

Full-Day Kindergarten and Academic Achievement

In the following report, Hanover Research examines the impact attending a full-day kindergarten program may have on students' academic achievement, with particular emphasis on literature examining the long-term impact of kindergarten dosage. Following the introduction, the second section of this report provides an overview of research relating to the impact of a full-day schedule on achievement within the kindergarten year, while the third section details research pertaining to the lasting effects of full-day kindergarten through the third grade. The final section of the report explores the potential non-academic effects of full-day kindergarten.

Introduction

The ideal amount of kindergarten exposure is under constant debate, as the half-day kindergarten system is increasingly falling out of favor with parents, teachers, and policymakers alike for several reasons. While many working parents find it difficult to manage the half-day kindergarten schedule, teachers struggle to fit all curricular requirements into a day that is only a few hours long. In addition, research on the ways in which young children learn emphasizes the importance of a "developmentally appropriate curriculum," which itself requires a longer day to facilitate student-centered and student-led learning experiences.¹ The matter is of particular importance to policymakers today, as states look to improve student outcomes from early grades in order to promote long-term learning success. Full-day kindergarten is an early step that may be taken to promote these ends, but it is costly to implement: staffing and classrooms need to be doubled, as does the cost of supplies. In a time when districts are universally tightening their budgets in order to keep the system running, full-day kindergarten requires an investment to which many district cannot commit.

Despite these concerns, the many positive outcomes associated with full-day kindergarten enrollment have caused its popularity to triple since the 1970s. According to a study published by the Northwest Regional Educational Laboratory, 60 percent of kindergarteners now spend approximately six hours per day in the classroom—more than twice the amount students in half-day programs spend.²

Unfortunately, despite the great amount of research and literature devoted to the subject, there is no clear consensus regarding the long-term effects of full-day versus half-day kindergarten. A large body of research has attempted to determine the most appropriate dosage of kindergarten to ensure students' social, emotional, and academic success in school. Many studies only look at short-term effects, concluding that full-day kindergarten is superior to half-day in that it imparts larger academic gains over the course

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of the kindergarten year. These studies look no further than the end of the kindergarten year, which is largely insufficient, as it is intuitive that a year of more instruction will lead to greater gains by the end of that year. But how far-reaching are

¹ Baskett, R., Bryant, K., White, W., and Rhoads, K. July 2005. "Half-Day to Full-Day Kindergarten: An Analysis of Educational Change Scores and Demonstration of an Educational Research Collaboration." *Early Child Development and Care*, Vol. 175, No. 5. 2.

apple.rms.concordnhschools.net/modules/groups/homepagefiles/cms/498203/File/2009%20Instructional%20Minutes/Kindergarten%20research%20articles/Half%20to%20full%20day%20kinder%20Baskett.pdf

² "Full-Day Kindergarten: Exploring an Option for Extended Learning." December 2002. Northwest Regional Educational Laboratory. 4. www.mespa.net/sites/2961a8e8-4b04-4b38-8da2-75542594a9f1/uploads/NREL_Kindergarten_Study.pdf

the effects of this greater amount of instructional time? Is the great additional expense of implementing full-day kindergarten worth the long-term impact? If no appreciable gains are seen two, three, or even four years after the kindergarten experience, it may seem less important that students spend a few more hours per day in kindergarten.

In fact, the studies which purport to offer authoritative answers regarding the long-term effectiveness of one kindergarten dosage over another have been retroactively identified as largely flawed. Most recent literature on the subject begins by lamenting the poor quality and questionable statistical significance of past studies. Take, for example, a 2008 piece from the *Australian Journal of Early Childhood*, which states:

The effects of all-day kindergarten on student achievement have not been established on the basis of empirical evidence using a nationally representative large-scale database...Because of insufficient longitudinal research...there is limited evidence on the long-term benefits of all-day kindergarten for most children. Many quantitative studies have shown inconsistent findings, because of small samples, cross-sectional data, and less reliable outcome measures.³

To further illustrate the inadequacy of many past studies in determining the impact of full- or half-day kindergarten on students' long-term academic achievement, Andrea Lash et al. undertook a cataloguing of relevant studies and their reliability.⁴ Among 299 studies identified as applicable to the matter of achievement after participation in full-day kindergarten, only 11 were ultimately identified as having sound statistical methods, studying a group of sufficient size to be representative, and taking into account background variables which might otherwise impact achievement on their own.⁵ These studies represent only six longitudinal studies, which examined the Early Childhood Longitudinal Study–Kindergarten dataset collected by the National Center for Education Statistics. This once again demonstrates the poor state of research on the topic at hand.

