

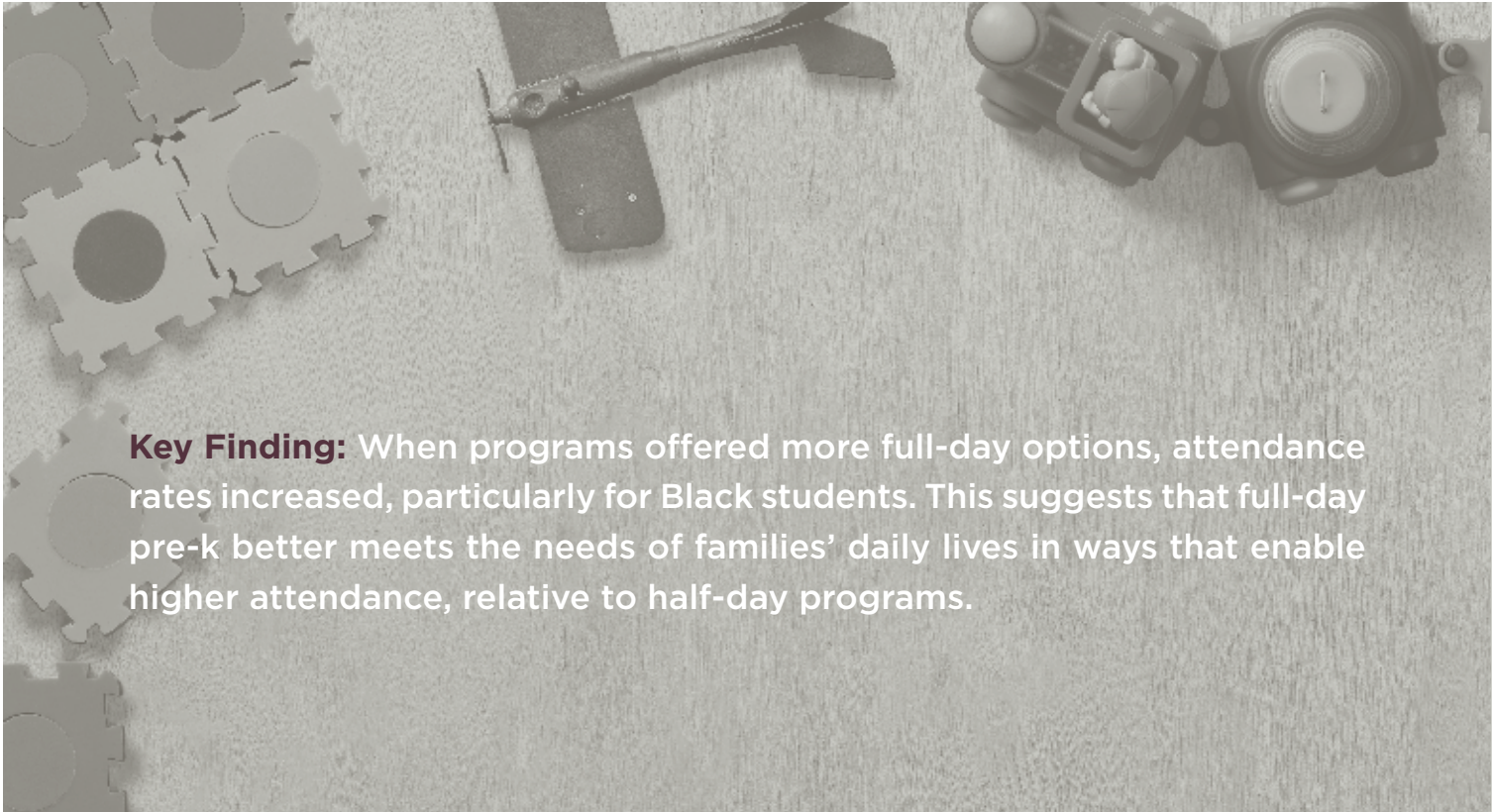
RESEARCH SUMMARY FEBRUARY 2022

Meeting Families' Needs

Attendance Rates in Full-Day vs. Half-Day Pre-K



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Key Finding: When programs offered more full-day options, attendance rates increased, particularly for Black students. This suggests that full-day pre-k better meets the needs of families' daily lives in ways that enable higher attendance, relative to half-day programs.

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Introduction

Young children benefit from participating in pre-kindergarten (pre-k). Evidence of the short- and long-term benefits of pre-k is so compelling¹ that K-12 districts, state education departments, and even federal officials, including Presidents Barack Obama and Joe Biden, have considered offering universal pre-k at no cost to children and families. In Chicago, a plan published in March 2019 aimed to provide free pre-k for all Chicago four-year-olds, regardless of income, by the fall of 2021.²

But while support for and enrollment rates in pre-k have increased, attendance rates among students enrolled in pre-k are lower than attendance rates in other elementary grades.³ This is true in Chicago and in the few other places where pre-k attendance has been publicly reported.⁴ Regular attendance for these youngest students matters. Lower pre-k attendance rates are linked to lower learning gains in pre-k, lower kindergarten readiness, lower likelihoods of reading at grade level in second grade, higher likelihoods of being retained within a grade, and higher likelihoods of leaving school before age 15.⁵ And attendance is most important for students who stand to gain the most: The strongest link between pre-k attendance and academic gains is for students with the lowest incoming skills.⁶

Why are pre-k students absent? While illness is a leading cause, logistical issues also pose challenges to

families. Interviews with families suggest logistical challenges are greater for families in half-day programs.⁷ For example, it can be difficult to pick students up in the middle of the day when parents are working. In addition, when a student is enrolled in a half-day program, families may be less inclined or able to spend limited resources and energy solving childcare issues, work schedule conflicts, transportation problems, a sick sibling, or other family commitments for a few hours of instruction. While finding babysitters, gas, or bus fare can be minor challenges for some families, they may be prohibitive for others.

