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Full-Day Kindergarten in California

Lessons from Los Angeles

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Summary

Almost half of California public school kindergartners are enrolled in full-day classes, but education policymakers have no empirical information on the effect of full-day kindergarten on California student performance. This report examines whether longer classes in the Los Angeles Unified School District (LAUSD) are having a positive impact on all students, and on economically disadvantaged and English learner students in particular. We focus on academic, grade retention, and English fluency outcomes through second grade. We look specifically at the effects on economically disadvantaged and English learner students, who are at the greatest risk for academic problems, and who are also groups that policymakers often target with full-day kindergarten.

Full-day kindergarten appears to provide some benefits, but in a small way and only to certain groups of students. Given the cost of implementing full-day kindergarten for schools that may lack space, if educators and policymakers proceed, they must consider whether it should be targeted to selected schools.

The strongest effect of full-day kindergarten we found is the reduced likelihood of grade retention. All the student groups we examined were 5 percentage points less likely to be retained before second grade. Full-day classes also appear to provide a small improvement in basic reading skills by the end of kindergarten. We also find a very small improvement for first-grade reading skills, but this benefit is not evident for English learner students. Little benefit was found for second-grade California Standards Test (CST) performance in English-Language Arts (ELA) or Mathematics. All students examined on average appear to be 1.5 percentage points more likely to be proficient in ELA in second grade, but no differences were found for math outcomes or for actual ELA scores. Moreover, the ELA proficiency benefit is not evident for economically disadvantaged or English learner students.

Contrary to expectations, we do not find a difference between full- and half-day kindergartners in English fluency through second grade, as measured by California English Language Development Test (CELDT) first and second-grade scores and by the probability of being reclassified as fluent-English proficient by the end of second grade.

To help guide policymaking on these issues, we further examined for which subpopulations full-day classes may have a greater or lesser effect, based on certain student and school characteristics. We find the most consistent evidence of more benefit to students in lower-ranked Academic Performance Index (API) schools than in those with higher rankings. Also, the youngest students and students whose parents have less than a high school education seem to benefit slightly more from the extra time, although this positive effect seems to matter mostly for basic kindergarten reading skills and for reducing the likelihood of being retained for an extra school year. As for English fluency outcomes, it appears that students with a relatively high initial kindergarten CELDT score, those among the top 16 percent of students on school entry levels of English fluency, are more likely to be reclassified as fluent-English proficient by the end of second grade than students in half-day kindergarten programs.

These findings can be considered in a broader statewide context. Potential statewide cost savings could occur from the reduced likelihood of grade retention that we find, although more

research would be needed for districts with retention policies different from those of the LAUSD. In addition, further focus on how the extra kindergarten class time is spent and how well teachers are prepared to use that extra time would be beneficial in understanding how to implement full-day classes for maximum effect; this may be especially important for EL students with low initial English fluency. More immediately, policymakers might first consider targeting full-day kindergarten to schools with low API ranking.

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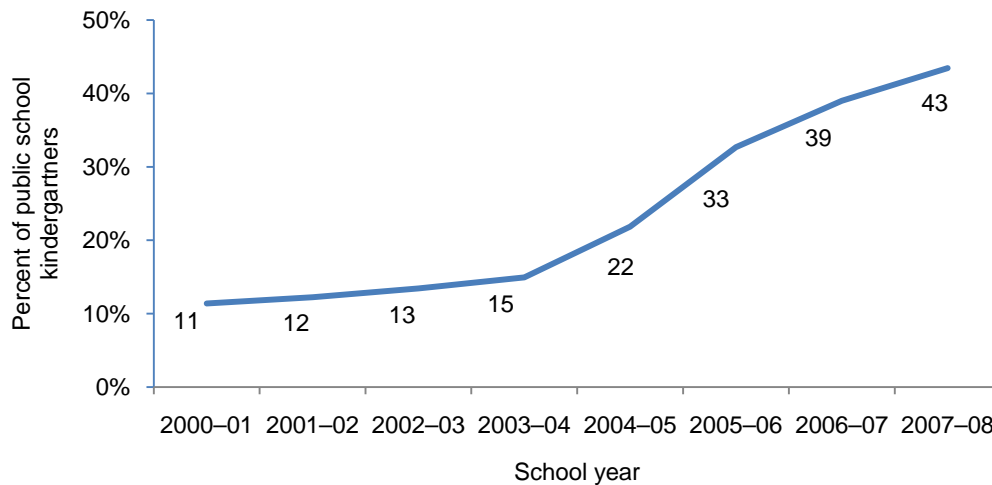
Acronyms

API	Academic Performance Index
CCSSO	Council of Chief State School Officers
CDE	California Department of Education
CELDT	California English Language Development Test
CST	California Standards Test
ECLS-K	Early Childhood Longitudinal Study – Kindergarten Class of 1998–99
ED	Economically Disadvantaged
EL	English Learner
ELA	English Language Arts
LAO	Legislative Analyst’s Office
LAUSD	Los Angeles Unified School District
NCLB	No Child Left Behind Act
RFEP	Reclassified Fluent-English Proficient
STAR	Standardized Testing and Reporting

Introduction

In the current environment of severe state budget limitations, schools in California are facing difficult choices about how to allocate scarce funds to best meet their students' needs. Over the past several years California has seen significant growth in the number of public school kindergarten students attending full-day classes, up from 11 percent in the 2000-01 school year to almost half of all kindergarten students now (Figure 1). Increasingly, many parents and educators find full-day kindergarten to be an attractive choice to support three major academic and social objectives.

Figure 1. California Public School Students Enrolled in Full-Day Kindergarten



SOURCE: PPIC Full-day Kindergarten Survey, 2007-08.

NOTE: Based on schools that were open in the 2007-08 school year and their kindergarten program history.

First, many believe the extra time in the classroom will improve overall student educational performance; some also argue that full-day classes allow more time for young children to develop their social, emotional, and physical skills, also important for later success. The second objective is closing achievement gaps; the California Governor's Committee on Education Excellence (2007) noted that full-day kindergarten might be a way to help narrow the achievement gap between disadvantaged students and students without those disadvantages. Third, the longer day provides a source of free child care to working families and single parents; for many families, it may be a preferred source of care.

However, there are some notable disadvantages of full-day kindergarten, including the costs of extra personnel, facilities, and materials.¹ State funding for full-day classes is the same as for half-day classes, so additional funds to implement the longer school day must come from other sources, including local bond revenue or federal funds for low-income students. In schools with

¹ For example, many schools offer a morning and an afternoon kindergarten class that share the same classroom space. One teacher may teach two classes using one classroom. Or, each class may have a separate teacher, and the two switch off morning and afternoon between teaching a class and assisting the other teacher with their class. A transition to full-day classes would require an additional classroom and materials, and in the case of partner teachers, classes would lose the benefit of two certificated teachers in the classroom. Schools would also face decisions about hiring additional classroom aides.

available classroom space and kindergarten teachers on full-time contracts, the additional expense may not be substantial, but for schools facing increasing enrollments and limited facilities, changing to a longer day that requires more classrooms or teachers could be a substantial expense.

