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**An Evaluation of the Effectiveness of the Remediation Plus Program on Improving**

**Reading Achievement of Students in the Marinette (WI) School District**

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**Executive Summary**

The study was implemented in the Title I Marinette School District in Wisconsin using a randomized experimental design and parallel quasi-experimental design spanning three grades (1-3) in three district elementary schools. The Remediation Plus intervention program is a multisensory, systematic, synthetic *phonics curriculum* for all ages of students who struggle with reading, spelling, and/or handwriting. It was taught in the study in 30 minute pull-out blocks to 1 to 3 students by teachers trained in the program. The teachers delivered 45 lesson plans totaling approximately 50 hours of intervention.

*Evaluation Questions*

   The primary evaluation questions for study were as follows:

1.  Does student reading achievement improve for students receiving the R+ program compared to students not receiving the program?

2.   What were teacher reactions to their experiences using the program and to its benefits for students?

*Evaluation Design*

      A mixed-methods (qualitative and quantitative) design was employed with the primary focus directed to analyzing quantitatively student achievement on a battery of age-appropriate reading-skills assessments as described below. The qualitative component consisted of interviews with the teachers who implemented R+ and the traditional ("comparison" or "business-as-usual") intervention approach during the period of the study. The comparison interventions were the Leveled Literacy Intervention (LLI) and Soar to Success, both having limited emphasis on phonics relative to R+.

The reading achievement posttests consisted of:

*PPVT, W-J III Letter-Word ID and Word Attack, GORT-4* (Grade 1)

*W-J III Letter-Word ID and Word Attack, GORT-4* (Grade 2)

*W-J III Word Attack, GORT-4* (Grade 3)

Five reading specialists at all three schools were interviewed individually for one hour in May, 2015. Questions asked them to describe the interventions employed and their perceptions regarding implementation demands and the quality/fidelity achieved, effectiveness for students, strengths, weaknesses, and recommendations regarding future personal and district use.

*Results and Conclusions*

*Teacher Attitudes*

Clearly, teachers were extremely positive about many aspects of R+. Most importantly, they viewed the program as highly beneficial for students, especially younger students and those most at-risk of falling behind. The phonics emphasis, structured lessons, and engaging materials were mentioned consistently as program strengths in comparison to alternative programs, such as LLI. Still, several teachers felt that different students have unique needs, and no one program can be "ideal" by itself. There was no question that teachers viewed R+ as a highly desirable option, whether used in combination with other interventions or as the primary program for struggling readers. Reactions to professional development were also positive, although two teachers noted some areas for which they would welcome more support.

The open-ended comments made by three R+ teachers capture overall perceptions of R+ as a program they very much want to continue to use:

*I am sold on it [Remediation Plus]*

*Remediation Plus is a product that is going to be beneficial for students struggling with phonemic awareness*

*It [Remediation Plus] works, it really works, with my third graders that really struggle, I see that they're getting it and they will learn how to read.*

In more informal communications, the lead district administrator, who was very knowledgeable about the schools and their literacy programs, conveyed on numerous occasions how effective she perceived R+ to be. While she left the school district for a different job opportunity, her plan had been to establish R+ as the primary intervention for struggling readers in all three schools. She also expressed the belief the PD provided to teachers was one of the better training exposures she had experienced in her career.

*Student Achievement*

Results pertaining to the impacts of the R+ program on student achievement were inconclusive. None of the comparisons between the R+ and control students on the various measures of reading performance was statistically significant. Non-significant results, in fact, occurred consistently in the main (all grades combined) analysis, and in supplementary analysis for individual grades, for the most at-risk students, and in comparison to students attending the control school (Merryman). Yet, as described in the prior section, teachers' reactions to R+ and its perceived impacts on improving reading skills were extremely positive.

Interpretation of the results is speculative without knowing much more about teachers' skills in teaching literacy, the fidelity of the R+ implementation on an everyday basis, and contextual conditions in the schools and the district. Several factors that could have suppressed measurable effects come to mind. First, R+ teachers were using the program for the very first time, while the control teacher was using an established district program familiar to her and to many of the students. Second, the control classes received other research-based programs (such as LLI), which were generally well liked by the teachers and considered beneficial for promoting certain types of outcomes (e.g., comprehension). Third, one of the R+ teachers was reported informally to be less effective in using the program and in relating to students. Fourth, while a randomized experimental design was employed, the scope of the study was relatively small in number of schools, teachers, and students. Finally, students in R+ received approximately eight weeks less of intervention than those in the control group. Therefore, the chances for random error to bias results were increased.

The study was implemented in the Title I Marinette School District in Wisconsin using a randomized experimental design and parallel quasi-experimental design spanning three grades (1-3) in three district elementary schools. A description of the program, as provided by R+, is provided below. The proposed methodology for the study follows.

## Background

The Remediation Plus intervention program is a multisensory, systematic, synthetic *phonics curriculum* for all ages of students who struggle with reading, spelling, and/or handwriting. It was taught in the study in 30 minute pull-out blocks to 1 to 3 students by teachers trained in the program. The teachers delivered 45 lesson plans (Reading Intervention Book 1: 25 lessons; Advanced Lesson Plan Book 1: 20 lessons) totaling approximately 50 hours of intervention. The

R+ System teaches the 44 speech sounds in a systematic curriculum. Every lesson has direct instruction in hearing the phoneme, developing the grapheme phoneme correspondence, and segmenting the phonemes from speech. Students are taught that the grapheme of phonemes changes on placement. Spelling, handwriting, and reading to automaticity and fluency are each lesson's main goal. Students are also taught rules of the English Language. Specifically, there are seven rules in total in the English language and each lesson has been fully developed clinically. The R+ System also systematically teaches the students the six lessons on syllables for their success in both reading and spelling of multisyllabic words.

Overall, the R+ System includes 85 sequential lesson plans. However, the research from clinical development shows that the students improve dramatically at the halfway mark, so the "stop" after 48 systematic lesson plans will be used to pretest and posttest the students. At the end of the sequence, teachers use the R+ grammar curriculum to learn to:

- teach parts of speech in a sentence
- review all word types, nouns, verbs, adjectives, pronouns, etc.
- teach the Main Idea and semantic webbing from existing text
- teach retelling the story
- teach students to create their own stories with proper writing instruction

*External Program Review*

Additional information about R+ is provided by Cari Miller, a Reading First specialist who reviewed the R+ approach relative to evidence-based practices. Miller described the R+ system as based on five resources of reading research:

1. National Institutes of Child Health and Development

2. Suggestions of phonological awareness training from Reading First document

3. Combining kinesthetic, tactile, visual, auditory, and speech simultaneously (multisensory)

4. Dr. Samuel Orton and Anna Gillingham pedagogy

5. Beth Slingerland - "Slingerland handwriting" technique

The R+ System is a synthesis of applied research packaged for teacher ease and support. According to Miller, a complete battery of assessments is given to all students, not for placement, since everyone starts on either lesson 1 or 2 (if student can already blend), but for teaching (prescriptive), so that the teacher knows each student's strengths/weaknesses. The lesson format is approximately 45 minutes (for one-on-one) and an hour (in two 30-minute blocks for small groups) and includes:

1. *Direct Instruction* (scripted): Phonological awareness, spelling rule, or syllable instruction begins each lesson

2. *Visual Drill* (Orton-Gillingham): Students look at 12 phonemes, then one at a time state the sound, think of a word in which the sound is used in this way (e.g., or for corn)

3. *Auditory Drill* (Orton-Gillingham): Teacher says the sound, students write what she/he hears on paper

4. *Phoneme Segmentation & Sequencing*: Use colored tiles or magnets to think about how many phonemes you hear in words

5. *Sound Manipulation Exercises*: Linguistic gymnastics – phoneme manipulation to create new words, substitution, deletion, isolation

6.  *Blending with the Ball*: Use the ball to roll to the student as the teacher segments and states the sound, then the student rolls it back as they repeat the sound. A rice tray is kept on the table for students who have trouble blending the sounds and executing the phoneme grapheme correspondence in their minds…enhancement of the skill by using touch in the rice helps to build the auditory knowledge necessary for improvement.

7.  *Finger Spelling* (Orton-Gillingham): Student finger taps one sound at a time before writing

8.  *Dictation of Sentences*: Two to four sentences provided in each lesson plan

9.  *Reading of Word Lists*: Frequent re-reading of word lists to improve automaticity and fluency. Teacher photocopies word list daily, >85 lists in binder, eventually

10. *Controlled Reading*: Use only controlled readers until after lesson 6 in the advanced binder – 31 language concepts have been learned by this time so the student is now able to read new words without reverting to guessing

Miller also noted that although there is not as yet empirical evidence for this program, the design of the program is based on research. There were no weaknesses noted in the approach employed.

*Teacher Training on R+*

Prior to beginning the intervention on students, teachers receive a two-day training covering analysis of the R+ testing, NICHD Reading research, and National Reading Panel research. They learn the 44 speech sounds, proper articulation for optimal instruction, and how the phonemes are represented by 90 graphemes. They further receive guidance on error correction during the intervention lessons. They learn the meaning of segmenting, blending, auditory discrimination, prosody, fluency, phonemic awareness versus phonics, and Orton

Gillingham. During the second day, role playing of several lesson plans is employed to build confidence. There are eight hours of video made available to teachers, which model instruction between teachers and students of lessons that teach phonemes, syllables, or rules.

*District Context and School Settings*

The City of Marinette, WI is located on the shoreline of Green Bay, at the Northeast boundary of Wisconsin and the Upper Peninsula of Michigan. Marinette is the hub of a Tri-Cities area with a combined population of almost 40,000. The population of Marinette is approximately 12,000. Its strategic location has given Marinette a strong economic base established on manufacturing, wholesaling, retailing, and tourism. Community higher education institutions include the University of Wisconsin-Marinette and Northeast Wisconsin Technical College.

The School District of Marinette SD (MSD) serves approximately 2,200 students who attend one high school, one middle school, four elementary schools and one four-year-old kindergarten program. In 2013-14, the most recent year that data are available, third grade students taking the reading portion as part of the Wisconsin Student Assessment System (WSAS) had the following results: 5.5% score advanced, 26.8% proficient, 36.2% basic, and 31.5% minimal performance. Accordingly, MSD overall has faced challenges in bringing students' reading and literacy skills to proficient and advanced levels.

The two treatment sites for this evaluation were Park and Garfield elementary schools. Park Elementary enrolls approximately 300 students in Pre-K through 5th grade and employs 19 teachers. Over half of the students (59.9%) qualify for free or reduced price lunch. The majority of the student population is Caucasian (97%), with a small percentage of African American

(1%), and a remainder of unreported ethnicity (2%). Garfield Elementary is located within a residential neighborhood near a city park. The school enrolls approximately 250 students in Pre-K through 4th grade and employs 19 teachers. Almost two-thirds of students (65.1%) qualify for free or reduced lunch. The student population is primarily Caucasian (98%), with a small percentage of African American (0.8%) and Asian (0.8%).

Merryman Elementary (which served solely as a control school) is located on a main thoroughfare in a rural-industrial area. The school enrolls approximately 250 students in Pre-K through 4th grade and employs 16 teachers. Approximately half of the students (52.6%) qualify for free or reduced price lunch. The majority of the student population is Caucasian (97.6%) with small percentages of Hispanic (1.2%), African American (0.4%), Asian (0.4%) and Native American (0.4%).

*Evaluation Questions*

The primary evaluation questions for study were as follows:

1. Does student reading achievement improve for students receiving the R+ program compared to students not receiving the program?
2. What were teacher reactions to their experiences using the program and to its benefits for students?

**Methodology**

*Evaluation Design and Sampling*

A mixed-methods (qualitative and quantitative) design was employed with the primary focus directed to analyzing quantitatively student achievement on a battery of age-appropriate reading-skills assessments as described below. The qualitative component consisted of

interviews with the teachers who implemented R+ and the traditional ("comparison" or "business-as-usual") intervention approach during the period of the study. The comparison interventions, as briefly described below, were the Leveled Literacy Intervention (LLI) and Soar to Success, both having limited emphasis on phonics relative to R+.

*Comparison programs*. The *Fountas & Pinnell Leveled Literacy Intervention System* (*LLI*) is a small-group, supplementary literacy intervention designed to help teachers provide powerful, daily, small-group instruction for the lowest achieving students at their grade level. Through systematically designed lessons and original, engaging leveled books, LLI is designed to support learning in both reading and writing, help students expand their knowledge of language and words and how they work. Lessons progress from level A (*beginning reading in kindergarten*) through level Z (*represents competencies at the middle and secondary school level*) on the F&P Text Level Gradient™.

SOAR is an intensive reading intervention program that uses quality literature, proven strategies, and powerful graphic organizers to accelerate reading growth. The program offers fast-paced lessons, consistent routines, and a focus on foundational skills and reading strategies through a balance of fiction and nonfiction trade books each week. The school district used this program as a second intervention to LLI. It places strong emphasis on comprehension but is considered weaker on phonics.

*Randomized experimental design (RCT)*. For assessing program effects on student achievement, we employed a pretest-posttest randomized controlled trial (RCT) involving a total of 87 students in grades 1 to 3 at three elementary schools. Within each of three "need" levels, as described below, half the students were to be designated to receive R+ for the implementation

period (approximately 100 hours of instruction) and the other half to receive the comparison intervention. The table below presents the numbers of low-performing students that participated in the pretesting and post-testing after being randomly assigned to treatment and comparison groups at each that "RCT" school (Park and Garfield). At Merryman, all students were in the comparison group. The need levels are based on assessments of students' reading performance relative to expectations for their grade level. "Red" indicates the highest need (lowest performance); "Yellow" intermediate, and "Blue" lowest (although still calling for intervention beyond regular classroom instruction). Randomization was stratified to ensure comparable R+ and control group representation of these levels.

