Reading First Impact Study: Interim Report

Executive Summary

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April 2008

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Acknowledgements

Disclosure of Potential Conflicts of Interests[1]

The research team for this evaluation consists of a prime contractor, Abt Associates, and two major subcontractors, MDRC and Westat. None of these organizations or their key staff has financial interests that could be affected by findings from the Reading First Impact Study. No one on the Technical Work Group, convened to provide advice and guidance, has financial interests that could be affected by findings from the evaluation.

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Executive Summary

This report presents preliminary findings from the Reading First Impact Study, a congressionally mandated evaluation of the federal government's $1.0 billion-per-year initiative to help all children read at or above grade level by the end of third grade. The No Child Left Behind Act of 2001 (P.L. 107-110) established Reading First (Title I, Part B, Subpart 1) and mandated its evaluation. This evaluation is being conducted by Abt Associates and MDRC with RMC Research, Rosenblum-Brigham Associates, Westat, Computer Technology Services, DataStar, Field Marketing Incorporated, and Westover Consulting under the oversight of the U.S. Department of Education, Institute of Education Sciences (IES).

The present report is the first of two; it examines the impact of Reading First funding in 2004-05 and 2005-06 in 17 school districts across 12 states and one statewide program (18 sites). The report examines program impacts on students' reading comprehension and teachers' use of scientifically based reading instruction. Key findings are that:

- On average, across the 18 participating sites, estimated impacts on student reading comprehension test scores were not statistically significant.

- On average, Reading First increased instructional time spent on the five essential components of reading instruction promoted by the program (phonemic awareness, phonics, vocabulary, fluency, and comprehension).

- Average impacts on reading comprehension and classroom instruction did not change systematically over time as sites gained experience with Reading First.

- Study sites that received their Reading First grants later in the federal funding process (between January and August 2004) experienced positive and statistically significant impacts both on the time first and second grade teachers spent on the five essential components of reading instruction and on first and second grade reading comprehension. Time spent on the five essential components was not assessed for third grade, and impacts on third grade reading comprehension were not statistically significant. In contrast, there were no statistically significant impacts on either time spent on the five components of reading instruction or on reading comprehension scores at any grade level among study sites that received their Reading First grants earlier in the federal funding process (between April and December 2003).

The study's final report, which is due early 2009, will provide an additional year of follow-up data, and will examine whether the magnitude of impacts on the use of scientifically based reading instruction is associated with improvements in reading comprehension.

The Reading First Program

Reading First promotes instructional practices that have been validated by scientific research (No Child Left Behind Act, 2001). The legislation explicitly defines scientifically based reading research and outlines the specific activities state, district, and school grantees are to carry out based upon such research (No Child Left Behind Act, 2001). The Guidance for the Reading First Program provides further detail to states about the application of research-based approaches in reading (U.S. Department of Education, 2002). Reading First funding can be used for:

- *Reading curricula and materials* that focus on the five essential components of reading instruction as defined in the Reading First legislation: 1) phonemic awareness, 2) phonics, 3) vocabulary, 4) fluency, and 5) comprehension;

- *Professional development and coaching* for teachers on how to use scientifically based reading practices and how to work with struggling readers;

- *Diagnosis and prevention* of early reading difficulties through student screening, interventions for struggling readers, and monitoring of student progress.

Reading First grants were made to states between July 2002 and September 2003. By April 2007, states had awarded subgrants to 1,809 school districts, which had provided funds to 5,880 schools. Districts and schools with the greatest demonstrated need, in terms of student reading proficiency and poverty status, were intended to have the highest funding priority (U.S. Department of Education, 2002). In addition to grants for individual schools, states and districts could reserve up to 20 percent of their Reading First funds to support staff development and reading assessments, among other activities, for all high-need schools (U.S. Department of Education, 2002).

The Reading First Impact Study

The Reading First Impact Study (RFIS) was commissioned to address the following questions:

1) What is the impact of Reading First on student reading achievement?
2) What is the impact of Reading First on classroom instruction?
3) What is the relationship between the degree of implementation of scientifically based reading instruction and student reading achievement?

The current report presents preliminary answers to the first two questions. The study's final report will address all three questions.