However, this is not to say that the researchers conducting these studies have been remiss in any way; the empirical ideal is difficult to achieve when studying educational outcomes. With public elementary schools facing increased expectations and decreased resources, students cannot simply be randomly assigned to any teaching methodology. Rather, their own needs, strengths, and shortcomings must be taken into account in order to ensure high levels of achievement. There are many external variables to account for: aside from the length of the kindergarten day, students may be influenced by teacher experience, home setting, community culture, parental

³ Chang, M., & Singh, K. "Is All-Day Kindergarten Better for Children's Academic Performance?" December 2008. *Australian Journal of Early Childhood*. findarticles.com/p/articles/mi_hb6418/is_4_33/ai_n31677765/

⁵ Ibid., 3.

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⁴ Lash, A., Bae, S., Barrat, V., Burr, E., and Fong, T. December 2008. "Full-Day Kindergarten and Student Achievement: A Literature Review." www.wested.org/online_pubs/REL_West_FDK_Brief_ALL.pdf

involvement, economic advantage, and other characteristics of a child's life. From study to study, certain of these variables are undoubtedly addressed, particularly those touching on socioeconomic status. However, there has been "insufficient attention to these variables to firmly guide educators in decisions surrounding length of day in early education."

Executive Summary

Much of the research on the topic of full-day kindergarten and academic achievement, particularly long-term achievement, has come under scrutiny for insufficient statistical controls and unreliable methodologies. Few can come to an agreement about the effects of full-day kindergarten; detractors cite high costs of

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implementation along with a lack of evidence of long-term benefits, while supporters cite both academic gains and clear non-academic gains.

Looking at the short-term impact full-day kindergarten might have—that is, the impact on academic achievement within the kindergarten year itself—we find the same level of disagreement. Researchers who state there is no academic benefit to full-day kindergarten have had their research re-evaluated by later authors and their conclusions have been found to be lacking. Other authors find that there are in fact gains in academic achievement attributable to participation in full-day kindergarten, but those gains occur only in specific populations under specific circumstances. For instance, one study found that full-day kindergarten only improved boys' understanding of mathematical concepts.

The majority of research studying the short-term academic impact of full-day kindergarten, however, appears to agree that there are solid benefits across the kindergarten year. This is logical, given that extra time in kindergarten allows students more time to learn and be taught. In particular, full-day kindergarten results in gains in reading and math achievement.

The debate over the longer-term effects of full-day kindergarten is more heated, as there is far less consensus amongst researchers. Four studies we examine for this report find that there are gains to be seen in academic achievement when students attend full-day kindergarten, but they contend that the effects of full-day kindergarten wear off quickly,

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dissipating shortly after first grade entry. Two other studies go so far as to state that

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⁶ Baskett et al., Op. Cit., 422.

the effects of full-day kindergarten are seen into the third grade, while one daring study claims full-day kindergarten can impact student academic achievement well into middle school.

Because the literature on the effects of full-day kindergarten on academic achievement does not agree, we also briefly look at the other areas in which students might benefit from participation in such a program. We find more consensus amongst researchers in this regard, who typically agree that students experience fewer behavioral problems, increased social and emotional development, lower remediation rates, and higher attendance rates after attending full-day kindergarten. Teachers and parents also benefit from children's participation in full-day programs.

Overall, the clearest academic benefits to full-day kindergarten occur during the kindergarten year and can potentially affect achievement through the early elementary years, though there is no consensus about how long such effects may last. Other benefits to full-day kindergarten are not academic in nature but do assist students in acclimating to the school environment and can therefore set students up for success in school.

Achievement over the Kindergarten Year

The effects of a full day versus a half day of kindergarten programming are easiest to measure over the kindergarten year itself, with student entry and exit exams. Numerous studies have been conducted on student achievement in this manner. However, such studies only provide us with a look at the short-term effects of kindergarten dosage, which is perhaps insufficient evidence of the benefit of full-day kindergarten when considering the financial burden states undertake in order to implement such a change. There is a wide variety of conclusions drawn from data examining the impact of full-day kindergarten on students.

