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**PROJECT IRIS:
INTENSIVE READING INTERVENTION STUDY,
A THREE-YEAR FOLLOW-UP**

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ABSTRACT

In 2002-03, the Intensive Reading Intervention Study (IRIS) was implemented in six Wake County Public School System elementary schools. The intervention was designed to help 1st-grade students experiencing reading difficulty meet grade-level standards and show sufficient progress to maintain that status in future years. An initial study examined the effects on students' 1st-grade reading skills. This follow-up study investigates students' reading skills through grade 4. Results generally show strong reading outcomes for students in both experimental and control groups, with no statistically significant differences in terms of percent proficient in reading and average reading performance. A more favorable and statistically significant average reading residual was found for 3rd-grade experimental group students compared to their counterparts. Students in both groups were placed in special education, provided remedial support, or retained in grade at about the same rates between grades 1 and 4.

BACKGROUND

At the end of the 1998 school year, the Wake County Public School System (WCPSS) signed a Consent to Resolve with the Office of Civil Rights (OCR). The initial complaint to OCR cited disproportionate referral of African-American male students to special education services. In the resolution, WCPSS agreed to analyze referral practices and design data-driven interventions that would address this issue. WCPSS agreed to hire staff dedicated to this effort. In 1999, six coordinating teachers were hired to work at selected schools found to have a disproportionate rate of referral based on a chi-square ratio that was computed yearly during the three years of the project. These teachers received intensive training in behavior support and literacy. A project called the Intensive Reading Intervention Study (IRIS) was piloted during the 2000-01 school year to determine whether literacy strategies

<u>Key Topics</u>	
Project IRIS Follow-up.....	p. 3-5
Special Programs.....	p. 8-9
Retention.....	p. 10
Reading Achievement.....	p. 11-14
Summary and Discussion	p. 15-19

could be used effectively as a short-term intensive intervention to affect the referral of students to special education services. At the end of the same year, OCR ended its consent agreement with WCPSS and found WCPSS to be a model for other school districts struggling with similar issues.

Project IRIS was evaluated in 2002-03 (Holdzkom, 2003). In 2002-03, Project IRIS was implemented in six WCPSS elementary schools. The intent of Project IRIS was to examine whether students identified as experiencing reading difficulty would gain the skills needed to meet grade-level benchmarks via participation in an intensive reading intervention. Specifically, the study addressed two questions:

- Can students identified as experiencing reading difficulty in 1st-grade acquire the skills needed to reach grade-level reading status and continue to make sufficient progress to earn grade-level scores on the End-of-Grade (EOG) test years later?
- Is it possible to intervene early with students and decrease their chances of needing remediation later?

The study participants included 1st-grade students from Baucom, Briarcliff, Cary, Lacy, Holly Springs, and Zebulon elementary schools. The selection process at each school began with class lists of 1st-grade students who had been referred to the Student Support Team. Students who had been retained in 1st-grade or were identified as not in need of intervention were immediately eliminated from possible participation. Students were then ranked according to their running record book-level results, and 20 students from the lowest quartile were randomly selected to take the Rapid Automatic Naming (RAN) assessment. Those students with mean RAN scores above 70 (indicating a need for remediation requiring more time than 10 weeks) were eliminated. The remaining students constituted the drawing pool from which 10 students from every 1st-grade class were randomly assigned to control and experimental groups.

Experimental group students met with tutors for an average of 45 minutes at least four times per week for ten weeks. The reading intervention was individualized rather than prescribed, in that tutors assessed the needs of each student and offered appropriate interventions which typically included lessons in phonemic awareness, decoding and encoding, text reading, comprehension strategies, fluency, and oral language. Tutors received the following training in reading problems and correctives to prepare for this specialized intervention: a five-day training session conducted by Dr. Cecil Mercer and colleagues, which included a practicum experience with a struggling first grade student; 20 hours of Reading Clusters Training by Dr. Lois Huffman and Carolyn Patton; and 30 hours of an intensive reading training, Foundation Level Training by Connie Steigerwald and Sherri Miller, Great Leaps, Wilson Overview, and K-5 Literacy Training.

Students participated in one of three cycles during the 2002-03 school year. All 169 students in the sample were tested at the beginning and end of the cycle on a number of measures, including running record book-level, rapid automatic naming, phonemic awareness, alphabetic principle, decoding, and sight words. The running records were administered by a trained group of four assessors. Inter-rater reliability was checked three times. To examine the long-term effects of

the intervention, Cycle 1 participants, who received the intervention at the beginning of 1st-grade, were assessed using the running record book level at the end of the school year. The short-term effects were examined among Cycle 3 participants, who received the intervention at the end of the year, and were subsequently assessed with the running record. It was hypothesized that students in the experimental group who received individualized reading intervention would demonstrate greater gains in reading than students in the control group. Moreover, it was assumed that these differences would surface after the intervention and continue through the end of the school year.

On many of the assessments, in each of the three cycles, students in the experimental condition started with lower scores but gained more than students in the control group on average. Patterns in year-end running record scores also favored the experimental group students, suggesting the intervention had a positive impact on reading skills. However, while students in the experimental group did outperform students in the control group on average, the differences between the groups were not statistically significant. Out of all students in Cycles 1 and 3 whose running record book levels were examined at the end of the year, 41 (74.5%) students in the experimental group had met the grade-level benchmark, compared to 23 (47.9%) students in the control group. Additionally, there appeared to be no significant differences in the likelihood of retention in grade for both the experimental and control groups. Considering all cycles, the vast majority of students were promoted to grade 2; however, 15 (17.2%) of the experimental group students and 16 (18.6%) of the control group students were retained.

PROJECT IRIS, A THREE-YEAR FOLLOW-UP

Acquiring the necessary reading skills to ensure academic success and personal, social, and economic advancement is highly valued in our technological society and era of educational accountability. Although most children learn to read with few difficulties, some children face the possibility of inadequate literacy development. Children who will likely require supplementary support for early language and literacy development should receive it as early in their educational careers as possible (Justice, 2006; Torgensen, 2004).

