The Effects of Read Naturally on Fluency and Reading Comprehension: A Supplemental Service Intervention (Two-School Study)

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Introduction

This report summarizes the effects of well implemented the Read Naturally (RN) interventions at two public schools in Minneapolis, Minnesota. RN programs at Dowling Urban Environmental School (K–5) and Emerson Spanish Immersion School (K–8) were administered by two trained and experienced teachers.

Methods

The two school programs described here used a "pull out" program for supplemental reading support within the regular school. Neither of these schools were forced to provide supplemental services under the provisions of the *No Child Left Behind Act*. Rather, these programs were supported through Compensatory Education Funds provided by the State of Minnesota.

One supervising teacher in each of the two schools was trained in the appropriate procedures by a RN certified instructor. This training included initial assessment of student level of instruction using curriculum-based measurement procedures, placement procedures, use of comprehension assessments and strategies, student goal setting, and progress monitoring procedures.

Students were selected for inclusion in the RN supplemental services based on school team and parent recommendations. Students selected were generally considered to not be "on course" to be proficient on Minnesota Comprehensive Assessments given in the Spring of grade 3 and grade 5. The 96 students in this study received RN interventions throughout the 2003–04 School Year.

Program

The first section of Read Naturally instruction involves a student choosing a story from his/her individual instructional level and making a prediction. The student then writes what s/he already knows about the subject of the story. Next, the student takes a "cold timing" on the passage where s/he reads for one minute and records difficult words. The student then graphs the number of words read correctly per minute.

During the next component of instruction the student reads along with prerecorded audio of a fluent reader on the same passage three consecutive times, with each reading slightly faster than the previous reading. The student then reads the story independently without audio support. The student sets the timer for one minute for each reading and practices the passage several times until the predetermined rate (i.e., words read correctly) is reached.

The final part of the process occurs once the target fluency is reached. The student then answers multiple choice and constructed response questions that pertain to the story. Passages at each grade level include non-fiction themes. The questions tap inferential and literal passage comprehension. After answering the questions, the student retells the story in writing. The entire process is monitored by the instructor with corrective feedback and guided practice provided as needed.

Subjects

Students were selected for inclusion in the RN supplemental services based on school team and parent recommendations. Students selected were not considered to be "on course" to be proficient on MN Comprehensive Assessments given in the Spring of grade 3 and grade 5. A total of 96 students received RN interventions throughout the 2003–04 School Year. Of these 96 students, 78 had both pretest and posttest scores available and their test scores were used in the analysis of reading effects. Student characteristics of the RN intervention groups are displayed in Table 1.

Table 1. Demographic Characteristics of Read Naturally Students (Percentage of Students by Category)

Category	Dowling School	Emerson School	Both Schools
Grade 3	17		17
Grade 4		18	18
Grade 5		16	16
All Grades	17	34	51
Male	47%	66%	56%
Special Education	6%	3%	4%
English Language Learner (ELL)	0%	66%	43%
Free or Reduced Price Lunch	47%	75%	67%
African American	24%	28%	27%
American Indian	18%	0%	6%
White American	53%	0%	18%
Hispanic American	6%	72%	49%

Test Instruments

Reading achievement in this study was assessed using three types of reading assessment. The first assessment given to all students was the Northwest Achievement Levels Tests (NALT). The NALT reading assessment is a standardized paper and pencil test that is given to all Minneapolis Public School (MPS) students in grades 2–7 in the Spring of the year. It is an adaptive assessment where each student receives a level (i.e., form) of the test appropriate to his or her reading achievement level as determined by prior assessment. Estimates of the appropriate level are made from prior year NALT or state tests for students enrolled in MPS the previous year. Students new to the district take a short "locator" assessment to place them in the correct level of assessment. All items in the NALT are multiple choice and are chosen from a large item bank by expert reading teachers to match the state standards in vocabulary, inferential, or literal comprehension standards. NALT raw scores are converted to scale scores using Rasch Model IRT scaling procedures. Traditional norms with means, standards errors, reliability and validity coefficients are published by the Northwest Evaluation Association (NWEA).[1] In addition Minneapolis Public Schools has conducted its own validity studies. In a 1999 study concurrent validity of NALT reading with the Minnesota Comprehensive Assessment (MCA) test of reading in grade 3 (n= 3,785) and grade 5 (n= 3,383) was .87 and .88 respectively.

