I am grateful for the assistance of the many teachers, Literacy Facilitators, and principals in the REA schools who participated in the external evaluation. Gratitude is also extended to the children in the study. Importantly, the external evaluation could not have been accomplished without the diligent and meticulous work of the UNC-CH REA Research Assistants who are doctoral students at UNC-CH: Steve Amendum, Kimberly Creamer, Darlene Head, Heidi Hollingsworth, and Kirsten Kainz. Thanks go to Brad McMillen for considerable support and assistance. Thanks also to Marnie Ginsberg, a doctoral student at UNC-CH, who assisted with selected analyses.
Executive Summary

This is a report to the North Carolina Department of Public Instruction of the external evaluation done for the North Carolina Reading Excellence Act (REA) implementation from the fall of 2001 through the spring of 2003. I emphasize that analyses done to date and reported in this document are not exhaustive. Main conclusions follow.

a) CONCLUSION: What happened for professional development during the REA implementation?

* Literacy Facilitators at the 16 REA schools received extensive staff development from the North Carolina DPI, mostly conducted by the North Carolina DPI REA representative, in 23 sessions totaling approximately 217 contact hours. Classroom teacher staff development was also extensive, ranging from approximately 43 hours to approximately 136 hours across the 16 schools.

b) CONCLUSION: How might classroom reading instruction practices in focal REA schools be characterized, and were there relationships between classroom instruction practices and staff development and/or children’s growth in reading?

* Four clusters of types of change in teacher instruction emerged: increased emphasis on word-level instruction, phonics/phonological awareness, vocabulary meaning, or comprehension.

* Unexpectedly, teachers who spent less time in staff development sessions had students who tended to show greater change in reading instructional level.

* There was a tendency for teachers in a Pre-Structured type of staff development to demonstrate higher Degree of Teacher Change than those in No Pre-Structured Program or Scaffolded Process staff development.

* Children who had moderate- or higher-change teachers tended to make more accelerated Instructional Reading Level progress, as compared to children who had lower-change teachers, and they tended to outperform the others on reading Words in Isolation and on Fluency.
c) CONCLUSION: How might children’s growth be characterized?

* Children in both first- and second-grade levels in 9 of the 16 schools made substantial growth on Instructional Reading level in both Year 1 and Year 2, ranging from, on average, 1.09 years growth to an amazing 3.69 years growth in a given year.

* In general, in most schools, kindergarteners ended the year knowing letter names quite well and having reasonably strong book and print awareness. However, in some schools, the mean percentages for both of these variables at the end of the year were somewhat low. For Phonics, on average, for most schools, knowledge at year-end tended to be in a “moderate” range. Finally, although on average students’ Phonological Awareness grew across the year, it was quite low across all schools at the beginning of the year, and at the end of the year, it was still in a moderate range.

d) CONCLUSION: Was there a relationship between Type of REA Intervention Reform Effort and Children’s Reading?

* Across REA Year 1, the schools that implemented both a Pre-Structured staff development program and Strongly Scaffolded Process made the greatest growth. However, across REA Year 2, the schools that implemented the Pre-Structured Program made extremely good growth, substantially more than schools in the other Types, with an overall mean growth of 2.64 years compared to from 1.02 to 2.10 for the remaining Types. It was especially noteworthy that students in the schools where No Pre-Structured Program or Scaffolded Process was used, on average, showed especially accelerated Instructional Reading Level growth in Year 2 as compared to Year 1.

e) CONCLUSION: How does third-graders’ growth on the NC End-of-Grade Reading Test compare to growth in previous years?

* Growth on EOG Achievement Level in REA Year 1 was similar to that of the pre-REA year, but growth in REA Year 2 exceeded that of the previous two years.

f) CONCLUSION: Was there a relationship between extent of student participation in REA schools and overall end-of-REA Instructional Reading Level?
At the four focal schools, on average, students who were at an REA school for the whole two years attained higher Instructional Reading Levels than did those who were only there at the end of the period.

g) Cost analyses

The range of total amounts of money received across the 16 schools was wide (from $151,344 to $977,307, including administrative costs estimated proportionately for schools within district). Per pupil expenditure was $1,666. Both Percent of Monies Spent on Workshops and Percent of Monies Spent on Instructional Materials were significantly related to student growth (from the beginning of Year 1 to the end of Year 2) on Instructional Reading Level, with higher expenditure in both areas tending to be associated with greater growth.

Closure

Some collective factors suggest some modest support for the effectiveness of features of the interventions accomplished in at least some of the REA schools. These are:

* The way staff development was done mattered in relation to teacher instructional change, at least in the focal schools. For instance, teachers in focal schools using Pre-Structured Programs tended to demonstrate a higher degree of positive change in their reading instruction than did others.

* Teacher change was positively associated with student growth on Instructional Reading Level and overall student performance on reading Words in Isolation and Fluency, at least in the focal schools.

* The way staff development was done mattered in relation to student growth on Instructional Reading Level, with a Pre-Structured Program associated with greatest student gain in the long run (across all 16 schools).

* Third graders in the last REA year outperformed those in the first REA year and the year preceding REA for growth across the year on the North Carolina End-of-Grade Reading Achievement Level.
At least in the focal schools, using a very small within-program comparison group, students who had been in an REA school for the entire two years outperformed those who arrived at an REA school at the end of Year 2 on Instructional Reading Level.

Regarding REA costs, perhaps historically unprecedented amounts of money were provided with the goal of enhancing classroom reading instruction. High expenditure on supplies and materials, which included purchasing children’s books, is likely justifiable in most, if not all REA schools. Prior research supports that “book floods” can be associated with student growth in reading, and wide reading alone can foster students’ vocabulary and conceptual development.

The REA per pupil expenditure was in the low- to mid-range of tutoring program costs provided in prior reports for supplementary tutoring programs, which have tended to range from $595 to $4,000 per child in the published literature. Coupled with at least some minimal evidence in the external NC REA evaluation of selected effects on children’s reading, the expenditure on “regular” classroom instruction as compared to expenditure on supplementary tutoring, might be considered by many to be particularly worthwhile, given that there is potential for classroom teachers to provide enhanced reading instruction to all children rather than selected children. One added benefit could be reduction in numbers of students who need supplementary tutoring programs.

The association of percent of expenditure on workshops and on instructional materials with student overall growth in Instructional Reading Level is important because it suggests that, at least in these 16 schools, money mattered and that the use of money mattered. One interpretation of the associations is that both staff development and instructional materials, such as books, independent of one another, can make a difference in aspects of students’ reading abilities.
Project Report to the North Carolina Department of Public Instruction:
North Carolina Reading Excellence Act External Evaluation

REA Background

In 1998 Congress enacted the Reading Excellence Act (REA) to teach all children to read by the end of third grade, with an emphasis on funding schools of great need, essentially high-poverty, low-performing schools (Amendment to Title II of the elementary and Secondary Education Act of 1965, 20 U.S. C. 6601 et seq.). (Unless otherwise noted, information provided in this section is extracted and paraphrased from http://www.ed.gov/offices/OESE/REA/Index.html.) Funds were primarily for professional development in reading instruction for classroom teachers. Additional aims included tutoring, family literacy, and kindergarten transition programs. Teachers were to use reading instruction methods based upon “scientifically based reading research,” defined as:

. . . the application of rigorous, systematic, and objective procedures to obtain valid knowledge relevant to reading development, reading instruction, and reading difficulties; and . . . research that . . . employs systematic, empirical methods that draw on observation or experiment; . . . involves rigorous data analyses that are adequate to test the stated hypotheses and justify the general conclusions drawn; . . . relies on measurements or observational methods that provide valid data across evaluators and observers and across multiple measurements and observations; and . . . has been accepted by a peer-reviewed journal or approved by a panel of independent experts through a comparably rigorous, objective, and scientific review” (Section 2252.Definitions, www.ed.gov/offices/OESE?REA/reading_act.pdf).

Eligible schools had to meet each of three criteria. They were schools within a district: that had at least one school in Title I improvement status; that had the highest or second highest percentages of poverty in the state; and that had the highest or second highest number of poor children in the state.
The legislation provided three-year grants to State Education Agencies on a competitive application basis. State Education Agencies in turn provided grants to Local Education Agencies on a competitive application basis. During the first of the three-year period the State Education Agency identified eligible schools and then, for interested representatives of those schools, the Agency provided “training” in grant submission. Schools that received funds then had two years to conduct REA activities.

In 2000 Congress appropriated $260,000,000 for the REA, and in 2001 they appropriated an additional $286,000,000. The North Carolina State Education Agency received $15,000,000 and funded 16 schools in 7 different school districts throughout the state, with funding ranging from $138,891 to $940,542 per school, excluding administrative district costs (funding figures provided North Carolina Department of Public Instruction).

**Evaluation Issues**

The broad evaluation issues were: a) What happened for professional development in the REA schools? b) What other reading efforts were simultaneous to the REA intervention in the REA schools? c) How might classroom reading instruction practices in selected (focal) REA schools be characterized, and were there relationships between classroom instruction practices and staff development and/or children’s growth in reading? d) How might children’s growth be characterized? e) Was there a relationship between type of REA intervention reform effort and children’s reading? f) How does third-graders’ growth on the North Carolina End-of Grade Reading Test compare to growth in previous years? g) Was there a relationship between extent of student participation in REA schools and students’ overall end-of-REA reading? h) What monies were spent, and were there relationships between expenditures and student reading? Subsets of questions within these broad areas will be noted in the Results section.
Methods

Design

This was a two-year longitudinal design in which selected data were collected at all 16 schools to address broad-based evaluation questions, and additional data were collected at 4 of the schools to allow for more in-depth and detailed study pertaining to particular evaluation questions. In order to collect the most complete information possible, principals and teachers were told at the start of the evaluation data collection that their responses on questionnaires and in interviews would be anonymous. Consequently, in this report, schools and individuals are identified by numbers. In Year 1, children were selected from kindergarten, first-, and second-grade classrooms. The children were then followed in Year 2 as they moved into first-, second-, and third-grade classrooms. Additional children were selected in Year 2 in the four focal schools to account for attrition.

In all, data were collected for 1,507 children, 20 principals, 18 full-time school-level Literacy Facilitators charged with REA oversight, and 262 teachers, including 19 first and second grade focal teachers in focal schools. Numbers of principals, Literacy Facilitators, and focal teachers were greater than 16 because of shifts in personnel assignments from Year 1 to Year 2. Subsets of participants were used for different evaluation questions and analyses.

Focal School and Focal Teacher Selection Procedures

In this report, the four focal schools are 1, 3, 5, and 10. Two (5 and 10) of the four focal schools were selected because the administrators and teachers chose to learn about, and implement, a well-known balanced program in reading that is highly structured, called the Four-Blocks Approach. Some limited research and evaluation has been done on the Four-Blocks program to date, and it appears to hold promise for facilitating young children’s reading abilities. However, to my knowledge, no prior research and evaluation has been done with the program in high poverty, low-performing schools. The other two focal schools (1 and 3) were selected because they have a growing language-minority population. There is a great need, both in North Carolina and in the nation, for substantive evaluation on
the reading of English-language learners and on teachers’ reading instructional practices with these students.