Original number of participating students by school, grade, and need level.

| School | Need Level | Grades | | | Total |
|---|---|---|---|---|---|
| | | One | Two | Three | |
| Park | Red | 7 | 17 | 10 | 34 |
| | Yellow | 1 | 3 | 3 | 7 |
| | Blue | 4 | 0 | 0 | 4 |
| | | | | | |
| Garfield | Red | 12 | 6 | 1 | 19 |
| | Yellow | 0 | 2 | 4 | 6 |
| | Blue | 0 | 3 | 1 | 4 |
| | | | | | |
| Merryman[*] | Red | 1 | 1 | 0 | 2 |
| | Yellow | 1 | 1 | 2 | 4 |
| | Blue | 2 | 4 | 1 | 7 |
| | | | | | |
| Total | | 29 | 37 | 22 | 87 |

[*] All Merryman students received the traditional intervention and therefore serve as a comparison condition in a supplementary study focus.

*Quasi-experimental design (QED).* As indicated above, a supplementary design component included a comparison of reading performance scores between students who participated in the R+ treatment at Garfield and Park elementary schools and those who received

a traditional intervention program at Merryman Elementary School. The latter students were expected to be similar in characteristics to those eligible for intervention support within the respective red, yellow, and blue categories at the two RCT schools (see Table 1). Although the QED design is weaker in internal validity than the RCT due to the confounding of treatments with schools, it was considered worthwhile to perform for two reasons. First, it represents the more typical condition in U.S. school districts (thus, increasing external validity) whereby school preference rather than random selection determines which supplementary interventions are used. Second, the school district is interested in adding to the empirical evidence obtained from the study by including the third school in the performance assessments.

*Measures*

*Student reading performance*. To provide baseline data for use as a covariate (control or leveling variable) in the study and also verify the equivalence of samples, pretest data was collected from students prior to treatment, in early November, 2014. One pretest was the *Peabody Picture Vocabulary Test* (*PPVT-III*)[1] a standardized, individually-administered measure of children's receptive vocabulary. The internal consistency of the *PPVT-III* on Cronbach's alpha is reported to be 0.95, and the test-retest reliability is 0.92. A second pretest was the *Woodcock-Johnson III (WJ-III)* [2] Letter-Word Identification subtest. The *Woodcock-Johnson III Tests of Achievement* were normed on a national sample of children.

These assessments have been demonstrated in numerous prior studies on reading and literacy conducted by the present researchers to be strong predictors of performance on posttest measures of varied reading skills. Accordingly, posttests conducted in May, 2015, included the

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[1]Dunn, Lloyd M. (1997). PPVT-III Peabody picture vocabulary test. Circle Pines, MN :American Guidance Service,
[2] Woodcock, R.W., McGrew, K.S., & Mather, M. (2001). (*Woodcock-Johnson III: Test of Achievement*. Itasca, IL: Riverside Publishing Company)

*PPVT-III, Woodcock-Johnson III* Letter-Word ID and Word Attack, and the *Gray Oral Reading Test-4*[3].

The *GORT-4* is a norm-referenced, reliable, and valid test of oral reading rate, accuracy, fluency, and comprehension. The *GORT-4* Form A contains 14 separate stories, each followed by 5 multiple-choice comprehension questions. The test/retest reliability of the *GORT-4* is 0.93 on the fluency portion and 0.86 on the comprehension portion. In review, the posttests consisted of:

*PPVT, W-J III Letter-Word ID and Word Attack, GORT-4* (Grade 1)

*W-J III Letter-Word ID and Word Attack, GORT-4* (Grade 2)

*W-J III Word Attack, GORT-4* (Grade 3)

*Teacher interview*. Five reading specialists at all three schools were interviewed individually for one hour in May, 2015. Questions asked them to describe the interventions employed and their perceptions regarding implementation demands and the quality/fidelity achieved, effectiveness for students, strengths, weaknesses, and recommendations regarding future personal and district use. A copy of the interview is provided in the Appendix.

*Procedure*

Pretesting was conducted in November, 2014 by testers (substitute teachers) hired by the school district and trained by CRRE. Pretesting on average took from 20-30 minutes per student. Original and new testers were engaged in the spring to administer the posttests. The latter

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[3] *Gray Oral Reading Tests: GORT-4*. (2001). Austin, TX: Pro-ed.

typically took from 45-60 minutes per student. Two CRRE researchers interviewed the teachers at the time of post-testing.

## Data Analysis

*Quantitative*. Repeated measures analysis of covariance (ANCOVA) (Gamst, Meyers, & Guarino, 2008; Hedeker & Gibbons, 2006; Norusis, 2012) and one-way analysis of covariance (ANCOVA) (Cohen, Cohen, West, & Aiken, 2003; Norusis, 2012) were conducted with various measures of reading achievement as the dependent variable to assess (1) if changes in reading achievement from pretesting to post-testing varied across the R+ and control treatment groups (the time*program status interaction effect), or (2) if reading achievement differed across the treatment group and the control group after controlling for pretest reading achievement via the test of the main effect of program status. More details of data analysis are listed in the Appendix. All data analyses were conducted with the data of all students regardless of their grade levels. This research decision was made based on the comparability of the Rasch-based W scores and the standard scores across grade levels and the small sample size in each grade level: 30 at the first grade, 40 at the second grade, and 23 at the third grade. The group sizes would get even smaller after splitting students into the treatment group and the control group at each group level and might lead to insufficient statistical power in significance testing. However, for exploratory purposes, supplementary analyses were conducted comparing R+ and control students (a) at each grade level, (b) for at-risk subgroups, and (c) at the RCT schools (Park and Garfield) vs. a pure control school (Merryman).

*Qualitative*. Analyses of qualitative data (interviews and open-ended survey responses) will be guided by Miles and Huberman's (2004) model, consisting of documenting the

responses, deriving codes, identifying themes, and revision and refinement based on member checking and inter-rater review.

## Results

### *Achievement: All Grades Combined*

*Participants*

The total number of participants was 93. However, due to different quantities of missing values on various research variables, the actual sample sizes changed across data analysis procedures (see Tables 1 - 2). Nearly all of the participating students were White ($n = 85$, 97.70%). There were few special education students ($n = 18$, 13.69%), and no (0%) English language learner students. More than half of the sample was male ($n = 52$, 55.91%). The composition of the participants was similar in both the treatment group and the control group in terms of ethnicity, gender, special education student status, and English language learner status. Additional demographic information of the participants is listed in Table 1.

*Descriptive Statistics of Dependent Variables*

A summary of the descriptive statistics for the various reading pretests and posttests is presented in Table 2. Inspection of the means shows generally similar performances by the R+ and control groups, with higher scores during post-testing than pretesting.