In the late 1990s, Joseph Fusaro compiled the results of 23 studies examining data on kindergarten students' achievement based on their full-day or half-day status.⁷ These studies reached back as far as the 1970s, and largely agreed that full-day kindergarten students showed greater levels of academic achievement than their half-day peers. Further—in an interesting illustration of the problem with some research on the topic—in 1995 Fusaro and Royce also examined a study from 1988 which had concluded that there is *no* significant academic gain to be had from attending full-day kindergarten and found errors in the statistical analysis. After correcting these errors, Fusaro and Royce found that the data pointed to "significant differences" in academic achievement in reading, vocabulary, and total test scores for students in full-day kindergarten, and that they showed greater progress than their half-day counterparts.⁸

Unfortunately, Fusaro's conclusions may be suspect: the corrections he made to the studies he examined resulted in the conclusion that full-day kindergarten students were put at a large advantage over half-day students. Meanwhile, nine of the 23 studies he examined found exactly the opposite. It is notable that more recent studies tend to find a more consistently positive relationship between full-day kindergarten and achievement by the end of the school year, but there are still exceptions.⁹

Another issue is that results often point toward very select positive outcomes, rather than universally positive outcomes. For instance, a 1990 study by Holmes and McConnell utilizing random selection and assignment within a metropolitan school district found that there were only real positive outcomes of full-day kindergarten in the area of male students' understanding of mathematical concepts.¹⁰

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⁷ As discussed in Baskett et. al. Op. cit. p. 420. (see Fusaro, J. (1997) The effect of full-day kindergarten on student achievement: a meta-analysis, *Child Study Journal*, 27, 269–280.)

⁸ Ibid. p. 420 (see Fusaro, J. & Royce, C. (1995) A reanalysis of research data, *Perceptual and Motor Skills*, 81, 358.) ⁹ Ibid. p.421.

Holmes, C., & McConnell, B. April 1990. "Full-day versus half day kindergarten: An experimental study." American Educational Research Association. www.eric.ed.gov/PDFS/ED369540.pdf

A 2004 study by Baskett et al. sought to determine the achievement gains made by children over the kindergarten year in both full- and half-day kindergarten in order to determine whether the length of the kindergarten day appeared to have an impact on children's learning. The Baskett et al. study is one of the eleven identified by the previously-mentioned Lash et al. report in which the methodologies of nearly 300 relevant research reports were

Table 1. Characteristics of Auburn School District¹¹

Characteristic	Value		
Total Schools	8		
Total Students	3,602		
FTE Teachers	304.8		
FTE Kindergarten Teachers	15.2		
Student/Teacher Ratio	11.8		
Setting	Small City		
Revenue per Student	\$11,578		

Source: NCES

examined for reliability as being statistically sound in its method. The authors conducted the study on kindergarten students in the Auburn School District, a suburban district with a largely economically disadvantaged base. The study followed two groups of students, each comprised of approximately 264 students; one group of students attended full-day kindergarten while the other attended half-day. These groups of students bridged the transition year in which half-day kindergarten was phased out for the district. Students were evaluated primarily on standard measures of curricular learning as well as on measures created by the school for inclusion in students' report cards. Each data input was gathered for the fall and the spring in order to access achievement across the year. The results pointed to several significant differences in favor of all-day kindergarten, including those relating to: reading level; literacy skills; letter sounds; and story sequence.¹² Meanwhile, marginal differences were found in students' ability to follow directions. On the other hand, no statistical significance was seen in all-day kindergarten students' ability to work left to right and create patterns. The ultimate conclusion of the Baskett study was that the data supports the district's transition from half-day to full-day kindergarten, in a small but statistically significant manner: "the child measures ... showed a pattern demonstrating modest academic advantage for the children attending full-day kindergarten."13

As another example of a study following student achievement only from the beginning to the end of the kindergarten year, we can point to Charlene Hildebrand's 2000 article on the topic. Hildebrand's subjects were the entire 1992-1993 kindergarten cohort across three schools in a primarily middle-class school district in a Midwestern city of 25,000. Each group of students was administered the Test of Early Reading Ability and Test of Early Mathematics, both of which are appropriate for children ages three through nine, and the Concepts of Writing informal

¹¹ "Search for Public School Districts." National Center for Education Statistics. nces.ed.gov/ccd/districtsearch/

¹² Baskett, Op. Cit., 425.

