

Trends and Gaps in Reading Achievement across Kindergarten and Grade 1 in Two Illinois School Districts

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Trends and Gaps in Reading Achievement across Kindergarten and Grade 1 in Two Illinois School Districts

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To assess education progress in the early grades and identify achievement gaps, this study examined reading achievement data for kindergarten and grade 1 students in two districts in Illinois: District U–46 (Elgin Area Schools) and District 186 (Springfield Public Schools). Drawing on a different reading assessment in each district, the study team documented reading achievement in these two early grades for two kindergarten cohorts (2016/17 for District U–46 and 2017/18 for District 186) and examined disparities in achievement for several student demographic groups. In particular, the study identified gaps in reading achievement at different time points in kindergarten and grade 1 by students’ race/ethnicity, eligibility for the national school lunch program (an indicator of poverty), English learner status, participation in special education, and gender. The findings can enhance alliance members’ understanding of reading achievement trends and gaps and can inform district administrators’, policymakers’, and educators’ decisions about which students could benefit from additional reading supports. In addition, the findings can motivate conversations about the root causes of inequities in reading achievement and how to resolve them.

Why this study?

In Illinois, as in many other states, statewide standardized assessments provide information about reading achievement for students in grades 3 and higher; however, educators in Illinois lack comparable information on students earlier in elementary school. According to a recent study based on data collected by teachers using the Illinois Kindergarten Individual Development Survey,¹ 85 percent of kindergarten students scored below the mid-point on the academic knowledge domain at school entry (Bowdon et al., 2019), and 46 percent of kindergarten students had the language and literacy skills expected at kindergarten entry (Illinois State Board of Education, 2019). Further, gaps were found in language and literacy skills at kindergarten entry between students in several demographic groups, including Black and Hispanic students relative to Asian and White students, students eligible for the national school lunch program (an indicator of poverty) relative to those who were not eligible, and English learner students relative to non-English learner students (Bowdon et al., 2019). Such gaps at kindergarten entry are consequential because children who enter kindergarten without foundational skills, such as letter–word sound recognition, become proficient in reading at a slower rate than children who enter kindergarten with those skills (Burchinal et al., 2011; Claessens et al., 2009; Foorman et al., 2016; Kieffer, 2012).

Gaps in reading achievement can be narrowed through effective instruction in early elementary school grades that enables children who start kindergarten with lower reading achievement to make rapid progress (Cameron et al., 2015). However, children who do not become proficient readers by grade 3 are at a higher risk for persistently lower reading achievement later in elementary and middle school (Pace et al., 2019) and into high school (Dabrowski & Klingner, 2015; Stanley et al., 2018) and for failure to graduate from high school (Hernandez, 2012).

For additional information, including background on the study, technical methods, and supporting analyses, access the report appendixes at <https://go.usa.gov/xAw2C>.

1. The Kindergarten Individual Development Survey is an observational assessment that teachers use during the first 40 days of instruction to rate students in six developmental areas, including language and literacy skills.

Members of the Midwest Early Childhood Education Research Alliance² of the Regional Educational Laboratory Midwest conducted this study to better understand the reading achievement of kindergarten and grade 1 students and to identify gaps in reading achievement between students in various demographic groups. This study followed the reading achievement of two cohorts of kindergarten students from two districts in Illinois—the 2016/17 cohort in District U–46 and the 2017/18 cohort in District 186—through kindergarten and grade 1. These districts were selected for the study because of their participation in the Midwest Early Childhood Education Research Alliance, the availability of reading achievement data, and their differing size and student characteristics (table 1). District U–46 is the second largest school district in Illinois; it serves students in Elgin and surrounding communities.³ District 186 is a midsize district that serves students in Springfield. The districts differed by more than 10 percentage points in the percentage of Black, Hispanic, and multiracial students served, which limits the comparisons that can be made between the districts.

The study findings can enhance alliance members’ understanding of reading achievement trends and gaps in these districts. Further, the findings could guide district administrators, policymakers, and educators’ decisions about which students could benefit from additional reading supports. Stakeholders in both districts have specified other ways in which the study results might inform efforts to improve reading achievement. For example, the districts plan to share the findings through teacher workshops on using assessment data to inform classroom practice, which could highlight conclusions drawn from trend analyses of student achievement across time, particularly when differences are found between student demographic groups.

Table 1. State and study district demographic characteristics of grade 1 students in Illinois (percent of fall enrollment)

Characteristic	Illinois, 2017/18 (n = 137,580)	District U–46, 2017/18 (n = 2,703)	District 186, 2018/19 (n = 928)
Asian students	5	8	3
Black students	17	6	43
Hispanic students	26	57	4
White students	48	26	36
Multiracial students	4	3	14
Other race/ethnicity students ^a	24	< 1	< 1
Students eligible for the national school lunch program ^b	59	64	73
English learner students ^b	11	52	—
Students in special education ^b	14	11	21
Female students	49	50	48

— is not available.

a. Includes students who identified as a race/ethnicity that made up less than 2 percent of the student population.

b. The data represent the percentages of students in public elementary and secondary schools, as data exclusively for grade 1 were not available.

Source: Authors’ analyses using data from the Common Core of Data (U.S. Department of Education, n.d.), Illinois State Board of Education (2018), District U–46 for students in grade 1 in 2017/18, and District 186 for students in grade 1 in 2018/19.

2. The Midwest Early Childhood Education Research Alliance members represent the following organizations: District U–46, District 186, Chicago Public Schools, Rockford Public Schools, Valley View Public Schools, Governor’s Office of Early Learning and Development, Illinois State Board of Education, Illinois Head Start Association, Illinois Department of Children and Family Services, Illinois Department of Human Services, Northern Illinois University, and Foresight Law and Policy.

3. In addition to Elgin, District U–46 serves Bartlett, Hanover Park, South Elgin, Streamwood, Wayne, and portions of Carol Stream, Hoffman Estates, St. Charles, Schaumburg, and West Chicago (District U–46, n.d.).

Research questions

The study addressed two research questions focused on reading achievement in each district’s cohort of students from the beginning of kindergarten through spring of grade 1 (the 2016/17 kindergarten cohort in District U–46 and the 2017/18 kindergarten cohort in District 186). Findings are presented separately for each district, as each district uses a different reading assessment.

1. How much does student reading achievement change across kindergarten and grade 1?
2. How much do changes in reading achievement differ by student demographic groups across kindergarten and grade 1?

Definitions of key terms used in the report are in box 1, and box 2 summarizes the data sources, sample, and methods used to answer the research questions (see appendix B for more details).