And because other, less costly programs may promote the same student performance objectives, a first step to guide state and local policymakers is to better understand the potential benefits of full-day kindergarten for California students, and specifically for English learner (EL) students and economically disadvantaged students.

In this report, we address the following questions:

- Do students in full-day kindergarten classes perform better academically through second grade than their half-day kindergarten peers?
- Is full-day kindergarten particularly beneficial for EL or economically disadvantaged students?
- Do EL students in a full-day kindergarten class gain English language skills faster or become English proficient earlier than their peers in half-day classes?
- Does full-day kindergarten matter more for some students and schools than others?

This report examines whether longer classes in the Los Angeles Unified School District (LAUSD) are having a positive impact on all students, and on economically disadvantaged and English learner students in particular. We focus on academic, grade retention, and English fluency outcomes through second grade. In particular, we look at how economically disadvantaged and EL students fare – groups at the greatest risk for academic problems who are also frequently mentioned by policymakers as beneficiaries of full-day kindergarten.

Focusing on public schools in Los Angeles is appropriate for this study for several reasons. In 2004, the district mandated a shift to full-day kindergarten over a four-year period. Studying this large group provides variation over time in the number of students transitioning to full-day classes, and results in more meaningful comparisons. (We have seven cohorts of kindergartners in almost 500 schools between school years 2001–02 through 2007–08, which translates into a total of about 297,000 students.) Further, the LAUSD data were provided at the student level, which allowed for more sophisticated analytical techniques. The district’s student population is large and diverse, including many EL and economically disadvantaged students, so results are meaningful beyond the district level. In addition, LAUSD is the largest school district in the state with the largest EL student population, and represents about 12 percent of the state’s kindergarten population and about 16 percent of the state’s kindergarten EL population. Lessons learned from LAUSD implementation of full-day classes are thus useful for a broader statewide discussion of program benefits for similar students, particularly for urban areas.

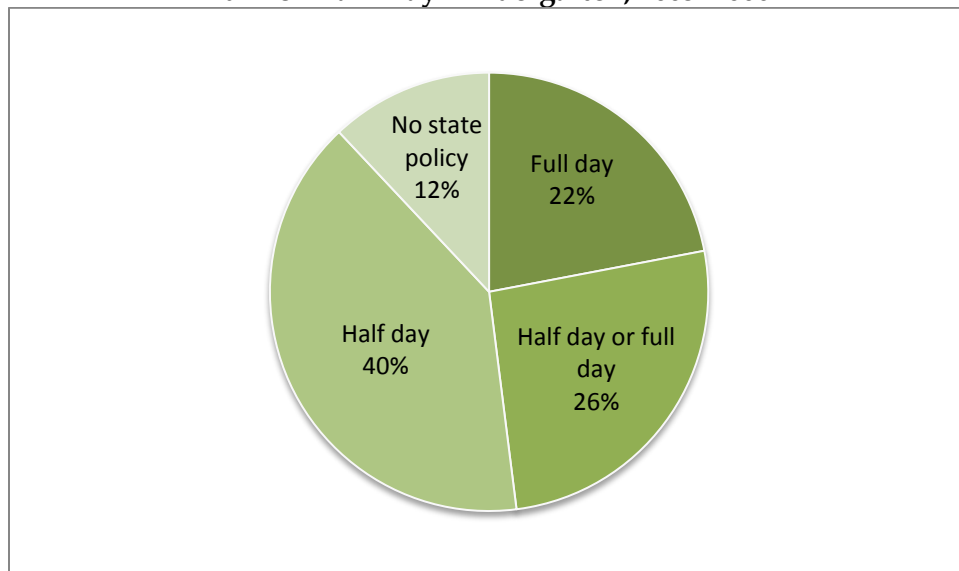
We describe the national and California trends in full-day kindergarten enrollment and place this study in the context of previous research. We briefly describe how LAUSD implements full-day kindergarten so that results can be placed in perspective for other schools and districts with similar or different implementation. We then explain our approach and present our results, with discussion and conclusions. More extensive details on data, methodology, and results can be found in technical appendices, available on the PPIC website.

National and State Trends

Kindergarten is the first year of formal schooling for most students and so plays an important foundational role for future learning. Kindergarten traditionally transitions young children from the home environment to the school environment, although many children at that age are also building on previous experience in non-parental child care and preschool. As students of different family and pre-kindergarten backgrounds, as well as of varying ages, are entering school, one aspect of kindergarten that is of interest to parents, educators, and policymakers is the length of the school day for these young children.

In public opinion, the potential advantages to full-day kindergarten appear to outweigh the disadvantages. The number of students in full-day kindergarten across the country has increased dramatically over the past few decades: in 1970, only about 13 percent of children were in full-day kindergarten classes (Elicker & Mathur, 1997), but that share grew to approximately 65 percent in 2003 (Child Trends Data Bank, 2008). An increasing number of states have offered school districts the option of choosing full-day or half-day kindergarten programs (Council of Chief State School Officers (CCSSO, 2007), and 11 states (22 percent) mandated full-day kindergarten in the 2005–2006 school year (Figure 2). Several states have no state policy and leave the decision to local education authorities.

Figure 2. Percentage of States Requiring Districts to Offer Full- or Half-Day Kindergarten, 2005–2006



SOURCE: CCSSO, 2007.

As the length of day has been extended, several studies have tried to identify the benefit. Early research had limitations (Puelo, 1988), but recently, several rigorous studies using a nationally representative dataset of kindergartners, the Early Childhood Longitudinal Study-Kindergarten Class of 1998–1999 (ECLS-K), found that full-day kindergarten may have short-term academic benefits by the end of the kindergarten year but that those benefits disappear in the longer term (Cannon, Jackowitz & Painter, 2006; DeCicca, 2007; Le et al., 2006; Rathbun,

West & Hausken, 2004). However, no studies have focused on California students, and the ECLS-K studies did not examine EL students as a separate group, nor outcomes capturing English proficiency.

California Full-Day Kindergarten Policy

In California, a longstanding state policy mandates that school districts offer half-day kindergarten programs, limited to four instructional hours per day, and that they have the option to provide full-day programs in select circumstances. Before 2005, all schools within a district had to maintain the same number of instructional minutes for equity purposes. California school districts seeking to offer full-day kindergarten programs in any schools needed to obtain a waiver from the State Board of Education, sometimes a burdensome process. In acknowledgement of a perceived academic benefit from more instructional minutes in the kindergarten year and of the need for district flexibility, AB 2407 (Bermudez) was passed, loosening the requirements for districts in meeting the equity and maximum hours laws. As of January 1, 2005, a district could adopt an early primary program to avoid the four-hour maximum requirement, and under the terms of AB 2407, could implement full-day kindergarten in any school they chose without waivers.²

On the surface, it appears that the relaxation in waiver requirements has fostered adoption of full-day kindergarten programs across school districts in California. For example, in 2004, LAUSD mandated a shift to all full-day kindergarten programs over a four-year period. The Oakland Unified School District also mandated that all schools provide full-day kindergarten, which was rolled out beginning in the 2005–06 school year. However, no additional funding is provided to schools that exercise the full-day option.