¹³ Ibid., 427.

¹⁴ Hildebrand, C. 2000. "Effects of All-Day and Half-Day Kindergarten Programming on Reading, Writing, Math, and Classroom Social Behaviors." National Forum Journal. www.eric.ed.gov/PDFS/ED459906.pdf

assessment. Additionally, teachers were asked to rate children's progress in social competence and behavior using the Hahnemann Elementary Behavior Rating Scale. The children were grouped by full-day, half-day, or alternate-day kindergarten settings. This study concluded that time in classroom—not quality of the learning environment—has the most significant impact on fostering high academic achievement. However, the full-day kindergarten group still only showed significant gains in reading over the half-day group; the differences in math and writing scores were statistically insignificant. Still, there were only minimal differences between full-day every-day kindergarten students and full-day alternate day students, suggesting there may be more to the matter than mere time in classroom.¹⁵

Stepping back from measures of academic achievement, we can see even shorter-term successes taking place in the classroom as a result of a full-day kindergarten schedule. At **Whitman Elementary School** in Portland, Oregon, full-day kindergarten was implemented in the 2001-2002 school year.¹⁷ Since then,

Table 2. Characteristics of Whitman Elementary School¹⁶

Characteristic	Value
Total Students	369
Kindergarten Students	19%
Free Lunch Eligible	69%
Setting	Large City

Source: NCES

administrators and teachers have had a chance to reflect upon the changes they have experienced in making the switch. According to teachers, most of the observed beneficial outcomes of full-day kindergarten relate directly to supporting the academic achievement of students. They note that full-day kindergarten has resulted in:

- ❖ More time to work on math every day, not just two days a week;
- ❖ More time for individual reading activities;
- More time to work on large motor skills using games and other activities; and
- ❖ More time for developing themes and working on science and art projects. ¹8

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¹⁵ Ibid., 12-12.

¹⁶ "Search for Public School Districts," Op. Cit.

¹⁷ "Full-Day Kindergarten: Exploring an Option for Extended Learning," Op. Cit., 20.

¹⁸ Ibid.

Achievement in First to Third Grade

It appears rather intuitive that more time in the kindergarten classroom will result in larger academic gains by the end of the kindergarten year. There is more time for instruction and teacher assistance, and the pace of the day is more relaxed and allows for more student-led learning and individual exploration. So what about the longer-term picture of student achievement? This section seeks to explore the question of whether full-day kindergarten has been shown to facilitate steady gains in academic achievement through the early elementary years.

The problems which plague research on the short-term effects of full-day kindergarten are also present in the research on long-term effects. Conclusions are inconsistent and data is less easily compiled when looking across multiple years. Many studies report that participation in full-day kindergarten results in higher academic achievement through the early elementary years, while others find that the initial academic gains are lost almost straightaway after kindergarten. Some argue that the effects of full-day participation diminish early, while others believe the effects persist through middle school. Several studies have also been criticized for their methodologies, with later researchers spotting irrelevancies, oversights, and statistical errors in the prior work.

Wolgemuth et al. sought to draw their own conclusions about the academic impact attending a full-day kindergarten program had on children, given the unreliability of past work on the topic.²⁰ Their study sample included a total of 489 students who attended either full- or half-day kindergarten between 1995 and 2001 at one elementary school in a middle-to-upper class city in Colorado in **Poudre School District**. Both kindergarten

Table 3. Characteristics of Poudre School District¹⁹

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Characteristic	Value		
Total Schools	54		
Total Students	25,960		
FTE Teachers	1,531		
FTE Kindergarten Teachers	102.9		
Student/Teacher Ratio	17		
Setting	City: Midsize		
Revenue per Student	\$9,637		

Source: NCES

formats placed children in small, ability-based groups in order to facilitate their learning. A much larger amount of time was spent on reading instruction than mathematics in both settings.

