THE EFFECT OF FULL-DAY KINDERGARTEN ON STUDENT ACHIEVEMENT

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Clinical Research Study Committee:

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ABSTRACT

This case study examined the full-day kindergarten program and its impact on student achievement. The assessment data were collected from the DIBELS (Dynamic Indicators of Basic Early Literacy Skills) assessment taken from half-day and full-day kindergarten students in the Shawnee Mission School District.

The DIBELS assessments were administered at the beginning of the school year (pretest) and at the end of the school year (posttest). Each tested indicator was analyzed and compared among students to make recommendations for intensive instructional support. This study used a two-way ANOVA when two types of factors divided students into two comparable groups. An analysis of variance (ANOVA) was used to determine if there were any significant differences between the treatment methods of select half-day and full-day kindergarten students in reading achievement as measured by the DIBELS assessment administered during the 2006-2007 school year in the Shawnee Mission School District.

Data were collected from 597 kindergarten students by analyzing DIBELS scores from the fall and spring. This study was quantitative and consisted of data collected from
the DIBELS assessment. The analysis of variance (ANOVA) was used when one factor or treatment variable (achievement of full-day kindergarten students) was explored and there are more than two groups within this factor.

Data analyzed from this case study gave appropriate feedback as to the overall impact of the full-day kindergarten on student achievement. While there was some improvement in the DIBELS scores of those students participating in the full-day program, the results were not significant.
ACKNOWLEDGEMENTS & DEDICATIONS

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Introduction

In 1837, Frederich Froebel established the first kindergarten in Germany. “Play was seen as a method of education and a way for the child to copy the natural life of man.” (Bloom 110) Froebel created “a child’s garden” for children ages three to seven which emphasized the total development of children mentally, socially, and emotionally. Many educators of this era believed young children learned differently than older children. Froebel operated his kindergarten in the afternoon for two hours and focused little attention on the length of the school day.

Kindergarten programs made their way to the United States in 1857. Margarethe Shurz opened the first Froebelian program in Wisconsin. In 1873, the first English speaking full-day program was inaugurated when the city of St. Louis, Missouri included kindergarten into its public system (Hill 8).

As a result of the teacher shortage that occurred during World War II, kindergarten programs throughout the Unites States were developed as half-day programs in order to accommodate more children. Full-day programs began to
re-emerge in the 1960s and 1970s (Oelerich 16).

This philosophy and model remained intact until 1970. Early childhood programs shifted traditional kindergarten programs from “play-based” to a more academic model. As a result, more emphasis was placed on reading and math in these new programs.

In 2000, nearly two thirds of America’s three and four year olds attended some kind of preschool program, up from 5% in 1964 (Belsie 2). The function of kindergarten from previous years in many communities has now become the role of preschool programs.

Nationally, the trend is moving to full-day kindergarten programs. From 1969 to 1982, student enrollment rose from 10% to 30%. By 1984, two states had full-day kindergarten programs for all of their kindergarten students, while eleven were providing the extended program for 50% or more, and ten other states had full-day programs for 25% or more (McConnell 48). By 1989 nearly half of the five year olds in the country were enrolled in full-day programs (Olsen 167).

Background for the Study

During the spring of 2006, the Shawnee Mission School District in Shawnee Mission, Kansas began to explore the benefits of offering full-day kindergarten to students
entering kindergarten in the fall of 2006. Parents in the school district have been asking for this option for three years but the school district has maintained the half-day kindergarten program. Across the Shawnee Mission School District half-day kindergarten sessions have been offered ranging in class size from fourteen to twenty-four depending on the fall enrollment. From approximately 2002 until 2005 kindergarten class sizes have ranged from twenty to twenty-four students. Hours have been spent analyzing the benefits of offering the full-day program.

In particular, the district has struggled with how to finance this program to best meet the needs of the students labeled at-risk while still meeting the needs of the rest of the learning community. Full-day kindergarten programs are not funded in the state of Kansas. Students who receive free or reduced lunch can attend the full-day program at no cost. Parents whose children do not qualify for free and reduce lunch pay for the full-day program. The parent pay option is open to every student.

Additionally, there is strong emphasis placed on each individual building to continue to make Adequate Yearly Progress (AYP), as defined by the legislation commonly known as No Child Left Behind (NCLB), and improve student achievement in the areas of reading and math. Schools
continue to adjust and alter program opportunities to meet the goals set forth by No Child Left Behind (NCLB) especially in the area of full-day kindergarten. It became necessary that the Shawnee Mission School District offer a full-day kindergarten program to meet the demands of Adequate Yearly Progress (AYP).

The Shawnee Mission School District is located in northeast Johnson County, Kansas. Johnson County’s population was estimated to be 506,562 at the time this study began, making it the most populous county in the state. Its county seat is Olathe, and its most populous city is Overland Park. Johnson County is nationally recognized for the quality of its six school districts. Three of the county’s school districts, Blue Valley, Olathe, and Shawnee Mission repeatedly are ranked among the top twenty-five in the country by Expansion Management magazine (Press). This magazine’s goal is to evaluate and compare various communities throughout the country in order to determine which will best enhance their long-term business requirements. Johnson County has the highest median income in the state and the nation’s forty-third highest per-person income and sixty-second highest median household income. Most of the county is suburban and is a part of the Kansas City Metropolitan Area that includes
municipalities in both Kansas and Missouri.

The enrollment in the Shawnee Mission School District has continued to decline over the last twenty years. In 2005, the total number of households in the Shawnee Mission School District was estimated at 97,879 (See Table 1.1). Of the 97,879 there were 67,623 homeowners and 30,256 renters. Total growth in the number of households increased by 14% (See Table 1.2). The average household size in Shawnee Mission is approximately 2.18 residents. Table 1 & 2 illustrate the total number of households and the average household size in 2005.

Table 1: Total Households in SMSD

<table>
<thead>
<tr>
<th>Household Type</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeowners</td>
<td>67,623</td>
</tr>
<tr>
<td>Renters</td>
<td>30,256</td>
</tr>
<tr>
<td>Total Households</td>
<td>97,879</td>
</tr>
</tbody>
</table>

Source: County Economic Research Institute, 2005

Table 2: Average Household Size in SMSD

<table>
<thead>
<tr>
<th>Percentage of Households</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of Family Households</td>
<td>63.6%</td>
</tr>
<tr>
<td>Percentage of Homeowners</td>
<td>69.2%</td>
</tr>
<tr>
<td>Percentage of Renters</td>
<td>30.8%</td>
</tr>
<tr>
<td>Average Annual Household Growth Rate</td>
<td>.14%</td>
</tr>
<tr>
<td>Average Household Size</td>
<td>2.18</td>
</tr>
</tbody>
</table>

Source: County Economic Research Institute, 2005

The annual Shawnee Mission School District Superintendent’s Report to the State Board of Education noted that Shawnee Mission had 28,450 students in grades K-12 in September of 2005. This figure included 9,694 high
school students, 4,472 middle school students, and 14,284 elementary students in the Shawnee Mission School District.

According to the Shawnee Mission School District records, (See Table 3) 52% of the students or 15,271 are male, with 48% or 13,179 female. Additionally, 82.9% of all students in the Shawnee Mission School District reported their ethnic background as White/Caucasian. Approximately 3.1% of all Shawnee Mission School District students are of Asian/Pacific Islander descent, while 6.7% of students are of African-American descent. Records also show that 6.8% of the students in the Shawnee Mission School District are of Hispanic background, and 0.5% are American Indian/Alaskan Native descent.

Table 3: Ethnicity and Gender in SMSD

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>White/Caucasian</td>
<td>82.9%</td>
</tr>
<tr>
<td>Asian-American/Pacific Islander</td>
<td>3.1%</td>
</tr>
<tr>
<td>African-American</td>
<td>6.7%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6.8%</td>
</tr>
<tr>
<td>Native American/Alaskan Native</td>
<td>.5%</td>
</tr>
<tr>
<td>Males</td>
<td>52%</td>
</tr>
<tr>
<td>Females</td>
<td>48%</td>
</tr>
</tbody>
</table>

Source: Superintendent’s Report, SMSD, 2005

The Shawnee Mission School District uses the cohort survival method of projecting enrollment for future years. A projection is made by applying the corresponding three-year average cohort survival rate to each grade level to estimate the subsequent year enrollment. The cohort
survival method uses past experience to project the future. As an example, a school might have a 4th grade class with eighty students. In the subsequent year, these 4th graders will be promoted to 5th grade. If this 5th grade is now 90 students, the cohort survival rate would be 112% (90/80). A rate above 100% suggests inward migration from other communities. A rate below 100% suggests an outward migration. Each building in the Shawnee Mission School District has a cohort survival rate for each grade level. After these calculations are made the principals are asked to provide information about the community that suggests trends are not aligned with normal expectations for future enrollment as a result of new housing, business growth or decline, and fluctuations in migration. This information is used to adjust the calculations.

While the cohort survival method has shown to be very accurate for the district for one year, multiple year projections are much more unreliable. The Shawnee Mission School District uses other data from the state to estimate the size of future kindergarten classes.

The Shawnee Mission School District enrollment history and trends reflect a district with declining enrollment. Figure 1 and Table 4 illustrate the Shawnee Mission School District enrollment history and projections. Since 1986,
the annual enrollment has ranged from 30,636 in the 1986-1987 school year to 28,450 in the 2005-2006 school year. Enrollment increased an average of 156 students per year from 1986-1987 to 1994-1995. Since that time the number of students has decreased by an average of 279 per year. This decrease is proportionately distributed across the elementary, middle, and high school levels.