The second assessment instrument given to all students in grades 3 and 5 was the Minnesota Comprehensive Assessments (MCA). MCA assessments are required by Federal *No Child Left Behind* (NCLB) adequate yearly progress (AYP) provisions. The reading assessment includes multiple choice and constructed response items designed to tap comprehension and vocabulary skills. MCAs are designed to assess the full range of reading achievement from below grade level to well above grade level. The state of Minnesota has minimum competency exams for graduation requirements. These assessments were designed to measure the "high standards" comparable to the National Assessment of Educational Progress (NAEP) standards. Evidence of technical adequacy of the MCAs is available at the Minnesota Department of Education website (education.state.mn.us/html/intro_dist_mca_tech.htm).

The third assessment instrument given to only Read Naturally students was the *Reading Fluency Monitor*[®] developed by Read Naturally, Inc. The *Reading Fluency Monitor* is an efficient, valid, and reliable way for teachers to measure a student's reading fluency skills. A student reads aloud from three grade-level passages for one minute each. The average number of words read correctly in one minute on three grade-level passages is the total score. Reliabilities for grades 3–5 reported in the technical manual were .97 to .98 for the three passages at each grade level. Validity coefficients were also very high. Correlations with the Minnesota Comprehensive reading assessment were .84 for grade 3 and .75 for grade 5.[2] Correlations with the NALT reading assessment were .93 (grade 3), .91 (grade 4) and .79.[3] Predictive validity with the Stanford-9 reading assessment (1 year later) were .75 (grade 4), .55(grade 5), and .79 (grade 6).[4]

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[1] Northwest Evaluation Association 1999 Norms Technical manual.

[2] Correlations were calculated on 24 and 37 students in grade 3 and 5 in Minneapolis Public Schools during the 2002-03 school year.

[3] Correlations were calculated on 23, 34, and 32 students respectively in grades 3,4,5 in Minneapolis Public Schools during the 2002-03 school year.

[4] Correlations were calculated on 23, 25 and 26 students respectively in grades 4,5,6 in a suburban district in California.

The high reliability and validity of oral reading passages in the *Reading Fluency Monitor* is consistent with large scale studies of curriculum based measures of oral reading.

Data Collection

Achievement data for this study were collected using standardized procedures which insured accuracy and independence of outcome from program staff. MCAs and NALTs were administered by test proctors under the supervision of highly trained test coordinators. Passages were administered and scored by well trained testers who were independent of the interventions. All demographic variables used in the matching of treatment and control students were obtained from the district student information system.

Experimental Design

Schools involved in the Read Naturally supplemental services were not on the *No Child Left Behind* (NCLB) list of schools failing to make adequate progress (AYP) in 2003. Students matched were chosen only from schools in Minneapolis within the same AYP status. That is, no schools that were forced to provide school choice busing or supplemental service provided students to the matched sample control group.

Each student receiving Read Naturally services was matched with a student not receiving Read Naturally (RN) services. Students were matched first on NALT pretest score from spring of 2003 (i.e., matches needed to be within three scale score points of the target student) followed by the following demographic factors:

1) Grade
2) English Language Learner status
3) Special Education status
4) Free or reduced price lunch
5) Racial/Ethnic category
6) Home Language
7) Sex

Perfect matches of RN and control students were accomplished for 47 (93%) of the pairs, three (6%) pairs were matched on 7 of 8 variables, and one pair (2%) was matched on 6 of 8 variables. NALT reading gains and MCA 2004 post-tests for RN vs. Control were analyzed with dependent t-tests. RFM data were analyzed using an independent t-test for differences in learning slopes versus the user norm group.