Prior research has shown associations between full-day pre-k programs and growth in academic skills, relative to half-day pre-k,⁸ but did not examine student attendance. Other studies have shown stronger attendance in full-day programs than half-day programs, but those studies could not determine whether switching programs from half-day to full-day would result in higher attendance rates.⁹ The relationship could exist because of differences in who chooses full-day vs. half-day programs, rather than because full-day programs support stronger attendance. Recent policy changes in Chicago offered the opportunity to evaluate the relationship between the length of the pre-k day and attendance rates more rigorously than prior research.

1 Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey (2001); Heckman (2011); Reynolds et al. (2007); Schweinhart, Montie, Xiang, Barnett, Belfield, & Nores (2005); Phillips et al. (2017); Weiland & Yoshikawa (2013); de la Torre, Freire, & Blanchard (2021).

2 See Chicago's Roadmap for Implementing Universal Pre-K for details. The plan is behind schedule, but as of January 2022, the CPS pre-k website reported a goal of offering free universal pre-k to all interested four-year-old students and families by fall 2022: <https://www.cps.edu/schools/grade-levels-served/pre-k/>

3 In 2019, CPS pre-k attendance rates were 89 percent, while attendance rates in grades 1-8 were between 94-96 percent (based on district data available at <https://www.cps.edu/about/district-data/metrics/>).

4 Connolly & Olson (2012); Dubay & Holla (2016); Ehrlich et al. (2014).

5 Berlinski, Galiani, & Manacorda (2008); Connolly & Olson (2012); Ehrlich et al. (2014); Ready (2010); Taylor, Gibbs, & Slate (2000).

6 Ehrlich, Gwynne & Allensworth (2018).

7 Ehrlich et al. (2014); Susman-Stillman, Storm, & Bailey (2018).

8 Atteberry, Bassok, & Wong (2019); Robin, Frede, & Barnett (2007).

9 Reynolds et al. (2014).

Studying Chicago's Expansion of Full-Day Pre-K

We studied two initiatives that increased the availability of full-day pre-k in Chicago Public Schools (CPS) to examine changes in attendance rates that occurred when students enrolled in full-day, rather than half-day, pre-k programs:

Study 1: CPS-Wide Full-Day Pre-K Expansion

In 2014, Illinois was the recipient of a federally-funded Pre-K Development Grant-Expansion, which increased state investment in full-day pre-k for four-year-old children. This grant, in addition to other investments by the city, expanded the number of full-day pre-k options for children in Chicago. New full-day pre-k classrooms were opened: **1)** in neighborhoods with many student groups the district prioritized to improve equitable enrollment—neighborhoods with a history of under-enrollment in public pre-k that served large numbers of Black and Latinx students, and neighborhoods with lower income and higher unemployment¹⁰—and **2)** where elementary schools had available space to offer full-day programs. Enrollment in CPS full-day pre-k increased more than threefold in three years, from roughly 1,700 students in 2012–13 to more than 6,000 students in 2015–16. Consortium researchers examined changes over time in full-day vs. half-day pre-k student enrollment, and whether attendance rates changed as full-day pre-k enrollment increased.

Study 2: The North Lawndale Cluster Initiative

Beginning in the 2013–14 school year, four elementary schools run by the Academy of Urban School Leadership in the North Lawndale area of Chicago received funding to transition their half-day pre-k to full-day pre-k programs as one part of an effort called the North Lawndale Cluster Initiative (NLCI).¹¹ The NLCI included supports for schools at all grade levels, but the largest share of funding went to the expansion of pre-k programs from half-day to full-day programs. An NLCI study examined changes in an array of outcomes, but it was pre-k attendance where the most consistently significant effects were found. Consortium researchers analyzed changes over time in student attendance using a propensity-score matching strategy, comparing schools that had the same characteristics as the NLCI schools in years prior to the initiative. There was baseline equivalence between the NLCI schools and comparison schools on pre-k attendance and on all other outcomes, which suggests changes in outcomes were not due to selection, but to changes in the programs themselves. The four schools primarily served Black families in the North Lawndale area of the city, and were a subset of the students included in the district-wide study also described in this research summary (study 1).

More details on both of these studies are included in the **Appendix on p.9**.

¹⁰ Ehrlich et al. (2020).

¹¹ Allensworth & Zou (2020).