Table 4: Shawnee Mission School District Enrollment History and Projections*

<table>
<thead>
<tr>
<th>Sept.20</th>
<th>K-6</th>
<th>7-8</th>
<th>9-12</th>
<th>Total</th>
<th>Difference</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>15,123</td>
<td>4,464</td>
<td>10,621</td>
<td>30,636</td>
<td>-293</td>
<td>-0.96%</td>
</tr>
<tr>
<td>1987</td>
<td>15,487</td>
<td>4,401</td>
<td>9,999</td>
<td>30,343</td>
<td>-272</td>
<td>-0.57%</td>
</tr>
<tr>
<td>1988</td>
<td>15,955</td>
<td>4,261</td>
<td>9,466</td>
<td>30,171</td>
<td>-172</td>
<td>0.22%</td>
</tr>
<tr>
<td>1989</td>
<td>16,295</td>
<td>4,364</td>
<td>9,029</td>
<td>30,236</td>
<td>65</td>
<td>0.22%</td>
</tr>
<tr>
<td>1990</td>
<td>16,762</td>
<td>4,499</td>
<td>8,779</td>
<td>30,619</td>
<td>383</td>
<td>1.27%</td>
</tr>
<tr>
<td>1991</td>
<td>17,294</td>
<td>4,403</td>
<td>8,789</td>
<td>31,044</td>
<td>425</td>
<td>1.39%</td>
</tr>
<tr>
<td>1992</td>
<td>17,533</td>
<td>4,634</td>
<td>8,780</td>
<td>31,534</td>
<td>490</td>
<td>1.58%</td>
</tr>
<tr>
<td>1993</td>
<td>17,515</td>
<td>4,738</td>
<td>8,823</td>
<td>31,761</td>
<td>227</td>
<td>0.72%</td>
</tr>
<tr>
<td>1994</td>
<td>17,407</td>
<td>4,792</td>
<td>8,964</td>
<td>31,864</td>
<td>123</td>
<td>0.39%</td>
</tr>
<tr>
<td>1995</td>
<td>17,359</td>
<td>4,890</td>
<td>8,955</td>
<td>31,871</td>
<td>-113</td>
<td>-0.35%</td>
</tr>
<tr>
<td>1996</td>
<td>16,903</td>
<td>5,055</td>
<td>9,213</td>
<td>31,586</td>
<td>-177</td>
<td>-0.56%</td>
</tr>
<tr>
<td>1997</td>
<td>16,730</td>
<td>4,951</td>
<td>9,441</td>
<td>31,635</td>
<td>151</td>
<td>0.51%</td>
</tr>
<tr>
<td>1998</td>
<td>16,201</td>
<td>4,972</td>
<td>9,704</td>
<td>31,956</td>
<td>-255</td>
<td>-0.87%</td>
</tr>
<tr>
<td>1999</td>
<td>15,743</td>
<td>4,961</td>
<td>9,846</td>
<td>31,104</td>
<td>-272</td>
<td>-0.86%</td>
</tr>
<tr>
<td>2000</td>
<td>15,359</td>
<td>731</td>
<td>9,947</td>
<td>30,226</td>
<td>-455</td>
<td>-1.49%</td>
</tr>
<tr>
<td>2001</td>
<td>15,527</td>
<td>4,752</td>
<td>10,088</td>
<td>30,370</td>
<td>-376</td>
<td>-1.22%</td>
</tr>
<tr>
<td>2002</td>
<td>15,081</td>
<td>4,849</td>
<td>9,902</td>
<td>30,832</td>
<td>-534</td>
<td>-1.76%</td>
</tr>
<tr>
<td>2003</td>
<td>14,752</td>
<td>4,734</td>
<td>9,885</td>
<td>30,424</td>
<td>-461</td>
<td>-1.55%</td>
</tr>
<tr>
<td>2004</td>
<td>14,459</td>
<td>4,565</td>
<td>9,812</td>
<td>30,683</td>
<td>-551</td>
<td>-1.88%</td>
</tr>
<tr>
<td>2005</td>
<td>14,284</td>
<td>4,472</td>
<td>9,694</td>
<td>29,155</td>
<td>-386</td>
<td>-1.34%</td>
</tr>
<tr>
<td>2006*</td>
<td>14,179</td>
<td>4,418</td>
<td>9,350</td>
<td>28,587</td>
<td>-403</td>
<td>-1.42%</td>
</tr>
<tr>
<td>2007*</td>
<td>14,199</td>
<td>4,280</td>
<td>9,169</td>
<td>27,633</td>
<td>-459</td>
<td>-1.64%</td>
</tr>
<tr>
<td>2008*</td>
<td>14,093</td>
<td>4,224</td>
<td>8,723</td>
<td>27,053</td>
<td>-488</td>
<td>-1.62%</td>
</tr>
</tbody>
</table>

Source: SMSD Enrollment Records and Projections, 2005
The Shawnee Mission School District is comprised of 37 elementary schools located in fourteen different communities of Johnson County, Kansas (Fairway, Lake Quivira, Leawood, Lenexa, Merriam, Mission, Mission Hills, Mission Woods, Overland Park, Prairie Village, Roeland Park, Shawnee, Westwood, and Westwood Hills). The pupil/teacher ratio was 17:1 in 2005-2006. The average class size in 2006-2007 was a pupil/teacher ratio of 20:1. Pupil/teacher ratio is the fall enrollment for the school year divided by the number of full-time equivalent classroom teachers in the school district. Excluded are teachers classified as special education teachers.

In July 2006, the Kansas Supreme Court approved a plan crafted by legislators that gave additional funding to Kansas schools. This funding was used for salary
increases, reducing class sizes, and additional reading assistance in each elementary building. With an increase in pupil/teacher ratio the Shawnee Mission School District decided a plan was needed to reduce class sizes.

Even though the lawmakers approved a large increase in funds statewide, Shawnee Mission did not receive the same benefit as other districts in the state due to declining enrollment. In 2006-2007, the Shawnee Mission School District received an additional $470 per pupil. The funding the Shawnee Mission School District received came to the district three different ways. First, Shawnee Mission received an increase in funding from the state of Kansas. Next, Shawnee Mission used 31% of the local option budget which allows districts in Kansas additional budget authority for initiatives in excess of the general fund allocation. Lastly, an additional $387,000 was provided through the cost-of-living provision. The cost-of-living provision provides financial assistance to school districts that must pay more to attract teachers to high-cost areas.

The Shawnee Mission School District used every available funding source in order to keep class sizes small and offer full-day kindergarten. Schools designated as Title I schools were able to offer the full-day kindergarten option without any extra cost to the parent.
Schools that were not Title I offered it to parents with a pay option. Without additional state funding, Shawnee Mission will need to levy additional 2% of their operating budget in order to offer the no pay option to every elementary school.

An excellent public education for all students continues to be a top priority for residents in Johnson County. Nearly 95% of all residents age twenty-five and above have at least a high school diploma. This eclipses the national average of around 80%. The number of residents with a Bachelor’s degree is 48% compared to the national average of 24%; and 16% of the population holds a graduate or professional degree which far exceeds the national average of 9% (Johnson County Economic Primer 3).

**Purpose of the Study**

There has been a substantial debate among educators, politicians, and the general public concerning which methods, purposes, and goals best support student success at the kindergarten level. Studies have shown that the traditional half-day program decreases the risk of stress and fatigue in relationship to programs that last the entire day (Emery 5). Additionally, others believe the full-day program incorporates structured lessons as a way to enrich the experience for each child (Housden 2).
Studies conducted since 1990 have indicated all students benefit from attending full-day programs; however, gains are greatest for identified at-risk students and students of low socio-economic status (Elicker 8).

During the 2005-2006 school year, ten elementary schools in the Shawnee Mission School District piloted the full-day kindergarten program. Parents were given the full-day or half-day kindergarten option in each elementary school.

The purpose of this study is to determine the effect the full-day kindergarten program will have on identified at-risk students based on the DIBELS (Dynamic Indicators of Basic Early Literacy Skills) assessment. Effect will be defined as specific literacy skills taught at the kindergarten level and include initial sound fluency (ISF), phoneme segmentation fluency (PSF), and nonsense word fluency (NWF). At-risk will be determined as defined by the Shawnee Mission School District based on performance on the DIBELS assessment, English Language Learners, race/ethnicity, socio-economic status, and/or teacher/counselor recommendations. The DIBELS assessment expects to reach benchmark skills in phoneme segmentation fluency during the second semester or a student will be considered at-risk.
Data will be collected over one school year using DIBELS. The Shawnee Mission School District made a decision to implement ten full-day kindergarten programs in the fall of the 2006-2007 school year. The traditional half-day kindergarten program was made available for parents who choose this option for their child. Kansas state law does not require a child to start school until age seven. If a parent decides to enroll his/her child at age six or seven they still begin in kindergarten.

This study will focus on the effect full-day kindergarten program has on student achievement based on the DIBELS assessment for students in the Shawnee Mission School District who are in the Title I elementary schools, schools with a full-day kindergarten program and schools with a half-day kindergarten program.

Research Hypothesis

Educational research has shown years one through five to be crucial for the intellectual development in humans. Therefore it is important to study the effects full-day kindergarten will have on student achievement.

Research Hypothesis. There is no difference in student achievement between full-day and half-day kindergarten students as measured by the DIBELS assessment at the .05 level of significance.
Significance of the Study

The findings of this study will provide the Shawnee Mission School District with helpful information on the effect of the full-day kindergarten program on student achievement versus the half-day program. This study will contribute to the literature by determining differences, if any, for at-risk students in Title I elementary schools and students who are not in Title I elementary schools. The results of this study will be submitted to the Shawnee Mission School District Board of Education to be used for program planning, curricular implementation, and budgetary adjustments. Lastly, the success or failure of the ten pilot schools could assist other elementary schools in determining what strategies may possibly work when they offer the full-day kindergarten program in their schools.

Definition of Key Terms

Adequate Yearly Progress (AYP). The Accountability component of No Child Left Behind that requires the same high standards of achievement for all, continuous and substantial academic improvement for all, measurable annual objectives for achievement, assessment participation rates, and graduation rates (U.S. Department of Education).

At-Risk Students. Students are classified as at-risk in the Shawnee Mission School District based on performance
on the DIBELS assessment, Measure of Academic Progress (MAP), and Kansas assessments, disabilities, English Language Learners, race/ethnicity, socio-economic status, and/or teacher/counselor recommendations. Students in this study are classified as at-risk as defined by the DIBELS assessment. Students are expected to reach benchmark levels on the DIBELS assessments by the end of the benchmark period. (U.S. Department of Education)

Cohort Survival Rate. Cohort survival rate is computed each year for all grade levels and buildings. A projection is made by applying the corresponding three-year average cohort survival rate to each grade level to estimate the subsequent year enrollment. After these manual calculations are made the principals are asked to provide information about the community that suggests trends that are not aligned with normal expectations for future enrollment such as new housing, business growth or decline, and fluctuations in immigration. This information is used to adjust the manual calculations (DiPierro 11).

Cost of Living Provision. A provision that provides financial assistance to school districts that must pay more to attract teachers to high-cost areas (Kansas State Department of Education).

Data Collection Method. The data collected for this
clinical research study are divided in two groups. The first group contains the difference in the average gain on each DIBELS tested indicator. The second group contains the comparison between gender and SES. Each group contains analysis of the data presented in chapter four.

DIBELS. Dynamic Indicators of Basic Early Literacy Skills (DIBELS) is an assessment instrument that measures how successfully a child is progressing in the critical skills that underlie success in early reading. Kindergarteners will be assessed over specific literacy skills taught at the kindergarten level which include initial sound fluency (ISF), phoneme segmentation fluency (PSF), and nonsense word fluency (NWF). DIBELS researchers use the subtests to classify student performance into three categories called instructional recommendations: Benchmark (on grade level), Strategic (needs some assistance), and Intensive (needs much assistance). Students who are at the Benchmark instructional recommendation level have approximately 80% chance of meeting subsequent DIBELS benchmarks. These students are at low risk for having difficulty reading in the future. Students classified as Strategic or Intensive are at-risk for having difficulty with future reading skills (Good).