NALT Results

Analysis of 2003 NALT reading scores found that the matching of pretest scores was done successfully. Mean scale scores and standard deviations for the 2003 pretest were as follows:

Table 2. Northwest Achievement Levels Test 2003 (Pretest) Reading Scale Score for Read Naturally Students and Control Students

Group	N	NALT Mean SS	NALT Std. Dev.
Read Naturally	51	**187.3**	**9.41**
Matched Control	51	**187.2**	**8.97**

Table 3. Paired Samples Descriptive Statistics on NALT 2004 (Posttest) Scale Scores for Read Naturally and Control Students

| Group	Mean	N	Std. Deviation	Std. Error Mean
Matched Control	193.4	51	11.72	1.64
Read Naturally	195.8	51	8.42	1.18

Table 4. Paired Samples t-Test Results on NALT 2004 Scale Scores for Read Naturally and Control Students

	Paired Differences					t	df	Sig. (2 tail)
	Mean	Std. Deviation	Std. Error Mean	95% CI Lower	95% CI Upper			
Control Group – Read Naturally	-2.347	9.641	1.35	-5.0587	.3645	-1.739	50	.088

The results in Table 4 and Figure 1 show that Read Naturally students made an average of 2.3 scale score points greater gain on the Northwest Achievement Levels Test (NALT) than students matched on pretest, poverty, ELL and Special Education services, gender, racial/ethnic category and home language.

Figure 1. Read Naturally vs. Matched Control NALT Gains
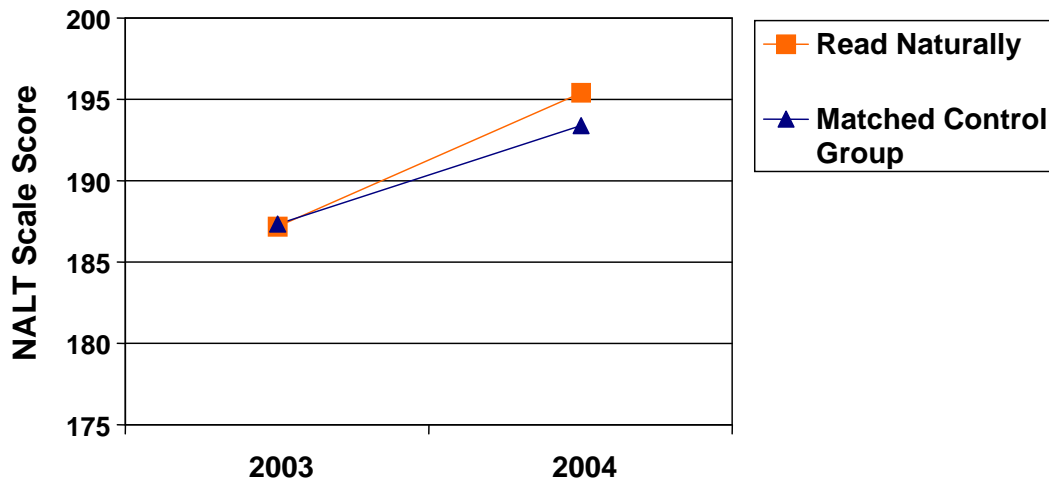
While the differences shown in Figure 1 were not quite statistically significant given the relative small sample size of the study, the size of the difference represents approximately 1/3 of a year more growth for Read Naturally students compared to Control Group students.

MCA Results

Similar analyses were performed on the 2004 Minnesota Comprehensive Assessments (MCA). All students with MCA test scores in grades 3 and 5 were entered into dependent t-test analyses.[5] Descriptive statistics are presented in table 5 below for 44 pairs of Read Naturally vs. Matched Comparison students.

Table 5. Paired Samples Descriptive Statistics (MCA 2004 Grades 3 and 5)

Group	MCA Reading SS Mean	N	Std. Deviation	Std. Error Mean
Matched Control	1327.576	33	153.97	26.80
Read Naturally	1380.909	33	136.11	23.69

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[5] MCA tests were not given in Minnesota for grade 4 in the year 2004.