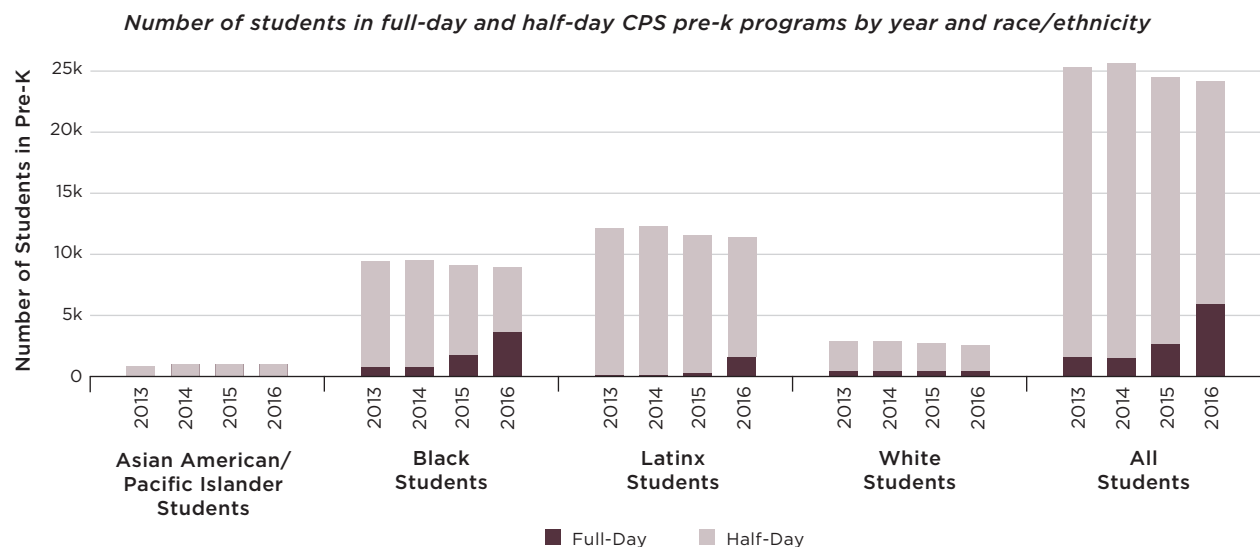
Key Findings

Study 1: District-wide, more CPS students enrolled in full-day pre-k programs from 2012-13 through 2015-16, while enrollment in half-day pre-k declined.

Full-Day Pre-K Enrollment Increased, Especially Among Black Students (see Figure 1).

- There were increases in enrollment in full-day programs among students of all races/ethnicities, but the changes were largest among Black students.
- Black students’ enrollment more than quadrupled and nearly 3,000 more students enrolled in full-day programs (3,721 students in 2015-16 vs. 871 students in 2012-13).
- Latinx students’ enrollment nearly tripled and approximately 1,000 more students enrolled in full-day programs (1,562 students in 2015-16 vs. 536 students in 2012-13).¹²
- The vast majority of students remained in half-day programs. There was also a slight decrease in the total number of pre-k students—shifting from half-day programs to a full-day program inherently reduces overall enrollment unless more teachers and classes are added.

FIGURE 1
Enrollment in Full-Day Pre-K Increased While Enrollment in Half-Day Pre-K Decreased, Especially Among Black Students



Note: Years listed are the spring of each academic year; for example, “2016” refers to the 2015-16 school year. Race/ethnicity categories are shown for groups that represented at least 1 percent of the pre-k population in these years, based on administrative records. Race/ethnicity categories not shown due to small group sizes include: Native American/Alaskan Native, multiracial, and students whose race/ethnicity was not available. Our Asian American/Pacific Islander category combines three CPS data categories—Asian, Pacific Islander/Hawaiian and Asian/Pacific Islander categories—due to the small number of students in the latter two categories.

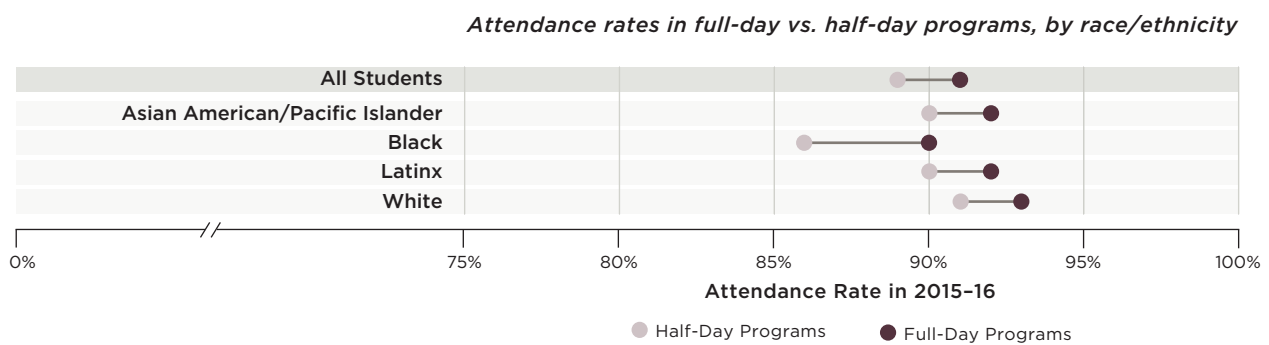
¹² We acknowledge that the race/ethnicity categories available in our data do not accurately reflect the full spectrum of races and ethnicities embodied by CPS students, conflate the two separate constructs of race and ethnicity, and mask diversity within racial groups. While we do not intend to define students

based on their race/ethnicity category, we recognize that race and ethnicity are significant lenses through which our society understands and influences peoples’ experiences, and therefore can provide important insights in our analysis.

