



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

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See <https://go.usa.gov/xAw2C> for the full report.

## Appendix A. About the reading assessments

This appendix provides information on the reading assessments administered by District U–46 (Elgin Area Schools) and District 186 (Springfield Public Schools).

The two districts in the study assessed students' reading achievement multiple times in kindergarten and grade 1. To track reading achievement, District U–46 uses the Fountas and Pinnell Benchmark Assessment System (Fountas & Pinnell, 2007), and District 186 uses the Measures of Academic Progress for Primary Grades (Northwest Evaluation Association, 2009). District U–46 data include the percentage of students who are meeting reading proficiency benchmarks by spring of grade 1 but do not provide comparisons with national norms. In contrast, the District 186 continuous score captures more nuance about reading achievement because it uses a standardized score at each time point, with trends in reading achievement in District 186 that can be compared with students nationally. The two assessments are described in detail below.

### *District U–46 assesses reading achievement in kindergarten and grade 1 using the Fountas and Pinnell Benchmark Assessment System*

The Fountas and Pinnell Benchmark Assessment System (Fountas & Pinnell, 2007), a formative reading assessment administered by teachers, provides information on the following early reading proficiencies: decoding, fluency, vocabulary, and comprehension. This assessment contains items that identify how many letters students recognize by name or sound and what students know about letter–sound identification. The student reads aloud from the Fountas and Pinnell book while the teacher observes and notes the student's responses. The teacher then conducts a comprehension conversation with the student (Fountas & Pinnell Literacy, n.d.). Teachers give each student an achievement rating from A to Z (Fountas & Pinnell, 2014).

Teachers determine eligibility for the Fountas and Pinnell reading assessment based on a number of factors. Before students can take the Fountas and Pinnell reading assessment, they must pass a district-created literacy screener in kindergarten. This screener contains items that identify how many letters a student recognizes by name or sound and what the student knows about letter–sound identification. Some students pass the literacy screener in fall of kindergarten and may take the Fountas and Pinnell Benchmark Assessment as early as winter of kindergarten, whereas other students take the assessment later in the year. General education students in kindergarten who receive instruction in English needed a letter–sound score of at least 17 in fall of kindergarten

to take the Fountas and Pinnell Benchmark Assessment in winter. Dual language education students receiving instruction in both English and Spanish needed a letter–sound score of at least 16 in fall of kindergarten to take the assessment in winter. Kindergarten students who did not score at or above these levels on the letter–sound assessment in fall took the assessment again in winter. For kindergarten students a passing score on the letter–sound screener in winter was 21 if they were in the general English program and 20 if they were in the Spanish-dominant one-way or two-way dual language program. All kindergarten students in the English-dominant dual language two-way program had to take the letter–sound screener in Spanish in fall and winter of kindergarten, regardless of their fall score. All students were eligible to take the Fountas and Pinnell Text Benchmark Assessment in winter and spring of grade 1. Students were given the assessment in fall of grade 1 only if they did not have a score in spring of kindergarten or if their Fountas and Pinnell Benchmark Assessment score was at level B or below.

Teachers administered the Fountas and Pinnell Benchmark Assessment in winter and spring of kindergarten, and again in winter and spring of grade 1, to all kindergarten and grade 1 students. In fall of grade 1 teachers administered the assessment only to grade 1 students who scored below the threshold for proficiency in spring of kindergarten. Students took the Fountas and Pinnell Benchmark Assessment System at approximately the same time in each administration period. Testing in winter and spring sessions took place in early February each year (January 31–February 14 of 2017 and 2018) and mid-May each year (May 12–26, 2017, and May 10–24, 2018).

Teachers scored student performance on the reading assessment using the Fountas and Pinnell Text Level Gradient, assigning a letter rating from A to Z representing the level of reading proficiency for a student at a given time. Students are considered proficient if they meet the time-specific milestone on any version of the assessment (English or Spanish): 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. The measure has a Cronbach’s alpha of .93 and convergent reliability of  $r = .93$  to  $.94$  with similar measures (Heinemann, 2008).

### ***District 186 assesses reading achievement in kindergarten and grade 1 through the Measures of Academic Progress for Primary Grades***

The nationally normed Measures of Academic Progress for Primary Grades is adaptive and appropriate for measuring growth in students’ reading achievement (Northwest Evaluation Association, 2009). The assessment measures three literacy achievement domains: phonological awareness, phonics, and concepts of print.

Students take the assessment by computer and complete it in 20–40 minutes on average; educators are encouraged to give students breaks as needed (Northwest Evaluation Association, 2009). A warm-up assessment is available to help students get accustomed to interacting with a computer. Developers limited the screen interaction functions in the assessment to moving a mouse across the screen and left-clicking. The warm-up application and limited functions help ensure that students without computer experience are able to take the assessment (Northwest Evaluation Association, 2009). District 186 administers the assessment three times a year—in fall, winter, and spring—from kindergarten through grade 2.

Reading scores are generated automatically when a student completes the assessment. The scores are reported as Rasch units. The testing model underlying the Measures of Academic Progress for Primary Grades is a one-parameter item-response theory model, and the Rasch unit scale is a transformation of the Rasch ability estimates. Scores range from 100 to 300. The technical manual for the assessment gives detailed information about the validity and reliability of the assessment (Northwest Evaluation Association, 2009). The Measures of Academic Progress for Primary Grades reading assessment is internally consistent, with Cronbach’s alphas ranging from  $.67$  to  $.93$ . The measure has test–retest correlations ranging from  $r = .71$  to  $r = .87$  and convergent reliability of  $r = .64$  to  $.81$  with similar measures.

## References

- Fountas & Pinnell Literacy. (n.d.). Benchmark Assessment System (BAS). Retrieved December 20, 2019, from <https://www.fountasandpinnell.com/bas/>.
- Fountas, I. C., & Pinnell, G. S. (2007). *Fountas and Pinnell benchmark assessment system 1: Grades K–2, levels A–N*. Heinemann.
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- Northwest Evaluation Association. (2009). *Technical manual for Measures of Academic Progress and Measures of Academic Progress for Primary Grades*. <https://www.richland2.org/RichlandDistrict/media/Richland-District/AdvancED/Standard%205/5.1/5-1-NWEA-Technical-Manual-for-MAP-and-MPG.pdf>.