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Table 6. Paired Samples t-Test (MCA 2004 Grades 3 and 5)

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% CI Lower	95% CI Upper			
Matched Control – Read Naturally	-53.33	168.36	29.31	-113.03	6.368	-1.820	32	.078

Students in the Read Naturally (RN) supplemental services intervention scored higher on the Minnesota Comprehensive Assessments of Reading in grades 3 and 5 (see table 6). On average, matched control students score 53.3 scale score points lower on the MCAs than RN students.
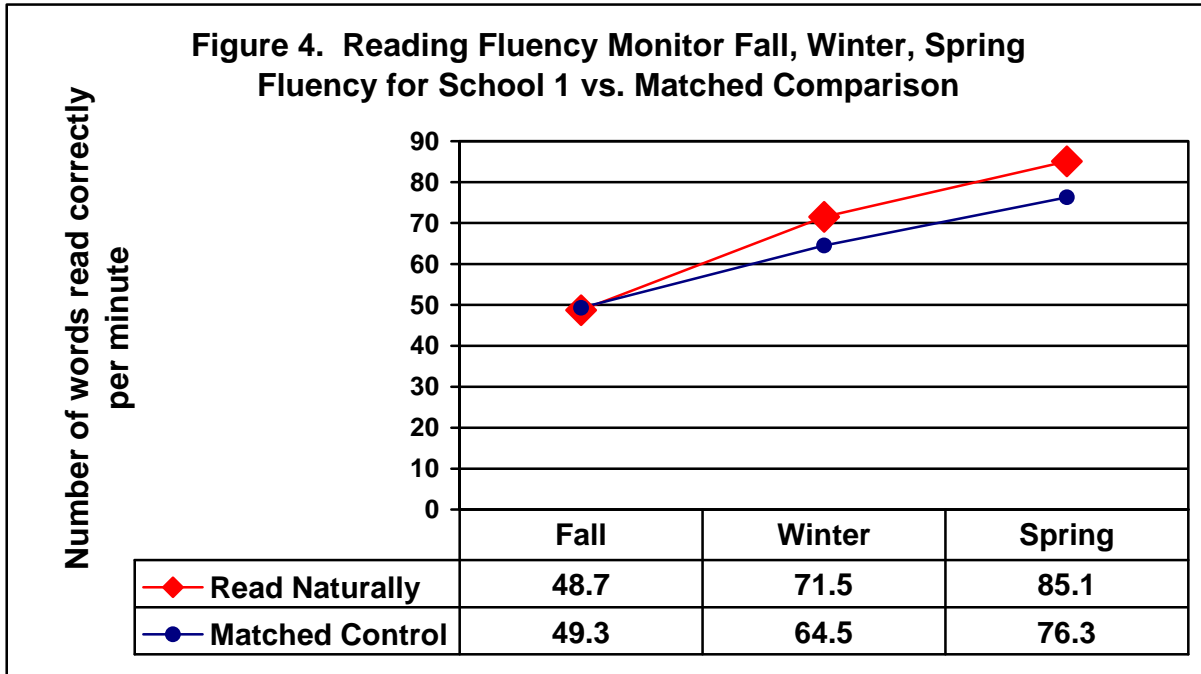
Students in grades 3 and 5 who received RN supplemental services also had a higher rate of students meeting the state standards for *No Child Left Behind* than matched comparison students. Table 7 shows that 30.3% of the matched comparison students scored at level III or higher compared to 42.4% of the RN supplemental students who achieved level III on the grade 3 and grade 5 MCAs. Table 8.provides a chi-square analysis of the percentage of students at or above 1420 on the MCA reading assessments for the matched control and RN groups. This analysis confirms that differences in MCA outcome of this magnitude would be found by chance approximately one time in 1,000 replications of the study.
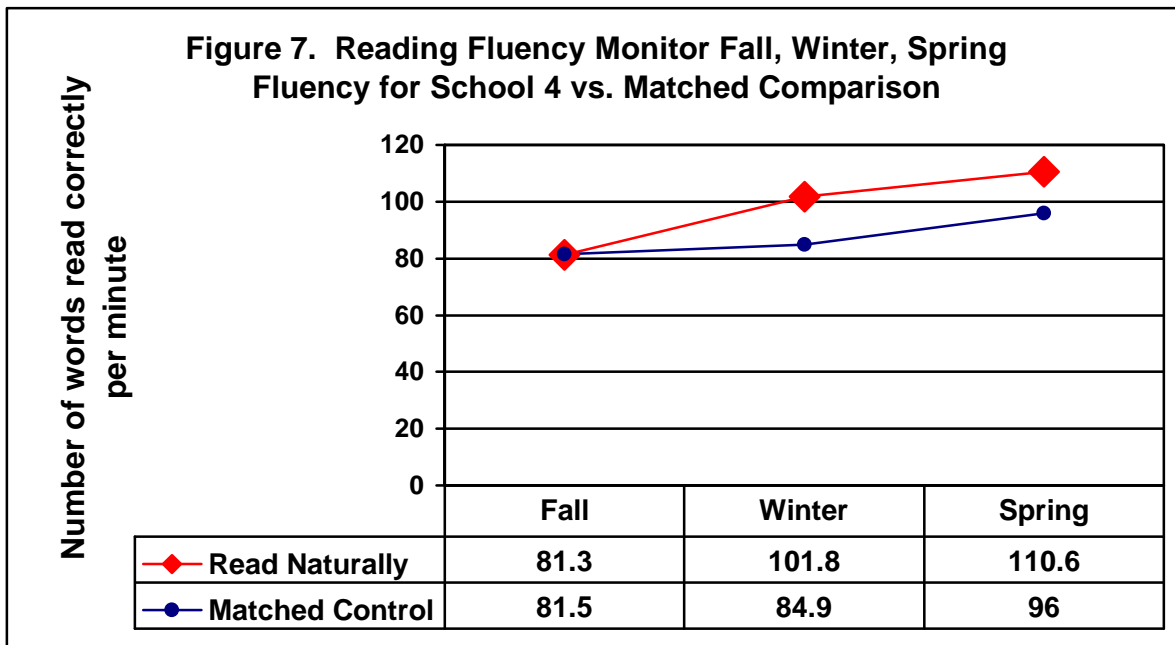
Reading Fluency Monitor (RFM) Results