Research Design

The Reading First Impact Study employs a regression discontinuity design that capitalizes on the systematic process used by a number of school districts to allocate their Reading First funds. A regression discontinuity design is the strongest quasi-experimental method that exists for estimating program impacts. Under certain conditions, outlined below, all of which are met by the present study, this method can produce unbiased estimates of program impacts:

1) Schools eligible for Reading First grants were rank-ordered for funding based on a quantitative rating, such as an indicator of past student reading performance or poverty.
2) A cut-point in the rank-ordered priority list separated schools that did or did not receive Reading First grants, and this cut-point was set without knowing which schools would then receive funding.
3) Funding decisions were based only on whether a school's rating was above or below its local cut-point; nothing superseded these decisions.
4) The shape of the relationship between schools' ratings and outcomes is correctly modeled.

Under these conditions, there should be no systematic differences between eligible schools that did and did not receive Reading First grants (Reading First and non-Reading First schools respectively), except for the characteristics associated with the school rating used to determine the funding decision. By controlling for differences in schools' ratings, one can then control statistically for all systematic pre-existing differences between the two groups. This makes it possible to estimate the impact of Reading First by comparing the outcomes for Reading First schools and non-Reading First schools in the study sample, controlling for differences in their ratings. Non-Reading First schools in a regression discontinuity analysis thereby play the same role as do control schools in a randomized experiment—they represent the best indications of what outcomes would have been for the treatment group (Reading First schools) in the absence of the program being evaluated.

Study Sample

Twenty-eight school districts plus one state Reading First program that met the preceding criteria were identified. Sixteen districts plus the state program were chosen from this pool to participate in the regression discontinuity design; the final selection reflected wide variation in district characteristics and provided enough schools to meet the study's sample size requirements. One other school district agreed to randomly assign some of its eligible schools to Reading First or a control group. The 17 school districts and one state Reading First program are referred to as study sites. The regression discontinuity sites provide 238 schools for the analysis and the randomized experimental site provides 10 schools. Half of these schools at each site are Reading First schools and half are non-Reading First schools; the study schools comprise some, not all, of the RF schools in study sites.

Exhibit ES.1 compares background characteristics of Reading First schools in the study sample to those of all Reading First schools in the 18 study sites, all Reading First schools in the 13 study states, and all Reading First schools in the nation. Visual inspection of the data displayed in this exhibit suggests that, overall, the present sample is similar to the other three groups of Reading First schools. Almost all are eligible for Title I support, they enroll high percentages of students eligible for free or reduced price lunch, and their past third grade reading scores are near their state averages for Reading First schools. The RFIS sample, on average, has proportionally lower percentages of Hispanic students and higher percentages of Black students than Reading First schools in the study states or in the nation; at the same time, RFIS sample schools, on average, have a lower percentage of Black students and a higher percentage of White students than Reading First schools in study districts. A greater proportion of Reading First schools in the study sample are in large or mid-size cities, and not other locales, than are Reading First schools in the study states or in the nation. Also, the sizes of Reading First schools in the study sample, on average, are somewhat smaller than those in the three other groups. Further, these data cannot provide conclusive evidence that the study sample fully represents the experience of the entire national Reading First program, as the study sample might differ from the Reading First population in other ways that were not observed.

Exhibit ES.1: Baseline Characteristics of Relevant Groups of Reading First Schools for 2002-2003

Characteristic	RF Schools in Study Sample	RF Schools in Study Districts	RF Schools in Study States	RF Schools in U.S.
Students				
Male (%)	52.3	52.0	51.7	51.5
Race (%)				
Asian	3.1	2.5	1.5	3.5
Black	35.6	41.1	26.4	30.5
Hispanic	26.7	28.6	37.1	34.8
White	34.2	27.4	34.3	28.6
American Indian/Alaskan	0.5	0.4	0.6	2.5
Free Lunch and Reduced Lunch (%)	74.4	75.0	67.8	73.2
Schools				
Eligible for Title 1(%)	97.6	97.4	96.4	94.8
Locale (%)				
Large City	39.2	39.8	26.7	26.8
Mid-size City	36.8	36.5	21.0	19.5
Other[a]	24.0	23.7	52.3	53.6
Size				
Total Number of Students	474.8	487.4	502.4	531.4
Number of Students in Grade 3	71.6	75.1	80.2	84.9
Student/Teacher Ratio	15.1	14.8	15.1	16.5
Third Grade Reading Performance				
Deviation from State RF Mean				
Proficiency Rate (%)[b]	-1.3	-3.3	0.0	0.0
Number of Schools[c]	125	274	1,728	4,793

Notes:

The RF study sample includes 128 schools from 18 sites (17 districts and 1 state) located in 13 states. The RF schools in Study Districts include all RF schools ranked and/or rated on the RF grant application for each of the 18 sites in the study. All RF schools in Study States include all RF schools in the 13 states included in the study. All RF schools nationally include all schools that received RF grants.