WJ-III Letter Word ID W Scores (Grades 1 and 2)

*WJ-III Letter Word ID* scores were analyzed via a repeated-measures ANCOVA using the pretest *WJ-III Letter Word ID* scores and posttest *WJ-III Letter Word ID* scores as the repeated measure. Program Status was the independent variable, and pretest *PPVT* standard

scores was the covariate. The test results of the Time*Program-Status interaction suggested the same magnitude of the reading achievement change (i.e., the difference between the posttest score and the pretest score) in both the treatment group and the control group, $F(1, 60) = .01$, $p > .05$, *partial* $\eta^2 < .001$. The adjusted pretest mean reading achievement score and the adjusted posttest mean reading achievement score controlling for the pretest PPVT standard scores were 410.59 and 438.08, respectively, in the treatment group and 423.72 and 451.75, respectively. in the control group. Regarding the change in reading achievement, the test results of Time main effect supported the improvement in reading achievement over time for all the participating students regardless of their treatment group status, $F(1, 60) = 7.63$, $p < .05$, *partial* $\eta^2 = .11$. In summary, the two treatment groups significantly improved from pretest to posttest but to a comparable degree.

*PPVT Standard Scores (Grade 1)*

   *PPVT* standard scores were analyzed via a repeated-measures ANCOVA as described above with the pretest *WJ-III Letter Word ID W* scores as the covariate. No difference in the magnitude of reading achievement change (i.e., the difference between the posttest score and the pretest score) was found between the treatment group and the control group in the test of Time*Program-Status interaction, $F(1, 26) = .03$, $p > .05$, *partial* $\eta^2 = .001$. The adjusted pretest mean reading achievement score and the adjusted posttest mean reading achievement score were 101.46 and 101.66, respectively, in the treatment group and 89.94 and 90.78, respectively, in the control group. According to the test of Time main effect, there was also no change in *PPVT* over time for all the participants regardless of their program status, $F(1, 26) = .35$, $p > .05$, *partial* $\eta^2 = .01$. The adjusted pretest mean reading achievement score and the adjusted posttest mean reading achievement score controlling for the pretest *WJ-III Letter Word ID W* scores were 95.70

and 96.22 respectively. It is noteworthy that the sample size is small (i.e., $n = 30$) in this data analysis due to the *PPVT* posttest being administered in Grade 1 only.

*WJ-III Word Attack Standard Scores (Grades 1-3)*

The *WJ-III Word Attack* standard scores were analyzed by one-way ANCOVA using Program Status as the focal independent variable, pretest *WJ-III Letter Word ID W* scores and pretest *PPVT* standard scores as the covariates. The test results of the Program Status main effect indicated no difference in reading achievement between the treatment group and the control group, $F(1, 80) = .09$, $p > .05$, $\Delta R^2 = .001$. The adjusted posttest mean reading achievement scores were 98.86 and 99.51 for the treatment group and the control group respectively.

*Reading Achievement as GORT Rate Score Percentile Ranks (Grades 1-3)*

The *GORT Rate score percentile ranks* were analyzed by one-way ANCOVA using Program Status as the focal independent variable, and pretest *WJ-III Letter Word ID W* scores and pretest *PPVT* standard scores as the covariates. According to the test of Program Status main effect, reading achievement did not differ between the treatment group and the control group, $F(1, 80) = 1.00$, $p > .05$, $\Delta R^2 = .01$. The adjusted mean reading achievement score percentile ranks were estimated to be 23.06 and 28.18 for the treatment group and the control group respectively.

*GORT Accuracy Score Percentile Ranks (Grades 1-3)*

The *GORT Accuracy score percentile ranks* were analyzed by one-way ANCOVA using Program Status as the focal independent variable, and pretest *WJ-III Letter Word ID W* scores and pretest *PPVT* standard scores as the covariates. The test results of Program Status main effect did not indicate any difference in reading achievement between the treatment group and

the control group, $F(1, 56) = .002$, $p > .05$, $\Delta R^2 < .001$. The adjusted mean reading achievement score percentile ranks were 7.37 and 7.38 for the treatment group and the control group, respectively.

*GORT Fluency Score Percentile Ranks (Grades 1-3)*

The *GORT Fluency score percentile ranks* were analyzed by one-way ANCOVA using Program Status as the focal independent variable, and pretest *WJ-III Letter Word ID W* scores and pretest *PPVT* standard scores as the covariates. No difference was found between the treatment group and the control group in reading achievement, $F(1, 79) = .83$, $p > .05$, $\Delta R^2 = .01$. The adjusted mean reading achievement score percentile ranks were estimated to be 19.67 and 24.07 for the treatment group and the control group, respectively.

*GORT Comprehension Score Percentile Ranks (Grades 1-3)*

The *GORT Comprehension score percentile ranks* were analyzed by ANCOVA using Program Status as the focal independent variable, and pretest *WJ-III Letter Word ID W* scores and pretest *PPVT* standard scores as the covariates. The test results of Program Status main effect indicated no difference in reading achievement between the treatment group and the control group, $F(1, 80) = .01$, $p > .05$, $\Delta R^2 < .001$. The adjusted mean reading achievement score percentile ranks were 34.79 and 34.36 for the treatment group and the control group, respectively.

*GORT Oral Reading Index (Grades 1-3)*

The *GORT Oral Reading Index ranks* were analyzed by one-way ANCOVA using Program Status as the focal independent variable, and pretest *WJ-III Letter Word ID W* scores and pretest *PPVT* standard scores as the covariates. Reading achievement did not differ between

the treatment group and the control group, $F(1, 80) = .01$, $p > .05$, $\Delta R^2 < .001$. For the treatment group and the control group, the adjusted mean *GORT Oral Reading Index* were estimated to be 85.94 and 86.19, respectively.

### *Achievement: Grade-level Analyses*

Follow-up analyses with the same aforementioned statistical models were conducted with the data of students at each grade level. As noted above, second graders and third graders were not administered the posttest *PPVT* and third graders were not administered the posttest *WJ-III Letter Word ID* assessments. Tables 3-5 present descriptive results for Grades 1-3, respectively. Findings from these supplementary analyses were very similar to those of the overall (all grades combined) analyses, after controlling for pretest reading achievement. Specifically, in two-way analyses, no statistically significant difference was found for any of the Time*Program-Status interactions (indicating differential growth for treatment groups). On one-way analyses, no significant differences were found in posttest.

### *Achievement: At-risk Learners*

The data from the students with the highest need (i.e., the lowest performance) were analyzed separately with the same aforementioned statistical models. The results did not support the statistically significant difference between the treatment group and the control group in either the reading achievement change over time or the reading achievement per se after controlling for various types of pretest reading achievement.