Day type. Day type is the same as program type. Day
type refers to students who are enrolled in a full-day or half-day kindergarten program.

DIBELS – Initial Sound Fluency (ISF). Kindergarten students are given a page with four pictures. They are asked to find the picture that starts with a particular sound or to say the beginning or initial sound in a word. Children should be able to say or recognize the beginning sounds in words by the middle of kindergarten. It takes three minutes to administer the assessment (Good).

DIBELS – Phoneme Segmentation Fluency (PSF). This is a measure of children’s awareness of the many sounds that make up the spoken word. Phoneme segmentation should be mastered by the end of kindergarten. The student is given a word like “cat” and asked to say all of the sounds in the word. The entire assessment takes one minute to administer (Good).

DIBELS – Nonsense Word Fluency (NWF). This is a measurement of the student’s ability to blend together the sounds represented by letters to make words. This skill helps students use their knowledge of the relationship between letters and sounds to read unfamiliar words. Students are shown a page of make-believe words, like “miz”, and asked to say the individual sound of each letter in the word or the whole word itself. The entire
assessment takes one minute to administer (Good).


Full-Day Kindergarten. A kindergarten schedule in which students attend every day for the full day. Students who do not qualify for free or reduced lunch pay to enroll in the full-day kindergarten program.

Full-Time Equivalent (FTE). FTE is a calculated figure that divides the number of students for each section by the total number of classroom teachers in each school for grades K-12.

Half-Day Kindergarten. A kindergarten schedule in which students attend the traditional one half day of every school day.

Local Option Budget. Each district is given additional budget authority through the local option budget (LOB). The local option is designed to provide additional budget authority for initiatives in excess of the general fund allocation. Shawnee Mission used 31% of the local option budget in 2006-07 to support basic operations (Kansas State Department of Education).

Lunch Status. Lunch status refers to students who
receive free or reduced lunch or no lunch support.

No Child Left Behind. Signed by President George W. Bush on January 8, 2002, the No Child Left Behind Act gives schools historical educational reform based on stronger accountability for results, more freedom for states and communities, encouraging proven education methods, and more choices for parents (U.S. Department of Education).

Socio-Economic Status (SES). In this study SES applies to the school as measured by the number of free or reduced lunches.

Title I Elementary School. Title I of the Elementary and Secondary Education Act (ESEA) was implemented in 1965 to provide financial assistance to school districts serving areas with concentrations of children from low-income families to expand and improve their educational programs (U.S. Department of Education).

Restatement of Purpose

The purpose of this study is to determine the effect the full-day kindergarten program will have on student achievement based on the DIBELS assessment. Although studies favor gains in student achievement in the full-day over the half-day kindergarten program, a few factors need to be considered in this study (Housden 4). First, self-selection by parents could increase the student achievement
results of the full-day program. Second, the study is limited to elementary schools inside the Shawnee Mission School District. Lastly, data will be analyzed to determine differences between the DIBELS scores of students enrolled in the full-day program and those enrolled in the half-day program. According to the DIBELS (Dynamic Indicators of Basic Early Literacy Skills) assessment manual, the DIBELS measures accurately predict future reading ability and identify areas of improvement for young readers. They also match appropriate reading intervention methods with identified reading skill deficiencies.

If this study produces significant information to the Shawnee Mission School District and other school districts it may be used to determine the effectiveness of the full-day kindergarten versus the half-day kindergarten program for student achievement. It is expected that the growth in student achievement determined by the DIBELS will be greater from those enrolled in the full-day compared to those in the half-day kindergarten program.

Limitations of the Study

To accurately study the effect the full-day kindergarten program will have on student achievement the researcher would need to collect data for more than one year. Data collected for this study occurred during the
2006-2007 school year.

The study is limited to ten elementary schools in the Shawnee Mission School District. It is limited to the number of full-day and half-day kindergarten sections in each school.

Factors such as teacher training, student socio-economic status, student motivation, class size and parent involvement are known to affect achievement but are not addressed in this study.
Review of Literature

Chapter 2 is divided into three parts: first, the historical development of kindergarten; second, research findings related to the benefits of the full-day kindergarten program; third, research findings related to the benefits of the half-day kindergarten program.

Historical Development of Kindergarten

The first kindergarten was established in Germany in 1837 by Friedrich Froebel. Nineteenth century pioneers saw kindergarten as a place for play and socialization. Froebel defined kindergarten as “a child’s garden of play.” Froebel, a German philosopher and teacher, was influenced by the romantic liberalism that swept across Germany during the nineteenth century. He observed that children were by nature physically active. Froebel gave physical play a central role in his kindergarten (ERS,1989,1). He wanted his students to imitate the teacher so as to help them discover what was within themselves. (Weber 36).

Much of Froebel’s thinking influenced the development of kindergarten in the United States. The first American kindergarten was established in Watertown, Wisconsin in 1856 by Margarethe Schurz. Elizabeth Palmer Peabody who
was influenced by Schurz opened the first English speaking kindergarten in Boston in 1860. She was instrumental in getting the superintendent of the St. Louis, Missouri School District, William Harris, to establish the first public kindergarten (Osborn 21). In the St. Louis kindergarten program students worked with their teachers in the morning and studied theory with the director in the afternoon. Susan Blow was the director. She said that as a result of the all-day program students were better disciplined, demonstrated greater intelligence and showed special aptitude for math, science and language arts (Osborn 25).

There were many well known educators in the early stages of the kindergarten movement. Mary Mann (wife of Horace Mann) published the first American kindergarten text. Other important leaders were Susan Blow, William Harris, and the U.S. Commissioner of Education, Henry Bernard. These educators stimulated interest in the kindergarten movement by their writings, lectures and training of teachers (Frost 24). This led to the establishment of a separate Kindergarten Department of the National Education Association in 1885.

During the late nineteenth century kindergartens in
the U.S. began to expand. Many different reforms such as prison reform, temperance, and the growth of education followed this expansion. Rural families began to move to the cities. Immigration increased as families moved into the U.S. In Massachusetts, during the latter part of the nineteenth century immigrant-born children were born at a faster rate than native-born babies. The proportion of immigrant women who had children less than five years of age doubled the number of native-born children (Lazerson 8). As a result of this increase religious groups set up the establishment of kindergarten. These kindergartens followed the Froebelian model. They were established with a religious and moral focus so that lower class children would benefit. Those who were sufficiently hurt by street influences needed the order and social morality these kindergartens provided (Cohen 5).

During this era John Dewey was instrumental in establishing the Laboratory School at Chicago University. Dewey believed that children live in the present and continue to evolve and change in their environment. He believed that the curriculum had to have a solid plan behind it for a child to develop experiences related to one another in an organized, sequential manner (Frost 34). The
scheme of problem-solving, sensing a problem, analyzing it, proposing solutions, testing them and drawing a final hypothesis was basic to his curriculum and to his philosophy (Frost 35).

Another philosopher whose work had a great deal of influence during this era was G. Stanley Hall. His essay, *The Contents of Children’s Minds on Entering School* stimulated widespread interest and was considered a major breakthrough in the study of learning. Later, two of his students, Arnold Gesell and Lewis Terman conducted research into child psychology. Their studies showed a sequence of child development from gross motor to fine motor skills. Hall wanted free play to become the medium for gross motor development. He took his research to the International Kindergarten Union in 1898. His research opened discussion and debate between the traditional Froebelian kindergarten program compared to the Dewey and Hall model. Out of this discussion came the appointment of the Committee of Nineteen. This committee’s assignment was to formulate a contemporary kindergarten model. Because of the debate and discussion the model changed from Froebelian to that defined by Dewey (Osborn 34).

As new kindergartens were established, states began to
mandate that children were to enter school by the age of six. The national kindergarten was established in 1909. Its purpose was to promote public kindergartens. Laws were written to establish guidelines for enrollment and funding. Most school districts wanted the kindergarten schedule to correspond with the other primary grades. As a result a morning and afternoon session became the norm.

In 1873, kindergartens numbered from 1200 and grew to 750,000 by 1930. Many changes occurred during this era. Arnold Gesell introduced the concept of developmental norms, and the National Education Association conducted a comprehensive study of kindergarten. The National Education Association found that kindergarten was an integral part of the school, numbers and reading were included in the curriculum in some schools, and afternoon sessions were as common as morning sessions of kindergarten (ERS, 1986, 46).

When the Great Depression hit in the early nineteen hundreds, some school districts eliminated kindergarten programs. The number fell from 750,000 to 600,000. A 20% decrease occurred during the era (ERS, 1989, 10). The kindergartens that remained in 1930 looked very similar to the kindergartens we have today.
During the 1950s and 1960s the post World War II baby boom had a dramatic effect on the development of kindergarten. Enrollment increased putting the system under great stress. Kindergarten classrooms had as many as 50 in a classroom (ERS, 1989, 11).

Programs like Head Start were created to focus on early intervention. Those working in the kindergarten system felt that the intellectual needs of the child were being ignored. The Head Start program created a public awareness of the effects and importance of the early childhood experience. This helped bring the academic emphasis back to kindergarten programs and the curriculum that was taught. An ERS study reported that over 62% of teachers and principals stated that the focus of their kindergarten program was academic readiness and social preparation. Twenty-two percent of the principals and twenty-nine percent of the teachers reported that the focus of their program was on academic skills and achievement (ERS, 1986, 56).

During the 1960s and 1970s many states began to publicly fund kindergarten programs. Most were half-day programs lasting two and one half to three hours per day modeled after traditional private nursery schools.
Curriculum focused on play, socialization and easing the transition from home to school (Connell 30).

By 1990, U.S. kindergartens had undergone significant transformation. Curriculum became more academic and skill oriented. Play and socialization had taken a back seat to preparation for an increasingly rigorous first grade curriculum (Gullo 35).

A Review of the Literature Related to Full-Day Kindergarten

Another development of the 1990s was the growth of “full-day” or “all-day” kindergarten. A major factor that created the need for full day care for children was the increase of women in the work place, single parent homes and economic factors that increased the growth of the childcare industry. Kindergarten programs had been offered in the U.S. particularly in rural areas, ever since Margerete Schurz opened the first Frobelian kindergarten in Wisconsin in 1857. During the 1960’s and 1970’s many states and communities implemented publicly-funded kindergarten programs for five-year-olds for the first time (Connell 36). By 1993, the nation’s five year olds enrolled in a full-day program had grown to 45% (Rothenberg 74).

