

**A Randomized Experiment on the Effects of  
Accelerated Reader/Reading Renaissance in an Urban School District:  
Final Evaluation Report**

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## **Executive Summary**

This report presents the findings of two experimental studies conducted by the Center for Research in Educational Policy (CREP) at The University of Memphis on the *Accelerated Reader*<sup>™</sup> (AR) / *Reading Renaissance*<sup>™</sup> (RR) program. The goals of this research were: 1) to evaluate the effect of AR/RR on students' reading comprehension, 2) to examine participating teachers' perceptions of the AR/RR program as well as perceived outcomes resulting from student participation in the program, and 3) to examine the impacts of implementation effectiveness of AR/RR on different student subgroups.

The design and methodology, to be described below, was oriented around the following research questions:

### **Study 1**

1. To what extent does AR/RR lead to improvements in student reading ability?
2. What are teachers' perceptions of AR/RR implementation?

### **Study 2**

1. What impact does implementation of AR/RR have on growth in reading achievement for at-risk students in grades 3 to 6?
2. How does the quality of AR/RR implementation relate to student growth in reading?
3. Does the quality of AR/RR implementation have an effect on growth in reading for students with learning disabilities?

## STUDY 1: AR/RR ACHIEVEMENT EFFECTS AND TEACHER REACTIONS

### Method

Participants included 76 K – 6<sup>th</sup> grade teachers in 11 Memphis City Schools and their 1,665 students. In each school, a minimum of two teachers at the same grade level volunteered to be randomly assigned either to implement the AR/RR program or to serve as a control teacher. Thus, the basic design was a truly randomized assignment to treatments.

The STAR Reading test (for grades 3 - 6) and STAR Early Literacy test (for grades K - 2) were administered at the beginning (pretest), midpoint, and end (posttest) of the school year to students in AR/RR classrooms and in Control classrooms. Additionally, in the late spring, AR/RR teachers were asked to complete a brief survey to assess teacher reactions to the program.

### Results

#### STAR and SEL Data

Of the total number of students, matched pretest-posttest data were available for 72.4% ( $n = 1,206$ ). ANCOVA indicated a significant difference favoring the AR/RR group for Kindergarten, after controlling for pretest scores and free lunch status ( $F_{1,88}=9.91, p =0.002$ ). The effect size associated with the AR/RR program was quite large and positive ( $ES = +0.71$ ). Similarly, for first grade, treatment status accounted for a significant amount of variance in posttest scores ( $F_{1,93}=4.62, p =0.034$ ), indicating that the adjusted mean for the AR/RR group ( $M'=733.6$ ) was significantly higher than that of the control group ( $M'=698.0$ ). The AR/RR program effect size was moderately large and positive ( $ES=+0.36$ ).

Second grade AR/RR students also had significantly higher mean adjusted posttest scale scores ( $M'=791.7$ ) than control students ( $M'=772.7$ ;  $F_{1,201}=5.50$ ,  $p=0.20$ ). The effect size associated with the AR program was +0.25. Similarly, for third grade, analysis of covariance revealed a statistically significant treatment effect ( $F_{1,174}=5.92$ ,  $p=0.016$ ) favoring the AR/RR group, after controlling for the effects of pretest score and free lunch status. The adjusted mean for the AR/RR group was 389.5, compared to an adjusted mean for the control group of 336.8, which represented a moderately large positive effect size ( $ES = +0.33$ ).

In contrast, for the fourth, fifth, and sixth grades, no significant differences were found between AR/RR and the respective control group means, although small positive trends were observed in each grade.

#### *Teacher Survey*

AR/RR teachers most frequently agreed or strongly agreed that they provide immediate feedback to students (97.4%), that they check TOPS reading practice reports (92.3%), and that they monitor the student reading log (82%). Almost all teachers (94.9%) agreed that they are highly supportive of the AR/RR program, and most (89.8%) agreed that they would like to use AR/RR again next year. Most agreed that the guidance and support provided by Renaissance's external facilitators/support team has helped them implement AR/RR (92.3%), and that they have received adequate training for implementation (82.1%). Finally, many teachers (74.4%) agreed or strongly agreed that they have a thorough understanding of the AR/RR program.

Teachers most frequently reported that the most effective aspects of the program were: the immediate feedback from the reports (19.7%), that AR/RR has nurtured a love

for, enjoyment of, excitement for, more enthusiasm for, or greater interest in reading among their students (10.6%), the books/library (10.6%), and the computer tests (9.1%).

Of the least effective aspects of AR/RR that *were* mentioned, the most common responses referred to time issues (11.9%), specifically the lack of time for it given the school's commitment to other programs, the time consuming nature of the program itself (at least initially), and the lack of time to keep folders organized and up-to-date.

### Discussion

Study 1 was oriented around the following research questions:

#### **1. To what extent does AR/RR lead to improvements in student reading ability?**

Students who received the AR/RR program in grades K, 1, 2, and 3 performed significantly and substantially higher on STAR Early Literacy or STAR Reading than control students after controlling for free lunch status and pretest scores. For grades 4-6, no significant differences were found between AR/RR students and control students on STAR Reading, although results slightly favored AR/RR students in grades 5 and 6.

#### **2. What are teachers' perceptions of AR/RR implementation?**

Teachers appeared to be highly positive about AR/RR implementation. Most teachers agreed that they have received adequate training for implementation of the program. Almost all teachers agreed that they are highly supportive of the AR/RR program, and most agreed that they would like to use AR/RR again next year. Almost three-fourths agreed or strongly agreed that they have a thorough understanding of the AR/RR program.

Of the concerns that were mentioned, the most common referred to a lack of time, with teachers often specifically noting the time-consuming nature of the program itself,

considering their school's commitment to other programs. Teachers also mentioned the lack of books (particularly on the lowest levels) and lack of supplies (e.g., paper and ink for printers). Further difficulties with implementation pertained to Kindergarten and first grade teachers' reading the quizzes to the students; most responses mentioned their inability to effectively quiz students without some support/help.

## **STUDY 2: THE IMPACT OF ACCELERATED READER/READING RENAISSANCE IMPLEMENTATION ON READING ACHIEVEMENT IN GRADES 3 TO 6**

### Method

Participants included 978 students in grades 3 ( $n = 250$ ), 4 ( $n = 381$ ), 5 ( $n = 215$ ), and 6 ( $n = 132$ ). Of the students, 89.9% were African American, 83.0% were eligible for free or reduced-price lunch, and 3.3% had a specified learning disability. Slightly more than half (53.5%) of students were female.

Program implementation measures consisted of distance consulting data collected for each treatment teacher, as well as implementation ratings generated by consultants based on on-site consultations during the school year. To facilitate further analyses, a principal components analysis was performed to generate a single, regression-based factor score representing overall classroom-level implementation. Reading achievement was again measured by the STAR Reading Test.

## Results

Students in AR/RR classrooms had higher average growth rates than students in control classrooms for all grades except 5<sup>th</sup> grade, in which growth rates were about equal. Program implementation scores did not predict time slopes as well as the simple treatment status indicator.

The results indicated a significant effect of treatment status on learning disability slopes. Learning disability slopes in high implementation classrooms were significantly higher than slopes in either control or low-implementation classrooms; no significant difference was observed between control and low-implementation classrooms.

## Discussion

The findings are interpreted below relative to the Study 2 research questions.

### **1. What impact does implementation of Accelerated Reader/Reading Renaissance (AR/RR) have on growth in reading achievement for at-risk students in grades 3 to 6?**

Students in AR/RR classrooms had significantly higher growth rates in reading compared to students in control classrooms. Effect size estimates were higher in lower grade levels: +0.34 in third grade, +0.15 in fourth grade, +0.10 in fifth grade, and +0.07 in sixth grade. Implementation ratings also tended to be higher in lower grades.

These positive results are particularly noteworthy, given that this was a first-year implementation in a difficult setting (especially within the context of numerous implementation issues raised by the consultants), and considering that the implementation levels of AR/RR were reportedly low compared to Renaissance Learning, Inc.'s benchmarks.

**2. How does the quality of AR/RR implementation relate to student growth in reading?**

In terms of average growth rates, accounting for variation in implementation did not improve the fit of the model over simply knowing whether the teacher was in the AR/RR treatment condition or the control condition.

**3. Does the quality of AR/RR implementation have an effect on growth in reading for students with learning disabilities?**

Exploratory HLM analyses suggested a positive relationship between AR/RR implementation and reading achievement growth rates for students with designated learning disabilities. Follow-up analyses indicated that “high” implementation AR/RR classrooms significantly reduced the negative impact of learning disability status on growth in reading when compared to control classrooms or “low” implementation classrooms.

## **OVERALL CONCLUSIONS**

Study 1:

- AR/RR students in grades K-3 significantly and substantially outperformed control students on STAR Early Literacy and STAR Reading, after controlling for free lunch status and pretest scores. These positive results are noteworthy, given that this was a first-year implementation in a difficult setting.
- There were no significant differences between AR/RR students in grades 4-6 as compared to control students on STAR Reading.
- Teacher perceptions of AR/RR implementation were strongly positive, with most agreeing that they would like to use AR/RR again next year.



Study 2:

- Implementation quality did not improve the positive effects of AR/RR relative to the control group.
- “High” implementing AR/RR classrooms significantly reduced the negative impact of learning disability status on growth in reading when compared to control classrooms or “low” implementation classrooms.

## **A Randomized Experiment on the Effects of Accelerated Reader/Reading Renaissance in an Urban School District: Preliminary Evaluation Report**

This report presents the findings of two related experimental studies conducted by the Center for Research in Educational Policy (CREP) at The University of Memphis on the *Accelerated Reader*<sup>™</sup> (AR) / *Reading Renaissance*<sup>™</sup> (RR) program. The goals of this research were: 1) to evaluate the effect of AR/RR on students' reading comprehension, 2) to examine participating teachers' perceptions of the AR/RR program as well as perceived outcomes resulting from student participation in the program, and 3) to examine the impacts of implementation effectiveness of AR/RR on different student subgroups.

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## STUDY 1: AR/RR ACHIEVEMENT EFFECTS AND TEACHER REACTIONS

### Introduction

According to *No Child Left Behind*, federal funds for schools can only be used for “scientifically research-based” programs. Although there is substantial supportive evidence on the beneficial effects of Accelerated Reader (and the broader Reading Renaissance program) for improving children’s reading attitudes and skills, high-quality, controlled studies are lacking. The present study – a randomized experiment conducted independently by CREP - was designed to meet the federal government’s most rigorous criteria.

Reading Renaissance (RR) refers to the reading improvement program designed to encourage reading skills development and motivation to read. Reading Renaissance emphasizes guided reading practice with the provision of a daily block (preferably one hour) of reading time. Reading time is organized accordingly: time spent reading texts *to* the student (T), time spent reading *with* the student via a paired-reading technique (W), or time the student reads independently (I).<sup>1</sup> Teachers guide students to the range of books appropriate to the student’s reading level. The students then select a book from within that range (as indicated on book labels). After the book has been read (regardless of whether it was read to them, with them, or independently), each student takes a short, computerized, literal comprehension quiz using Accelerated Reader (AR).

Accelerated Reader (AR) refers to the reading management software that assists student reading practice by providing assessment and feedback of reading progress. AR administers the reading assessments, immediately scores the quizzes, generates detailed

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<sup>1</sup> The focus in the younger grades (K-3) tends to be on time spent reading *to* (T) and *with* (W) students; students then transition to an increasing emphasis on independent reading (I).

reports on student performance, and manages record-keeping tasks. Teachers use the AR database to monitor quiz performance<sup>2</sup> frequently. Teachers can then use the AR diagnostic reports to identify appropriately challenging reading materials, to reinforce those students who are experiencing successful reading practice, and to identify students who may need remediation or other interventions (such as close monitoring of book selections and/or targeted instruction on a particular reading skill).

## Method

### *Participants*

Participants included 76<sup>3</sup> teachers in eleven Memphis City schools, and their 1,665 students. Grade levels ranged from Kindergarten through the 6<sup>th</sup> grade. Of the 76 teachers, 42 were assigned to serve as AR/RR teachers and 36 were assigned to serve as controls.<sup>4</sup> Participating teachers were to have had minimal or no exposure to Accelerated Reader and Reading Renaissance. Table 1 shows the number of teachers participating at each grade level by condition.

More than three-fourths (80.9%) of the students were eligible for free or reduced-price lunch. About 3.9% were special education students, and 2.6% were identified as having a specific learning disability.

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<sup>2</sup> A 60% correct score is required to “pass” an individual quiz, whereas an 85% quiz average is considered a “mastery” level across books of similar difficulty.

<sup>3</sup> Although student data from 76 teachers were analyzed by CREP, it should be noted that the actual number of participating teachers is 77. Student data from one teacher (a 2<sup>nd</sup> grade control teacher) were not provided to CREP.

<sup>4</sup> In one of the schools, three teachers at each grade level (K – 6) volunteered to participate. For this school, two of the three teachers were randomly assigned to be AR/RR teachers, and the third was randomly assigned to be a control teacher. Thus, there were more treatment teachers than control overall.

Table 1

Number of Participating Teachers by Grade and Treatment Condition

Grade	Control	Treatment
<i>K</i>	3	4
<i>1</i>	4	5
<i>2</i>	7	9
<i>3</i>	6	7
<i>4</i>	8	9
<i>5</i>	4	5
<i>6</i>	2	3
<i>Total</i>	34	42

*Design and Procedure*

The basic design was a randomized field study in which teacher volunteers from the same grade in the same school were randomly assigned to experimental and control groups. Renaissance Learning, Inc. sent recruitment letters in the spring of 2002, notifying elementary schools of the opportunity to participate in the study. Schools that had principal consent and at least two teacher volunteers at any grade level were eligible to participate in the study. Within each school, a minimum of two teachers at the same grade level volunteered to be randomly assigned to either a treatment group, meaning they would implement *Accelerated Reader* and *Reading Renaissance* in their classrooms, or a control group that would not implement either program or participate in professional development related to either program for the 2002-2003 school year. The teachers were told that, as part of the process, the school would receive the equipment and training incentives. They were also told that for the 2003-2004 school year, Reading Renaissance would be made available to the control groups as well. During the summer of 2002, a sample was selected, and CREP randomly assigned teachers to treatment (AR/RR) and control conditions. Renaissance Learning provided participating schools free AR, STAR,

and AR quizzes, books, training and consulting as were necessary to ensure successful implementation of Reading Renaissance.

Participants were asked to install AR and STAR Reading, and to implement them in treatment classrooms only, according to Reading Renaissance guidelines. Training was provided. Throughout the year, at least once a month, Renaissance consultants visited the participating schools in order to monitor implementation, provide consulting support, and record observations. During a normal visit, one consultant met with administration and the other two consultants met with teachers to troubleshoot technical issues and provide implementation feedback. Each consultant kept an implementation log, and at the end of the year completed implementation ratings based on their observations and interviews. In addition to the implementation ratings, the consultants recorded specific narrative descriptions of implementation issues, based on their observations during the on-site visits.