## Appendix B. Methods

This appendix contains information about the study sample for District U–46 (Elgin Area Schools) and District 186 (Springfield Public Schools) and the methods used for the descriptive analyses.

### *The study sample for District U–46 included 2,703 students in kindergarten and grade 1*

District U–46 only recently began to digitize the data on students’ performance on the Fountas and Pinnell Benchmark Assessment System (Fountas & Pinnell, 2007). As a result, the study team had access to data only on the cohort of students who were in kindergarten in 2016/17 and who transitioned to grade 1 in 2017/18. Thus, the study timeframe included a maximum of four measurement occasions for the 2016/17 cohort of kindergarten students: winter and spring of kindergarten and winter and spring of grade 1. Although students who scored a B or below on the Fountas and Pinnell Benchmark Assessment in spring of kindergarten were tested again in fall of grade 1, these data were excluded from the analyses because only a subset of students was tested. The total sample for the analyses of District U–46 data thus consisted of 2,703 students in kindergarten and grade 1 (table B1), including 2,396 students in winter of kindergarten, 2,420 students in spring of kindergarten, 2,586 students in winter of grade 1, and 2,582 students in spring of grade 1.

**Table B1. Demographic characteristics of grade 1 students in the analytic samples for District U–46 and District 186 in Illinois**

Demographic group	District U–46 (grade 1 in 2017/18)		District 186 (spring of grade 1 in 2019)	
	Sample	Percent	Sample	Percent
Asian students	217	8.03	23	2.48
Black students	153	6.66	404	43.53
Hispanic students	1,540	56.97	35	3.77
White students	698	25.82	332	35.78
Multiracial students	83	3.07	131	14.12
Other race/ethnicity students	12	0.44	3	0.03
Students eligible for the national school lunch program	1,725	63.82	678	73.06
Students not eligible for the national school lunch program	978	36.18	150	16.16
English learner students	1,412	52.24	na	na
Non–English learner students	1,291	47.76	na	na
Students in special education	310	11.47	202	21.77
Students not in special education	2,393	88.53	626	67.46
Female students	1,362	50.39	449	48.38
Male students	1,341	49.61	479	51.62
Total number of students	2,703	100.00	928	100.00

na is not applicable.

Note: The sample for District U–46 represents all grade 1 students enrolled in the 2017/18 school year who took a reading assessment at any time point. The sample for District 186 represents only students enrolled in spring of grade 1 in the 2018/19 school year who took a reading assessment at any time point. Percentages may not sum to 100 because of rounding.

Source: Authors’ analysis of assessment and student records data for 2016/17–2017/18 from District U–46 and for 2017/18–2018/19 from District 186.

Students must meet district-defined criteria to be eligible to take the Fountas and Pinnell Benchmark Assessment (see appendix A). District U–46 allows students to demonstrate proficiency on either the English or the Spanish version of the assessment. If a student passed at least one version of the assessment, the study team included that student’s score in the sample for that time point. (See figure C1 and table C2 in appendix C for supporting information.) All grade 1 students were eligible to take the Fountas and Pinnell Benchmark Assessment in winter and spring.

### ***The study sample for District 186 included 928 students in kindergarten and grade 1***

District 186 began administering the Measures of Academic Progress for Primary Grades to kindergarten students in 2017/18. The study time frame allowed for measurement at six time points: fall, winter, and spring of kindergarten in 2017/18 and fall, winter, and spring of grade 1 in 2018/19. At the teacher’s discretion, a student could take the assessment multiple times in a single testing period. The study team used the score with the largest standard error (when available), the criterion used by the district to select a score when a student had multiple scores. When multiple assessments had the same standard error, the score of the most recent assessment was used in the analysis, following the suggestion of district administrators.

The total sample size for the analyses of District 186 data consisted of 928 students in kindergarten and grade 1 (see table B1). The sample included 927 students in fall of kindergarten, 947 students in winter of kindergarten, 927 students in spring of kindergarten, 930 students in fall of grade 1, 929 students in winter of grade 1, and 928 students in spring of grade 1.

### ***To calculate the percentage of students in District U–46 who met the reading proficiency milestone at each time point, the study team divided the number of students who met the milestone by the number of students with nonmissing assessment scores at each time point***

To address research question 1, the study team calculated the percentage of students in District U–46 who met the reading milestone at each time point. The numerator was the number of students who met the spring of grade 1 reading proficiency milestone (level J) at each time point, and the denominator was the number of students with assessment scores at each time point. The study team conducted supplemental analyses using a stable sample, which included only students for whom reading achievement scores were available at all four time points (see appendix D).

To address research question 2, the study team used binary indicators of membership in the following student demographic groups: Asian, Black, Hispanic, White, multiracial, or other race/ethnicity each relative to another racial/ethnic group; eligible for the national school lunch program or not eligible; English learner student or non–English learner student; in special education or not in special education; and male or female. The “other race/ethnicity” category combined race/ethnicity categories that each represented less than 2 percent of the total number of students in the study. The study team calculated the percentages of students from each demographic group who met the reading proficiency milestone across successive time periods by dividing the number of students in the demographic group who met the spring of grade 1 proficiency milestone (level J) at each time point by the number of students in the demographic group with assessment scores at each time point.

### ***To calculate reading achievement in District 186, the study team computed the average Rasch unit score on the assessment at each time point***

To address research question 1, the study team calculated the average Rasch unit score on the Measures of Academic Progress for Primary Grades (Northwest Evaluation Association, 2009), standard deviation, interquartile range, and range at each time point for students in District 186. The study team conducted supplemental analyses using a stable sample, which included only students with reading achievement scores at all six time points (see appendix D).

To make differences between demographic groups more meaningful for practitioners, the study team reported differences at the last time point (spring of grade 1) as effect sizes (Hedges’  $g$ ) and then translated differences into days of instruction. The study team calculated days of instruction by dividing the difference in means by the mean effect size for annual achievement in reading across seven nationally normed assessments and then multiplying the result by 180 days. For assessment scores from kindergarten, the study team used the mean effect size for annual achievement in reading in kindergarten across seven nationally normed assessments, or 1.52 standard

deviation units. For assessment scores from grade 1, the study team used the mean effect size for annual achievement in reading in grade 1 across seven nationally normed assessments, or .97 standard deviation units.

