers of the unusual pattern of recovery: federal pandemic relief, student absenteeism, and the share of schools identified for comprehensive support and improvement.

The federal government provided three packages of aid to school districts during the pandemic, totaling $190 billion: Elementary and Secondary School Emergency Relief (ESSER) I and II and the American Rescue Plan (sometimes referred to as ESSER III). School districts were required to obligate funds from the first and smallest package, ESSER I ($13 billion), by September 2022. Since most of those funds would have been spent prior to spring 2022 (the beginning of the period we are studying), we focus on the second two packages, ESSER II and ARP.

In Figure 8, we report the variation in ESSER II and ARP grants per student by district poverty. ESSER funding was highly targeted to the highest poverty districts. Among districts with more than 80 percent of students receiving federal lunch subsidies, the median grant was $6,128 per student in ESSER II and ARP. This is more than three times larger than the median grant received by the median district with 40–50 percent of students receiving federal subsidized lunch. Not only is the median funding per student higher in highest poverty districts, but the variation in size of grants

is much wider for the higher poverty districts. For example, in the highest poverty districts (those with 80–100 percent of students eligible for federally subsidized lunches), the 10th percentile district received $3,707 per student. However, the 90th percentile district in that group received roughly three times more per student ($10,725).

FIGURE 8. FEDERAL PANDEMIC RELIEF PER STUDENT BY DISTRICT POVERTY



Note: ESSER II and ARP ESSER grant per student, weighted by district enrollment size.

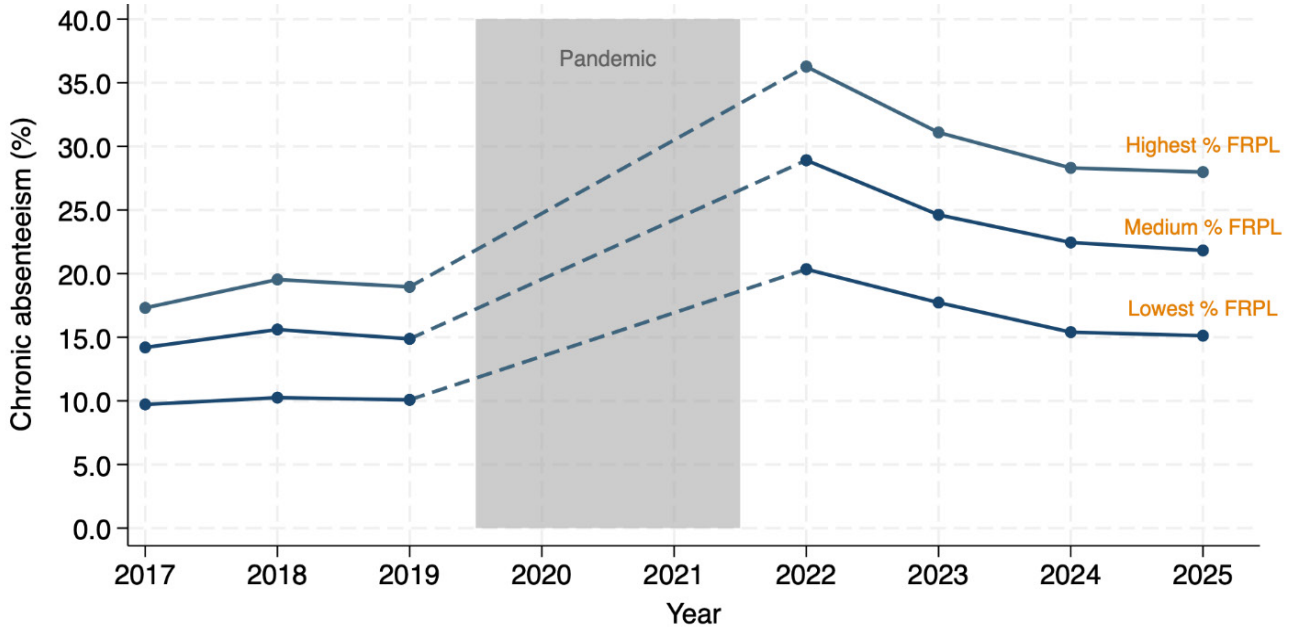
Both the high degree of targeting based on income and the wider variation in grants per student at the highest poverty levels is due to the way Congress distributed the ESSER funds: grants were directly proportional to the amount of federal Title I aid the district received in Fiscal Year 2020. Because the Title I program targets aid to districts with higher concentrations of poor children, such districts received the lion's share of the federal aid.

Moreover, the wide variation in ESSER grants among districts with similar levels of poverty is also a reflection of the differing formulae for Title I in different states. As reported in Appendix Figure C.1, some states provided larger Title I grants per student for districts with the same poverty level. The disparity in state Title I funding formulas is widest among higher poverty districts.

In Figure 9, we report the trends in rates of chronic absenteeism by tertile of district poverty. Before the pandemic, absence rates were fairly stable for all three groups of districts, albeit higher among higher poverty districts than middle and lower poverty districts. However, in the wake of the pandemic, rates of chronic absenteeism essentially doubled from pre-pandemic levels for all three tertiles: rising from 10 percent in 2019 to 20 percent of students in 2022 in the lowest poverty districts, and from 20 to 37 percent of students in the highest poverty districts. While the

proportional increases were similar, the absolute increases in chronic absenteeism were larger in the highest poverty districts because they were starting from a higher base.

FIGURE 9. CHRONIC ABSENTEEISM RATE 2017–25 BY DISTRICT POVERTY TERTILE



Note: Based on data from Nat Malkus at the American Enterprise Institute. Estimates are weighted by district enrollment.

Thus, both the amount of federal pandemic relief received and the level of student absenteeism post-pandemic were related to district poverty. For that reason, the simple correlation between federal pandemic relief and academic recovery likely combines the effect of the federal pandemic funding, higher absence rates, and the consequences of district poverty—all of which could either offset (or add to) each other. In the following analysis, we attempt to isolate the effect of the federal pandemic relief and absenteeism by studying the relationship with achievement growth ***among districts with similar poverty rates***. In our statistical model, we group districts by every 2 percentage points of their school-age population that were eligible for Title I in FY 2020. We look within each of these groups of districts (those that were 0 to 2 percent poor, 2 to 4 percent poor, 4 to 6 percent poor and so on) at the relationship between federal relief per student and the increase in achievement between 2022 and 2025. We also control for district enrollment, the share of students in different race/ethnicity groups in 2022, and the change in those student characteristics between 2022 and 2025.

We then ask whether the districts in each group which received more pandemic relief or had higher absences in the post-pandemic years had faster or slower achievement growth. In doing so, we are essentially taking the variation in federal ESSER grants among similar districts as a "natural experiment" driven by the state Title I formulae. We are also assuming that the variation in days absent within these groups is also as good as random, although we do not know the mechanism

(like the state Title I formulae) driving those differences. (See Appendix D for details of the statistical model.)

TABLE 1. FACTORS RELATED TO POST-PANDEMIC ACADEMIC RECOVERY

	Change in Math Achievement			Change In Reading Achievement		
	2022-2024	2022-2025		2022-2024	2022-2025	
	(1)	(2)	(3)	(1)	(2)	(3)
ESSER II+III Allocation per Student ($1,000s)	0.0195**	0.0313***	0.0309***	0.0313***	0.0378***	0.0378***
	(0.0080)	(0.0098)	(0.0099)	(0.0071)	(0.0110)	(0.0112)
Days Absent	-0.0042***	-0.0055***	-0.0057***	-0.0037***	-0.0056***	-0.0056***
	(0.0016)	(0.0014)	(0.0014)	(0.0015)	(0.0014)	(0.0015)
CSI Status SY 2022-23			0.0362			-0.0005
			(0.0801)			(0.0894)
N	7408	5380	5380	7064	4988	4988
R2	0.234	0.257	0.257	0.204	0.302	0.302

Note: The outcome is measured in grade equivalent units. Controls include state fixed-effects, dummy variables for every 10% free/reduced price lunch, log total enrollment, percent black, Hispanic, white, rural, town, suburb in 2022. We also control for changes in demographics and enrollment from 2022 to 2025. Additional controls include % of the year spent remote or hybrid in the 2020–2021 school year, the trend in achievement from 2015–2019, and dummies for every 2% of formula-eligible children. Observations are weighted by grade 3–8 enrollment in 2022. We capped ESSER allocation per student at $16,000 per student. Standard errors are robust without clustering.