To determine if this change in the waiver requirement is in fact correlated with an increase in full-day programs throughout the state, we conducted a survey of California public elementary schools with kindergarten enrollment in the 2007–08 school year, asking about full-day kindergarten implementation. We received responses for 73 percent (4,160) of the schools we surveyed, a response generally representative of public schools in California and of the student population. We categorize any class that exceeds four instructional hours as full-day, although this is sometimes called extended day if it does not exceed five instructional hours. Most schools with full-day classes offer more than 5 hours of instructional time four to five days a week, although a few offer longer classes only two or three days a week. These numbers are based on data from schools that were open as of the 2007–08 school year; the small percentage of schools that were open in 2000 but closed before 2008 are not included. Further details on the survey results and how well they represent students and schools in the state are available in Technical Appendix A and in a separate publication at www.ppic.org/content/pubs/jtf/JTF_FullDayKJTF.pdf.

Our data indicate that since the passage of AB 2407, full-day kindergarten is indeed on the rise. As was seen in Figure 1, the number of students enrolled in full-day classes increased at a faster rate starting around the 2004–05 school year. The survey indicated that about 44 percent

² An early primary program consists of any combination of pre-kindergarten through third grade students who are provided developmentally appropriate instruction. The program must be established by a local board-adopted policy, may not have a school day that lasts longer than that permitted for the oldest students at the school, and must provide ample opportunities for active and quiet activities. See <http://www.cde.ca.gov/ci/gs/em/extendaykinder.asp>.

of public schools representing 43 percent of public kindergarten students in the 2007–08 school year offered full-day kindergarten. At the beginning of the decade, in the 2000–01 school year, only about 13 percent of schools (representing 11 percent of students) offered full-day classes. This percentage has increased in each subsequent school year, with more rapid increases around the time of the policy change.

Full-day kindergarten also appears to be more common in the state for certain groups of students and in lower-performing schools. Full-day kindergarten enrollment is higher for blacks (49%) and Hispanics (49%) than for Asians (37%) and whites (36%). About 48 percent of EL kindergartners are in full-day programs, compared to 40 percent of non-EL students. Full-day classes are more commonly found in schools with higher proportions of economically disadvantaged students. Likewise, in schools with a low Academic Performance Index (API) rank of 1 or 2 (well below average), 53 percent of children are enrolled in full-day kindergarten classes, whereas the share drops to 30 percent in schools with a 9 or 10 API rank (well above average).

English Learners and Economically Disadvantaged Students

Educators are especially concerned about EL and economically disadvantaged students because they are at greater risk of failing to meet state education standards (Cannon and Karoly, 2007; Governor’s Committee on Education Excellence, 2007).³ Policymakers are also interested in intervention options to improve performance among these at-risk students; these include extra student funding for these two groups (Governor’s Committee on Education Excellence, 2007). Students who are learning the English language comprise one-quarter of California’s K–12 student population and more than a third of kindergarten students (Legislative Analyst’s Office, 2004). An additional concern about EL students is that they are at a disadvantage when entering school and their achievement lags behind non-EL students (Cannon and Karoly, 2007, for example). Increased English language proficiency is also one of the accountability goals for states under the federal No Child Left Behind (NCLB) Act of 2001.⁴ As a result, educators focus much attention on how to foster English language acquisition while educating students in traditional subjects. Our school survey finds, anecdotally, that among schools with full-day kindergarten, a significant number implemented full-day kindergarten specifically to help EL students.

A limited amount of research suggests that students benefit from additional time spent hearing and speaking English (Genesee et al., 2005): teachers have more time to focus on individual student needs, including EL students, in a full-day class compared to a half-day class. In a recent survey of California teachers of EL students, Gándara, Maxell-Jolly, and Driscoll (2005) find that the second greatest teaching challenge for elementary teachers is lack of time. However, no existing research evaluates the effects of full-day kindergarten among EL students.

Full-day kindergarten is also considered a way to improve the outcomes of economically disadvantaged students, for some of the same reasons. Economically disadvantaged students on

³ We use the same definition of economically disadvantaged students that is used by the California Department of Education. Namely, a student is economically disadvantaged if his parents’ highest education level is less than a high school degree or his family is eligible for a subsidized lunch (i.e., household income at or below 185% of the federal poverty level).

⁴ NCLB is a federal law aimed at, among other things, increasing accountability for schools, districts, and states for improved student educational performance, specifically through standards-based reforms.

average consistently perform worse academically than their more advantaged counterparts, and fully half of public school students in California were classified as economically disadvantaged in school year 2006–07 (LAO, 2009). Hence, the Governor’s Committee (2007) recommends incentives to offer full-day kindergarten in schools with high proportions of disadvantaged students. Many districts nationally use Title I funds to support full-day kindergarten programs for low-income students (Kauerz, 2005).

Our school survey shows that students in California schools with a high proportion of economically disadvantaged students are more likely to be in full-day classes; among schools with full-day kindergarten, several school administrators noted that helping disadvantaged children was one motivation. Any increases in Title I funds will allow schools to consider new reforms for these students, including full-day kindergarten.

Los Angeles Unified School District Data

The Los Angeles Unified School District is the largest school district in the state, home to about 12 percent of the state's kindergarten population and about 16 percent of the state's kindergarten EL population. A number of characteristics made LAUSD a good target for this research. The district decided to implement full-day kindergarten district-wide in all non-charter schools over a four-year period beginning in fall 2004. We have student-level data for seven groups of students entering kindergarten from fall 2001 through fall 2007, the period both before and after full-day kindergarten was implemented. This dataset represents almost 297,000 students in 498 schools.⁵ Because full-day kindergarten was phased in over four years, there is significant variation in schools with and without full-day classes over time; this variation over time increases analytical power. We were also able to track kindergartners through third grade or spring 2008, if they stayed in the district. In addition, the district implemented full-day kindergarten for the same number of annual instructional minutes, so we have a more consistent measure of class time than other districts where class lengths may vary. Finally, the district's student population is large and diverse, including many EL students and economically disadvantaged students, so results are meaningful beyond the district level.

We examine three outcome areas for LAUSD students:

- Academic achievement as measured by a reading skills assessment at the end of kindergarten and first grade and California Standards Test (CST) English-Language Arts (ELA) and mathematics scores and proficiency in second grade;
- Retention in grade before second grade;
- English fluency skills as measured by scores on the first- and second-grade California English Language Development Test (CELDT) and reclassification as fluent-English proficient (RFEP) by the end of second grade.

To answer our research questions, we use a regression framework, explained in Technical Appendix C, to examine differences in student performance in schools, before and after full-day kindergarten is implemented. To isolate the true effect of full-day kindergarten participation, our study uses analytical methods that account for the fact that students are not randomly assigned to full-day kindergarten classes – and that LAUSD schools did not begin implementing full-day classes over the four-year phase-in randomly.

⁵ We include all non-charter schools as well as several charter schools for which we were able to determine full-day kindergarten status. See Technical Appendix B for further details on our analysis sample.