Box 1. Key terms

Effect size. Effect sizes are quantitative measures in standard deviation units. In this report effect sizes are used to characterize the size of differences between the average achievement of different student groups.

Fountas and Pinnell Benchmark Assessment System. The formative reading assessment (Fountas & Pinnell, 2007) administered by District U–46 teachers to assess the reading proficiency of kindergarten and grade 1 students on a scale from A to Z. Students were considered proficient in reading at a given time point if they met the established milestone on either the English or the Spanish version of the assessment. As suggested by the assessment developers’ rubric, District U–46 expects students to receive a level C rating in winter of kindergarten, a level D rating in spring of kindergarten, a level F rating in winter of grade 1, and a level J rating in spring of grade 1. Before taking the assessment students first had to pass a district-created letter–sound screening assessment (see appendix A).

Full sample. The full sample for the main analyses for each school district included all students who took the reading assessment at any time point covered by the study, even if they did not take an assessment at every time point.

Measures of Academic Progress for Primary Grades. The formative reading assessment (Northwest Evaluation Association, 2009) used by District 186 teachers to assess reading achievement. The assessment is adaptive and appropriate for universal screening and for measuring the growth of students’ reading scores. Scores on this nationally normed assessment range from 100 to 300.

Number of instructional days. To aid readers’ understanding of the size of the differences in average achievement between student groups, differences in effect sizes were translated into number of instructional days. The methodology used is described in appendix B.

Rasch unit scores. Measures of Academic Progress for Primary Grades uses a Rasch Unit scale that extends across all grades. This scale measures academic difficulty and makes it possible to measure academic growth over time.

Stable sample. The stable sample for analyses for each school district included only students who took the reading assessment at every time point covered by the study.

Box 2. Data sources, sample, and methods

Data sources. The study analyzed data from two Illinois school districts' kindergarten and grade 1 student assessments and student records systems, which house students' assessment scores and demographic information. The demographic information includes binary indicators for students' race/ethnicity, eligibility for the national school lunch program (an indicator of poverty), special education status, and gender. The District U–46 data also included a binary indicator for English learner status, while the District 186 data did not. District U–46 used district-defined milestones to determine reading proficiency, and District 186 used a nationally normed assessment of reading achievement. (See appendix A for more information about each district's reading assessment system.)

- *District U–46.* The study used Fountas and Pinnell Benchmark Assessment System data from four time points (winter and spring of kindergarten in 2016/17 and winter and spring of grade 1 in 2017/18).
- *District 186.* The study used Measures of Academic Progress for Primary Grades data from six time points (fall, winter, and spring of kindergarten in 2017/18 and fall, winter, and spring of grade 1 in 2018/19).

Sample. The full sample included all students who took the reading assessment at any time point covered by the study, even if they did not take an assessment at every time point. Tested students are the population of interest because schools use the assessment results to make decisions about reading instruction. For example, in District U–46 students who do not pass the letter–sound screening assessment (see appendix A) automatically receive reading intervention.

- *District U–46.* The sample consisted of a total of 2,703 students with assessment results at any time point: 2,396 (88 percent) of the 2,714 students enrolled in winter of kindergarten, 2,420 (89 percent) of the 2,714 students enrolled in spring of kindergarten, 2,586 (96 percent) of the 2,704 students enrolled in winter of grade 1, and 2,582 (96 percent) of the 2,704 students enrolled in spring of grade 1.
- *District 186.* The sample consisted of a total of 928 students with assessment results at any time point: 927 (96 percent) of the 966 students enrolled in fall of kindergarten, 947 (96 percent) of the 982 students enrolled in winter of kindergarten, 927 (97 percent) of the 959 students enrolled in spring of kindergarten, 930 (95 percent) of the 974 students enrolled in fall of grade 1, 929 (97 percent) of the 955 students enrolled in winter of grade 1, and 928 (98 percent) of the 951 students enrolled in spring of grade 1.

Supplemental analyses were conducted for a stable sample that included only students who took the assessments at every time point covered by the study (see appendix D for results of the analysis of the stable sample). In District U–46, 2,261 students had assessment scores at every time point; in District 186 the number was 731. The main analyses focused on the full sample of students who took the assessment at any time point rather than on the stable sample to ensure that as many students as possible were represented in the analysis. Comparing the main results with the supplemental results helps determine whether changes in the composition of the cohort across years affected the results. Findings from the full and stable samples suggest similar patterns of reading achievement (see appendix D).

Methods. The study examined trends and gaps in the reading achievement of each district's cohort of kindergarten students across kindergarten and grade 1, as well as differences in reading achievement across student demographic groups. Calculations of the percentage of students meeting the reading proficiency or achievement goals were based on the number of students with nonmissing data at each time point. Separate analyses were performed for each district because of differences in the outcome measures and dates of the study period. District U–46 used a discrete proficient or not proficient measure of reading achievement, while District 186 used a continuous measure of reading achievement (see appendix A). In addition, the study period for District U–46 began in 2016 and ended in 2018, whereas the study period for District 186 began in 2017 and ended in 2019. These differences are limitations of the study.

- *District U–46.* To determine how reading proficiency increased over the study period, the study team converted students' Fountas and Pinnell Benchmark Assessment ratings to a binary indicator (proficient or not proficient) and calculated the percentage of students who, at each time point, reached the level required for proficiency in spring of grade 1 (level J or above) as well as the percentage of students who met time-specific reading proficiency milestones at each time point (level C in winter of kindergarten, level D in spring of kindergarten, level F in winter of grade 1, and level J in spring of grade 1). To determine how reading proficiency differed by student characteristics, the study team examined differences in the percentage of students in

District U–46 who met the reading proficiency milestone at each time point by student demographic group. In consultation with the stakeholder advisory group, differences greater than 5 percentage points were considered substantively meaningful.