We report the results of that analysis in Table 1 above. In column (1), we repeat our analysis from last year's report on the effect of federal relief and student absences on achievement growth between 2022 and 2024 (Dewey et al., 2025). We find that each $1,000 per student is associated with a .0195 additional grade equivalent in math and .0313 grade equivalents in reading.

In column 2, we re-estimate the relationship between spending and achievement growth between 2022 and 2025. In math, the coefficient increases by roughly 60 percent to .0313 grade equivalents per $1,000 of pandemic relief from last year's analysis. This could either be because districts had some funds left over after the end of the 2024 school year (we assumed they expended it all by then) or because districts invested the federal dollars in ways which would yield continuing effects, such as teacher training, curriculum, or capital improvements. The estimated impact per $1,000 on reading achievement also increased in 2022–25 compared to the earlier period, 2022–24, though more modestly.

As we discussed in last year's report, these estimates are in line with prior evidence on the effect of general revenues on student achievement summarized by Jackson and Mackevicius (2024).[7]

7 The authors identified 32 quasi-experimental studies with the most plausible claims to estimating causal effects of spending (as opposed to simple correlations). Their meta-analysis implied an average impact of .0316 standard deviations per $1,000 annual increase in spending over 4 years. Dividing by four yields .0079 s.d. per $1,000 spent. A grade equivalent is .287 s.d. in math and .268 s.d. in reading, implying a coefficient of .0275 in math and .0295 in reading.

In column (1), we find that each additional day in student absences during the 2022–2024 period was associated with a .0042 grade equivalent decline in achievement growth in math and .0037 decline in reading. In column (2), we repeat the analysis estimating the effect of the number of days absent between 2022 and 2025 on achievement growth between 2022 and 2025. We find a similar answer: each day of absence is associated with a .0055 grade equivalent loss in both math and reading. We see the same relationship between a day absent and achievement even though we are looking over three years rather than two years.

However, our estimate of .0055 grade equivalents per day of absence is smaller than that found in prior research. For example, three recent studies estimated how changes in an individual student's days absent from one school year to the next were associated with changes in their test scores (by including student fixed effects) (Aucejo and Romano, 2016; Gershenson et al., 2017; Goodman, 2014). The authors found that every day of absence reduced achievement by between .005 and .008 standard deviations in math (.017 to .028 grade equivalents), and between .003 and .008 standard deviations in reading (.011 to .030 grade equivalents). These estimates are 2–5 times larger than ours.

On top of the impact on the students who are absent, prior research suggests that the negative effects of absences spill over onto classmates. Two studies (Goodman, 2014; Gottfried, 2011) estimate the impact of absenteeism on other students in a school, grade, or classroom. If teachers are forced to use class time to reteach material when students return from absences, then the collective effect of absences for a whole cohort of students would be larger than the effect on the absent students.

That appears to be the case. For example, using data from Massachusetts, Goodman (2014) reports that one additional day of absence is associated with .008 standard deviations in lost achievement for the absent student. A one-day increase in peer absences is associated with a similar .008 loss in achievement. Combining the two, a one day increase in average days absent in a cohort would be associated with a .016 standard deviation loss in achievement (.056 grade equivalents). Gottfried (2011) finds similar combined effects of an extra day of cohort absences (.062 grade equivalents in math and .056 grade equivalents for reading).

Our estimate reflects the total effect of an extra day of absence both on the individual student and on classmates. Our estimate implies that the marginal effect of a day of absence is equal to the average effect of each day of attendance: In most states, the school year is 180 days. Multiplying the coefficient on absences in column (2), .0055, by 180 yields an estimate of a full school year.

Following the pandemic, states resumed designating schools for "comprehensive" and "targeted" support and improvement. Depending on the state, the ratings were announced in the 2021–22 or 2022–23 school years, based on school outcomes in the prior year (either 2020–21 or 2021–22). Both sets of ratings were based on student outcomes preceding our baseline year of spring 2022, so they are not a direct function of achievement growth over the period we are investigating.

Several recent papers have studied the effect of being designated for "comprehensive support and improvement" under ESSA. For instance, Atchison et al. (2025) find no positive effects of CSI designation on elementary or middle school math or reading achievement in Ohio. In contrast,

Burns et al. (2023) find positive effects on math achievement for CSI schools in Michigan. Cullum and Harbatkin (2023) find that Michigan schools designated for comprehensive improvement fared better in math during the pandemic.

In column (3), we report the relationship between the share of students identified for comprehensive support and improvement in the district and the growth between 2022 and 2025. We would expect a positive effect if being designated for comprehensive support either boosted districts' incentives to remove schools from the list or reflected positive effects of additional school improvement dollars. Unfortunately, we found no relationship between the share of schools designated for comprehensive support and improvement and post-pandemic improvement. Being designated as a school in need of comprehensive support and improvement under ESSA does not seem to be generating improvement in student achievement.

The Net Effect of Federal Aid, Student Absences, and Federal Accountability

In Figure 10, we use the coefficients from Table 1 to isolate the effect of federal pandemic relief and absences on recovery. The solid lines portray the actual change in math and reading scores between 2022 and 2025 by district poverty. As discussed above, the recovery was "U-shaped" with larger recovery among the lowest poverty and highest poverty districts. For the long dashed lines, we use the results in Table 1 to predict what each district's academic recovery would have been without the federal relief. For districts with more than 40 percent of students receiving free and reduced-price lunch, we estimate that there would have been no recovery in math and a .3 grade equivalent loss in reading. In both math and reading, the relationship is more "L-shaped" than "U-shaped," implying that much of the increase in achievement among higher poverty districts was associated with the federal pandemic relief.

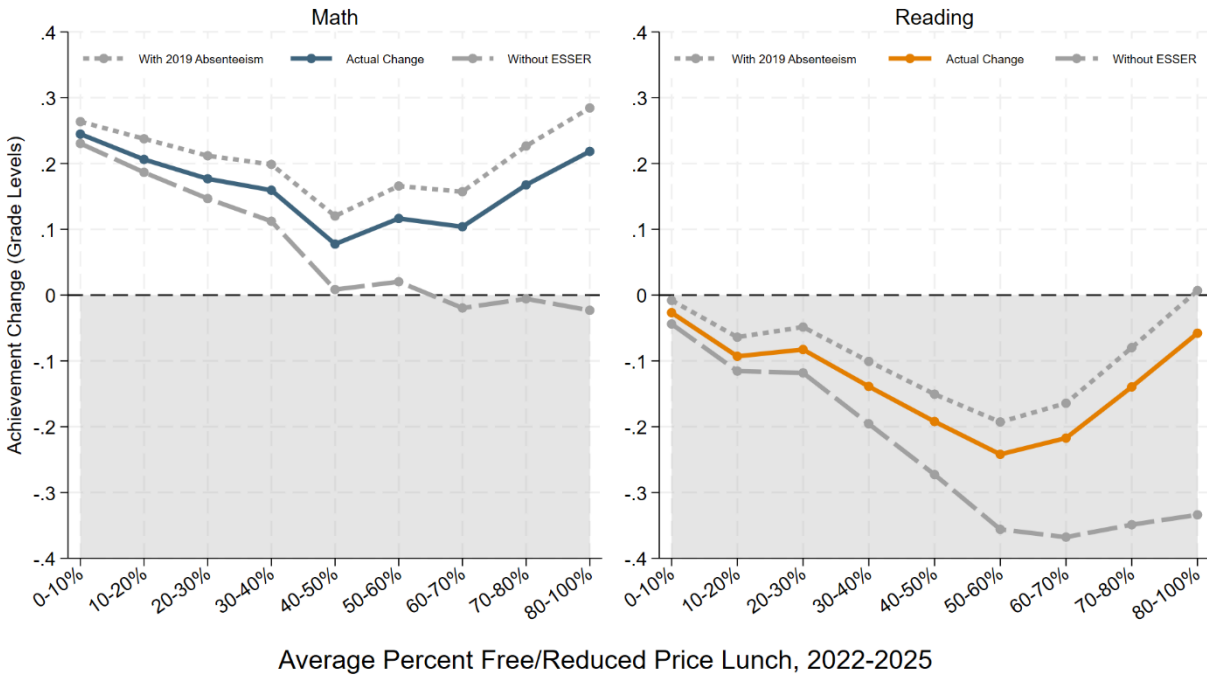
We did not do a similar exercise for measuring the impact of having schools designated for CSI because the coefficient was small and statistically insignificant.