Full-day kindergartens have increased in number for
several reasons. Families with complex schedules and child
care needs believe that traditional half-day kindergarten
programs do not meet their needs. Sixty percent of mothers
in the work force have children younger than six years old
(Children’s Defense Fund 4).

Second, kindergarten teachers have found it difficult
to meet the academic needs of the students within the
 confines of the traditional two and one-half to three hour
day (Sava 15).

As a result of these concerns, there arose a call for
a more developmentally appropriate program in kindergarten
with a more integrated curriculum approach, and more
attention to content (Bredekamp 4). The results of a study
by Stipek, Fieler, Daniel, and Milburn indicate that
children in a “child-centered” program have more positive
expectations for themselves in school than those in a
“didactic” program (209). This suggests that a full-day
kindergarten schedule is more “child-centered” because
there is more time available for teachers and children to
explore topics in depth (Rothenberg 5).

Implementation of full-day kindergarten in the United
States came with some criticism and controversy. Those who
supported the full-day program claimed that a longer day
gave the teacher and student more time together to meet and assess the student’s academic needs. They believed that it allowed for more individualization of the curriculum and opportunities to expand the curriculum. Advocates thought that full-day kindergarten can help level the playing field for those who were not able to afford quality preschool experiences. They felt that kindergarten-age students need a safe and enriching environment for more than two hours per day. It also provided child care relief for working parents.

It is no longer news that the structure of the American family is changing. Such phenomena as the increase in the divorce rate, two-parent-employed families, and teen-age pregnancies have changed the kind of experiences children need at an early age. This has led to what Zimiles called the “diminishing” factor (35). That is, mothers pursue work out of necessity; therefore schools and other institutions have taken on many of the functions of what used to be the mother’s role. As a result, the demand for out-of-home care has increased as well as the need for academic experiences before kindergarten. According to Day pre-kindergarten enrollment grew 81% between 1970 and 1980, and 25% from 1980 to 1985.
Enrollment totals will continue to grow because the number of children in this age range is expected to increase during the 1990s (Center for Education Statistics). Because of this phenomena full-day kindergarten is a natural outcome for a few reasons.

Mothers who work all day are now the norm. Children need an extended day program. Although kindergarten is not compulsory in many states, approximately 97% are enrolled in a full-day kindergarten program (National Association of Elementary School Principals 16). If working mothers decide they do not want to pay for the other half of the kindergarten day then their child is placed in another type of care for the remainder of the day. The care and education students receive in the full-day kindergarten program is with a certified teacher compared to a traditional day care provider. Research suggests that an unhurried atmosphere due to the length of the day promotes better student achievement (Rothenberg 10).

This has continued to be a very controversial issue. Many advocates of the half-day program say that a full-day kindergarten program is just another way to get the parents to pay for public education. Many of the proponents of full-day kindergarten see the cost of a full-day program as
the same amount they would spend on childcare. As Day states, by thinking in terms of “education versus care” we inaccurately depict education as the provision of protective and custodial services (60).

The result is that students enter kindergarten with a wide range of past group experiences, from participation in an academic preschool to no preschool at all. Because of this wide range of experiences teachers are seeing groups of children come into kindergarten with wider developmental spans. Many of the half-day kindergarten teachers work with a different group of students in the morning and the afternoon. This does not allow them the time they need to work on social and academic skills.

The full-day kindergarten program provides a logical format that allows the teachers more time for in-depth exploration of experiences. It also allows the full-day kindergarten teacher more time to get to know the student individually and provides more time for one-on-one activities.

Critics of the full-day program have expressed concerns about the length and rigor of the full-day program. They believe five year olds may become overly tired with a full-day program. They have stated that the
experiences a child gets at home in the half-day program are very important. They do not believe school districts should concern themselves with custodial care.

In summary, listed below are the advantages and disadvantages of the full-day kindergarten program.

Advantages:

• Is convenient for parents who work all day
• Provides teaching and learning continuity
• Allows time for in-depth exploration of experiences
• Provides potential for greater academic performance
• Decreases time spent on transitions
• Teachers get to the know the child individually and spend more one-on-one time

Disadvantages:

• Greater cost potential for working parents
• Teachers must learn to alter teaching to suit a full-day program
• May focus on custodial care only
• Focus on academic learning too much and forget to address social development
• More expensive in staff, equipment and space

There seem to be many positive learning and social behavioral benefits for children in full-day kindergarten
programs. At the same time it is important to see that what children are doing during the kindergarten day is more important than the length of the day. Gullo warns educators and parents to resist the pressure to include more didactic academic instruction in full-day kindergarten programs. He contends that this type of instruction is inappropriate for young children (37).

**A Review of the Literature Related to Half-Day Kindergarten**

Across the United States schools have changed from half-day kindergarten to full-day kindergarten. Proponents of the traditional half-day kindergarten program still see many advantages. First, they feel that children’s attention spans and interest levels are more suited to a half-day kindergarten program. Children become overly tired in a full-day kindergarten program (Emery 15). They argue that a half-day kindergarten program can provide a high quality educational and social experience. Observers of trends in kindergarten scheduling argue that changing the length of the day is not as important as providing developmentally appropriate learning environments. They say that spending individual amounts of time doing enrichment worksheets is not as valuable as spending most of the day working in large-group instruction (Karweit 82).
Cryan, Wiechel, and Bandy-Hadden found that attendance in full-day kindergarten programs resulted in greater academic and social benefits for students in the primary grades (187). Even though advocates for the half-day kindergarten program point out that many of the students in full-day kindergarten programs tend to miss more school because of fatigue.

Student achievement results seem to show some academic advantages for students in the full-day program compared to those in a half-day program. Fusaro looked at twenty-three studies comparing full-day kindergarten programs. Fusaro found that students who attended full-day kindergarten programs had higher achievement results than those in the half-day program (269).

Another study conducted by Holmes and McConnell examined the differences between 311 half-day and 326 full-day kindergarteners. They measured academic achievement by using the California Achievement Test (CAT). Data were compiled in six areas: sound recognition, vocabulary, visual recognition, language expression, comprehension, and math. A significant difference was found in comprehension and math skills. Further analysis showed that girls in the half-day program scored higher than boys in the full-day
program when tested for comprehension. In math concepts, boys in the full-day program scored higher than boys in the half-day kindergarten program. The analysis concluded that differences between the scores of the students could not be attributed to differences in the two kindergarten programs (5).

Williams conducted a study to determine if full-day kindergarten versus half-day produced higher academic achievement in two Missouri elementary schools. Two hundred forty-one first and second graders participated in the study. The Dial-R Test of Developmental Skills was given as a pretest at the beginning of kindergarten and the Terra Nova Achievement Test was given as a post-test. When the results were analyzed, students in the full-day kindergarten program showed a significant increase in scores over students in the half-day kindergarten program (61).

Schools have traditionally used half-day kindergarten programs. In the traditional half-day model 50% of school’s kindergarten students attend in the morning and the other 50% attend in the afternoon. In this model a kindergarten teacher has a morning and an afternoon class.

In summary, listed below are the advantages and
disadvantages of the half-day kindergarten program.

Advantages:

• Decreases stress on children
• Allows more time at home with parents
• Allows more time in a less formal environment
• Provides all that young children need to begin introduction to school

Disadvantages:

• Children are less prepared for transitions
• More disruptions in the day
• Less time for in-depth exploration
• Less time to get to know the child individually

Research indicates that the half-day kindergarten program is less stressful for students. Children have a greater opportunity and more time to transition from the small-family setting to the large-group setting. There is more time for non-school activities for families to share. Children benefit academically from a shorter day and are better able to concentrate. Therefore, research suggests that the half-day kindergarten program provides a greater opportunity for achievement (Rothenberg 3).

Conclusion

In conclusion, in reviewing the research conducted on
full-day kindergarten in the 1970s and 1980s, Puleo suggested that much of the early research employed inadequate methodology that created problems with validity. A mid-1970s study in early childhood education examined the effects of full-day versus half-day kindergarten (427). Since the rapid growth of the full-day kindergarten is a phenomenon of the 1980s the research is contemporary, and some of the findings are tentative (ERS, 1989, 20). ERS evaluated 37 studies that compared full-day to half-day programs. Thirty-two compared the academic effects on the students. Of those 32 studies, 20 found some results favoring the full-day program (ERS, 1989, 19). In no case did the half-day students out-perform the full-day students academically. More research conducted in the 1970s and 1980s showed consistent academic effects for students identified as being at-risk (Housden 2). Researchers found positive academic and social benefits for children in the full-day programs from low socio-economic status or educationally disadvantaged backgrounds (Cryan 203).

Nunnelley investigated the impact of full-day versus half-day kindergarten programs looking at academic achievement levels for at-risk students. He found no significant differences in academic achievement. Only
nineteen students were included in his study. Nunnelley later suggested that a larger sample size might bring more accurate results. Some recent studies do show differences in achievement in children enrolled in full-day versus half-day (5). Cryan conducted a two-phase study that examined the effects of full-day and half-day programs on children’s academic and behavioral success in school. The first phase collected data on eight thousand children in twenty-seven school districts who entered kindergarten in 1982-84. The second phase was a longitudinal study of nearly six thousand children who entered kindergarten in two cohorts, in 1986 and 1987. The researchers found that participation in full-day kindergarten was related positively to strong school performance. Children in the full-day program scored higher on standardized tests and had fewer retentions (200).

Lastly, a study by Elicker and Mathur found that academic outcomes at the end of the kindergarten year indicated slightly greater progress in kindergarten and higher levels of first grade readiness for children in a full-day program. In addition, teachers reported significantly greater progress for full-day kindergarten in math and reading (460).
The research studies conducted thus far have not resolved all of the issues related to full-day and half-day kindergarten programs. First, the content and activities compared in the full-day program versus the half-day program are difficult to compare. An increase in instructional time is obviously one aspect of that comparison but still does not differentiate the program activities and content (Olsen 167). Second, the findings of full-day kindergarten research have been weakened by other research design problems, lack of documentation of children’s kindergarten readiness skills, lack of information about teachers’ philosophy and expertise, and the non-random assignment of children to full-day and half-day programs (Gullo 35).
Chapter 3

Methodology

Introduction

This chapter presents the research design, methodology, and statistical procedures used in the study. In addition, the population, instrument and data collection methods are discussed.

This study was designed to assess the effect a full-day kindergarten program has on student achievement based on the DIBELS assessment for students in the Shawnee Mission School District in schools with a full-day and a half-day kindergarten program. The DIBELS was first used as an assessment of academic achievement in the Shawnee Mission School District (in selected schools) during the 2002-2003 school year. In September of the 2006-2007 school year, the DIBELS assessments were implemented into every elementary school in the Shawnee Mission School District. Demographic data (gender and eligibility for free and reduced lunch) was collected to demonstrate the differences between students who were in full-day and half-day programs in Title I schools, and schools with only full-day and half-day kindergarten programs. Students were selected from schools in the Shawnee Mission School
District that provided a half-day and full-day kindergarten program. Each of the ten elementary schools assigned students to classes to achieve gender balance. Kindergarten students were enrolled in either the half-day or full-day program.