To answer research question 2, the study team created binary indicators of membership in the following demographic groups: whether a student was Asian, Black, Hispanic, White, multiracial, or other race/ethnicity each relative to another racial/ethnic group; eligible for the national school lunch program or not eligible; in special education or not in special education; and male or female. The “other race/ethnicity” category combined racial/ethnic categories that each represented less than 2 percent of the total number of students in the study. The study team then compared the average Rasch unit scores on the Measures of Academic Progress for Primary Grades across demographic groups.

### **References**

- Fountas, I. C., & Pinnell, G. S. (2007). *Fountas and Pinnell benchmark assessment system 1: Grades K–2, levels A–N*. Heinemann.
- Northwest Evaluation Association. (2009). *Technical manual for Measures of Academic Progress and Measures of Academic Progress for Primary Grades*.

## Appendix C. Supporting analyses

This appendix includes supporting analyses for the report findings. District U–46 (Elgin Area Schools) has different testing procedures for Spanish speaking students and a larger number of English learner students than District 186 (Springfield Public Schools). Therefore, the appendix includes supporting analyses related to Spanish speaking students and English learner students only for District U–46.

Supporting analyses for District U–46 include detailed information by race/ethnicity on the number of students who took the assessment at each time point and the percentage of students who met the spring of grade 1 reading proficiency milestone (level J) at each time point. These analyses also include information on how many students took the English or Spanish version only and how many students took both versions of the assessment at each time point. In addition, the study team calculated the number and percentage of Hispanic students in District U–46 who also were English learner students and Hispanic students who were non–English learner students who met the spring of grade 1 reading proficiency milestone. Finally, the study team examined the percentage of students in District U–46 eligible for the national school lunch program, by race/ethnicity, and the percentage eligible for the program who met the spring of grade 1 proficiency milestone at each time point, by race/ethnicity.

Supporting analyses for District 186 included an examination of average assessment scores of students eligible for the national school lunch program, by race/ethnicity.

### *The percentage of students in District U–46 who met the spring of grade 1 reading proficiency milestone at each time point varied by race/ethnicity*

The main report contains information about the percentage of Asian, Black, and Hispanic students in District U–46 who met the spring of grade 1 reading proficiency milestone by the end of grade 1. Additional detail about students of other races/ethnicities shows that 61 percent of White students, 56 percent of multiracial students, and 36 percent of other race/ethnicity students met the spring of grade 1 reading proficiency milestone by the end of grade 1 (table C1). The starkest contrast in reading proficiency at spring of grade 1 was between Asian students (73 percent) and other race/ethnicity students (36 percent).

**Table C1. Percentage of students in District U–46 in Illinois who met the spring of grade 1 reading proficiency milestone (level J) at each time point, by race/ethnicity and time point, 2016/17–2017/18**

Race/ethnicity and statistic	Kindergarten		Grade 1	
	Winter (n = 2,396)	Spring (n = 2,420)	Winter (n = 2,586)	Spring (n = 2,582)
<b>Asian students</b>				
Number of students who took the assessment	178	184	204	194
Number of students who met the proficiency milestone	5	23	85	141
Percent of students who met the proficiency milestone	2.81	12.50	41.67	72.68
<b>Black students</b>				
Number of students who took the assessment	115	117	141	147
Number of students who met the proficiency milestone	0	5	19	55
Percent of students who met the proficiency milestone	0.00	4.27	13.48	37.41
<b>Hispanic students</b>				
Number of students who took the assessment	1,391	1,404	1,484	1,484
Number of students who met the proficiency milestone	1	18	196	815
Percent of students who met the proficiency milestone	0.07	1.28	13.21	54.92
<b>White students</b>				
Number of students who took the assessment	626	627	670	666
Number of students who met the proficiency milestone	8	50	181	408
Percent of students who met the proficiency milestone	1.28	7.97	27.01	61.26
<b>Multiracial students</b>				
Number of students who took the assessment	75	76	76	80
Number of students who met the proficiency milestone	1	2	17	45
Percent of students who met the proficiency milestone	1.33	2.63	22.37	56.25
<b>Other race/ethnicity students</b>				
Number of students who took the assessment	11	12	11	11
Number of students who met the proficiency milestone	1	1	2	4
Percent of students who met the proficiency milestone	9.09	8.33	18.18	36.36

Note: Students could meet the milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System. The samples consisted of all students who took a reading assessment at any time point.

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

### ***Students in District U–46 took the English, Spanish, or both versions of the Fountas and Pinnell Benchmark Assessment System***

The study team calculated the number of students in District U–46 who took only the English version, only the Spanish version, or both versions of the Fountas and Pinnell Benchmark Assessment System (table C2). The number of students who took only the English version increased across winter of kindergarten and spring of grade 1, as did the number of students who took both versions. The number of students who took only the Spanish version declined over the same period. Of the 1,088 students who took only the Spanish version in winter of kindergarten, a majority took the English version by spring of grade 1 (929 students took both versions and 25 students took only the English version, for a total of 954 students who completed the English version; figure C1).



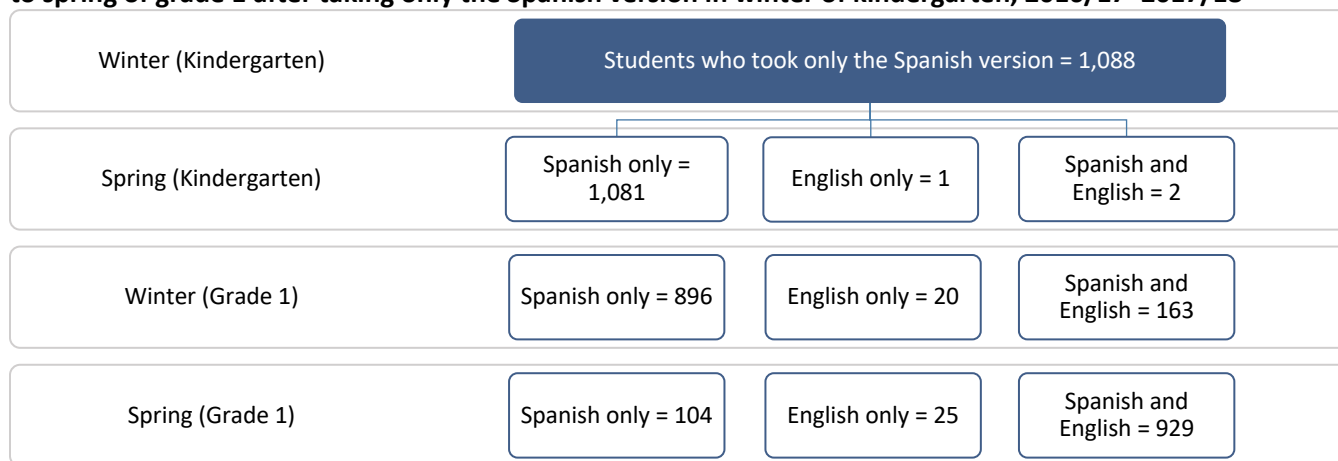
**Table C2. Number of students in District U–46 in Illinois who took only the English version of the Fountas and Pinnell Benchmark Assessment System, only the Spanish version, or both, at each time point, 2016/17–2017/18**