Nevertheless, our results are not cause for celebration. As reported in Appendix E, although high poverty districts have recovered as much as low poverty districts since 2022, they remain behind 2019 levels. The highest poverty districts are still about half a grade equivalent behind their 2019 level of achievement (they lost .7 grade equivalents during the pandemic and recovered .2 grade equivalents since 2022). In contrast, the lowest poverty districts are only an average of .1 grade levels below their 2019 levels.

The federal dollars seemed to have an impact, but were they used effectively? The federal dollars had a similar impact per dollar to a general revenue increase, such as from an increase in state grants to districts. General revenue increases are used for instructional and non-instructional purposes—everything from school buses to facilities improvements to administrator salaries. The relief dollars would have had an even larger impact had they been fully invested in academic recovery efforts, such as tutoring, summer learning, or extending the school year. For example, Guryan et al. (2023) estimate that a specific high-dosage tutoring program had an impact per dollar spent roughly 10 times larger than we are estimating. However, it would be inappropriate to

blame all of that on district leadership. Part of the responsibility rests on the U.S. Congress, since they only required districts to spend 20 percent of the American Rescue Plan grants on academic recovery.

FIGURE 10. ACTUAL AND PREDICTED ACADEMIC RECOVERY BY DISTRICT POVERTY



Note: The solid line is mean change in achievement from the Stanford Education Data Archive, weighted by district enrollment size. To calculate the estimated change in achievement without ESSER (the long dashed line) we subtracted the product of the district's ESSER II/ARP grant per student and the coefficient from column (3) in Table 1. To calculate the effect of absenteeism, we multiplied the change in average annual days absent from 2017–19 to 2023–25 by 3 to get the average days absent over the 3-year period. We then took this value and multiplied it by the coefficient on days absent in column (3) in Table 1 and subtracted it from the actual change in achievement.

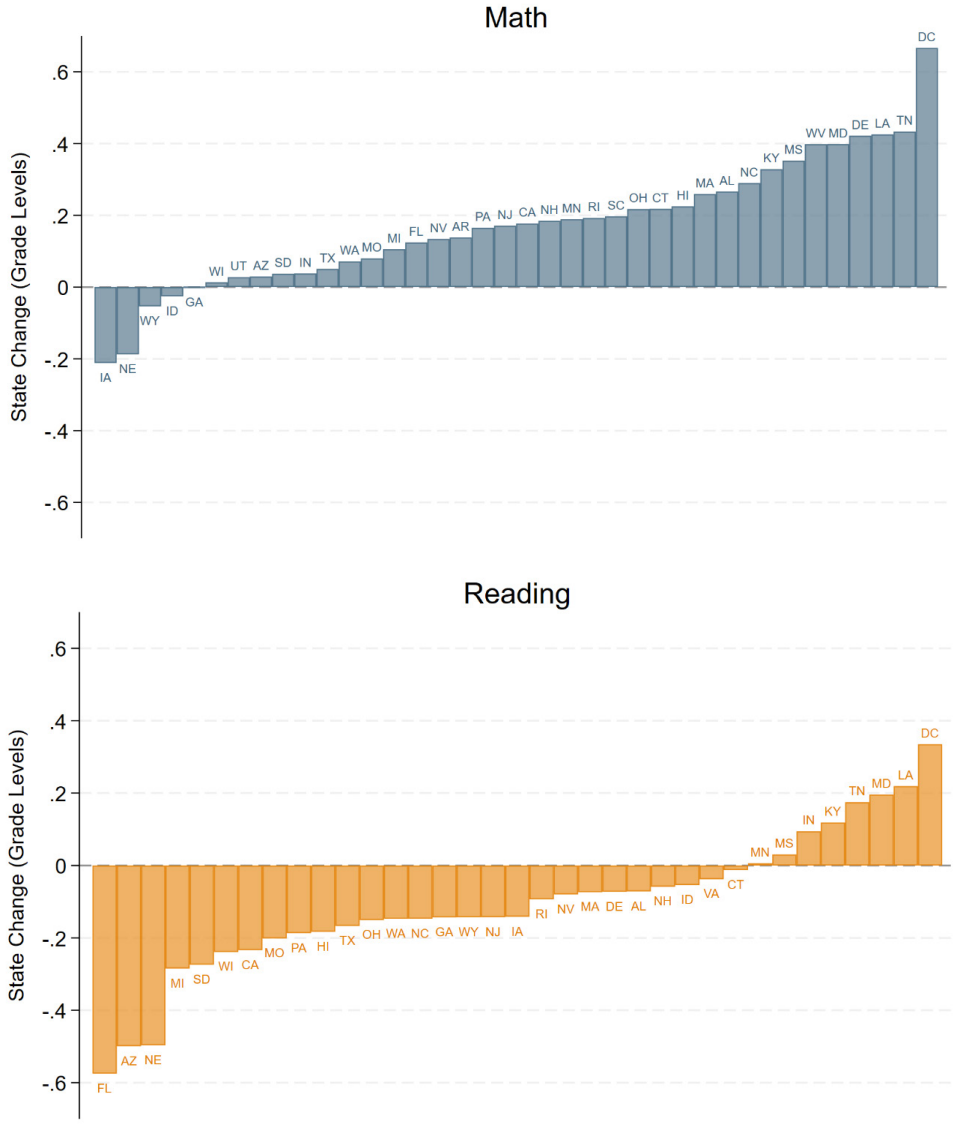
For the dashed line above the actual change, we subtract out the change in the average number of absences since 2019 times the coefficient on absences in column (3) of Table 1. In effect, we run the following thought experiment: "How much recovery would we have seen if absences rates had remained at their 2019 levels?" We estimate that the average high poverty district would have seen an extra .05 grade equivalent improvement in math and reading if absences had returned to 2019 levels. Recovery would have improved in the lowest poverty districts as well, but by a smaller amount, given that their number of absences increased by less than in the highest poverty districts. As discussed above, our estimates of the impact of a day of absence are considerably smaller than prior research. Thus, if anything, our estimates of the consequences of rising absence rates are understated.

State Improvement in Reading and Math 2022 to 2025

In Figure 11, we report the change in achievement between 2022 and 2025 by state.[8] Only seven states (plus the District of Columbia) improved in reading achievement in the three years following the pandemic: Louisiana, Maryland, Tennessee, Kentucky, Indiana, Mississippi, Minnesota, and D.C. 27 states followed up their pandemic declines with further declines in reading achievement.