- *District 186.* To determine how reading achievement increased over the study period, the study team calculated average Rasch unit scores and associated standard deviations on the Measures of Academic Progress for Primary Grades. The Rasch unit scores are vertically equated to allow for comparison of achievement across academic years. To determine how reading achievement differed by student characteristics, the study team calculated the average score for student demographic groups at each time point. For ease of interpretation, differences between student groups at the first time point (fall of kindergarten) and last time point (spring of grade 1) are reported as effect sizes (Hedges' *g*) and then translated into number of instructional days (see appendix B for details on the methodology used to translate gaps in reading achievement into number of instructional days). However, recent research suggests that the number of instructional days metric should be interpreted with caution, as it has the potential to produce inconsistent results (Baird & Pane, 2019). A gap of 18 days or more was considered to be substantively meaningful (Bowdon et al., 2019) because missing more than 10 percent of instructional time is negatively correlated with subsequent student achievement (Romero & Lee, 2007).
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Findings

Reading achievement increased across kindergarten and grade 1 in District U–46 and in District 186. In both districts reading achievement varied by race/ethnicity, eligibility for the national school lunch program, and special education status. Reading achievement also varied by English learner status in District U–46 and by gender in District 186. In District 186 gaps in reading achievement between student groups based on race/ethnicity, eligibility for the national school lunch program, and special education status widened from fall of kindergarten through spring of kindergarten. Supplemental analyses were also conducted for the subset of students who had assessment scores at every time point (the stable sample; see appendix D). In both districts the differences in results between the full sample and the stable sample at spring of grade 1 were small. (See appendix C for supporting analyses.)

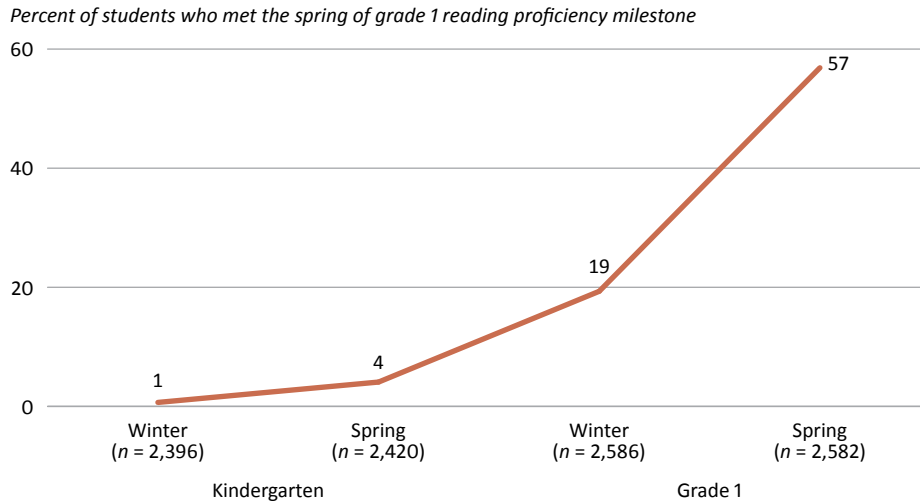
The following sections provide detailed findings for the main analyses for the two research questions, first for District U–46 and then for District 186.

In District U–46 reading proficiency for the 2016/17 kindergarten cohort increased across kindergarten and grade 1, with more than half the students meeting the district's spring of grade 1 proficiency milestone by the end of grade 1

To answer research question 1 for District U–46, the study team examined the percentage of District U–46 students who met the district-defined level of proficiency for spring of grade 1 (level J) on the district's reading proficiency assessment at all time points (the percentage of students who reached level J in both winter and spring of kindergarten and in both winter and spring of grade 1). This analysis provided a common milestone, allowing comparison across assessment time points. The study team then examined the percentage of District U–46 students who met the expected milestones at each time point (level C in winter of kindergarten, level D in spring of kindergarten, level F in winter of grade 1, and level J in spring of grade 1). Educators could use this additional analysis to determine whether children met grade-level reading proficiency benchmarks at each time point.

By the end of grade 1, 57 percent of students in District U–46 met the spring of grade 1 reading proficiency milestone (level J). The percentage of students who met the reading proficiency milestone expected by spring of grade 1 increased over time (figure 1). As expected, only a small share of kindergarten students met the spring of grade 1 proficiency milestone in winter (1 percent) and spring (4 percent) of kindergarten. By winter of grade 1, 19 percent of students met the milestone, and by spring of grade 1, 57 percent of students met the milestone.

Figure 1. By the end of grade 1, 57 percent of students in District U–46 in Illinois met the spring of grade 1 reading proficiency milestone (level J), part of a rising trend in reading proficiency, 2016/17–2017/18

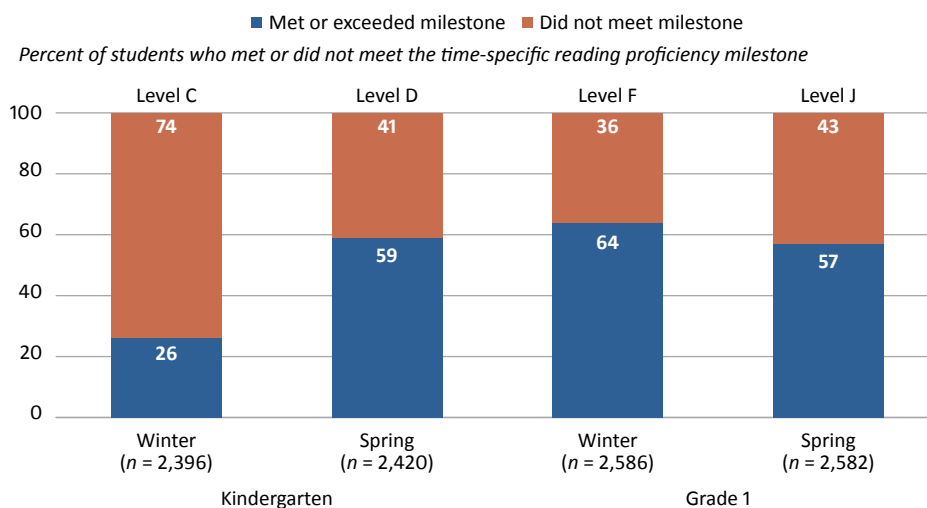


Note: Students could meet the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System. The sample included all kindergarten students in 2016/17 and grade 1 students in 2017/18 in 40 schools who took an assessment at any of the time points covered, even if they did not take an assessment at every time point.

Source: Authors' analysis using assessment and student records data for 2016/17–2017/18 from District U–46.

In District U–46 the percentage of students who met the time-specific reading proficiency milestone was highest in winter of grade 1 (64 percent). Because district administrators and assessment developers did not expect students to meet the level J milestone before spring of grade 1, the second analysis focused on the percentage of students who met the time-specific reading proficiency milestone at each time point (level C in winter of kindergarten, level D in spring of kindergarten, level F in winter of grade 1, and level J in spring of grade 1). Except for winter of kindergarten, a majority of students met the time-specific milestone at each time point (figure 2).

Figure 2. The percentages of students in District U–46 in Illinois who met or exceeded time-specific reading proficiency milestones (levels C, D, F, and J) increased substantially from winter through spring of kindergarten and plateaued at around 60 percent through grade 1, 2016/17–2017/18



Note: Students could meet the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment. The sample included all kindergarten students in 2016/17 and grade 1 students in 2017/18 in 40 schools who took an assessment in any of the time points covered, even if they did not take an assessment in every time point.