The experimental group was composed of ten elementary schools in the Shawnee Mission School District. The independent variables were: (a) the program type, as defined by the length of day (half or full-day) (b) students’ gender, and (c) the socio-economic status of the students being analyzed, based on the percentage of students participating in the free and reduced lunch program.

The DIBELS scoring instrument consists of seven short individual subtests. Each DIBELS subtest focuses on a different skill and takes about one minute to complete. Kindergarten students in the Shawnee Mission School District were tested three times during the 2006-2007 school year in August, January, and May.

Each DIBELS subtest is an indicator of how well a student is doing in learning a particular early reading skill. A student’s score on a subtest tells the teachers whether the student’s skills are on grade level.
In order to understand the individual student results each student is given a performance profile. Their performance profile shows how well they score on each of the tested benchmarks. Each filled dot on the student’s performance profile represents a benchmark assessment score. Benchmark assessments are administered in the fall, winter and spring. Each unfilled dot on the student’s performance profile represents a progress monitoring assessment score that may be given between each benchmark period. If no dots appear on the student’s performance profile graph then the assessment was not given. The gray bars on the student performance profile represent the minimum score the student should receive in order for their skills to be at grade level. Dots that appear below the gray bar on the student performance profile graph indicate the student is at-risk and will need additional support in order to bring their skills up to grade level.

Kindergarten students scoring below ten initial sounds correct (initial sound fluency), less than ten phonemes correct (phoneme segmentation fluency), and below 30 correct letter sounds (nonsense word fluency) receive additional instructional skill support. These scores on the DIBELS assessment indicate the student is at-risk. The
DIBELS assessment was individually administered to each student enrolled in the ten pilot schools in the Shawnee Mission School District kindergarten program. Finally, the DIBELS assessment was used to compare fluency measures and to regularly monitor the development of pre-reading and early reading skills of full-day and half-day kindergarteners.

**Research Hypotheses**

To determine the effect the full-day kindergarten program has on student achievement based on the DIBELS assessment for students in the Shawnee Mission School District who are in the Title I elementary schools, schools with a full-day and half-day kindergarten programs, the following hypotheses were tested.

**H1.** There is no significant difference in reading achievement as measured by DIBELS between kindergarten students in either a full-day or half-day program at the 0.05 level of significance.

**H2.** There is no significant difference in reading achievement as measured by DIBELS between identified “at-risk” kindergarteners in either a full-day or half-day program at the 0.05 level of significance.
**Instrumentation**

The research instrument used to collect student data was the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessment (Good, Kaminski, Shinu, Bratten, and Lainon 2003).

This research instrument consists of seven short individual subtests. Each DIBELS subtest focuses on a different skill and takes about one minute to complete. Kindergarten students in the Shawnee Mission School District were tested three times during the 2006-2007 school year for the purposes of progress monitoring.

Each DIBELS subtest is an indicator of how well a student is doing in learning a particular early reading skill. A student’s score on a subtest tells the teachers whether the student’s skills are on grade level.

In order to understand the individual student results each student is given a performance profile. Their performance profile shows how well they score on each of the tested benchmarks. Each filled dot on the student’s performance profile represents a benchmark assessment score. Benchmark assessments are administered in the fall, winter and spring. Each unfilled dot on the student’s performance profile represents a progress monitoring
assessment score that may be given between each benchmark period. If no dots appear on the student’s performance profile graph then the assessment was not given. The gray bars on the student performance profile represent the minimum score the student should receive in order for their skills to be at grade level. Dots that appear below the gray bar on the student performance profile graph indicate the student is at-risk and will need additional support in order to bring their skills up to grade level.

Kindergarten students scoring below 10 initial sounds correct (initial sound fluency), less than 10 phonemes correct (phoneme segmentation fluency), and below 30 correct letter sounds (nonsense word fluency) receive additional instructional skill support. These scores on the DIBELS assessment indicate the student is at-risk. The DIBELS assessment was individually administered to each kindergarten student enrolled in ten pilot schools in the Shawnee Mission School District.

**Research-Based Accuracy**

DIBELS assessments are scientifically-based instruments that provide valid and reliable student achievement data. Researchers at the University of Oregon (DIBELS Development and Research Team) continually conduct
research to ensure the assessment data remains reliable. According to the DIBELS Development and Research Team evidence of reliability, validity and sensitivity for DIBELS has been investigated in a series of studies (2001). Alternate form reliability for the DIBELS measures usually ranges from .72 to .94 for the various indicators.

**Dynamic Indicators of Basic Literacy Skills (DIBELS)**

Dynamic Indicators of Basic Literacy Skills are a set of standardized, individually administered measures of early literacy development. They are short, one to three minute, fluency measures used to regularly monitor the development of pre-reading and early reading skills.

DIBELS Initial Sound Fluency (ISF) is standardized, individually administered measure of phonological awareness that assesses a child’s ability to recognize and produce the initial sound in an orally presented word (Kaminski & Good, 1998; Laimon, 1994). The examiner presents four pictures to the child, names each picture, and then asks the child to identify (i.e., point to or say) the picture that begins with the sound produced orally by the examiner.

The ISF measure is a revision of the Onset Recognition Fluency (ORF) measure incorporating minimal revision. Alternate-form reliability of the ORF measure is .72 in
January of kindergarten (Good, Kaminski, Shinn, Bratten, Shinn, & Laimon, in preparation). By repeating the assessment four times, the resulting average is estimated to have a reliability of .91 (Nunnally, 1978). The concurrent, criterion-related validity of ORF with DIBELS PSF is .48 in January of kindergarten (Good et al., in preparation).

DIBELS Phoneme Segmentation Fluency (PSF) is a standardized, individually administered test of phonological awareness (Good & Kaminski, 2001). The PSF measure assesses a student’s ability to segment three- and four-phoneme words into their individual phonemes fluently. The PSF measure has been found to be a good predictor of later reading achievement (Kaminski & Good, 1996). The PSF measure takes about 2 minutes to administer and has over 20 alternate forms for monitoring progress. The two-week, alternate-form reliability for the PSF measure is .88 (Kaminski & Good, 1996), and the one-month, alternate-form reliability is .79 in May of kindergarten (Good et al., in preparation).

DIBELS Nonsense Word Fluency (NWF) is a standardized, individually-administered test of the alphabetic principle, including letter-sound correspondence and of the ability to
blend letters into words in which letters represent their most common sounds (Kaminski & Good, 1996). The student is presented an 8.5” x 11” sheet of paper with randomly ordered VC and CVC nonsense words (e.g., sig, rav, ov) and asked to produce verbally the individual letter sound of each letter or verbally produce, or read, the whole nonsense word. The one-month, alternate-form reliability for NWF in January of first grade is .83 (Good et al., in preparation).

Instructor Training

Each teacher in grades kindergarten through second grade received DIBELS training in August, 2006. The training focused on the implementation and administration of the DIBELS assessment. Consultants from the DIBELS Development and Research Team conducted the training. In October, 2006, the district required that each teacher attend a follow-up training. This second training was conducted by the Shawnee Mission School District Staff Development Department. The purpose of the second training was to discuss problems and concerns related to the implementation and administration of the DIBELS assessment. At each elementary school in the Shawnee Mission School District the trained kindergarten teacher administered the
same form of the DIBELS assessment in the fall, winter and spring.

Population of the Study

The general population for this study was the kindergarten students in the Shawnee Mission School District during the 2006-2007 school year. Ten elementary schools were divided into two groups: 1) schools that had full-day or half-day kindergarten programs that were not Title I and 2) schools that had full-day or half-day kindergarten programs that were Title I. The ten elementary schools chosen in this study were located in various geographical locations in the school district and their physical location within the district was not a factor that was considered in determining which elementary schools to include for this project. These ten elementary schools were part of a pilot program that offered a full-day or half-day kindergarten program unlike the rest of the elementary schools that only offered half-day kindergarten programs.

The sample population included 597 students; 346 who attended full-day kindergarten and 251 who attended half-day kindergarten program. Of the 597 students enrolled, 283 were female and 314 were male. There were 183 students
who participated in the free and reduced lunch program. Of the 251 in the half-day program, 118 were females and 133 were males. Of the 346 in the full-day program who participated in the free and reduced lunch program, 165 were females and 181 were males.

**Dependent and Independent Variables**

The independent variable in this study is the effect a full-day kindergarten program has on student achievement in the Shawnee Mission School District. The dependent variable is the reading achievement of the kindergarten students. The DIBELS is the instrument that was used to measure reading achievement. The reading achievement is measured by using fluency indicators to regularly monitor early literacy development. Every kindergarten student was given the DIBELS assessment in the fall, winter and spring.

**Data Analysis**

Every kindergarten student was given the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) in early September 2006. Of the 346 kindergarten students who were tested for the full-day program, 181 students or 52%, did not meet the benchmark. Of the 251 kindergarten students who were tested for the half-day program, 133 students or 53%, did not meet the benchmark in September. These scores
were used for the pretest data.

In mid May, 2007 these same kindergarteners were given the same form of the DIBELS assessment again. Of the 346 kindergarten students who were tested for the full-day program, 100 students or 29%, did not meet the benchmark in May. Of the 251 kindergarten students in the half-day program, 75 students or 30%, did not meet the benchmark. These scores represent the posttest data.

This study was quantitative and consisted of data collected from the DIBELS assessment. The analysis of variance (ANOVA) was used to analyze the reading data. This study used a two-way ANOVA when two types of factors divided students into two comparable groups. The ANOVA is used when one factor or treatment variable (achievement of full-day kindergarten students) is explored and there are more than two groups within this factor. The level of risk or level of significance for this study is set at .05.

**Summary**

This study examined the effects of full-day kindergarten on student achievement. The DIBELS assessment has been used as a tool to assess early literacy development. In this study the focus was on student achievement in the full-day kindergarten program. Three
key fluency indicators were measured to monitor the development of pre-reading and early reading skills. The results of the treatment (using DIBELS to determine additional instructional support in reading) were compared and examined.