A child's 1st-grade reading level is a strong predictor of his or her projected literacy. Several longitudinal studies (Catts, Fey, Tomblin, & Zhang, 2002; Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Juel, 1988; Shaywitz & Fletcher, 1999; Reynolds, 1991) found that it is highly likely for children who experience reading difficulties in kindergarten and 1st-grade to struggle with reading throughout their education. Nevertheless, reading problems can be prevented if students who are identified as having or potentially having reading difficulties participate in early intervention programs (Juel, 1996; Pikulski, 1994). To meet their long-term literacy potential, essential steps must be taken to ensure that children overcome their reading problems during their primary education.

The early intervention that Project IRIS offered students was intended to be both proactive and preventive. Project IRIS was an early school intervention program that intended to avert the development of literacy problems, rather than to correct established reading problems. Ideally, such programs are utilized in the 1st- and 2nd-grades. Often, students are eligible for services in the area of reading around 3rd grade, beyond the early intervention years. Project IRIS delivered

intervention to 1st-grade students in the emergent and early stages of literacy. Intervention during this period helps to build skills that are necessary for future reading success and can be highly effective at reducing reading achievement developmental inequalities (Justice, 2006).

At the time Project IRIS was implemented, students having difficulty in reading may have been helped solely by the classroom teacher or by classroom teachers and supplemental services. Students with reading difficulties may have been placed in special education programs, especially if they were identified as learning disabled (Snow, Burns & Griffin, 1998). Students with limited skills in English might have received English as a Second Language (ESL) services as well. Some schools offered the Accelerated Learning Program (ALP) at the primary grades (called ALP II or ALP K-2). ALP II, which began in WCPSS in 2000-01, utilizes published materials and is highly structured, with brief instruction in several components of reading four days a week. Multiple criteria were used to identify students for ALP II services: below grade-level scores on print concepts and running record book-level assessments, teacher observations, service in special education and ESL programs, retention status, prior service in the program, and additional test results collected during screening (Paeplow & Baenen, 2005). Most students selected to participate in Project IRIS were receiving and continued to receive this supplemental service. After 2nd-grade, remedial support would also be available to students scoring below grade level through ALP I, which primarily provides tutoring support. Some schools also used Title I funds to provide supplemental services at grades 3-5 (e.g., small group instruction, tutoring, and parent involvement activities).

It was hypothesized in the 2002-03 Project IRIS study that gains resulting from the 1st-grade intervention made by study participants who were at risk for reading difficulties would enable students to progressively build their reading skills after the intervention was completed. The primary purpose of this follow-up study is to test the endurance of this hypothesis through time-series analysis. This follow-up study tracks the progress of the initial Project IRIS participants by analyzing their participation in special education and other supplemental services, grade-level retention, and reading achievement at grades 2, 3, and 4. We compare the development of those students in the experimental group at the outset to those students originally in the control group.

The 2002-03 study was implemented with the short-term goal that early and intensive interventions might reduce each student's need for subsequent special education or other supplemental services and decrease retention in grade. Additionally, the findings of the initial study showed some positive, although not statistically significant, gains for the experimental group compared to the control group. The current study intends to:

- investigate longitudinally (school years 2003-04, 2004-05, and 2005-06) whether the original Project IRIS participants were identified as students with disabilities (SWD), provided service by ALP II at grade 2 or Title I at grades 3 or 4, or were retained in grade; and
- examine whether gains made by students in the experimental group are maintained after the cessation of intervention and are significantly different from students in the control group through the examination of three years of reading data: the grade 2 running record

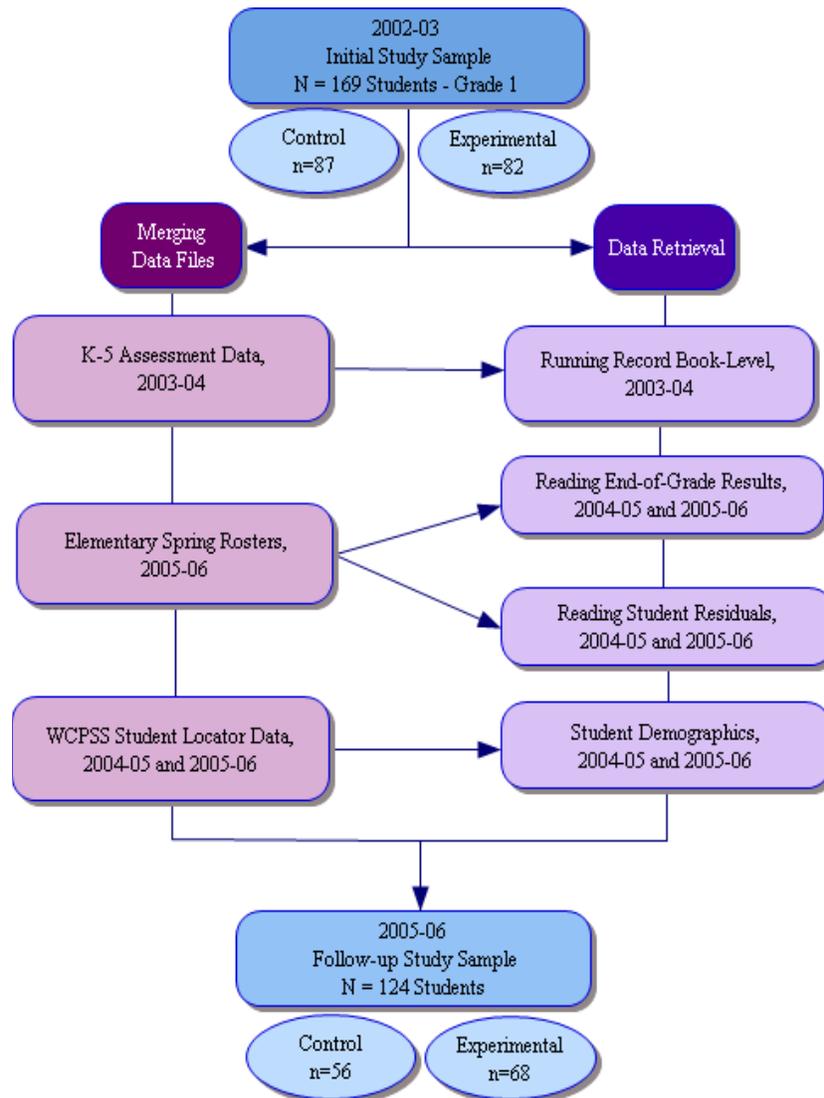
book level in May 2004, the grade 3 reading EOG pretest and posttest in 2004-05, and the grade 4 reading EOG in 2005-06.