The STAR Reading test and/or the STAR Early Literacy test were administered at the beginning (pretest), midpoint, and end (posttest) of the school year to all students in AR/RR and control classrooms to provide a longitudinal profile of reading achievement. STAR is the norm-referenced, computer, adaptive assessment routinely given in grades K-12 to assess vocabulary skills and reading ability in the more than 60,000 AR schools in the country. The STAR Reading test is designed to be administered to students who have a 100 word sight vocabulary. The STAR Early Literacy test is a criterion-referenced, computer adaptive assessment designed to measure seven early literacy domains: general readiness, graphophonemic knowledge, phonic awareness, phonics, comprehension, structural analysis, and vocabulary. Because students wear headphones

and the test is read to them, it can be administered to non-readers and students who do not have a high enough vocabulary (i.e., 100 words) to successfully take STAR Reading on their own.

The STAR test uses Rasch measurement techniques to generate a scaled score ranging from 0 to 1400. In a 1999 norming study, split-half reliability coefficients for STAR Reading ranged between 0.89 and 0.90 for 3<sup>rd</sup> through 6<sup>th</sup> grades (Renaissance Learning, Inc., 2001). STAR Reading scale scores also exhibit moderate to strong correlation with other standardized reading tests, including the California Achievement Test, the Comprehensive Test of Basic Skills, the Gates-MacGinitie Reading Test, the Stanford Achievement Test, and the Iowa Test of Basic Skills.

For this study, the STAR Reading test was administered at pretest, midtest, and at posttest to all treatment and control students in grades 3-6, and to those students in grades K-2 who scored above 700 on the STAR Early Literacy (SEL) test.

At the beginning of the year, teachers in grades K-2 were instructed to administer the STAR Early Literacy test (SEL) to their students. Any students scoring 700 or better were to also immediately be given the STAR Reading test. Conversely, for grades 3-6, teachers were instructed to administer the STAR Reading test at the beginning of the year to their students. Any students in grades 3-6 scoring at the pre-primer level were to also immediately take the STAR Early Literacy (SEL) test. All students (i.e., those at the pre-primer level) in AR/RR classrooms were to continue taking the SEL test monthly; those in control classrooms were to take the SEL at pretest, midtest, and at posttest.

Additionally, in the late spring, AR/RR teachers were asked to complete a brief survey (15 minutes) to assess their reactions to the program. The survey consisted of 5

background questions (e.g., years of experience, grade level, etc.); 9 items pertaining to extent of AR/RR implementation; 16 questions pertaining to AR/RR support, resources, pedagogy, outcomes, and teacher understanding of the program; and 3 open-ended questions (i.e., most effective aspects, least effective aspects, and additional comments). Teachers were asked to mail back their survey in the provided postage-paid envelopes. A total of 39 of the 42 surveys were received, for a return rate of 92.3%.

This study was also designed to include analyses of student-level TCAP and TVAAS scores. In order to obtain access to student-level TVAAS scores, the Memphis City School district required that parental consent be obtained. Thus, all participating teachers were mailed sets of parent consent forms to distribute to their students to take home and have their parents complete. Parents were instructed to indicate whether or not they consented to their child's participation in the study, in particular, to the release of their child's TCAP scores, and they were asked to sign the form. Once the forms were collected, teachers returned the signed forms to CREP. A total of 1,112 permission forms were returned, of which 1,057 indicated consent (615 treatment and 442 control), with 22 indicating they did not consent, and with 33 leaving the item blank. Thus, based on the total number of students in the STAR database, approximately two-thirds (68.2%) returned the consent forms.

The Memphis City Schools' Office of Research and Evaluation (ORE) was then to provide student-level achievement scores, where available for those students whose parents had agreed, from the current year (2003) and prior year. To date, however, no achievement data have been received by CREP from ORE. Thus, this report will only



present the results of the STAR tests and teacher survey, as well as a summary of the consultants' observations of implementation issues.

### *Analyses*

Statistical analyses were performed to determine if AR/RR students performed statistically significantly better than control students, controlling for mediating variables such as prior achievement, socio-economic status, teacher effectiveness, and various school-level variables.

At each grade level, analysis of covariance (ANCOVA) was used to determine whether posttest scale score means differed as a function of treatment condition after adjustment for pretest scores and free or reduced-price lunch status. Learning disability and special education status were not incorporated because there were too few such students within any given grade level to reliably estimate their effects.

Repeated-measures analyses incorporating all testing periods were not conducted because this would have resulted in a further reduction in the number of cases with matching data. An effect size was computed for each grade level by subtracting the adjusted mean for the control group from that of the AR/RR group, and dividing the result by the pooled within-groups standard deviation on the posttest. Descriptive longitudinal profiles were constructed from STAR Reading percentile ranks for grades 3 to 6.

## Results

### *STAR and SEL Data*

*Matched vs. non-matched status.* Of the total number of students, matched pretest-posttest data were available for 72.4% ( $n = 1,206$ ). Match rates within levels of grade and treatment condition ranged from a low of 59.1% for 5th grade AR/RR students, to a high of 88.9% for Kindergarten control students (see Table 2).

Table 2

Pretest-posttest Match Rates by Grade and Treatment Condition

Grade	Control			Treatment		
	Total	Matched	%Matched	Total	Matched	%Matched
K	54	48	88.9%	83	61	73.5%
1	76	53	69.7%	98	73	74.5%
2	134	98	73.1%	197	131	66.5%
3	119	85	71.4%	149	102	68.5%
4	180	144	80.0%	212	163	76.9%
5	98	73	74.5%	127	75	59.1%
6	63	41	65.1%	75	59	78.7%
Total	724	542	74.9%	941	664	70.1%

Analysis of Variance (ANOVA) indicated no significant main or interaction effects for matched versus non-matched status on K-2 pretest scores. For grades 3 to 6, however, ANOVA revealed a significant main effect for matching status ( $F_{1,865}=45.65$ ,  $p < .001$ ), indicating that students with matched pretest-posttest scores had significantly higher pretest scores than non-matched students. There were no interaction effects with grade or treatment condition.

*Kindergarten.* Analysis of Covariance (ANCOVA) indicated a significant difference favoring the AR/RR group, after controlling for pretest scores and free lunch status ( $F_{1,88}=9.91$ ,  $p = 0.002$ ). Overall, the model explained about 13% of the variance in

posttest means ( $R^2=0.13$ ), with an adjusted AR/RR mean of 644.4 compared to an adjusted mean of 569.2 for the control group (see Table 3). The effect size associated with the AR/RR program was quite large and positive ( $ES = +0.71$ ).

*First Grade.* Treatment status accounted for a significant amount of variance in posttest scores ( $F_{1,93}=4.62, p =0.034$ ), indicating (see Table 3) that the adjusted mean for the AR/RR group ( $M'=733.6$ ) was significantly higher than that of the control group ( $M'=698.0$ ). The model accounted for about 40% of the variance in posttest scores ( $R^2=0.40$ ). The AR/RR program effect size was moderately large and positive ( $ES=+0.36$ ).

Table 3

Raw and Adjusted Posttest Means by Grade and Treatment: STAR Early Learning Scale Scores

Grade/Treatment	<i>M</i>	<i>M'</i> <sup>1</sup>	<i>SD</i>	<i>n</i>	<i>ES</i> <sup>2</sup>
<u>Kindergarten</u>					
AR/RR	644.8	644.4*	114.4	61	+0.71
Control	568.4	569.2	94.1	31	
<u>First</u>					
AR/RR	743.4	733.6*	96.2	61	+0.36
Control	680.5	698.0	97.8	36	
<u>Second</u>					
AR/RR	790.2	791.7*	72.1	107	+0.25
Control	774.1	772.7	82.2	98	

\*Statistically significantly higher than control group mean at  $p <.05$ .

<sup>1</sup>Adjusted for pretest scale score and free lunch status.

<sup>2</sup>Difference between the adjusted means divided by the pooled within-groups standard deviation.

*Second Grade.* AR/RR students had significantly higher mean adjusted posttest scale scores ( $M'=791.7$ ) than control students ( $M'=772.7$ ;  $F_{1,201}=5.50, p =0.020$ ; see Table

3). The effect size associated with the AR program was +0.25. The model explained nearly half the variance in posttest scores ( $R^2=0.46$ ).

*Third Grade.* Analysis of covariance revealed a statistically significant treatment effect ( $F_{1,174}=5.92, p =0.016$ ) favoring the AR/RR group, after controlling for the effects of pretest score and free lunch status. The adjusted mean for the AR/RR group was 389.5, compared to an adjusted mean for the control group of 336.8, which represented a moderately large positive effect size ( $ES = +0.33$ , see Table 4). The model explained about one-third of the variance in posttest scores ( $R^2 = 0.33$ ). As shown in Figure 1, AR/RR students' median percentile rank rose from the 25<sup>th</sup> to the 30<sup>th</sup> percentile, while control students' median percentile rank rose from the 22<sup>nd</sup> to the 24<sup>th</sup>.

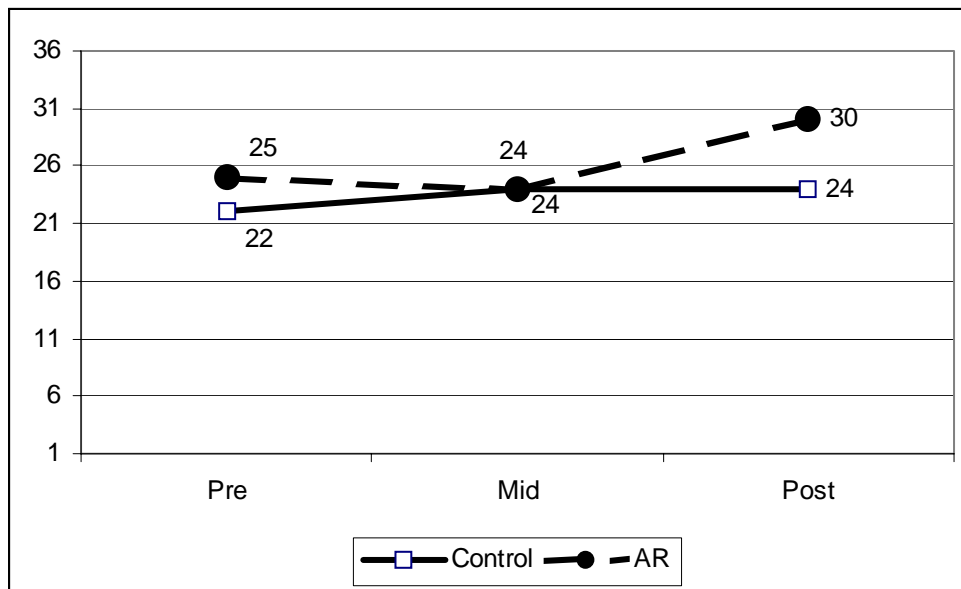


Figure 1. Third-Grade STAR Reading Test Median Percentile Ranks by Testing Period and Treatment Condition.

*Fourth Grade.* ANCOVA did not detect a significant difference between treatment groups ( $F_{1,266}=2.94, p = 0.088$ ). The model explained more than half of the variance in posttest scores ( $R^2=0.57$ ). The effect size estimate was near zero ( $ES = -0.01$ ),

indicating that adjusted posttest means were both statistically and practically equal (see Table 4). The longitudinal profile of percentile ranks suggested a slight advantage for the AR/RR, which rose from the 24<sup>th</sup> to the 27<sup>th</sup> percentile rank while the control group remained at the 23<sup>rd</sup> percentile rank across the year (see Figure 2).

Table 4

Raw and Adjusted Posttest Means by Grade and Treatment: STAR Scale Scores

Grade/Treatment	<i>M</i>	<i>M</i> <sup>1</sup>	<i>SD</i>	<i>n</i>	<i>ES</i> <sup>2</sup>
<u>Third</u>					
AR/RR	391.1	389.5*	139.6	93	+0.33
Control	335.0	336.8	198.3	85	
<u>Fourth</u>					
AR/RR	422.4	423.1	139.8	126	-0.01
Control	404.3	403.5	141.8	144	
<u>Fifth</u>					
AR/RR	507.0	481.0	174.7	75	+0.11
Control	451.3	477.9	157.4	73	
<u>Sixth</u>					
AR/RR	677.2	671.0	233.5	59	+0.14
Control	630.7	639.5	225.7	41	

\*Statistically significantly higher than control group mean at  $p < .05$ .

<sup>1</sup>Adjusted for pretest scale score and free lunch status.

<sup>2</sup>Difference between the adjusted means (*M*<sup>1</sup>) divided by the pooled within-groups standard deviation.

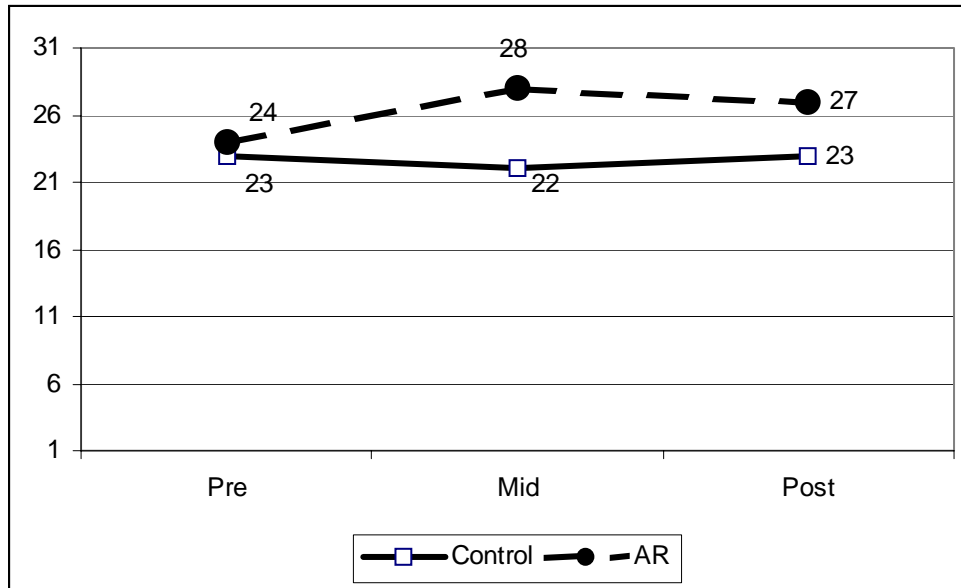


Figure 2. Fourth-Grade STAR Reading Test Median Percentile Ranks by Testing Period and Treatment Condition.

*Fifth Grade.* Adjusted means did not differ significantly as a function of treatment ( $F_{1,144}=0.04, p = 0.05$ ), although the overall model explained nearly two-thirds of the variance in posttest scores ( $R^2=0.67$ ). A small positive effect was associated with the AR/RR program ( $ES = +0.11$ ; see Table 4). As Figure 3 shows, median percentile ranks declined for both AR/RR and control students across the year, although the decline was greater for AR/RR students.