Attendance Rates Were Higher in Full-Day Pre-K Than Half-Day Pre-K Programs

- Across all years of the study, students in CPS full-day programs had significantly higher attendance rates than students in half-day programs (see Figure 2). Attendance rates at full-day programs remained higher than half-day programs, even as more students in groups that historically had lower attendance rates enrolled in full-day instead of half-day programs.¹³ This suggests that the differences in attendance rates between students in half-day and full-day programs comes from the different structure of the programs.
- The difference in attendance rates between students enrolled in full-day vs. half-day programs was particularly pronounced for Black students.

FIGURE 2
Attendance Rates in Full-Day Programs Were Higher Than in Half-Day Programs for All Student Groups



Note: Differences between full-day and half-day attendance in each year, 2012-13 through 2015-16, remain significant in models controlling for: gender, special education status, English Learner status, students in transitional living situations status, neighborhood poverty, neighborhood social status, and age. Race/ethnicity categories are shown for groups that represented at least 1 percent of the pre-k population in these years, based on administrative records. Race/ethnicity categories not shown due to small group sizes include: Native American/Alaskan Native, multiracial, and students whose race/ethnicity was not available. Our Asian American/Pacific Islander category combines three CPS data categories—Asian, Pacific Islander/Hawaiian and Asian/Pacific Islander categories—due to the small number of students in the latter two categories.

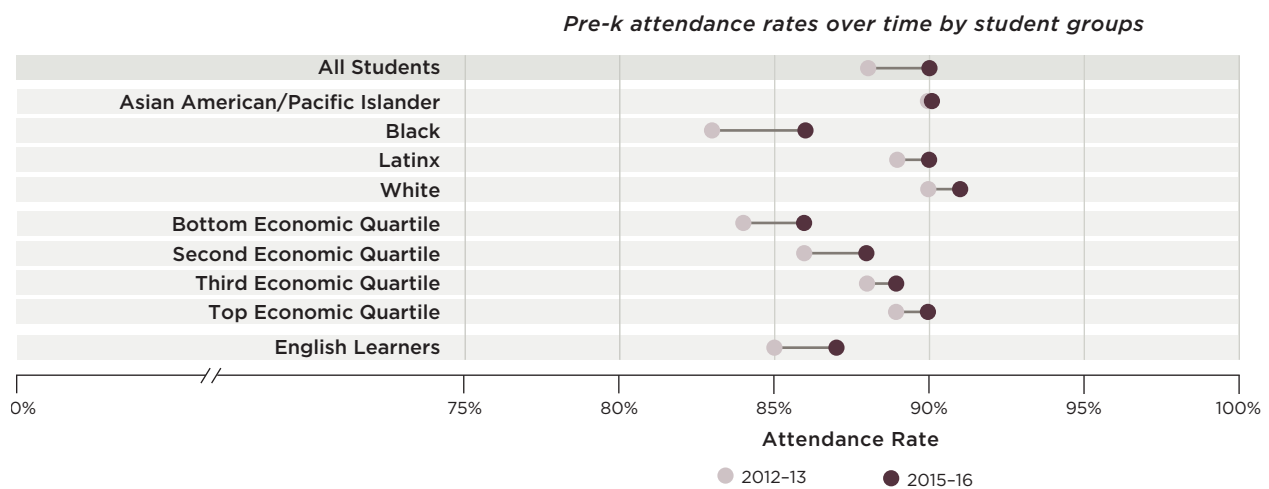
13 Between 2012-13 and 2015-16, the difference in attendance rates between students in full-day versus half-day programs was about 2 percentage points among Asian American/Pacific Islander students, between 4-5 percentage points

among Black students, from 1-3 percentage points among Latinx students, and 2-4 percentage points among White students, without a consistent trend up or down for any group over time.

District-Wide CPS Pre-K Attendance Rates Increased as More Students Enrolled in Full-Day Programs

- While most pre-k students continued to enroll in half-day programs (see Figure 1 on p.3), the higher attendance rates of students enrolled in full-day pre-k contributed to a modest but statistically significant overall increase in pre-k attendance rates (1.5 percentage points; see Figure 3).
- The fact that full-day pre-k attendance rates drove an increase in overall pre-k attendance rates is particularly notable given that full-day student enrollment never reached more than one-quarter of all pre-k enrollment during the study period.
- Attendance rates for Black students increased by 3 percentage points, more than twice as much as among students of other races/ethnicities.
- The more sizable increase in attendance among Black students comes from the larger increase in attending full-day programs among Black students (see Figure 1 on p.3), and the fact that program length (full day vs. half day) seemed to matter more for Black families (see Figure 2).
- This 3 percentage point increase in attendance rates translates to five additional days in school.
- Other student groups that were prioritized by the district for full-day programs also showed larger improvements in attendance than average, although the improvements were smaller than among Black students. Attendance rates improved by 2 percentage points among English Learners (EL) and among students living in communities with the lowest incomes and highest unemployment.
- The potential impact of full-day vs. half-day programs on pre-k student attendance rates overall was limited because most students continued to enroll in half-day programs. Our second study examined changes in attendance rates at four elementary schools that shifted from half-day to full-day pre-k programs for *all* students during the study period.