⁶ All English learners are tested annually to determine if they have reached a level of English language proficiency to be officially designated as RFEP, which means they are no longer considered an EL needing special language support. Several factors are considered in making reclassification decisions, which vary somewhat across districts. The reclassification criteria used by LAUSD in first and second grades include annual CELDT test results of an overall performance level of 4 or 5 and skill area scores of 3 or higher in listening and speaking, and a determination by the Language Appraisal Team that the student can be successful in a mainstream English program based on progress report marks of 3 or 4 in English Language Arts and three consecutive scores of benchmark on ELA periodic assessments, either Open Court or Reading Mastery (per LAUSD Memorandum REF-1848.4, 2007).

Failing to account for the non-random nature of full-day participation may give misleading results. Two potential problems with how students are assigned to full-day kindergarten classes concern us in this study: the student (or parent) selecting a school, and the school (or district) deciding whether a school will offer full-day kindergarten.⁷ Our models using student-level data allow us to address these potential concerns.

Limitations in comparing measures

The CST scores are intended to represent how well a student performs on a full range of skills based on the California ELA standards for the grade level. However, the kindergarten and first-grade reading skills assessments in our study are somewhat different and thus these results should be interpreted with caution. The kindergarten and first-grade skills assessments we use are composite measures of select reading skills assessed at the end of each year based on the Open Court reading curriculum. Teachers administer the Open Court skills assessments periodically throughout the school year, and the skills in our composite measures for each grade are limited to those that are available at the end of the school year across our time frame and to ones that are likely to have the least teacher subjectivity in administration. Kindergarten measures include uppercase and lowercase letter recognition, matching vowels to appropriate letters, and matching consonants. First-grade measures include spelling, reading comprehension, word reading, and average reading fluency. We sum the scores from the individual measures by grade and standardize them with a mean of zero and standard deviation of one.

We note that these measures are limited, especially for kindergarten, and do not fully reflect the California ELA standards for these grades. Furthermore, reading skills assessments are intended as diagnostic measures for teachers, are not meant to be compared between grades, and should not be directly compared to the second-grade CST ELA scores. However, they are the only student assessments available in kindergarten and first grade across our time period and serve as a limited measure of student learning. ELA activities predominate within kindergarten classrooms (LAUSD, 2005; Fernandez, 2005). Previous research has found a positive academic benefit of full-day kindergarten on ELA skills in the kindergarten year and we wanted to test that in this California study to the extent possible. For more information on these outcome variables, see Technical Appendix B.

⁷ For example, parents with greater resources or involvement may choose full-day classes if they are perceived as being desirable for learning. Children of these higher-resource parents may also be likely to have better academic performance regardless of their kindergarten program. If better performing students are disproportionately represented in full-day kindergarten classes, a comparison of outcomes between full-day and half-day classes would favor full-day, and perhaps exaggerate the true effect.

Alternatively, schools with high proportions of lower-performing children may choose to offer full-day classes as an academic boost. If lower-performing students are disproportionately enrolled in full-day kindergarten, a negative relationship between full day and student performance may be found but would not necessarily be a true effect. Another scenario is that schools with the ability to offer full-day classes due to space and teacher availability may adopt full-day kindergarten at higher rates and this would lead to the perception of a positive relationship, when in fact it may simply capture the effect of other factors associated with the school and not directly related to a full-day kindergarten effect.

Full-Day Implementation in LAUSD

In our sample, 30 percent of students were in full-day classes in the first year of full-day kindergarten implementation (2004–05), 77 percent in the second year, 94 percent in the third year, and the remainder in the fourth year. Schools were not allowed to implement full-day classes gradually; when they transitioned, it was for all classes within the school at the same time. Also, schools were not allowed to eliminate programs such as special education to make room for full-day classes, nor could they use libraries, auditoriums, or multi-purpose rooms (LAUSD, 2005). LAUSD allowed all schools with space to implement in the first year. For schools with limited facilities, the district received funds through a bond, Measure R, to provide additional facilities such as portable classrooms. The district gave first priority for Measure R funds to schools with the lowest API ranks.

Full-day kindergarten instructional time is meant to match that of classes in grades one through five at the school, the equivalent of 320 daily minutes for single-track schools with 180-day schedules over a school year. LAUSD intended that the longer kindergarten day follow the same general curriculum as half-day classes, but would provide more time for each curricular area. The district provided sample schedules for full-day implementation, but schedules were determined by local districts and schools. LAUSD board policy required a minimum of 30 minutes daily English language development instruction for EL students (LAUSD, 2005, 23). Our sample of EL students includes those who are in sheltered English immersion classes, not dual language or bilingual classes (a small percentage), and who are assessed in English.

In many LAUSD schools, half-day classes were offered in the morning and afternoon in a shared classroom, with one certificated teacher leading one class and then assisting in the other class, led by a second certificated teacher. Kindergarten teachers in the district are all on full-time contracts, so no additional teachers were required for the conversion to full-day. It is unclear how this affected the use of classroom aides or student-adult ratios, however. For our study, we were unable to determine how instructional time is spent in individual classrooms, or how many classroom aides were available.

Los Angeles Students and California Students

Although we would prefer to examine full-day kindergarten across all state public schools, the statewide school-level data publicly available from the California Department of Education (CDE) are limited in several important ways. However, we rely on them to test whether the LAUSD results are generally similar to the state's and therefore representative. This work is described in more detail in Technical Appendices C and D.

Our sample of LAUSD students may differ from statewide kindergartners in several ways. First, LAUSD students are more disadvantaged than California students—86 percent of kindergartners are economically disadvantaged in Los Angeles compared to about 58 percent in the state. In addition, 58 percent are EL students, compared to about 40 percent in the state; 44 percent of LAUSD students are in a school with an API rank of 1 or 2, compared to about 23 percent in the state;⁸ and 78 percent of LAUSD students are Hispanic, with about 52 percent in

⁸ An API rank of 1 is the lowest and 10 is the highest.

the state as a whole.⁹ Additionally, LAUSD students in full-day kindergarten classes experience 320 daily instructional minutes, which may differ from other schools in the state. Given these differences, this study might be more reflective of outcomes for urban disadvantaged kindergartners more than for kindergartners in the state as a whole.

We explored the similarity between district data and state-level data, testing whether the LAUSD results would be applicable in a broader California context.¹⁰ Although we have concerns about the limitations of the CDE publicly-available data for examining true effects of full-day kindergarten classes, they are useful to test whether the state sample produces results similar to the LAUSD-only sample of schools. Because we find that results from the state data are not statistically different from the LAUSD-only data,¹¹ we conclude that findings from the LAUSD student data have implications for statewide full-day kindergarten performance, at least for the CST score and English fluency outcomes.¹²

⁹ State percentage estimates are authors' calculations from publicly-available CDE data over our time frame.

¹⁰ We also examined the LAUSD data in several additional ways to observe whether the results changed depending on the specific model and sample of students used. If results change in these tests, it would mean that our findings are sensitive to specific data and analysis models and we would have to use caution in making claims because the results are less reliable than preferred. Based on the additional tests we performed, we find that our results using the LAUSD student data are robust to different ways of examining the data. The same patterns and magnitudes of results persist. See Technical Appendices C and D for further details on these tests.