At each focal school in Year 1 two first-grade teachers and two second-grade teachers were invited to participate in the two-year study as focal teachers. Literacy Facilitators were asked to select teachers who they thought: a) would be interested in participating, b) would be responsive to our requests, and c) who tended to have good classroom discipline management abilities. The latter characteristic was requested because if students were unduly disruptive optimal instruction and learning might be compromised.

Eleven of the Year 1 teachers continued in the evaluation study through Year 2, staying in the same grade. One teacher at School 1 moved from second to third grade with her students, and another teacher in School 10 moved from first to second grade (but not with her students as an intact class), and both of these teachers were retained in Year 2. Three additional teachers in Schools 3, 5, and 10 joined the study as focal teachers in Year 2, replacing Year 1 teachers. All “new” focal teachers in Year 2 had participated in REA staff development in their schools during the prior year.

Child Selection Procedures

In Year 1, at each of the 12 non-focal schools, child measures were administered to random samples (random within classroom) of approximately 25% of the children in kindergarten through second grade. Step-by-step directions were provided for teachers and Literacy Facilitators regarding the random sampling. The selection procedure was double checked by the external evaluation team by having Literacy Facilitators provide lists of students in classrooms on a given day within the first two weeks of school along with lists of the randomly selected students by classroom.

At the 4 focal schools, in Year 1 approximately 50% of the children in kindergarten through second grade were sampled. Additionally, at the two focal schools chosen for their high ELL student percentages, we attempted to include all of the Latino children in the kindergarten through second-grade classrooms, and then randomly selected (within classroom) from remaining children to bring the total
percent of children tested to 50%. (In analyses, where needed, to correct for over-representation of
Latino students in the two focal schools, Latino students were randomly selected from the database in
proportions commensurate with the schools’ respective ethnic representations in each grade [within Year
1 and within Year 2]. These processes will be explained in more detail in the Results section.) Also, in
the four focal schools, Literacy Facilitators were asked, to the extent possible, to test new kindergarten
through third-grade students who entered during Year 1 and to continue testing them at each testing
point. As well, they were asked to test any outgoing students before they left, to the extent possible.
These students, along with others who moved away, provided a base of potential students for later
analyses for creating a within-program control group for selected analyses.

In Year 2, an effort was made to continue testing any child who was tested at any time point in
Year 1. Additionally at the four focal schools, at the beginning of Year 2, to account for attrition,
teachers and Literacy Facilitators were given specific directions for procedures for “topping off” student
numbers in each classroom by randomly selecting from students who were not in the Year 1 sample,
bringing the total numbers of students (by classroom) up to the 50% level used the beginning of Year 1.
In the two “high-English-language learner” focal schools (schools 1 and 3), unlike Year 1, teachers and
Literacy Facilitators were not asked to include all English-language learner students in their classrooms.
Finally, in the four focal schools, as was the case in Year 1, teachers and Literacy Facilitators were
asked to test incoming and exiting students, to the extent they possibly could.

*Timeline, Procedures for Data Collection, and Faithfulness of Test Administration*

Table 1 shows the outline and timeline of data collection for all 16 schools, including the
additional data collection at the four focal schools. Measures, variables, and reliabilities are detailed in a
following section. Administration of child measures was done in a fully counterbalanced fashion across
the two years. To ensure that testing occurred at approximately the same time across all 16 sites,
Literacy Facilitators were given approximately three-week spans for each testing time, within which to
accomplish the testing.
Research assistants were trained on child test administration and scoring in advance of data collection. At a three-hour meeting before data collection began, all 16 Literacy Facilitators were trained by the REA external evaluation consultant on administration and scoring of child measures. Most of the Literacy Facilitators were already familiar with the instruments or similar versions of the instruments. The concept of counterbalancing was explained to the Literacy Facilitators, and three packets of tests, each with a different order, were provided to them. They were asked to randomly assign order one to approximately one-third of the participating students in a classroom, order two to another third, and so on.

In many cases, Literacy Facilitators did the child testing, sometimes with the assistance of another Reading Teacher. In some cases, the numbers of children to be tested prohibited the Literacy Facilitator from doing all of the testing herself. In these cases, either the Literacy Facilitator or an external evaluation team research assistant trained testers who were recently retired teachers, or in two cases, the school counselor or central office coordinator.

Highly specific, scripted, written directions were provided for each measure, and examiners were asked to read the directions to students and to avoid deviating from the directions. Likewise, very detailed written directions were provided for each measure about scoring. A cover summary sheet was given for recording the final scores for a given child, and examiners were asked to turn in all test booklets and summary sheets (collated) to the external evaluation team contact liaison for that school.

Checks on faithfulness of test administration and scoring were accomplished in five ways, and overall, the checks support the contention that the tests were well administered. First, research assistants went to 9 of the 16 schools in the first round of test administration. The schools were ones with the largest numbers of participating students. It was not physically possible to attend all 16 schools across the state within the three-week period allotted for test administration given limited numbers of research assistants. At each site, the research assistant sat with as many testers as possible during the days they were at the school, and as testers administered tests, research assistants scored alongside the testers,
watching the testers’ direction-giving and other features of test administration and scoring. The research assistants tried to sit with all testers for at least one student, but this was not always possible because not all testers were testing on the days the assistants were there. In all, 21 (of a possible 57) testers across the 9 (of 16) schools were visited, so 37% of the total possible testers were checked for faithfulness of administration. A total of 36 children were involved in this check, or 3% of all children in that round of testing (1,206) across the 16 schools. The overall results were: a) Tests were, on the whole, administered well. b) When assistants noted any problems in test administration or any differences in scoring while they were with the examiners, they gave feedback immediately following a student’s exit. c) The assistants’ scores matched well with the testers’ scores. Across the 9 variables calculated as percentages, and across kindergarten, first, and second grade, the agreements ranged from .74 to 1.00 for scoring (within 5 points), and only two were below .80. The agreement for number of words read correctly in one minute (first and second grade) was .89 (within two words). For the average score for the Attitude measure, (kindergarten, first, and second grade), the agreement was .89 (within .5 points). It was .84 for Instructional Reading Level (first and second grade).

The second check on testing was done for the first round of testing by assistants randomly selecting approximately 10% of the students (by teacher within all 16 schools) who had not been observed in the first round of testing and then re scoring all of the tests for those students (from the teachers’ protocols that were turned in). Interscorer agreements for the 155 children’s tests that were checked, for the 9 variables scored as percents, ranged from .70 to .99 (within five points). For number of words read correctly in one minute, the agreement was .76 (within two words). For the average score for Attitude, it was .92 (within .5 points), and for Instructional Reading Level, it was .74.

Third, from the work accomplished in checks one and two above, where needed the assistants then drafted lists of areas for special attention by tester. The lists were given to Literacy Facilitators for themselves and, where needed, for dissemination to testers. Literacy Facilitators were asked to make sure the items listed were addressed in the following rounds of assessment.
Fourth, at the next two rounds of assessment, assistants returned to their original lists by tester and pulled a few of that testers’ children’s protocols and checked them to see if the issues had been addressed. In every case, the issues appeared to have been addressed.

Fifth, lists were maintained of the names of testers at every round of assessment, and where new testers were involved, 5% of the children’s complete sets of new testers’ protocols provided by were rescored by the assistants. There were four new testers in Year 2 (and none in Year 1) in four schools, all of whom were checked across all three testing points for Year 2. Protocols for 11% of the children tested by new testers were rescored. For the 9 variables scored as percents, interscorer agreement ranged from .83 to 1.00 (within five points). For words read correctly in one minute, it was .96 (within two words). For the average score for Attitude (within .5 points), it was 1.00, and for Reading Level, within one level, it .96.

Measures, Variables, and Associated Reliability Estimates

There were seven categories of measures: measures of children’s reading abilities; principal and Literacy Facilitator questionnaires; Literacy Facilitator telephone individual interviews at all schools and principal and teacher individual interviews at the four focal schools; focus-group interviews with focal teachers; a focal school classroom observation instrument; focal teacher logs about classroom reading instruction for selected children; and North Carolina End-of-Third Grade Scores for all schools. Also, selected demographic information was collected about the principals, Literacy Facilitators, teachers, and children. The seven categories of measures are described in the following sections. In each of the seven sections, the measure is first detailed, followed by description of the variables created from that measure and accompanying reliability estimates.

Children’s reading abilities. Eight measures of child reading abilities were used (see column 2 of Table 2): a) Book and Print Awareness (used in the kindergarten [K] and first grade [1] classrooms) (modified slightly from Concepts of Print, Clay, 1993; North Carolina DPI K-2 Assessments); b) Lower Case Letter Knowledge (K-1) (from the Letter Identification test, Clay, 1993; North Carolina DPI K-2
The measures were selected so as to assess critical features of early reading development that have been supported by prior research, to ensure use of measures that have been widely used in practice and in prior research, and, significantly, to represent authentic measures that are typically used in school settings. For each of the child measures, the third column of Table 2 shows the procedures for administration and scoring all measures.

Variables for children’s reading abilities and associated reliability estimates. Eleven variables were created from the eight measures for children’s reading abilities:

a) Book and Print Awareness;

b) Letter Name Knowledge;

c) Phonological Awareness;

d) Knowledge of the Alphabetic Principle;

e) Knowledge of Correct Letters for Sounds;

f) Reading Words in Isolation;

g) Phonics Knowledge;

h) Instructional Reading Level;

i) Comprehension;

j) Fluency; and

k) Attitude toward Reading.
The first column of Table 2 shows the variable. Information on scoring is contained in column three.

Reliability estimates for children’s reading ability variables were obtained by targeting a random selection of 10% of children in the sample within classroom at each testing point and having research assistants re-score those children’s complete sets of protocols. The range of percents of children sampled across testing points was 6% to 13%. Reliability estimates were the proportion of times the examiner agreed with the research assistant. Reliability estimates calculated across all testing times for the children’s reading abilities variables are provided in the last column of Table 2. The reliability estimates were strong, ranging from .83 to .98.

**Principal and Literacy Facilitator questionnaires.** The main purposes of the questionnaires were to gather information about perceptions of the extent and success of staff development and classroom change in reading instruction, and to ascertain perceptions about challenges and obstacles to classroom change in reading instruction.

The questionnaires consisted of 30 (principal questionnaires) to 32 (Literacy Facilitator questionnaires) Likert items (1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree). The items across the principal and Literacy Facilitator questionnaires were parallel to the extent possible. Examples were: “Reading instruction in my school today is pretty much the same as it was about a year ago—before REA,” and “Staff development for teaching reading was/is ample and of high quality” (both questions were on both principal and Literacy Facilitator questionnaires). The questionnaires were mailed to the participants at the end of Year 1 and again at the end of Year 2. Return rate was 100%.

**Individual interviews.** There were three types of individual interviews—principal interviews, focal teacher individual interviews, and Literacy Facilitator telephone interviews. The main purpose of the individual interviews was to gather information about perceptions of the extent and success of staff development and classroom change in reading instruction, as well as perceptions about challenges and
obstacles to classroom change in reading instruction. In this regard, the individual interviews served in part as triangulating checks on principal and Literacy Facilitator questionnaire reports.