The Committee on the Prevention of Reading Difficulties in Young Children (Snow et al., 1998) cited failing to achieve grade-level expectations in reading as the major reason for retention in the early grades. Although we cannot verify that reading difficulties are the primary source of retention, we will document and compare the retention patterns of Project IRIS control and experimental group students and assess whether these retention patterns mirror those of the district. This study also cannot assess whether an intervention longer than ten weeks would have been more beneficial or whether a continuation of some form of intervention over the years would have led to a more extensive remediation of these children's reading difficulties. Another limitation of the current study is the inability to control for any differences arising from other interventions for students, such as ALP II, Title I services, special education services, or other academic support.

Data Source and Sample

Figure 1 illustrates the data collection pattern for the 169 initial Project IRIS participants. Students who were promoted each year would be 4th-grade students in 2005-06. Of the original sample, 45 students were no longer part of WCPSS by the year 2005-06. The remaining 124 students (56 from the control group and 68 from the experimental group) serve as the analytical sample for this follow-up study. The analysis of reading achievement data is restricted to promoted students with complete assessment data.

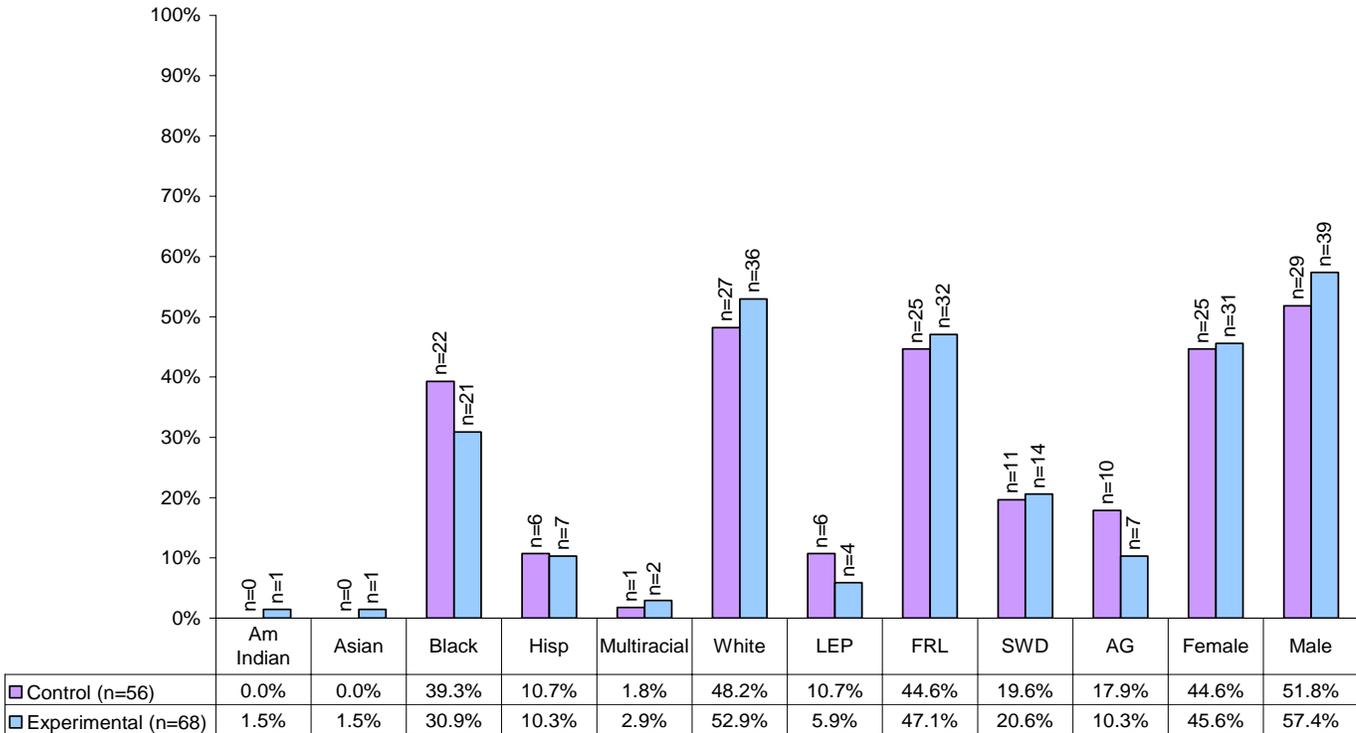
Figure 1
Project IRIS Follow-up Study Data Flowchart



Interpretation Example: Of the 169 initial Project IRIS participants, 124 were still attending WCPSS schools in 2005-06 and had available data. Of these 124 students, 56 were from the control group and 68 were from the experimental group.

Figure 2 displays the characteristics of the 124 students in the follow-up sample. As shown, students in the experimental group were slightly more likely than students in the control group to be White students, male students, free or reduced-price (FRL) students, and SWD students. Black students, LEP students, and academically gifted (AG) students were more frequently found in the control group.