### *Achievement: Control School Comparison*

The students in Garfield and Park elementary schools were randomly assigned to the treatment group and the control group. On the other hand, the students in the Merryman

Elementary School were all in the control group. In the present supplementary data analyses, students from Merryman Elementary School were used as the control group to be compared with the students in the treatment group from Garfield and Park elementary schools respectively, using the previously implemented data analysis procedures. The results did not suggest the statistically significant difference between the treatment group and the control group for either treatment-control pair in either the reading achievement change over time or the reading achievement per se after controlling for various types of pretest reading achievement.

### *Teacher Interview Results*

The teacher interview results are summarized by question in the sections below.

*Main strategies and goals of R+*

The respondents named and described the literacy programs implemented in their schools to help struggling readers. The control school teacher documented three key interventions (Guided Reading Plus, Reading Recovery, and the LLI). In addition to Remediation Plus, the R+ teachers reported using LLI (three teachers) and Soar to Success (one teacher). One of the R+ teachers did not report an alternate intervention. As teachers predominantly discussed the LLI as the alternate to R+, the following analysis focuses on LLI and R+.

From descriptions of the interventions, it is evident that perceived program goals vary as a function of intervention type. Whereas the Leveled Literacy Intervention was reported by all teachers to concentrate on comprehension, Remediation Plus was described by all treatment teachers as developing foundational reading skills, namely, phonemic awareness. For example, while LLI includes segments of student (silent) reading, teacher reading, and writing, R+ has students primarily listen to phonemes, develop phoneme-grapheme associations and distinguish

phonemes from speech. Furthermore, R+, as described by one teacher, offers a very tactile approach designed to engage students in activities to aid skill development ("finger spelling using the opposite hand they write with, finger spelling the grapheme then writing the word with the other hand").

All teachers stated that the interventions used are tailored to the needs of the students and bringing struggling readers up to par for their grade level. The consensus among respondents is that the *optimal* reading program varies as a function of student needs. One teacher reported that the R+ program is particularly applicable for Grade 1 students and those "in the red zone." It is also evident from teacher responses that the various literacy interventions work well in concert. In the words of one teacher "Remediation Plus is one of the programs used along with LLI and Soar to Success. Between the three interventions we're attempting to match the student with the right strategy."

*Preparedness for Implementation*

All teachers reported that they were prepared to use the interventions implemented during the academic year in which the study was conducted. Teachers commented that they had gained preparedness in a range of ways, including prior years of teaching experience or implementing the named programs, drawing on knowledge associated with other literacy-based programs (e.g., Reading Recovery) and forms of self-training (e.g., reading manuals). However, all four R+ teachers commented that the two-day R+ training helped prepare them for implementing the program[4].

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[4]Further details regarding *R+* training are reported in subsections pertaining to questions 10 through 13.

*Positive Program Features*

With respect to the LLI, the control teacher liked the structured nature of that intervention and the books/stories used for instruction. The control teacher also liked that the program is "spiraled" in the sense that it covers decoding strategies needed within each book, as well as introductions to complex vocabulary items. In the words of the control teacher, "It is easy to level students according to where they need to be and move them forward quickly."

Two R+ teachers reported that they liked the LLI program. They discussed the strong comprehension aspect of the intervention (e.g., students learn strategies for comprehension and how to look at text for understanding). LLI was also described as presenting holistic writing skills through stories (students asked to write about a story they have read, compose sentences about characters in the story).

R+ teachers further liked that the program provided fundamental skills or "tools" needed to read (e.g., "attacking words phonetically"). Another key positive component, documented by two R+ respondents, was how the hands-on, tactile nature of the learning process played a key role in engaging students. R+ activities were described to use all the senses and keep students focused as they explicitly address phonics on a level that implements variety (e.g., the blending ball, decoding, finger spelling, and vocabulary activities).

**Least Favored Program Features**

In reaction to LLI, the control teacher commented that although the structured nature of the intervention offers a useful teaching framework, it takes away some creativity on the part of the teacher. The control teacher also mentioned that the intervention only allowed limited time to

use certain resources, such as "wonderful rich books," which were more frequently used before the introduction of the Leveled Literacy Intervention.

Two R+ teachers discussed limitations with the decodable reading equipment in terms of the need (a) for more decodable books (and decodable readers) for students to use outside school and (b) to improve story books to include more pictures and improved content (the stories were perceived by the teachers as not always making sense). Teachers recognize, however, that there are limitations as to what can be included in resources designed for children to finger spell words.

R+ teachers described a range of concerns associated with the fidelity of implementation. One teacher outlined the challenge associated with small-group work and keeping three students working at the same pace (some students go "off-task" if they get ahead). This teacher also expressed concern as to whether children adequately grasp skills in the relatively short lesson durations, suggesting that higher doses of intervention may be needed for struggling children. Concerns about on-task time extended to what students are able to accomplish outside of school, when completing homework. One apprehension is that word list tasks assigned for homework may not be engaging for students or parents who play a key role in helping children learn to read. Indeed, students reportedly do not always see the connection between word calling and reading and often prefer comprehension skill tasks.

### *Program Benefits for Writing and Spelling Skills*

Teachers discussed numerous benefits associated with the interventions. The control teacher observed "marked improvement" in reading ability, explaining that there are now fewer low performing readers. This teacher also commented that through literacy-based programs, such

as LLI, students have had the opportunity to practice writing and spelling and expand their vocabularies. However, the control teacher explained that due to the volume of information children experience in the first grade, the greatest gains have been observed during the second grade.

All four R+ teachers reported that student reading ability has improved as a function of the program. Improvements were observed in children's reading level, as well as specific skills, such as word attack strategies and recognizing/applying different phonemes. One teacher explained that *R+* is highly successful in helping "problem readers" learn to read, commenting that "I have third graders who, for the first time, can read something fluently." While R+ teachers thought the program had boosted fundamental reading skills, three of the four thought that the program had not been as impactful on comprehension (because of the emphasis on phonics-based training).

R+ teachers also discussed improvements in writing and spelling. One respondent explained that the ability to finger spell is "a very discrete strategy along with slowing the brain down to listen to individual sounds." Finger spelling used in conjunction with listening to phonemes, was described as helping students (especially first graders with limited to no prior reading ability) write unfamiliar words.

Although two R+ teachers perceived LLI to provide better support for improving comprehension and holistic writing skills (as mentioned above), they found LLI to be less effective for helping struggling readers, in particular, children experiencing difficulties with foundational reading skills emphasized in the R+ approach. Overall, the teachers felt that the LLI and R+ interventions are complementary and the skills emphasized by both programs "cannot be separated to develop a fluent reader."