[a] Other Locale includes urban fringe of a large city, urban fringe of a mid-sized city, large town, small town, and rural.

[b] A school's proficiency score is defined as the percentage of third grade students (or fourth or fifth grade when third grade is unavailable) in the school that score at or above the state-defined proficiency threshold on the state's reading assessment. The values in this row represent the average percentage point deviation from the mean proficiency score for the Reading First schools in the state. By definition, for a given state the mean proficiency score for all Reading First schools in the state is the benchmark for comparison. Therefore, in the final two columns, the deviation from the benchmark within each state is zero and the average deviation across states is zero.

[c] Due to missing values for some variables, the number of schools included varies by characteristic.

Sources: *Baseline characteristic data are from the Common Core of Data. RF school samples are defined based on information from the Southwest Educational Development Laboratory.*

Data Collection and Outcome Measures

Exhibit ES.2 summarizes the study's three-year, multi-source data collection plan. The present report reflects data for 2004-05 and 2005-06. Key outcome measures include student reading comprehension, teacher reading instructional practices, and student engagement with print.

Exhibit ES.2: Data Collection Schedule for the Reading First Impact Study						
	2004-2005		2005-2006		2006-2007	
Data Collection Elements	Fall	Spring	Fall	Spring	Fall	Spring
Student Testing	✓	✓		✓		✓
Classroom Observations		✓	✓	✓	✓	✓
Teacher, Principal, Reading Coach Surveys		✓				✓
District Staff Interviews		✓				✓

Student reading comprehension was assessed with the Stanford Achievement Test, 10th Edition (SAT 10, Harcourt Assessment, Inc., 2004). Its comprehension subtests are well documented, broadly accepted, and widely used.[2] Test scores are analyzed in two forms: scaled scores and the percentage of students who read at or above grade level, based upon national SAT 10 norms. The SAT 10 was administered to students in grades one, two, and three during spring 2005 and spring 2006, with completion rates of 80 percent or higher for both waves.

Classroom instruction was assessed in first grade and second grade reading classes through an observation system developed by the study team called the Instructional Practice in Reading Inventory (IPRI). Observations were conducted in each study school on two consecutive days in spring 2005, fall 2005, and spring 2006, with completion rates over 96 percent.

Measures of classroom instruction were created from IPRI data to represent the components of reading instruction emphasized by the Reading First legislation:[3]

- *Total daily minutes of instruction in all five dimensions:* This measure equals the total number of minutes of instruction in phonemic awareness, phonics, vocabulary, fluency, and comprehension during the daily reading block, which is the time period designated for reading instruction.

- *Minutes of instruction per day in each of the five dimensions:* These five measures correspond to the number of minutes of instruction in each of the five dimensions per daily reading block.

- *Percentage of three-minute observational intervals with instruction in the five dimensions that involve highly explicit instruction:* This measure records instances of "highly explicit instruction" that occur during instruction in any of the five dimensions. Highly explicit instruction means active teaching, modeling or explaining concepts, or helping children use reading strategies.

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[2] In spring 2007, the study added the Test of Silent Word Reading Fluency (TOSWRF) for grade 1; findings based on this test will be presented in the final report.

[3] For ease of explication, the measures created from IPRI data are referred to as the five dimensions of reading instruction (or "the five dimensions") throughout the report. References to the programmatic emphases as required by legislation are labeled as the five essential components of reading instruction.

- *Percentage of three-minute observational intervals with instruction in the five dimensions that involve high quality student practice:* This measure records instances of "high quality student practice" that occur during instruction in any of the five dimensions. High quality student practice involves dimension-specific opportunities for students to practice their skills.