Many of the states that improved in reading also had a larger than average improvement in math achievement. However, four states lost additional ground in math in the years following the pandemic: Iowa, Nebraska, Wyoming, and Idaho.

FIGURE 11. STATE ACADEMIC GROWTH BETWEEN 2022 AND 2025



Note: These are state improvements in math and reading achievement in grade level units between 2022 to 2025. State improvements are based on overall state achievement which includes non-traditional public school districts.

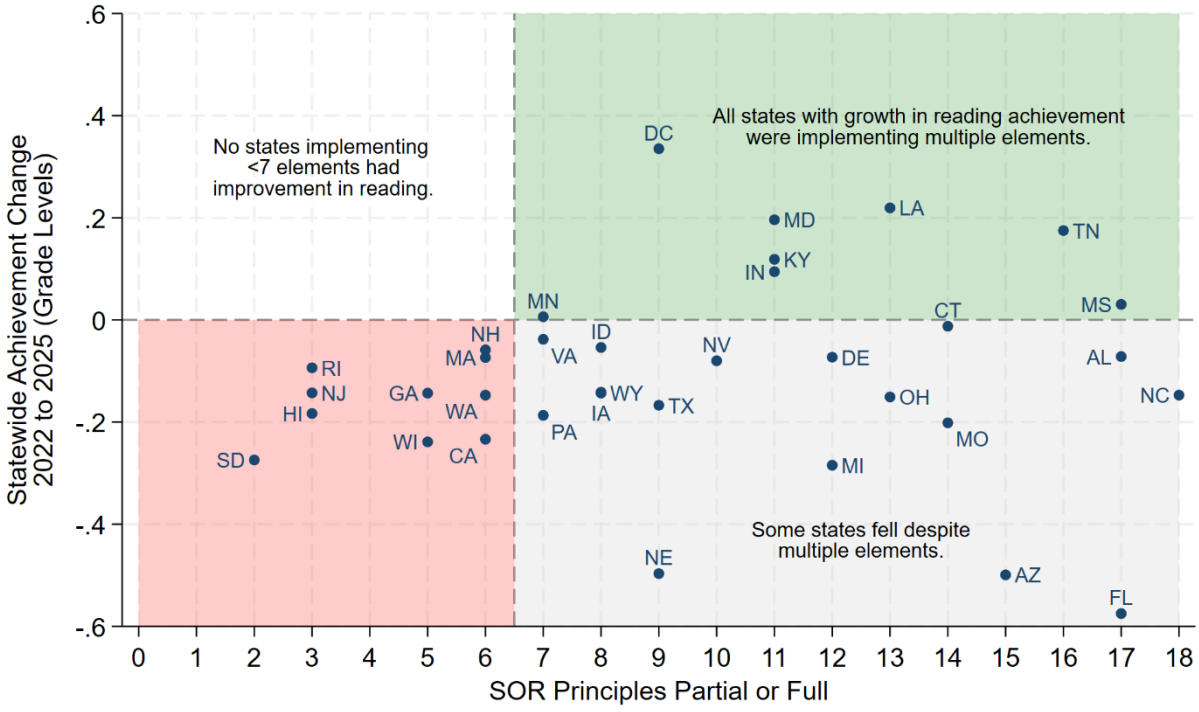
8 We have done a similar analysis using the "adjusted state improvements" captured by the state fixed effects in Table 1. The results are similar using the state changes adjusted using district-level variation in demographics, absences, and ESSER spending.

Early Literacy Initiatives

As of March 2026, ***Education Week*** estimates that 42 states plus the District of Columbia have passed laws or implemented policies related to evidence-based reading instruction—often referred to as the "science of reading" (Schwartz, 2026). However, policies and implementation have varied widely, with some states simply providing voluntary guidance on curricula while other states implemented a full package of reforms, such as requiring all K-3 teachers and administrators to be retrained, hiring literacy coaches for elementary schools, limiting district choices to approved curricula, and retaining students who fail to show reading proficiency at the end of third grade.

In January 2024, the non-profit organization the Foundation for Excellence in Education (ExcelinEd) reported on the implementation of 18 "science of reading" policy elements (including those above) in every state: whether "full implementation," "partial implementation," "future implementation," or "not adopted." Based on the ExcelinEd report, we created an index, counting each element in full or partial implementation. Any policy element which was not adopted or was pending future implementation was not counted. In Figure 12, we plot the change in state reading achievement between 2022 and 2025 against the sum of the number of policy elements that had been implemented or partially implemented as of January 2024.

FIGURE 12: IMPLEMENTATION OF SCIENCE OF READING AND GROWTH IN READING 2022–25



Note: The vertical axis is the achievement growth between 2022 and 2025. The horizontal axis is the number of "science of reading" policy elements implemented fully or partially in each state according to the Foundation for Excellence in Education in January 2024.

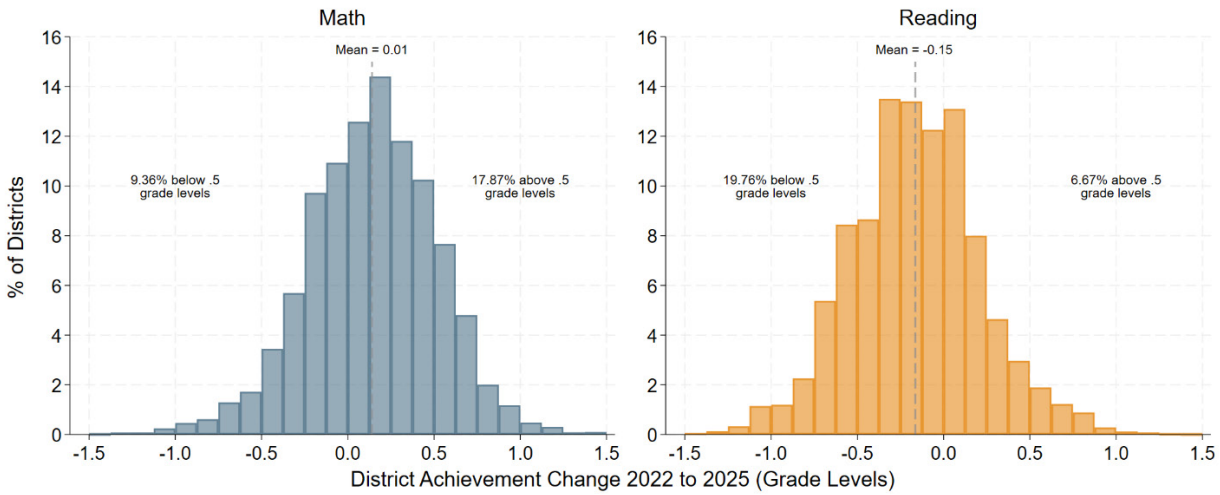
There is not a strong correlation between the magnitude of state reading improvement and the number of science of reading policy elements adopted. However, we did note a striking pattern: **none** of the states which had implemented fewer than seven of the science of reading policy elements as of January 2024 (South Dakota, Hawaii, Rhode Island, New Jersey, New Hampshire, Georgia, Wisconsin, California, Washington and Massachusetts) saw achievement growth in reading. (The upper left quadrant in Figure 12 is empty.) Reading achievement in these states continued to fall following the pandemic.

Meanwhile, **all** of the states (plus the District of Columbia) with any improvement in reading following the pandemic (the District of Columbia, Maryland, Louisiana, Kentucky, Tennessee, Indiana, Mississippi, and Minnesota) had implemented more than seven of the policy elements tracked by ExcelinEd. However, there were some states which had implemented more than 7 of the policy elements who still had not improved in reading (notably, Florida, Arizona, and Nebraska). While we see evidence suggesting that implementation of a comprehensive literacy strategy may be a necessary condition for improvement, mere adoption is apparently not sufficient.