*Students' Enjoyment of Lessons*

All teachers reported that the children enjoyed the lessons. While the control teacher highlighted enjoyment experienced among first and second grade students, she perceived older students to be less engaged  largely due to their dislike of being taken out of the classroom (to take part in the lessons). The R+ teachers reported that students enjoyed the LLI program's stories in terms of contents and variety. The R+ students were reported to enjoy the tactile nature of the activities and lesson structure (e.g., starting with skills then finger spelling, etc.). The lesson structure was described to offer a framework in which children know what to expect and can find solutions, even when they are experiencing difficulties. As such, the lesson environment was thought to play a critical role in keeping struggling readers on task. However, while teachers considered R+ as highly advantageous for struggling readers, they perceived children mastering skills more easily sometimes becoming bored with the repetition and wanting to move on with the lesson.

*Student Engagement*

All R+ teachers indicated that most students were engaged by the R+ program. Students were described as being interested in the equipment (e.g., blending balls, rice trays) and direct manipulation of tools. One teacher reported that the students see the tasks as fun, whereas another thought the hands-on aspect of learning kept students on task. In contrast, one R+ teacher perceived students as being less engaged with the LLI approach because the tasks are typically more challenging.

*Future Program Use*

All R+ teachers reported that they would want to continue using the program to help children read (more effectively). The four R+ teachers said they had seen marked improvements in students' reading ability, often in a short period of time. One R+ teacher commented that the program would be used with an expanded number of children during summer school.

*Recommendations*

Building on key themes raised in their responses to the above questions, teachers had a range of suggestions for making reading interventions more effective. Some of the suggestions have already been incorporated into reading training sessions. For ease of interpretation, ideas are bulleted below under reading intervention subtitles.

Leveled Literacy Intervention (Control teacher)

- Add components from other literacy interventions, such as Reading Recovery, Guided Reading Plus and Developmental Spelling

Remediation Plus

- Add equipment, such as extra blending balls and rice trays to engage students who do not have good sitting skills
- Provide further teacher support, including:
  - Higher quality decodable texts (with illustrations) as a part of each lesson
  - Prompts to guide teachers giving lessons (e.g., "say this" or "do this here")
- Incorporate words students likely to know/use in lesson materials to help children:
  - Recognize whether they are generating correct responses (e.g., when sounding out words)

- o Develop vocabulary skills (e.g., possibly enhance comprehension when working with familiar or high frequency terms)
- Develop a norm-based progress monitoring system to help teachers adequately track student progress
- Add a technology component

*Benefits of the Remediation Plus 2-Day Training*

All four R+ teachers reported that they learned valuable information regarding the science of reading though the program's two-day training. They acquired rich understandings about how the brain creates pathways through practice and the combined role of auditory input, visual input and producing products on paper in the learning to read process. Teachers were also made aware of typical trajectories of children's reading with phonics-based instruction, as well as reasons why some children struggle. They were offered guidance regarding strategies to use when difficulties arise, as well as ways to optimize the training (e.g., coordinating with classroom teachers such that letter-sound work completed in the classroom aligns to that being covered in R+).

Only one of the four R+ teachers knew the 44 speech sounds and 90 graphemes prior to the training (as they had looked up the answers for school students). Three teachers claimed to learn a range of new information (over and above the 44 speech sounds and 90 graphemes) as a function of the training and direct experience of implementing the intervention in their schools. One teacher reported "I have learned some things. It makes a difference when you sound out or finger spell. I picked up a lot of little techniques and I look at it [the teaching method] differently."

*The R+ Explicit Systematic Lesson Plan Curriculum*

Three of the four teachers agreed that the R+ explicit, systematic lesson plan was supportive to them. Teachers explained that it is important to have consistency when so much is included in each lesson and dealing with students with "remedial" skills. It was also documented that the program structure (together with training DVDs) allow for a substitute teacher to seamlessly continue lessons when the regular teacher cannot be available. However, it was also documented that the scripted method is not as helpful for students making large learning gains as they are less interested in the lesson. Also, teachers commented that scripted plans do not allow for teacher creativity.

*Quality of Professional Development*

There were mixed feelings as to whether the professional development for R+ was sufficient. One teacher reported that it was because the design and organization of the program enabled smooth implementation. The same teacher also thought the format of the professional development, including teachers' role-playing students, made the training engaging and understandable. Two teachers reported that the professional development was adequate because the training kit comes with supplemental DVD support.

However, two teachers indicated that further support is needed. It was suggested that observations by the program developer would be useful to gain feedback about aspects of implementation (e.g., saying phonemes correctly) and for highlighting areas in which teaching could be improved. One teacher felt that further professional development is needed for teaching more intricate aspects of lessons, such as making complex sounds and syllable dividing. She further commented that watching a DVD is not sufficient for developing teaching skills in these areas.

*Final Thoughts*

When asked to provide final thoughts, teachers made a range of positive comments about the reading interventions implemented in their schools. Teachers were pleased with the reading gains made by children and expressed gratitude for participation in the study. Two teachers also provided highly positive feedback about Remediation Plus, showing support and buy-in for the program. Below is a sample of teacher comments:

*I am sold on it [Remediation Plus]*

*Remediation Plus is a product that is going to be beneficial for students struggling with phonemic awareness*

*It [Remediation Plus] works, it really works, with my third graders that really struggle, I see that they're getting it and they will learn how to read.*

However, teachers also commented that Remediation Plus is not necessarily a "quick fix," stressing the importance of completing all components with fidelity and systematically setting up the program. They also expressed the belief that Remediation Plus *by itself* will not eliminate the need for additional literacy interventions, such as those focusing more strongly on reading comprehension.

## Conclusions

In this section, we draw conclusions from our findings regarding each of the major research questions. Because the second research question concerns mediating outcomes (teacher reactions) likely to bear on the second question's culminating outcomes (student achievement), we will discuss its results first.

1.  Does student reading achievement improve for students receiving the R+ program compared to students not receiving the program?

2.  What were teacher reactions to their experiences using the program and to its benefits for students?

*Teacher Attitudes*

Clearly, teachers were extremely positive about many aspects of R+. Most importantly, they viewed the program as highly beneficial for students, especially younger students and those most at-risk of falling behind. The phonics emphasis, structured lessons, and engaging materials were mentioned consistently as program strengths in comparison to alternative programs, such as LLI. Still, several teachers felt that different students have unique needs, and no one program can be "ideal" by itself. There was no question that teachers viewed R+ as a highly desirable option, whether used in combination with other interventions or as the primary program for struggling readers. Reactions to professional development were also positive, although two teachers noted some areas for which they would welcome more support.

The open-ended comments made by three R+ teachers are worth repeating here, as they capsule overall perceptions of R+ as a program they very much want to continue to use:

*I am sold on it [Remediation Plus]*

*Remediation Plus is a product that is going to be beneficial for students struggling with phonemic awareness*

*It [Remediation Plus] works, it really works, with my third graders that really struggle, I see that they're getting it and they will learn how to read.*

In more informal communications, the lead district administrator, who was very knowledgeable about the schools and their literacy programs, conveyed on numerous occasions how effective she perceived R+ to be. While she left the school district for a different job opportunity, her plan had been to establish R+ as the primary intervention for struggling readers in all three schools. She also expressed the belief the PD provided to teachers was one of the better training exposures she had experienced in her career.