FIGURE 3
Pre-K Attendance Rates Increased Most Significantly Among Students in High-Priority Groups



Note: Income for each student was calculated as a combination of the percent of families with income below the federal poverty line and the percent of males unemployed at the census block level, divided into quartiles. Race/ethnicity categories are shown for groups that represented at least 1 percent of the pre-k population in these years, based on administrative records. Race/ethnicity categories not shown due to small group sizes include: Native American/Alaskan Native, multiracial, and students whose race/ethnicity was not available. Our Asian American/Pacific Islander category combines three CPS data categories—Asian, Pacific Islander/Hawaiian and Asian/Pacific Islander categories—due to the small number of students in the latter two categories.

Study 2. The North Lawndale Cluster Initiative (NLCI) elementary schools showed significantly more improvement in pre-k attendance rates after expanding their pre-k programs to full-day, compared to average pre-k attendance rates district-wide and at schools serving similar students.

Pre-Expansion: In the year before expanding to full-day pre-k (2012–13), pre-k attendance rates in the NLCI schools were not different from pre-k attendance rates district-wide, nor at similar schools.¹⁴

Year 1 of Expansion: When two of the four NLCI schools offered full-day pre-k (2013–14), average pre-k attendance rates were higher in the NLCI schools than in similar schools by 3.8 percentage points, but the difference was not statistically significant.

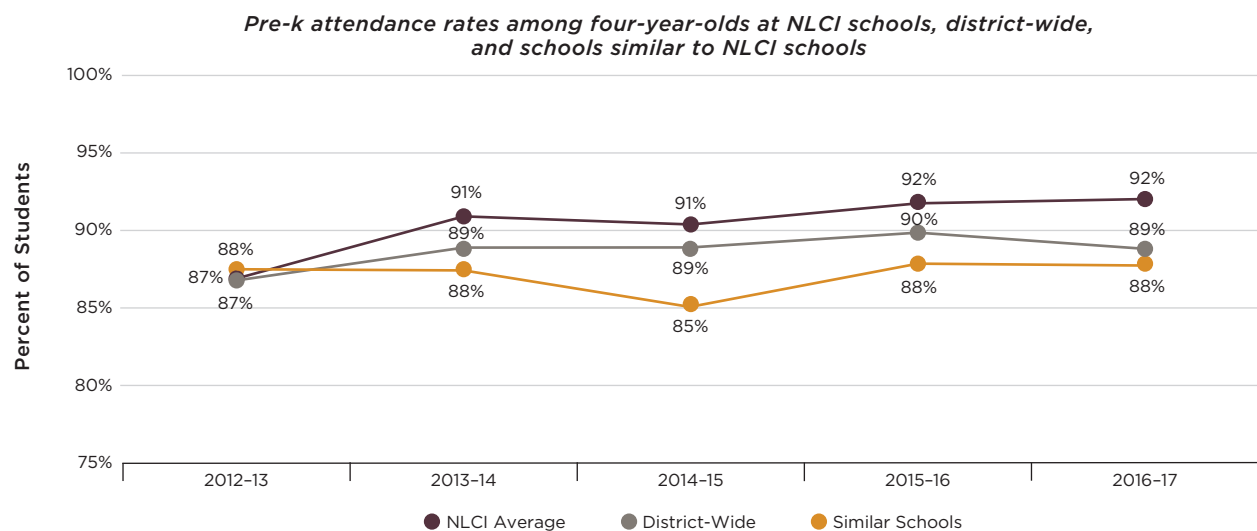
Year 2 of Expansion: When all four NLCI schools offered full-day pre-k (2014–15), pre-k attendance rates at those schools remained about the same as in the prior year (about 91 percent), but pre-k attendance rates in similar schools declined. This decline was atypical compared to prior and later years, but it did mean that NLCI pre-k attendance rates in Year 2, relative to similar schools, were 5.5 percentage points higher, a

statistically significant difference. Because attendance rates in this year seem anomalous, the subsequent years provide stronger evidence of effects.

Post-Expansion: Pre-k attendance rates in the NLCI schools improved in the 2015–16 school year and were about 4 percentage points higher than at comparison schools through the 2016–17 school year. The differences were statistically significant despite the small number of schools in the initiative, and represent an additional seven days of attendance—about a week and a half more school—on top of the additional instructional time from the extended day.

The change in attendance rates at these schools, which predominantly serve Black students, was the same magnitude as the difference in attendance rates among Black students in full-day vs. half-day pre-k programs district-wide, shown previously in Figure 2 on p.4.

