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# *The Effects of the* Language Arts *Strand of the* Reading Mastery Signature Series *on the Reading and Language Skills of English Language Learners*

**Abstract: Building on research showing the interdependence of language skills and reading proficiency, this study examined the effects of using the *Language Arts* strand of the *Reading Mastery Signature* 2008 series program as a supplement to non-Direct Instruction reading programs with English Language Learner (ELL) students. Seventy-six kindergarten through fifth-grade ELL students received the intensive intervention delivered by trained school staff (n = 5) at three elementary schools. Multiple classroom-based fidelity of implementation monitoring demonstrated that the Language Arts strand was well taught on a consistent basis by all teachers and paraprofessionals. Statistically significant gains were made in the word recognition, oral reading accuracy, silent reading comprehension, spelling, and word meaning percentile ranks of participants from pre- to posttest (p < .01). Absolute change and effect size estimates (see Gresham, 2005) indicated reliable changes in the reading and language skills of participants. Results, implications, and future research priorities were discussed.**

English language learners (ELLs) are the fastest growing school-age population, increasing by 105% since 1990 (Capps et al., 2005). Although ELLs are most concentrated in six states—California, Florida, Illinois, New Jersey, New York, and Texas—the number of ELLs is growing rapidly in all states. For example, in the 1990s, the ELL student population increased by 350% in Nebraska and 354% in Nevada. Rising numbers of ELLs present challenges for educators, with implications for resources needed to meet No Child Left Behind (NCLB) reading targets set for protected groups. ELLs experience meaningful differences in language and literacy development compared to their non-ELL counterparts (National Reading Council, 2001). In addition, the limited opportunities of ELL students to engage in literacy activities with parents also results in significant receptive, expressive, and pragmatic language deficits (Catts, Hogan, & Fey, 2003; Hart & Risley, 1995). An analysis of the fourth-grade 2007 National Assessment of Educational Progress (NAEP) reading test revealed that test scores of ELL students averaged 35 scale score points less than non-ELL students (National Center for Education Statistics, 2007).

The National Research Council concluded that building foundational oral language skills is paramount to the prevention of the majority of reading problems (Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 2001). For exam-

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ple, Catts, Fey, Zhang, and Tomblin (1999) examined the reading and language characteristics of 604 second-grade students divided into groups of poor and good readers. These researchers explored how well phonological awareness, alphabetic knowledge, and oral language skills at kindergarten predicted reading performance in second grade. They found that three of four poor readers in second grade had exhibited language problems in kindergarten. In second grade, significantly more poor readers (50%) had difficulty in oral language skills compared to 12% of their counterparts with good reading skills. Subsequently, Catts and colleagues (2001) followed 208 of these poor readers who had language difficulties in second grade into fourth grade. They found that 50% of children with language delays in kindergarten qualified for special education services under the category of learning disability in reading in either second or fourth grade. Not surprisingly, children with both reading and language problems in second grade performed significantly poorer than grade level on measures of reading comprehension and word recognition in fourth grade.

Given the correlation of strong language skills with reading success, particularly for ELLs, the US Department of Education Institute of Education Sciences developed a practice guide on effective literacy and English language instruction for ELLs (Gersten et al., 2007). The panel's report suggests that enhancing the language skills of ELL students is a potential approach to improving the literacy development of ELL students. In addition, the panel found strong evidence for providing extensive and varied vocabulary instruction with ELL students.

One program designed for such purposes (i.e., to enhance language skills and provide vocabulary instruction) is the *Language Arts* (*LA*) strand of the *Reading Mastery* (*RM*) *Signature 2008* series program (SRA/McGraw-Hill, 2008). The *LA* strand focuses on building the oral language skills necessary to understand what is said, written, and read in the classroom, and is designed to be used as a supplement for any comprehensive reading or language arts program. Although no research currently exists on the specific effects of the *LA* strand when used as a supplement for ELLs, there is a substantial research base for prior versions (*Language for Learning, DISTAR Language)*, which were designed to complement earlier versions of *RM Classic* and *RM Plus*.

The two previous versions of *RM*, along with a variety of other developmental Direct Instruction (DI) programs, have consistently demonstrated their feasibility and effectiveness with a wide range of students, including ELL students (Adams & Engelmann, 1996). For example, Gunn and colleagues (2000; 2002) analyzed the effects of the previous non-language version of *RM* by conducting a randomized controlled trial with ELL and non-ELL elementary students. Results indicated that the intervention significantly improved ELL student performance on measures of word attack, oral reading fluency, and passage comprehension. Further, in evaluating this study, the What Works Clearinghouse (WWC; Reading Mastery/SRA/McGraw-Hill, 2006) concluded that the *RM* intervention had the potential to provide positive effects on the reading achievement of ELLs (i.e., their improvement index indicated that *RM* students improved an average of 28 percentile points).