Assessment version	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
English only	1,300	1,320	1,423	1,425
Spanish only	1,088	1,097	985	138
Both English and Spanish	8	3	178	1,019

Note: The samples consist of any students who took a reading assessment at any time point.

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

**Figure C1. Number of students in District U–46 in Illinois who took only the Spanish version of the Fountas and Pinnell Benchmark Assessment System, only the English version, or both versions from spring of kindergarten to spring of grade 1 after taking only the Spanish version in winter of kindergarten, 2016/17–2017/18**



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

***A smaller percentage of Hispanic students in District U–46 who were English learner students than of Hispanic students who were not English learner students met the spring of grade 1 reading proficiency milestone***

Because District U–46 had a high percentage of Hispanic students (57 percent)—not all of whom were English learner students—the study team conducted additional analyses to determine whether the percentage of Hispanic students who met the spring of grade 1 reading proficiency milestone (level J) by the end of grade 1 varied by English learner status. A smaller percentage of Hispanic students who were English learner students (54 percent) than of Hispanic students who were not English learner students (59 percent) met the reading proficiency milestone by the end of grade 1 (table C3).

**Table C3. Number and percentage of Hispanic students who met the spring of grade 1 reading proficiency milestone (level J) in District U–46 in Illinois, by English learner status and time point, 2016/17–2017/18**

English learner status and statistic	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
<b>Hispanic English learner student</b>				
Number of students who took the assessment	1,099	1,113	1,175	1,175
Number of students who met the proficiency milestone	0	7	129	632
Percent of students who met the proficiency milestone	0.00	0.63	10.98	53.79
<b>Hispanic non–English learner student</b>				
Number of students who took the assessment	292	291	309	309
Number of students who met the proficiency milestone	1	11	67	183

English learner status and statistic	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
Percent of students who met the proficiency milestone	0.34	3.78	21.68	59.22

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 consisted of students who took a reading assessment at any time point.

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

### ***The percentage of students in District U–46 who were eligible for the national school lunch program who met the reading proficiency milestone varied by race/ethnicity***

The study team compared the results for students who were eligible for the national school lunch program and those who were not eligible for the program by racial/ethnic group. National school lunch program eligibility is an indicator of socioeconomic disadvantage. A higher percentage of Black and Hispanic students were eligible for the national school lunch program than of Asian and White students (table C4). The study team performed these supplementary analyses to determine whether the results varied by student race/ethnicity when students with similar socioeconomic disadvantage were compared and thus whether racial/ethnic disparities in reading proficiency existed even after socioeconomic disadvantage was accounted for.

**Table C4. Demographic characteristics of students eligible for the national school lunch program in District U–46 in Illinois, 2016/17–2017/18**

Student racial/ethnic group	Total students	Students eligible for the national school lunch program	
	Number	Number	Percent
Asian students	217	60	27.65
Black students	153	129	84.31
Hispanic students	1,540	1,283	83.31
White students	698	215	30.80
Multiracial students	83	32	38.55
Other race/ethnicity students <sup>a</sup>	12	6	50.00
Total number of students	2,703	1,725	63.82

a. Students who identified as a race/ethnicity that made up less than 2 percent of the population were combined into the other race category.

Note: Percentages represent students by racial/ethnic group as a proportion of the district's total number of students in the sample across the two years. The sample consisted of students who took a reading assessment at any time point.

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

Among students eligible for the national school lunch program, Black students were less likely than students of the other racial/ethnic groups to meet the spring of grade 1 reading proficiency milestone (level J) by the end of grade 1: 35 percent of Black students met the milestone compared with 54 percent of Hispanic students and 49 percent of White students (table C5).

**Table C5. Percentage of students in District U–46 in Illinois eligible for the national school lunch program who met the spring of grade 1 reading proficiency milestone (level J) at each time point, by race/ethnicity, 2016/17–2017/18**

Student racial/ethnic group and statistic	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
<b>Asian students</b>				
Number of students who took the assessment	49	52	56	53
Number of students who met the proficiency milestone	0	0	18	36
Percent of students who met the proficiency milestone	0.00	0.00	32.14	67.92
<b>Black students</b>				
Number of students who took the assessment	97	99	120	125
Number of students who met the proficiency milestone	0	3	12	44
Percent of students who met the proficiency milestone	0.00	3.03	10.01	35.20
<b>Hispanic students</b>				
Number of students who took the assessment	1,159	1,171	1,240	1,238
Number of students who met the proficiency milestone	0	12	152	673
Percent of students who met the proficiency milestone	0.00	1.02	12.29	54.36
<b>White students</b>				
Number of students who took the assessment	190	190	198	199
Number of students who met the proficiency milestone	0	5	38	97
Percent of students who met the proficiency milestone	0.00	2.63	19.19	48.74
<b>Multiracial students</b>				
Number of students who took the assessment	25	26	29	32
Number of students who met the proficiency milestone	0	0	2	13
Percent of students who met the proficiency milestone	0.00	0.00	6.90	40.63
<b>Other race/ethnicity students</b>				
Number of students who took the assessment	5	6	6	6
Number of students who met the proficiency milestone	a	a	a	a
Percent of students who met the proficiency milestone	a	a	a	a

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 consisted of students who took a reading assessment at any time point.