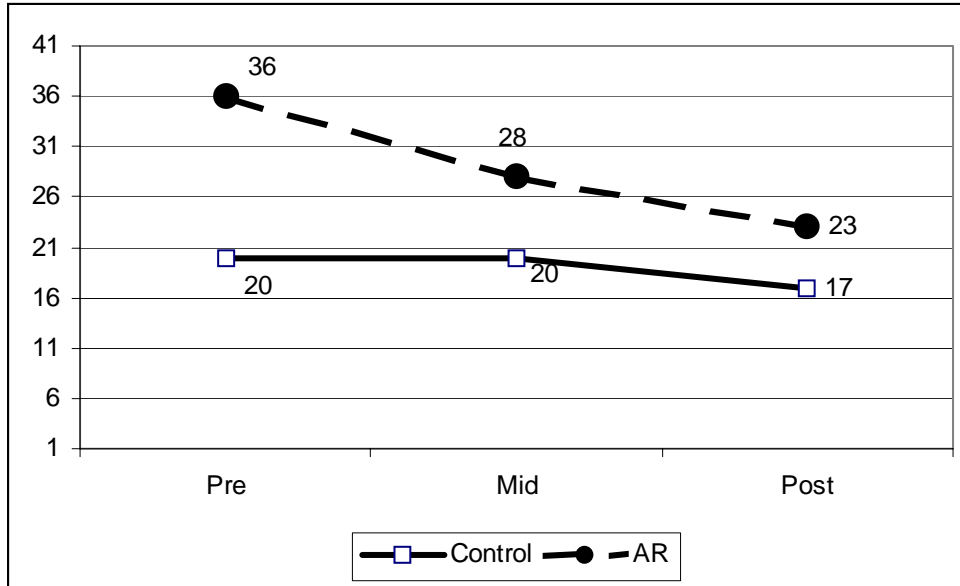


Figure 3. Fifth-Grade STAR Reading Test Median Percentile Ranks by Testing Period and Treatment Condition.

*Sixth Grade.* As with fourth and fifth grade, no significant difference was found between AR/RR and control group mean ( $F_{1,96}=1.08, p = 0.30$ ). A small positive effect was associated with the AR/RR program ( $ES = +0.14$ ). AR/RR median percentile ranks remained constant at the 31<sup>st</sup> percentile, while control group median percentile ranks declined from the 34<sup>th</sup> to the 26<sup>th</sup> percentile (see Figure 4).

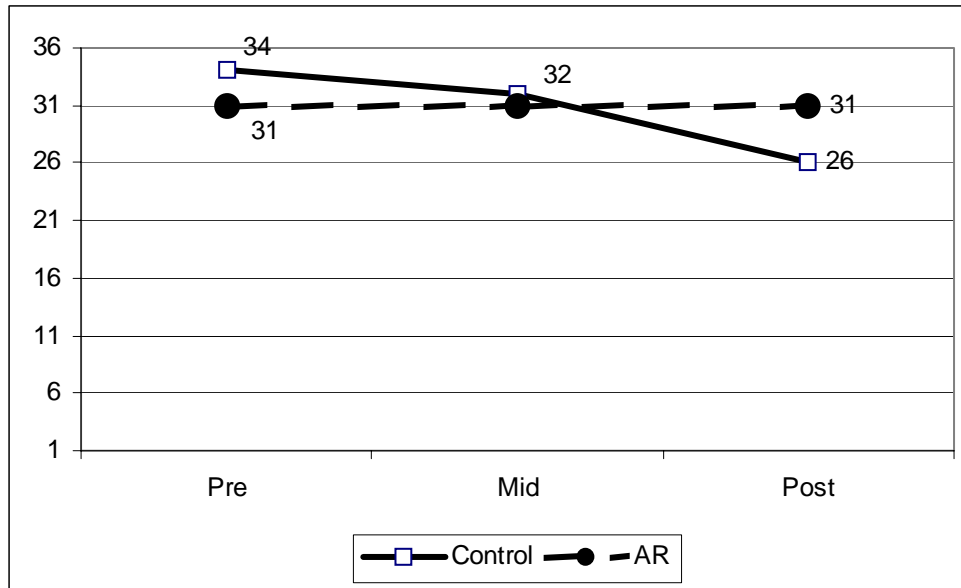


Figure 4. Sixth-Grade STAR Reading Test Median Percentile Ranks by Testing Period and Treatment Condition.

*Teacher Survey: Quantitative Data*

The teacher survey was designed to examine teachers’ perceptions of the AR/RR program; as such, only the treatment (AR/RR) teachers were asked to complete the survey. Because the following results were based only on the participants’ *perceptions* of AR/RR, findings regarding outcomes and effects should be interpreted cautiously. It should be noted that item percentages may not total 100% because of missing input from some respondents. As noted in the method section, a total of 39 of the 42 surveys were received, for a return rate of 92.3%. See Appendix A for data summary table.

*Years of experience as a teacher in any school.* Two-thirds of the AR/RR teachers (66.7%) reported that they had more than 10 years of teaching experience. The remaining one-third was divided relatively evenly between the other categories, with 12.8% reporting 6-10 years of experience, 10.3% reporting 3-5 years of experience, and 10.3% reporting two years of experience or less.



*Years of experience with Reading Renaissance.* As indicated in the Method section, one criterion for participation was that teachers were to have had minimal or no exposure to Accelerated Reader and Reading Renaissance. As for Reading Renaissance experience, most of the AR/RR teachers (74.4%) indicated that they had less than one year of experience with Reading Renaissance (i.e., the current year). Another 23.1% indicated that they had had one to two years of experience with Reading Renaissance. One teacher (2.6%), however, reported three to five years of experience with Reading Renaissance.

*Years of experience using Accelerated Reader.* Two-thirds (66.7%) of the AR/RR teachers reported less than one year of experience using Accelerated Reader. Another 25.6% indicated one to two years of experience. Again, however, one teacher (2.6%) – the same as above - reported three to five years of experience.

*Time allocated for reading practice (not including reading skills instruction) per day.* On average, 43.6% of AR/RR teachers allocated one hour of reading practice per day. Another 20.5% reported that they allocated 45 minutes of reading practice per day, and another 15.4% reported 30 minutes. Two AR/RR teachers (5.1%) reported allocating less than 30 minutes per day to reading practice. Conversely, three teachers (7.7%) reported 90 minutes, and another 7.7% reported allocating more than 90 minutes per day.

*Implementation tasks.* Teachers were asked to indicate the extent to which they agreed about having performed several tasks pertaining to AR/RR implementation. Teachers most frequently agreed or strongly agreed that they provide immediate feedback to students (97.4%), that they check TOPS reading practice reports (92.3%), and that they monitor the student reading log (82%). Almost three-fourths (74.3%) of the teachers

agreed that, on average, they review the diagnostic report weekly. Additionally, many teachers (71.8%) agreed or strongly agreed that they set and adjust student reading goals for the class. The least common response was frequent use of the literacy skills test; only about half of the teachers agreed (51.3%) and approximately 25.7% disagreed or strongly disagreed with this item. Additionally, only 64.1% agreed or strongly agreed (and 15.4% disagreed) that their students average 85 to 92% correct on the quizzes, and that they adjust book levels accordingly to maintain this average; 15.4% disagreed.

*Use of motivators.* Teachers were also asked to rate how frequently they used several motivators (see Table 5). The most frequently used motivator was reading aloud to students (used frequently or extensively by 89.8% of teachers, and occasionally by another 7.7%). Book discussions were reportedly used frequently or extensively by two-thirds of the teachers, and occasionally by another 20.5%. Cooperative reading teams were reportedly used frequently or extensively by 61.6%, and occasionally by another 28.2%. More than half (53.8%) of teachers reported that they occasionally use voting for favorite books as a motivator, with another 17.9% reporting frequent use, and one teacher (2.6%) reporting extensive use. Teachers reported the *least* frequently used motivator to be family reading night, with 61.5% indicating it was rarely used or not at all, 25.6% reporting it was occasionally used, and 12.8% indicating frequent or extensive use. Similarly, for the reading wall of fame, teachers most commonly reported that it was used rarely or not at all (41%). Just over one-third of teachers (35.9%) reported frequent or extensive use of their reading wall of fame, with another 20% reporting occasional use.

Table 5

Reported Frequency of Use of Reading Motivators by AR/RR Teachers

The extent to which each of the following was used . . .	Percent None	Percent Rarely	Percent Occasionally	Percent Frequently	Percent Extensively	Missing Data
Reading wall of fame	23.1%	17.9%	20.5%	12.8%	23.1%	2.6%
Cooperative reading teams	10.3%	0%	28.2%	46.2%	15.4%	0%
Book discussions	5.1%	7.7%	20.5%	48.7%	17.9%	0%
Reading aloud to students	2.6%	0%	7.7%	38.5%	51.3%	0%
Voting for favorite books	7.7%	17.9%	53.8%	17.9%	2.6%	0%
Family reading night	33.3%	28.2%	25.6%	7.7%	5.1%	0%

*Support, professional development, understanding, and buy-in.* Almost all of the teachers (92.3%) agreed that the guidance and support provided by Renaissance’s external facilitators/support team has helped them implement AR/RR. Most teachers (82.1%) agreed that they have received adequate initial and ongoing professional development for implementation of AR/RR. (Only two respondents disagreed with each of these items.) Finally, many teachers (74.4%) agreed or strongly agreed that they have a thorough understanding of the AR/RR program; 7.7% disagreed. Almost all teachers (94.9%) agreed that they are highly supportive of the AR/RR program and most (89.8%) agreed that they would like to use AR/RR again next year; just one respondent disagreed with both of these items.

*Resources and technical issues.* Most teachers (92.3%) agreed or strongly agreed that the materials needed to implement AR/RR have been sufficient, have been based on students’ zone of proximal development, and are readily available; only two respondents (5.1%) disagreed. Many (76.9%) agreed or strongly agreed that they experienced few, if any, technical difficulties using the AR software program; 15.4% disagreed.

*Reports and feedback.* All 39 teachers agreed or strongly agreed (100%) that the AR/RR reports were generally straightforward and easy to understand. Similarly, almost all teachers (97.5%) agreed that their students have benefited from the formative and diagnostic feedback provided by AR/RR, with one respondent remaining neutral (2.6%).

*Overall use, pedagogical changes, effectiveness of placement.* Approximately three-fourths of teachers (76.9%) agreed or strongly agreed that AR/RR was used extensively in their classrooms. Most (84.6%) agreed that AR/RR has changed classroom learning activities a great deal. Two respondents disagreed (5.1%) with each of these items. Most agreed that AR/RR has helped them better target instruction and manage student practice (79.5%), and that AR/RR enables effective placement of students according to reading level (89.8%). One respondent disagreed with each of these items (2.6%).

*Outcomes and special needs.* Most (89.7%) agreed that student achievement has been positively impacted by AR/RR. One respondent disagreed (2.6%), and the rest remained neutral (7.7%). Almost all teachers (94.8%) agreed that students are more enthusiastic about reading because of AR/RR. None disagreed and the rest remained neutral (5.1%). One area where relatively fewer teachers agreed appeared to be the extent to which AR/RR addresses children with special needs (61.5% agreed); 17.9% disagreed, and the other 20.5% remained neutral.

#### *Teacher Survey: Open-Ended Comments*

For each open-ended question, teachers' responses were organized into categories and subcategories, based on content similarity. Response frequencies within each category and subcategory were then tallied, and percentages were tabulated out of the

total number of responses for each question. If, as was often the case, a respondent's answer consisted of multiple responses (e.g., a series or list), each response was treated independently, and categorized accordingly. Therefore, the total number of responses for each item exceeds the total number of respondents. See Appendix B for verbatim participant responses.

*Most effective aspects of AR/RR.* Teachers most frequently reported that the most effective aspect of the program was the immediate feedback from the reports (19.7%), which benefited the students, parents, and the teachers; see Table 6. Another 10.6% of the responses expressed that AR/RR has nurtured a love for, enjoyment of, excitement for, more enthusiasm for, or greater interest in reading among their students. Other effective aspects mentioned included: the books/library (10.6%) and the computer tests (9.1%). Additionally, several responses mentioned that AR/RR enables effective placement of students, allowing them to progress at their own rate of achievement (9.1%), and that it challenges students to read (7.6%). Other commonly mentioned effective aspects included: the time spent reading (4.5%) and the extra opportunities for reading (4.5%).

Table 6

## The Most Effective Aspects of AR/RR

<b>What do you consider to be the most effective aspects of the Accelerated Reader/ Reading Renaissance program?</b>	<b>Frequency</b>	<b>Percent (out of 66 responses)</b>
Reports/feedback (immediate) – for teachers, students, and parents	13	19.7%
Love for, enjoyment of, excitement for, more enthusiasm for, or greater interest in reading	7	10.6%
Books/library	7	10.6%
Effective placement of students/progressing at own rate of achievement	6	9.1%
Computer-based tests	6	9.1%
Motivating students to read and challenge themselves at reading	5	7.6%
Time spent reading	3	4.5%
Extra reading, more opportunities for reading, frequent reading practice	3	4.5%
General non-specific response	3	4.5%
Improved reading abilities, reading levels, comprehension	2	3.0%
Improved self-confidence	2	3.0%
Progress and growth	2	3.0%
General positive	2	3.0%
Question left blank	2	3.0%
Excitement at serving as peer tutors	1	1.5%
Fosters independence	1	1.5%
Insight and perception into reading	1	1.5%
<b>TOTAL</b>	<b>66</b>	<b>100.0%</b>

*Least effective aspects of AR/RR.* Teachers most frequently left this question blank (16.7%) or wrote that the question was not applicable (14.3%); see Table 7. Of the least effective aspects of AR/RR that *were* mentioned, the most common responses referred to time issues (11.9%), specifically the lack of time for it given the school's commitment to other programs, the time consuming nature of the program itself (at least initially), and the lack of time to keep folders organized and up-to-date. Teachers also mentioned the lack of books (particularly on the lowest levels) (9.5%). Additionally, 7.1% of the responses pertained to difficulties with teachers' reading the quizzes to the students; most responses mentioned their inability to effectively quiz students without

some support/help. Finally, supplies – especially paper and ink for printers - were commonly mentioned (4.8%) least effective aspects.