¹¹ By this we mean that the results from two models, such as the state sample and the LAUSD-only samples from CDE, are not significantly different from each other.

¹² These are the only outcomes from the LAUSD student-level data that are available for comparison with the CDE data.

Do Students in Full-Day Kindergarten Classes Perform Better?

We report the answers to this question below, using effect sizes in standard deviation units or percentage points. With such a large number of students in our sample, we are able to detect small but statistically significant differences in outcomes. We focus on any differences we find that are statistically significant at the 5-percent level. Statistical significance is important but not the sole criterion by which to measure the effectiveness of full-day kindergarten; it is important to place statistically significant findings in the context of what is considered a meaningful difference.

Because we examine several outcomes that use different measures and that have different scoring ranges, we convert scores on academic and CELDT assessments to a common metric. We use a measure of standard deviation units known as effect sizes. These measures can be used to compare the size of effects across different outcomes, both within this study and others.

There is no common interpretation of what constitutes an effect size that is small or one that is large, although many authors refer to Cohen's (1988) designation of 0.20 as small and 0.80 as large. In education, where a host of factors affect student outcomes and many interventions do not improve them, smaller positive effects can be considered meaningful if a large number of children benefit.¹³ This is a subjective determination. Hill et al. (2008) find that educational interventions in elementary grades that have been well studied have mean effect sizes with a magnitude from 0.23 to 0.33, approximately.

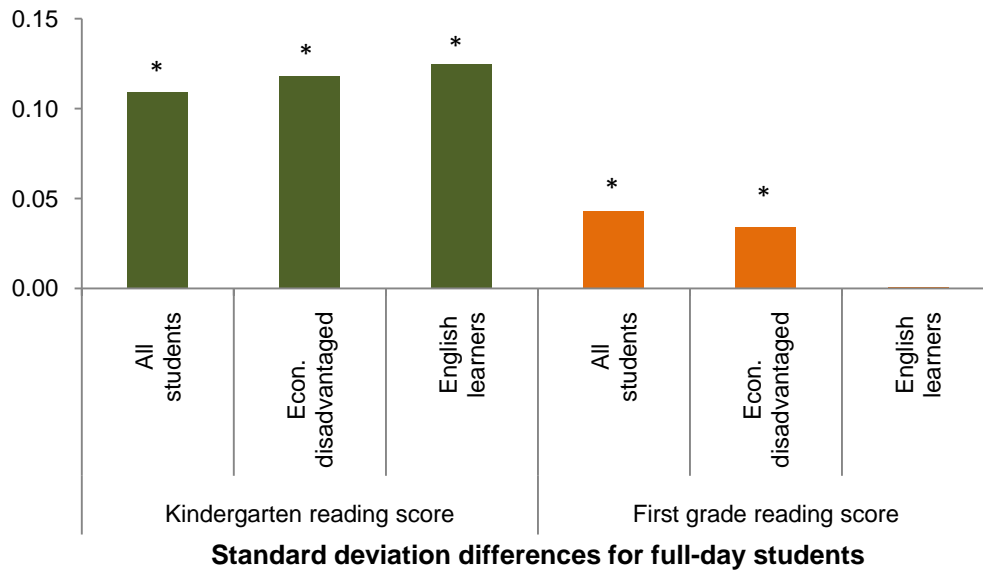
No Long-Term Test Score Benefit

Our analysis reveals a short-term benefit to full-day kindergarten classes, primarily in the kindergarten year, but little significant benefit for students' second-grade CST scores.¹⁴ For all full-day students, we find a 0.11 standard-deviation increase in kindergarten reading skills assessment scores compared to their half-day peers. Economically disadvantaged students and EL students experience similar benefits of 0.12 and 0.13 standard deviations, respectively (Figure 3). Looking separately at first-grade reading skills assessments, which are not directly comparable to kindergarten outcomes, we find on average a very small benefit of full-day classes for all students and for economically disadvantaged students of 0.04 and 0.03 standard deviations, respectively. However, the first-grade reading skills of EL students do not appear to benefit.

¹³ Another way to think about standard deviations is in percentage terms. Under a standard normal distribution of scores, if full-day students on average were to have an effect size of 1.0 standard deviation units, it would imply their mean outcome is better than the outcomes of 84 percent of half-day peers. If the two groups were not statistically different, the mean of full-day students would be better than 50 percent of half-day students. An effect size of 0.20 standard deviation units equates to 58 percent.

¹⁴ See Technical Appendix D for a complete set of results.

Figure 3. Small Early Reading Skills Benefit Found for Full-Day Kindergarten



SOURCE: LAUSD student-level data, kindergarten cohorts 2001–02 through 2007–08.

NOTE: * denotes a statistically significant result at the 5% level using a two-tailed hypothesis test.

Although we find only limited benefits to second-grade CST scores, for ELA proficiency (proficient or not proficient), all full-day kindergarten students on average appear to benefit, with a 1.5 percentage point increase in likelihood of proficiency in ELA compared to half-day students.¹⁵ There appears to be no benefit to math proficiency status, or to ELA or math scores. Nor do we find any benefits for economically disadvantaged or EL students in any of the CST assessments.¹⁶ We note again that the kindergarten and first-grade reading skills assessments are not intended for comparison with performance on the CST ELA test, so our results cannot be interpreted as a fading of effects over time. Each grade’s assessment measures something different and can only be used to determine if there is a difference between full-day and half-day students within that grade. Nonetheless, this pattern is consistent with the national studies noted above, which find a benefit to full-day kindergarten within the kindergarten year but no longer-term academic benefit.

¹⁵ The significantly significant 1.5 percentage point result is not consistently found across different regression models we tested (see Technical Appendix Table D2), so we consider this finding to be weaker than our results for other outcomes that are similar across different models.

¹⁶ We also examined third-grade CST results with a smaller number of students who stayed in our sample through third grade and found similar results, with the exception of ELA proficiency, which was insignificant. This smaller sample only includes one cohort of kindergartners who received full-day kindergarten during the first year of implementation. They entered kindergarten in the 2004–05 year so we have third-grade information on non-repeaters; however, only about 30 percent of this year’s cohort was in full-day classes. Thus, we report on second-grade outcomes in our study because we are able to include two cohorts who attended full-day kindergarten and this substantially increases the variation in full-day kindergarten attendance.

No Fluency Benefit for EL Students

We hypothesized that extra time in a kindergarten classroom speaking and hearing English would help EL students gain English fluency faster than students who were in shorter classes. We examined this idea in two ways. The first was to determine if EL students in full-day classes who are not reclassified fluent-English proficient by the end of first grade have higher CELDT scores by the fall of first or second grade. The second was to examine whether full-day EL students have an increased likelihood of being reclassified as proficient by the end of second grade. Contrary to expectations, our results indicate that EL students do not experience benefits in their first or second-grade CELDT scores after having been in full-day kindergarten, nor do they appear to become reclassified at greater rates than half-day students on average.¹⁷ Below, we look in more detail at several factors that may influence how EL students benefit from longer classes.