Figure 2
Follow-up Study Sample Characteristics, 2005-06



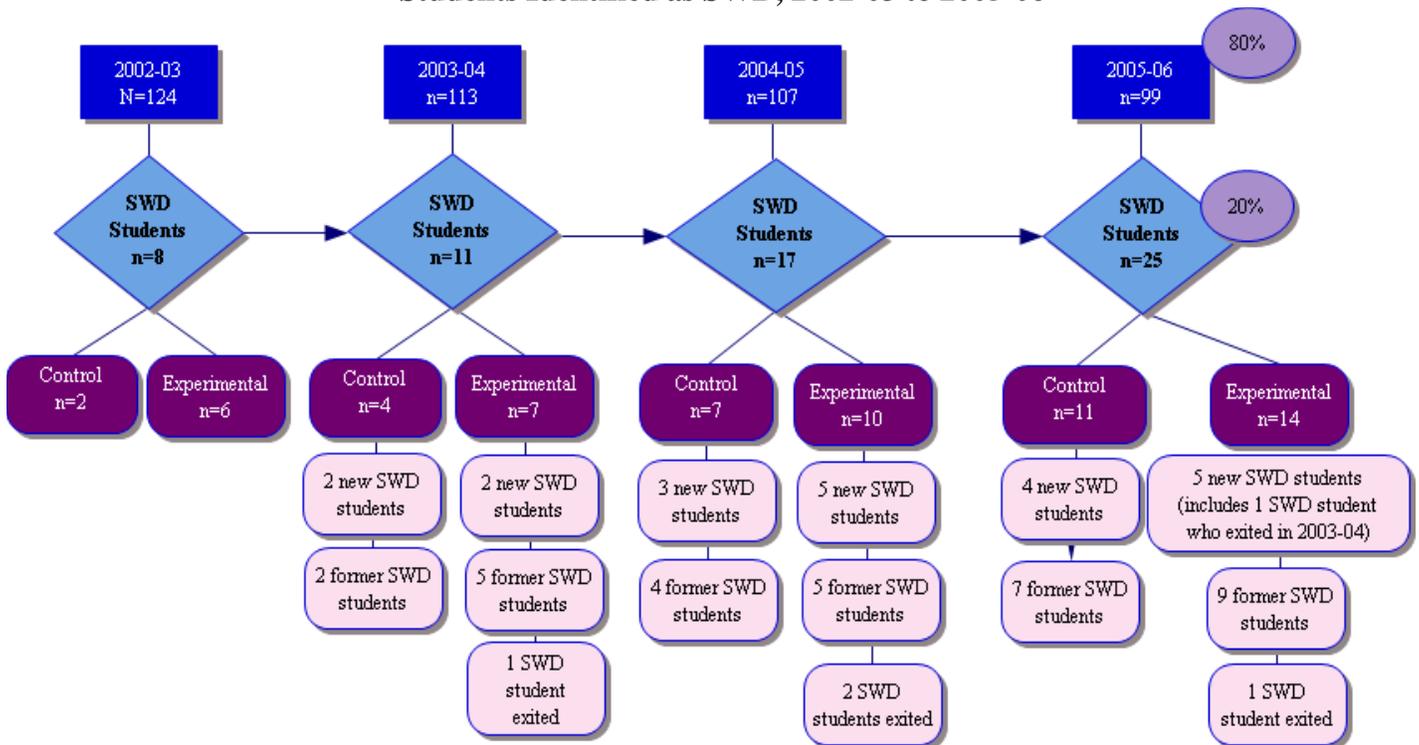
Interpretation Example: Of the 56 students in the control group, 22 (39.3%) were Black students, compared to 21 (30.9%) of the 68 students in the experimental group.

Students with Disabilities Analysis

Figure 3 charts the progress of SWD identification between 2002-03 and 2005-06. Eight students who were identified as SWD were selected to participate in Project IRIS in 2002-03. Five of these students received services from a speech language pathologist. Over the course of the three years, most of the other students (80%) from the original study were not directed into special education services. Instances of SWD identification tended to occur more frequently among students in the experimental group compared to the control group in 2003-04 and 2004-05. By 2005-06, an equal number of experimental group and control group students were identified as SWD.

- Eleven (four control group and seven experimental group) students were identified as SWD in 2003-04.
- In the following year, eight additional SWD students were identified: three control group students and five experimental group students. Conversely, two SWD students from the experimental group exited special education services.
- By 2005-06, nine more students were classified as SWD. One of these students exited in 2004-05 and was reclassified under a different SWD code in 2005-06. One SWD student from the experimental group exited during 2005-06.

Figure 3
Students Identified as SWD, 2002-03 to 2005-06



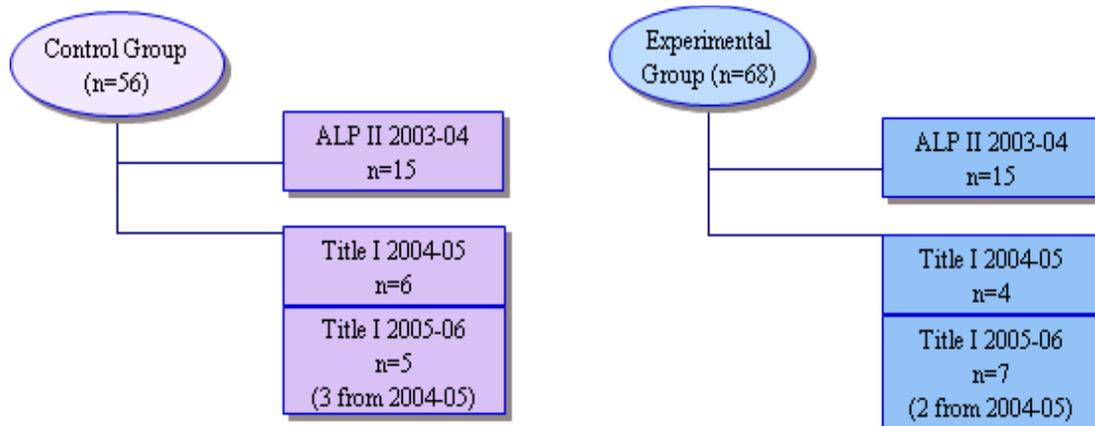
Interpretation Example: Only eight of the 124 students in the original study sample were identified as SWD students. By 2003-04, 11 students, including four from the control group and seven from the experimental group, had been identified as SWD students.