FIGURE 4
Pre-K Attendance Improved More in the North Lawndale Schools than the CPS Average, and Were Significantly Higher than at Similar Schools



Note: Percentages are based on all students who enrolled in an NLCI pre-k school or CPS pre-k school at age four in the fall of each year. Differences between NLCI and comparison schools were not statistically significant ($p < 0.05$) before the initiative (2012–13), but were statistically significant after the initiative (2013–14, 2014–15, and 2015–16); and in 2016–17 in some variations of the statistical models but marginally significant in others (although still 4 percentage points higher). Coefficients come from hierarchical linear models with students nested within schools, controlling for year fixed effects, whether the school was managed by AUSL, and student background (i.e., gender, race, ethnicity, neighborhood poverty, disability status), with propensity weights applied based on school characteristics in the 2011–12 school year. In each year, there were between 99 and 204 pre-k students in the NLCI schools and 13,000–16,000 students in any CPS pre-k.

¹⁴ For more information on comparison schools, see the Appendix.

Implications

These two Chicago studies show that when more full-day pre-k programs were available to families, students were more likely to enroll in full-day programs and student attendance rates increased. Students therefore received more time in pre-k not only because of the longer school day, but also because they were able to attend more regularly. Especially for families that have fewer economic resources to overcome hurdles such as access to childcare, transportation challenges, and limited healthcare options, half-day programs may present more logistical burdens than full-day programs. Increasing opportunities for full-day programs is especially beneficial for these families. Increased attendance rates may also—at least partially—explain why prior research has found that students enrolled in full-day pre-k demonstrated more growth in academic skills than their peers in half-day programs.

Policymakers can consider which students may benefit most from access to full-day pre-k when making decisions about program location and enrollment processes. Full-day pre-k is more expensive for K–12 districts to offer than half-day pre-k, but the benefits are clear, especially for students who face more barriers to regular attendance. Two other recent Chicago studies found that **1) increased access to full-day pre-k (having more full-day pre-k options located near where students lived) was a key lever for increased enrollment in full-day programs, and 2) increased access and enrollment to full-day, school-based pre-k was also related to higher kindergarten entry skills and better academic outcomes**

in second grade, especially among student groups prioritized by the district to improve equitable enrollment in pre-k.¹⁵ The district facilitated enrollment for students in high-priority groups by offering a greater number of full-day programs, locating programs in high-priority neighborhoods, and facilitating the enrollment process. Together, these four studies offer important insights and considerations to policymakers who are working towards more equitable educational outcomes for students, seeking to equip all young learners with experiences and skills that will fuel their success in K-12.

Full-day pre-k addresses some, but not all, logistical barriers for student and family access to pre-k programs. The higher student attendance rates in full-day programs are consistent with previously-published parent surveys and interviews that indicated that half-day programs were more logistically challenging than full-day programs. While full-day programs present fewer logistical challenges for families than half-day programs, families with more limited economic resources still have fewer alternatives for addressing these challenges when they do come up. This can be seen in lower attendance rates for students based on neighborhood income and race/ethnicity. Policymakers, districts, and schools can continue partnering with families to learn how to better arrange school schedules and logistics to facilitate regular attendance for all students, and to develop new strategies or try strategies that have been found to be effective elsewhere.¹⁶

These studies examine pre-k enrollment and attendance prior to COVID-19. While the context has changed and will continue changing, the key findings remain relevant today. Ultimately, these studies provide additional, rigorous evidence that access to full-day pre-k matters for attendance rates, especially for students with historically lower attendance rates. Local, state, and federal policymakers, public schools, and community programs have an enormous opportunity to offer pre-k programs that promote access and break down barriers for students and families.

¹⁵ Ehrlich et al. (2020); Connors, Ehrlich, Stein, Francis, Easton, & Kabourek (2021). ¹⁶ Gottfried & Hutt (2009).

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Appendix A

Further Information on Studies

Study 1: CPS-Wide Full-Day Pre-K Expansion

We used CPS administrative data to look at pre-k attendance patterns between 2012–13 and 2015–16.

We also looked at potential factors that could be driving improvements among particular student groups, such as distance to school, full-day vs. half-day programs, and whether students had siblings in the same school.

Sample

The quantitative analyses in this study were conducted on district-wide data of pre-k student enrolled in CPS from 2012-13 through 2015-16. In each year, there were roughly 25,000 pre-k three- and four-year-olds. **Table D.1** provides background characteristics on all students included in analyses. Although we did not study differences among various pre-k programs within CPS, students were served by several programs, including Preschool for All (Illinois’s state-funded pre-kindergarten program), Head Start, Child-Parent Centers (CPC), and tuition-based programs. Charter school students were excluded from analyses presented in the report, as some data were not available for them (see Data section).

Data

Administrative data on all CPS students are collected by the district and were shared with the authors for the purpose of this study, under an existing data sharing agreement. Student background data include race/ethnicity, gender, grade level, birthdate, free or reduced-price lunch eligibility, special education status, English Learner status, an indicator for transitional living situations (students experiencing homelessness), home address, and the school each student was enrolled in. **Table A.1** shows the student data included in analyses. Additionally, using the home address of each student and census block group information, we created two

measures of the economic conditions of students’ residential block group:¹⁷

1. Neighborhood poverty was calculated as a combination of the percent of adult males unemployed and the percent of families with incomes below the poverty line. **Figure 3 on p.5 and Table A.2 on p.10** describe neighborhoods in quartiles, such that the bottom economic quartile represents the highest-poverty neighborhoods.
2. Neighborhood socioeconomic status (SES) was constructed from data on the mean level of education of adults and the percentage of employed persons who work as managers or professionals.