Districts on the Rise: Counting 108 Mississippis

Figure 13 illustrates the distribution of district-level improvements between 2022 and 2025 in math and reading. Although the average district improved by .01 grade equivalents in math and lost .15 grade equivalents in reading, the actual amount of recovery varied widely from district to district. For example, 18 percent of districts improved by more than half a grade level in math, while 9 percent declined by more than half a grade level.

FIGURE 13. DISTRIBUTION OF CHANGES IN ACHIEVEMENT 2022–25



Note: The distribution of changes in achievement between 2022 to 2025, weighted by district enrollment.

In the past couple of years, much has been written about the "Mississippi Miracle"—the large improvement in both math and reading achievement seen in Mississippi since 2012. The progress

in Mississippi has inspired state leaders around the country to take more significant action to improve student achievement.

Using Mississippi as our example, we identify 108 "districts on the rise" (108 Mississippis, if you will) that have shown unusual progress in both math and reading relative to similar districts in their own states. A total of 448 districts showed large improvements relative to their peers in either math or reading. To be considered a "district on the rise," a district must have had enrollment of more than 1,200 students in grades 3–8, have achievement estimates available for 2019, 2022, and 2025, and a comparison group of at least four similar districts, each with achievement estimates for 2019, 2022, and 2025. To ensure that any changes in achievement are not driven by demographic changes within the district, the percentage change in grades 3–8 enrollment and the percentage change in students eligible for federal free lunch from 2022 to 2025 must both be no more than 10 percentage points different than the percent change among similar districts. We then selected the districts which improved by more than .3 grade equivalents relative to their similar districts' average achievement from spring 2019 to spring 2025 and spring 2022 to spring 2025.[9]

The set of similar districts is provided by the SEDA data. Similar districts were selected based on their similarity on the following district characteristics: the average enrollment in grades 3 to 8 between 2022 and 2025; the average SES of families in the district between 2022 and 2024; the average percentage of students receiving federal subsidized lunches between 2022 and 2025; the average proportions of students who identify as Asian, Black, Hispanic, and White in the district between 2022 and 2025; and the proportions of students in urban schools, suburban schools, and town schools from 2022–2025. The similar districts are the five districts in the same state closest in these characteristics (as measured by Mahalanobis distance) to the focal district.

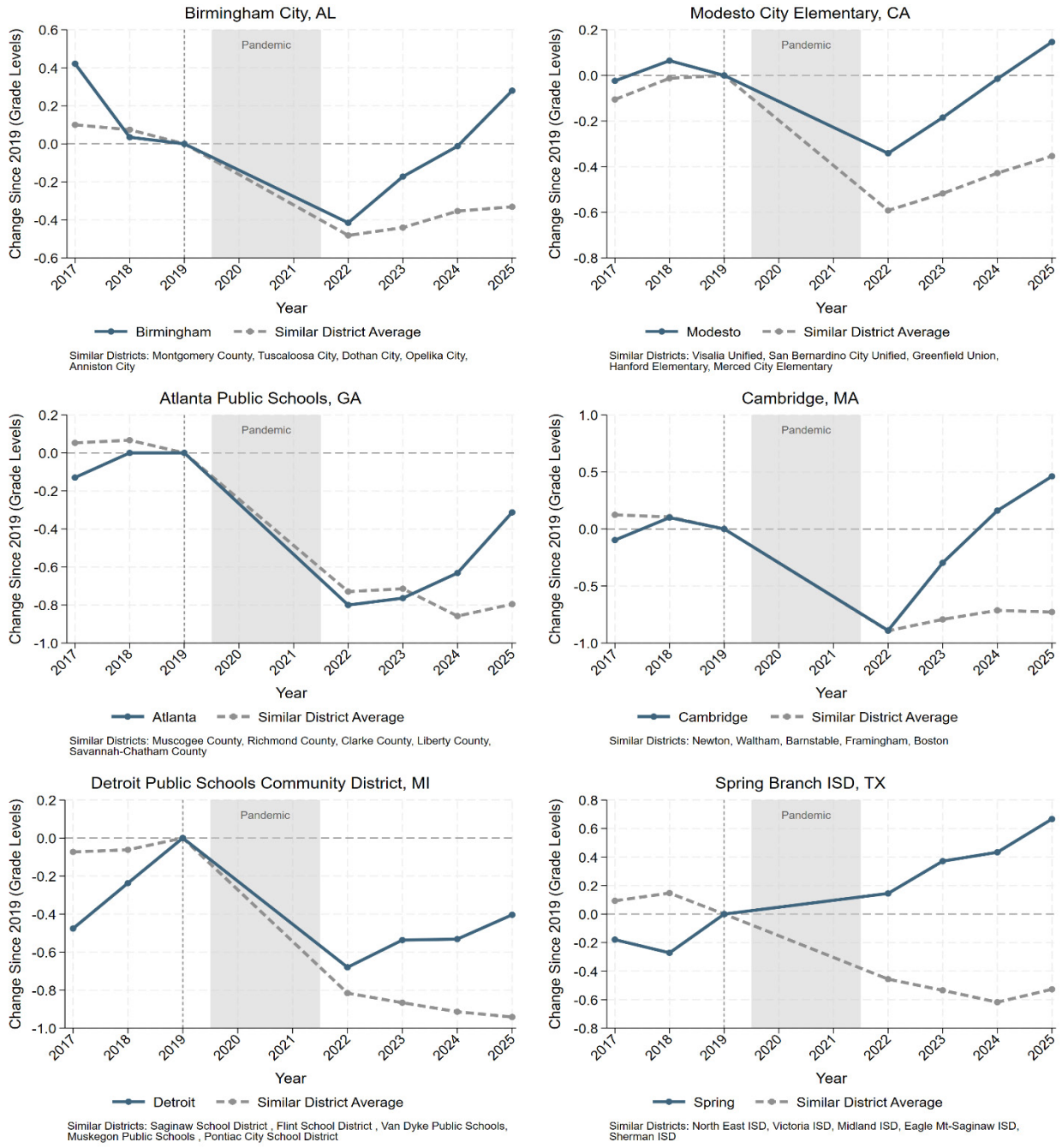
In Figure 14 below, we describe the trends in math achievement in six of those districts. For instance, Birmingham City school district in Alabama, like its comparison districts, lost about .4 grade equivalents in math achievement during the pandemic between 2019 and 2022. The comparison districts have rebounded slightly, improving by roughly .2 grade equivalents since 2022. However, Birmingham enjoyed an unusually robust recovery, improving by .7 grade equivalents since 2022. Birmingham students are now scoring .3 grade equivalents above their predecessors in 2019.

Atlanta Public Schools offer another inspiring story. Like its comparison districts, math achievement in Atlanta declined by .8 grade equivalents between 2019 and 2022. While the comparison districts have continued to decline since the pandemic, Atlanta has made up more than half of the loss, rising by .5 grade equivalents in math since 2022.

The other districts shown in Figure 14—Detroit, Michigan; Modesto, California; Cambridge, Massachusetts; and Spring Branch, Texas—follow similar patterns. Although we cannot say exactly what these districts were doing to help their students recover, we owe it to our children to understand what they did and learn whether similar strategies are working elsewhere.

9 We also added districts in the top five in their state if their increase relative to comparison was less than .3 grade equivalents.

FIGURE 14. SIX DISTRICTS ON THE RISE



Note: The figure reports difference in math achievement for six districts relative to their within-state comparisons. Both the districts and the comparisons are being compared to their own 2019 achievement.