Students were tested upon kindergarten entry in both foundational reading skills and pre-math skills. The school then conducted reading and mathematics testing in the spring of each year to determine the level of students' ability in these core areas. The tests administered, developed by the Northwest Evaluation Association, measure

¹⁹ "Search for Public School Districts," Op. Cit.

²⁰ Wolgemuth, J., Cobb, B., Winokur, M., Leech, N., & Ellerby, D. May-June 2006 "Comparing Longitudinal Academic Achievement of Full-Day and Half-Day Kindergarten Students." *Journal of Educational Research*. Vol. 99, No. 50. 262.

student performance independent of grade level and correlate with other achievement tests such as the Colorado State Assessment Program test and the Iowa Tests of Basic Skills.²¹

Ultimately, the study concluded that full-day kindergarten students do learn more than their half-day counterparts, but the effects wear off quickly. By the start of first grade, the benefits of full-day kindergarten had diminished so as to no longer be statistically significant, in both reading and math. In an attempt to reason out why this occurs, the authors turned to an explanation from school administrators with whom they spoke. According to these administrators, teachers must focus their attentions primarily on those students who come into first grade with little foundational reading and math skills, and thus do not have enough time to work equally as hard with the high-achieving students. Because of this, the gain in academic achievement seen in the full-day kindergarten students gradually erodes with a lack of attention.²²

A 2005 paper presented at the Educational American Research Association Annual Conference also found no noticeable achievement gains lasting through third grade for full-day kindergarten students.²⁴ The study, headed by Jill Walston and Amy Rathbun (of the Education Statistics Services Institute) and Jerry West (of the Department Education), observed data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLS-K). These data followed students from kindergarten into the Table 4. Characteristics of the ECLS-K Group²³

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Characteristic	Percent of Sample				
Full-Day Kindergarten	54%				
Half-Day Kindergarten	46%				
Female	50%				
Male	50%				
English as home language	89%				
Other language at home	11%				
At or above federal poverty threshold	80%				
Below federal poverty threshold	20%				
Single-parent family	24%				
Two-parent family	76%				

Source: American Educational Research Association

fifth grade, and represents the largest data collection effort on this topic, including 22,782 students from 1,277 schools.²⁵ The students were primarily above the federal poverty threshold, from two-parent families, and with maternal education levels at high school or above.²⁶

²¹ Ibid., 263.

²² Ibid., 268

²³ Walston, J., West, J., & Rathbun, A. April 2005. "Do the Greater Academic Gains Made by Full-Day Kindergarten Children Persist Through Third Grade?" American Educational Research Association. 6. www.air.org/files/AERA2005Full-day_Kindergarten.pdf

²⁴ Ibid.

²⁵ Ibid., 5.

²⁶ Ibid., 6.

The analyses focused on the long-term relationship of kindergarten dosage with reading and mathematics achievement, though the researchers also explored the effect of other background characteristics such as ethnicity, sex, and mother's education using two-level hierarchical linear modeling. Such characteristics were only described in relation to children's skills and knowledge at the outset of the kindergarten year.

This study concluded that children who attend full-day kindergarten *do not* tend to "maintain their [academic] advantage over the three years after kindergarten."²⁷ On average, children gained 107 points on reading tests and 84 points in math from the fall of kindergarten to the spring of third grade; however, the reading score growth per month for full-day kindergarten participants was 0.04 points lower than half-day kindergarten students by the end of third grade, with no appreciable difference in math scores between the groups.²⁸ The only group for which full-day kindergarten-related achievement gains were still visible at the end of third grade were those students for whom English was not the primarily language spoken at home. For these students, the achievement gap between them and native English speakers was narrowed by the end of third grade in reading.²⁹ Finally, the study also concludes that full-day kindergarten is "associated with greater growth in mathematics when measured through third grade for Hispanic children as compared to White children after accounting for other child and family characteristics."³⁰

A 2005 study by Cannon et al. also utilized the ECLS-K dataset, but narrowed the sample size drastically from the original 22,000+ students to 8,540 who met certain criteria for inclusion.³¹ Students had to have complete data from kindergarten through third grade, have attended kindergarten for the first time, have attended the same kindergarten program for the whole year, and have been identified by state and county. The primary independent variable for the study was whether the children attended full-day kindergarten.³²

Cannon et al. found that while achievement at the end of the kindergarten year was much higher for full-day kindergarten students, those gains had been cut in half for math scores and eliminated entirely for reading scores by the end of first grade. The gains in mathematics were then seen to be wholly insignificant by third grade.³³ As the authors note, "we observe that attending a full-day kindergarten is significantly related to greater gain scores during kindergarten for both reading and math scores,

²⁷ Ibid., 15.