Table 7

The Least Effective Aspects of AR/RR

<b>What do you consider to be the least effective aspects of the Accelerated Reader/ Reading Renaissance program?</b>	<b>Frequency</b>	<b>Percent (out of 42 responses)</b>
Question left blank	7	16.7%
"N/A"	6	14.3%
Time issues: lack of time for AR/RR given other programs, time consuming (initially), lack of time to keep folders organized and up-to-date	5	11.9%
Lack of books (esp. Lack of books on lowest levels)	4	9.5%
Difficulty reading quizzes to students: lack of support; kindergarten needs all voice quizzes	3	7.1%
Supplies: paper and ink for printers	2	4.8%
Having to share the books	1	2.4%
Difficulty getting students tested (initially)	1	2.4%
More computers in the classrooms	1	2.4%
Lack of parent involvement	1	2.4%
"Low" students still hate to read and just go through the motions	1	2.4%
Knowing when to make changes from one color book to another	1	2.4%
Paperwork	1	2.4%
Need more training	1	2.4%
Some inappropriately worded questions, given the students	1	2.4%
How about non-fiction books?	1	2.4%
RR interferes with daily teaching activities	1	2.4%
Not enough higher order thinking skills for younger readers	1	2.4%
Use of literal comprehension questions only	1	2.4%
All aspects are equally effective	1	2.4%
Nothing is ineffective	1	2.4%
<b>TOTAL</b>	<b>42</b>	<b>100.0%</b>

*Additional comments.* Most of the teachers’ additional comments regarding AR/RR were generally or globally positive (e.g., “I love it;” “It is a great program.”) (23.1%); see Table 8. Teachers also frequently left this question blank (21.2%) or wrote “N/A” or “None” (3.8%). Other frequently mentioned comments were that AR/RR should be available to every child or implemented in all schools (5.8%), that they would

like Accelerated Math too (5.8%), or that the program was time consuming/ they lacked time (5.8%). Two responses also mentioned that students were more motivated to read because of AR/RR (3.8%).

Table 8

Additional Comments Regarding AR/RR

<b>What additional comments do you have regarding the AR/RR program?</b>	<b>Frequency</b>	<b>Percent (out of 52 responses)</b>
General positive	12	23.1%
Question left blank	11	21.2%
Should be available to every child	3	5.8%
Would like Accelerated Math too	3	5.8%
Time consuming/lack of time	3	5.8%
Motivated to read	2	3.8%
Should replace old program	1	1.9%
Want to use it again next year	1	1.9%
Should be easier next year	1	1.9%
Targets individual reading level	1	1.9%
Students enjoy it	1	1.9%
The facilitators	1	1.9%
Improves reading ability	1	1.9%
N/A	1	1.9%
None	1	1.9%
Could be an asset if used properly.	1	1.9%
Technical difficulties with ink and printers	1	1.9%
Need more training; training should be ongoing	1	1.9%
Need to add vocabulary words	1	1.9%
Use of AR, but less RR	1	1.9%
Would like to send books home, but doubts they'll be returned	1	1.9%
Want books in own room; not library	1	1.9%
No funds for replacing ink cartridges	1	1.9%
Too expensive	1	1.9%
<b>TOTAL</b>	<b>52</b>	<b>100.0%</b>



### *Teacher Survey: Potential Implementation Concerns*

Informal data analysis of the teacher survey indicated one obvious outlier: a first grade teacher disagreed or strongly disagreed with 12 of the 16 positively-worded questions pertaining to perceptions of the AR/RR program. By contrast, each of the other 38 teachers disagreed or strongly disagreed with no more than 3 of the 16 items. For example, the teacher disagreed that AR/RR training was adequate or that external facilitators helped with implementation of the program. Furthermore, the teacher strongly disagreed about having a thorough understanding of AR/RR or wanting to use the program again next year. With regard to implementation, the teacher did not indicate taking status of the class daily, reviewing the diagnostic report weekly, maintaining an 85-92% average on quizzes, using the literacy skills test frequently, or monitoring the student reading log frequently.

Additionally, participating teachers were to have had minimal or no exposure to Accelerated Reader and Reading Renaissance, and, indeed, most teachers appeared to meet this criterion. Still, one 5<sup>th</sup> grade AR/RR teacher - representing 20 students - reported three to five years of experience with both Reading Renaissance and Accelerated Reader. Despite this added teaching experience, no significant differences were found between 5<sup>th</sup> grade AR/RR students and control on STAR reading (although the results slightly favored AR/RR students).

### *Consultants' Observations: Potential Implementation Concerns*

Additionally, implementation concerns were expressed by the consultants who conducted regular consultation visits with the teachers. During their monthly visits, the consultants recorded several implementation concerns for 16 of the 42 AR/RR teachers

and for 1 control teacher. No implementation issues were noted for 26 of the AR/RR teachers (61.5% of these 26 were K-3 teachers; 38.5% were 4<sup>th</sup> -6<sup>th</sup> grade teachers).

Most of the concerns recorded by the consultants pertained to limited, delayed, or incomplete AR/RR implementation, often associated with lack of teacher/principal commitment to AR/RR, low prioritization of AR/RR, teacher resistance, teacher mobility, and/or technical issues. At one school, for example, the principal informed the consultants during their February visits that their teachers had been told “not to do AR/RR at all until after TCAP testing was complete (meaning at least a month and a half was lost).” At another school, teachers reported being completely overwhelmed, considering all the other programs the school was trying. Additional issues pertained to lack of teacher attendance/engagement during the consultation visits, one teacher’s negativity toward her students, and another teacher assisting students during testing. Other examples of these implementation issues were as follows:

*Lack of implementation due to teacher resistance.*

- One teacher (1<sup>st</sup>) was highly opposed to the program, and refused to implement it; the only activity that took place was what one of the teacher’s first grade students read to the other students and then helped them test. (This was the same teacher who was noted to be an “outlier” on the teacher survey.)

*Limited implementation.*

- One teacher (5<sup>th</sup>) “talked a good game but did nothing.” Over the first four marking periods, only a total of 5 quizzes were taken in the whole class; had lots of excuses.
- One teacher (K) “did very little.”
- Another teacher (6<sup>th</sup>) simply turned the program over to her student teacher who had not been trained.
- One teacher (5<sup>th</sup>) did not start AR/RR until the end of October, and did not monitor. Some of the students did not take an AR quiz all year.

*Teacher replacement.*

- Two teachers (2<sup>nd</sup>, 4<sup>th</sup>) were replaced mid-year, with the new teachers having had no AR/RR training. The original 2<sup>nd</sup> grade teacher had been absent frequently and “did not do much;” the original 4<sup>th</sup> grade teacher went to another grade level in January.

*Overwhelmed teachers.*

- Two teachers (K, 1st) reported being completely overwhelmed and needing extra help; they received none, despite principal approval for the requested help.

*Lack of teacher attendance/engagement during the consultation visits.*

- Three teachers (1<sup>st</sup>, 5<sup>th</sup>, and 5<sup>th</sup>) missed consultation appointments, despite reminders.
- For one teacher (4<sup>th</sup>), the consultations “often seemed pointless,” given that on every visit except one - they were held in her classroom (with her students present), and thus the visits were subject to frequent interruptions and a chaotic atmosphere.
- For another teacher (3<sup>rd</sup>), during one of the visits, the consultant could only “print her reports, make comments, and wait” until the next month’s visit, as the teacher was “buried under paperwork” and meeting with three other teachers during the scheduled meeting time.

*Intimidation by technical issues*

- One (1<sup>st</sup>) teacher was extremely “intimidated by technical issues.”

*Teacher negativity toward students*

- One (6<sup>th</sup>) teacher was strongly negative toward the students, wanting the consultant to “ream out” four of her students.

*Assisting students during testing*

- Additionally, one control teacher (1<sup>st</sup>) was observed assisting her students with the answers, prompting them if their answer was incorrect.

## Discussion

Study 1 was oriented around the following research questions:

### **1. To what extent does AR/RR lead to improvements in student reading ability?**

It appears that AR/RR did have a positive impact on student reading ability in the lower grades. Students who received the AR/RR program in grades K, 1, 2, and 3 performed significantly and substantially higher on STAR Early Literacy or STAR Reading than control students after controlling for free lunch status and pretest scores. The results for Kindergarten and first grades, however, should be interpreted with caution due to the relatively small number of participating classes.

For grades 4-6, no significant differences were found between AR/RR students and control students on STAR Reading, although results slightly favored AR/RR students in grades 5 and 6. Repeated-measures analyses incorporating all testing periods were not conducted because this would have resulted in a further reduction in the number of cases with matching data.

### **2. What are teachers' perceptions of AR/RR implementation?**

Teachers appeared to be highly positive about AR/RR implementation. Most teachers agreed that they have received adequate training for implementation of the program. Almost all teachers agreed that they are highly supportive of the AR/RR program, and most agreed that they would like to use AR/RR again next year. Almost three-fourths agreed or strongly agreed that they have a thorough understanding of the AR/RR program.

Teachers found the immediate feedback from the reports to be one of the most effective aspects of the program, in addition to the books and tests themselves. As for

perceived outcomes, most teachers indicated that student achievement has been positively impacted by AR/RR; nevertheless, achievement test data were unavailable to be analyzed. Most also agreed that AR/RR has changed classroom learning activities a great deal, has helped them better target instruction and manage student practice, and enables effective placement of students according to reading level. Many reported that their students have a greater interest in and appreciation for reading, and almost all teachers agreed that students are more enthusiastic about reading because of AR/RR.

Of the concerns that were mentioned, the most common referred to a lack of time, with teachers often specifically noting the time-consuming nature of the program itself, considering their school's commitment to other programs. Teachers also mentioned the lack of books (particularly on the lowest levels) and lack of supplies (e.g., paper and ink for printers). Further difficulties with implementation pertained to Kindergarten and first grade teachers' reading the quizzes to the students; most responses mentioned their inability to effectively quiz students without some support/help.

## STUDY 2: THE IMPACT OF ACCELERATED READER/READING RENAISSANCE IMPLEMENTATION ON READING ACHIEVEMENT IN GRADES 3 TO 6

Study 2 continued the examination of AR/RR impacts by focusing on possible mitigating effects of implementation effectiveness. Research questions, methods, and results are described below.

### Research Questions

1. What impact does implementation of Accelerated Reader/ Reading Renaissance (AR/RR) have on growth in reading achievement for at-risk students in grades 3 to 6?
2. How does the quality of AR/RR implementation relate to student growth in reading?
3. Does the quality of AR/RR implementation have an effect on growth in reading for students with learning disabilities?
4. What is the relationship between implementation, as measured by classroom average percent correct (APC) and achievement growth slopes.

### Method

#### *Participants*

Study participants included 978 students in grades 3 ( $n = 250$ ), 4 ( $n = 381$ ), 5 ( $n = 215$ ), and 6 ( $n = 132$ )<sup>5</sup>, and 44 teachers in nine<sup>6</sup> Memphis City Schools. Of the students,

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<sup>5</sup> This study's analysis covered only those students in the 3rd-6th grades (i.e., those students taking the STAR Reading test). Given that the dependent measure was grade-dependent, it was not possible to include all of the grades (K-6) in one analysis. As for the K-2 grades (i.e., those students taking the SEL), since there were only 32 K-2 teachers in both control and AR conditions, it was thought the N may be too low to run an independent analysis of grades K-2, given the number of parameters estimated.

<sup>6</sup> Two of the original 11 schools had only K-2 implementation, and thus were not included in the analyses.

89.9% were African American, 83.0% were eligible for free or reduced-price lunch, and 3.3% had a specified learning disability. Slightly more than half (53.5%) of students were female.

### *Student Outcome Measure*

As in Study 1, the STAR Reading Test comprised the dependent measure of achievement.

### *Program Implementation Measures*

“Distance consulting” implementation measures, which are intended to provide feedback for program monitoring, were collected for each teacher in the treatment group. Distance consulting reports are run for each school after each 6-week marking period, in order to determine implementation progress over the past 6 weeks (e.g., how the students stand on quality and quantity of reading, and how each teacher is doing in respect to other teachers at that same grade level and within a school). Specific measures included: (a) the percentage of students reading at or above the expected level, (b) reading practice points achieved, and (c) a measure of independent reading practice.

Additionally, implementation ratings were generated by consultants based upon the on-site consultations during the school year. The consultant ratings were gathered in four areas: (1) *Classroom Implementation*, which rated the quality of implementation of the AR/RR program for each classroom on a 3-point Likert-type scale (1 = Poor, 2 = Average, 3 = Strong); (2) *TWI* (time spent reading To, With, or Independently) rated on a 3-point Likert-type scale (1 = 30 minutes or less, 2 = 30-60 minutes, 3 = 60 minutes or more); (3) *Hardware Usage*, which represented the degree to which problems were experienced using the computer hardware and software necessary to implement the

program (1 = no problems, 2 = few problems, 3 = substantial problems); and (4) *Principal Support*, which rated the perceived level of principal support for the program on a 3-point, Likert-type scale (1 = Poor, 2 = Average, 3 = Strong).

Additionally, a principal components analysis was performed to generate a single, regression-based factor score representing overall classroom-level implementation. A single factor accounted for 79.4% of the variance in the 7 implementation measures.

## Results

### *Initial Data Screening and Transformations*

STAR scale scores at pretest, midterm, and posttest were first examined for normality within grade levels and homogeneity of variance across grade levels. Initial examination of the test scores revealed moderate to strong skewness for pretest ( $Sk = 0.72$ ), midterm ( $Sk = 1.10$ ), and posttest scores ( $Sk = 1.215$ ). Levene's test indicated that variances across grade levels were significantly different for pretest ( $F_{3,877}=9.77, p<.001$ ), midterm ( $F_{3,798}=13.21, p<.001$ ), and posttest ( $F_{3,828}=6.92, p < .01$ ). A square root transformation was performed on all three variables to reduce skewness and stabilize variances. Levene's test indicated no significant differences in variance across grade levels on the transformed variable. Skewness was also substantially reduced through transformation for each variable: pretest ( $Sk = -0.02$ ), midterm ( $Sk = 0.14$ ), and posttest ( $Sk = 0.24$ ). Visual examination of normal plots within grade levels and spread-and-level plots confirmed that the square root transformation was largely successful in inducing normality and homogeneity of variance.

A total of 1,023 students in grades three to six were enrolled in either AR classrooms or control classrooms for the entirety of the study. Of these, 4.4% ( $n = 45$ )



did not complete any STAR reading tests, and thus were eliminated from subsequent analyses. Chi-square tests indicated no relationship between missing test data and treatment condition, free or reduced-price lunch status of student, learning disability status of student, or gender of student.

### *Multiple Imputation of Missing Values*

Initial screening procedures showed that, of 978 students who had data from at least one test administration, 97 were missing pretest scores, 176 were missing midterm scores, and 146 were missing posttest scores. About 75% ( $n=736$ ) had matching pretest-midterm scores, ( $n=742$ ) matching pretest-posttest scores, or ( $n=738$ ) matching midterm-posttest scores.

About 70% ( $n=679$ ) had scores for all three test administrations, whereas 11% ( $n = 113$ ) had only one test score.  $\chi^2$  tests indicated no significant relationships between treatment or grade level with the pattern of missing data. Because of the large percentages of students who had complete data or at least two scores, it was deemed desirable to use multiple imputation procedures so all cases could be included in analyses of program effects. Multiple imputation uses expected maximum likelihood methods to generate values to replace missing data. The imputed values represent the most likely value that would have been observed for a particular case given the data profile on measured variables.