III. Conclusion

K-12 education in the United States has been far from stagnant. Like the economy, K-12 education has been through ups and downs over the past four decades—but mostly ups. For nearly 25 years between 1990 and 2013, math achievement in grades 4 and 8 rose steadily, improving by more than two grade equivalents over that time period. The 4th grade students in 2013 were scoring at a similar level to 6th graders in 1990. Reading achievement also rose, albeit by somewhat less than one grade equivalent. Those prior improvements make the decline since 2013 appear more striking and anomalous. The "learning recession" began before the pandemic and only turned around in 2022 in math and in 2024 in reading. As with an economic recession, recovery is possible—but it requires decisive action.

To capitalize on the energy behind the recent literacy reforms, we call for a national effort to identify which efforts are most effective. For instance, states could use their own data systems to monitor whether student achievement growth improves when schools switch curricula or when schools receive a literacy coach. Payments to providers of literacy curricula could be made contingent on students' achievement growth.

A number of research teams (including ours) will be releasing studies on the impact of cell phone bans in the coming months. Once those emerge, there should be a coordinated effort to resolve any disparities in the findings and to reach a consensus on the impact of bans for students. The research community does not have a great track record of reconciling differences in findings on its own. New approaches to restricting cell phone use in schools are emerging which could avoid the unintended consequences for student discipline, like geo-fencing cell phone access on school sites. There should be a national effort to evaluate different approaches to cell phone bans.

But cell phone bans address only one of many possible mechanisms through which social media could be impacting student achievement: by distracting students during instructional time. There are other possible mechanisms which could be more important: displacing homework time out of school, disrupting sleep, weakening executive function/attention management, promoting stress/anxiety, etc. Failure to find large impacts of cell phone bans does not mean that the concern over social media is misplaced. Rather, cell phone bans are only one vector for reducing potential harm from social media exposure. We should also be piloting and evaluating efforts to reduce student access to social media outside of school.

Absence rates remain a headwind for school improvement. Lowering student absenteeism offers a substantial "bang for the buck." Taxpayers are already paying for teacher salaries and classroom space. If students were back in seats at rates similar to before the pandemic, the recovery would have been more robust. Some may believe that attendance is a parental responsibility and that if parents are willing to accept lower achievement for their own children as a consequence of irregular school attendance, they should be able to make that choice. However, evidence suggests that the costs of absenteeism spill over onto other students, when teachers have to reteach material and learning slows for everyone. Thus, we all have a collective interest in lowering student absenteeism.

The most valuable contribution of the Education Scorecard is in making local recovery efforts—both successful and unsuccessful—more visible. Without the SEDA data, it would be impossible to compare achievement improvement across state lines, given the differences in state proficiency definitions. Moreover, because states occasionally change their standards, it is also impossible to compare a given community's achievement over time.

We hope that states will use these data in two ways: first, states should consider continuing loss in achievement since 2019 when designating schools for comprehensive support and improvement. The federal pandemic relief is gone. If the schools that remain far behind 2019 levels are going to recover, they will need additional support. States could target the federal dollars for school improvement under Title I to the schools that remain furthest behind their own 2019 levels of achievement. Second, states should offer to pay the cost for districts who have lost the most ground to visit similar school districts in their state who have had much more success recovering. To avoid overwhelming the successful districts, the state could pair one struggling district to each "district on the rise"—and then see if the chosen districts outperform the other struggling districts who were not chosen. It would be a low-cost way to see the power of peer learning.

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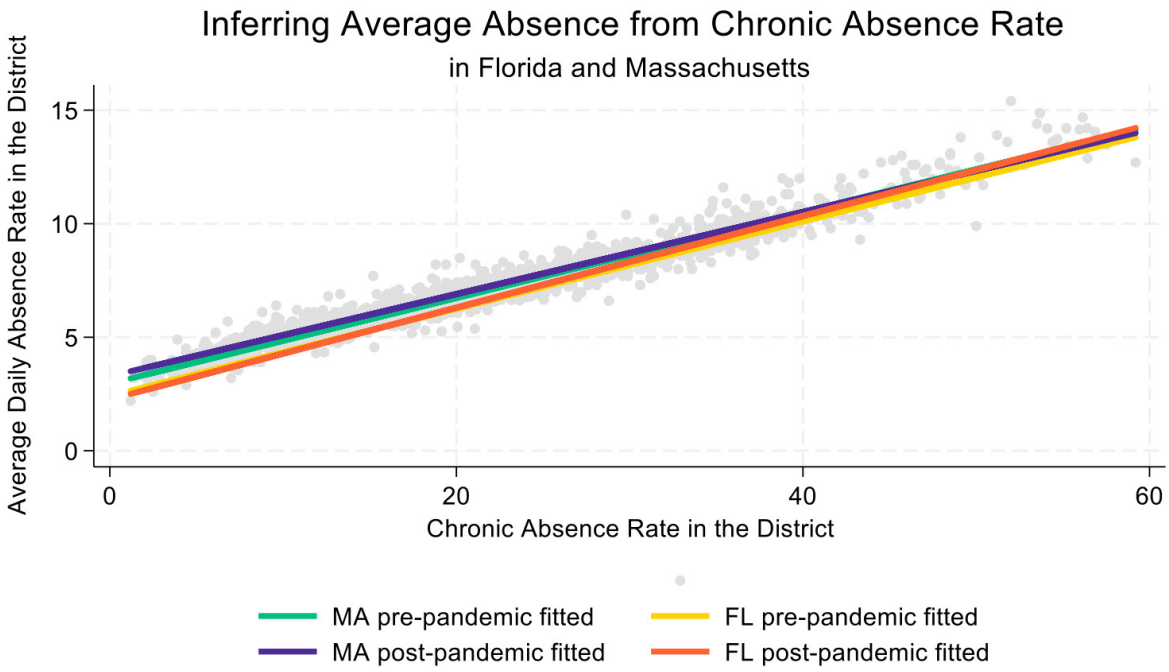
Appendix A. Comparing the 2025 Sample to National Sample

	Nationally	38 States + DC	Analysis Sample
2022-25 Change in Math	0.166	0.139	0.166
2022-25 Change in Reading	-0.165	-0.166	-0.135
2019-25 Change in Math	-0.396	-0.410	-0.360
2019-25 Change in Reading	-0.445	-0.434	-0.428
2019-22 Change in Math	-0.562	-0.550	-0.525
2019-22 Change in Reading	-0.279	-0.267	-0.292
2017-2019 Chronic Absence Rate	14.8%	14.1%	13.8%
2022 Chronic Absence Rate	27.9%	27.2%	27.1%
2024 Chronic Absence Rate	23.0%	22.3%	22.2%
2025 Chronic Absence Rate	22.9%	22.0%	22.0%
% Black (2025)	14.8%	15.6%	15.7%
% Hispanic (2025)	30.0%	30.3%	30.0%
% Minority (2025)	57.1%	57.8%	57.8%
% Free Lunch (2025)	57.1%	57.3%	57.3%
Percent of 2020-21 SY in Remote Instruction	24.4%	25.0%	24.4%
Percent of 2020-21 SY in Hybrid Instruction	39.3%	36.8%	36.1%
ESSER I Dollars Allocated Per Student	$261.96	$254.24	$226.60
ESSER II Dollars Allocated Per Student	$1,077.74	$1,053.66	$938.90
ESSER III Dollars Allocated Per Student	$2,420.45	$2,366.37	$2,095.10
ESSER Dollars Allocated Per Student	$3,760.15	$3,674.28	$3,260.60
Number of Districts	17,952	13,656	5,680
Number of Students Grades K-12	48,999,325	41,136,507	34,802,337
Number of Students Grades 3-8	21,775,782	18,317,231	15,728,212
Average K-12 Enrollment (2025)	2,729	3,012	6,127
Average 3-8 Enrollment (2025)	1,213	1,341	2,769

Appendix B: Imputing Average Absence Rate from Chronic Absence Rate

The chronic absence rate is the share of students absent for more than 10 percent of a school year, while the average absence rate refers to the percent of students missing on a particular day. It is not possible to derive analytically the average absence rate from the chronic rate, because absence rates will vary by student. However, it turns out that there's a surprisingly robust empirical relationship between the share of students chronically absent and average absence rates.