Earlier DI language interventions similar to the *LA* strand also have been highly effective in improving student language performance. Students receiving the *Language for Learning* or *DISTAR Language* interventions, for example, demonstrated significantly improved receptive language skills, expressive language skills, language comprehension, vocabulary, and expression (Benner et al., 2002; Muthukrishna & Naidoo, 1987). Such language programs also have been associated with improved reading outcomes versus comparison students. Although the researchers used a combination

of interventions including *RM*, researchers Darch, Gersten, and Taylor (1987) found that students receiving *DISTAR Language* significantly outperformed comparison students on the reading section of the Metropolitan Achievement Test (MAT). Cole and colleagues (1993), however, discovered no significant score differences on the Test of Early Reading Ability (TERA) between students receiving *Language for Learning* and students in the comparison groups. However, few studies have employed reading outcome measures when implementing language interventions as supplements to core reading programs. Further, no studies to date have been conducted specifically using the recently developed *LA* strand, despite its design for use as a supplementary program having the potential to enhance the effectiveness of reading instruction for ELL students.

The purpose of this study was twofold: (a) to explore the feasibility of using the *LA* strand of the *RM Signature 2008* series program with ELL students as a supplement to non-DI reading instruction, and (b) to document the associated achievement growth on the reading and language skills of ELL students.

# *Method*

## Participants

Participants were 76 kindergarten through fifth-grade students (40 males, 36 females) enrolled in three urban schools located in the same school district in the Pacific Northwest. All of the students had qualified for and were receiving ELL services. The selection of student participants was based on grade and placement test scores. If students placed in the *LA* program, they received the intervention. If a student's placement test score showed the intervention was not appropriate because the student was too advanced, the student did not receive the intervention. Two schools chose to include students in grades 3 through 5, while one school chose to include students in grades kindergarten through 5. The numbers and percentages of students who received the intervention in kindergarten, first, second, third, fourth, and fifth grades were 17 (22%), 12 (16%), 4 (5%), 15 (20%), 12 (16%), and 16 (21%), respectively.

Eleven (14%) of the 76 students were enrolled in School 1, 43 (57%) of the 76 students were enrolled in School 2, and 22 (29%) of the 76 students were enrolled in School 3. Percentages of students receiving free or reduced lunch at Schools 1, 2, and 3 were 44%, 54%, and 65%, respectively. Percentages of students receiving special education services at Schools 1, 2, and 3 were 14%, 12%, and 14%, respectively. Percentages of students classified transitional bilingual at Schools 1, 2, and 3 were 17%, 15%, and 19%, respectively.

## Dependent Measure

The *Diagnostic Assessments of Reading* (*DAR*; Roswell, Chall, Curtis, & Kearns, 2005) was administered to all students in the fall prior to the implementation of the *Language Arts* strand and again in the spring. The five major *DAR* subtests (Word Recognition, Oral Reading Accuracy, Silent Reading Comprehension, Spelling, and Word Meaning), which produce a grade equivalent and percentile rank scores, were used in the present study.

The Word Recognition subtest measures student ability to read words of increasing difficulty, while Oral Reading Accuracy measures automaticity with word recognition, or word reading and fluency. Silent Reading Comprehension measures passage comprehension and depends on basic word recognition, word analysis, and background knowledge. The Spelling subtest measures encoding or transposing speech into writing. Finally, the Word Meaning subtest measures productive (i.e., meanings are known well enough to become part of a person's speech) and receptive (i.e., known well enough to understand when heard or read) vocabulary, and thus pro-

vides an estimate of language abilities. The reported internal consistency reliability coefficients of these five subtests are all greater than .90 for grades 2 to 12 and range from .68 to .99 for grades kindergarten to 1 (Roswell et al., 2005).

## Language Arts Strand

In the present study, the *LA* strand of *RM Signature 2008* was implemented as a supplement to non-DI reading instruction for ELL students in kindergarten through grade five. The *LA* strand is a DI program designed to teach overall communication skills, written language skills, and oral language skills to students, with an emphasis on comprehending what is written, read, and said in academic settings. Each level (K-5) of the *LA* strand comprises from 110 to 150 lessons that take 45 minutes each to complete. Each lesson contains 5 to 10 different exercises that teach specific language, writing, and thinking skills. Typical exercises include responding orally to directions, performing actions, describing the performed actions, and completing written workbook activities. Program materials include teacher materials, pacing guides, specific error correction procedures, presentation books containing scripts for each lesson, student books, and student workbooks. In addition to the program materials, teachers use dry erase boards, markers, pencils, and folders to track the progress of students.