### *Analysis*

A three-level hierarchical linear model was estimated to examine relationships between student characteristics and growth in reading achievement, and to estimate the impact of treatment condition on the growth trajectory of students. The level 1 model

was a within-students model relating the repeated measures of reading achievement to time, where  $time = 0$  was the September administration,  $time = 1$  was the January administration, and  $time = 2$  was the April administration:

$$Y_{ijk} = \pi_{0jk} + \pi_{1jk}(\text{time}) + e_{ijk} \quad (\text{within-students model})$$

In the level 2 (within-classes) model, the level 1 intercept ( $\pi_{0jk}$ ) and level 1 slope ( $\pi_{1jk}$ ) were modeled as functions of student characteristics. Specifically, the intercept was modeled as a function of grade level and gender, whereas the slope was modeled as a function of the learning disability status of the child:

$$\pi_{0jk} = \beta_{00k} + \beta_{01k}(\text{grade}) + \beta_{02k}(\text{gender}) + r_{0jk} \quad (\text{within-classes intercept model})$$

$$\pi_{1jk} = \beta_{10k} + \beta_{11k}(\text{learning disability}) + r_{1jk} \quad (\text{within-classes slope model}).$$

Although each of the  $\beta$ 's is a potential outcome in the level 3 model, the interest in this study was to explain variation in  $\beta_{10k}$ , the average time slope within each class  $k$ . Thus, the level 3 (between-classes) model was:

$$\beta_{00k} = \gamma_{000} + u_{00};$$

$$\beta_{01k} = \gamma_{010};$$

$$\beta_{02k} = \gamma_{020} + u_{02};$$

$$\beta_{10k} = \gamma_{100} + \gamma_{101}(\text{treatment condition}) + u_{10};$$

$$\beta_{11k} = \gamma_{110} + u_{11}.$$

The residual parameter variance for grade ( $\beta_{01k}$ ) was set to zero. A model with only the level 1 predictor (time) was also estimated to serve as a baseline to assess model fit. Exploratory analyses were also performed to test for the effects of variations in program implementation and classroom heterogeneity (i.e., classroom achievement variance at time=0) on level 3 slopes and intercepts.

To aid in the interpretation of results, the mean transformed STAR Reading score was computed and plotted for each administration, grade level, and treatment condition. Treatment effect size estimates were computed at each grade level by performing analysis of covariance using treatment condition as the independent variable, untransformed STAR Reading scale score at time = 2 as the dependent variable, and untransformed STAR Reading scale score at time = 0 as a covariate. Cohen's  $d$  was computed as an effect size estimate for each grade level performing an analysis of covariance using treatment condition as the independent variable, STAR Reading scale score at time = 0 as a covariate, and STAR Reading scale score at time = 2 as a dependent variable. The adjusted mean for the control group was subtracted from the adjusted mean for the treatment group, and the result was divided by the pooled within-groups standard deviation for STAR Reading at time = 0 to yield  $d$ . Finally, frequencies of consultants' implementation ratings were computed for each grade level.

As shown in Figures 5-8, students in AR/RR classrooms had higher average growth rates than students in control classrooms for all grades except 5<sup>th</sup> grade, in which growth rates were about equal (see Figure 7). The strongest effects were observed in 3<sup>rd</sup> and 4<sup>th</sup> grades, in which there was almost no difference between AR/RR and control means at time=0, and a substantial difference at time=2 (see Figures 5 and 6). In sixth grade, students in control classrooms had a higher average growth rate than those in AR/RR classrooms from time=0 to time=1, but experienced no growth from time=1 to time=2, resulting in nearly equal overall growth across the year (see Figure 8).

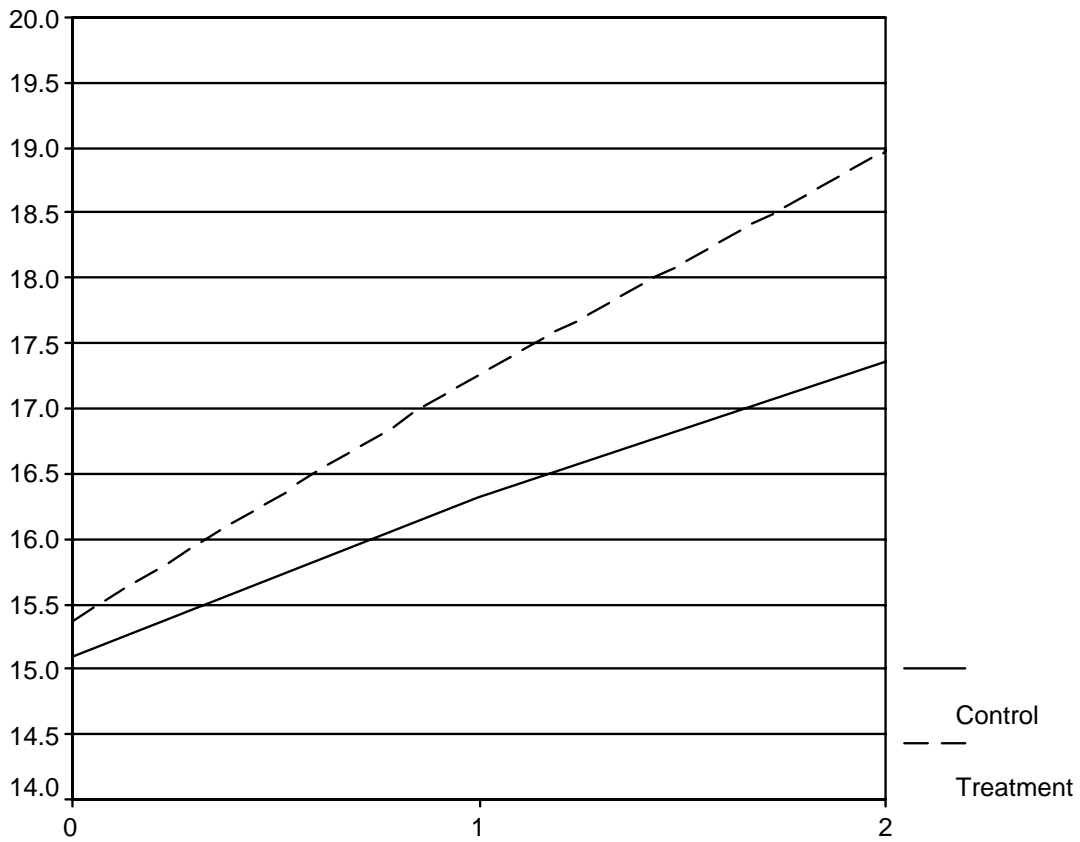


Figure 5. Mean Transformed (Square Root) STAR Reading Scale Scores by Treatment Condition and Time of Administration, Grade 3. Note. Time 0 = September, Time 1 = January, Time 2 = April.

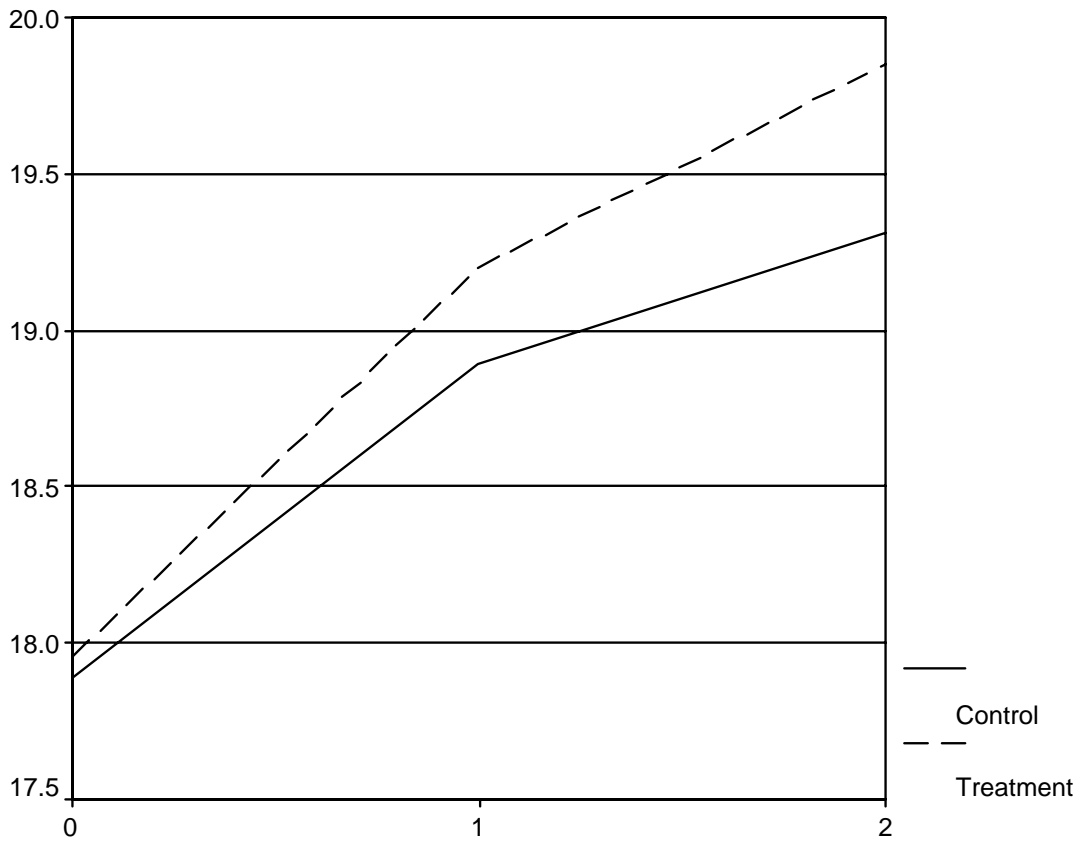


Figure 6. Mean Transformed (Square Root) STAR Reading Scale Scores by Treatment Condition and Time of Administration, Grade 4. Note. Time 0 = September, Time 1 = January, Time 2 = April.

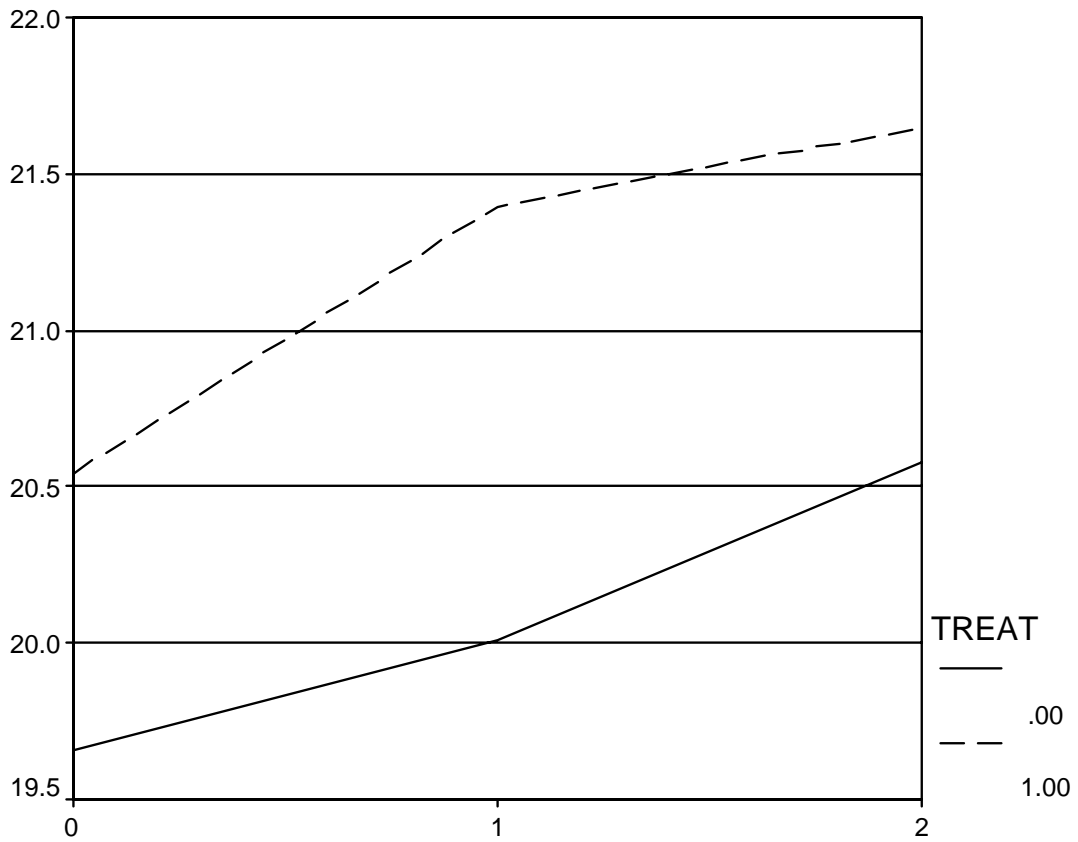


Figure 7. Mean Transformed (Square Root) STAR Reading Scale Scores by Treatment Condition and Time of Administration, Grade 5. Note. Time 0 = September, Time 1 = January, Time 2 = April.

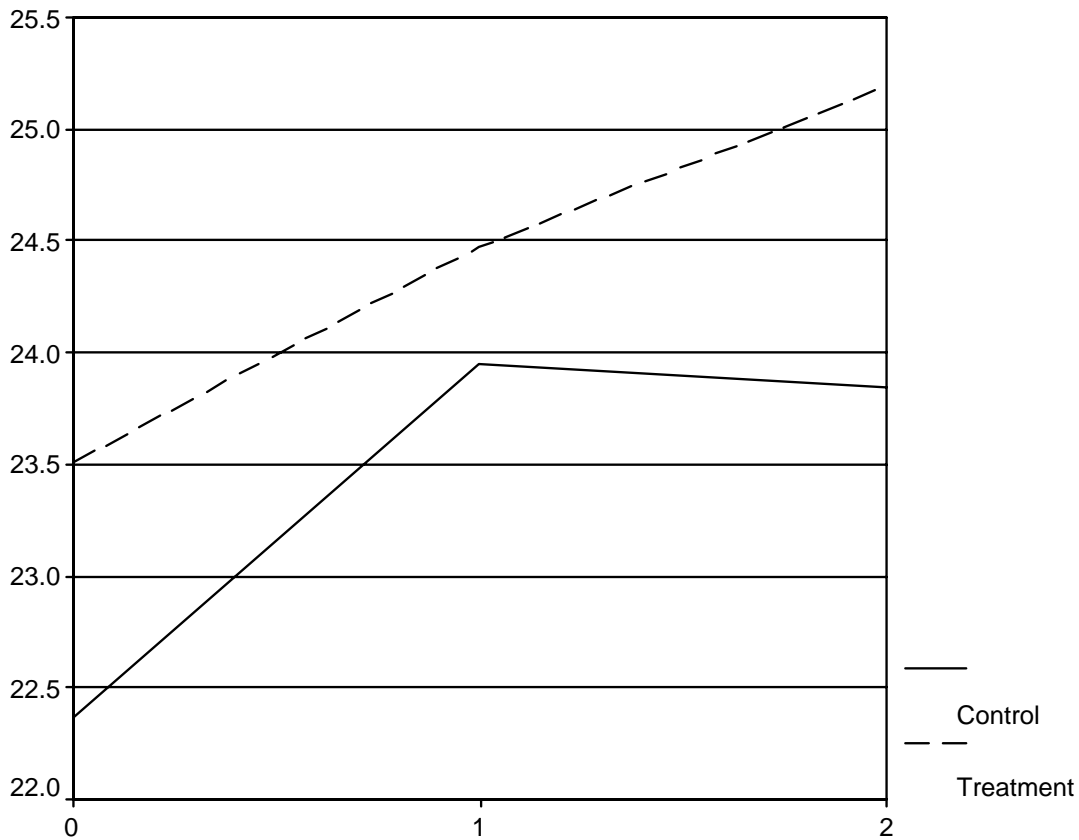


Figure 8. Mean Transformed (Square Root) STAR Reading Scale Scores by Treatment Condition and Time of Administration, Grade 6. Note. Time 0 = September, Time 1 = January, Time 2 = April.