Likelihood of Early Retention Reduced

For LAUSD students, full-day kindergarten participation reduces the likelihood of being retained at any point before second grade.^{18 19} All groups experience a combined reduction of five percentage points in the likelihood of being retained in kindergarten and first grade compared to half-day students (Figure 4).²⁰ However, in California, retention policy is made at the district level and thus it is unclear if similar effects would be found in other districts with different retention policies. In LAUSD, retention decisions at the kindergarten and first-grade level are made with the agreement of the teacher, principal, other school staff, and parents, based on the student's best interest; there are no official district criteria mandated. Social and emotional skills as well as academic are considered. Given the strength and magnitude of our retention findings and the fact that retention policy varies by district, similar analyses for other districts are worthwhile, especially when reduced grade retention also reduces the cost of educating students.

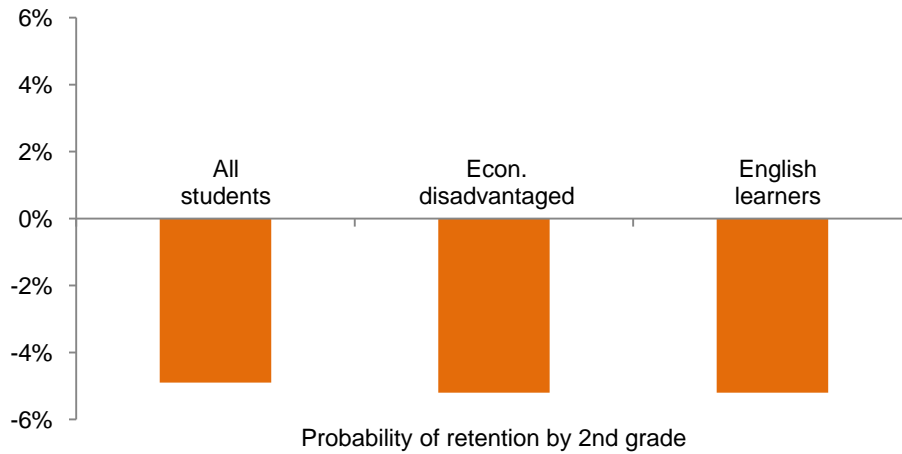
¹⁷ We also examined third grade CELDT scores and reclassification by end of third grade with a smaller sample of students, and the results were also non-significant.

¹⁸ This is contrary to our previous study with national data where we found no differences between full-day and half-day students for grade retention (Cannon, Jackowitz, and Painter, 2006).

¹⁹ We do not examine the effects of full-day kindergarten on retention at the end of kindergarten or first grade separately because a small percentage of students are retained in each grade. Also, in the district, more students are retained in first grade than in kindergarten. We want to be sure to account for any instances where perhaps a full-day student might be more likely to be promoted to first grade but then it is determined their progress is not adequate to be promoted to second grade. Using a smaller sample of LAUSD students, we also examined the probability of being retained by third grade and find similar and larger benefits of full-day kindergarten for all groups.

²⁰ We caution that the magnitude of this finding is very large compared to the average retention rate. We are unsure why, but exploratory analysis of all the LAUSD data indicate that there was a slight upward trend in K-1 grade retention in the early years of our sample before full-day classes were fully implemented, and this upward trend might have continued had full-day kindergarten not been implemented. We also find evidence that after full-day kindergarten was implemented for most students, there is a notable downward trend in K-1 retention, which supports our finding of a reduced likelihood of retention in full-day classes.

Figure 4. Reduced Likelihood of Retention by Second Grade



SOURCE: LAUSD student-level data, kindergarten cohorts 2001–02 through 2005–06.

NOTE: All results are statistically significant at the 5% level using a two-tailed hypothesis test.

It is interesting that we find a significant reduction in early grade retention but no improvement in CST scores and only a small effect across students for ELA proficiency. It would seem that one major reason a student would be retained is due to failure to meet academic standards, even the limited ones we examine in the earliest grades. If full-day kindergarten is helping students who are closest to the threshold for being retained, it might be that the initial kindergarten boost we observe is enough to affect retention decisions on average but is not enough to affect the average ability greatly on skills assessed in the CST tests. Further, it is possible that, because more half-day children are retained and have an extra year of schooling before taking the CST, our estimates of the effects of full-day kindergarten on second-grade academic achievement are lower than they should be. However, recent literature on early grade retention suggests that being retained in kindergarten or first grade is associated with negative or neutral academic outcomes (Hong & Raudenbush, 2005; Burkam et al., 2007; Wu, West & Hughes, 2008). We also tested the effect of full-day kindergarten on CST scores for non-retained students only, and the results are quite similar to the results that include retained students. Therefore, this scenario is unlikely to affect our results. An alternative consideration is that some factor associated with full-day kindergarten that does not relate to academic ability, such as maturity or behavior, is affecting retention decisions. Even if this is the case, it does not seem to negatively affect CST scores later since we do not find any negative differences.

Variations in Full-Day Benefits

Earlier, we found that full-day kindergarten classes can improve outcomes for selected LAUSD students, but we would not necessarily expect that full-day classes would benefit all children in the same way. Nor would we expect the same effect for full-day kindergarten students in every school because teacher quality, instructional practices, and support for classes vary by school.²¹ All things equal, are there certain characteristics of students or schools that might be worth targeting to improve outcomes related to full-day kindergarten funds?

To answer this question, we tested whether student abilities at school entry might change the effects that full-day kindergarten has on student outcomes. Although we don't have kindergarten school readiness measures such as tests of academic or emotional skills upon entry to kindergarten, we use school entry age, parent education level, and for EL students only, their kindergarten CELDT scores as proxies for student abilities at entry. Regarding age, research and anecdotal evidence suggests that older children may be better positioned to take advantage of full-day kindergarten (Cannon and Lipscomb, 2008, for example), and we find that some schools with full-day kindergarten programs phase in a full-length day over the first few months of the academic year because of concern that younger students will not be prepared for the longer day. For similar reasons, we might expect that a better command of English at kindergarten entry would lead to better academic performance for EL students tested in the English language. Instead, the extra class time may help those who have the lowest English ability the most. Finally, education research and our own analysis show that higher parent education levels are associated with better academic outcomes for their children.

In addition, it may be more important for students in schools with more disadvantaged students to have more time in the classroom. We tested for differences in the effect of full-day kindergarten based on a school's proportion of disadvantaged students, using state API rank, share of students in subsidized meal programs, and percentage of EL students.^{22 23} (These are also easily identifiable school characteristics for policymakers.) The Governor's Committee has recommended providing incentive grants to schools serving high concentrations of disadvantaged students.

Effects for All Students

Not surprisingly, for kindergarten reading and retention outcomes, where the full-day effect is strongest, we find the most significant differences in effects by student and school characteristic. For kindergarten reading skills, students who have parents with some college

²¹ We analyzed our data further to explore whether schools differed in the size of effects for full-day students compared to half-day students, and we found that there is variation in effects across schools, although the variation seems larger for retention outcomes than for academic outcomes. With available data, we are unable to determine specifically why full-day classes affect students differently in different schools. Because we cannot directly identify the source of these differences, we focus our tests on variables that we can observe. In some cases, these variables can be targeted by policymakers.