In this study, only *LA* Levels K, 1, and 2 were utilized to supplement core reading instruction. Within each level, specific skills and concepts are organized into tracks. Level K contains six tracks: actions, description of objects, information and background knowledge, instructional words and problem-solving concepts, classification, and problem-solving strategies and applications. Level 1 contains three tracks: language concepts, story grammar and literature, and writing. Level 2 contains 13 tracks located in two parts, including story grammar, sequencing, classification, directions, deductions, clarity, perspectives, and writing in Part 1, and main idea, reporting, clarity, passage organization, and editing in Part 2.

Prior to the intervention, the *LA Placement Test* was administered to determine appropriate placement of students in the three levels. Placement testing resulted in the following instructional placements: 34 students (44.7%) received Level K, 19 students (25%) received Level 1, and 23 students (30.3%) received Level 2. Table 1 displays the grade level of students placed in each of the intervention levels.

*LA* instruction began approximately a third of the way through the school year, after student placement was completed. One ELL teacher at each school taught the *LA* strand to participants at Schools 1 and 3; and three ELL paraprofessionals taught the *LA* strand to participants at School 2. ELL pull-out schedules were rearranged to fit the *LA* grouping requirements and intervention schedules. Because a large number of students were served relative to the limited implementation

**Table 1**

Reading Mastery Language Arts *Strand Intervention Level of Participating Students by Grade*

| | *Language Arts* Strand Level | | |
|---|---|---|---|
| | K | 1 | 2 |
| Grade | | | |
| Kindergarten | 17 | 0 | 0 |
| First | 12 | 0 | 0 |
| Second | 0 | 4 | 0 |
| Third | 3 | 10 | 2 |
| Fourth | 2 | 4 | 6 |
| Fifth | 0 | 1 | 15 |
| Total | 34 | 19 | 23 |

staff across the three schools, instructional time was limited to 15 to 30 minutes a day. Consequently, students completed approximately one-half of a total year of lessons within the level assigned in the study.

## Core (Non-DI) Reading Program Supplemented

Each of the three schools participating in the study utilized a non-DI core reading approach emphasizing balanced literacy. Approaches to reading instruction at all three schools were similar. All core reading instruction was taught in self-contained classrooms. All teachers used the Developmental Reading Assessment (DRA) pre-test results to differentiate instruction in the core reading program. Differentiated instruction was provided through the use of reading centers and literature circles. Teachers of students in grades K-2 emphasized readiness skills, comprehension, accuracy, and fluency. Teachers of students in grades 3-5 emphasized comprehension, accuracy, fluency, and vocabulary.

## Professional Development

The certified teachers, paraprofessionals, and other school personnel participating in the study were trained during a two-day workshop concerning program implementation and placement testing, a one-day workshop regarding DAR testing, and three onsite coaching visits. The trainer had 13 years of experience using and training teachers on DI programs. During the two workshop days, teachers learned program implementation, placement test administration, instructional methods, corrective feedback procedures, and monitoring systems. They were also provided with opportunities to practice using the *LA* strand. Further, the trainer conducted three onsite follow-up coaching visits at each school during the school year, in which the trainer observed teacher implementation and provided feedback, addressed teachers' implementation questions, and discussed student progress.

## Research Design

The research study followed a "proof of concept" approach that consisted of two major components. The first component was the monitoring of the fidelity of implementation of the *LA* strand to establish its feasibility as a supplementary program for use with ELL student populations. The second component consisted of documenting the pre- and posttest DAR achievement on the reading and language skills of ELL students associated with the use of the *LA* strand. The DAR pre- and posttest measures were administered in the fall, prior to implementation of the *LA* strand, and again in the spring, at the conclusion of the academic year.

Teacher fidelity of implementation was assessed using an observational checklist targeting five teacher actions critical to the implementation of the *LA* strand: (a) following the lesson format, (b) providing specific feedback, (c) monitoring student responses, (d) re-teaching when needed, and (e) using proper error correction procedures. At least two fidelity observations were conducted for each teacher. In each observation, the trainer rated the teacher on each of the five components using a 10-point Likert-type scale ranging from 0 (does not cover component at all during lesson) to 10 (covers component well during lesson).