Student engagement with print was assessed beginning in fall 2005 through classroom observations using the Student Time-on-Task and Engagement with Print (STEP) instrument to measure the percentage of students engaged in academic work who are reading or writing print. The STEP, which was developed by the study team, was used to observe classrooms in both fall 2005 and spring 2006, with a completion rate of over 97 percent.

Average Impacts Across All Sites

Exhibit ES.3 reports average impacts for school years 2004-05 and 2005-06.[4] All impact estimates are regression-adjusted to control for a linear specification of the rating variable each site used to select its Reading First schools as well as selected teacher and/or student background characteristics used in the analysis. The impacts have been estimated using multi-level models to account for the clustering of students within classrooms, classrooms within schools, and schools within sites. In Exhibit ES.3, values in the "Actual Mean with Reading First" column are actual, unadjusted values for Reading First schools; values in the "Estimated Mean without Reading First" column represent the best estimates of what would have happened in Reading First schools absent Reading First funding and are calculated by subtracting the impact estimates from the Reading First schools' actual mean values. Impacts were estimated for each study site and averaged across sites in proportion to their number of Reading First schools in the sample. Average impacts thus represent the average study school. On average:

- **Reading First did not improve students' reading comprehension**. The program did not increase the percentages of students in grades one, two, or three, whose reading comprehension scores were at or above grade level. In each of the three grades, fewer than half of the students in the Reading First schools were reading at or above grade level.

- **Reading First increased total class time spent on the five essential components of reading instruction promoted by the program.** The program increased average class time spent on the five essential components of reading instruction by 8.56 minutes per daily reading block in grade one, and by 12.09 minutes per daily reading block in grade two. This implies a weekly increase of three quarters of an hour for grade one and one hour for grade two.

- **Reading First increased highly explicit instruction in grades one and two and increased high quality student practice in grade two**. The program increased the percentage of class observational intervals spent on the five dimensions of reading instruction that involve highly explicit instruction by 3.65 percentage points in grade one and by 6.98 percentage points in grade two. The program also increased the percentage of class observational intervals spent on the five dimensions of reading instruction that involve high quality student practice by 3.67 percentage points in grade two. There was virtually no observed change in grade one.

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[4] Exhibit ES.3 and all other tables indicate whether findings are based on the full study sample or specific subgroups. Where appropriate, each exhibit also includes an "Exhibit Reads" section that walks readers through the exhibit by highlighting the first row or line of information presented.

Exhibit ES.3: Estimated Impacts on Reading Comprehension, Instruction, and Percentage of Students Engaged with Print: Spring 2005, Fall 2005, and Spring 2006

	Actual Mean with Reading First	Estimated Mean without Reading First	Impact	Statistical Significance of Impact (p-value)
Reading Comprehension				
Percent Reading At or Above Grade Level				
Grade 1	45.4	42.2	3.15	(0.260)
Grade 2	38.9	38.8	0.12	(0.965)
Grade 3	37.9	40.1	-2.22	(0.383)
Instruction				
Number of minutes of instruction in the five dimensions combined				
Grade 1	59.41	50.85	8.56*	(0.003)
Grade 2	59.53	47.44	12.09*	(<0.001)
Percentage of intervals in five dimensions with Highly Explicit Instruction				
Grade 1	29.78	26.13	3.65*	(0.023)
Grade 2	31.55	24.57	6.98*	(<0.001)
High Quality Student Practice				
Grade 1	19.21	18.35	0.86	(0.559)
Grade 2	18.78	15.11	3.67*	(0.012)
Percentage of Students Engaged with Print				
Grade 1	46.92	42.29	4.63	(0.216)
Grade 2	49.72	58.14	-8.42*	(0.030)

Notes:

The complete Reading First Impact Study (RFIS) sample includes 248 schools from 18 sites (17 school districts and 1 state) located in 13 states. 125 schools are Reading First schools and 123 are non-Reading First schools. For grade 2, one non-RF school could not be included in the analysis because test score data were not available.

Impact estimates are statistically adjusted (e.g., take each school's rating, site-specific funding cut-point, and other covariates into account) to reflect the regression discontinuity design of the study.