The individual principal and focal teacher interviews were conducted by research assistants trained in using a structured interview protocol. The telephone Literacy Facilitator interviews were conducted by Dr. Brad McMillen at NC DPI, using a structured interview protocol as well. The interviewer wrote notes about the participants’ responses directly on the protocol, and for the first two types of interviews, the interviewer later typed details of participants’ responses. In addition for the first two types of interviews, as long as the participant consented, the individual interviews were audiotaped.

Focus-Group focal teacher interviews at the four focal schools. At each of the four focal schools, all four focal teachers met for an hour with an interviewer as a group in the middle of Year 1 and again in the middle of Year 2. The main purposes of the focus-group interviews were the same as for questionnaires and individual interviews, and consequently, these interviews served as another triangulating “leg” on issues. Research Assistants trained in the procedures, used a structured focus group interview, audiotaped the sessions, and made copious notes, later typing the teachers’ responses more completely.

Focal classroom observation instrument. An observation instrument previously used by Taylor and associates (Taylor, Pearson, Clark, & Walpole, 2000; Taylor & Pearson, 2000) was used and modified slightly. Each of the four focal teachers at each of the four focal schools was observed for one hour during reading instruction, three times a year, once at the beginning, once at the middle, and once at the end, during Year 1 and again during Year 2. The purpose of the observations was to document classroom practices in the teaching of reading. Basically, the observer wrote on a laptop for a four-minute period, recorded the proportion of children in the lesson that appeared to be on task (doing what they were supposed to be doing), and waited one minute before resuming typing. Laptop notes were a narrative account of what was happening in the classroom, including, where possible, what the teacher and children were saying. Audio recordings were also made for each session. Observers also made
rough drawings of the layout of the classroom, especially noting literacy artifacts. They also completed a summary form for each observation. Later, usually the same day, observers re-examined their typed records, edited them, and modified them if they thought modifications would provide additional detail or context.

Observation coded variables and associated reliabilities. The coding scheme was taken from Taylor and associates (Taylor, Pearson, Clark, & Walpole, 2000), and additionally, amendments were created for definitions of code categories, and examples for various coding categories were created. There were three steps in coding the observation narratives. Each observer coded her own observations. First, while reading a four-minute narrative segment, the coder coded the most salient literacy activities occurring during that period. These are the activities delineated as Level 4 activities in Appendix A. For every Level 4 activity noted, codes were determined for every other Level in Appendix A, that is, for Who was providing the instruction, the Grouping arrangement, the Major (literacy) Focus, Materials used, Teacher Interaction type, and Expected Pupil Response.

Second, after all four-minute segments for an hour of observation for a particular teacher were coded, then the codes were entered onto a second sheet by segments, showing each Level and the corresponding subcategories and denoting with subcategories were used in each segment. Next, for each teacher, for each observation, these variables were created: Who—Percent of Segments That Were Teacher, and That Were Assistant; Grouping—Percent of Segments That Were Whole Class, That Were Small Group, Pairs, and Individual; Major Focus—Percent of Segments That Were Reading, That Were Writing, That Were Other; Activity—Percent of Segments That Were Reading Connected Text, That Were Listening to Text, That Were Vocabulary, Lower-level Meaning, Higher-level Meaning, Comprehension Skill, Comprehension Strategy, Writing, Exchange of Ideas, Word ID, Sight Words, Phonics, Word Recognition Strategies, Phonemic Awareness, Letter ID, Spelling, and Other; Material—Percent of Segments That Were Textbook (Narrative), That Were Textbook (Information), Narrative Trade Book, Student Writing, Board/Chart, Worksheet, Oral Presentation, Pictures, Video/Film,
Computer, and Other; Teacher Interaction—Percent of Segments that were Telling/Giving Information, Modeling, Recitation, Discussion, Coaching/Scaffolding, Listening/Watching, Reading Aloud, Checking Work, Assessment, and Other; Expected Pupil Response—Reading, Orally Responding, Listening, Writing, Manipulating, and Other; and Active Responding (combined across student responses coded as reading, writing, manipulating, and oral responding), and Passive Responding (combined across reading—turn taking and listening). For expected pupil response in Level 7, two levels were created labeled active responding and passive responding. As well, Time on Task proportions were added across segments to create one Time on Task variable for each one-hour observation.

Third, for each teacher, parallel percentages for those just named were created for Total Percentages across the three observations for Year 1 and then again for Year 2.

Observers were trained in doing the observations as well as coding them. During approximately 20 hours of training, observers: attended a 4-hour session on using the observation instrument led by Dr. Barbara Taylor; watched videotapes supplied by Dr. Barbara Taylor; and practiced coding observation narratives previously done for another project.

Reliability estimates were excellent. They were estimated in two ways. First, the Principal Investigator accompanied observers to sites and did an observation alongside observers for each teacher in the study. Then the Principal Investigator and the “main” observer coded their own narratives. Reliabilities (proportion of times the “main” observer agreed with the Principal Investigator) for the seven Levels were .96, .93, .94, .71, .82, .78, and .88, respectively. Second, the Principal Investigator worked from the observers’ narratives and recoded them, checking the proportion of times the observer agreed with the Principal Investigator. The Principal Investigator began by randomly sampling 25% of the one-hour sessions, making sure to sample at least one hour from each observer (and excluding sessions the Principal Investigator had observed in person). This was done at each observation time so
that by the end of the study, she had done this with every teacher who was observed. The reliability estimates for the seven Levels were .99, .95, .93, .78, .86, .87, and .90, respectively.

Finally, reliability for the Time on Task variable was calculated from the Principal Investigator’s sessions sitting alongside the “main” observer. The Pearson Correlation was .72.

Teacher change in reading instruction examination, variable creation, and reliability. Degree of teacher change in reading instruction was investigated two ways. The first followed procedures sometimes used in qualitative analyses in order to cluster teachers according to the type of change they demonstrated (Bogdan & Biklen, 1992). The second was creation of a variable, Degree of Teacher Change, to be used in statistical analyses. For both ways of examining degree of teacher change in reading instruction, a subset was used of 11 focal teachers who had participated as focal teachers in both REA years and who had remained in the same grade for both years.

For the qualitative analysis, key variables were considered in advance to be particularly worthy of attention. These included: a) reading processes suggested as important by prior research, in particular the National Reading Panel (National Institute of Child Health and Human Development, 2000), including phonics/phonological awareness, word-level processes (other than meaning), vocabulary meaning, and comprehension; and b) other areas suggested in prior research as being related to student growth (Taylor, Pearson, Clark, & Walpole, 2000; Taylor, Peterson, Pearson, & Rodriguez, 2002), including size of instructional group, degree of coaching, level of comprehension questions, and active versus passive student response. Phonics/phonological awareness included the variables defined in coding observations as Phonics and Phonemic Awareness. Word-level included variables defined in coding observations as Word Identification, Sight Words, Word Recognition Strategies, Letter Identification, or Spelling. Vocabulary meaning was Vocabulary in the coded observations, and comprehension was Meaning of Text—lower level, Meaning of Text—higher level, Comprehension Skill, and Comprehension Strategy.
First, a table was made for each teacher in which the variables created during coding were listed in a column on the left side of the table, and then six columns of the percents for each variable were listed, one for each observation. Then, focusing on the first two and the last two observations, an investigator skimmed all the field notes typed on laptops during observations, moving teacher by teacher and in chronological sequence. As she read the field notes, she also looked at the tables of percents, all the while trying to discern patterns of changes, with the goal of clustering teachers who seemed alike in ways that they changed their reading instruction over time. As she worked, she made notes about possible hypotheses for clusters and rechecked the field notes and tables, adjusting her conclusions where new information came to light or embellishment was needed.

To triangulate findings, while the first investigator was doing her analyses, a second used slightly different means to address the same issue, exploring patterns in the data. Rather than reading protocols, at this point in the analyses, he focused exclusively on the tables of percents of sequences for which the various variables occurred. Looking at the first and last two observations for each teacher, he made charts using “up” and “down” arrows to show possible teacher change from the beginning to ending of the two years for each of several variables in the tables. Then he looked across the charts to explore possible clusters of teachers who shared patterns of “up” and “down” arrows. The result was a list of tentative hypotheses about teachers who changed in like ways.

Next, the two investigators met with the Principal Investigator and shared their respective hypotheses. All agreed that, on the whole, the most evident pattern in teacher change was that some teachers changed emphasis in teaching, tending for instance, to teach more comprehension later than earlier, or teach more about words later than earlier. Then each hypothesis about possible clusters of “like” teachers, with regard to ways in which they changed, was examined, one at a time, with one investigator suggesting one set of teachers, and the other checking his work to agree or disagree. Where there were disagreements, discussion ensued, and in one or two cases, a hypothesis was dropped. The result was a list of conclusions about several clusters of teachers who appeared to change in like ways.
The variable, Degree of Teacher Change, was created from the clusters created in the qualitative analysis by assigning a “3” (higher change) to the teachers who exhibited positive instructional change from the first two observed lessons to the last two for at least two of the reading subprocesses emphasized in the National Reading Panel report (National Institute of Child Health and Human Development, 2000) (phonics/phonological awareness, word-level processes [other than meaning], vocabulary meaning, and comprehension). Teachers 4, 6, 7, 8, 9, and 10 were higher-change teachers. Those teachers (teachers 1, 5, and 11) who exhibited positive instructional change in only one of the subprocesses were assigned a “2” (moderate change). Those (teachers 2 and 3) who showed no clearly identifiable positive instructional change in a reading subprocess were assigned a “1” (lower change).

**Focal teacher logs.** The four focal teachers at each of the four focal schools were asked to complete a classroom log form for one designated week in the middle of Year 1 and Year 2. The log and procedures were modified slightly from Taylor and associates (Taylor, Pearson, Clark, & Walpole, 2000). Research Assistants trained the focal teachers in use of the logs in advance of their implementation.

First, two children were chosen in each focal classroom for the teacher to “follow” for the logs. One child was the highest scorer on Reading Instructional Level, Reading Words in Isolation, and Phonics Knowledge at the beginning of the academic year, and the other child was the lowest scorer. Each teacher was asked if the chosen children were accurate representations of high and low readers or if the children were challenged by attentional or behavioral difficulties or if their attendance was erratic. In each case teachers agreed that the chosen children were accurate representations of high and low readers in the classroom and said that the chosen children were not “challenged” in any ways.

The goal was for the teacher to use the log to track each of the two students’ actual literacy activities for one week. The teacher filled out one log form for each student at the end of each day, resulting in five logs for each student at the end of the week. Literacy activities were defined as Phonics/Phonological Awareness, Other Word-Level Instruction, Word Meaning, Comprehension 1—
Instruction for Skills and strategies; Comprehension 2—Talk or Writing about Text; Listening to a Read Aloud; Teacher Directed Reading; Independent or Partner Reading; Composition; Spelling/Mechanics; and Other. Definitions and examples of each literacy activity were provided. A teacher also noted on the form the subject area within which the literacy activity occurred (Reading/Language Arts; Social Studies; Science; Math; Other). As well, she/he noted the type of grouping used (Large Group, Small Group, Pair, Alone, and Independently with an Adult). Finally time periods for each literacy activity were noted on the logs.