The reliability estimates of the random level 2 coefficients for  $\beta_{00}$  (achievement at time = 0) and for  $\beta_{10}$  (time slope) were 0.927 and 0.852, respectively. These values indicated a strong possibility of discriminating between classes with respect to baseline achievement and growth in reading achievement. The average time-slope coefficient was statistically significant ( $\gamma_{100} = 0.948$ ,  $t = 9.56$ ,  $df = 43$ ,  $p < .001$ ), indicating that, on average, student growth rates were positive across classrooms. A test of the level 3 variance components indicated significantly variability across classrooms in the mean rate of change in reading achievement ( $\chi^2 = 332.89$ ,  $df = 43$ ,  $p < .001$ ). The correlation

between the level 1 intercepts and level 1 slopes was  $-0.065$ , showing little or no relationship between the beginning level of achievement and growth in achievement.

*Conditional Model: Treatment Status*

As expected, grade level ( $\gamma_{010} = 2.30, t = 12.74, p < .001$ ) and gender ( $\gamma_{020} = 1.26, t = 6.20, p < .001$ ) were significantly related to STAR Reading scores at time = 0, reflecting higher pretest scores at higher grade levels and higher pretest scores for females (see Table 9). The level 3 intercept for time slope was significant ( $\gamma_{100} = 0.76, t = 8.41, p < .001$ ), as were the relationships between the time slope with treatment ( $\gamma_{101} = 0.39, t = 2.41, p = 0.02$ ) and learning disability status ( $\gamma_{110} = -0.60, t = -2.53, p = 0.015$ ). Effect size estimates based on the ANCOVA described above were  $+0.34, +0.15, +0.10,$  and  $+0.07$  for 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grades, respectively (see Figure 9).

Table 9

Treatment and Learning Disability Effects on Growth in Student Reading Achievement

Fixed effect	Coefficient	S.E. <sup>1</sup>	<i>t</i>	<i>df</i>	<i>p</i>
<b>Intercept</b>					
Intercept ( $\gamma_{000}$ )	6.78	0.95	7.13	43	0.000
Grade ( $\gamma_{010}$ )	2.30	0.18	12.74	975	0.000
Gender ( $\gamma_{020}$ )	1.26	0.20	6.20	43	0.000
<b>Time slope</b>					
Intercept ( $\gamma_{100}$ )	0.76	0.09	8.41	42	0.000
Treatment ( $\gamma_{101}$ )	0.39	0.16	2.41	42	0.020
Learning disability ( $\gamma_{110}$ )	-0.60	0.24	-2.53	43	0.015

<sup>1</sup>Robust standard error. <sup>2</sup>0=Control. 1 = Accelerated Reader/ Reading Renaissance.



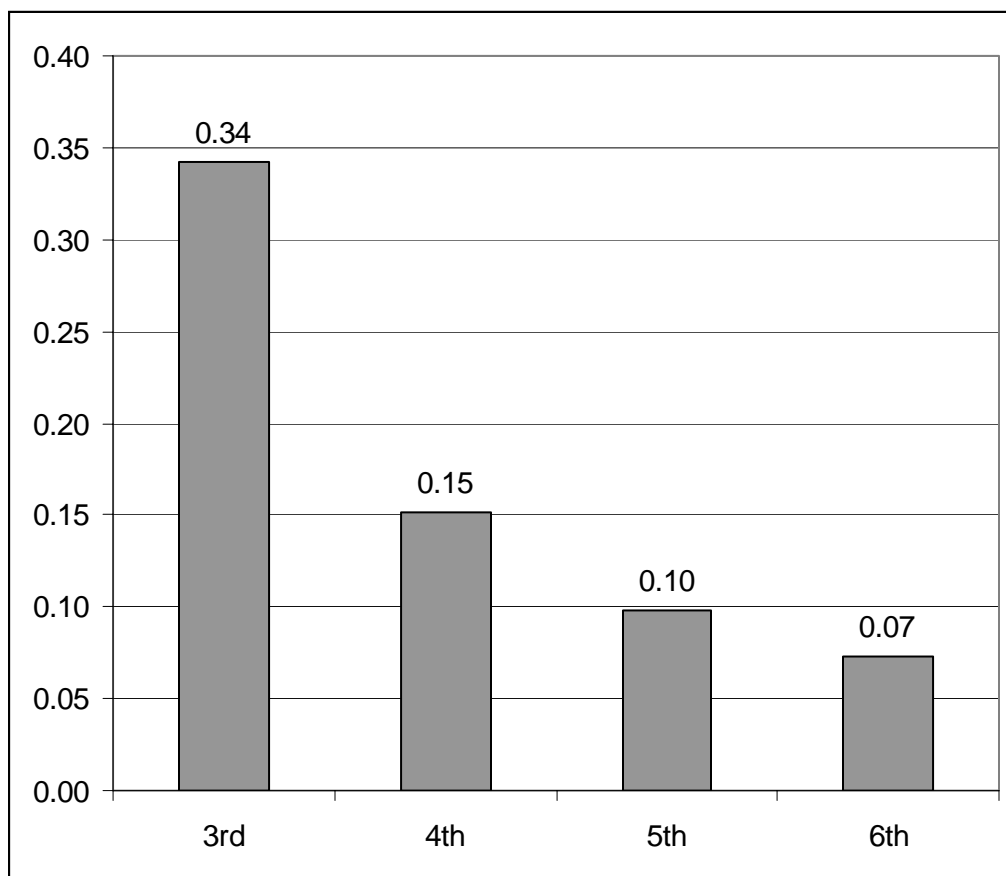


Figure 9. Effect Size Estimates by Grade Level.

*Conditional Model: Exploratory Analyses of Classroom Heterogeneity and Program Implementation Effects*

Correlation coefficients between classroom heterogeneity and program implementation scores with level 3 slopes and intercepts were examined to determine whether the addition of either of these variables influenced the slope for learning disability. Based on this examination, program implementation was included as a predictor of the slope for learning disability status. Program implementation scores ( $\gamma_{101} = 0.16, t = 1.79, p = 0.08$ ) did not predict time slopes as well as the simple treatment status indicator. As reported in Table 10, the level of program implementation probably

has a positive relationship with the average impact of learning disability status across schools ( $\gamma_{111}=0.54$ ,  $t = 1.89$ ,  $p =0.065$ ), indicating that high-implementation classrooms tended to mitigate the negative effects of learning disability on student growth in reading achievement.

Table 10

Treatment and Implementation Level Effects on Growth in Student Reading Achievement

Fixed effect	Coefficient	S.E. <sup>1</sup>	<i>t</i>	<i>df</i>	<i>p</i>
Intercept					
Intercept ( $\gamma_{000}$ )	6.76	0.95	7.09	43	0.000
Grade ( $\gamma_{010}$ )	2.30	0.18	12.82	975	0.000
Gender ( $\gamma_{020}$ )	1.26	0.20	6.14	43	0.000
Time slope					
Intercept ( $\gamma_{100}$ )	0.76	0.09	8.41	42	0.000
Treatment ( $\gamma_{101}$ )	0.39	0.16	2.39	42	0.022
Learning disability					
Intercept ( $\gamma_{110}$ )	-0.59	0.23	-2.50	42	0.017
Implementation ( $\gamma_{111}$ )	0.54	0.28	1.89	42	0.065

<sup>1</sup>Robust standard error. <sup>2</sup>0=Control. 1 = Accelerated Reader/ Reading Renaissance.

The relationship between program implementation and learning disability status was further explored by computing empirical Bayes (EB) estimates of the classroom-level learning disability slopes, classifying AR classrooms as either “low” or “high” implementation based upon a median split of the implementation factor scores, then performing a one-way ANOVA with treatment status (control, low-implementation, high-implementation) as the independent variable and EB slope estimates as the dependent variable. The results indicated a significant effect of treatment status on learning

disability slopes ( $F_{2,41} = 5.55, p = .007$ ). Pairwise post hoc comparisons were performed using Fisher's least significant difference procedure, which indicated that learning disability slopes in high implementation classrooms ( $M = -0.20$ ) were significantly higher than slopes in either control ( $M = -0.62$ ) or low-implementation ( $M = -0.92$ ) classrooms; no significant difference was observed between control and low-implementation classrooms (see Figure 10).

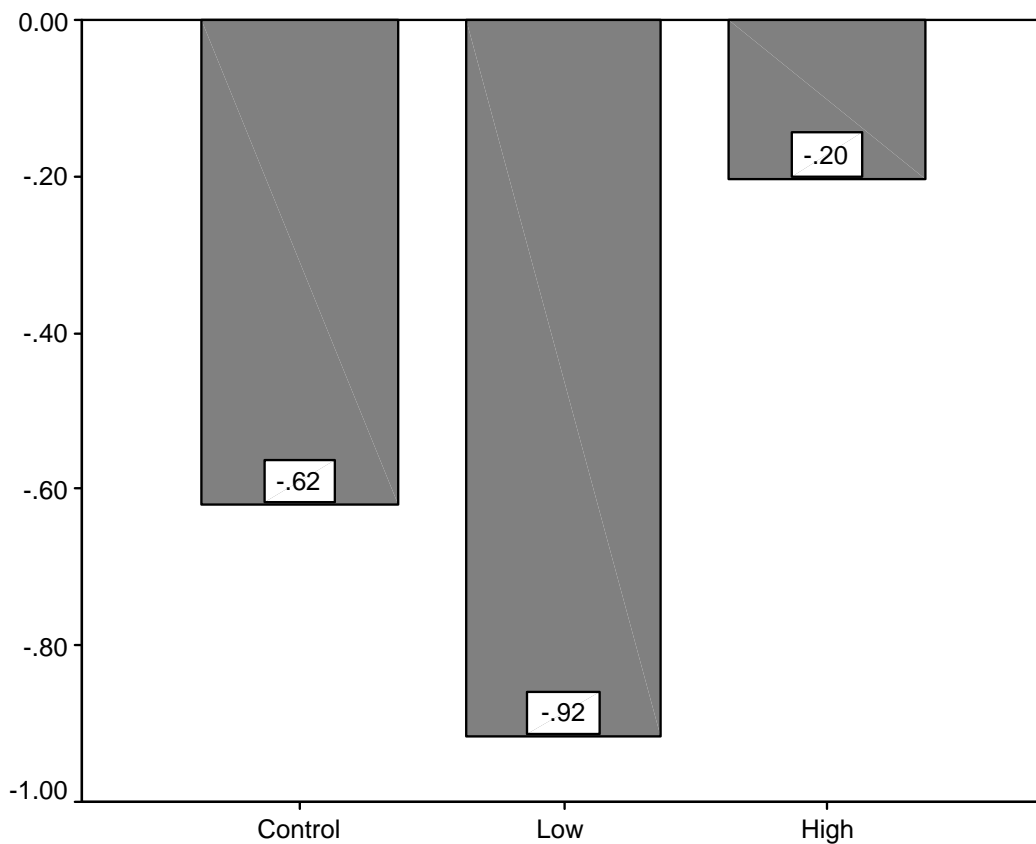


Figure 10. Mean Classroom-level Impact of Learning Disability Status by Treatment Condition (Control, Low-implementation AR/RR, High-implementation AR/RR)

## Implementation Ratings

As reported in Table 11, consultants generally rated classroom implementation as “average” for all grade levels except 5<sup>th</sup> grade, in which 60% ( $n = 3$ ) of the ratings were “poor.” Likewise, consultant estimates of TWI (time spent reading “to, with, or independently”) were quite low for 5<sup>th</sup> grade, with 80% ( $n = 4$ ) of 5<sup>th</sup> grade AR/RR teachers’ classrooms rated as spending less than 30 minutes engaged in these reading activities. Fourth (44%) and fifth (40%) grade teachers tended to experience more “substantial” problems related to using program technology. Principal support was rated as “weak” in 44% ( $n = 4$ ), “average” in 22% ( $n = 2$ ), and “strong” in 33% ( $n = 3$ ) of program schools.

Table 11

Accelerated Reader/ Reading Renaissance Implementation Ratings by Grade Level<sup>1</sup>

Implementation Area	Rating		
	1	2	3
<b>Classroom Implementation<sup>2</sup></b>			
3 <sup>rd</sup>	1 (14%)	4 (57%)	2 (29%)
4 <sup>th</sup>	1 (11%)	8 (89%)	0 (0%)
5 <sup>th</sup>	3 (60%)	1 (20%)	1 (20%)
6 <sup>th</sup>	0 (0%)	2 (67%)	1 (33%)
<b>TWI<sup>3</sup></b>			
3 <sup>rd</sup>	1 (14%)	2 (29%)	4 (57%)
4 <sup>th</sup>	3 (33%)	2 (22%)	4 (44%)
5 <sup>th</sup>	4 (80%)	0 (0%)	1 (20%)
6 <sup>th</sup>	0 (0%)	1 (33%)	2 (67%)
<b>Hardware<sup>4</sup></b>			
3 <sup>rd</sup>	1 (14%)	3 (43%)	3 (43%)
4 <sup>th</sup>	4 (44%)	3 (44%)	2 (22%)
5 <sup>th</sup>	2 (40%)	1 (20%)	2 (40%)
6 <sup>th</sup>	0 (0%)	2 (67%)	1 (33%)
<b>Principal Support<sup>5</sup></b>			
	4 (44%)	2 (22%)	3 (33%)

<sup>1</sup>Only one rating per school is reported for *Principal Support*. <sup>2</sup>Scale: 1 = poor, 2 = average, 3 = strong. <sup>3</sup>Scale: 1 = 30 minutes or less, 2 = 30-60 minutes, 3 = 60 minutes or more. <sup>4</sup>Scale: 1 = substantial problems, 2 = few problems, 3 = no problems. <sup>5</sup>Scale: 1 = poor, 2 = average, 3 = strong.

### *Classroom Average Percent Correct Analyses*

Classroom average percent correct (APC) was also used as an implementation index in a separate analysis of implementation effects. The program goal is to have an APC of 85%, which putatively indicates that teachers are intervening appropriately to ensure a high level of comprehension of books read. Such interventions might include helping students identify books at the appropriate reading level, guiding students to books that are interesting to them, providing targeted instruction on decoding skills or comprehension and self-monitoring strategies, and setting expectations for high percent correct a goal. APC can thus be considered a measure of implementation integrity (Borman & Dowling, 2004; Paul 2003).