Both neighborhood measures are standardized such that a 0 value is the mean value for census block groups in Chicago and 1 is the standard deviation. Students are then assigned these values based on the block in which they lived. In a district where more than 85 percent of students are eligible for free- or reduced-price lunch, the concentration of poverty variable is especially useful for determining the lowest-income and -SES neighborhoods in the city because it is much more sensitive to differences across students. It can be interpreted in all analyses as a standardized measure of neighborhood poverty among all students in the district in any given year.

Program Enrollment. Additional district data allowed us to link students to information about the classroom they were enrolled in, including whether it was a half- or full-day classroom. These data excluded information on students enrolled in either Montessori or charter schools, and therefore prohibited the inclusion of these students in any analyses that examined information about the specific classroom students were enrolled in.

¹⁷ There are CPS students in 2,450 census block groups in the city; each block group is equivalent to about one city block.

Attendance Data. The authors were provided with daily attendance files for pre-k students for 2012–13 through 2015–16 school years. These files allowed us to carefully examine the attendance files for issues in record-keeping and make necessary adjustments. For example, we removed days that represented non-enrollment days after the school calendar was set, such as those due to a teacher strike, weather-related closures, and

furlough days. For all analyses, we limited our sample to students who were enrolled for more than 20 days over the school year, ensuring that students were in the system for at least a month. These files also allowed us to identify how many days students were enrolled in each school, allowing us to account for enrollment in multiple schools when students moved in the middle of the school year. See Table A.2

TABLE A.1
Background Characteristics on Students included in Analyses

	2012–13	2013–14	2014–15	2015–16
Asian American/Pacific Islander	3.5%	3.9%	4.2%	4.4%
Black	37.5%	36.5%	37.2%	37.1%
Latinx	46.5%	47.0%	46.8%	47.0%
White	11.3%	11.3%	10.8%	10.5%
Additional Race Categories	1.3%	1.3%	1.1%	1.1%
Age 3	36.2%	37.4%	38.1%	38.2%
Age 4	62.0%	60.6%	59.4%	59.3%
% English Learner	37.0%	38.2%	37.7%	38.0%
% Special Education	13.5%	14.9%	15.2%	16.6%
% Students in Transitional Living Situations	2.2%	3.1%	2.9%	1.9%
% High-Poverty Neighborhood	19.2%	18.3%	18.9%	18.8%
% from High SES Neighborhood	6.9%	6.9%	6.5%	6.4%
TOTAL STUDENTS	26,791	25,831	24,847	24,322

Note: Students living in high-poverty neighborhoods or high-SES neighborhoods are those with neighborhood economic status or neighborhood SES 1 standard deviation or greater than city average. Analyses exclude students enrolled for fewer than 20 days in that school year and those enrolled in charter schools. Race/ethnicity categories are shown for groups that represented at least 1 percent of the pre-k population in these years, based on administrative records. Race/ethnicity categories not shown due to small group sizes include: Native American/Alaskan Native, multiracial, and students whose race/ethnicity was not available. Our Asian American/Pacific Islander category combines three CPS data categories—Asian, Pacific Islander/Hawaiian and Asian/Pacific Islander categories—due to the small number of students in the latter two categories.

TABLE A.2

Annual Attendance and Chronic Absence Rates by Student Groups, 2013–2016

		Average Attendance Rate				Chronic Absence Rate			
		2013	2014	2015	2016	2013	2014	2015	2016
Race/Ethnicity	Asian American/ Pacific Islander	89.66%	90.42%	90.19%	89.59%	40.32%	35.01%	36.28%	37.17%
	Black	83.29%	84.04%	84.55%	85.96%	59.92%	56.71%	55.15%	50.11%
	Latino	88.77%	90.00%	89.89%	90.02%	43.12%	36.00%	37.27%	36.29%
	White	89.64%	90.92%	90.62%	90.71%	38.93%	31.41%	33.54%	32.58%
	Additional Race Categories	87.35%	88.97%	88.95%	89.25%	47.40%	35.69%	35.61%	37.21%
Neighborhood Economic Quartiles	Bottom Economic Quartile	84.02%	84.78%	85.30%	86.47%	57.97%	54.41%	53.18%	48.69%
	Second Economic Quartile	86.35%	87.88%	87.70%	88.30%	50.39%	43.30%	43.43%	41.64%
	Third Economic Quartile	87.93%	89.01%	89.10%	89.44%	45.87%	39.76%	40.37%	38.01%
	Top Economic Quartile	89.01%	90.08%	89.86%	90.05%	41.31%	34.42%	36.78%	35.92%
Gender	Male	86.83%	87.68%	87.99%	88.54%	49.21%	43.61%	43.15%	41.18%
	Female	86.82%	88.19%	87.99%	88.58%	48.57%	42.35%	43.78%	40.95%
Age	3 years old	85.89%	86.80%	87.23%	87.37%	52.53%	47.25%	46.93%	45.61%
	4 years old	87.49%	88.76%	88.64%	89.53%	46.41%	39.81%	40.60%	37.36%
Students in Transitional Living Situations	No	86.99%	88.19%	88.18%	88.69%	48.40%	42.21%	42.77%	40.60%
	Yes	79.78%	79.94%	81.64%	82.06%	70.47%	67.54%	66.16%	64.77%
Special Education	No	87.00%	88.16%	88.16%	88.90%	47.83%	42.05%	42.59%	39.76%
	Yes	85.68%	86.65%	87.01%	86.84%	55.68%	48.34%	48.25%	47.67%
English Language Learner	No	85.03%	86.06%	86.28%	87.22%	54.80%	49.82%	49.76%	45.94%
	Yes	89.89%	90.96%	90.81%	90.75%	38.82%	31.96%	33.02%	33.12%