Staff development logs. Literacy facilitators maintained REA staff development logs and turned them in at the end of Year 1 and end of Year 2. On the logs, they indicated: date of activity and who attended (e.g., first grade teachers); type of activity (e.g., workshop, grade level meeting); topic (the reason or purpose for the activity or what the teachers were supposed to learn or get out of it); who conducted the activity; and how the activity was conducted (e.g., 30-minute presentation followed by 15-minute small-group discussions).

Variables and associated reliability estimates. Three variables were created from the staff development logs: Total Amount of Time Teachers Spent in Staff Development (contact hours by school), excluding time spent on summer school planning and attending a Reading Recovery conference; Topics Covered in Staff Development (rank ordered by amount of time spent on topics within school, except for Schools 8 and 9 where the logs did not contain sufficient information to calculate times); and Type of Intervention Reform Effort used for staff development described as follows:

a) Pre-Structured Program—Four Blocks (Cunningham & Hall, 1994; Cunningham, Hall, & Defee, 1998; cf. http://4blocks.com]. Four Blocks is a structured, balanced literacy framework to help children be better readers, writers, and spellers (http://4blocks.com). The four blocks are: Guided Reading, Self-Selected Reading, Writing, and Working with Words. In Guided Reading, students are led through a text chosen by the teacher, in a whole group, small group, or paired
setting. In Self-Selected Reading, children choose books themselves. Children may share responses to what they have read and teachers may hold individual reading conferences during this time. During Writing, children write independently and the teacher may do a mini-lesson modeling aspects of what good writers do, such how to start a piece, revise, or illustrate. Individual conferences are held during this time, and children share writing too. During Working with Words, children focus on word recognition abilities. Four Blocks is used in first-through third grades. A modified version for kindergarten is called Building Blocks.

b) Weakly Scaffolded Process—Center for the Improvement of Early Reading Achievement (CIERA) project implemented only in REA Year 1 (cf. http://www.schoolchange.CIERA.org/emdo/MP.html; Taylor, Pearson, Clark, & Walpole, 2000). CIERA refers to the Center for Improvement of Early Reading Achievement’s School Change Project, a grassroots effort to scaffold educators in reading instruction reform. CIERA typically serves high-poverty, low-income schools. To participate in CIERA, 90% of teachers at a school must volunteer. While it is a systematic reform process, it is also responsive to needs within a particular school. Each CIERA project is based upon a plan that is developed in concert with the faculty and staff. The scaffolded process is a hallmark of the CIERA effort, and six major emphases are covered in the process: school change, professional development, school-wide decisions, classroom instruction, specific reading interventions, and school/home/community connections. The classroom instruction emphasis includes elements of effective instruction (instructional balance, modeling/coaching/scaffolding, encouragement of self-reliance, and authentic, engaging literacy activities. Each of the six emphases is discussed, and specifics are planned and implemented together with school faculty and staff.

c) Both Pre-Structured Program and Strongly Scaffolded Process—Four Blocks done along with CIERA.
d) Pre-Structured Program along with weakly Scaffolded Process—Four Blocks done along with CIERA or CIERA-like process, but CIERA done only for REA Year 1.

e) No Pre-Structured Program or Scaffolded Process.

The Principal Investigator: a) read all of the logs, b) created categories for topic collation, c) created a set of rules for categorizing and ranking Topics Covered and counting Total Amount of Time; and for categorizing schools into Type of Intervention Reform Effort. She then reread the logs to categorize and rank order Topics Covered by amount of time spent within school, count Total Amount of Time spent, and categorize schools as Type of Intervention Reform Effort. She then trained a research assistant in the rules for determining the three variables, and he read the logs to create the variables. For Topics Covered, an additional brief training session was done by selecting three schools and comparing the Principal Investigator’s and the research assistant’s rankings. Disagreements about rankings for those three schools were resolved through discussion.

For Total Amount of Time Teachers Spent in Staff Development, the Pearson Correlation between the Principal Investigator and the research assistant was .75. For Topics Covered in Staff Development, Spearman Rank Order Correlations ranged from .66 to .93 for the 16 schools, with three from .66 to .67, three from .74 to .76, and the rest from .90 to .96. For classification of school into Type of Intervention Reform Effort, agreement was 1.00.

*North Carolina End-of-Third-Grade Reading Achievement scores.* The North Carolina End-of-Grade (EOG) Reading Test for third grade, a required 50-item multiple-choice test for eight passages, is administered in the spring. The test was originally field tested during May 1992, and was first administered in May 1993 (Public Schools of North Carolina, 1999).

Passages vary from year to year and can include a broad range of text, such as fiction, poetry, drama, biographies, or informational text (Public Schools of North Carolina, 2003). According to the NC Department of Public Instruction (Public Schools of North Carolina, 2003), four categories are addressed in the questions: cognition, interpretation, critical stance, and connections. The following
definitions and sample items are from Public Schools of North Carolina, 2003 (pp. 2-3): Cognition applies to the text as a whole and refers to strategies that a reader would use to understand the text selection (e.g., “What is the main idea?”). Interpretation requires students to clarify, explain, extend or adapt ideas and/or concepts to develop understanding (e.g., “What will most likely happen next?”). Critical stance requires that a student engage in processes such as comparing and contrasting to objectively consider a selection (e.g., “How is X different from Y?”). Connections refers to having a reader relate the selection to other experiences and information beyond the text selection, or with other selections (e.g., Which experience is most similar to Joe’s experience in the selection?”).

**Scoring.** The North Carolina EOG Reading test is scored on three scales—developmental scale scores, percentiles, and achievement levels. In this report, only achievement level scores were used. Achievement level can range from “one” to “four.” According to the NC Department of Public Instruction (Public Schools of North Carolina, 1999), students performing at an achievement level of “one” do not have satisfactory mastery of skills and knowledge to be successful at the next grade level. “Two” indicates that students’ demonstration of knowledge and skills is not consistent with grade-level material, and they are minimally prepared to be successful at the next grade level. “Three” indicates that students’ demonstration of knowledge and skills is consistent with grade-level material, and they are well prepared for the next grade level. “Four” indicates performance at an advanced level that is consistently beyond grade-level work.

Achievement levels were originally set using the contrasting-groups method of standard setting, which involves having students categorized into the various levels by expert judges, in this case, teachers. Percentages of students in each achievement level along with frequency distributions of scores from the first EOG test in May 1993 were used to determine the cut points on the EOG Reading Test for achievement levels (Public Schools of North Carolina, 1999).

There is some evidence to support the validity of the EOG achievement level scores in that at least one North Carolina school district found reasonably good correlations (.63 to .74) between EOG
achievement level scores and instructional reading level scores for two years determined in the same way as in the present report (Baenen & Dulaney, 2000).

Financial information. To determine per pupil expenditure, budget breakdowns by school were provided by the North Carolina DPI. The breakdowns included administrative costs, but only by county, and not by school. Where there was more than one school in a county, to arrive at a total cost for each school, the county administrative cost was reassigned to schools within counties proportionately to a school’s non-administrative costs. The North Carolina DPI also supplied annual numbers of students by grade level by school. Numbers of students for calculating per pupil expenditure were determined by calculating the total number of students in a school in kindergarten through third grade for Year 1 and then for Year 2 and then averaging across the two years.

Descriptions of Schools, Literacy Facilitators, Teachers, and Principals

Communities and Schools

First, some commentary on the communities within which the schools were located may provide contextual information for interpretation of results. Individual school history accounts are provided in Appendix B. The schools were located in the Coastal, Southern, and Piedmont, but not the westernmost, regions of North Carolina. Table 3 shows community sizes and median incomes for each school, derived from the 2000 U.S. Census (United States Census, 2000) excepting School 13, which is from the 1990 U.S. Census (United States Census, 1990) (because it was not available in the 2000 census information). Information was retrieved using the city/town/village for the school’s address. Sizes of communities where the schools were located were extremely varied, ranging from under 1,000 residents (Schools 9, 11, 13, 14, and 15) to 540,828 (School 3). The median size was 7,672 people. Local economies varied across schools. In some (Schools 1, 2, 4, 6, and 12), economies had centered on mills and factories, with several closing within the past 50 years, severely affecting communities, and especially impacting unemployment rates. At least one school (3) community was considered inner-city. One school (5) was located near a military base. Two school communities (7 and 8) that were
located in the same county neighboring a major North Carolina city might have been considered “bedroom” communities, though not clearly suburban. Other communities (Schools 9, 10, 11, 13, 15, and 16) were predominantly rural, farming communities. Finally, one school (14) was located in an area predominantly known for tourism.

Median income (2000 Census) tended to be positively associated with community size. Extremely low median income for a city/community, from $17,287 to $23,182, tended to be associated with the more rural areas (e.g., Schools 9, 10, 11, 12, 13, 15, and 16). In areas with larger populations (e.g., Schools 1, 3, 5, 7, and 8), median incomes tended to be higher, ranging from $35,301 to $39,924.

Table 4 provides a summary of key demographic characteristics of schools. All information in Table 4 was provided by the North Carolina DPI for the academic year 2001-2002. Total school enrollments ranged from 83 students (School 14) to 735 students (School 16). Schools 1 and 2 appeared the most ethnically diverse of the 16 schools, with School 1 having approximately 19% students who were Caucasian of European descent, 46% African American, and 32% Latino, and School 2 approximately 43%, 33%, and 23%, respectively. Latino presence was also notable in School 3 (22%), but no other schools had more than more than 16% Latino students. On the other hand, some schools tended to be ethnically homogeneous. For instance, the ethnic make-up of School 14 was 81% Caucasian of European descent, and Schools 3, 5, 8, 9, 10, 11, 12, and 16 were predominantly African American (73% to 98%). Other schools (e.g., 1, 2, 4, 6, 7, 13, and 15) were somewhat more mixed ethnically among Caucasians of European descent and African Americans.

A commonality across most of the 16 schools was a high percentage of students receiving free or reduced lunch rates. For all but Schools 4 and 15, the percentage of students in the sample receiving free or reduced lunch ranged from 68% to 97%. The percentages for Schools 4 and 15 were 46% and 41%, respectively.

Principals
The 22 were females, 11 were males, and 2 did not report gender. Two of the 22 were African American, 12 were Caucasian of European descent, and 3 did not report ethnicity. This was an extremely varied group with respect to prior teaching or administrative experience (prior to Year 1), ranging from 4 to 38 years (N = 20, 2 missing data). At the same time, most of the principals had a considerable amount of prior experience, with the median amount of prior experience of 22 and the mean of 20. All 20 who reported information about their licenses held a North Carolina administrator’s license. They were also a highly educated group, with 12 having a master’s degree, 5 having an educational specialist diploma, and 3 having a doctorate (again, two did not report this information).