This study analyzed statistical data collected from the DIBELS assessment and is quantitative in nature. The analysis consists of comparing the achievement levels of two groups (full-day and half-day kindergarten students) using a pretest and posttest. In this particular clinical research study the effect full-day kindergarten had on student achievement was based on the DIBELS assessment.
CHAPTER 4

Findings of the Study

Introduction

The purpose of this study was to determine the effect a full-day kindergarten program has on student achievement based on the DIBELS assessment for students in the Shawnee Mission School District who are in the Title I elementary schools, schools with full-day programs and schools with half-day kindergarten programs. The DIBELS assessment was used to measure student achievement for students in Shawnee Mission during the 2006-2007 school year. The general population size included 597; 346 who attended full-day kindergarten and 251 who attended half-day kindergarten program. In addition, 183 students participated in the free and reduced lunch program.

Overview

The reading assessment data were collected from the DIBELS (Dynamic Indicators of Basic Early Literacy Skills) assessment taken from half-day and full-day kindergarten students in the Shawnee Mission School District. The DIBELS assessments were administered at the beginning of the school year (pretest) and at the end of the school year (posttest). Each tested indicator was analyzed and compared among students to make recommendations for
intensive instructional support. A two-way analysis of variance (ANOVA) was used to determine if there were any significant differences between the treatment methods of select half-day and full-day kindergarten students in reading achievement as measured by the DIBELS assessment administered during the 2006-2007 school year in the Shawnee Mission School District. Data were collected from 597 kindergarten students by analyzing scores from a pretest and posttest. The ANOVA was used when one factor or treatment variable (the effect of full-day kindergarten) was explored and there were more than two groups within that factor. The level of risk or level of significance was set at .05.

The Data

The analyses of data from this clinical research study are presented in two sections. The first section contains the difference in the average gain on each DIBELS tested indicator. The second section contains the comparison between gender and SES. Each section contains analysis of the data presented.

DIBELS Tested Indicator Results

During the 2006-2007 school year 558 kindergarten students completed all required benchmark assessments. In the full-day kindergarten program there were 328 students
and 230 students in the half-day program. The following table shows the percent of each group who are at the Benchmark instructional recommendation level.

Table 5: Percent of Students in Half and Full Day Kindergarten Meeting the DIBELS Instructional Recommendation Status of Benchmark

<table>
<thead>
<tr>
<th>Percent of Students at Benchmark</th>
<th>August</th>
<th>January</th>
<th>May</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Day (N=328)</td>
<td>49.4%</td>
<td>59.1%</td>
<td>72.6%</td>
</tr>
<tr>
<td>Half Day (N=230)</td>
<td>50.0%</td>
<td>57.0%</td>
<td>70.4%</td>
</tr>
</tbody>
</table>

Figure 2: Percent of Students Meeting DIBELS Benchmarks

The percent of students in the full day program who are reading at benchmark increased by 23.2%. The percent of students in the half day program who are reading at benchmark increased by 20.4%. Yet both programs started with nearly the same percent of students at benchmark in August. This serves as preliminary evidence that the full
day program may yield more growth in student reading skills.

Hypothesis - H1. There is no significant difference in reading achievement as measured by DIBELS between kindergarten students in either a full-day or half-day program at the 0.05 level of significance.

In this study day type refers to students who are enrolled in a full-day or half-day kindergarten program. Kindergarten students who paid to enroll in the full-day kindergarten program did not qualify for free or reduced lunch.

Kindergarten students were given the DIBELS Initial Sound Fluency (ISF) assessment. Students were given a page with four pictures. They were asked to find the picture that starts with a particular sound or to say the beginning or initial sound in a word. They were expected to say or recognize the beginning sounds in words by the middle of kindergarten. It took three minutes to administer the DIBELS assessment.

Kindergarten students were given the DIBELS Phoneme Segmentation Fluency (PSF) assessment. This measured the student’s awareness of the many sounds that make up the spoken word. They were expected to master phoneme segmentation fluency by the end of kindergarten. The
students were given a word like “cat” and asked to say all of the sounds in the word. The entire assessment took one minute to administer.

Kindergarten students were given the DIBELS Nonsense Word Fluency (NWF) assessment. This measured the student’s ability to blend together the sounds represented by letters to make words. This skill helps students use their knowledge of the relationship between letters and sounds to read unfamiliar words. Students were shown a page of make-believe words, like “miz”, and asked to say the individual sound of each letter in the word or the whole word itself. The entire assessment takes one minute to administer.

Reading development involves a single universal sequence of mastering component skills. Each skill as tested is a necessary prerequisite to each other and to competent reading. Reading achievement in kindergarten is represented by the culmination of initial sound fluency (ISF), phoneme segmentation fluency (PSF), and nonsense word fluency (NWF). None of these indicators carry more value than another. Any significant difference that may be found in one indicator needs to be supported by the results of another in order to determine whether the full-day or half-day kindergarten program is more effective.
Table 6: Independent Samples t-Test for Equality of Means of All Assessed Students by Day Type*

<table>
<thead>
<tr>
<th>Day Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>t</th>
<th>Sig. (2-tailed)</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>ISF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>Half Day</td>
<td>238</td>
<td>13.79</td>
<td>11.959</td>
<td>-.858</td>
<td>.391</td>
</tr>
<tr>
<td>PSF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>Half Day</td>
<td>241</td>
<td>14.35</td>
<td>12.172</td>
<td>-1.441</td>
<td>.150</td>
</tr>
<tr>
<td>NWF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>Half Day</td>
<td>241</td>
<td>14.35</td>
<td>12.172</td>
<td>-1.441</td>
<td>.150</td>
</tr>
</tbody>
</table>

*The variance within each group is assumed to be equal.

The significance levels for the change in ISF and NWF are both above the alpha = 0.05 level. Hence, there is no significant difference in the average ISF or NWF gain of at-risk students in full day or half day kindergarten programs.

The significance level for the average change in PSF .002 is below the alpha = 0.05 level. Hence, there is a significant difference in the average PSF gain of at-risk students in full-day and half-day kindergarten programs.

The average gain in PSF by at-risk students in half-day kindergarten was significantly higher (23.63) than the average gain in PSF by at-risk students in full-day kindergarten (19.79).

Univariate Analysis of Variance on Day Type and Lunch Status of All Students Assessed

Table 7: Descriptive Statistics for Initial Sound Fluency
Free or reduced kindergarten students have made smaller gains 10.7 & 12.7 in initial sound fluency (ISF) than those who are not identified for free or reduced lunch 16.8 & 14.1. However, the differences do not appear to be affected by full-day or half-day kindergarten status.

Table 8: Tests of Between-Subjects Effects for Analysis for Initial Sound Fluency of All Assessed Students by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>ISF</th>
<th>Free/Reduced</th>
<th>Paid</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>Mean Std.</td>
<td>N</td>
<td>Mean Std.</td>
</tr>
<tr>
<td>Full Day</td>
<td>Mean Std.</td>
<td>N</td>
<td>Mean Std.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There is no significant difference between the initial sounds fluency (ISF) gains made by the full-day and half-day kindergarten students by free or reduced lunch status. The significance level of .073 is above the alpha = 0.05 level.

Similarly, since the partial eta squared value is small 0.006, any observed difference in the sample means could not be considered significant.
Table 9: Descriptive Statistics for Phoneme Segmentation Fluency of All Assessed Students by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>Day Type</th>
<th>PSF Free/Reduced</th>
<th>PSF Paid</th>
<th>PSF Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>N</td>
</tr>
<tr>
<td>Half Day</td>
<td>26.02</td>
<td>15.306</td>
<td>58</td>
</tr>
</tbody>
</table>

Free or reduced kindergarten students in half-day kindergarten program appear to have made larger gains in phoneme segmentation fluency (PSF) than the other groups.

In addition, all kindergarten students in the half-day kindergarten program appear to have made larger gains than their peers in the full-day kindergarten program.

Table 10: Tests of Between-Subjects Effects for Analysis for Phoneme Segmentation Fluency of All Assessed Students by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>PSF Source</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>11.945</td>
<td>.001</td>
<td>.020</td>
</tr>
<tr>
<td>Lunch</td>
<td>.755</td>
<td>.385</td>
<td>.001</td>
</tr>
<tr>
<td>Day Type * Lunch</td>
<td>1.962</td>
<td>.162</td>
<td>.003</td>
</tr>
</tbody>
</table>

There is no significant difference between the phoneme segmentation fluency (PSF) gains made by the full-day and half-day kindergarten students by free or reduced lunch.
status. The significance level of .162 is above the alpha = 0.05 level.

Similarly, since the partial eta squared value is small (0.003), any observed difference in the sample means could not be considered significant.

Table 11: Descriptive Statistics for Nonsense Word Fluency of All Assessed Students by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>NWF</th>
<th>Free/Reduced</th>
<th>Paid</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>N</td>
</tr>
<tr>
<td>Full Day</td>
<td>16.75</td>
<td>15.512</td>
<td>118</td>
</tr>
<tr>
<td>Total</td>
<td>16.71</td>
<td>14.791</td>
<td>176</td>
</tr>
</tbody>
</table>

The average gain in nonsense word fluency (NWF) is similar across full-day and half-day kindergarten students as well as between kindergarten students who received free or reduced lunch and those who paid.

Table 12: Tests of Between-Subjects Effects for Analysis for Nonsense Word Fluency of All Assessed Students by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>NWF</th>
<th>Source</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day Type</td>
<td>.695</td>
<td>.405</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Lunch</td>
<td>1.906</td>
<td>.168</td>
<td>.003</td>
</tr>
<tr>
<td></td>
<td>Day Type * Lunch</td>
<td>.546</td>
<td>.460</td>
<td>.001</td>
</tr>
</tbody>
</table>

There is no significant difference between the nonsense word fluency (NWF) gains made by the full-day and half-day kindergarten students by free or reduced lunch.
status. The significance level of .460 is above the alpha = 0.05 level.

Similarly, since the partial eta squared value is small (0.001), any observed difference in the sample means could not be considered meaningful.

Table 13: Summary Results of Analysis of All Students Assessed

<table>
<thead>
<tr>
<th>Measure</th>
<th>Overall</th>
<th>By SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISF</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
</tr>
<tr>
<td>PSF</td>
<td>Half Day has larger gains</td>
<td>No Significant Difference</td>
</tr>
<tr>
<td>NWF</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
</tr>
</tbody>
</table>

Summary of All Students Assessed

In general there is no significant difference in reading achievement of kindergarten students in full-day and half-day kindergarten programs.

The difference in the phoneme segmentation fluency (PSF) comparison is not supported by the initial sound fluency (ISF) and nonsense word fluency (NWF) analyses. The difference in phoneme segmentation fluency (PSF) is an indication that there are differences between full-day and half-day kindergarten instruction of phonemic awareness.

Hypothesis - H2. There is no significant difference in reading achievement as measured by DIBELS between identified at-risk kindergarteners in either a full-day or
half-day program at the 0.05 level of significance.

Students who are at the Benchmark instructional recommendation level have approximately 80% chance of meeting subsequent DIBELS benchmarks. These students are at low risk for having difficulty reading in the future (Good). Students who are not at Benchmark are at-risk for having difficulty with future reading skills.