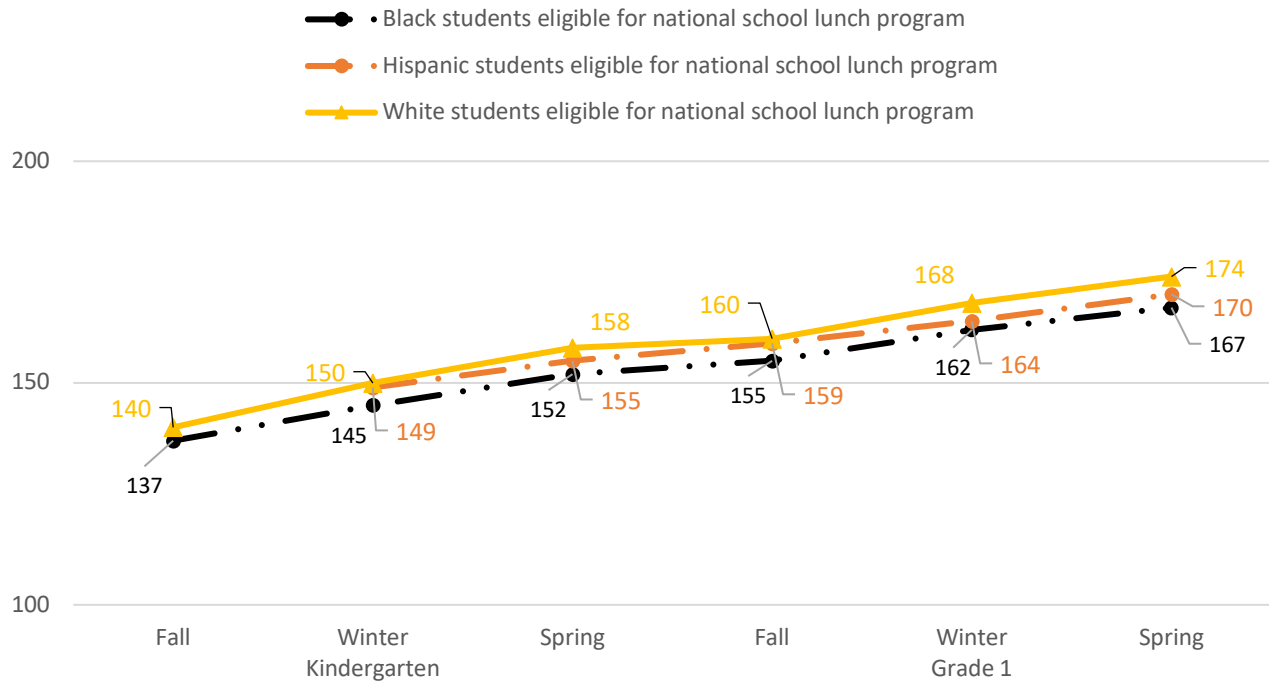
a. The data in these cells have been suppressed because there were fewer than 10 students in each cell.

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

### ***In District 186 student demographic groups varied in their average Rasch unit score on the Measures of Academic Progress for Primary Grades***

Among students in District 186 who were eligible for the national school lunch program, White students had higher average Rasch unit scores on the Measures of Academic Progress for Primary Grades throughout the study period than Black students did (figure C2). The difference between the average scores of White students eligible for the national school lunch program and Black students eligible for the program in spring of grade 1 was 0.49 standard deviation units (equivalent to 88 days of instruction). The sample sizes for some demographic groups at some time points were very small, so the findings should be interpreted with caution.

**Figure C2. Among students in District 186 in Illinois who were eligible for the national school lunch program, White and Hispanic students had slightly higher average scores than did Black students, 2017/18–2018/19**  
*Average Rasch unit score on the Measures of Academic Progress for Primary Grades*



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 were eligible for a reading assessment at any time point and were eligible for the national school lunch program: 184 Black students and 131 White students in fall of kindergarten; 366 Black students, 17 Hispanic students, and 215 White students in winter of kindergarten; 352 Black students, 20 Hispanic students, and 209 White students in spring of kindergarten; 311 Black students, 13 Hispanic students, and 153 White students in fall of grade 1; 351 Black students, 26 Hispanic students, and 183 White students in winter of grade 1; 354 Black students, 24 Hispanic students, and 189 White students in spring of grade 1. Findings for Asian students at all time points and for Hispanic students in fall of kindergarten are suppressed because there were fewer than 10 students at each time point.

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

## Appendix D. Other analyses

This appendix compares results between the full sample (students who had assessment scores at any time point) and the stable sample, the subset of students in District U–46 (Elgin Area Schools) and District 186 (Springfield Public Schools) who had assessment scores at all time points. By performing sensitivity analyses with analytic samples that remain stable across time, the study team was able to determine whether increases in reading achievement for a cohort reflected actual changes in student reading achievement rather than changes in the cohort composition resulting from student mobility. The findings for the samples in both districts were similar, indicating that results were not due to changes in the composition of the cohorts across time.

The stable sample for each district was similar to the full sample, which included all students who had assessment scores at any time point. In District U–46 there were 2,703 students in the full sample and 2,261 students in the stable sample. In District 186 there were 928 students in the full sample and 731 students in the stable sample.

### *In District U–46 differences between the full sample and stable sample were small*

The percentages of students in the full sample who met the spring of grade 1 reading proficiency milestone (level J) were similar to the percentages of students in the stable sample who met the milestone, both overall and for each subgroup analysis. The largest difference between the two samples was in spring of grade 1, when 57 percent of students in the full sample met the spring of grade 1 proficiency milestone compared with 60 percent of students in the stable sample (table D1).

**Table D1. Percentage of students in District U–46 in Illinois who met the spring of grade 1 reading proficiency milestone (level J), by full sample and stable sample and time point, 2016/17–2017/18**

Statistics and sample	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
<b>Number of students who took the assessment</b>				
Full sample	2,396	2,420	2,586	2,582
Stable sample	2,261	2,261	2,261	2,261
<b>Number of students who met the proficiency milestone</b>				
Full sample	16	99	500	1,468
Stable sample	16	95	448	1,333
<b>Percentage of students who met the proficiency milestone</b>				
Full sample	0.67	4.09	19.33	56.86
Stable sample	0.71	4.20	19.81	59.96

Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points. Students could meet the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System.

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

The percentages of students who met the proficiency milestone by student demographic groups was similar for the full and stable samples. For English learner and non–English learner students in District U–46, the largest difference between the two samples was in spring of grade 1 for English learner students, when 53 percent of English learner students in the full sample met the proficiency milestone compared with 56 percent of English learner students in the stable sample (table D2).