The mean pre- and posttest percentile ranks for each DAR subtest were analyzed using two different indicators: paired-sample *t*-statistics and reliable change metrics (Gresham, 2005). The paired-sample *t*-tests were conducted to determine if students showed statistically significant gains in their DAR Word Recognition, Oral Reading Accuracy, Silent Reading Comprehension, Spelling, and Word Meaning scores. As a control for multiple comparisons, Bonferroni corrections were used to set the significance levels for each *t*-test at .01 (i.e., .05/5 tests = .01).

The two "reliable change" metrics used allowed the likelihood that student changes in DAR performance were reliable and not due to chance or extraneous factors (Gresham, 2005). Gresham's framework was chosen to complement the *t*-test comparisons. The first reliable change index used represents a pre- and posttest "absolute change" and addresses the difference between baseline (pre-) and posttest intervention scores. The second reliable change index used was an "effect size estimate" that scaled the absolute pre-post change values by dividing the difference between the means from baseline and post-intervention by the standard error of difference between post-intervention and baseline values.

# *Results*

## Fidelity of Implementation

The average levels of fidelity of implementation across the fidelity of implementation scores for the five program teachers (i.e., two certified teachers and three paraprofessionals) were 84% (follows the lesson format), 84% (provides specific feedback), 83% (monitors student responses), 79% (re-teaches when necessary), and 79% (uses proper error correction procedures). Together these data confirmed the feasibility of using the DI *LA* strand as a supplementary intervention for ELL students receiving a non-DI core reading program. Additionally, the fidelity data obtained confirms the teacher training and follow-up assistance model used in the study was effective in engendering strong teaching of the *LA* strand.

## Pre- and Posttest Student Performance

Table 2 summarizes the mean pre- and posttest percentile ranks, paired sample *t*-statistics, and reliable change metrics obtained for each of the five DAR subtests. As Table 2 indicates, statistically significant *t*-values ($p < .01$) were obtained on all tests, showing significant achievement gains by the ELL students in Word Recognition, Oral Reading Accuracy, Silent Reading Comprehension, Spelling, and Word Meaning.

Also shown in Table 2 are the results obtained using the reliable change metrics. First, the percentile rank (*PR*) pre- and posttest differences (i.e., the absolute change metric values) ranged from 8.4 (Silent Reading Comprehension) to 23.7 (Oral Reading Accuracy). Averaged over all five subtests, students scored at the low average range (*PR* = 15.2) on the pretest and scored at an improved average range (*PR* = 25.0) on the posttest, with three of five subtests (Word Recognition, Oral Reading Accuracy, and Spelling) increasing more than 10 *PR* values. In interpreting these changes, the reliable change effect size metrics ranged from .48 (Silent Reading Comprehension) to 1.03 (Word Recognition). Thus, a large effect size was produced from pre- to posttest on the Word Recognition subtest, while the remaining effect sizes were moderate in magnitude (see Cohen, 1988).

# *Discussion*

It appears that no studies to date have examined the effects of the *LA* strand of the *RM Signature 2008* program on ELL students. Therefore, the purposes of this "proof of concept" study were twofold: (a) to explore the feasibility of using the *LA* strand of the *RM Signature 2008* series program with ELL students as a supplement to non-DI reading instruction, and (b) to document the associated achievement growth on the reading and language skills of ELL students. Several findings warrant discussion.

The results of this study clearly demonstrated the feasibility of using the new *LA* strand from *RM Signature 2008* as a supplement to the types of regular, non-DI reading approaches typically used by schools. The teacher profes-

sional development and support plan was found effective in engendering strong teaching of the *LA* strand with both paraprofessionals and certified teachers. As a complementary finding interpreted within a "proof of concept" framework, the participating ELL students showed consistent reading achievement growth over the school year as measured by the DAR pre-post subtests.

The potential importance of this study is that it shows a feasible instructional approach for addressing the difficulties experienced by ELL students in language and literacy development in comparison to their non-ELL counterparts (National Reading Council, 2001).