Source: Authors' analysis using assessment and student records data for 2016/17–2017/18 from District U–46.

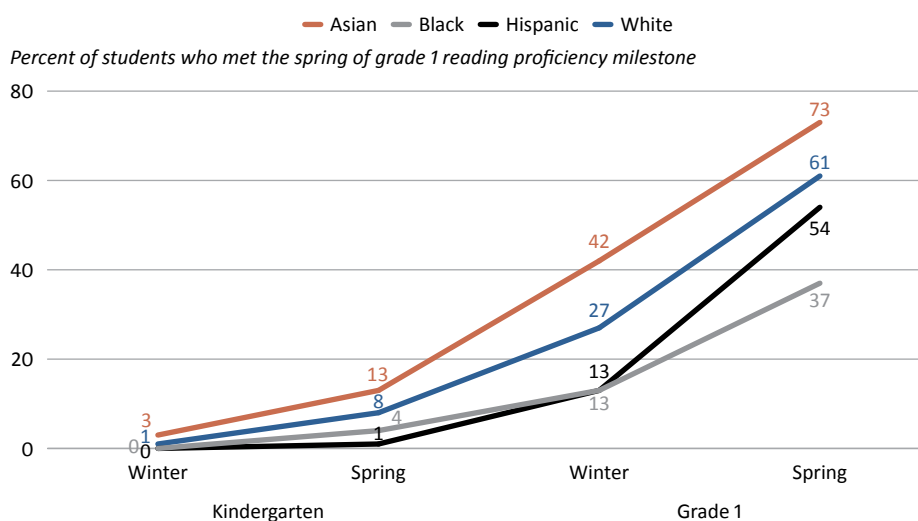
In District U–46 the percentage of students who met the district’s spring of grade 1 reading proficiency milestone by the end of grade 1 was higher for Asian and White students than for students of other races/ethnicities and higher for students who were not eligible for the national school lunch program, for students who were not English learner students, and for students who were not in special education than for students who were

The study team averaged reading proficiency by student demographic group at each time point to answer research question 2. These findings pertain only to students with nonmissing data on the demographic characteristics examined.

In District U–46 the percentage of students who met the spring of grade 1 reading proficiency milestone (level J) across kindergarten and grade 1 varied by race/ethnicity. Although similar percentages of students in different racial/ethnic groups met the spring of grade 1 reading proficiency milestone in winter and spring of kindergarten, differences emerged by winter of grade 1. Asian students were the most likely to meet the proficiency milestone, followed by White, Black, and Hispanic students (figure 3; see table C1 in appendix C for differences by all racial/ethnic groups). By winter of grade 1, 42 percent of Asian students met the spring of grade 1 proficiency milestone compared with 27 percent of White students, 13 percent of Black students, and 13 percent of Hispanic students. By spring of grade 1, 73 percent of Asian students met the proficiency milestone compared with 61 percent of White students, 55 percent of Hispanic students, and 37 percent of Black students.

The majority of Hispanic students were also English learner students. A slightly higher percentage of Hispanic students who were not English learner students (59 percent) than of Hispanic students who were English learner students (54 percent) met the spring of grade 1 reading proficiency milestone by the end of grade 1 (see table C3 in appendix C).

Figure 3. In District U–46 in Illinois, higher percentages of Asian and White students than of students of other races/ethnicities met the spring of grade 1 reading proficiency milestone (level J) by the end of grade 1, 2016/17–2017/18



Note: Students could reach the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System. The sample included kindergarten students in 2016/17 and grade 1 students in 2017/18 in 40 schools who took a reading assessment at any time point: 178 Asian students, 115 Black students, 1,391 Hispanic students, and 626 White students in winter of kindergarten; 184 Asian students, 117 Black students, 1,404 Hispanic students, and 627 White students in spring of kindergarten; 204 Asian students, 141 Black students, 1,484 Hispanic students, and 670 White students in winter of grade 1; and 194 Asian students, 147 Black students, 1,484 Hispanic students, and 666 White students in spring of grade 1.

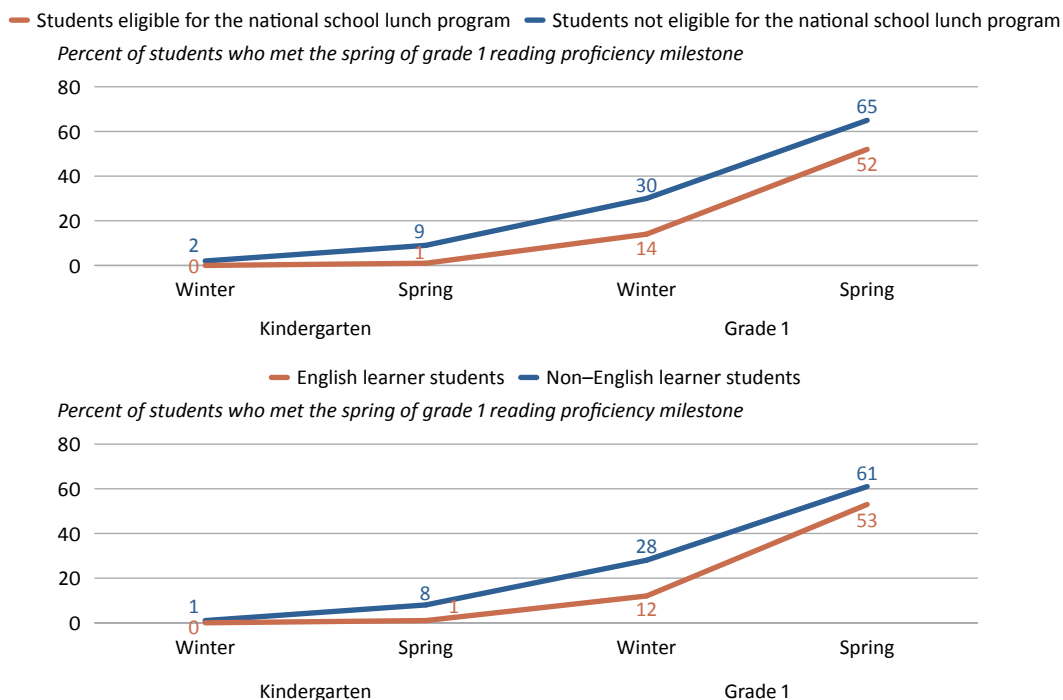
Source: Authors’ analysis using assessment and student records data for 2016/17–2017/18 from District U–46.