**Table D2. Number and percentage of English learner students and of non–English learner students in District U–46 in Illinois who met the spring of grade 1 reading proficiency milestone (level J), by full sample and stable sample and time point, 2016/17–2017/18**

English learner student status, statistic, and sample	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
<b>English learner students</b>				
<i>Number of students who took the assessment</i>				
Full sample	1,255	1,277	1,360	1,345
Stable sample	1,195	1,195	1,195	1,195
<i>Number of students who met the proficiency milestone</i>				
Full sample	0	9	158	715
Stable sample	0	8	141	667
<i>Percent of students who met the proficiency milestone</i>				
Full sample	0.00	0.70	11.62	53.16
Stable sample	0.00	0.67	11.80	55.82
<b>Non–English learner students</b>				
<i>Number of students who took the assessment</i>				
Full sample	1,141	1,143	1,226	1,237
Stable sample	1,066	1,066	1,066	1,066
<i>Number of students who met the proficiency milestone</i>				
Full sample	16	90	342	753
Stable sample	16	87	307	666
<i>Percent of students who met the proficiency milestone</i>				
Full sample	1.40	7.87	27.90	60.87
Stable sample	1.50	8.16	28.80	62.48

Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points. Students could meet the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System.

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

For students in special education and students not in special education in District U–46, the largest difference between the two samples was in spring of grade 1 for students who were not in special education. At that time point 60 percent of students who were not in special education in the full sample met the proficiency milestone compared with 63 percent of students who were not in special education in the stable sample (table D3).

**Table D3. Number and percentage of students in special education and not in special education in District U–46 in Illinois who met the spring of grade 1 reading proficiency milestone (level J), by full sample and stable sample and time point, 2016/17–2017/18**

Special education status, statistic, and sample	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
<b>Students in special education</b>				
<i>Number of students who took the assessment</i>				
Full sample	268	274	272	270
Stable sample	243	243	243	243
<i>Number of students who met the proficiency milestone</i>				
Full sample	1	6	22	75
Stable sample	1	6	20	71
<i>Percent of students who met the proficiency milestone</i>				
Full sample	0.37	2.19	8.09	27.78
Stable sample	0.41	2.47	8.23	29.22
<b>Students not in special education</b>				
<i>Number of students who took the assessment</i>				
Full sample	2,128	2,146	2,314	2,312
Stable sample	2,018	2,018	2,018	2,018
<i>Number of students who met the proficiency milestone</i>				
Full sample	15	93	478	1,393
Stable sample	15	89	428	1,262
<i>Percent of students who met the proficiency milestone</i>				
Full sample	0.70	4.33	20.67	60.25
Stable sample	0.74	4.41	21.21	62.54

Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points. Students could meet the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System.

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

The percentages of students who met the proficiency milestone were also similar in the full and stable samples in District U-46 for students who were eligible for the national school lunch program and for students who were not eligible. The largest difference between the two samples was in spring of grade 1. At that time point 52 percent of students who were eligible for the national school lunch program in the full sample met the proficiency milestone compared with 55 percent of students who were eligible for the national school lunch program in the stable sample (table D4).

**Table D4. Number and percentage of students in District U–46 in Illinois eligible for the national school lunch program and not eligible for the program who met the spring of grade 1 reading proficiency milestone (level J), by full sample and stable sample and time point, 2016/17–2017/18**

National school lunch program status, statistic, and sample	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
<b>Students eligible for the national school lunch program</b>				
<i>Number of students who took the assessment</i>				
Full sample	1,525	1,524	1,426	1,653
Stable sample	1,439	1,439	1,439	1,439
<i>Number of students who met the proficiency milestone</i>				
Full sample	0	20	223	866
Stable sample	0	18	203	789
<i>Percent of students who met the proficiency milestone</i>				
Full sample	0.00	1.30	13.52	52.39
Stable sample	0.00	1.25	14.11	54.83
<b>Students not eligible for the national school lunch program</b>				
<i>Number of students who took the assessment</i>				
Full sample	871	876	937	929
Stable sample	806	822	822	822
<i>Number of students who met the proficiency milestone</i>				
Full sample	16	79	277	602
Stable sample	16	77	245	544
<i>Percent of students who met the proficiency milestone</i>				
Full sample	1.84	9.02	29.56	64.80
Stable sample	1.95	9.37	29.81	66.18

Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points. Students could meet the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System.

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

The percentages of students who met the proficiency milestone by racial/ethnic group in District U-46 were also similar in the full and stable samples. The largest difference in the percentage of students meeting the reading proficiency milestone between the two samples was for Asian students in winter of grade 1, when 42 percent of Asian students in the full sample met the proficiency milestone compared with 44 percent of Asian students in the stable sample (table D5 and figure D1).



**Table D5. Percentage of students in District U–46 in Illinois who met the spring of grade 1 reading proficiency milestone (level J), by student race/ethnicity, full sample and stable sample, and time point 2016/17–2017/18**

Student race/ethnicity, statistic, and sample	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
<b>Asian students</b>				
<i>Number of students who took the assessment</i>				
Full sample	178	184	204	194
Stable sample	160	160	160	160
<i>Number of students who met the proficiency milestone</i>				
Full sample	5	23	85	141
Stable sample	5	22	71	120
<i>Percent of students who met the proficiency milestone</i>				
Full sample	2.78	12.50	41.67	72.68
Stable sample	3.13	13.75	44.38	75.00
<b>Black students</b>				
<i>Number of students who took the assessment</i>				
Full sample	115	117	141	147
Stable sample	106	106	106	106
<i>Number of students who met the proficiency milestone</i>				
Full sample	0	5	19	55
Stable sample	0	5	13	40
<i>Percent of students who met the proficiency milestone</i>				
Full sample	0.00	4.27	13.48	37.41
Stable sample	0.00	4.72	12.26	37.74
<b>Hispanic students</b>				
<i>Number of students who took the assessment</i>				
Full sample	1,391	1,404	1,484	1,484
Stable sample	1,330	1,330	1,330	1,330
<i>Number of students who met the proficiency milestone</i>				
Full sample	1	18	196	815
Stable sample	1	17	182	759
<i>Percent of students who met the proficiency milestone</i>				
Full sample	0.07	1.28	13.21	54.92
Stable sample	0.08	1.28	13.68	57.07
<b>White students</b>				
<i>Number of students who took the assessment</i>				
Full sample	626	627	670	666
Stable sample	587	587	587	587
<i>Number of students who met the proficiency milestone</i>				
Full sample	8	50	181	408
Stable sample	8	48	164	371
<i>Percent of students who met the proficiency milestone</i>				
Full sample	1.28	7.97	27.01	61.26
Stable sample	1.36	8.18	27.94	63.20