²² To be eligible to receive a subsidized meal, a student must reside in a household with an income at or below 185% of the poverty line.

²³ Although API rank is a measure of school performance, it is highly correlated with economic disadvantage.

education receive a smaller benefit from full-day kindergarten than do students with parents that have not attended any college. Presumably, more highly educated parents are able to provide a richer academic home environment to their children in half-day programs, and so full-day kindergarten is less important. It could also be the case that students with more educated parents enter kindergarten with more knowledge of the basic reading skills we measure and thus have less room to improve over the year. These parental education effects are not evident for other outcomes.

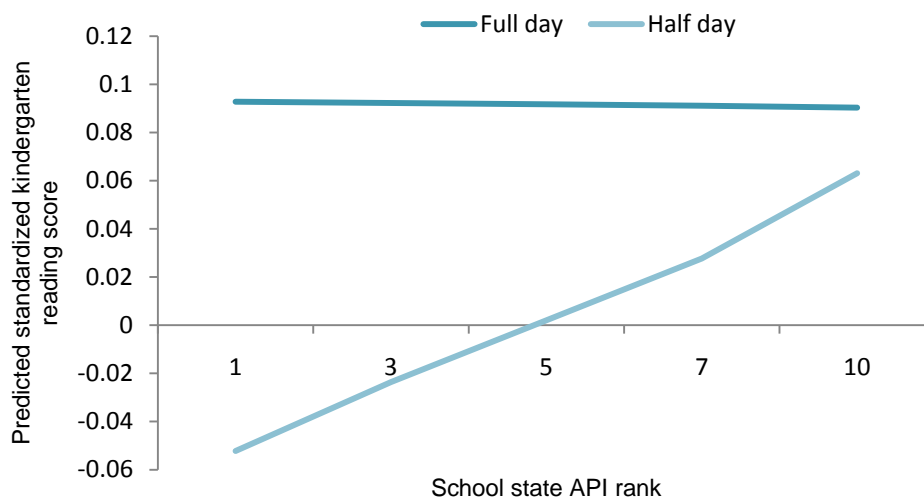
Older students receive no extra benefits from attending full-day kindergarten, suggesting that younger students do benefit from extra time for both kindergarten reading skills and a reduced likelihood of being retained, but these differences are very small and results for the differences by age for other outcomes are insignificant.

Students in schools that are performing more poorly receive larger academic benefits from full-day kindergarten for several outcomes. For reading skills in kindergarten through second grade, students in lower-ranked API schools receive slightly higher benefits from being in the classroom longer; it should be noted that the results for the interaction between API school rank and attending full-day kindergarten on grade retention are not consistent with the results for reading skills. The reduction in the likelihood of being retained when attending full-day programs is larger for students in higher-ranked schools than in lower-ranked ones. The results for students attending schools with higher percentages of free and reduced-price lunches are largely insignificant. The results that are significant, first- and second-grade reading, contradict the results on API rank. This may be due to the fact that there is little variation in the percentage of students in school receiving free and reduced price lunches in the LAUSD data.

Figure 5 shows the magnitude of the kindergarten reading effect over the distribution of API rankings. The test scores of full-day students do not vary across the distribution of school ranks, but half-day students in low-ranked schools do much worse than half-day students in highly ranked schools. This suggests that half-day students are at a particular disadvantage in lower ranked schools, and that full-day kindergarten seems to help students in lower ranked schools perform at a similar level to students in higher ranked schools on basic reading measures. We find similar results in both first- and second-grade reading scores for students in half-day programs; this further emphasizes that students in full-day programs at low-ranked schools receive a small relative advantage.²⁴

²⁴ The results for first and second-grade reading scores actually imply that students in full-day programs at low ranked schools do slightly better than full-day students in highly ranked schools. Because there are so few highly ranked schools and we have limited variation in type of kindergarten program in the analysis samples for 1st and 2nd grade scores, we believe it is appropriate to focus on lower ranked schools in these analyses because that is where the vast majority of students are found. The results comparing students across this more relevant range of schools implies that there are no significant differences in the performance of students who attended full-day programs in kindergarten by school rank.

Figure 5. Full-Day and Half-Day Differences in Kindergarten Reading Skills by School Rank



SOURCE: LAUSD student-level data, kindergarten cohorts 2002–03 through 2007–08.
NOTE: API=Academic Performance Index (1=lowest to 10=highest).

Effects for Economically Disadvantaged Students

The differences in the effects of full-day kindergarten for economically disadvantaged students are similar to those found for all students (Technical Appendix Table D5). As in the full sample, economically disadvantaged students with more highly educated parents receive less of a benefit from attending a full-day program than do students with parents with low education levels. The benefits of an economically disadvantaged student being older in this sample are identical to the full sample. The results suggest younger economically disadvantaged students benefit a small additional amount from extra class time compared to older students. Notably, we also find similar results for school rank: economically disadvantaged students in lower-ranked schools benefit most from attending a full-day program in terms of kindergarten and first-grade reading skills, second-grade CST-ELA scores and proficiency levels, and likelihood of being retained.

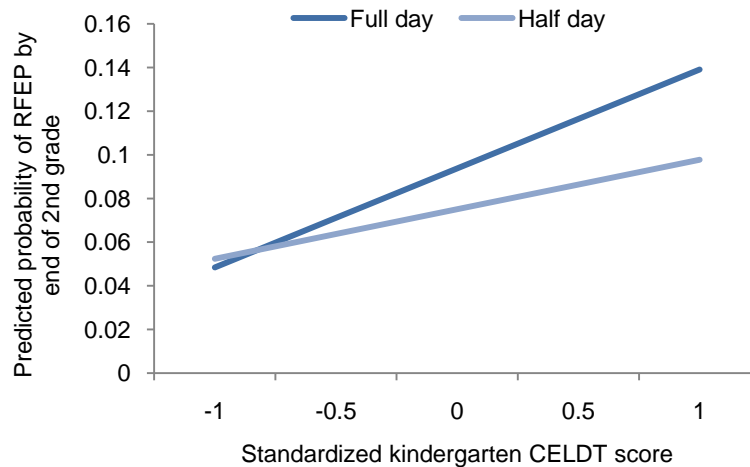
Effects for English Learners

EL students whose parents have less than a high school education benefit more from full-day kindergarten than those whose parents have a college education. Moreover, we see similar significant effects for EL students' first-grade reading skills – unlike results for the other groups – and for first-grade CELDT scores. EL students in low-ranked schools appear to benefit more than EL students in higher-ranked schools for several outcomes, indicating effects by school rank are consistent across all groups. In addition, we find differences in the effect of full-day kindergarten for students of different kindergarten English fluency levels as measured by the CELDT score in kindergarten. This evidence is mixed, however. For kindergarten reading scores and retention, students with lower initial fluency benefit more from the extra time. By contrast, students with the highest kindergarten CELDT scores in full-day programs are more likely to be reclassified fluent-English proficient by the end of second grade, are more likely to

be proficient on the second-grade CST-ELA, and have slightly higher first-grade reading and CELDT scores than those students with low kindergarten CELDT scores. These findings suggest that there are benefits throughout the population of EL students, but that those closest to being fluent-English proficient are able to move across this threshold by receiving more attention in a full-day classroom.