Initial Sound Fluency (ISF) was administered at the beginning and in the middle of Kindergarten. Phoneme Segmentation Fluency (PSF) and Nonsense Word Fluency (NWF) were administered to students at the middle and end of kindergarten.

Reading development involves a single universal sequence of mastering component skills. Each skill as tested is a necessary prerequisite to each other and to competent reading. Reading achievement in kindergarten is represented by the culmination of initial sound fluency (ISF), phoneme segmentation fluency (PSF), and nonsense word fluency (NWF). None of these indicators carry more value than another. Any significant difference that may be found in one indicator needs to be supported by the results of another in order to determine whether the full-day or half-day kindergarten program is more effective.
Table 14: Independent Samples t-Test for Equality of Means of At-Risk Students by Day Type*

<table>
<thead>
<tr>
<th>Day Type</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>t</th>
<th>Sig. (2-tailed)</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>ISF</td>
<td>Half Day</td>
<td>121</td>
<td>13.64</td>
<td>11.618</td>
<td>.282</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full Day</td>
<td>143</td>
<td>23.37</td>
<td>17.268</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NWF</td>
<td>Half Day</td>
<td>108</td>
<td>15.48</td>
<td>11.076</td>
<td>-.546</td>
<td>.585</td>
</tr>
<tr>
<td></td>
<td>Full Day</td>
<td>143</td>
<td>16.39</td>
<td>14.382</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The significance levels for the change in initial sound fluency (ISF) and nonsense word fluency (NWF) are both above the alpha = 0.05 level. Hence, there is no significant difference in the average initial sound fluency (ISF) or nonsense word fluency (NWF) gains of at-risk students in full-day or half-day kindergarten programs. The variance within each group is assumed to be equal.

The significance level for the average change in phoneme segmentation fluency (PSF) .011 is below the alpha = 0.05 level. Hence, there is a significant difference in the average phoneme segmentation fluency (PSF) gain of at-risk students in the full-day and half-day kindergarten programs.

The average gain in phoneme segmentation fluency (PSF) by at-risk students in the half-day kindergarten program was significantly higher 28.81 than the average gain in phoneme segmentation fluency (PSF) by at-risk students in
full-day kindergarten 23.37.

Table 15: Descriptive Statistics for Initial Sound Fluency by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>ISF</th>
<th>Free/Reduced</th>
<th>Paid</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>N</td>
</tr>
<tr>
<td>Full Day</td>
<td>11.03</td>
<td>12.203</td>
<td>88</td>
</tr>
<tr>
<td>Half Day</td>
<td>12.48</td>
<td>10.666</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>11.5</td>
<td>11.707</td>
<td>130</td>
</tr>
</tbody>
</table>

Free or reduced kindergarten students made smaller gains 11.0 & 12.4 in initial sound fluency (ISF) than students who are not identified for free or reduced lunch 15.6 & 14.2. However, the differences do not appear to be affected by the full-day or half-day status.

Table 16: Tests of Between-Subjects Effects for Analysis of Initial Sound Fluency by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>ISF</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day Type</td>
<td>0</td>
<td>0.991</td>
<td>0</td>
</tr>
<tr>
<td>Lunch</td>
<td>4.905</td>
<td>0.028</td>
<td>0.017</td>
</tr>
<tr>
<td>Day Type * Lunch</td>
<td>0.964</td>
<td>0.327</td>
<td>0.003</td>
</tr>
</tbody>
</table>

There are no significant differences between the initial sound fluency (ISF) gains made by the full-day and half-day kindergarten students by free or reduced lunch status (alpha = 0.327).

Similarly, since the partial eta squared value is small 0.003, any observed difference in the sample means could not be considered significant.
Table 17: Descriptive Statistics for Phoneme Segmentation Fluency by Day Type and Lunch Status

| PSF   | Free/Reduced |  | Paid |  | Total |  |
|-------|--------------|  |      |  |       |  |
| Day Type | Mean | Std. Deviation | N | Mean | Std. Deviation | N | Mean | Std. Deviation | N |
| Full Day | 19.0 | 17.424 | 85 | 29.78 | 15.008 | 58 | 23.37 | 17.268 | 143 |
| Half Day | 28.78 | 15.969 | 40 | 28.82 | 15.92 | 68 | 28.81 | 15.864 | 108 |
| Total   | 22.13 | 17.516 | 125 | 29.26 | 15.453 | 126 | 25.71 | 16.863 | 251 |

Overall, at-risk kindergarten students enrolled in the half-day program made larger gains in phoneme segmentation fluency (PSF) 28.81 than at-risk kindergarten students enrolled in the full-day kindergarten program 23.37.

At-risk students receiving lunch support enrolled in the half day program show larger gains in PSF 28.78 than at-risk students receiving lunch support in the full day program 19.0.

Table 18: Tests of Between-Subjects Effects for Analysis of Phoneme Segmentation Fluency by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>PSF Source</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>4.287</td>
<td>0.039</td>
<td>0.017</td>
</tr>
<tr>
<td>Lunch</td>
<td>6.453</td>
<td>0.012</td>
<td>0.025</td>
</tr>
<tr>
<td>Day Type * Lunch</td>
<td>6.338</td>
<td>0.012</td>
<td>0.025</td>
</tr>
</tbody>
</table>

There is a significant difference between the phoneme segmentation fluency (PSF) gains made by the full-day and half-day kindergarten students by lunch status (alpha = 0.012).
However, since the partial eta squared value is small 0.025, the difference in the sample means could not be considered meaningful.

Table 19: Estimated Marginal Means for Analysis of Phoneme Segmentation Fluency by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>Day Type</th>
<th>Lunch</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FullDay</strong></td>
<td>Free/Reduced</td>
<td>19.0</td>
<td>1.763</td>
<td>15.527</td>
<td>22.473</td>
</tr>
<tr>
<td></td>
<td>Paid</td>
<td>29.776</td>
<td>2.134</td>
<td>25.572</td>
<td>33.98</td>
</tr>
<tr>
<td><strong>HalfDay</strong></td>
<td>Free/Reduced</td>
<td>28.775</td>
<td>2.57</td>
<td>23.713</td>
<td>33.837</td>
</tr>
<tr>
<td></td>
<td>Paid</td>
<td>28.824</td>
<td>1.971</td>
<td>24.941</td>
<td>32.706</td>
</tr>
</tbody>
</table>

At-risk kindergarten students who received free or reduced lunch support and who were enrolled in the full-day kindergarten program showed significantly less improvement on phoneme segmentation fluency (PSF) than those students in the half-day kindergarten program.

However, since the partial eta squared value is small 0.025, the difference in the sample means could not be considered significant. The researcher is not confident that this difference can be replicated in future studies.

Table 20: Descriptive Statistics for Nonsense Word Fluency by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>NWF</th>
<th>Free/Reduced</th>
<th>Paid</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>N</td>
</tr>
<tr>
<td>Full Day</td>
<td>15.26</td>
<td>14.06</td>
<td>85</td>
</tr>
<tr>
<td>Half Day</td>
<td>17.05</td>
<td>12.848</td>
<td>40</td>
</tr>
</tbody>
</table>
At-risk kindergarten students receiving free or reduced lunch support made larger gains on nonsense word fluency (NWF) in the half-day kindergarten program.

In contrast, at-risk kindergarten students who did not receive free or reduced lunch support made larger gains in the full-day kindergarten program.

Table 21: Tests of Between-Subjects Effects for Analysis of Initial Sound Fluency by Day Type and Lunch Status

<table>
<thead>
<tr>
<th>Source</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>0.247</td>
<td>0.619</td>
<td>0.001</td>
</tr>
<tr>
<td>Lunch</td>
<td>0.008</td>
<td>0.93</td>
<td>0.00</td>
</tr>
<tr>
<td>Day Type * Lunch</td>
<td>2.386</td>
<td>0.124</td>
<td>0.010</td>
</tr>
</tbody>
</table>

There are no significant differences between the nonsense word fluency (NWF) gains made by the full-day and half-day kindergarten students by lunch status (alpha = 0.124).

Similarly, since the partial eta squared value is small 0.01, any observed difference in the sample means could not be considered meaningful.

Table 22: Descriptive Statistics for Initial Sound Fluency by Day Type and Gender

<table>
<thead>
<tr>
<th>ISF</th>
<th>Female</th>
<th></th>
<th>Male</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>N</td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>N</td>
</tr>
<tr>
<td>Half Day</td>
<td>15.76</td>
<td>11.706</td>
<td>46</td>
<td>12.35</td>
<td>11.448</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>14.05</td>
<td>11.913</td>
<td>115</td>
<td>12.99</td>
<td>11.917</td>
<td>174</td>
</tr>
</tbody>
</table>
At-risk females in the half-day kindergarten program made larger gains in initial word fluency (ISF) than females in the full-day kindergarten program as well as males in both the half-day and full-day kindergarten program.

The standard deviations are similar which means that the variation in initial sound fluency (ISF) growth, although large, is similar for each of the groups.

Table 23: Tests of Between-Subjects Effects for Analysis of Initial Sound Fluency by Day Type and Gender

<table>
<thead>
<tr>
<th>ISF</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day Type</td>
<td>0.349</td>
<td>0.555</td>
<td>0.001</td>
</tr>
<tr>
<td>Gender</td>
<td>0.96</td>
<td>0.328</td>
<td>0.003</td>
</tr>
<tr>
<td>Day Type * Gender</td>
<td>1.866</td>
<td>0.173</td>
<td>0.007</td>
</tr>
</tbody>
</table>

The significance levels for day type and gender are above the alpha = 0.05 level. Hence, there are no significant differences in the average gain in initial sound fluency (ISF) of at-risk kindergarten students by gender.

Table 24: Descriptive Statistics for Phoneme Segmentation Fluency by Day Type and Gender

<table>
<thead>
<tr>
<th>PSF</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>N</td>
</tr>
<tr>
<td>Day Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Day</td>
<td>21.47</td>
<td>18.187</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>24.86</td>
<td>17.516</td>
<td>101</td>
</tr>
</tbody>
</table>
Overall, at-risk kindergarten students enrolled in the half day program showed larger gains in phoneme segmentation (PSF) 28.81 than at-risk kindergarten students enrolled in the full-day kindergarten program 23.37. However, gender does not appear to be a determining factor for this difference.

Table 25: Tests of Between-Subjects Effects for Analysis of Phoneme Segmentation Fluency by Gender

<table>
<thead>
<tr>
<th>PSF Source</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>7.339</td>
<td>0.007</td>
<td>0.029</td>
</tr>
<tr>
<td>Gender</td>
<td>0.14</td>
<td>0.708</td>
<td>0.001</td>
</tr>
<tr>
<td>Day Type * Gender</td>
<td>1.282</td>
<td>0.259</td>
<td>0.005</td>
</tr>
</tbody>
</table>

There is no significant difference between the PSF gains made by the full day and half day groups by gender (alpha = 0.259).