*Student Achievement*

Results pertaining to the impacts of the R+ program on student achievement were inconclusive. None of the comparisons between the R+ and control students on the various measures of reading performance was statistically significant. Non-significant results, in fact, occurred consistently in the main (all grades combined) analysis, and in supplementary analysis for individual grades, for the most at-risk students, and in comparison to students attending the control school (Merryman). Yet, as described in the prior section, teachers' reactions to R+ and its perceived impacts on improving reading skills were extremely positive.

Interpretation of the results is speculative without knowing much more about teachers' skills in teaching literacy, the fidelity of the R+ implementation on an everyday basis, and contextual conditions in the schools and the district. Several factors that could have suppressed measurable effects come to mind. First, R+ teachers were using the program for the very first time, while the control teacher was using an established district program familiar to her and to many of the students. Second, the control classes received other research-based programs (such as LLI), which were generally well liked by the teachers and considered beneficial for promoting certain types of outcomes (e.g., comprehension). Third, one of the R+ teachers was reported informally to be less effective in using the program and in relating to students. Fourth, while a

randomized experimental design was employed, the scope of the study was relatively small in number of schools, teachers, and students. Finally, students in R+ received approximately eight weeks less of intervention than those in the control group. Therefore, the chances for random error to bias results were increased.

Future research in the present district or other districts might employ a similar randomized design in a longitudinal study of two or more years. The extended time would provide teachers greater opportunity to gain familiarity with R+ and improve their implementation skills. Students, in turn, would have several years of exposure to program benefits. Adding a phonics measure would provide a more complete picture of R+ and comparison impacts on varied reading skills.

**Appendix**

**Quantitative Data Analysis Procedures**

All quantitative data were analyzed with IBM SPSS Statistics 22. Furthermore, the alpha level was set at .05 for all the significance tests.

**Repeated Measures Analysis of Covariance (ANCOVA)**

**Repeated measure ANCOVA models.** The repeated measures ANOVA (Gamst, Meyers, & Guarino, 2008; Hedeker & Gibbons, 2006; Norusis, 2012) was conducted to assess if the improvement in reading achievement (i.e., the difference between the posttest score and the pretest score) varied across the Remediation Plus group and the control group after controlling for pretest reading achievement measured by another test. The pretest *W* scores and the *W* scores of reading achievement measured by the *WJ-III Letter Word ID* subscale were two levels in the within-subject variable, Time, in repeated measures ANOVA using Remediation Plus Program Status (i.e., treatment vs. control) as the focal independent variable and the pretest scores on reading achievement measured by the *PPVT* as the covariate. In the repeated measures ANCOVA model of the pretest results and the posttest results on reading achievement measured by the *PPVT* standard scores as two levels of the within-subject variable, Time, Remediation Plus Program Status served as the focal independent variable and the pretest *WJ-III Letter Word ID* scores as the covariate.

**Significance test.** The *F* test of the variance related to the product term of Time and Program Status (i.e., the Time*Program-Status interaction effect) (Hedeker & Gibbons, 2006) assessed if the change from the pretest results to the posttest results on reading achievement

differed across the treatment group and the control group after controlling for pretest reading achievement.

**Effect size index.** The partial $\eta^2$ was computed as an effect size index to estimate the proportion of the variance in the dependent variable accounted for by a research variable after removing the variance related to systematic individual differences (Warner, 2008).

## One-Way Analysis of Covariance (ANCOVA) with Hierarchical Regression

**One-Way ANCOVA with Hierarchical Regression.** For reading achievement measured by the standard scores of (1) *WJ-III Letter Word Attack*, by the score percentile ranks of (2) *GORT Rate*, (3) *GORT Accuracy*, (4) *GORT Fluency*, (5) *GORT Comprehension*, and by (6) *GORT Oral Reading Index* respectively as the dependent variable, analysis of covariance (ANCOVA) was conducted with hierarchical regression (Cohen, Cohen, West, & Aiken, 2003; Norusis, 2012) using Program Status as the focal independent variable, the pretest *WJ-III Letter Word ID W* scores and the pretest *PPVT* standard scores as the covariates. As suggested by Pedhazur (1997), regression is equivalent to ANOVA or ANCOVA and preferable while the group sizes are unequal as in the current study.

**Significance test.** The *F* test of the squared multiple correlation coefficient change ($\Delta R^2$) in hierarchical regression (Cohen et al., 2003) while moving from (1) the baseline regression model with the covariates to (2) the final regression model with the covariates and the focal independent variable, Program Status, examined if there was a difference in reading achievement between the treatment group and the control group (i.e., the main effect of Program Status) after controlling for pretest reading achievement.

**Effect size index.** The $R^2$ change while moving from the baseline regression model to the final regression model (Cohen et al., 2003) was computed as the effect size index to estimate the proportion of variance in reading achievement associated with Program Status after controlling for pretest reading achievement.

**References**

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Table 1

*Participant Demographics by Remediation Plus Program Status*

_____

| Variable | Control | | Treatment | | Total | |
|---|---|---|---|---|---|---|
| | *n* | *%* | *n* | *%* | *n* | *%* |
| Ethnicity | | | | | | |
| White | 50 | 98.04 | 35 | 97.22 | 85 | 97.70 |
| Minority | 1 | 1.96 | 1 | 2.78 | 2 | 2.30 |
| Gender | | | | | | |
| Female | 23 | 44.23 | 17 | 43.59 | 41 | 44.09 |
| Male | 29 | 55.77 | 22 | 56.41 | 52 | 55.91 |
| English Language Learner | | | | | | |
| No | 51 | 100.00 | 36 | 100.00 | 87 | 100.00 |
| Yes | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Special Ed. Student | | | | | | |
| No | 43 | 84.31 | 32 | 88.89 | 75 | 86.21 |
| Yes | 8 | 15.69 | 4 | 11.11 | 12 | 13.79 |

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Table 2

*Descriptive Statistics of Dependent Variables by Remediation Plus Program Status*

| Variable | Control | | | Treatment | | |
|---|---|---|---|---|---|---|
| | *M* | *SD* | *n* | *M* | *SD* | *n* |
| Pretest *WJ-III Letter Word ID* | 427.63 | 27.72 | 49 | 426.84 | 30.40 | 38 |
| Posttest *WJ-III Letter Word ID* | 447.65 | 22.60 | 40 | 443.73 | 25.39 | 26 |
| Pretest *PPVT* | 94.20 | 10.95 | 49 | 101.11 | 9.89 | 38 |
| Posttest *PPVT* | 91.41 | 12.51 | 17 | 101.54 | 13.26 | 13 |
| *WJ-III Word Attack* | 98.86 | 8.71 | 51 | 99.76 | 9.28 | 37 |
| *GORT Rate* | 27.02 | 22.66 | 51 | 24.03 | 21.99 | 37 |
| *GORT Accuracy* | 7.48 | 1.18 | 38 | 7.59 | 1.23 | 25 |
| *GORT Fluency* | 22.78 | 21.30 | 50 | 21.27 | 21.25 | 37 |
| *GORT Comprehension* | 31.53 | 28.25 | 50 | 38.38 | 29.82 | 37 |
| *GORT Oral Reading Index* | 85.12 | 13.01 | 51 | 87.68 | 13.62 | 37 |

*Note. WJ-III*: *Woodcock Johnson-III*; *PPVT*: *Peabody Picture Vocabulary Test*; *GORT*: *Gray Oral Reading Test*.