Values in the "Actual Mean with Reading First" column are actual, unadjusted values for Reading First schools; values in the "Estimated Mean without Reading First" column represent the best estimates of what would have happened in RF schools absent RF funding and are calculated by subtracting the impact estimates from the RF schools' actual mean values.

A two-tailed test of significance was used, and where applicable, statistically significant findings at the p≤.05 level are indicated by *.

EXHIBIT READS: The observed average percent of first-graders reading at or above grade level with Reading First was 45.4 percentage points. The estimated average percent without Reading First was 42.2 percentage points. The impact of Reading First on the percent of first grade students reading at or above grade level was 3.2 percentage points, which was not statistically significant at the p<.05 level (p=.260).

Sources: RFIS SAT 10 administration in the spring of 2005 and 2006, as well as from state/district education agencies in those sites that already used the SAT 10 for their standardized testing (i.e., FL, KS, MD, OR); RFIS Instructional Practice in Reading Inventory, spring 2005, fall 2005, and spring 2006; RFIS Student Time-on-Task and Engagement with Print, fall 2005 and spring 2006.

- **Reading First had mixed effects on student engagement with print**. The program reduced the percentage of students engaged with print by a statistically significant 8.42 percentage points in grade two. The impact on student engagement with print in grade one (4.63 percentage points) was not statistically significant.

Impact Differences

Study sites differ from each other in ways that could potentially influence the effectiveness of Reading First. For example, sites differ in terms of the length of time since date of Reading First grant award, levels of Reading First funding per student, and prior levels of reading performance. Consequently, average impacts for the full study sample might mask important differences that exist over time and/or across sites. The study explored this possibility by examining the pattern of impacts over time for two groups of study sites. The first group consists of the eight "late award" sites that received Reading First grants between January and August 2004. As of May 2006, these sites had been receiving Reading First funds for an average of approximately two years. The second group consists of the 10 "early award" sites that received Reading First grants between April and December 2003. As of May 2006, these sites had been receiving Reading First funds for an average of approximately three years, although data from the study are available only for the last two years. Study findings indicate that:

- **The impacts of Reading First on classroom instruction and student reading comprehension have not changed consistently over time**. Exhibit ES.4 shows estimated impacts for the two years that data are available for late award and early award sites, respectively. For both groups of sites, estimates of program impacts on reading comprehension and classroom instruction vary from year to year (across columns). However, this variation exhibits no consistent pattern and is not statistically significant. These findings do not suggest that program impacts increased or decreased with program maturity.

- **The estimated impacts of Reading First were consistently positive for late award sites and mixed for early award sites.** Exhibit ES.5 presents estimated impacts for the two groups of sites that are averaged over the two years for which data are available. It indicates that, for grades one and two in late award sites, Reading First produced positive and statistically significant increases both in teachers' instruction in the five dimensions and in students' reading comprehension. Impacts on third grade reading comprehension were not statistically significant for late award sites, though the direction of the (not significant) estimated impact was positive. None of the impact estimates presented in Exhibit ES.5 are statistically significant for early award sites. The (not significant) estimated impacts on teachers' instruction were positive, and the (not significant) estimated impacts on student reading comprehension were negative. Differences in impacts on reading comprehension test scores between early and late award sites were statistically significant for grades two and three, and not statistically significant for grade one. Differences in impacts on instruction in the five dimensions between early and late award sites were not statistically significant.

- **It is not possible to determine which of numerous differences between early award sites and late award sites may have caused observed differences in Reading First impacts, only some of which were statistically significant.** The average per K-3 student Reading First funding was higher in late award sites than early award sites ($574 versus $432 per student). Although the study did not begin to collect data until after early award sites began to implement Reading First, it appears that the benchmarks of comparison for student reading comprehension were lower for late award sites. Thus, late award sites may have had more room to increase reading comprehension skills. Any or all of these differences, plus others not measured, could have produced the impact differences observed.