Similarly, since the partial eta squared value is small (0.005), any observed difference in the sample means could not be considered meaningful.

Table 26: Descriptive Statistics for Nonsense Word Fluency by Day Type and Gender

<table>
<thead>
<tr>
<th>NWF</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>Std. Deviation</td>
</tr>
<tr>
<td>Day Type</td>
<td></td>
<td>Mean</td>
<td>Std. Deviation</td>
</tr>
<tr>
<td>Total</td>
<td>101</td>
<td>15.70</td>
<td>12.916</td>
</tr>
</tbody>
</table>
Overall, there are no notable differences in the average gains in nonsense word fluency (NWF) made by at-risk kindergarten students by day type or gender.

Table 27: Tests of Between-Subjects Effects for Analysis of Nonsense Word Fluency by Day Type and Gender

<table>
<thead>
<tr>
<th>Source</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Type</td>
<td>0.238</td>
<td>0.626</td>
<td>0.001</td>
</tr>
<tr>
<td>Gender</td>
<td>0.073</td>
<td>0.787</td>
<td>0.00</td>
</tr>
<tr>
<td>Day Type * Gender</td>
<td>0.076</td>
<td>0.783</td>
<td>0.00</td>
</tr>
</tbody>
</table>

There are no significant differences between the nonsense word fluency (NWF) gains made by the full-day and half-day kindergarten students by gender (alpha = 0.783).

Similarly, since the partial eta squared value is small 0.00, any observed difference in the sample means could not be considered significant.

Table 28: Summary Results of Analysis of At-Risk Students

<table>
<thead>
<tr>
<th>Measure</th>
<th>Overall</th>
<th>By Gender</th>
<th>By SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISF</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
</tr>
<tr>
<td>PSF</td>
<td>Half Day has larger gains</td>
<td>No Significant Difference</td>
<td>Half Day lunch support has larger gains*</td>
</tr>
<tr>
<td>NWF</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
</tr>
</tbody>
</table>

Other indicators suggest that the difference seen in phoneme segmentation fluency (PSF) may not be significant because the sample size is small relative to the large variance.
Summary Results of At-Risk Students

In general there are no significant differences in the reading achievement of at-risk kindergarten students between the full-day and half-day kindergarten programs.

The differences in the phoneme segmentation fluency (PSF) comparison are not supported by the initial sound fluency (ISF) and nonsense word fluency (NWF) analyses. The differences in phoneme segmentation fluency (PSF) are an indication that there are differences between the full-day and half-day kindergarten instruction of phonemic awareness.

Chapter 5 contains a summary of the study, conclusion based on the research findings, synthesis of the findings, and recommendations for future research.
Chapter 5
Summary, Conclusions, and Recommendations

Introduction

Traditional kindergarten programs are changing throughout the United States. The length of the day and curricular expectations has changed educational practices in kindergarten programs. In the past, kindergarten programs were considered a voluntary educational experience that occurs between preschool and first grade. As family needs have changed so has the demand for full day kindergarten. According to the Education Commission of the States (ECS, 2004), most children of kindergarten age (about 98%) attend at least a half-day kindergarten program. The trend of enrollment in full-day kindergarten over 25 years has shown an increase from less than 25% in 1975 to nearly 63% in 2000. As of 2005, nine states had a policy requiring local educational agencies to offer full-day kindergarten (ECS, 2005). (Martinez 1)

The purpose of this study was to determine the effect full-day kindergarten had on the reading achievement of at-risk students as determined by the DIBELS assessment. The DIBELS reading assessment was used to measure reading achievement in Shawnee Mission during the 2006-2007 school year. The DIBELS was first used in assessment of academic
achievement in the Shawnee Mission School District in selected schools during the 2002-2003 school year. In September of the 2006-2007 school year, the DIBELS assessment was used in every elementary school in the Shawnee Mission School District. Demographic data (gender and eligibility for free and reduced lunch) were collected to demonstrate the differences between students who were in Title I schools, schools with full-day kindergarten and schools with a half-day kindergarten program. Students were selected from schools in the Shawnee Mission School District that provided a half-day and full-day kindergarten program.

**Summary**

This study employed a pretest/posttest design using the data from the DIBELS (Dynamic Indicators of Basic Early Literacy Skills) assessment. The DIBELS assessment data were collected from half-day and full-day kindergarten students in the Shawnee Mission School District. The DIBELS assessments were administered at the beginning of the school year (pretest) and at the end of the school year (posttest). Each tested indicator was analyzed and compared among students to make recommendations for intensive instructional support.

Kindergarten students were enrolled in either the
half-day or full-day program. The independent variables were: (a) the program type, as defined by the length of day (b) students’ gender, and (c) the socioeconomic status of the schools being analyzed, based on the percentage of students participating in the free and reduced lunch program. Each tested indicator was analyzed and compared among students to make recommendations for intensive instructional support.

Following the collection of data, a two-way analysis of variance (ANOVA) was used to determine if there were any significant differences between the treatment methods of full-day and half-day kindergarten students in reading achievement as measured by the DIBELS assessment. Data were collected from 597 kindergarten students by analyzing scores from the DIBELS pretest and posttest. A two-way ANOVA was used when one factor or treatment variable (DIBELS assessment) was explored and there were more than two groups within that factor. The level of risk or level of significance was set at .05.

As a result of data collected in this study, the research hypothesis (There is no significant difference reading achievement as measured by DIBELS between kindergarten students in either a full-day or half-day program at the 0.05 level of significance.) was validated
since no significant differences could be determined between the DIBELS assessment scores collected from half-day and full-day kindergarten students in the Shawnee Mission School District.

**Conclusion**

The kindergarten students who were selected for this case study were given the DIBELS (Dynamic Indicators of Basic Early Literacy Skills) assessments during the 2006-2007 school year selected from schools in the Shawnee Mission School District that provided a half-day and full-day kindergarten program. Several points can be concluded from the research.

First, the data shows that the percent of students in the full day program who were reading at benchmark increased by 23.2%. The percent of students in the half day program who were reading at benchmark increased by 20.4%, yet both programs started with nearly the same percent of students at benchmark in August. This serves as preliminary evidence that the full day program may yield more growth in student reading skills. A possible explanation for these results may be that teachers can individualize instruction better if given half as many students for twice as much time. Teachers and schools are continuing to refine how they allocate instructional
resources and instructional time.

Second, half-day kindergarteners made larger gains when testing PSF (Phoneme Segmentation Fluency). ISF, (Initial Sound Fluency) is assessed at the beginning and middle of the school year. PSF, (Phoneme Segmentation Fluency) is assessed at the middle and end of the school year. NWF, (Nonsense Fluency Words) is assessed at the middle and end of the school year.

Other indicators suggest that the difference seen in PSF (Phoneme Segmentation Fluency) may not be meaningful because the sample size is small relative to the large variance. Table 29 shows summary results by gender and SES.

**Table 29: Summary Results of Analysis**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Overall</th>
<th>By Gender</th>
<th>By SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISF</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
</tr>
<tr>
<td>PSF</td>
<td>Half Day has larger gains</td>
<td>No Significant Difference</td>
<td>Half Day lunch support has larger gains*</td>
</tr>
<tr>
<td>NWF</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
<td>No Significant Difference</td>
</tr>
</tbody>
</table>

In general there is no significant difference in the reading achievement of at-risk students between full day and half day programs.

The difference in the PSF(Phoneme Segmentation Fluency) comparison is not supported by the NWF(Nonsense
Fluency Words) comparison. However, there is evidence that there is a difference in full and half day instruction of phonemic awareness.

Another reason for seeing the slight gain between half-day and full-day kindergarteners may be attributed to teacher quality, school environment, and possible testing errors in the administration of DIBELS. Each teacher participated in a one day training session in order to properly administer the DIBELS assessment. Teachers also attended follow-up sessions throughout the school year to keep their assessment skills sharp. As with anything new, there are items to be improved, instructional methodology to be adjusted, and considerations to classroom environment.

Finally, DIBELS data for the full-day and half-day kindergarten program were taken over a one year period. A similar study should be conducted after the full-day program has been in place for three or more years. Kindergarten students in the Shawnee Mission School District would be better served if the data were recorded of a longer length of time and instructional methods adjusted.

Recommendations for Future Research

This study adds to the research that has been
conducted in the past regarding student achievement when comparing full-day and half-day kindergarten programs. The following recommendations are a result of consideration following the completion of the study.

Full-day kindergarten is new to the Shawnee Mission School District and within the state of Kansas. Many teachers and schools are continuing to refine how they allocate instructional resources and instructional time. A longitudinal study should be conducted after the full-day program has been in place for three or more years to determine if the differences in achievement are significant.

The training provided to the instructors for the administration of the DIBELS needs to be more in-depth and continued throughout the school year. This would not only increase the instructor’s overall effectiveness in scoring the results, but would also ensure proper administration of the assessment. To insure teacher quality the training would be best if a person from the Institute for the Development of Educational Achievement trained the kindergarten teachers in the Shawnee Mission School District. The current training was a one day August in-service with follow-up support from a Shawnee Mission School District resource specialist.
Future studies should use a larger population of students to reduce the effects of teacher quality, school environment, and possible testing errors in administering the DIBELS assessment.

To conclude, the half-day versus the full-day program has long been a debate among parents, educators, and policy makers. Half-day kindergarten proponents have concluded that a shorter day decreases the stress on the child, provides all that young children need to be introduced to school, and allows more time in a less formal structure. Full-day kindergarten advocates claim the longer day gives students more time for in-depth exploration of experiences, provides teaching and learning continuity, decreases time spent in transition, provides more time for one-to-one interaction, and provides potential for greater academic performance.

Finally, despite the researcher’s focus on the effects of student achievement in the full-day kindergarten program perhaps the greatest debate and challenge continues to be about maintaining a balance in the kindergarten curriculum to include components that support academic, social and emotional development. It is important to remember that these students are only five years old. Even though kindergarten programs are more academic than ever before,
the students still need to have choices every day, to be able to sing, and to use their imagination. All of these things belong in kindergarten, and need to stay in kindergarten.

One of the greatest pressures that schools have worked so hard to offer in full-day kindergarten programs is the rigor demanded in math and reading in order to meet AYP. The growing diversity seen in all schools has increased the need to work with at-risk populations to insure all children can and do learn. This means that we begin expecting the best for our children right from the start. We owe it to them to organize our schools so that the highest level of instruction is offered beginning in kindergarten.
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