Figure 6 shows the probability of being reclassified as English-proficient by kindergarten CELDT score. There is little difference for students by type of kindergarten program if the kindergarten English fluency was a standard deviation below the mean (i.e., the bottom 16 percent of students taking CELDT in same grade and year). On the other hand, students who have kindergarten CELDT scores one standard deviation above the mean (i.e., the top 16 percent of students) are four percentage points more likely to be reclassified if they attended a full-day, not a half-day program.

Figure 6. Full-Day and Half-Day Differences in RFEP by Kindergarten CELDT Score



SOURCE: LAUSD student-level data, kindergarten cohorts 2001-02 through 2005-06.

NOTES: CELDT = California English Language Development Test; RFEP = Reclassified Fluent-English Proficient.

In sum, several student and school characteristics may increase the effectiveness of full-day kindergarten. The characteristics we examined seemed to affect grade retention and kindergarten reading skills more than other outcomes. Where we find significant effects by API school rank, students in low-API schools seem to have consistently better outcomes in full-day classes than do students in higher-rank API schools. Further, it appears that students who are younger in kindergarten and whose parents are less educated seem to benefit more from the extra time, although these effects seem to matter mostly for kindergarten reading skills and retention. The exception is EL students with lower-educated parents, who also seem to benefit more from full-day classes, judging by first-grade reading skills and CELDT scores. Overall, the differences in these effects are small across characteristics, with the possible exception of the effect of kindergarten CELDT score on RFEP status. At the same time, the results suggest that policymakers focus first on low-performing schools when considering a transition to full-day kindergarten.

Conclusion and Policy Implications

Full-day kindergarten classes, on average, seem to provide little to no statistically significant benefit compared to half-day classes for selected academic and English fluency outcomes from kindergarten to second grade. However, full-day kindergarten appears to significantly reduce the likelihood of grade retention in kindergarten or first grade. Although we find some small positive effects on basic reading skills in the earliest grades, they are smaller than those that other kinds of elementary school interventions might achieve. Moreover, we find little evidence suggesting that the achievement gap in second grade, as measured by test score performance, will narrow, on average. Given the cost of implementing full-day kindergarten for schools with limited space, educators and policymakers must consider if this intervention makes sense for individual schools.

One positive outcome – the reduced likelihood of retention – could have a sizeable effect if multiplied across the student population. It has the potential to produce meaningful cost savings for the state if there are fewer funded educational years per student or if an extra year in early elementary grades means higher costs for remediation or for extra support services, such as summer school and tutoring programs. In the longer term, several studies suggest reduced retention rates may help produce greater high school completion rates, although a more recent study finds only limited evidence of this (Jacob and Lefgren, 2007). Because retention policies are determined at the district level, and in kindergarten and first grade at the school level, it is unclear whether the same magnitude of effects would be found in other districts. However, given the focus on disadvantaged students statewide and the large proportion of disadvantaged students in LAUSD, other districts with similar retention policies may be interested in these findings. It would be worthwhile to explore the effect of full-day kindergarten on retention rates in other districts to determine if similar effects are found in other areas.

The lack of strong findings for average CST scores is notable because they are one of the accountability measures under No Child Left Behind (NCLB) legislation. These results imply that a primary motivation for full-day kindergarten, improving academic performance, is not being realized based on tests used for accountability purposes. For the same reasons, the lack of English fluency gains is also notable from an accountability standpoint.

Our findings also suggest that to maximize benefits, policymakers may want to consider focusing full-day classes on certain schools and along certain child characteristics. For instance, across the outcomes we measure, the benefit of full-day classes seems to be larger for students in the lowest-ranked API schools. Thus, targeting full-day kindergarten on low-performing schools, with an API score of 1 or 2, might be a useful place to start. These are also the schools that are composed of large numbers of economically disadvantaged and EL students in LAUSD, so Title I funds might be a possible funding mechanism. Notably, we find that this benefit applies to the CST ELA scores of economically disadvantaged and EL students, whereas we found no differences in ELA scores for all full-day students, on average. This suggests that full-day classes could sometimes improve CST ELA scores.

In addition, our study highlights how child age, parent education level, and kindergarten English fluency level may have small effects on how much benefit a student receives

from the longer class day. Students with high kindergarten CELDT scores, however, do appear to receive a greater benefit from full-day classes for CST-ELA and RFEP outcomes, which suggests that focusing on English language skills at or before kindergarten entry could result in better outcomes for EL students in full-day classes.

We note that the effects of the program are small and may be smaller than other education interventions could produce.²⁵ Only in a limited group of students, notably those who are in low API schools and those with higher kindergarten CELDT scores, do we find positive effects for full-day kindergarten on CST ELA scores and English fluency. However, we do recognize that full-day programs may produce some benefits that are not well captured by the measures we have access to in our study. For example, we do not test behavioral outcomes or measures such as approaches to learning (e.g., task persistence) that might matter in the long term. Also, we do not evaluate the benefits of full-day kindergarten on child care, or on increased household income; additional family resources from this income may positively affect student outcomes in later years in ways we cannot measure here.

Our research may have some useful implications for improving full-day kindergarten where it is already being implemented. Because we find that there may be a small benefit to full-day kindergarten, and because full-day classes are increasingly common, an opportunity exists for educators to consider ways that the additional class time may be used to improve student outcomes. Some early childhood experts believe that how time is spent may matter as much as or more than the quantity of time in the classroom (Gullo, 1990; Olsen and Zigler, 1989).²⁶ One important issue is how well teachers are prepared to use the additional class time and the support they receive. It may be that the extra time is more beneficial when teachers are specifically trained in making good use of it rather than merely extending normal instruction. A 2005 survey of LAUSD half-day kindergarten teachers indicated that some worried about how much professional development they would receive for full-day classes and how extra class-room support would be affected (Fernandez, 2005). This might be especially important for EL students with low kindergarten English language skills who need additional attention in the classroom.²⁷

Finally, many new programs have a “ramp up” period before they begin showing strong effects. This study only looks at the first few years of full-day kindergarten implementation. And though full-day kindergarten is not a new program, per se, because it extends what is already in place, it may be the case that teachers and schools will adjust to longer days over the first several years in ways that will be more beneficial to students over time.

²⁵ To put this in context, as noted earlier, educational interventions that have been well-studied have mean effect sizes with a magnitude around 0.23 to 0.33 Hill et al. (2008). The effects we find are generally less than 0.15 standard deviations on average for academic and CELDT outcomes or for differences within selected characteristics.

²⁶ We note again that LAUSD students receive 320 instructional minutes on average, which other state educators should put in the context of their own schools’ kindergarten schedules to consider whether students would receive the same benefits we describe.

²⁷ We are unable to address these issues in our study to determine with certainty whether the lack of strong effects is related to a lack of benefit from the extra time or is also an issue of how well teachers are prepared to use that time with all groups of students.

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