Note: Years listed are the spring of each academic year; for example, “2016” refers to the 2015–16 school year. Race/ethnicity categories are shown for groups that represented at least 1 percent of the pre-k population in these years, based on administrative records. Race/ethnicity categories not shown due to small group sizes include: Native American/Alaskan Native, multiracial, and students whose race/ethnicity was not available. Our Asian American/Pacific Islander category combines three CPS data categories—Asian, Pacific Islander/Hawaiian and Asian/Pacific Islander categories—due to the small number of students in the latter two categories.

Study 2. North Lawndale Cluster Initiative

The NLCI aimed to advance a cohesive school and student support system by coordinating and aligning resources, programs, and partnerships to support students from pre-k through high school graduation in a cluster of neighborhood schools run by the Academy of Urban School Leadership. A 2020 Consortium study evaluated the NLCI over an array of outcomes from pre-k to college. The largest portion of the initiative funding went to support full-day pre-k classes in four elementary schools, and it was at the pre-k level where schools consistently showed significantly greater improvements over time than comparison schools. That part of the evaluation is described in this brief.

Research Methods. Researchers created propensity weights based on school characteristics in 2011–12, to find schools that matched to the NLCI schools on racial/ethnic composition, socioeconomic variables, school mobility, and average achievement (attendance, GPA, test scores) two years prior to the initiative (2011–12). The propensity weight method compared NLCI schools to all other schools in the district, but weighted the contribution of other schools to the comparison based on how similar they were to the NLCI schools in 2011–12 using the propensity scores. Schools that were very dissimilar in 2011–12 had weights close to zero and did not contribute to the comparison, while schools that were more similar had larger weight. They checked for baseline equivalence in the outcome variables in the year prior to NLCI funding (2012–13) using the propensity weights, and found no significant differences in the comparison group relative to the NLCI schools on the outcomes variables.

Researchers used hierarchical linear models (HLM), with students nested within schools, to conduct statistical tests for whether student outcomes were higher at the NLCI schools than the comparison schools in each year, applying propensity weights at the school level. At the student level, they included control variables for student characteristics (gender, race/ethnicity, neighborhood poverty level, disability status, and grade level) to adjust for any changes in student population in the schools over time. They also included indicator variables representing years, which allowed for non-linear trends in outcomes. There was no intercept; the year indicator variables represented the average weighted outcome in each year in the comparison groups. An indicator variable representing the cluster schools was included in each of the level 2 models to estimate the difference in attendance rates in cluster schools relative to the comparison group in each year.

The modeling strategy can be summarized as follows:

- Identify each elementary school's probability of being an NLCI school (i.e., propensity score), based on school characteristics two years prior to funding (2011–12) including racial/ethnic composition, socio-economic variables, school mobility, and average achievement (attendance, GPA, test scores);
- Examine outcomes in the year prior to funding (2012–13), applying the propensity weights, to make sure the comparisons are equivalent; and
- Get effect estimates from hierarchical models with all years stacked, students within schools, applying propensity weights, and controlling for student demographics.

The Models were as follows:

Level 1 (Students)

$$\text{Attendance}_{ij} = B_{0j} (D2012-13)_{ij} + B_{1j} (D2013-14)_{ij} + B_{2j} (D2014-15)_{ij} + B_{3j} (D2015-16)_{ij} + B_{4j} (D2016-17)_{ij} + B_{5j} (D2017-18)_{ij} + B_{6j} (D2018-19)_{ij} + B_{7j} (D \text{ 1st year AUSL})_{ij} + B_{8j} (D \text{ later year AUSL})_{ij} + \sum B_{xj} (\text{Student Demographics})_{ij} + r_{ij}$$

Level 2 (Schools)

$$B_{0j} = G_{00} + G_{01} (D_ever_cluster)_j + u_{0j} \quad \dots \quad B_{6j} = G_{60} + G_{61} (D_ever_cluster)_j + u_{6j}$$

All other B fixed at level 2.

Level 1 includes a series of indicator variables for school year. *D_ever_cluster* is an indicator variable indicating whether a school was in the NLCI. Student demographics include gender, race/ethnicity, neighbor-

hood poverty level, disability status, and grade level.

The coefficients of interest are G01, G11, G21, G31, G41, G51, and G61, which each represent the difference between NLCI vs. comparison school among students with similar characteristics.

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This report reflects the interpretation of the authors. Although the UChicago Consortium's Steering Committee provided technical advice, no formal endorsement by these individuals, organizations, or the full Consortium, should be assumed.

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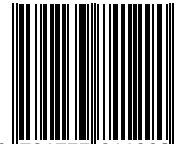
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