**Literacy Facilitators**

Each school had a full-time teacher called a Literacy Facilitator, whose responsibilities included oversight of staff development for the classroom teachers, teaching reading to children in need of additional help, and REA administrative duties. Literacy Facilitators 17 and 18 replaced Facilitators at Schools 6 and 13 during Year 2. All Literacy Facilitators were females. Four of the 18 were African American, 13 were Caucasian of European descent, and 1 declined to provide ethnicity. This was also an extremely varied group in relation to years of teaching experience prior to Year 1, ranging from 1 to 31, with the median being 14 years and the mean 15. All 18 had held a NC teaching license. For 6 of them, their highest degree was an undergraduate degree, and for 12, their highest degree was a master’s degree.

**Teachers**

Two-hundred-sixty-two teachers participated in the study across the two years. The majority (N= 254, 97%, missing data for 3) was female, and there were five males. Most (of the 257 self-reports) were Caucasian of European descent (62%), 34% were African American, 1% (N=3) was Asian, 1% (N=3) Latino, and less than 1% (N=2) of another ethnicity. Again, the group’s (N =256) prior teaching experience was highly varied, ranging from no prior experience to 45 years. The mean and median
number of years of prior teaching experience were 12 and 8, respectively. Most (236 of 257 self-reports or 90%) held a North Carolina teaching license. However, 21 teachers (8%) did not. The vast majority (198 of 253 self-reports or 76%) reported their highest degree as an undergraduate degree; only 20% (N=53) reported having a master’s degree; and fewer than 1% (N=2) reported having as their highest degree a two-year degree.

Results

What Happened for Professional Development during the REA Implementation?

Two levels of professional development occurred and these are described separately in the following passages. A representative of the North Carolina Department of Public Instruction organized staff development for the Literacy Facilitators during the two-year REA implementation, and the Literacy Facilitators oversaw REA staff development for the classroom teachers at their schools.

Literacy Facilitator staff development. During each of the two years of REA implementation, the Literacy Facilitators met with the DPI representative as a group approximately once a month, usually for two consecutive days at each meeting. Information for this section was obtained from the North Carolina DPI in the form of session agendas, which included dates, topics, and approximate amounts of time spent on each topic. Across the two years, they had 23 sessions totaling approximately 217 contact hours, with approximately 12.8 hours spent on administrative issues related to the grant and the remaining 204.2 hours on content for staff development. Many would view this as a serious and intensive effort. Major topics covered clearly reflected reading process and instruction domains suggested as important, and based upon what was referenced as scientific research, by the National Reading Panel (National Institute of Child Health and Human Development, 2000), including phonemic awareness, phonics, fluency, comprehension, and vocabulary. Topics covered, and approximate amounts of time in contact hours, could be categorized as follows:

a) how to teach reading (approximately 49.2 hours total across the following subgroups of topics)—writing (approximately 15.4 hours), phonics and phonological awareness
b) how to plan and deliver staff development (approximately 42.6 hours, the bulk of which was in Year 1—34 hours);

c) reading theory, development, and research (approximately 32.9 hours);

d) literacy assessment (approximately 29.2 hours);

e) REA purposes and related administrative issues (approximately 22.9 hours);

f) Family Literacy (approximately 9.0 hours);

g) working with struggling readers (approximately 5.5 hours);

h) classroom organization and management (approximately 5.4 hours);

i) planning for summer school programs (approximately 4.0 hours);

j) literacy centers (approximately 2.5 hours); and

k) effective teaching behaviors (approximately 1.0 hour).

The DPI representative conducted most of the sessions herself. On four occasions, a guest presenter led the group. Means of conducting the sessions included: discussion, lecture/presentation, “practicing” how to teach something or how to administer a test, role playing, planning for professional development, and watching videos.

Classroom- teacher professional development. The range of Total Amount of Time Teachers Spent in Staff Development by school was large—from approximately 42.75 hours (School 12) to approximately 136.00 hours (School 8). There was remarkable consistency across schools in Topics Covered in Staff Development. In general, and not surprisingly, topics paralleled those covered in the sessions that the NC DPI representative did with the Literacy Facilitators, and they consequently included the major areas considered to be based upon scientific research as suggested in the National
Reading Panel (National Institute of Child Health and Human Development, 2000) report. They included: how to teach writing; phonics and phonological awareness; comprehension; vocabulary and language development; fluency; words; guided reading; reading theory, development, and research; literacy assessment; REA purposes; classroom organization and management; literacy centers; reading with English-language learners; balanced literacy; Four Blocks and CIERA sessions (at schools using Four Blocks and CIERA); and miscellaneous sessions such as having a trade book publisher representative do a session on use of classroom materials. Numbers of topics covered ranged from 7 (School 2) to 14 (School 16). After ranking categories within school according to the approximate amount of staff development time spent on each category, it was evident that for all schools, teaching—phonics/phonological awareness was among the top four areas of emphasis, and for all but Schools 7 and 13, literacy assessment was also among the top four areas of study. No other patterns in topic emphasis (or lack of emphasis) emerged across schools or subgroups of schools.

Formats for sessions were highly similar across the 16 schools, with each school using multiple formats, including: lecture/presentation, discussion, “make and take,” teacher “practice,” watching videos, watching demonstrations, and discussing articles and books. In a few instances, teachers attended reading conferences, and/or observed in other teachers’ classrooms. In CIERA schools, “Study Groups” were frequently listed. In general, sessions were led by the Literacy Facilitator, but on several occasions, sessions were led by other teachers or central office staff, the DPI REA representative, an outside consultant, and publishing company representatives. Also, for the schools doing CIERA, many sessions involved a CIERA facilitator.

For Type of Intervention Reform Effort, schools were categorized as follows. Listing of Four Blocks and CIERA or CIERA-like processes had to be done in the staff development logs in order to be placed in one of those “types,” and to be claimed as implementing CIERA, Dr. Barbara Taylor had to agree that the school actually participated in a CIERA project.

a) Pre-Structured Program—Four Blocks: Schools 2, 5, 10.
b) Weakly Scaffolded Process—CIERA: Schools 7, 8, implemented for REA Year 1 only.

c) Pre-Structured Program and Strongly Scaffolded Process—both Four Blocks and CIERA implemented simultaneously: Schools 13 and 14.

d) Pre-Structured Program along with Weakly Scaffolded Process—both Four Blocks and CIERA, but CIERA done only for REA Year 1 (School 16), or a school did Four Blocks and claimed to imitate CIERA sessions done at another school during REA Year 1 (however, this latter school was disavowed as a CIERA school by Dr. Taylor) (School 15).

e) No Pre-Structured Program or Scaffolded Process: Schools 1, 3, 4, 6, 9, 11, and 12.

What Other Reading Efforts Were Simultaneous to REA Intervention in the REA Schools?

On the questionnaires, Literacy Facilitators and Principals were asked about their schools’ use of basals and other reading efforts that might be considered simultaneous to the REA intervention. Probably because REA was consonant with a state basal adoption year, fourteen of the 16 schools were also implementing basal series that were new to them. Four different basals were used by all 16 schools: Scott Foresman (Afflerback, Beers, Blachowicz, Boyd, Cheyney, Diffily, Gaunty-Porter, Juel, Leu, Partore, Segesta, & Wixson, 2002) (Schools 1, 2, 4, 5, 6, 7, 8, 16), Open Court (Adams, Bereiter, Brown, Campione, Carruthers, Case, Hirshberg, McKeough, Pressley, Roit, Scardamalia, Stein, & Treadway, 2002) (School 3), McGraw Hill (Flood, Medearis, Hasbrouck, Paris, Hoffman, Stahl, Lapp, Tinajero, & Wood, 2001) (Schools 9, 10, 11, 12), and Harcourt School (Harcourt School Publishers, 2001) (School 13, 14, 15). Notice that which basal is used does not appear to be associated with Type of Intervention Reform Effort. However, since use of basals can have an important influence on children’s learning about reading, it seems important to characterize the four basals used by the REA schools. Table 5 provides a classification scheme within which it appears that: a) All include phonemic awareness/phonological awareness/phonics instruction, although Harcourt Brace may not emphasize these areas as much as the other three basals, and only the Harcourt Brace publisher mentions oral language as a target ability. b) All refer to the importance of explicit instruction. c) Open Court appears
to be the most heavily scripted, with Harcourt Brace also having some scripted lessons. d) Only Open Court publishers mention scientifically-based reading instruction, but Scott Foresman publishers refer to an evidence base, and Harcourt Brace publishers also refer to research-based instruction. In short, claims for targeted reading skills and some other features overlap, but the basals may be primarily distinguished in that Open Court appears to the most heavily scripted, and it, along with Harcourt, refer to research-based practices.

As for other reading efforts schools considered supplementary to their REA interventions, between zero and four were mentioned per school, with four being the mode. Efforts given were: use of supplementary reading materials, such as Accelerated Reader (Advantage Learning Systems, 1993), Pearson Learning materials (Pearson Learning Group) and Wright Group books (Wright Group/McGraw-Hill); using computer software for supplementary instruction; and individual tutoring (in after-school programs).

How Might Classroom Reading Instruction Practices in Focal REA Schools be Characterized, and Were there Relationships between Classroom Instruction Practices and Staff Development and/or Children’s Growth in Reading?

To address issues related to classroom reading instruction practices, unless otherwise noted, 11 focal teachers in the four focal schools were selected. The 11 teachers were ones who had been observed during both REA years and who had remained in the same grade. Some prefatory remarks may provide a context for readers to interpret the findings in this section: a) An assumption was made in the analyses that teachers’ decisions about lessons for observations were driven by what they felt was most important for students to learn in order to become good readers. All focal teachers were told that the purpose of the observations was to understand their reading instruction and their changes in reading instruction. Observation times were agreed upon in advance. b) Two limitations to the study should be noted. First, each observation was only one hour long, and there were only six observations. Consequently, inferences from findings may not be generalizable to teachers’ entire reading programs.
Second, some aspects of good reading instruction may be more amenable to revealing emphases in particular variables rather than others. For instance, during a guided-reading lesson, a teacher may instruct students in word-level processes, vocabulary meanings, comprehension, and even fluency. However, in a word-level session, only emphases on word-level processes, phonological awareness, or vocabulary meaning may likely emerge.

Results of analyses for the following issues are provided in this section: a) Did classroom reading instruction change over the two years? b) To address the relationship between teacher change and staff development, two sub-questions were raised: “Was Degree of Teacher Change related to Total Amount of Time Spent on Staff Development?” and “Was Degree of Teacher Change related to Type of Intervention Reform Effort?” c) To address the relationship between teacher change and children’s growth, two sub-questions were raised: “Was Degree of Teacher Change related to children’s overall Instructional Reading Level growth,” and “Was Degree of Teacher Change related to children’s growth in Reading Words in Isolation, Phonics Knowledge, Comprehension, and/or Fluency?”

*Did classroom reading instruction practice change over the two years?* The issue of classroom reading instruction practice change was addressed by first describing change on key reading instruction factors across teachers within school and then by exploring whether there were patterns for clusters of teachers who changed in similar ways on one or more key characteristics of reading instruction.