Exhibit ES.4: Estimated Impacts on Reading Comprehension and Minutes in the Five Dimensions, by Implementation Year, Calendar Year, and Award Status

| | Implementation Year | | | | | |
| | Year 1 | | Year 2 | | Year 3 | |
	Impact	(p-value)	Impact	(p-value)	Impact	(p-value)
Panel 1						
Late Award Sites	**2005**		**2006**		**2007**	
Grade 1						
Percent reading at or above grade level (%)	6.3	(0.077)	9.4*	(0.024)	N/A	N/A
Instruction in five dimensions (minutes)	11.51*	(0.001)	12.03*	(0.004)	N/A	N/A
Grade 2						
Percent reading at or above grade level (%)	6.3*	(0.028)	5.7	(0.155)	N/A	N/A
Instruction in five dimensions (minutes)	14.84*	(<0.001)	16.11*	(<0.001)	N/A	N/A
Grade 3						
Percent reading at or above grade level (%)	1.7	(0.537)	4.2	(0.269)	N/A	N/A
Instruction in five dimensions (minutes)	N/A	N/A	N/A	N/A	N/A	N/A
Panel 2						
Early Award Sites	**2004**		**2005**		**2006**	
Grade 1						
Percent reading at or above grade level (%)	N/A	N/A	-2.6	(0.708)	-1.9	(0.751)
Instruction in five dimensions (minutes)	N/A	N/A	5.49	(0.376)	4.16	(0.457)
Grade 2						
Percent reading at or above grade level (%)	N/A	N/A	-8.2	(0.163)	-6.8	(0.303)
Instruction in five dimensions (minutes)	N/A	N/A	10.93	(0.083)	4.56	(0.410)
Grade 3						
Percent reading at or above grade level (%)	N/A	N/A	-9.9	(0.110)	-7.7	(0.225)
Instruction in five dimensions (minutes)	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

The complete RF study sample includes 248 schools from 18 sites (17 school districts and 1 state) located in 13 states. 125 schools are Reading First schools and 123 are non-Reading First schools. For grade 2, one non-RF school could not be included in the analysis because test score data were not available.

Implementation year represents the number of years since sites received notice of their Reading First grants. For early award sites, this occurred in 2003, and Years 1, 2, and 3 refer to the 2003-2004, 2004-2005, and 2005-2006 school years, respectively. For late award sites, notification of funding occurred in 2004, and Years 1 and 2 refer to the 2004-2005 and 2005-2006 school years, respectively (data are available for the 2004-2005 and 2005-2006 school years only).
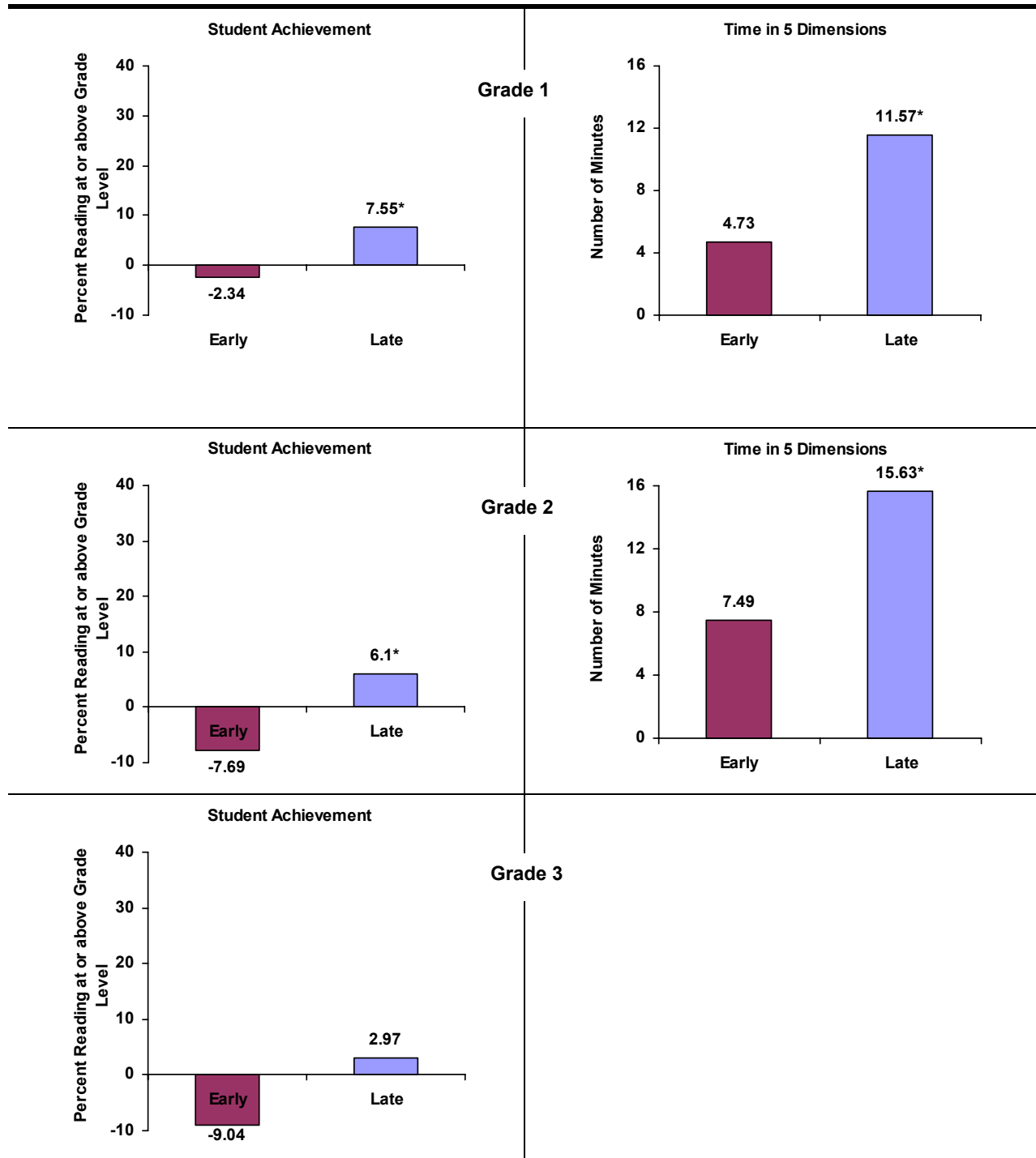
Impact estimates are statistically adjusted (e.g., take each school's rating, site-specific funding cut-point, and other covariates into account) to reflect the regression discontinuity design of the study.