Other Supplemental Services Analysis

Figure 4 tracks students' participation in supplemental support services after grade 1 through ALP II at grade 2 in 2003-04 and Title I service at grade 3 in 2004-05 and grade 4 in 2005-06¹. When comparing percentages of students' participation in the programs, students in the experimental group were slightly less likely to be served by ALP II in 2003-04 or Title I in 2004-05 than were students in the control group. Similar percentages of students in both groups were served by Title I in 2005-06.

- In 2003-04, 15 students in the control group and 15 students in the experimental group were served by ALP II. However, this yielded a slightly higher participation percentage for control group students than experimental group students (27% versus 22%, respectively).
- Six students in the control group (11%) and four students in the experimental group (6%) were served by Title I in 2004-05.
- In 2005-06, five students in the control group (9%) and seven students in the experimental group (10%) were served by Title I.

Figure 4
Student Participation in ALP 2003-04 and Title I 2004-05 to 2005-06



Interpretation Example: In 2003-04, 15 students in the control group and 15 students in the experimental group were served by ALP II. However, this yielded a slightly higher participation percentage for control group students than experimental group students (27% versus 22%, respectively).

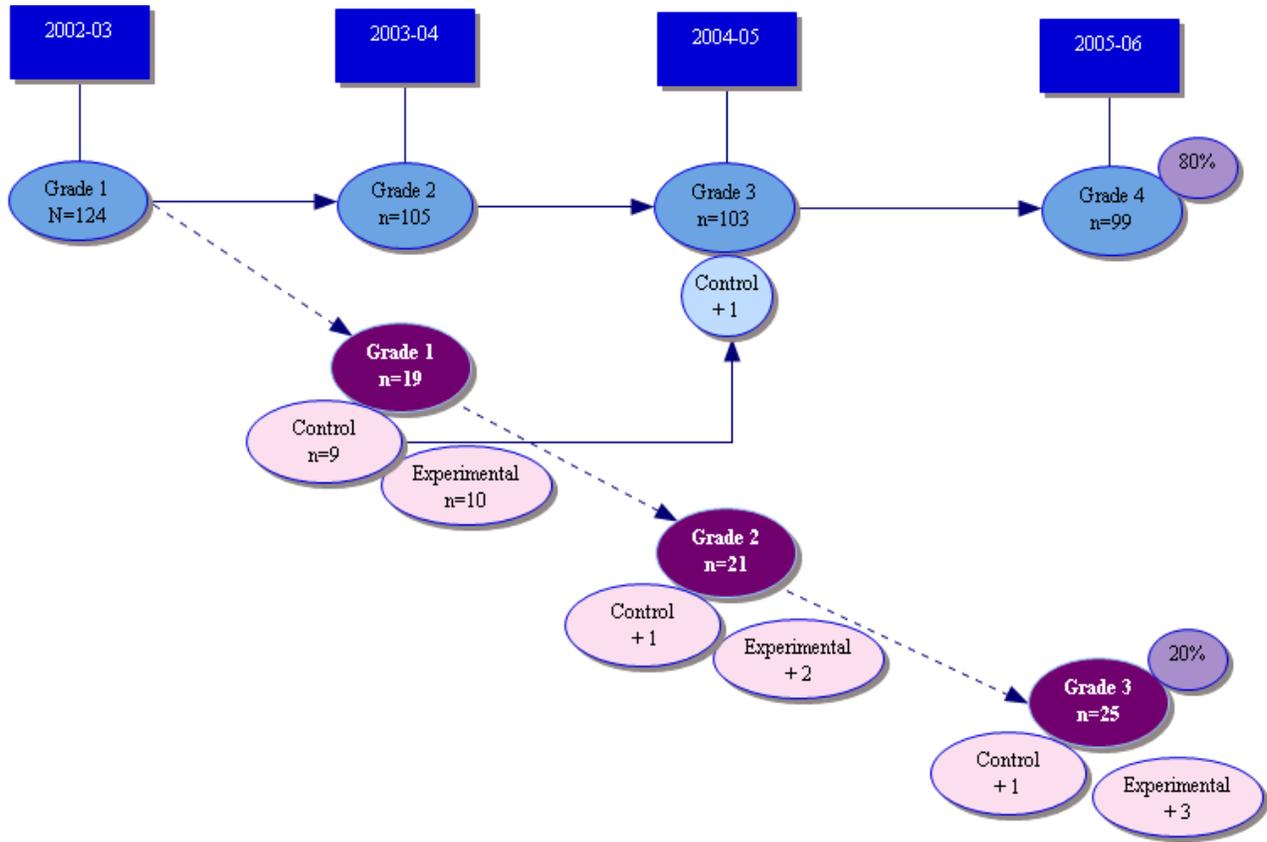
¹ We did not monitor assistance through ALP I at grades 3 and 4, which provides tutoring support primarily to those scoring below grade level, because we had incomplete data.

Grade-Level Promotion and Retention Analysis

Figure 5 presents students' grade-level promotion and retention between 2002-03 and 2005-06. Over the three-year span, the vast majority (80%) of the 124 1st-grade students from the initial study maintained a typical grade-level trajectory and had been promoted to grade 4 in 2005-06. This included 46 (82.1%) of the control group students and 53 (77.9%) of the experimental group students. Students in the experimental group were not less likely, but rather more likely, to be retained than students in the control group. In general, the retention patterns of this sample reflect the WCPSS district pattern for elementary schools (Baenen and Holdzkom, 2006), with Project IRIS students most frequently retained in grade 1 than in grades 2 or 3.

- Of the 124 1st-grade students from the initial study, 19 (nine in the control group and ten in the experimental group) repeated the 1st grade in 2003-04, whereas 105 were promoted to the 2nd grade.
- In 2004-05, one control group student and two experimental group students repeated the 2nd grade, and one 1st-grade student from the control group who repeated the 1st grade in 2003-04 was promoted to the 3rd grade.
- In 2005-06, one control group student and three experimental group students were retained in 4th grade.