First, Table 6 shows mean percents on key instructional variables averaged across teachers within a school for the first two observations and then again for the last two observations. The table was examined for changes considered positive in important reading subprocesses previously identified in the National Reading Panel report (National Institute of Child Health and Human Development, 2000), including phonics/phonological awareness, word-level processes (other than meaning), vocabulary meaning, and comprehension, as well as other areas previously suggested as being related to student growth in reading (Taylor et al., 2000; Taylor et al., 2002), including size of instructional group, degree of coaching, level of comprehension questions, and active versus passive student response.
Three results are particularly noteworthy: a) At each school, at REA inception, some teachers were already exhibiting instructional behaviors previously considered to be beneficial for student growth. For instance, in School 1, during observations 1 and 2, a relatively large percent of observation segments contained small group instruction (67.17% of observed segments), coaching (68.67%), and active student responding (82.50%). At School 3, during observations 1 and 2, both word-level (64.13%) and phonics/phonological awareness (57.50%) were emphasized. At School 5, considerable coaching (62%), word-level (55.00%), phonics/phonological awareness (38.17%) instruction was emphasized. At School 10, considerable comprehension questioning (higher-level, 20.83%, and lower-level, 32.23%) and active student responding (62.48%) occurred. b) Still, at each of the four schools at least some positive change occurred over time in emphasizing certain reading subprocesses. In this regard, School 10 stands out as perhaps showing the most positive changes in instructional emphases. Teachers at School 10 shifted to emphasize more small group instruction during observations (from 19.43% to 44.08%), increased coaching (from 20.83% to 30.18%), decreased telling (48.85% to 0.00%), increased active student responding (from 62.48% to 94.25%), and increased phonics/phonological awareness instruction (from 5.55% to 76.78%). c) Across schools and across time comprehension strategy/skill instruction tended to have received little emphasis.

Second, there were two main conclusions from the analyses exploring patterns for clusters of teachers who changed in similar ways. a) First, several teachers showed substantial increases from the beginning of REA to the end of REA in the percent of observed segments that included one of the following four areas of reading subprocesses: word-level instruction, phonics/phonological awareness, vocabulary meaning, or comprehension. Teachers 4, 6, 8, and 10 showed increased emphasis on word-level subprocesses. Teachers 4, 7, 10, and 11 showed increased emphasis on phonics/phonological awareness. Teachers 4, 6, 7, 8, and 9 showed increased emphasis on vocabulary meaning. Teachers 1, 4, 5, 7, and 9 increased emphasis on comprehension. For a given reading subprocess, the cluster of teachers showing positive change includes teachers from more than one school. b) However, there were
few changes in the nature of instruction in a reading subprocess. That is, when teachers were already including a reading subprocess area in observed instruction at the beginning of REA, and then they continued to include it at the end of REA or they emphasized it more, generally, there was not a significant shift in how the subprocess was taught. There were occasional exceptions to this latter statement however.

In the following section, prototypical scenarios illustrate positive teacher change in each of the four reading subprocesses. The scenarios represent an amalgam across the teachers in a cluster; they are not represented verbatim from any one observation. For each of the four subprocess teacher-change clusters, first summary conclusions are stated, then illustrative scenarios for REA beginning and REA ending observations are provided. As the scenarios are read, it is important to keep in mind, that as was usually the case in classroom observations, the scenarios below are “layered” in so far as at least some of the activities in them would be coded in several categories. For instance in the early phonics/phonological awareness scenario, the retelling part of the activity would be coded as comprehension, while the inserted italics part would be coded as phonological awareness.

**Phonics/Phonological Awareness increased emphasis.**

Nearly all of the positive change in emphasis in the cluster, phonics/phonological awareness, was attributable to percent of segments containing phonics. In most cases, the change was entirely a movement from no emphasis on phonics to some phonics instruction. Notice that in the following early REA scenario the teacher did little to encourage students to develop phonics knowledge, whereas in the later scenario the teacher scaffolded the students as they did the work of matching sounds to letters. *An example of early REA instruction—phonics/phonological awareness cluster:*

Note in the following scenario that included in italics and parentheses are examples of what the teacher might have done/said (but didn’t) to include phonics/phonological awareness in the lesson.

**Teacher:** [Circulating around the room as students write.] You are doing a retelling.

**Make sure you have a beginning, a middle, and an end.**
Teacher: Class, listen while I read this [looking at a student’s paper]: “Sue saw a flower.” Clap that with me. [Teacher and class clap once for each word as she read the sentence again.] Listen, “Sue saw.” Who can take “Sue” apart?

Student 2: S-ue.

Teacher: Good. Are “Sue” and “saw” the same at the beginning?

Student 3: Yes!

Teacher: I like the pictures and writing I’m seeing!

An example of late REA instruction—phonics/phonological awareness emphasis cluster:

Teacher: [Using overhead transparency] Look at this letter [pointing to “r”]. What sound does it make?

Class: /R/, /r/, /r/.

Teacher: And these letters [pointing to “aw” and asking Student 1 to respond]? Student 1: /Aw/.

Teacher: Altogether now.

Class: /Aw/, /aw/, /aw/. R-aw, r-aw, r-aw [while teacher slides her finger under the “r” and the “aw” on the transparency].

Teacher: Now look at this list of words. Who can blend these?


Word-Level increased emphasis.

Most of the teachers who showed increase in word-level emphasis did do some word-level instruction in early REA, primarily through spelling. At REA end, however, there were also occasional instances of word-level instruction during reading of connected text—kinds of word-level instruction not seen as much in the beginning.

An example of early REA instruction—word-level cluster:
Teacher: We are going to learn words from the “at” family. What’s /r/ and /at/ put together?

Children: Rat.

Teacher: Good. Spell it.

Children: R, a, t [naming the letters in unison].

Teacher: Next word, /c/, /at/.

Children: Cat.

Teacher: Good. Spell it.

Children: C, a, t [naming the letters in unison].

[The teacher progresses through the lesson by having students blend words from sounds given by the teacher, and spelling each word.]

An example of late REA instruction—word-level cluster:

Teacher: Everybody has eight cards with eight letters. We’re going to build the word “be” using two letters. Do you have the two-letter word, William? [He goes to the pocket chart and builds “be.”] What is the word, William?

Student: Be.

Teacher: Now make the word “sea.”

Teacher: Who can spell it?

Student: “S” “e” “a” [puts “sea” on chart].

Teacher: Good. The first vowel says what?

Class: Its name.

Teacher: And what kind of “sea” is this?

Student: [Waving her hands] It’s like the ocean.

Teacher: Let’s make the word “all” now.

[Student 1 makes it on the pocket chart.]
Teacher: We’re going to keep “all” like it is, and spell “ball” [points to a student with the correct spelling on his cards].

Student: [Adds “b” to “all” on pocket chart.]

[The teacher leads students through several more words in a similar fashion.]

_Vocabulary meaning increased emphasis._

Teachers who tended to increase emphasis on vocabulary meaning over time showed some additional shift in the nature of their instruction in so far as they also integrated vocabulary meaning more into what might be called guided reading or shared writing lessons toward the end of REA than they did at the beginning.

_An example of early REA instruction—vocabulary meaning cluster:_

Teacher: I want to make more than one hog. What do I need to add?

Child 1: S [naming the letter and writing “s” on a word chart].

Teacher: How would I need to change letters to spell “gosh?” [Teacher emphasizes /sh/.] Make it with your tiles first before calling out the answer. [Calls on child.]

Child 2: G, o, s, h [naming the letters and writing “s” on the word chart].

Teacher: How would I need to change letters to spell “shot?” [Teacher emphasizes the /t/.]

Child 2: S, h, o, t [naming the letters and writing on the chart].

Teacher: With these same letters, you spell “host.” When you have a party, you _host_ the party.

_An example of ending REA instruction— vocabulary meaning cluster:_

Teacher: [Reviewing a book used the previous day.] What other new words from the story yesterday do you remember? We had three “g” words.

Child 1: Grass.
Teacher: He was doing this to the grass [teacher points to a word on the whiteboard].

Child 1: Gobbled.

Teacher: [Teacher has students raise their hands and name words and writes words on the whiteboard as students name them—“feather,” “wedding,” “banquet,” “kernel,” “gobbled.”] Good. Another “d” word. This word means disappointed, upset about something.

Child 2: Dismay. [Teacher adds “dismay” to the list on the whiteboard.]

Teacher: Before we reread our story, can someone tell me in just a few words what our story was about?

Child 3: [Summarizes story briefly with the teacher’s help.]

Teacher: [Asks the class to read story in unison.] Now it’s about flowers. What do we call flowers that just grow on their own?

Child 4: Wildflowers.

Teacher: Right. Where did the flowers come from?

Comprehension increased emphasis.

Some of the teachers in this cluster incorporated some lower-level questioning in early REA lessons. In contrast, at REA end, the teachers in this cluster tended to incorporate: a) more comprehension questioning and even, in some cases, b) more comprehension skill and strategy instruction. Notice these two differences in the following two examples.

An example of early REA instruction—comprehension cluster:

Teacher: Who can tell me the name of this book?

Child 1: [Answers with name of book]

Teacher: Let’s read the book together. Child 2, please read the first page for us.
[Child 2 reads the page with occasional assistance from the teacher who tells the child a word sometimes. Then other children read, again with the teacher telling words occasionally.]

Teacher: What was the name of the boy in the story?
Child 2: Jim.
Teacher: Right. Where did he live?
Child 2: I don’t know…
Teacher: Who can help Child 2?
Child 1: He lived on a farm?
Teacher: Right. What color was his tractor?

[The remainder of the lesson proceeds with the teacher asking lower-level comprehension questions based on recall from the text, and then moving to another activity.]

An example of ending REA instruction—comprehension cluster:

Teacher: Let’s begin to read on page 1. Open your books and read with me. [Teacher and students read in unison.] Let’s stop for a moment. Where was Ben?
Child 1: At the zoo.
Teacher: Good. Why did he feel bad about going to the zoo?
Child 2: He was sorry the animals were in cages.
Teacher: Right. Let’s keep reading. [Teacher and students continue reading in unison.]

Let’s think about what happened so far. Help me summarize. Good readers always summarize what they have read. What happened first in the story?
[Child 1 answers.]
Teacher: Great. Then what happened?
Teacher: Great job summarizing. Let’s make predictions about what will happen next.

Good readers also ask questions and make predictions. Does anyone have a prediction?

[Different students make predictions.]

Teacher: Let’s continue reading to see if any of our predictions were correct.

Was there a relationship between Degree of Teacher Change and Amount of Time Spent on Staff Development or Type of Intervention Reform Effort? There was an inverse relationship between Degree of Teacher Change and Total Amount of Time Spent on Staff Development, Spearman’s Rho = -.16, p < .02 (N = 218). Counter-intuitively, teachers who spent less time in staff development sessions tended to show greater change in reading instruction.

There was a significant relationship between Degree of Teacher Change and Type of Intervention Reform Effort, Kruskal-Wallis Chi-Square = 67.58, p < .01 (N = 218). For the four focal schools, only two types of Intervention Reform Effort were represented—Pre-Structured Program (Schools 5 and 10) and No Pre-Structured Program or Scaffolded Process (Schools 1 and 3). There was a tendency for teachers in a Pre-Structured Program to demonstrate a higher Degree of Teacher Change.