APPENDIX FIGURE B.1.

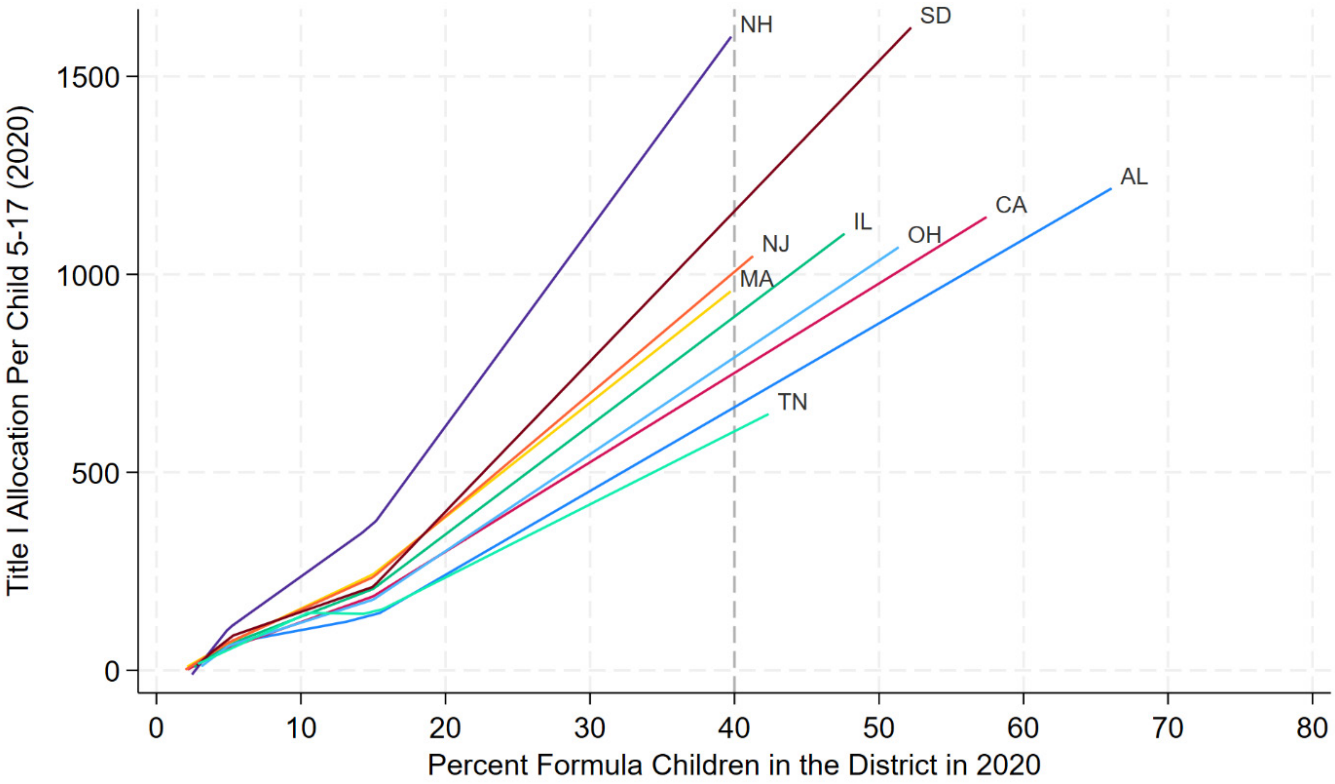


Note: Estimated with district level data on average absence rate and chronic absence rate in Massachusetts and Florida in 2019 and 2022. If pooled across both time periods and two states, the estimated linear relationship is $AvgAbsRate = 3.12 + .182 * Chronic\ Rate$, with standard errors on the intercept and slope of .03 and .002 respectively.

In Figure B.1, we plot districts' average absence rate (on the vertical axis) against the share of students chronically absent (on the horizontal axis) for districts in Florida and Massachusetts—two states which happen to report both statistics. We estimate the relationship between the two measures separately by state and by before the pandemic (2019) and after the pandemic (2022). The relationship is strikingly consistent between states and over time: one percentage point rise in chronic absenteeism implies a .18 percentage point rise in the average daily absence rate. We used the pooled linear regression of average absence rate on chronic absence rate (Average Absence Rate=3.12+.182*Chronic Rate) to infer average absence rate from the chronic absence rate.

Appendix C. The Natural Experiment Created by State Title I Formulae

APPENDIX FIGURE C.1 DIFFERENCE IN TITLE I ALLOCATIONS BY PERCENT OF CHILDREN ELIGIBLE BY STATE



Notes: This figure was based on actual Title I allocations in FY 2020, fitted with a linear spline function, with knots at 2 percent, 5 percent and 15 percent eligible children, separately for each district. Although not a perfect fit (for instance, large districts can qualify for a concentrated grant even if they have fewer than 15 percent poor children, as long as they have more than 6,500 eligible children), the splines are a good summary, explaining 98 percent of the variance in Title I grants per population for districts not subject to hold harmless provisions.

Figure C.1 reports the mean Title I allocation per population aged 5–17 by the percentage of school-age children eligible for Title I for each of seven states.[10] Title I allocations per child are typically zero for the lowest poverty districts (those with fewer than two percent eligible children).

10 These figures were fitted with a linear spline function, with knots at 2 percent, 5 percent and 15 percent eligible. Although not a perfect fit (for instance, large districts can qualify for a concentrated grant even if they have fewer than 15 percent poor children, as long as they have more than 6,500 eligible children), the fitted spline functions shown in Figure 4 are a good summary. The fitted splines explain 98 percent of the variance in Title I grants per population for those districts not subject to hold harmless provisions.

The relationship between eligibility and allocations steepens at five and fifteen percent eligible children, as districts become eligible for additional types of Title I grants.

At any given percentage of eligible children (equivalent to drawing a vertical line in Figure C.1), Title I grants vary depending upon the state where the district is located. Those differences become larger at higher poverty levels. For instance, a district with 40 percent of children meeting the eligibility formula would have received $572 per child in Tennessee, $652 per child in Alabama, $742 in California, $769 in Ohio, $870 in Illinois, $957 in Massachusetts, $1,069 in South Dakota, and $1,602 in New Hampshire.[11] In other words, for very poor districts, there is roughly a $1,000 difference in Title I allocations per child for those in New Hampshire versus those in Alabama or Tennessee.

Such differences are driven by two primary factors: state average per pupil expenditures and the minimum grants for small states.[12] In general, when states increase their average per pupil spending, districts will receive more Title I funding for each poor child. That is the primary reason why districts in most states, like Massachusetts or Illinois, receive more Title I funding than districts in Alabama and Tennessee with the same percentage of eligible children.

However, poor districts in small states benefit tremendously from the minimum state grant provisions. The states with the largest Title I grants in Figure C.1 (New Hampshire and South Dakota) are not particularly high spending states, but they do have small populations. Congress has guaranteed that small states receive a minimum share of appropriations for Title I. But, in Figure C.1, it is not just the average grant that is higher in South Dakota and New Hampshire; the slope is steeper—meaning that poor districts especially benefit from the small state minimum. The reason for the steeper slope is an indirect result of the fact that Title I is not fully funded. Based on the formula, districts were eligible for seven times more funding under the Title I basic grant program than Congress appropriated in FY 2021 (Gordon and Reber, 2023). When appropriations fall short of authorized grants, Title I allocations are proportionally reduced within a state. Thus, when a state benefits from the small state minimum, all the district allocations are increased proportionally, meaning that districts in small states receive allocations closer to the full authorized amount. The states that benefited from the small state minimums in FY 2020 were Vermont, Wyoming, North Dakota, New Hampshire, DC, Alaska, South Dakota, and Montana (Gordon and Reber, 2023).