In District U–46 a higher percentage of students not eligible for the national school lunch program than of eligible students met the spring of grade 1 reading proficiency milestone (level J) by the end of grade 1. The proportion of students who met the spring of grade 1 reading proficiency milestone by the end of grade 1 was 65 percent for students eligible for the national school lunch program and 52 percent for students who were not eligible for the program (figure 4).

Because higher percentages of Black and Hispanic students than of students of other racial/ethnic groups were eligible for the national school lunch program (see table C4 in appendix C), additional analyses were conducted to determine whether reading proficiency among students eligible for the national school lunch program varied by race/ethnicity. Among students eligible for the national school lunch program, a higher percentage of Hispanic students (54 percent) than of Black students (35 percent) or White students (49 percent) met the spring of grade 1 reading proficiency milestone by the end of grade 1 (see table C5).

In District U–46 a higher percentage of non–English learner students than of English learner students met the spring of grade 1 reading proficiency milestone at each time point. A higher percentage of non–English learner students met the spring of grade 1 reading proficiency milestone (level J) in winter and spring of grade 1, and the gap between these two groups narrowed across these time points (see figure 4). In winter of grade 1, 28 percent of non–English learner students met the spring of grade 1 proficiency milestone compared with 12 percent of English

Figure 4. Higher percentages of students not eligible for the national school lunch program than of students eligible for the program and of non–English learner students than of English learner students in District U–46 in Illinois met the spring of grade 1 reading proficiency milestone (level J) by the end of grade 1, 2016/17–2017/18



Note: Students could meet the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System. The sample included kindergarten students in 2016/17 and grade 1 students in 2017/18 in 40 schools who took a reading assessment at any time point: 1,525 students eligible for the national school lunch program and 871 students not eligible for the program in winter of kindergarten, 1,544 students eligible for the program and 876 students not eligible for the program in spring of kindergarten, 1,649 students eligible for the program and 937 students not eligible for the program in winter of grade 1, 1,653 students eligible for the program and 929 students not eligible for the program in spring of grade 1, 1,255 English learner students and 1,141 non–English learner students in winter of kindergarten, 1,277 English learner students and 1,143 non–English learner students in spring of kindergarten, 1,360 English learner students and 1,226 non–English learner students in winter of grade 1, and 1,345 English learner students and 1,237 non–English learner students in spring of grade 1.

Source: Authors’ analysis using assessment and student records data for 2016/17–2017/18 from District U–46.

learner students. By spring of grade 1, 61 percent of non–English learner students met the proficiency milestone compared with 53 percent of English learner students.

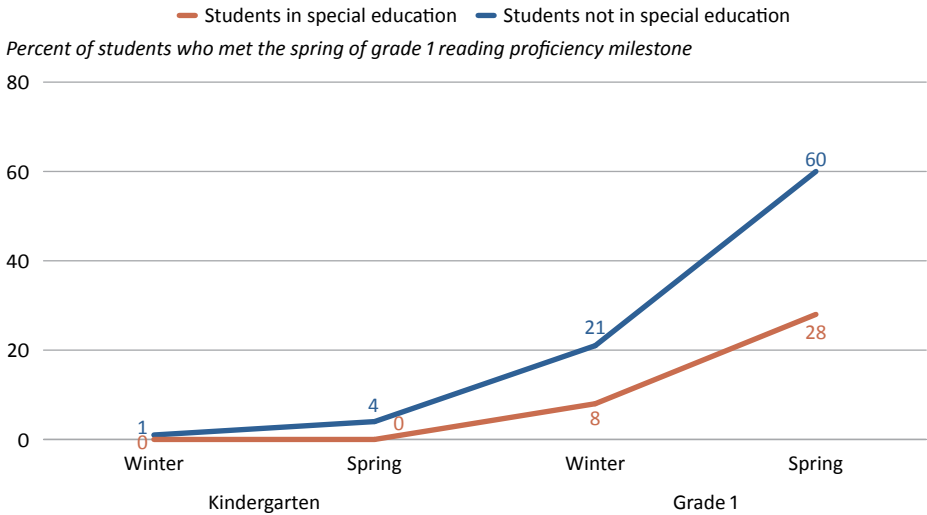
In District U–46 a higher percentage of students not in special education than of students in special education met the spring of grade 1 reading proficiency milestone. The percentages of students who met the spring of grade 1 reading proficiency milestone in winter and spring of grade 1 were higher for students not in special education than for students in special education (figure 5). In winter of grade 1, 21 percent of students not in special education met the milestone compared with 8 percent of students in special education. By spring of grade 1, 60 percent of students not in special education met the proficiency milestone compared with 28 percent of students in special education.

In District U–46 the percentage of students who met the spring of grade 1 reading proficiency milestone did not vary substantially by gender. Similar percentages of male and female students met the spring of grade 1 proficiency milestone at every time point. There were almost no differences in the percentage of students who met the proficiency milestone by gender in winter of kindergarten, spring of kindergarten, and winter of grade 1. A slight but not substantively meaningful difference between male and female students emerged in spring of grade 1: 54 percent of male students met the proficiency milestone compared with 59 percent of female students.⁴

In District 186 reading achievement for the 2017/18 kindergarten cohort increased across kindergarten and grade 1 at rates similar to the assessment’s national norms by the end of grade 1

Average reading scores in District 186 increased consistently across kindergarten and grade 1 and were similar to national norms. National norms allow for the comparison of students’ scores with a national sample of students

Figure 5. A higher percentage of students not in special education than of students in special education in District U–46 in Illinois met the spring of grade 1 reading proficiency milestone (level J) by the end of grade 1, 2016/17–2017/18



Note: Students could meet the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System. The sample included kindergarten students in 2016/17 and grade 1 students in 2017/18 in 40 schools who took a reading assessment at any time point: 268 students in special education and 2,128 students not in special education in winter of kindergarten, 274 students in special education and 2,146 students not in special education in spring of kindergarten, 272 students in special education and 2,314 students not in special education in winter of grade 1, and 270 students in special education and 2,312 students not in special education in spring of grade 1.

Source: Authors’ analysis using assessment and student records data for 2016/17–2017/18 from District U–46.

4. A substantively meaningful difference is defined as a difference greater than 5 percentage points.

who took the same assessment in a prior academic year. The largest gaps in average achievement in the District 186 cohort were between racial/ethnic groups and between students in special education and students not in special education.