Standard *Reading Fluency Monitor* (RFM) passages were administered Fall, Winter and Spring to all students receiving supplemental RN. Students from each RN school were matched with students from the Read Naturally growth norm sample.

The growth norm sample included approximately 100 students per grade from Minnesota, Texas, California, Texas, Virginia, Michigan, Iowa and Pennsylvania. Since poverty status was not available for all students in the growth norms, matching was done on fall reading fluency, gender, ethnic and grade level only.

Figure 4 presents the data for 20 grade 3 students at Dowling Elementary compared to 20 matched students from RFM grade 3 growth norms.

Figure 4. Reading Fluency Monitor Fall, Winter, Spring Fluency for School 1 vs. Matched Comparison

Number of words read correctly per minute

	Fall	Winter	Spring
Read Naturally	**48.7**	**71.5**	**85.1**
Matched Control	**49.3**	**64.5**	**76.3**

Analysis of the difference in spring oral reading rates using a dependent t-test found that the Read Naturally students from Dowling averaged significantly greater words read correctly at the end of the year [$t_{(19)}$= 2.42; p= .03] than the matched comparison students. School 1 had overall attendance at supplemental reading sessions of 96% and received positive evaluations of treatment fidelity from the independent assessor hired by Read Naturally to administer the RFM and observe implementation strengths and weaknesses.

Figure 7. Reading Fluency Monitor Fall, Winter, Spring Fluency for School 4 vs. Matched Comparison

Number of words read correctly per minute

	Fall	Winter	Spring
Read Naturally	**81.3**	**101.8**	**110.6**
Matched Control	**81.5**	**84.9**	**96**

Differences in fluency growth rates for School 4 and the matched growth norms are shown in Figure 7. Students in grades 4 and 5 in this school were matched with two schools that had a large number of Hispanic students but perfect matches were not found for all students. A total of 28 matches with all three oral reading fluency measures. Dependent t-test analysis of the difference in spring oral reading rates found that the differences in means at the end of the year between School 4 and the matched comparison students was statistically significant [$t_{(27)}$= 3.30; p= .003]. The Read Naturally intervention at this school was rated highly by the independent observer. Average attendance throughout the year was 93%.

Discussion

The results of a year long supplemental intervention using Read Naturally found the students receiving the intervention improved in overall reading proficiently as measured by Minnesota Comprehensive Assessments, Northwest Achievement Levels Tests, and the *Reading Fluency Monitor*. Matched comparison groups used in this study controlled for prior achievement and student demographic characteristics.

The sample sizes for this study were relatively small and yet the results of three different reading assessments showed Read Naturally students performing better than a matched sample of similar students. Replication of these finding across a larger sample of classrooms is needed.