Figure 5
Grade-Level Promotion and Retention, 2002-03 to 2005-06



Interpretation Example: Nineteen students (nine in the control group and ten in the experimental group) repeated the 1st grade in 2003-04, whereas 105 were promoted to the 2nd grade.

Reading Achievement Analysis

Of the original 169 students in the 2002-03 Project IRIS, 45 students were no longer enrolled in WCPSS by spring of 2005-06 and 25 had been retained. Students who were retained were not included in the achievement analyses because they did not have complete assessment data: the grade 2 running record book level in May 2004, the grade 3 reading EOG pretest and posttest in 2004-05, and the grade 4 reading EOG in 2005-06. Complete reading assessment data for longitudinal analyses were available for 94 of the 99 students who were in 4th grade in 2005-06. Thus, achievement analyses are based on 56% of the original sample. This sample size is much smaller; and therefore, less stable than system patterns, so results must be interpreted with caution.

Table 1 displays the percentage of students proficient on the running record book-level and reading EOGs for the 44 students from the control group and 50 students from the experimental group, as well as the district. Overall, promoted students in both the experimental and control groups had positive achievement outcomes after grade 1. The experimental student group was not able to maintain the slight advantage they had over the control group at the end of grade 1. By the spring of grade 2 and the fall of grade 3, the percentage of experimental group students scoring at grade level was slightly lower than the control group students. However, by the spring of grade 3, the proficiency of students in the experimental group surpassed that of students in the control group. By the end of grade 4, students in the experimental group continued to have slightly higher percentages of students scoring at grade level compared to students in the control group, but differences were not statistically significant.

- In 2003-04, the percentage of students in both the control and experimental groups who met running record book-level standards for grade 2 was more than 90%, higher than the district (83.8%). Control group students scored 1.2 percentage points higher than experimental group students; this difference was not significant.
- A smaller percentage of the experimental group students scored proficient on the grade 3 reading EOG pretest compared to the control group students. Both groups had lower percentages of students proficient on this exam compared to the district.
- By the grade 3 reading EOG posttest, the percentage of students in the experimental group who were proficient increased by 24 percentage points (68% to 92%).
- With the exception of the grade 3 reading EOG pretest, greater percentages of experimental group students were proficient on the various reading assessments compared to district percentages between 2003-04 and 2005-06, whereas the percentages of control group students who were proficient on grade 3 and 4 EOG posttests were more aligned with the district.

Table 1
Percent Proficient on Reading Assessments, 2003-04 to 2005-06

Year	Assessment	Proficiency Level	Control (n=44)	Experimental (n=50)	District
2003-04	Grade 2 Running Record	Book Level at or above 23-24	93.2%	92.0%	83.8%
2004-05	Grade 3 Reading EOG Pretest	Levels III and IV	72.7%	68.0%	81.4%
	Grade 3 Reading EOG Posttest	Levels III and IV	88.6%	92.0%	88.5%
2005-06	Grade 4 Reading EOG Posttest	Levels III and IV	90.9%	94.0%	90.9%

Note: Analyses of chi-square results show no statistically significant differences between the control group's percent proficient and the experimental group's percent proficient on the various assessments.

Interpretation Example: In 2003-04, 93.2% of the control group students met reading book-level standards compared to 92.0% of the experimental group and 83.8% of students districtwide.

Table 2 presents students' average reading performance by the various grade-level assessments beginning with data compiled in the initial 2002-03 study and continuing through 2005-06. Results show similar average book-levels and scale scores for students in the control and experimental groups throughout the three years. Both groups have similar standard deviations for each assessment as well and appear to be more similar to each other rather than the district in terms of reading performance. Overall, EOG performance for both groups was slightly lower, but within one standard deviation, of the district.

- The year after the initial study, control group and experimental group students exhibited roughly equivalent average book-level performance.
- By grade 3, the average performance of students in the experimental group fell slightly behind the control group's mean scale score on the reading EOG pretest.
- Students in the experimental group improved in their average reading performance by the end of grade 3, although their average reading scale scores for grades 3 and 4 were comparable to the average performance of students in the control group.
- On average, control and experimental group students' reading performance on the EOG exams was lower than the district means between 2004-05 and 2005-06. Yet the averages were still within one standard deviation of the district averages.
- Both groups have smaller standard deviations compared to the district, indicating less variation within and between groups.

Table 2
Average Reading Performance, 2002-03 to 2005-06

Year	Assessment	Control			Experimental			District		
		Mean	SD	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>
2003-04	Grade 2 Running Record Book Level	24.5	3.09	44	25.0	3.23	50	25.0	6.15	7,629
2004-05	Grade 3 Reading EOG Pretest	238.0	9.83	44	236.1	8.53	50	241.9	10.1	8,404
	Grade 3 Reading EOG Posttest	247.9	7.34	44	248.9	6.35	50	250.5	8.9	8,702
2005-06	Grade 4 Reading EOG Posttest	252.9	7.48	44	253.6	6.82	50	255.5	8.4	8,848

Note: Analyses of t-test results show no statistically significant differences between the control group's average performance and the experimental group's average performance on the various assessments.

Interpretation Example: In 2003-04, the control groups' average reading booklevel was 24.5 compared to 25.0 for the experimental group, and 25.0 districtwide.

Table 3 presents the average reading residuals based on the WCPSS effectiveness index for 3rd-grade students in 2004-05 and 4th-grade students in 2005-06. The effectiveness index uses regression analyses to indicate whether students' scale scores for one year are higher or lower than would be predicted based on scale scores from the previous year and student characteristics. The residuals represent the difference between the predicted scores for students and their actual scores expressed in scale score points. When comparing average residuals of groups of students, the following assumptions can be made:

- If average reading and mathematics residuals of one group of students are similar to another group of students, both groups are growing at a similar rate from EOG pretests to posttests.
- If average reading and mathematics residuals of one group of students are close to zero, the growth of that group is comparable to the growth of similar WCPSS students who took EOGs (an average residual for each EOG in WCPSS is zero).