Previous studies confirmed the relationship between oral language skills and reading achievement (Snow, Burns, & Griffin, 1998; Griffin et al., 2004), for which instruction is directly provided in the *LA* strand of *RM Signature 2008*. Although the absence of a control/comparison group does not allow the study to make conclusions of the effect of the *LA* strand alone, the combination of a regular reading program and the *LA* strand resulted in positive growth in the reading achievement of ELL students participating in the study across the school year (i.e., from DAR baseline to posttest). In this regard, the reliable change metric revealed moderate to large effect size

**Table 2**

*Pre- and Posttest Percentile Ranks, Paired-Sample t-statistics, and Reliable Change Metrics by DAR Subtest*

| | | DAR Percentile Rank | | | Reliable Change Metric | |
|---|---|---|---|---|---|---|
| | *N* | Pre (SD) | Post (SD) | *t* | Absolute Change | Effect Size |
| DAR Subtest | | | | | | |
| Word Recognition | 75 | 35.1 (29.3) | 51.7 (33.0) | 8.95** | 16.6 (16.1) | 1.03 |
| Oral Reading Accuracy | 62 | 25.7 (30.8) | 49.4 (38.5) | 5.26** | 23.7 (35.5) | 0.67 |
| Silent Reading Comprehension | 37 | 20.1 (19.0) | 28.5 (23.8) | 2.90* | 8.4 (17.7) | 0.48 |
| Spelling | 70 | 38.7 (34.5) | 50.7 (34.7) | 6.31** | 12.0 (15.9) | 0.75 |
| Word Meaning | 70 | 15.2 (16.1) | 25.0 (23.1) | 5.40** | 9.8 (15.2) | 0.65 |

*Note 1.* Pre- and posttest DAR subtest scores are percentile ranks. Numbers in parentheses are standard deviations. The absolute change metric is equivalent to pre- and posttest differences.

*Note 2.* Effect sizes in the range of 0 to .29 are considered small, 0.3 to 0.79 are considered moderate, and 0.8 and above are considered large (Cohen 1988).

* $p < .01$, ** $p < .001$.

growth from pre- to posttest and robust mean average absolute change across DAR subtests.

Other reliable change analyses revealed several notable pre-post changes in ELL student DAR performance. Absolute change on the DAR Word Meaning, a measure of productive and receptive language vocabulary, was nearly 10 *PR*, which represented participant growth from the normative low-average to average range on the Word Meaning subtest. The most robust absolute change was found on the DAR Oral Reading Accuracy subtest on which the mean ELL growth was over 23 percentile ranks (from the 26th to 49th percentile rank). While change in the DAR Word Recognition skills of participants was large, the remaining effect sizes were moderate in magnitude.

The high observed teacher fidelity underscores the feasibility of the level of teacher training and follow-up assistance as providing a means for implementing the *LA* strand. However, it is important to recognize that to implement and sustain evidence-based approaches, training and support must be ongoing. For example, the National Reading Panel has reported that such support must be continued for at least 12 to 15 months to build and maintain capacity of teachers (National Institute of Child Health and Human Development, 2000), a time span that is beyond the length of the present study.

Overall, the findings of this study are supportive of the conclusion that the *LA* strand of the *RM Signature 2008* program has significant promise to address the deficiencies in ELL students that research has shown provide a barrier for the development of effective reading skills (Gersten et al., 2007). However, at the same time, such a conclusion will require additional research. First, despite positive improvements in the reading achievement of ELL students, the present study design does not allow definitive statements or analysis of unique effects of the *LA* strand on the reading and language skills of ELL students to be determined. Future research studies implementing the *LA* strand must involve methodologically sound quasi-experimental or randomized field trial designs to provide comparison groups. Second, it is important to emphasize that only approximately half of a year's *LA* lessons were implemented in the present study. Experimental research of full implementation and the program's cumulative effects longitudinally across grade levels is a vital next step. Third, future research should also utilize a broader set of assessment measures. Although the DAR subtests measure a variety of reading and language skills, future research should also measure oral language proficiency (e.g., Comprehensive Assessment of Spoken Language [CASL]) in the key areas of social communication, expressive language skills, and receptive language skills. Finally, future research should also incorporate curriculum-based measures of student growth, which are embedded in the *LA* strand. Documenting such performance would provide an additional and important form of implementation fidelity data that would strengthen the management of classroom teaching and provide a criterion-referenced benchmark of student reading and language growth that could also serve as a method for tracking cumulative student progress in comparison to students not receiving the *LA* strand intervention.

In 2007, the US Department of Education released a report documenting three instructional practices for ELLs in the elementary grades that had demonstrated strong evidence (Gersten et al., 2007). These included: (a) screening for reading problems and monitoring progress, (b) providing intensive small-group reading interventions, and (c) providing extensive and varied vocabulary instruction. This preliminary "proof of concept" study targeted these three important recommendations through utilizing the *LA* strand intervention of *RM Signature 2008* with ELL elementary students. Due to these research-based instructional strategies and the findings discussed

above, the *LA* strand is a supplementary intervention that has promise for ELL students.

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