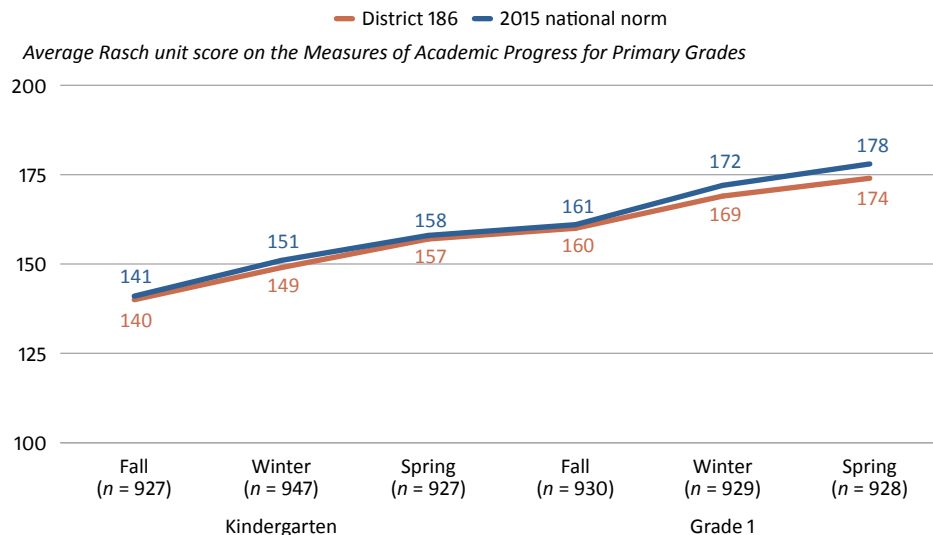
Across time periods average Rasch unit scores on the Measures of Academic Progress for Primary Grades increased in District 186. The average Rasch unit scores on the Measures of Academic Progress for Primary Grades increased at each time point. An additional analysis comparing average Rasch unit scores by grade level to national norms (Thum & Hauser, 2015) found a 34 point increase in the average Measures of Academic Progress for Primary Grades score from fall of kindergarten to spring of grade 1 in District 186, smaller than the 37 point increase in the national sample. In fall of kindergarten the difference in reading scores between students in District 186 and the national sample was 0.07 standard deviation units (equivalent to 14 days of instruction⁵). By spring of grade 1 the gap had grown to 0.27 standard deviation units (equivalent to 51 days of instruction).

In District 186 gaps in average reading scores across kindergarten and grade 1 widened between student groups defined by race/ethnicity, eligibility for the national school lunch program, and special education status and narrowed between male and female students

In District 186 the average Rasch scores on the Measures of Academic Progress for Primary Grades varied between student demographic groups across kindergarten and grade 1, and most gaps widened over time.

In District 186 average reading scores across kindergarten and grade 1 varied by race/ethnicity, and gaps by race/ethnicity widened. Asian students made the largest gains in average Measures of Academic Progress for Primary Grades scores (41 points) throughout kindergarten to spring of grade 1, and the differences were clearest by the end of grade 1 (figure 7). Across kindergarten and grade 1 Asian and White students had higher average reading

Figure 6. Average reading scores on the Measures of Academic Progress for Primary Grades in District 186 in Illinois were similar to national norms and rose for students from fall of kindergarten to spring of grade 1, 2017/18–2018/19

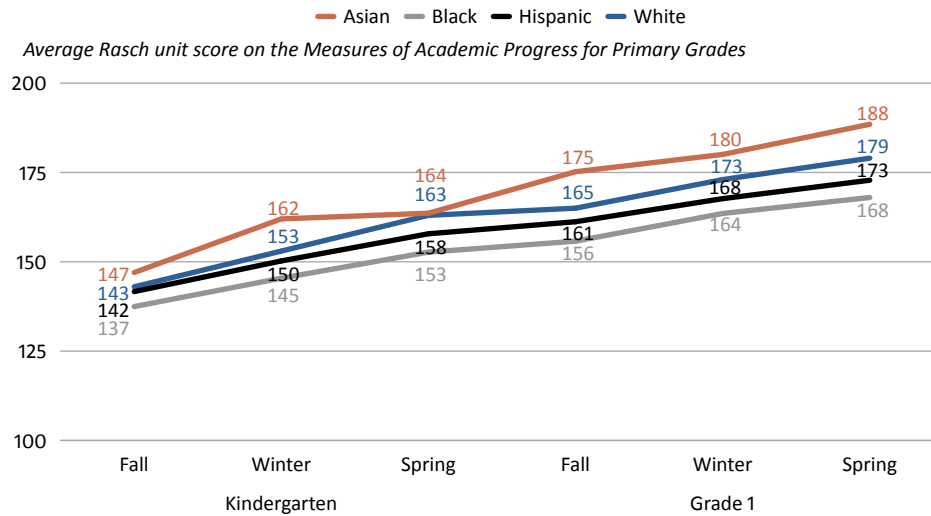


Note: The sample included kindergarten students in the 2017/18 school year and grade 1 students in the 2018/19 school year in 23 schools who took a reading assessment at any time point.

Source: Authors' analysis using assessment data for 2017/18–2018/19 from District 186 and national norms data for the Measures of Academic Progress for Primary Grades from Thum and Hauser (2015).

5. A gap of 18 days or more is considered substantively meaningful.

Figure 7. Asian students in District 186 in Illinois made the largest gains in reading achievement from kindergarten through grade 1, 2017/18–2018/19



Note: The sample included kindergarten students in the 2017/18 school year and grade 1 students in the 2018/19 school year in 23 schools who took a reading assessment at any time point: 14 Asian students, 401 Black students, 29 Hispanic students, and 341 White students in fall of kindergarten; 13 Asian students, 413 Black students, 29 Hispanic students, and 351 White students in winter of kindergarten; 15 Asian students, 400 Black students, 32 Hispanic students, and 341 White students in spring of kindergarten; 24 Asian students, 406 Black students, 33 Hispanic students, and 333 White students in fall of grade 1; 24 Asian students, 403 Black students, 36 Hispanic students, and 329 White students in winter of grade 1; and 23 Asian students, 404 Black students, 35 Hispanic students, and 332 White students in spring of grade 1.