A two-tailed test of significance was used, and where applicable, statistically significant findings at the p≤.05 level are indicated by *.

EXHIBIT READS: The impact of Reading First on the percent of students reading at or above grade level in grade one, for late award sites, in implementation Year 1 and Calendar Year 2005, was 6.3 percentage points, which was not statistically significant at the p≤.05 level (p=.077).

Sources: RFIS SAT 10 administration in the spring of 2005 and 2006, as well as from state/district education agencies in those sites that already use the SAT 10 for their standardized testing (i.e., FL, KS, MD, OR); and RFIS Instructional Practice in Reading Inventory, spring 2005, fall 2005, and spring 2006.

Exhibit ES.5: Estimated Impacts on Key Outcomes for Early and Late Award Sites, by Grade

Notes:

The complete RF study sample includes 248 schools from 18 sites (17 school districts and 1 state) located in 13 states. 125 schools are Reading First schools and 123 are non-Reading First schools. There are 8 late award sites, with 137 schools, and 10 early award sites, with 111 schools.

Impact estimates are statistically adjusted (e.g., take each school's rating, site-specific funding cut-point, and other covariates into account) to reflect the regression discontinuity design of the study.

A two-tailed test of significance was used, and where applicable, statistically significant findings at the $p \leq .05$ level are indicated by *.

EXHIBIT READS: For grade one, the impact of Reading First on the percent of students reading at or above grade level was 7.55 percentage points for late award sites, which was statistically significant ($p \leq .05$). The corresponding impact for grade one in early award sites was –2.34 percentage points, which was not statistically significant.

Sources: RFIS SAT 10 administration in the spring of 2005 and 2006, as well as from state/district education agencies in those sites that already use the SAT 10 for their standardized testing (i.e., FL, KS, MD, OR); and RFIS Instructional Practice in Reading Inventory, spring 2005, fall 2005, and spring 2006.

Further Research

Data for the study's final report will include three years of follow-up on students' reading comprehension for grades one, two and three and three years of follow-up on teachers' classroom instruction for grades one and two. These data will enable the study to examine program impacts on comprehension and instruction for an additional school year and on one year of follow-up on first grade students' decoding skills. Finally, the study's final report will explore whether the observed Reading First impacts on instructional practices are associated with observed impacts on student reading comprehension.

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