Results presented in Table 3 show a more favorable average 3rd-grade reading residual for students in the experimental group compared to students in the control group. This difference was found to be statistically significant ($p = 0.5$).

- According to the average 3rd-grade residuals, students in the experimental group grew significantly more between reading EOG pre- and posttests than did students in the control group. As shown in Table 2, student in the experimental group started out with slightly lower scale scores than students in the control group in the fall on the pretest.
- While the control group students appear to have made comparable growth to students in the district with similar characteristics, experimental group students seem to have progressed more than other students in the district between the grade 3 reading pre- and posttest.
- At grade 4, the groups' average residuals were similar, indicating that these groups of students grew at about the same rate from EOG pretests to posttests and that their growth was similar to other students in the district.

Table 3
Average Reading Residuals, 2004-05 to 2005-06

	Control		Experimental		District	
	<i>n</i>	Average Reading Residual	<i>n</i>	Average Reading Residual	<i>n</i>	Average Reading Residual
2004-05 (Grade 3)*	44	-0.404	50	1.874	8,344	-0.0006
2005-06 (Grade 4)	44	-0.819	50	-0.410	7,737	-0.0007

Note: Analyses of t-test results show a statistically significant difference between the control group's average grade 3 reading residuals and the experimental group's average grade 3 reading residuals. No statistically significant difference was found at grade 4.

* $p = 0.5$ level of significance

SUMMARY OF FINDINGS

Given the difficulty the Project IRIS students were having in reading in 1st-grade, we would expect many students to be retained, placed in special education, or receiving supplemental services. It is not possible to quantify these expectations precisely, but the control group allows us to see whether the intervention provided by Project IRIS led to fewer retentions or less need for supplemental help for those students. About 20% of students in the experimental and control groups received subsequent support through their SWD identifications. Few students in either group were served through other supplemental services between 2002-03 and 2005-06.

About 20% of the experimental and control group students were retained in grade between grades 1 and 4. Those students who were retained did not have the opportunity to demonstrate 4th-grade-level proficiency on the 4th grade EOG. Of those students who were promoted to grade 4 in 2005-06, high percentages of students in both groups were able to show grade-level proficiency in grades 2, 3, and 4. By grade 4, both groups of promoted students showed a reading proficiency rate of 90% or better on the EOG, which was similar to district results. If we count students who were retained as having below-grade-level performance, the percentage of all Project IRIS participants performing at grade level three years later would be lower than 90%.

Average scale scores for experimental and control group students were slightly lower, but within one standard deviation, of those across the system. These are indeed positive outcomes for students who were identified as having difficulty in reading in 1st-grade. However, we cannot conclude that the intervention received during Project IRIS was the key element that made the difference, because both groups, those receiving the intervention and those not receiving this support, showed similar progress.

DISCUSSION

Despite being at risk for below-grade-level reading performance, most Project IRIS experimental group students were not eventually identified as SWD students or retained in grade. The fact that most of these students scored proficient in reading on subsequent end-of-year assessments likely contributed to their satisfactory progress. In fact, the proficiency rates found in this study were higher than those found in the ALP II study conducted the same year, in which both served and the comparison students showed lower percentages of students meeting grade-level proficiency (55-58%) than in the Project IRIS study (Paeplov, Baenen & Harlow, 2004; Paeplov & Baenen, 2005). Thus, Project IRIS was successful with a larger percentage of targeted students. Two differences that may have made a positive difference with Project IRIS participants are the more specific and objective screening measures that were used as well as the more tailored intervention techniques. Possible differences in the students involved in the two studies are not known.

The intervention provided by Project IRIS did not appear to produce a more measurable impact on participants' reading achievement for the students in the experimental group than regular classroom instruction and support; therefore, we cannot conclude that experimental group

students received more effective support than the control group students. Regardless of whether they received the reading intervention, Project IRIS students who were initially perceived as facing reading difficulties have achieved strong reading outcomes. One reason for these outcomes may be that other support services did help some students reach grade-level proficiency. The intervention provided by Project IRIS did not replace any services that were already available to students. For example, some students in experimental and control groups received ALP K-2 or other support services. After grade 1, we were able to identify which students were served by ALP at grade 2 and Title I at grades 3 and 4, but we could not identify and control for all sources of services or remediation that may have impacted their literacy potential.

Other possibilities for the strong reading outcomes could be the quality of regular classroom instruction and the coordination of regular and supplemental instruction. The results of extant literacy program evaluations suggest that WCPSS has improved its overall literacy program since the early 1990s.

- In the early 1990s, the WCPSS Evaluation and Research (E&R) Department conducted a longitudinal study of Reading Recovery (RR), which was similar to the Project IRIS study in terms of students served, program goals, and outcome measures (Baenen, Bernholc, Dulaney, & Banks, 1997). At the end of grade 1, students in RR showed higher reading achievement than the comparison group. However, by the end of grade 3, reading EOG posttests for cohorts served in 1990-91, 1991-92, and 1992-93 were not statistically different for control and experimental group students. It is noteworthy, however, that the percentage of Project IRIS students proficient in reading at grade 3 (88.6% for control group students and 92.0% for experimental group students) is considerably higher than the percentage of all RR students proficient in reading at grade 3 in 1992-93 (only 34.5%)
- Later, a 2004-05 study of Predictive Assessment of Reading (PAR), found that kindergarten students made considerable improvement regardless of their participation in experimental or control groups. The PAR instrument has been found to predict later reading achievement. The author commented that WCPSS must have been providing strong instruction to all kindergarten students, because the pattern found in his study was unusually strong compared to the patterns found among pilot schools across the country (Wood, 2005).