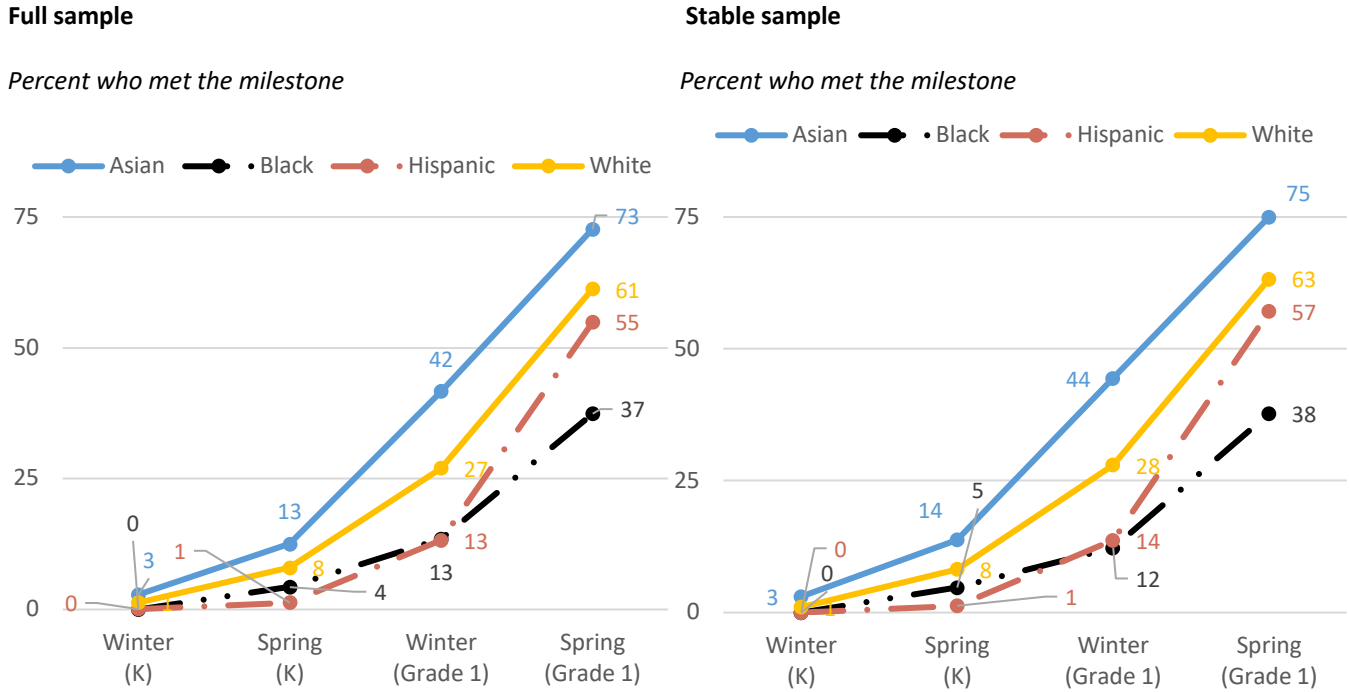
Student race/ethnicity, statistic, and sample	Kindergarten		Grade 1	
	Winter	Spring	Winter	Spring
<b>Multiracial students</b>				
<i>Number of students who took the assessment</i>				
Full sample	75	76	76	80
Stable sample	68	68	68	68
<i>Number of students who met the proficiency milestone</i>				
Full sample	1	2	17	45
Stable sample	1	2	16	39
<i>Percent of students who met the proficiency milestone</i>				
Full sample	1.33	2.63	22.37	56.25
Stable sample	1.47	2.94	23.53	57.35
<b>Other race/ethnicity students</b>				
<i>Number of students who took the assessment</i>				
Full sample	11	12	10	11
Stable sample	5	5	5	5
<i>Number of students who met the proficiency milestone</i>				
Full sample	1	1	1	2
Stable sample	a	a	a	a
<i>Percent of students who met the proficiency milestone</i>				
Full sample	9.09	8.33	10.00	18.18
Stable sample	a	a	a	a

Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points. Students could meet the proficiency milestone in either the English or the Spanish version of the Fountas and Pinnell Benchmark Assessment System.

a. The data in these cells have been suppressed because there were fewer than 10 students in each cell.

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

**Figure D1. The percentages of students in each racial/ethnic group in District U-46 in Illinois who met the spring of grade 1 reading proficiency milestone (level J) at each time point were similar for the full sample and the stable sample, 2016/17–2017/18**



Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points. Students could reach the proficiency milestone in either the English or Spanish version of the Fountas and Pinnell Benchmark Assessment System. The full sample consisted of 2,703 students in 40 schools. In winter of kindergarten the sample included 178 Asian students, 115 Black students, 1,391 Hispanic students, and 626 White students. In spring of kindergarten, the sample included 184 Asian students, 117 Black students, 1,404 Hispanic students, and 627 White students. In winter of grade 1 the sample included 204 Asian students, 141 Black students, 1,484 Hispanic students, and 670 White students. In spring of grade 1 the sample included 194 Asian students, 147 Black students, 1,484 Hispanic students, and 666 White students. The stable sample consisted of 160 Asian students, 106 Black students, 1,330 Hispanic students, and 587 White students. Source: Authors' analysis using assessment and student records data for 2016/17–2017/18 from District U-46.

**In District 186 differences between the full sample and the stable sample were also small**

Students in District 186 in the full sample and in the stable sample had nearly identical average Rasch unit scores on the Measures of Academic Progress for Primary Grades at each time point. The largest difference between the two samples was in winter of kindergarten, when the average scores were 149 for the full sample and 151 for the stable sample (table D6).

Scores by student demographic groups were also similar for the stable sample and the full sample.

For students in special education and students not in special education, average Rasch unit scores were similar for the two samples at each time point (table D7).