*Method.* In the present analyses, APC was calculated as the mean percentage correct score across all quizzes. APC ranged from a low of 0.42 to a high of 0.86 among the 24 3<sup>rd</sup> to 6<sup>th</sup> grade treatment classrooms, with a median value of 0.74 (see Figure 11). Only 3 classrooms met the program standard. The effect of APC on the average growth in reading achievement across classrooms was explored by performing a median split of APC scores, classifying classrooms as “high” or “low” in implementation. Next, Empirical Bayes (EB) estimates of the time slope in Reading Renaissance classes were computed by adding Empirical Bayes residuals to the fitted slope values. The EB slope estimates represent the average amount of growth in reading achievement each semester in a classroom, as measured by the transformed STAR scale score. Higher EB slope estimates indicate a higher growth trajectory within the class.

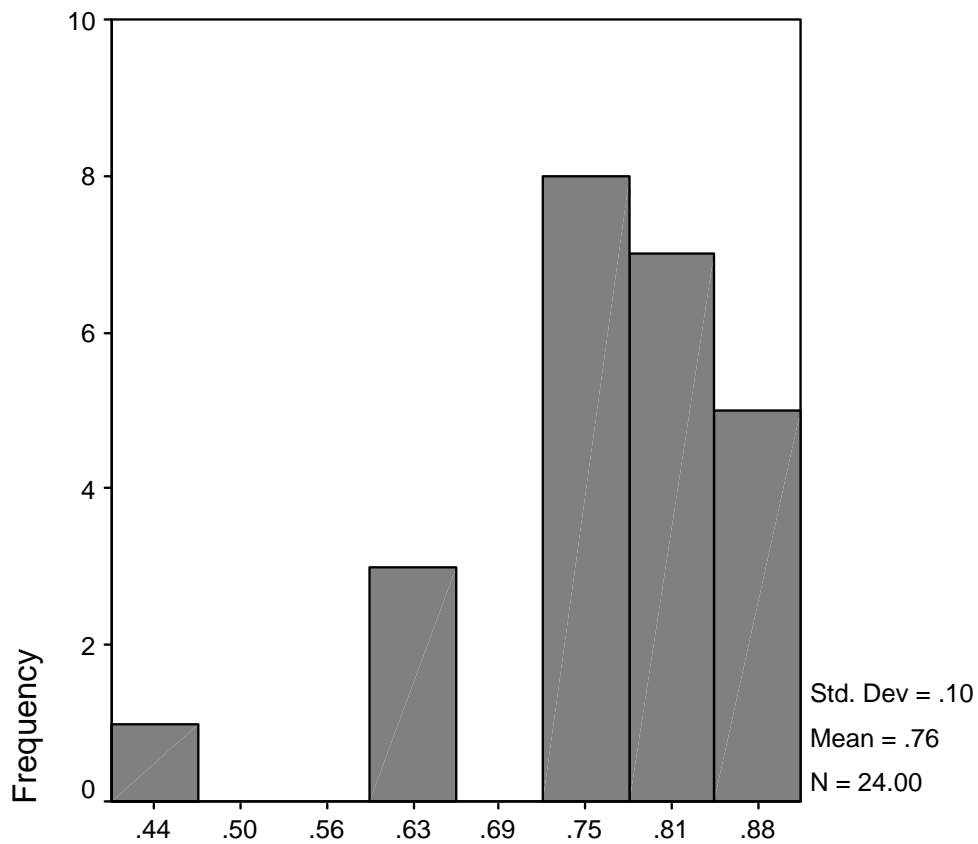


Figure 11. Histogram of APC scores.

*Results and conclusions.* As Figure 12 shows, the distribution of EB slope estimates was clearly shifted upward in the treatment group, reflecting the significant treatment effect reported above. One strongly positive outlier was observed in the SR distribution—the APC score for that classroom was 81%.

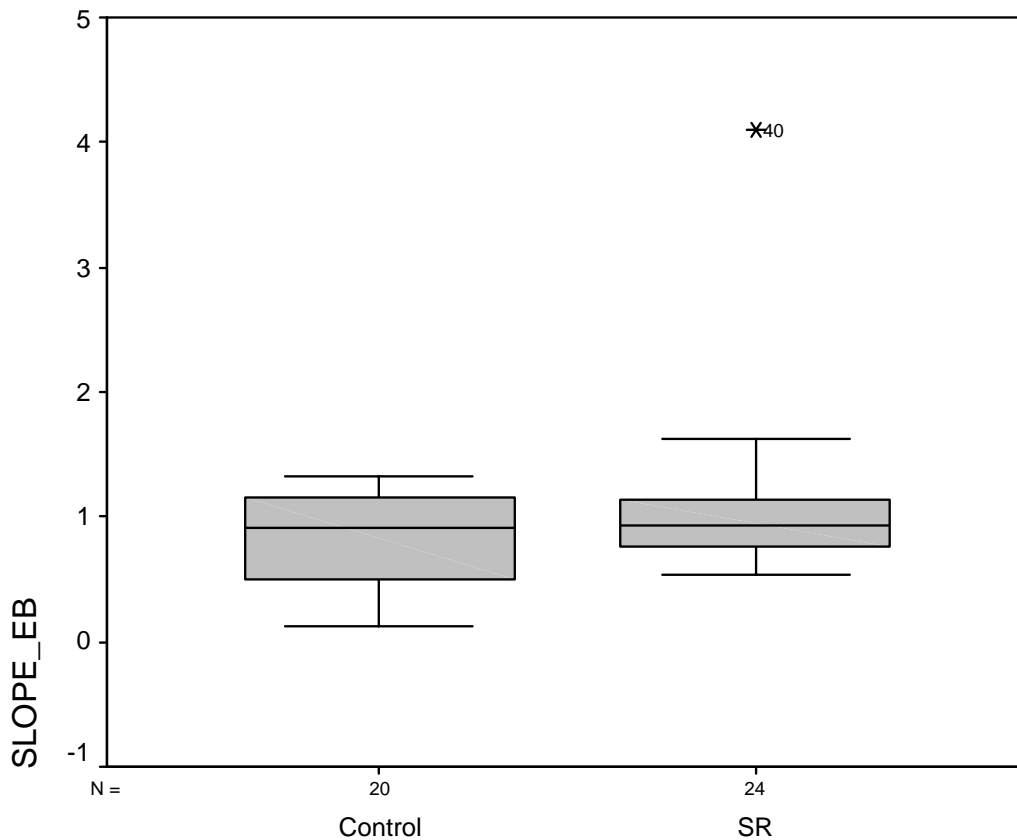


Figure 12. Boxplot of EB slope estimates by treatment status (Control, School Renaissance).

An independent samples t-test was performed on the EB slope estimates, using APC implementation status as the independent variable. Results indicated no significant difference in mean slopes between the low-implementation group ( $M = 0.92$ ) and the high-implementation group ( $M = 1.25$ ;  $t_{22}=1.16$ ,  $p = 0.26$ ; see Figure 13), although results directionally favored the high-implementation group. A weighted  $t$ -test, using the number of students in each class as the weighting variable, indicated a significant difference favoring the high implementation group ( $M = 1.32$  versus  $M = 0.90$ ,  $t_{535}=6.71$ ,  $p < .001$ ).

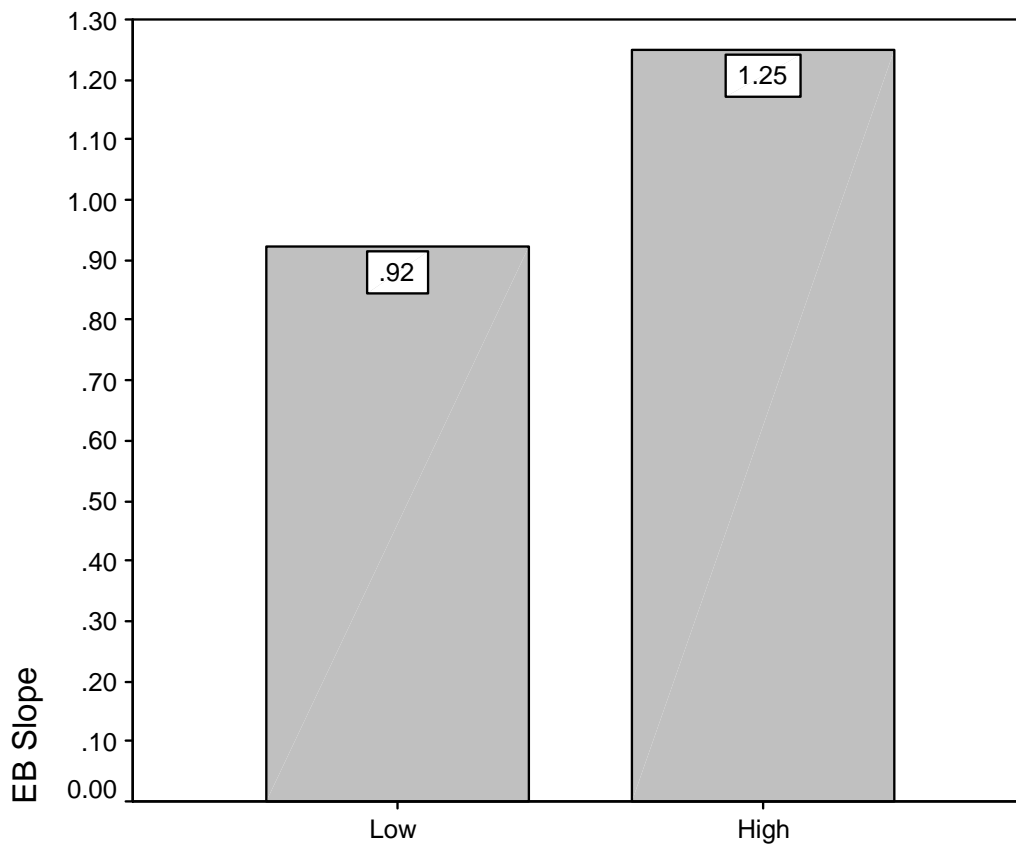


Figure 13. Mean EB time slope by APC implementation category.

Note. Mean EB time slope for control group = 0.83.

A final exploratory analysis was performed omitting two outlying cases—one case with an extremely low APC score (42%, next closest 61%), and the case with an unusually high estimated slope (4.09, next closest 1.62). Correlation analysis was performed on the remaining 22 cases, yielding an  $r$  of .39 ( $p = 0.07$ ), which suggests a moderately strong relationship between APC and growth slopes (see Figure 14).



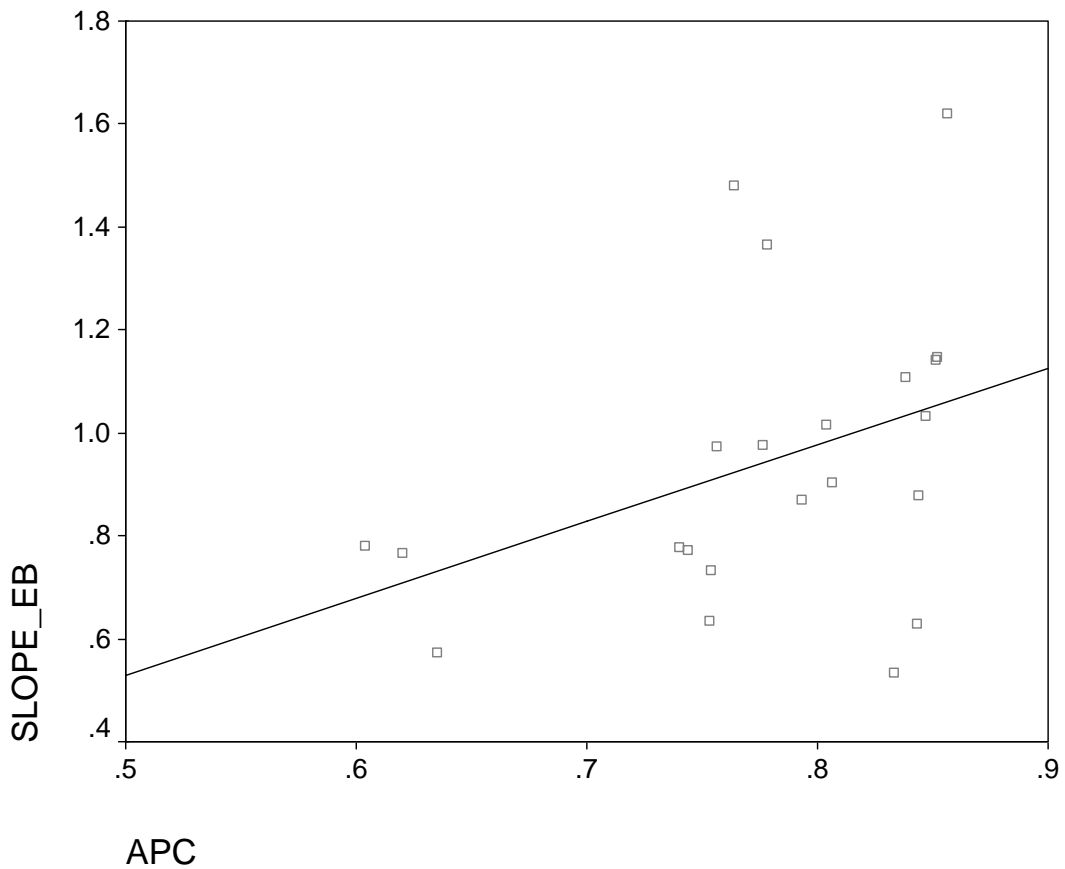


Figure 14. Regression of average EB growth slopes

The results of the exploratory analyses of the relationship between APC and growth slopes suggests a positive, but not statistically significant relationship between average classroom-level growth slopes and implementation as measured by APC. At the student level, there appears to be a positive, significant relationship. The classroom-level findings are somewhat limited given the omission of two outliers in deriving the results, the small classroom level sample size, and the fact that only a small number of classrooms achieved the desired level of APC.

## Discussion

The findings are interpreted below relative to the Study 2 research questions.

**1. What impact does implementation of Accelerated Reader/Reading Renaissance (AR/RR) have on growth in reading achievement for at-risk students in grades 3 to 6?**

Students in AR/RR classrooms had significantly higher growth rates in reading compared to students in control classrooms. Effect size estimates were higher in lower grade levels: +0.34 in third grade, +0.15 in fourth grade, +0.10 in fifth grade, and +0.07 in sixth grade. Implementation ratings also tended to be higher in lower grades.

The positive results for AR/RR are particularly noteworthy, given that this was a first-year implementation in a difficult setting (especially within the context of the numerous implementation issues raised by the consultants), and considering that the implementation levels of AR/RR were reportedly low compared to Renaissance Learning, Inc.'s benchmarks.

**2. How does the quality of AR/RR implementation relate to student growth in reading?**

In terms of average growth rates, accounting for variation in implementation did not improve the fit of the model over simply knowing whether the teacher was in the AR/RR treatment condition or the control condition.