Was Degree of Teacher Change related to children’s Instructional Reading Level growth or growth in Reading Words in Isolation, Phonics Knowledge, Comprehension, and/or Fluency? To address the relationship between Degree of Teacher Change and children’s Instructional Reading Level growth, a mixed-model repeated measures analysis of variance was done, with time of testing as a within-subjects factor (Year 1 beginning and Year 2 ending), Instructional Reading Level as the dependent variable, and Degree of Teacher Change as an independent variable. For all remaining analyses throughout the rest of this report, corrections were made for over-sampling of English-language learners at Schools 1 and 3. It is important to note that Instructional Reading Level was determined on the basis of word recognition accuracy and that comprehension was not included in the variable creation.
Also, since the repeated measures uses only cases for which an entire set of variables is present, the students included in this analysis were those who were at the schools for the entire two years. Children included in the analysis were those who had a focal teacher (in the group of 11) in either REA year or in both REA years. a) There was a significant ordinal interaction of time of testing with Degree of Teacher Change, $MV F (2, 89) = 3.98, p < .02$. Figure 1 shows that children who had moderate- and higher-change teachers tended to make more accelerated Instructional Reading Level progress as compared to children who had lower-change teachers. Moderate-change teachers’ students showed 5.55 years growth across the two years (Mean = 6.38 at the end, .83 at the beginning); high-change teachers’ students showed 4.99 years growth across the two years (Mean = 5.59 at the end, .60 at the beginning); and low-change teachers showed 3.12 years growth across the two years (Mean = 3.20 at the end, .08 at the beginning). b) Degree of Teacher Change was significantly related to children’s performance, $MV F (2, 89) = 4.53, p < .02$, and this effect held in the face of the ordinal interaction, with both moderate-change teachers’ and higher-change teachers’ students outperforming lower-change students on average (overall Mean regardless of time for moderate-growth teachers’, higher-growth teachers’, and lower-growth teachers’ students, respectively, 3.61, 3.10, and 1.64), $p < .01$, for moderate-change teachers compared to lower-growth teachers, and $p < .03$ for higher-change teachers compared to lower-growth teachers). c) As would be expected, on average, regardless of their teachers’ degree of change, children tended to perform better at the end of Year 2 than at the beginning of Year 1, $MV F (1, 89) = 200.11, p < .01$.

To address the relationship between Degree of Teacher Change and children’s growth in Reading Words in Isolation, Phonics Knowledge, Comprehension, and/or Fluency, separate repeated measures analyses of variance models were explored, combining Reading Words in Isolation and Phonics Knowledge in one model and Comprehension and Fluency in another model. This was necessary because too few numbers of students were available for analyses with all four variables in one model due to pair-wise deletion of subjects in analyses such that only students who had scores on all
four variables could be included. In particular, early first graders especially tended not to read well enough for comprehension and fluency measures to be obtained.

First, a doubly multivariate repeated measures analysis of variance was done with time of testing (Year 1 beginning, Year 2 end) as a within-subjects variable, Reading Words in Isolation and Phonics Knowledge as coupled dependent variables, and Degree of Teacher Change as an independent variable. a) Degree of Teacher Change was significantly related to children’s performance over the two years on Reading Words in Isolation and Phonics Knowledge, $MV F(4, 164) = 3.29, p < .02$. The multivariate effect was largely attributable to children’s knowledge of Reading Words in Isolation, $univariate F(2, 83) = 4.52, p < .02$ (for Phonics Knowledge, $univariate F[2, 83] = 1.42, p < .25$). As the Marginal Mean (fourth) column in Table 7 shows, on average and regardless of time, children who had moderate-change (2) or higher-change (3) teachers tended to outperform those who had lower-change teachers (1) on Phonics Knowledge. The interaction of Degree of Change with time of testing was not significant.
b) As would be expected, there was a significant effect of time of testing, and Table 7 shows that, on average, regardless of Degree of Teacher Change, children tended to perform better on both Reading Words in Isolation and Phonics Knowledge over time.

Second, a doubly multivariate repeated measures analysis of variance was done with time of testing as a within-subjects variable (beginning, middle, and end of Year 2), Comprehension and Fluency as dependent variables, and Degree of Teacher Change as an independent variable. The analyses included all students present focal teachers’ classrooms in Year 2. There were insufficient students to do a comparable Year 1 analysis, again due largely to early first graders’ low passage-reading abilities. a) On average, Degree of Teacher Change was significantly related to students’ performance, $MV F(4, 94) = 3.05, p < .03$. The effect was largely attributable to a relationship with Fluency, $univariate F(1, 48) = 4.48, p < .02$ (for Comprehension, $univariate F[1, 48] = 1.91, p < .16$). The column for the marginal means for Fluency in Table 8 shows that, on average regardless of time of testing, children of moderate-change (marginal Mean = 78.81%) and higher-change (marginal Mean =
61.02%) teachers tended to outperform children of lower-change (marginal Mean = 58.73%) teachers. The interaction of Degree of Teacher Change with time of testing was not significant. b) There was a significant effect for time of testing, $MV F (4, 45) = 5.036, p < .02$, primarily attributable to Fluency, $univariate F (2, 48) = 8.60, p < .02$ (for Comprehension, $univariate F (1, 48) = 2.46, p < .09$). Both at the end (marginal Mean = 74.48) and the middle (marginal Mean = 67.00) of the year, students scored higher on Fluency than at the beginning (Marginal Mean = 57.08). Note however, that although, on average, over the year, the Marginal Mean Comprehension percentages (bottom row of Table 8) stayed in a range that most would consider acceptable, there was an unexpected slight downward trend, from 83.57 to 75.82 to 72.29—which was not statistically significant.

How Might Children’s Growth be Characterized?

In the following sections, growth on Instructional Reading Level is described for students who began REA Year 1 in first or second grade. Then REA Year 1 kindergartener growth is described for Letter Knowledge, Book and Print Awareness, Phonics, and Phonological Awareness. Within each section, descriptive data are discussed, and then statistical analyses of children’s growth are given. For Instructional Reading Level, especially where mean scores appear exceptionally high, it is important to remember that the variable was calculated using children’s word recognition errors. While comprehension can be an important sub-process that is used to recognize words, comprehension per se, was not included in the operationalization of that variable. Also the statistical analyses could only include cases for which an entire set of data was available. Consequently, exceptionally high scores on Instructional Reading Level primarily reflect only students who were continuously present in conjunction with students’ strong word recognition abilities. Also, kindergarteners were not tested for Instructional Reading Level so they were not included in Instructional Reading Level analyses.

**Instructional Reading Level growth.** A general examination is given first of the changes in Instructional Reading level over time by school and grade within school. Table 9 shows means and standard deviations for Instructional Reading Level for all students who were continuously present in the
schools, having scores at all four time points. Looking at the columns in Table 9 for Years 1 and 2 growth for Instructional Reading Level, it appears that children in 9 of the 16 schools (Schools 2, 3, 4, 7, 10, 11, 12, 15, and 16) made substantial growth in both Year 1 and Year 2 in both grade level groups, ranging from, on average, 1.09 years growth to an amazing 3.69 years growth in a given year. In nearly all cases, students, on average, ended the school year (for Year 1 and/or Year 2) at or above the level expected for typically developing children in their grade level (approximately 1.00 for first graders, approximately 2.00 for second graders, and 3.00 for third graders) (see columns in Table 9 for Year 1 End and Year 2 End). Also noteworthy is the finding that in all 16 schools, on average, students ended Year 2 at or, in many cases, well above the level expected for typically developing children (see the next to last column of Table 9).

A repeated measures analysis of variance was done to investigate the statistical significance of potential effects for overall growth. Instructional Reading Level was the dependent variable, time of testing on Instructional Reading Level (with four time points—Year 1 Beginning, Year 1 End, Year 2 Beginning, and Year 2 End) was the within-group variable, and school (1 through 16) and grade (those in first grade in Year 1 and second in Year 2 formed one group, and those in second grade in Year 1 and third in Year 2 formed a second group) were between-subjects factors. The $F$ ratios were calculated with the multivariate method rather than using the potentially more powerful averaged univariate or mixed model method. That is, the $F$ ratios generated for the model made no assumptions about the variance-covariance matrices as tests of variance-covariance matrices required for the mixed model method were significant.

No single overall pattern of growth emerged across the schools. There was a complicated significant disordinal interaction of time by school by grade, $MV F(45, 1501) = 1.75, p < .01$. Both the school and grade a student started in mattered in relation to growth on Instructional Reading Level over time. Figure 2 shows the interaction, and the Year 1 and Year 2 Growth columns in Table 9 show the growth means. The variable that is plotted is growth in Year 2 minus growth in Year 1. If students
made more growth in Year 2 than in Year 1, the resultant score was positive. If they made more growth in Year 1 than in Year 2, the resultant score was negative.

Three general conclusions were: a) In most schools, in general, children who started REA in first grade (dotted line with the triangle) made more growth in Year 2 than in Year 1 (reflected in the time points that are above the zero on the vertical axis. b) But, in most schools, in general, children who started REA in second grade (solid line with squares) made more growth in Year 1 than in Year 2 (reflected in the time points below the zero on the vertical axis). c) Significantly, there were two exceptions to generalizations “a” and “b.” In Schools 7 and 13, children who started in first grade were exceptions to generalization “a.” Those children showed more growth in Year 1 than in Year 2. In Schools 2, 3, 10, 12, and 16, children who started as second graders were exceptions to generalization “b” in that they grew more in Year 2 than in Year 1. Every other effect in the model was significant: time by grade interaction, $MV F (3, 505) = 12.53, p < .01$; time by school interaction, $MV F (45,1501) = 4.36, p < .01$; time, $MV F (3, 505) = 334.85, p < .01$; school by grade, $MV F (15, 507) = 1.78, p < .03$; grade, $MV F (1, 507) = 94.28, p < .01$; and school, $MV F (15, 507) = 3.50, p < .01$. However, the disordinal three-way interaction overrode all other effects.

Kindergarten Letter Knowledge, Book and Print Awareness, Phonics, and Phonological Awareness growth. To address REA Year 1 kindergarteners’ growth on Letter Knowledge, Book and Print Awareness, Phonics, and Phonological Awareness, a doubly repeated measures analysis of variance was done, with time of testing (Year 1 Beginning, Year 1 End) as a within-subjects variable, four dependent variables—Letter Knowledge, Book and Print Awareness, Phonics, and Phonological Awareness, and school (N= 16) as a between-subjects variable.