²⁸ Ibid., 12, 15.

²⁹ Ibid., 15.

³⁰ Ibid., 16.

³¹ Cannon, J., Jacknowitz, A., & Painter, G. October 2005. "Is Full Better than Half?" RAND Corporation. 9. www.rand.org/pubs/working_papers/2005/RAND_WR266-1.pdf

³² Ibid., 13.

³³ Ibid., 21.

is significantly related to greater math gain scores from kindergarten to first grade, but unrelated to increases in gain scores for reading or math by third grade."³⁴ So even with the sample size decreased and selected for specific dependent variables, the conclusion remains the same: students see great initial gains from full-day kindergarten which then taper off and disappear entirely by the end of third grade.

While Wolgemuth et. al., Walston et. al., and others conclude that there are no significant differences in achievement shortly after students leave kindergarten, there are others who disagree. For example, in a 2000 article for Early Child Development and Care, Dominic Gullo found that the positive impact full-day kindergarten attendance has on a child lasts at least through the second grade.³⁵ In first and second grade, children from full-day kindergarten settings scored higher in mathematics and reading on standardized tests, had fewer absences, and were less likely to be held back a year.³⁶

Many studies which find positive "long-term" results fail to look past first grade in order to do so. Elicker and Mathur, for instance, studied 12 all-day and half-day kindergarten classes for two years and found (among other conclusions suggesting the benefit of full-day kindergarten) that the full-day students were ultimately more prepared for first grade entry.³⁷ Elicker later concluded that "there is not current, strong evidence that the academic achievement gains of full-day kindergarten persist beyond first grade."³⁸

³⁴ Ibid., 20.

³⁵ Gullo, D. 2000. "The long term educational effects of half-day vs. full-day kindergarten." *Early Child Development and Care.* Vol. 160, 17–24.

³⁶ Baskett et al., Op. Cit., 421.

³⁷ "Elicker, J. & Mathur, S. 1997. "What Do They Do All Day? Comprehensive Evaluation of a Full-Day Kindergarten." *Early Childhood Research Quarterly*. Vol. 12. 18. www.findlaycityschools.org/forms/adk/EarlyChildhoodResearch.pdf

³⁸ "Full Day Kindergarten: Exploring an Option for Extended Learning." December 2002. Northwest Regional Educational Laboratory. 11. www.mespa.net/sites/2961a8e8-4b04-4b38-8da2-75542594a9f1/uploads/NREL_Kindergarten_Study.pdf

However, there are exceptions. In a study by the Center for Evaluation and Education Policy, researchers conducted analyses of the effect of full-day kindergarten on student achievement across a number of districts in Indiana. 40 Within the Evansville-Vanderburgh School Corporation, students were followed from their kindergarten year through the third grade. It was found that there were significant academic gains seen amongst the full-day kindergarten students which did not exist for the half-day students by the end of the kindergarten year, as would be expected. 41 However, the research then goes on to state that full-day students had better reading

abilities in first grade than half day students did, and further, full day groups remained significantly ahead of half-day students in comprehension and vocabulary skills.⁴²

Finally, the Evansville group was tested again in the fifth and seventh grades. Given the amount of research indicating that the impact of full-day kindergarten does not last Table 5. Characteristics of Burnsville-Eagan-Savage School District³⁹

Characteristic	Value
Total Schools	24
Total Students	10,194
FTE Teachers	620
FTE Kindergarten Teachers	29
Student/Teacher Ratio	16.4
Setting	Suburb (Large)
Revenue per Student	\$11,774
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Source: NCES

well past even the first grade, one might expect that the Indiana studies find effects to be waning or even nonexistent by these late years. However, the study goes on to state that both fifth-grade and seventh-grade scores for the full day kindergarten group were higher than the half day group in all areas studied.⁴³

Another exception to the idea that academic gains are not seen past the first grade comes from a school district in Minnesota. Researchers from the University of Minnesota examined data and found that students who participated in a free full-day kindergarten program in the **Burnsville-Eagan-Savage School District** demonstrated notable gains in standardized test scores in both first and second grades, when compared to half-day kindergarten students and fee-based full-day kindergarten.⁴⁴ All kindergarten students were given the Gates-MacGinitie test in the fall and spring of their kindergarten year, then subsequently in the spring and fall of first and second grades. The results are summarized in the following table:

³⁹ "Search for Public School Districts," Op. Cit.