**Table D6. Descriptive statistics for students in District 186 in Illinois for average Rasch unit score on the Measures of Academic Progress for Primary Grades, by full sample and stable sample and by time point, 2017/18–2018/19**

Statistic and sample	Kindergarten			Grade 1		
	Fall	Winter	Spring	Fall	Winter	Spring
<b>Average Rasch unit score</b>						
Full sample	140	149	157	160	169	174
Stable sample	141	151	158	161	169	174
<b>Standard deviation of Rasch unit score</b>						
Full sample	10	12	14	14	16	16
Stable sample	10	12	14	14	15	16
<b>Number of students who took the assessment</b>						
Full sample	927	947	927	930	929	928
Stable sample	731	731	731	731	731	731

Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points.

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

**Table D7. Descriptive statistics for students' average Rasch unit score on the Measures of Academic Progress for Primary Grades in District 186 in Illinois, by students' special education status and by full sample and stable sample and by time point, 2017/18–2018/19**

Special education status, statistic, and sample	Kindergarten			Grade 1		
	Fall	Winter	Spring	Fall	Winter	Spring
<b>Students in special education</b>						
<i>Average Rasch unit score</i>						
Full sample	138	146	153	155	161	165
Stable sample	138	147	154	156	162	167
<i>Standard deviation of Rasch unit score</i>						
Full sample	10	11	14	15	16	17
Stable sample	10	12	13	14	16	17
<i>Number of students who took the assessment</i>						
Full sample	173	190	188	181	184	202
Stable sample	138	151	148	154	156	174
<b>Students not in special education</b>						
<i>Average Rasch unit score</i>						
Full sample	140	149	157	159	168	174
Stable sample	140	151	158	160	168	174
<i>Standard deviation of Rasch unit score</i>						
Full sample	9	11	13	12	14	15
Stable sample	9	11	13	12	14	14
<i>Number of students who took the assessment</i>						
Full sample	631	687	670	629	639	626
Stable sample	492	518	519	493	498	484

Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points.

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

For students eligible for the national school lunch program and students not eligible, the largest difference between the two samples was 1 point, with the full sample lower. For example, students eligible for the national school lunch program in fall of kindergarten had an average Rasch unit score of 138 in the full sample and 139 in the stable sample (table D8).

**Table D8. Descriptive statistics for students' average Rasch unit score on the Measures of Academic Progress for Primary Grades in District 186 in Illinois, by eligibility for the national school lunch program and by full sample and stable sample and by time point, 2017/18–2018/19**

National school lunch program eligibility, statistic, and sample	Kindergarten			Grade 1		
	Fall	Winter	Spring	Fall	Winter	Spring
<b>Students eligible for the national school lunch program</b>						
<i>Average Rasch unit score</i>						
Full sample	138	147	154	157	165	170
Stable sample	139	148	155	157	165	170
<i>Standard deviation of Rasch unit score</i>						
Full sample	8	11	12	12	14	15
Stable sample	8	11	12	12	14	14
<i>Number of students who took the assessment</i>						
Full sample	393	722	703	568	674	678
Stable sample	314	538	539	469	532	533
<b>Students not eligible for the national school lunch program</b>						
<i>Average Rasch unit score</i>						
Full sample	140	154	162	161	173	178
Stable sample	141	155	163	163	173	179
<i>Standard deviation of Rasch unit score</i>						
Full sample	10	12	15	14	16	18
Stable sample	10	11	16	13	15	16
<i>Number of students who took the assessment</i>						
Full sample	411	155	155	242	149	150
Stable sample	316	129	130	178	122	125

Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points.

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

For the racial/ethnic groups most average scores were the same or differed by just 1–2 points between the two samples (table D9). The largest difference was for Asian students in fall of grade 1, when average Rasch unit scores were 175 in the full sample and 170 in the stable sample.

**Table D9. Descriptive statistics for students' average Rasch unit score on the Measures of Academic Progress for Primary Grades in District 186 in Illinois, by racial/ethnic group, full sample and stable sample, and time point, 2017/18–2018/19**

Student race/ethnicity, statistic, and sample	Kindergarten			Grade 1		
	Fall	Winter	Spring	Fall	Winter	Spring
<b>Asian students</b>						
<i>Average Rasch unit score</i>						
Full sample	147	162	163	175	180	188
Stable sample	148	165	167	170	176	185
<i>Standard deviation of Rasch unit score</i>						
Full sample	13	15	19	13	18	17
Stable sample	14	14	21	14	18	17
<i>Number of students who took the assessment</i>						
Full sample	14	13	15	24	24	23
Stable sample	11	11	11	11	11	11

Student race/ethnicity, statistic, and sample	Kindergarten			Grade 1		
	Fall	Winter	Spring	Fall	Winter	Spring
<b>Black students</b>						
<i>Average Rasch unit score</i>						
Full sample	137	145	153	156	164	168
Stable sample	138	146	154	156	164	168
<i>Standard deviation of Rasch unit score</i>						
Full sample	9	11	13	13	14	14
Stable sample	9	11	13	13	14	14
<i>Number of students who took the assessment</i>						
Full sample	401	413	400	406	403	404
Stable sample	315	315	326	325	325	325
<b>Hispanic students</b>						
<i>Average Rasch unit score</i>						
Full sample	142	150	158	161	168	173
Stable sample	142	151	160	162	169	175
<i>Standard deviation of Rasch unit score</i>						
Full sample	10	11	14	16	18	19
Stable sample	11	11	15	15	18	18
<i>Number of students who took the assessment</i>						
Full sample	29	29	32	33	36	35
Stable sample	24	24	24	20	20	20
<b>White students</b>						
<i>Average Rasch unit score</i>						
Full sample	143	153	162	165	173	179
Stable sample	144	155	163	166	174	180
<i>Standard deviation of Rasch unit score</i>						
Full sample	9	12	14	14	16	17
Stable sample	9	11	15	13	16	15
<i>Number of students who took the assessment</i>						
Full sample	341	351	341	333	329	332
Stable sample	269	269	269	267	267	267
<b>Multiracial students</b>						
<i>Average Rasch unit score</i>						
Full sample	139	150	157	161	171	176
Stable sample	140	152	159	162	172	177
<i>Standard deviation of Rasch unit score</i>						
Full sample	10	11	13	15	15	16
Stable sample	10	10	12	14	14	15
<i>Number of students who took the assessment</i>						
Full sample	140	139	137	131	134	131
Stable sample	110	110	110	105	106	106

Note: The full sample includes students who had assessment scores at any time point, and the stable sample includes the subset of students who had scores at all time points.

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