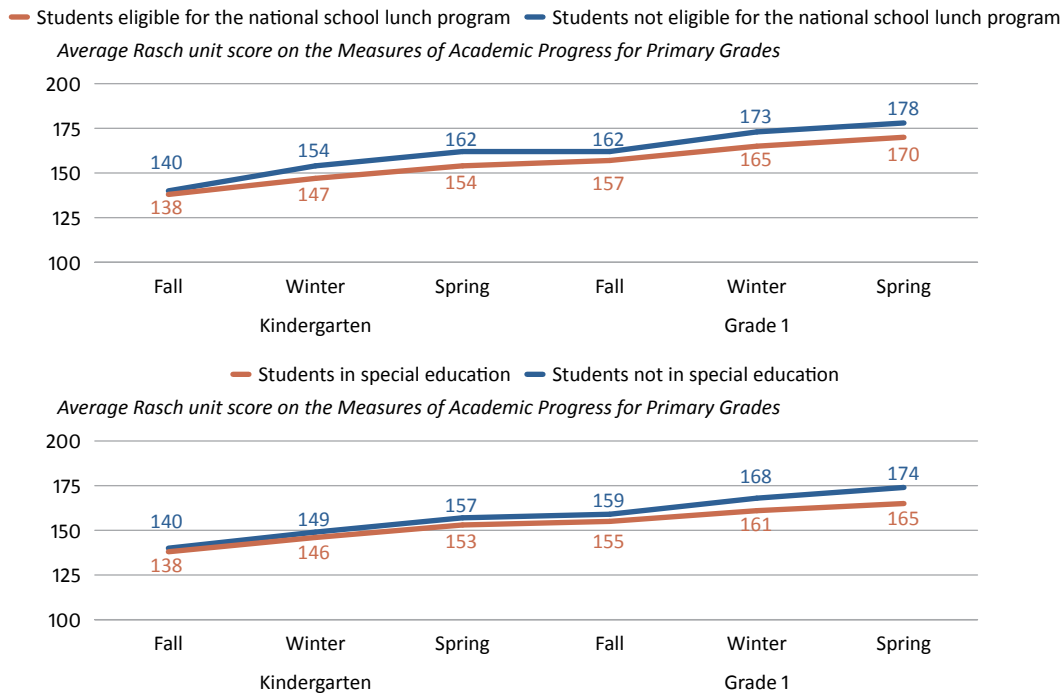
Source: Authors' analysis using assessment and student records data for 2017/18–2018/19 from District 186.

scores on the Measures of Academic Progress for Primary Grades than students of other races/ethnicities. The gap in scores between Asian students and Black students widened from 1.04 standard deviation units (equivalent to 194 days of instruction) in fall of kindergarten to 1.39 standard deviation units (equivalent to 259 days of instruction) by spring of grade 1. The gap in scores between Asian students and Hispanic students widened from 0.49 standard deviation units (equivalent to 91 days of instruction) in fall of kindergarten to 0.82 standard deviation units (equivalent to 151 days of instruction) by spring of grade 1. The gap in scores between White students and Black students widened from 0.57 standard deviation units (equivalent to 105 days of instruction) in fall of kindergarten to 0.72 standard deviation units (equivalent to 133 days of instruction) by spring of grade 1.

In District 186 gaps in average reading scores between students of different races/ethnicities persisted even after eligibility for the national school lunch program was controlled for. The study team conducted additional analyses to identify trends and gaps in reading achievement by race/ethnicity among students eligible for the national school lunch program. The most prominent differences were between Black and Hispanic students and Asian and White students (see figure C2 in appendix C). The gap in average reading scores on the Measures of Academic Progress for Primary Grades between Asian students eligible for the national school lunch program and Black students eligible for the program narrowed from 1.71 standard deviations (equivalent to 318 days of instruction) in fall of kindergarten to 0.89 standard deviation units (equivalent to 164 days of instruction) by spring of grade 1. The gap in scores between White students eligible for the national school lunch program and Black students eligible for the program widened from 0.39 standard deviation units (equivalent to 72 days of instruction) in fall of kindergarten to 0.49 standard deviation units (equivalent to 91 days of instruction) by spring of grade 1.

In District 186 the gap in average reading scores between students not eligible for the national school lunch program and students eligible for the program widened over time. Students not eligible for the national school lunch program had an average score of 140 on the Measures of Academic Progress for Primary Grades in fall of kindergarten compared with 138 for students eligible for the program (figure 8). The gap between these two

Figure 8. The gap in reading achievement in District 186 in Illinois across groups defined by eligibility for the national school lunch program and special education status widened over time, 2016/17–2017/18



Note: The sample included kindergarten students in the 2017/18 school year and grade 1 students in the 2018/19 school year in 23 schools who took a reading assessment at any time point: 393 students eligible for the national school lunch program and 411 students not eligible for the program in fall of kindergarten, 722 students eligible for the program and 155 students not eligible for the program in winter of kindergarten, 703 students eligible for the program and 155 students not eligible for the program in spring of kindergarten, 558 students eligible for the program and 242 students not eligible for the program in fall of grade 1, 674 students eligible for the program and 149 students not eligible for the program in winter of grade 1, and 678 students eligible for the program and 150 students not eligible for the program in spring of grade 1, 173 students in special education and 631 not in special education in fall of kindergarten, 190 students in special education and 687 not in special education in winter of kindergarten, 188 students in special education and 670 not in special education in spring of kindergarten, 181 students in special education and 629 not in special education in fall of grade 1, 184 students in special education and 639 not in special education in winter of grade 1, and 22 students in special education and 626 not in special education in spring of grade 1.

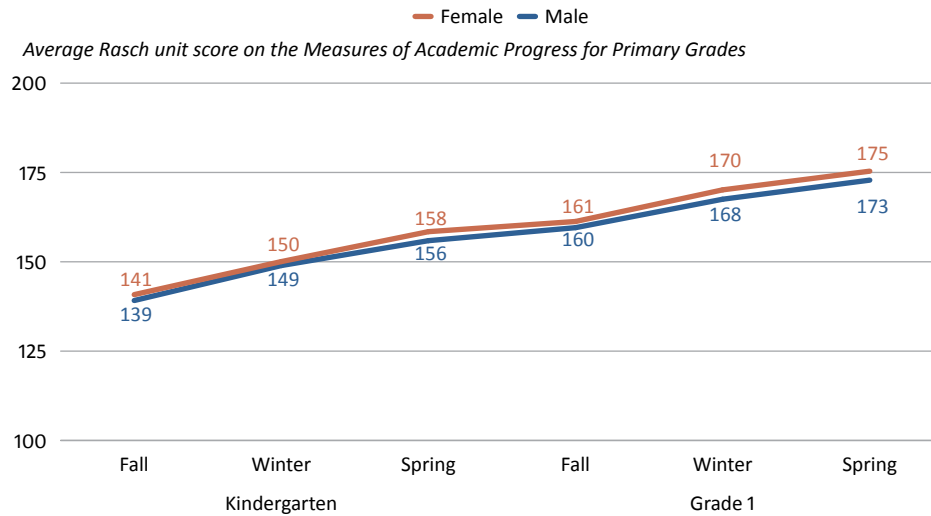
Source: Authors' analysis using assessment and student records data for 2017/18–2018/19 from District 186.

groups widened from 0.23 standard deviation units (equivalent to 43 days of instruction) in fall of kindergarten to 0.52 standard deviation units (equivalent to 97 days of instruction, or half a school year) by spring of grade 1.