⁴⁰ Plucker, J., Eaton, J., Rapp, K., Lim, W., Nowak, J., Hansen, J., and Bartleson, A. January 2004. "The Effects of Full Day versus Half Day Kindergarten: Review and Analysis of National and Indiana Data." Center for Evaluation and Education Policy. 9. ceep.indiana.edu/projects/PDF/FDK_report_final.pdf

⁴¹ Ibid.

⁴² Ibid., 18.

⁴³ Ibid., 19.

⁴⁴ Wahlstrom, K., Michlin, M., & Hansen, A. January 2007 "District 191 All-Day Kindergarten Program Longitudinal Findings 2003-2006." Center for Applied Research and Educational Improvement, University of Minnesota. 21. www.mespa.net/sites/2961a8e8-4b04-4b38-8da2-

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Table 6. 1st and 2nd Grade Gates-MacGinitie Scores by Kindergarten Type⁴⁵

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	1 st Grade Fall	1 st Grade Spring	2 nd Grade Fall
National Average	50	50	50
Universal Full-Day	55.93	65.46	61.82
Fee-Based Full-Day	57.83	65.2	56.35
Free Half-Day	45.37	57.74	47.19

Source: Center for Applied Research and Educational Improvement

The two full-day cohorts see similar levels of achievement across the first grade, but 2nd grade fall scores are slightly higher for the free full-day program group. Across all three measured time periods, the half-day kindergarten cohort performed significantly below the full-day kindergarten students, through second grade.

The study then moves on to examine the effect of full-day and half-day kindergarten programming on students based on socioeconomic status, as represented by free or reduced lunch status. The district is fairly middle-class, with 35% percent of students qualifying for the federal lunch program as of the 2009-2010 school year.⁴⁶ The test results of this permutation of the data are available below:

Table 7. 1st and 2nd Grade Scores: FRL Status⁴⁷

	Universal Full-Day K		Fee-Based Full-Day K		Free Half-Day K	
	FRL	No FRL	FRL	No FRL	FRL	No FRL
1 st Grade Fall	51.93	59.29	43.81	62.08	36.69	51.52
1 st Grade Spring	60.77	68.69	53.52	68.57	49.01	63.89
2 nd Grade Fall	56.32	64.43	43.91	60.42	38.38	54.84

Source: Center for Applied Research and Educational Improvement

From the table above, it is evident that all students made gains from the end of the kindergarten year to the end of the first grade year. It is also evident that the gains made by economically disadvantaged students were not as great as those made by the non-free reduced lunch status students. However, students receiving FRL benefits do perform better on first and second grade assessments after having attended full-day kindergarten over half-day kindergarten. The same trend appears in the study's examination of English language learners.⁴⁸

⁴⁵ Ibid.

^{46 &}quot;Burnsville Public School District: Student Demographics." Minnesota Department of Education. http://education.state.mn.us/ReportCard2005/demographics.do?SCHOOL_NUM=000&DISTRICT_NUM=0191&DISTRICT_TYPE=01

⁴⁷ Ibid., 22.

⁴⁸ Ibid.

Non-Academic Effects of Full-Day Kindergarten

While kindergarten is not as academically-driven as later grades, academic achievement is a significant concern as districts push toward higher and higher levels of competency amongst students in line with national goals. Research may be inconclusive regarding full-day kindergarten's long-term academic effects, but it is useful to examine the other impacts full-day kindergarten might have on children.