**3. Does the quality of AR/RR implementation have an effect on growth in reading for students with learning disabilities?**

Exploratory HLM analyses suggested a positive relationship between AR/RR implementation and reading achievement growth rates for students with designated

learning disabilities. Follow-up analyses indicated that “high” implementation AR/RR classrooms significantly reduced the negative impact of learning disability status on growth in reading when compared to control classrooms or “low” implementation classrooms.

**4. What is the relationship between implementation, as measured by classroom average percent correct (APC) and achievement growth slopes?**

The results of the exploratory analyses of the relationship between APC and growth slopes suggests a positive, but not statistically significant relationship between average classroom-level growth slopes and implementation as measured by APC. At the student level, there appears to be a positive, significant relationship. The classroom-level findings are somewhat limited given the omission of two outliers in deriving the results, the small classroom level sample size, and the fact that only a small number of classrooms achieved the APC criterion.

## OVERALL CONCLUSIONS

### Study 1:

- AR/RR students in grades K-3 significantly and substantially outperformed control students on STAR Early Literacy and STAR Reading, after controlling for free lunch status and pretest scores. These positive results are noteworthy, given that this was a first-year implementation in a difficult setting.
- There were no significant differences between AR/RR students in grades 4-6 as compared to control students on STAR Reading.
- Teacher perceptions of AR/RR implementation were strongly positive, with most agreeing that they would like to use AR/RR again next year.

### Study 2:

- Implementation quality did not improve the positive effects of AR/RR relative to the control group.
- “High” implementing AR/RR classrooms significantly reduced the negative impact of learning disability status on growth in reading when compared to control classrooms or “low” implementation classrooms.

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- Borman, G. D., & Dowling, N. M., (2004). *Testing the theory underlying the Reading Renaissance Guided Independent Reading Program: A multilevel analysis*. Madison, WI: University of Wisconsin—Madison.
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- Renaissance Learning, Inc. (2001). *STAR Reading: Understanding reliability and validity (Version 2.2)*. Wisconsin Rapids, WI: Advantage Learning Systems.

**Appendix A:**  
**Teacher Survey Summary Table**

Appendix A. Teacher Survey Summary Table

**Accelerated Reader - Reading Renaissance Memphis  
City Schools Study**

*Teacher Survey Data Summary*

**Number of Respondents for Year 1 (2002-2003): N = 39**

**Section 1: Respondent Demographics: Percentages by Categories**

*NOTE: Item percentages may not total 100% because of missing input from some respondents.*

<b>Total Years of Teaching Experience</b>	
	2002-2003
Less than 1 year	5.1
1 -2 years	5.1
3 - 5 years	10.3
6 - 10 years	12.8
More than 10 years	66.7
Number of Respondents	39

<b>Total Years of Experience with Reading Renaissance</b>	
	2002-2003
Less than 1 year	74.4
1 -2 years	23.1
3 - 5 years	2.6
6 - 10 years	0.0
More than 10 years	0.0
Number of Respondents	39

<b>Total Years of Experience with Accelerated Reader</b>	
	2002-2003
Less than 1 year	66.7
1 -2 years	25.6
3 - 5 years	2.6
6 - 10 years	0.0
More than 10 years	0.0
Number of Respondents	39

<b>Grade Level Taught This Year</b>	
	2002-2003
Kindergarten	10.3
1st Grade	12.8
2nd Grade	23.1

3rd Grade	15.4
4th Grade	20.5
5th Grade	10.3
6th Grade	7.7
Number of Respondents	39

Time Allocated for Reading Practice Per Day (On Average)	
2002-2003	
Less than 30 minutes	5.1
30 minutes	15.4
45 minutes	20.5
60 minutes	43.6
90 minutes	7.7
More than 90 minutes	7.7
Number of Respondents	39

## Section 2: Perceptions of Implementation

*NOTE: Item percentages may not total 100% because of missing input from some respondents.*

Items	Percent Strongly Agree and Agree	Percent Neutral	Percent Disagree and Strongly Disagree
1. During reading practice on an average day in my classroom, I check the TOPS reading practice reports immediately after students take the quizzes.	92.3	5.1	2.6
2. I frequently monitor the student reading log.	82	7.7	10.2
3. I generally take status of the class daily.	66.7	17.9	15.4
4. On average, I review the diagnostic reports weekly.	74.3	10.3	5.1
5. My students average 85-92% on quizzes, and I adjust book levels accordingly to maintain this average.	64.1	17.9	15.4
6. I set and adjust student reading goals (e.g., points, certification goals) for the class.	71.8	17.9	10.3
7. I use the literacy skills test frequently.	51.3	15.4	25.7
8. I usually provide immediate feedback to my students.	97.4	2.6	0



### Section 3: Use of Motivators

*NOTE: Item percentages may not total 100% because of missing input from some respondents.*

Items	Extensively	Frequently	Occasionally	Rarely	Not at all
<b>How often do you use any of the following motivators:</b>					
1. Reading wall of fame	23.1	12.8	20.5	17.9	23.1
2. Cooperative reading teams	15.4	46.2	28.2	0	10.3
3. Book discussions	17.9	48.7	20.5	7.7	5.1
4. Reading aloud to students	51.3	38.5	7.7	0	2.6
5. Voting for favorite books	2.6	17.9	53.8	17.9	7.7
6. Family reading night	5.1	7.7	25.6	28.2	33.3

### Section 4: Teacher Perceptions

*NOTE: Item percentages may not total 100% because of missing input from some respondents.*

Items	Percent Strongly Agree and Agree	Percent Neutral	Percent Disagree and Strongly Disagree
1. I have a thorough understanding of the Accelerated Reader (AR) / Reading Renaissance (RR) program.	74.4	15.4	7.7
2. I have received adequate initial and ongoing professional development/training for implementation of AR/RR.	82.1	12.8	5.1
3. Guidance and support provided by AR/RR's external facilitator/support team has helped me implement AR/RR.	92.3	2.6	5.2
4. The materials (books and other resources) needed to implement AR/RR have been sufficient based on my students' zone of proximal development, and are readily available.	92.3	2.6	5.1
5. I experienced few, if any, technical difficulties using the Accelerated Reader software program.	76.9	5.1	15.4
6. The Accelerated Reader reports were generally straightforward and easy to understand.	100	0	0
7. This year, I used the AR/RR program extensively in my classroom.	76.9	15.4	5.1
8. The AR/RR program has changed classroom learning activities a great deal.	84.6	10.3	5.1
9. I feel that AR/RR enables effective placement of students according to reading level.	89.8	5.1	2.6
10. My students have benefited from the formative and diagnostic feedback provided by the AR/RR program.	97.5	2.6	0
11. Student achievement has been positively impacted by AR/RR.	89.7	7.7	2.6
12. Students are more enthusiastic about reading because of AR/RR.	94.8	5.1	0
13. AR/RR adequately addresses the requirements of children with special needs.	61.5	20.5	17.9
14. I feel that AR/RR has helped me better target instruction and manage student reading practice.	79.5	15.4	2.6
15. I am highly supportive of the AR/RR program.	94.9	2.6	2.6
16. I would like to use the AR/RR program again next year.	89.8	7.7	2.6

## **Appendix B:**

### **Teacher Survey Responses to Open-Ended Questions**

## Appendix B. Teacher Survey Responses to Open-Ended Questions

### 1. What do you consider to be the most effective aspects of the Reading Renaissance program?

- Time spent reading and materials (Books are wonderful!)
- BLANK
- The wonderful books and computer tests.
- The students love testing on the computer and getting the report to take home. My parents like this part too.
- For me, the most effective aspect is having the more than adequate AR library in my classroom which provided an excellent and effective home-school connection. This was my best parent support in 13 years.
- Getting the students wanting to read and trying to read harder books.
- The children can select reading material. They are also excited about being peer tutors for others. The love of reading is the MOST important aspect of the program.
- It motivates the students to read. The books are great. All of the diagnostic reports are excellent. They help in planning for instruction in reading.
- The children have the opportunity to test as soon as they complete a book.
- Greater student interest in reading.
- Encourages students to read and motivates even the reluctant reader.
- Reading Renaissance has strengthened my children's reading comprehension. During the Fifth six weeks, even my low performing students have made 4 out of 5 or 5 out of 5 correct. This has really helped their self-confidence. They love instant feedback.
- Technology involved gets kids excited about reading. Easy to read score after the test and on the report so that the students know what they made; Printouts to show to parents (reports of scores) etc.
- I consider the level readers to be the most effective aspects of RR.
- The reports - allows teachers an on-hands immediate feedback to the students and allows adjustments as needed.
- That the RR enables effective placement of students according to reading level. Students enjoy seeing computer results from their AR; they love the books and use of the computer.
- Students are more enthusiastic about reading because of RR.
- The most effective aspect of the RR program is how it has made my students more enthusiastic about reading and taking tests.
- Students who have never read much or for enjoyment are now reading and enjoying reading. Because of this, their reading levels and abilities have improved. I give AR the credit.
- To see the ongoing progress.
- Extra reading
- Reading Practice is frequent and students get immediate feedback, results, and review from the tests about their progress.

- The students receive immediate feedback on the testing of their comprehension. It also let the [sic] see the one or ones they missed.
- The STAR test that assigns their Reading level. The fact that their reading level is personalized for them in their comfort zone.
- The most effective aspect for my class was providing the 60 minutes for daily reading. This allotted time assured me that everyone was reading who may not have otherwise picked up a book.
- The most effective aspects of the RR program. It motivate [sic] the students to improve in their reading skill [sic] such as comprehension. Also, it gives the students insight and perception on what they are reading. This program broad [sic] their awareness for learning.
- The reports helped me pinpoint my students weaknesses and strengths.
- This program can be used as another teaching strategy for Reading.
- Students reading at their own levels and receiving immediate feedback.
- It allows student [sic] to have many more opportunities to practice fluent reading. The reading on their own level helps them feel like they have accomplished a great deal.
- I enjoy how it is computer-based and the students are able to move on their own.
- Immediate feedback on diagnostic testing and reading practice tests.
- Most effective aspect of the Reading Renaissance program is motivating children to read and providing time in a structured environment for them to become motivated because everyone is reading.
- I have enjoyed seeing the growth through the reports as well as the students performance in reading and other subjects.
- Students read on their level, choose their reading material, and get immediate feedback.
- BLANK
- It gears students towards the love of reading.
- The most effective aspect of the RR program was the adequate response from the students testing. My students were very excited about the immediate response from their testing. The grade level books meet the need of every individual. Excellent Program.
- The students progress at their own rate of achivement [sic].

**2. What do you consider to be the least effective aspects of the Reading Renaissance program?**

- Not enough books on the lowest levels.
- BLANK
- BLANK
- Paper did become a problem as well as ink for printers.

- On first grade level, I need strong support to have the tests read to the children and this support is hard to find. As the classroom teacher, I'm unable to effectively quiz children on my own.
- Having to share AR books. I feel each teacher should have their own set of books in their classrooms. The children are able to read new books as they finish the old one and have the book at their finger tips.
- I have found all aspects to be equally effective.
- BLANK
- Knowing when to make changes from one color book to another.
- In the beginning, it was very time consuming for the teacher.
- BLANK
- It was very difficult at the beginning of the year getting the students tested. I taught one of my students how to use the program and read to the students the questions. This fifth six weeks, some of the students could read the book and take the quizzes.
- N/A
- N/A
- All the paperwork weekly, daily, but that is life.
- N/A
- N/A
- I could benefit from more training.
- For me, this year, the lack of supplies such as printer ink and paper and rewards made the program an added school expense. Also, finding time to keep folders organized and up-to-date was hard.
- Kindergarten needs to have all voice quizzes. It is to [sic] difficult to read a quiz to every child for each story.
- Interferes with daily teaching activities
- Not enough higher order thinking skills for the younger readers.
- N/A
- Although my low students do occasionally pass tests, my low kids still hate to read and they just go through the motions of AR and fail all of their tests. I found it difficult to add or delete students as they withdrew and enrolled.
- There were not enough books to target my At-Risk student. Because the test could only be taken once, she had read all the books on her level by Feb.
- N/A
- Having to read each quiz to each child. There isn't enough time for me to sit down with each student. I really needed help in my classroom to implement program successfully.
- Some of the questions were not worded appropriately for my students.
- Not having enough books! :) Also only using literal comprehension questions.
- It is hard to get all of the Reading Ren. Time in when you are already implementing other programs.
- The element of time to "fit in" one more thing to our schedule; however, it is worth it.

- Not enough books for students. Some have read all of the books in their zone and had to be moved to the next zone. Definitely not enough books for below level readers, i.e., 1.0 - 2.0. I would like to see non-fiction books introduced to the program.
- The least effective aspect of the RR program is that parents are not involved in this process . I think something as crucial as reading that will impact the rest of one's life should have parents involved.
- BLANK
- I don't consider anything ineffective.
- BLANK
- BLANK
- My room was provided with 2 computers for 20 students. If there was enough money funded for this program, I would suggest more computers in the classrooms.
- "time"

### **3. What additional comments do you have regarding the RR program?**

- Great program! Children are motivated to read. They have thoroughly enjoyed the program.
- BLANK
- BLANK
- I love it!
- I find this an excellent and productive program.
- It is a great program, but it can become time consuming especially when there is only one computer.
- I have used a lot of programs and this by far, is the most effective. I love it and want to use AM. This program should be available to every child.
- BLANK
- I enjoyed working with the facilitators and I think the program is excellent.
- I would like the books to be in my room next year, not the library.
- I appreciate the pace of the program, but it is not enough time, due to the fact that we have other reading programs. We have three others in the classroom for Kindergarten.
- None
- Should be in every classroom of every school!
- BLANK
- Wish that this program would replace the old style program - this is self-paced (?) and students are held accountable. I Believe this Should Be the Future.
- N/A
- RR is an excellent program.
- BLANK

- I LOVE that the program identifies and targets individual reading levels. Students and [sic] encouraged by being able to choose books that they can read. The program, also, improves reading ability.
- BLANK
- Too expensive.
- I'd love to have the math program also.
- Teachers need more training and it needs to be on-going because you don't get to every aspect of the program the first year.
- I think it is a wonderful program, and I wish I could do more with it than I do. Most of my students enjoy it. Unfortunately, at our school, we just don't have any extra time, so finding time for it during the day is difficult. I wish we could send the books home as my daughter's school does, but here, I just don't think they would come back.
- BLANK
- Need to add Vocabulary Words in the test practice or let the school purchase the Vocabulary Test at a reasonable price.
- BLANK
- The program could be an asset if used properly.
- I would like to try AR Math! :)
- It can get expensive, replacing ink cartridges, and our funds don't allow this.
- Next year should be easier since the 3rd graders coming to me will have knowledge of RR.
- The technical difficulties I had were ink and printers. Reports were due; however, they could not be completed. Our tech support person was very ill during part of the year.
- I think the program should be implemented in all MCS's K - 12.
- I have truly enjoyed the positive effect that this program has had on my students. They are always asking to read new books.
- I hope to do it again next year. We used Accelerated Reader. I'm not sure how much of Reading Renaissance we used. We did skills with our basal series.
- BLANK
- BLANK
- BLANK
- Excellent program