In District 186 the gap in average reading scores widened between students not in special education and students in special education. Students not in special education had an average Measures of Academic Progress for Primary Grades score of 140 at kindergarten entry compared with 138 for students in special education (see figure 8). This 2 point gap widened to 9 points by spring of grade 1, as average scores rose 27 points for students in special education and 34 points for students not in special education. The gap between students in special education and students not in special education widened from 0.18 standard deviation units (equivalent to 34 days of instruction) in fall of kindergarten to 0.59 standard deviation units (equivalent to 110 days of instruction) by spring of grade 1.

In District 186 female students began kindergarten with slightly higher average reading scores on the Measures of Academic Progress for Primary Grades than male students, and both female and male students made the same gains in average scores across kindergarten and grade 1. Female students started kindergarten and ended grade 1 with an average score 2 points higher than that of male students (141 for female students and 139 for male students in fall of kindergarten and 175 for female students and 173 for male students in spring of grade 1; figure 9). Male and female students both gained an average of 34 points across kindergarten and grade 1. The gap between the scores

Figure 9. Female students’ average reading achievement score in District 186 in Illinois was 2 points higher than male students’ average score across kindergarten and grade 1, 2016/17–2017/18



Note: The sample included kindergarten students in the 2017/18 school year and grade 1 students in the 2018/19 school year in 23 schools who took a reading assessment at any time point: 436 female students and 491 male students in fall of kindergarten, 453 female students and 494 male students in winter of kindergarten, 443 female students and 484 male students in spring of kindergarten, 448 female students and 482 male students in fall of grade 1, 448 female students and 481 male students in winter of grade 1, and 449 female students and 479 male students in spring of grade 1.

Source: Authors’ analysis using assessment and student records data for 2017/18–2018/19 from District 186.

of female and male students narrowed from 0.18 standard deviation units (equivalent to 33 days of instruction) in fall of kindergarten to 0.12 standard deviation units (equivalent to 22 days of instruction) by spring of grade 1.

Limitations

This study has six key limitations. First, although the study found differences in reading achievement between students of different racial/ethnic groups, the study was not designed to examine the causes of differences in reading achievement. Thus it cannot be inferred that membership in a particular racial/ethnic group causes these disparities. Future research is needed to identify and assess drivers of inequality in reading achievement.

Second, it is possible that differences between groups were not detected after the first assessment in District U–46 (winter of kindergarten) because the assessment was not sensitive enough to identify students with low foundational reading achievement. Students who did not pass the literacy battery screener were included in the analytic sample of students who were not considered proficient, along with students who took the assessment and fell below the proficiency threshold. As a result, the findings might have prematurely indicated when gaps between demographic groups emerged or widened. However, sensitivity analyses conducted with a stable sample that excludes students who did not pass the language screener indicate that results are nearly identical (see appendix D).

Third, District U–46 provided data on English learner status and special education status only in spring of grade 1 and not for each time point in the study. A student who qualified as an English learner student in kindergarten and in fall and winter of grade 1 but did not qualify in spring of grade 1 was classified as a non–English learner student in the study. The same procedure was applied for special education status. As a result, the study team was unable to investigate whether the composition of the group of English learner students and students in special education changed over time or whether such changes were associated with trends or gaps in reading achievement. In addition, English learner status was not assessed in District 186.

Fourth, findings comparing student demographic groups pertain only to students without any missing data on background characteristics. There were no missing data for District U–46. However, in District 186 data on one or more demographic variables were missing for 7–13 percent of students across the six time periods.

Fifth, the start and end times for the samples in the two districts differed by one year, with District U–46 focused on 2016/17 and 2017/18 and District 186 on 2017/18 and 2018/19. This one-year difference between the two cohorts, in conjunction with the difference in how the districts assessed reading achievement (categorical versus continuous measurement), further limits analytic comparisons between the two districts.

Finally, the effect size translation from Hedges' *g* into equivalent number of instructional days for the difference between demographic groups in District 186 should be interpreted with caution. The instructional days metric assumes that achievement increases linearly both within and across grades, but the rate of growth in achievement likely varies by season within grades and across grades, resulting in biased calculations (Baird & Pane, 2019).

Implications

The current study builds on a recent study finding that inequalities in reading achievement between student demographic groups in Illinois—including students eligible for the national school lunch program relative to those not eligible for the program, English learner students relative to non-English learner students, and Black and Hispanic students relative to Asian and White students—start before the first day of kindergarten (Bowdon et al., 2019). The current study demonstrates that gaps in reading proficiency were still present at the end of grade 1 in District U–46 and that gaps in reading achievement existed in fall of kindergarten in District 186 and widened through grade 1.

Policymakers can use these findings to advocate for increased supports for early intervention before or at the start of kindergarten to close reading achievement gaps. District leaders might consider collaborating with other state and local agencies and community organizations to offer opportunities for children not currently in Head Start or public prekindergarten programs to gain exposure to print and language. With increased funding for early intervention and high-quality assessments for identifying students in need of support, it might be possible to close reading achievement gaps.

District leaders can use the results of this study to motivate conversations about the root causes of these growing inequalities. The study found that some gaps between students in District U–46 widened and others narrowed between fall of kindergarten and spring of grade 1 and that gaps in District 186 widened during the first two years of schooling. Widening gaps suggest that schooling may be exacerbating rather than reducing inequalities. District leaders might want to investigate whether there are differences between or within schools in instruction and in how curricula are delivered or whether other factors are associated with the differences in reading achievement between key groups. Based on the results of that investigation, district leaders might consider providing additional books, professional development, or literacy coaches to schools that serve higher concentrations of Black or Hispanic students, students eligible for the national school lunch program, students in special education, and English learner students.

To address inequalities in reading achievement within schools, educators could use scores on reading assessments, rather than student demographic groups, as the basis for identifying students in need of reading interventions. Going forward, district administrators can continue to track trends and gaps in reading achievement to inform their decisions about resource allocation for all students or for specific student demographic groups. Educators could use fall screening assessments, progress monitoring, and outcome assessments to further support students' reading achievement in the early grades.

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