Literature points to a number of areas in which children can be impacted when attending full-day kindergarten, and indeed the effects are far-reaching. A 2005 WestEd Policy Brief provided an overview of the impacts full-day kindergarten can have on students, aside from academic achievement. These areas include:

- ❖ Improved student attendance: a number of studies have shown that students are less likely to miss school days after attending full day kindergarten; effects last into the primary grades.
- ❖ Increased social and emotional development: The structure of full-day kindergarten can improve children's social, emotional, and behavioral development. Research is of mixed opinion regarding the longevity of these effects.
- * Reduced retention and remediation rates: Full-day kindergarten's impact on academic achievement can help students stay in line with their grade expectations, reducing the likelihood students will be held back. One study, for instance, finds full-day students to be more than twice as likely to remain on grade through third grade.⁴⁹

Elsewhere, in Saskatchewan, Canada, full-day kindergarten has been identified as the catalyst behind an increase in independence in learning and a greater level of classroom involvement, productivity, and ability to reflect amongst kindergartners.⁵⁰

Such positive outcomes from full-day programs are generally attributed to the types of learning facilitated by the longer day. Full-day curriculum allows for greater continuity of day-to-day activities, field trips, and free play as well as time for teachers to become familiar with each student's developmental needs. Full-day kindergarten systems also tend to feature more repetition of academic content, offer more

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⁴⁹ "Full-Day Kindergarten: Expanding Learning Opportunities." April 2005. WestEd. 1. www.wested.org/online_pubs/po-05-01.pdf

Muhajarine, N., Horn, M., Glacken, J., Evitts, T., Pushor, D., Keegan, B. 2007. "Full Time Kindergarten in Saskatchewan." Community-University Institute for Social Research. University of Saskatchewan. 7. www.usask.ca/cuisr/docs/pub_doc/cuisr_mandate/FTK1.pdf

remedial instruction, and emphasize reading and math achievement more than half-day kindergarten.⁵¹

Most studies which perform teacher interviews as part of an assessment of academic achievement address behavioral differences amongst full- and half-day kindergarten students as well, and many of these studies find positive correlations between kindergarten dosage and student behavior. A study by Hildebrand found that when measured according to the Hahnemann Elementary School Behavior Rating Scale, students attending half-day kindergarten achieved significantly more positive behavioral ratings than full-day students in the areas of originality, independent learning, involvement, productive with peers, intellectual dependency, failure anxiety, approach to teacher, inattention, and academic achievement.⁵² The data implies that half-day kindergarten is better for children's social development and results in fewer negative classroom behaviors.

Cannon et al. however, disagree with Hildebrand's findings. Their analysis found "no effect of full-day attendance on the likelihood that a student will exhibit internal behavioral problems, and a small, positive probability of exhibiting external behavioral problems in kindergarten and third grade." This is thought to be because full-day schooling so early in a child's life can cause them to feel overwhelmed and pressured, leading to acting out.

Not only do students benefit from the longer kindergarten day, but parents and teachers as well. According to the research, parents benefit due to:

- Lowered childcare costs possible;
- ❖ The opportunity for lower-income families to enroll children in a higher quality early education program than might otherwise be affordable in the private market;
- Less difficulty scheduling childcare and transportation; and
- ❖ Increased opportunities to get involved in their children's classroom, as well as to communicate with the teacher.⁵⁴

Teachers, as well, can benefit from the implementation of full-day kindergarten. Examples of benefits include:

- Reduced ratio of transition time to learning time;
- ❖ More time to spend with students individually and in small groups;
- ❖ More time to get to know and communicate with parents;

⁵³ Cannon, J., Jacknowitz, A., Painter, G. October, Op. Cit. 25-26.

⁵¹ Chang, M., and Singh, K.. December 2008. "Is All-Day Kindergarten Better for Children's Academic Performance?" *Australian Journal of Early Childhood.*

findarticles.com/p/articles/mi_hb6418/is_4_33/ai_n31677765/?tag=content;col1

⁵² Hildebrand, Op. Cit., 14.

⁵⁴ "Full-Day Kindergarten: Exploring an Option for Extended Learning," Op. Cit., 8.

More time to assess students and individualize instruction to their needs and interests; and

❖ Fewer total students—20 to 25 per year as compared to 40 to 50—than in two half-day classroom.⁵⁵

So while the matter of whether academic achievement is increased by participation in full-day kindergarten remains undecided amongst researchers, there are at least other widely agreed-upon benefits to the implementation of such programs.

55 Ibid.

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