Table 3

*Descriptive Statistics of Dependent Variables by Remediation Plus Program Status for the First Graders*

| Variable | Treatment | *n* | M | SD |
|---|---|---|---|---|
| Pretest *WJ-III Letter Word ID* | R+ | 13 | 392.85 | 17.20 |
| | Control | 16 | 397.75 | 11.89 |
| Posttest *WJ-III Letter Word ID* | R+ | 12 | 426.92 | 24.43 |
| | Control | 17 | 435.71 | 22.60 |
| Pretest *PPVT* | R+ | 13 | 99.77 | 10.22 |
| | Control | 16 | 90.00 | 12.26 |
| Posttest *PPVT* | R+ | 12 | 101.25 | 13.81 |
| | Control | 17 | 91.41 | 12.51 |
| *WJ-III Word Attack* | R+ | 12 | 102.83 | 9.50 |
| | Control | 17 | 103.88 | 9.41 |
| *GORT Rate* | R+ | 12 | 24.33 | 17.65 |
| | Control | 17 | 25.82 | 19.78 |
| *GORT Accuracy* | R+ | 4 | 6.88 | .66 |
| | Control | 6 | 7.08 | .74 |
| *GORT Fluency* | R+ | 12 | 19.75 | 16.73 |
| | Control | 17 | 19.35 | 18.33 |
| *GORT Comprehension* | R+ | 12 | 32.58 | 27.87 |
| | Control | 17 | 17.18 | 21.58 |
| *GORT Oral Reading Index* | R+ | 12 | 87.75 | 11.16 |
| | Control | 17 | 80.06 | 11.90 |

*Note. WJ-III*: *Woodcock Johnson-III*; *PPVT*: *Peabody Picture Vocabulary Test*; *GORT*: *Gray Oral Reading Test.*

Table 4

*Descriptive Statistics of Dependent Variables by Remediation Plus Program Status for the Second Graders*

| Variable | Treatment | *n* | M | SD |
|---|---|---|---|---|
| Pretest *WJ-III Letter Word ID* | R+ | 14 | 436.71 | 16.14 |
| | Control | 22 | 435.09 | 17.07 |
| Posttest *WJ-III Letter Word ID* | R+ | 14 | 458.14 | 15.82 |
| | Control | 23 | 456.48 | 18.51 |
| Pretest *PPVT* | R+ | 14 | 105.86 | 7.94 |
| | Control | 22 | 96.09 | 10.31 |
| Posttest *PPVT* | R+ | 1 | 105.00 | - |
| | Control | 0 | - | - |
| *WJ-III Word Attack* | R+ | 14 | 101.71 | 8.43 |
| | Control | 23 | 98.17 | 7.30 |
| *GORT Rate* | R+ | 14 | 22.79 | 24.55 |
| | Control | 23 | 29.65 | 24.88 |
| *GORT Accuracy* | R+ | 11 | 7.18 | .90 |
| | Control | 21 | 7.46 | 1.20 |
| *GORT Fluency* | R+ | 14 | 20.29 | 21.69 |
| | Control | 22 | 26.91 | 23.62 |
| *GORT Comprehension* | R+ | 14 | 36.43 | 37.03 |
| | Control | 23 | 37.39 | 30.42 |
| *GORT Oral Reading Index* | R+ | 14 | 86.93 | 15.37 |
| | Control | 23 | 88.13 | 14.49 |

*Note. WJ-III*: *Woodcock Johnson-III*; *PPVT*: *Peabody Picture Vocabulary Test*; *GORT*: *Gray Oral Reading Test*.

Table 5

*Descriptive Statistics of Dependent Variables by Remediation Plus Program Status for the Third Graders*

| Variable | Treatment | *n* | M | SD |
|---|---|---|---|---|
| Pretest *WJ-III Letter Word ID* | R+ | 11 | 454.46 | 15.74 |
| | Control | 11 | 456.18 | 16.26 |
| Posttest *WJ-III Letter Word ID* | R+ | 0 | - | - |
| | Control | 0 | - | - |
| Pretest *PPVT* | R+ | 11 | 96.64 | 9.95 |
| | Control | 11 | 96.55 | 9.19 |
| Posttest *PPVT* | R+ | 0 | - | - |
| | Control | 0 | - | - |
| *WJ-III Word Attack* | R+ | 11 | 93.91 | 8.02 |
| | Control | 11 | 92.55 | 5.65 |
| *GORT Rate* | R+ | 11 | 25.27 | 24.71 |
| | Control | 11 | 23.36 | 23.38 |
| *GORT Accuracy* | R+ | 10 | 8.33 | 1.41 |
| | Control | 11 | 7.74 | 1.36 |
| *GORT Fluency* | R+ | 11 | 24.18 | 26.30 |
| | Control | 11 | 19.82 | 21.12 |
| *GORT Comprehension* | R+ | 11 | 47.18 | 26.66 |
| | Control | 11 | 41.46 | 25.92 |
| *GORT Oral Reading Index* | R+ | 11 | 90.73 | 14.42 |
| | Control | 11 | 86.64 | 9.52 |

*Note. WJ-III*: *Woodcock Johnson-III*; *PPVT*: *Peabody Picture Vocabulary Test*; *GORT*: *Gray Oral Reading Test*.

**Teacher Interview Protocol**

Generic Questions (Both control and R+)

1. Briefly describe what you feel are the main strategies and goals of PROGRAM.
2. Did you feel prepared to use it?  Why or why not?
3. What did you like most about it? Why?
4. What did you like least?  Why?
5. Do you feel that it benefitted students in improving their reading skills, and if so, in what ways?  What about their writing skills? Spelling skills?
6. Did the children enjoy the lessons? Why or why not?
7. Were the children engaged by the lessons? Why or why not?
8. Would you want to use this program rather than an alternative program in the future?  Why or why not?
9. Do you have any recommendations for making the program more effective if used in the future?

R+ Questions

10. Did you feel you learned new information about the science of Reading through the Remediation Plus 2-day training?  Explain.
11. Did you know your 44 speech sounds and 90 graphemes prior to the training?
12. Was the Remediation Plus explicit systematic lesson plan curriculum supportive to you?  Explain.
13. Was the professional development that you received sufficient? Why or why not?


Any final thoughts?