Major initiatives have occurred within the WCPSS district between 2002-03 and 2005-06. The extensive literacy training available to all primary-grade and intermediate-grade teachers, the development of assessments to monitor student progress in literacy for grades K-5, the proficiency goals established by WCPSS, and the additional supplemental services provided by programs (such as ALP at grades 3-8) are likely to have contributed to the district's increase in reading proficiency. It is conceivable that the results of this study could have been even stronger, especially rates of retention and special education service, if some students had received the intervention beyond grade 1, or if they had been provided with follow-up service in grade 2. Often even the most effective early interventions may call for "booster" sessions, which can affect academic outcomes (Snow et al., 1998). Nevertheless, Project IRIS participants'

proficiency rates tended to exceed district rates and their average reading performance closely followed the district's performance.

In some ways the findings suggest that existing support in the classroom and ALP K-2 were sufficient to improve reading proficiency. However, lower proficiency rates at grade 2 for ALP K-2 participants suggest this might not be the case. More likely, the results for this study suggest that supplemental services provided to students with high needs may make it more manageable for the classroom teacher to address other students' needs. For example, students who were subsequently retained or who did not score at grade level may have needed longer or different types of support. Overall, it seems clear that some students will always need support beyond what the regular classroom teacher can provide. Aligning interventions and providing extra services within the classrooms, rather than pulling students out of class (which can be disruptive), are strategies needing further exploration.

STAFF REFLECTIONS

Sherrill Miller, coordinator for Project IRIS, contributed these thoughts about implications of the results for the future after consultation with some of the teachers who implemented the program.

Although it is encouraging to find that students in the Project IRIS experimental group, as well as students in the control group, continued to make gains in reading, limitations related to the study should be noted and addressed. In the 2002-2003 study, the experimental group received specialized intensive instruction in a one-on-one setting with a well-trained reading teacher, but the study design did not allow for variations in the duration of the intervention. Because the intervention cycles were limited to ten weeks, it is not clear what the results would have been if the tutors had been able to work with the students in the experimental group for a longer period. It was evident at the end of each cycle that there were some students who had made great strides in their reading ability, while others were still learning prerequisite skills such as alphabetic knowledge and print concepts and may have benefited from additional sessions. Results may have been more positive if the number of minutes per week or the number of weeks during the year had been greater for students identified as most in need.

A second limitation is related to the tutors' limited collaboration with other professionals who taught the students participating in Project IRIS. Due to the nature of the randomization, some teachers had students from experimental and control groups in their general education classrooms, Title I, or ALP II classrooms. In an effort to maintain the integrity of the intervention, the tutors limited their conversations with teachers about the strategies and approaches they were using. Intervention specialists, classroom teachers, and parents saw the progress that the students were making very quickly into the 10-week cycle and inquired about what they could be doing differently with these students. However, nothing was shared with colleagues and parents until the end of the year, when all three cycles were completed. Because there was no collaboration regarding effective strategies, it is not clear what the results would have been if the intervention specialists, teachers, and parents had been able to continue instruction using those strategies during and after the 10-week cycle. Would the students have generalized their new skills and strategies more, or continued to refine their new skills in their

everyday reading if another adult had continued using strategies the tutors found effective? The students' reading achievement gains may have been impacted by the lack of strategy reinforcement beyond the Project IRIS intervention.

In addition, these interventions were conducted on a one-on-one basis outside of the general education classroom. Replications of this model, providing intense interventions outside the classroom to every individual student deemed as having difficulty with reading, would be very difficult for most elementary schools. When intervention occurs within the general education classroom, there is an increased opportunity for collaboration. Dialogue and observation occur regarding varied teaching approaches, strategic interventions, and varied resources. A future study could examine the reading gains of all students in a 1st-grade classroom where intervention occurs as a teacher-directed center in very small homogeneous groups as teacher-directed centers. For example, tutors might work with a small group of three students, with very similar needs, for a longer period of time within the classroom. One hypothesis is that teachers would learn strategic interventions from the intervention specialists and incorporate them into the guided reading lessons. Providing explicit instruction on targeted skills to very small groups of students with similar needs is one way that we can reach more students who are struggling in their primary school years.

Many studies show that if students receive targeted strategic interventions early, very few students would need intensive interventions (Chhabra, 2006; Dickman, 2006). This multi-tiered system for delivery of scientific research-based interventions is the heart of Response to Intervention (RTI), which is included in the December 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA). Within this law, local education areas have the option of using RTI, an alternative to the current approach of identifying a student as learning disabled based on a 15-point discrepancy between ability and achievement. This latter approach generally focuses on remediation after students have demonstrated considerable academic failure and often relies on the demonstration of special education eligibility as the provision for intervention. As Joseph Torgesen imparts in his presentations, RTI is "giving the right interventions to the right students at the right time". The effectiveness of RTI (referred to as Intervention Alignment by WCPSS) depends on professional development and coordination among teachers and other professionals in a building and often results in a redesign of service delivery systems and resources.

As WCPSS implements Intervention Alignment, it is important that classroom teachers continue to provide research-based reading instruction to all students, with the goal of reaching 80-90% of students in core instruction. For the less than 20% who are unable to reach benchmarks in reading with core instruction alone, teachers must address these students' needs with strategic interventions conducted in small groups rather than individually. This could be done across the grade-level professional learning community (PLC), so that a teacher may be working with students from several classrooms, but with students whose data demonstrate a similar need. If students are not responding, adjustments to the intervention such as time, approach, and size of the group could be made. The students who are unable to make sufficient progress would then be recommended by the grade-level PLC to the Student Support Team, and only a few students would receive individual intensive interventions (more similar to Project IRIS).

The results of the Project IRIS study do indicate that classroom teachers are doing a better job instructing students in early reading skills compared to decades ago, and that intervention specialists are reaching 90% of students on average, as demonstrated on the 3rd-and 4th-grade EOG exam results for both control and experimental group students. Torgesen (2004) points out that it is extremely difficult for children who remain poor readers during the first three years of elementary school to ever acquire average levels of reading fluency. Children who are poor readers at the end of first grade almost never acquire average-level reading skills by the end of elementary school. Given the growing number of primary-grade students who struggle with learning to read, schools may want to look at Project IRIS as they redesign interventions for students who have reading difficulties in the early years.

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