Because ESSER funding was more than 10 times larger than Title I funding in FY 2020, the pandemic relief simply amplified by idiosyncrasies in the Title I formula. Total funding for the Title I program was $16 billion in FY 2020, while the total funding for ESSER II and ARP was $175 billion—more than 10 times larger. In effect, with ESSER II and ARP, Congress pushed $175 billion through pipes that were designed to carry one-tenth the volume of funds. The relief packages essentially multiplied the differences in Figure C.1 by 10: a $1,000 difference in Title I grant per student became a $10,000 difference in federal pandemic relief per student. In our analysis, we use this variation to investigate the impact of federal pandemic relief on student achievement.

11 For an excellent explanation of the Title I formula, see Gordon and Reber (2023).

12 On paper, there are other factors that matter as well, such as the "state equity factor" (based on the coefficient of variation in expenditures per student across districts in the state) and the "state effort factor" (a function of the ratio of education spending per child and per capita income). However, as Gordon and Reber (2023) show, those adjustments have little effect on the state differences illustrated in Figure C.1.

Appendix D. Statistical Model

We model the change in achievement between 2022 and 2025, $S_{i25} - S_{i,22}$, , as a function of the average number of days that students were absent, the federal pandemic relief per student, and the share of schools identified for comprehensive support and improvement (CSI), as well as a set of district characteristics, X_i, and state fixed effects, δ_s.

$$(1)\ S_{i25} - S_{i,22} = \beta_0 + \beta_1 Federal\ Pandemic\ Relief_i + \beta_2 Avg\ Days\ Absent + X_i\gamma + \delta_s + \varepsilon_i$$

We use the ESSER allocation per student as a proxy for the increase in expenditure per student. Unfortunately, the data on local government revenues per student and actual expenditures per student are not yet available for 2023–24 or 2024–25. Until such data are released by the federal Department of Education, we assume that the federal aid did not crowd out spending from state and local revenue. This is a reasonable assumption regarding state revenues, since maintenance of effort provisions in the federal law required states to maintain their school funding.[13] If state governments tried to reduce their contribution, it would negatively impact their Title I revenues in the future. However, the maintenance of effort provisions did not apply to contributions from local revenue. If local governments did cut back their contributions, a $1,000 allocation per student in ESSER dollars would have resulted in less than $1,000 in additional expenditures. Importantly, such bias would lead us to understate (not overstate) the impact per federal dollar in aid.

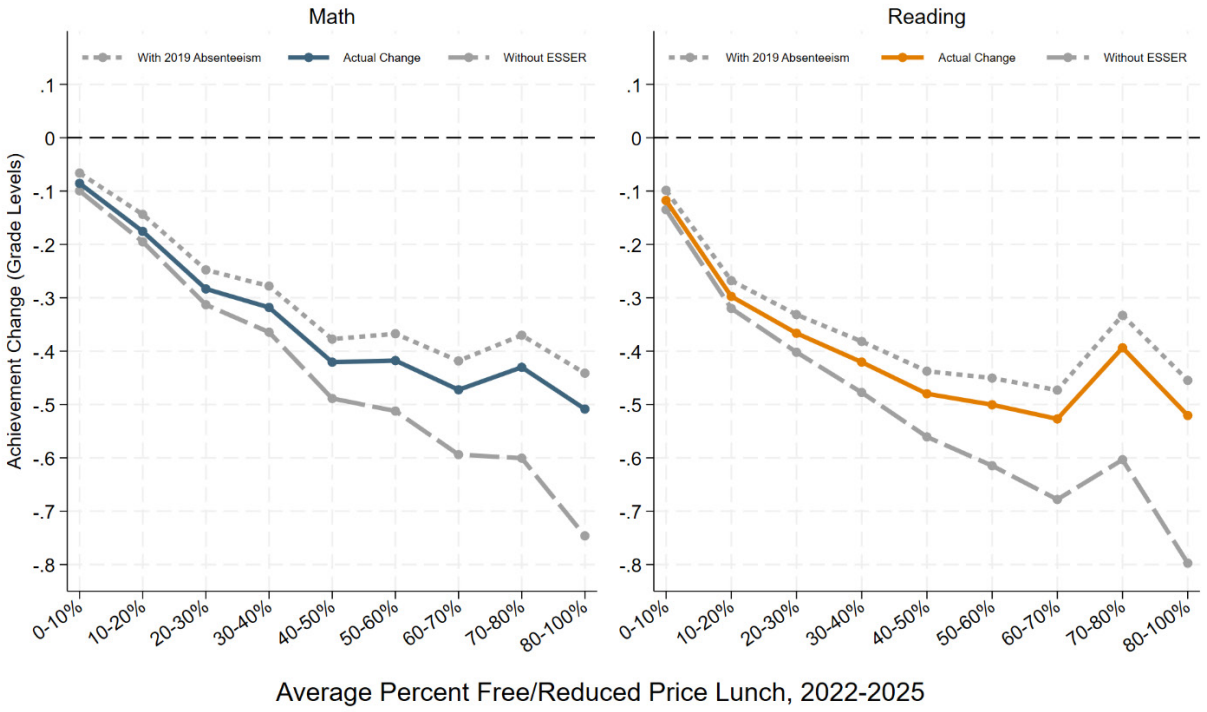
The set of district characteristics included in equation (1) are student demographics in 2022 (the percentage of students in each racial group, the log of total district enrollment, dummy variables for every 10% free/reduced price lunch, percentage of students in rural, town, suburb, or urban geographies), the change in these student demographics from 2022 to 2025, the percent of the 2020–21 school year that schools were either remote instruction and a hybrid of remote and in-person (see our 2024 report for details on how this measure was calculated) and the trend in district achievement between 2015 and 2019. In addition, we included fixed effects for every two percentage points of student eligibility for Title I. By including such fixed effects, we attempt to distinguish the effect of federal pandemic relief and student absences from the effect of district poverty.

The state fixed effects in equation (1) reflect the achievement growth in each state, after adjusting for the amount of pandemic relief states received as well as other components of X_i: student demographics, levels of poverty in the district, the share of the 2020–21 school year that schools were remote or hybrid, and the trend in scores between 2015 and 2019.

13 The maintenance of effort requirements under ESSER did not apply to local governments. However, as the Department of Education indicated in E-14 of ESSER-and-GEER-Use-of-Funds-FAQs-December-7-2022-Update-1.pdf (ed.gov), any district that chose to replace state or local funds with federal ESSER funds risked failing to meet the maintenance of effort requirement under the Title I program itself.

Appendix E. Changes Since 2019 by District Poverty (Without ESSER and Absenteeism)

APPENDIX FIGURE E.1 ACTUAL AND PREDICTED ACHIEVEMENT CHANGES SINCE 2019 BY DISTRICT POVERTY



Note: The solid line is mean change in achievement from the Stanford Education Data Archive, weighted by district enrollment size. To calculate the estimated change in achievement without ESSER (the long dashed line) we subtracted the product of the district's ESSER II/ARP grant per student and the coefficient from column (3) in Table 1. To calculate the effect of absenteeism, we multiplied the change in average annual days absent from 2017–19 to 2023–25 by 3 to get the average days absent over the 3-year period. We then took this value and multiplied it by the coefficient on days absent in column (3) in Table 1 and subtracted it from the actual change in achievement.

The Education Scorecard is a collaboration between two of the nation's leading education research centers: the **Center for Education Policy Research (CEPR) at Harvard University** and the **Educational Opportunity Project (EOP) at Stanford University**. Together, CEPR and EOP have built a real-time, publicly accessible window into how students in local school districts across America are learning and growing.

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