First, on the whole, growth on the four measures varied according to school. There was a disordinal interaction of time with school, $MV F (6, 1173) = 4.53, p < .01$. All univariate follow-up constrasts were significant (for Letter Knowledge, $F (15, 2717) = 7.65, p < .01$; for Book and Print Awareness, $F(15, 868) = 4.79, p < .01$; for Phonics, $F (15, 1342) = 3.67, p < .01$; for Phonological
Awareness, $F(15, 830) = 4.32, p < .01$. Tables 10 and 11 show, for each school, the Year 1 mean beginning and ending scores as well as the growth means for all four variables. To better understand the interaction, higher-growth schools were compared to lower-growth schools on each of the four outcome variables. To classify schools as higher- or lower-growth, means for growth for each school were rank ordered for each of the four variables. To be considered a higher-growth school, a mean growth score had to appear in the top third for at least three of the four measures and never appear in the bottom third. To be considered a lower-growth school, mean growth had to appear in the bottom third for at least three of the four measures and never in the top third. Then the higher-growth and lower-growth schools’ mean Year 1 beginning and ending scores were graphed for comparison. Figures 3 through 6 show the comparisons. Main conclusions were: a) In general, Schools 1, 5, and 7 appeared in the higher-growth category, and Schools 11, 15, and 16 appeared in the lower-growth category. b) Looking at the growth column in Table 10 and the last data points in Figure 3, for Letter Knowledge, in most schools, on average, kindergarteners ended the year knowing the letter names quite well. However, in some schools the mean percents for Letter Knowledge at the end of the year were somewhat low—for example, around 70% or so for Schools 6, 14, and 15. c) Looking at the growth column in Table 10 and Figure 4, for Book and Print Awareness, again, in most schools kindergarteners had reasonably strong book and print awareness abilities at the end of the year, but in some schools, on average, those abilities were somewhat low—hovering in the low 70% range, as for Schools 2, 6, 10, 11, 12, and 16. d) Looking at the growth column in Table 11 and Figure 5, most kindergarteners’ end-of-year Phonics knowledge tended to be, on average, in what some would call a “moderate” range, for instance, from a mean of 35% (School 14) to around 77% (School 11). In only two schools were end-year means for Phonics relatively high, for instance above 80% (Schools 10 and 12). d) Finally, looking at the final growth column in Table 11 and Figure 6, although on average, students’ phonological awareness grew across the year, it was, on average, quite low across all of the schools at the beginning of the year, and at the end of the year, it still was in the moderate range across the 16 schools (from 36% to 65%).
Was there a Relationship between Type of REA Intervention Reform Effort and Children’s Reading?

The issue was addressed of whether different “types” of REA staff development interventions were associated with differential student achievement, first for Instructional Reading Level (for those who began in first or second grade) and second for a cluster of kindergarten variables.

Instructional Reading Level. The first model was a repeated measures analysis of variance including all 16 schools, and using Instructional Reading level as the dependent variable. Time of testing (with four levels, Beginning of Year 1, End of Year 1, Beginning of Year 2, End of Year 2) was a within-subjects variable. The variable described previously, Type of Intervention Reform Effort, with five types of efforts indicating the degree to which the effort involved pre-structured content and/or scaffolded process, was a between-subjects variable. Statistical assumptions for the more powerful mixed-model method were not met, and consequently a multivariate analysis was done.

Five points should be made about the results of the analysis. First, on average, students in all Types of Intervention Reform Effort made good growth, and in some cases exceptional growth, ranging in Year 1 from 1.53 years growth, on average, to 2.53 years growth (shown in column four in Table 12), and in Year 2 from 1.02 years growth, on average, to 2.64 years growth (shown in the last column in Table 12).

Next, there was a significant disordinal interaction between Time and Type of Intervention Reform Effort, $MV F(12, 1,407) = 4.29, p< .01$. Figure 7 shows the complicated interaction. Growth across years was different according to Type of Intervention Reform Effort. The second main point is that across REA Year 1, the schools that implemented both a Pre-Structured Program (Four Blocks) and a Strongly Scaffolded Process (Schools 13 and 14) made the greatest growth (2.53 years on average, across grades) (see the first two points on line 3 on Figure 6). Schools in the remaining four Types of Intervention Reform Effort (see the first two points on lines 1, 2, 4, and 5 on Figure 6) yielded less growth overall, and their growth was approximately equal (1.53 years on average to 1.69 years on average across grades).
Third, however, across REA Year 2, the schools that implemented the Pre-Structured Program only—Four Blocks Schools 2, 5, and 10)—made extremely good growth, substantially more than schools in the other Types, with an overall mean growth of 2.64 years compared to from 1.02 to 2.10 for the remaining Types (see the last column of Table 12 and the last two points for lines in Figure 7). The schools using the Pre-Structured Program along with the Weakly Scaffolded Process (Schools 15 and 16, and line 4 on Figure 6), made the second highest gain (2.10 years).

Fourth, it is especially notable that students in the schools where No Pre-Structured Program or a Scaffolded Process was used, on average, showed especially accelerated growth in Year 2 (as compared to Year 1) (see the last two time points on Figure 7).

Fifth, there was a significant main effect for time of testing, \( MV F(3, 532) = 239.97, p < .01 \). Regardless of reform effort, on average, students’ scores were higher at each ensuing time of testing.

Cluster of kindergarten variables. A doubly multivariate repeated measures analysis of variance was done for kindergarten growth, with time of testing (beginning of Year 1 and end of Year 1) as the within-subjects variable, with four dependent measures—Letter Knowledge, Book and Print Awareness, Phonics, and Phonological Awareness. Type of Intervention Reform Effort was a between-subjects factor. Assumptions were not met for a mixed-model method.

First, growth on the four measures collectively and independently varied according to Reform Effort. There was a significant interaction of time of testing with Reform Effort, \( MV F(16, 952) = 6.06, p < .01 \). All univariate contrasts were significant (for Letter Knowledge, \( F(4, 4369) = 10.48, p < .01 \); for Book and Print Awareness, \( F(4, 1843) = 9.55, p < .01 \); for Phonics, \( F(4,1976) = 5.04, p < .01 \); and for Phonological Awareness, \( F(4, 1110) = 5.26, p < .01 \)). Table 13 shows the beginning of Year 1 and end of Year 1 means as well as the mean growth, and Table 14 shows the rank order of the different Types of Intervention Reform Efforts for growth on each of the four dependent variables.

The basic conclusions were as follows. First, looking at Table 14, a) For Letters, Book and Print Awareness, and Phonics, the following Types of Intervention Reform Efforts tended to show greatest
growth: Pre-Structured Program (Type 1), Weakly Scaffolded Process (Type 2), and No Pre-Structured Program or Scaffolded Process (Type 5). b) For Phonological Awareness, the results were slightly different only in that the Pre-Structured Program (Type 1) was not among those showing greatest growth, and instead, the Type, “Both Pre-Structured Program and Strongly Scaffolded Process” (Type 3) also was among those showing greatest growth.

Second, there was a significant effect of time of testing, $MV F (4,311) = 368.91, p < .01$. All follow-up univariate tests were significant—for Letter Knowledge, $F (1,314) = 467.96, p < .01$; for Book and Print Awareness, $F (1,314) = 619.95, p < .01$; for Phonics, $F (1,314) = 847.83, p < .01$; and for Phonological Awareness, $F (1,314) = 446.98, p < .01$. As Table 13 shows, mean scores at the end of the year were higher than at the beginning of the year for every Type of Reform Intervention Effort and for each of the four dependent variables. There was a significant effect for Type of Reform Intervention Effort. However, this effect was overridden by the disordinal significant interaction.

How Does Third-Graders’ Growth on the NC End-of-Grade Reading Test Compare to Growth in Previous Years?

The following question was addressed for the End-of-Grade Reading Test Achievement Level score: Did third graders’ growth (in REA Year 2) (end of year minus beginning of year) exceed students’ growth rates in REA Year 1 or in the year before REA started? A repeated measures analysis of variance was done with Achievement Level score as the dependent variable; time of testing during the year as a within-subjects variable (with two levels, end-of-year test time and beginning-of-year test time); and year of testing as a between-subjects variable (with three levels, one year prior to the inception of REA, Year 1 of REA, and Year 2 of REA). Subjects for these analyses were third graders in all 16 schools who were present (and whose tests were scorable) for both test dates during a given year. Tests of assumptions about the variance-covariance matrices, required for mixed model analysis were not met, and consequently, the multivariate procedure was done. It is important to note that this
There was a significant disordinal interaction of time of testing with year of testing, \( MV F(2, 2423) = 3.192, p < .04 \). Figure 8 shows that, on average, growth in Year 1 of REA was similar to that of the pre-REA year (note the parallel lines), but growth in Year 2 of REA exceeded that of the previous two years. Table 15 shows that the practical shift in growth was small, albeit significant, with the mean growth in the pre-REA year and in Year 1 of REA being .21 and .19 achievement levels respectively, as compared to .29 in REA Year 2. In the pre-REA year and REA Year 1, students made approximately one-quarter of a point gain across the year, on average, whereas in REA Year 2, they made more than one-quarter of a point gain across the year.

Also for Achievement Level, there were significant main effects for time of test and for year of testing, \( MV F(1, 2423)= 175.81, p < .01 \), and \( MV F(2, 2423) = 4.95, p < .01 \), respectively. For time of test, regardless of year of testing, students, on average, scored higher at the end of the year than at the beginning. The year-of-test main effect was overridden by the significant disordinal interaction.

Another way to consider the End-of-Grade Reading Test Achievement Level scores was to examine the percents of students at or above grade level at the beginning of a given year compared to those at or above grade level at the end of a given year. Table 16 shows there was a 6.00% increase in percents of students at or above grade level during the Pre-REA year, an 8.00% increase during REA Year 1, and a 13.30% increase during REA Year 2. Again, it is important to note however, that factors such as changes in the test or student population across years may have accounted for changes across the three years.

**Was There a Relationship between Extent of Student Participation in REA Schools and Overall End-of-REA Instructional Reading Level?**

One way to examine the possible effects of REA on children’s reading ability was to create a within-program comparison group and do a post-test only comparison. Recall that at the four focal
schools, children who entered late or left early were tested. There were 15 students in that group who arrived at school just prior to the final testing (within two months) and who were not in an REA school until that point. Those children were selected as a low-treatment group who received a small amount of instruction under the REA umbrella. They were compared to another group of children who received the full complement of instruction across the two years of REA implementation.

Two preliminary points need to be made. First, although a group of 15 clearly indicates low statistical power to reveal significant effects that may exist, if significant effects are found, then the low number of students becomes moot. Second, it was possible that the low-treatment group and the full-treatment group differed on at-risk features that might account for possible differences in outcome. To test for such possible effects, correlations were done for treatment group (low versus full) with each of the following child variables: ethnicity, gender, free/reduced lunch, mother’s highest level of education, whether special services were received, and English-language learner status. No significant relationships were found (Kendall’s tau ranged from -.15 to .06). Consequently there were no significant differences in the two groups for these risk factors.

An analysis of variance was done with Instructional Reading Level as the dependent variable, and treatment level (low versus full) and grade at end of Year 2 (second or third) as two crossed between-subjects factors. School was not included in the analysis because of insufficient cell numbers. Treatment level was significant, $F(1, 226) = 4.64, p < .01$. Across grade levels, on average, those who were in the school for the whole two years of REA implementation attained higher Instructional Reading Levels ($M = 5.35$, s.d. = 3.62) than did those who were only there for the end of the period ($M = 3.02$, s.d. 3.15). (See Table 17.) There was also a significant grade level effect, $F(1, 226) = 6.79, p<.01$, with third graders ($M = 6.24$, s.d. = 3.79) outperforming second graders ($M = 4.17$, s.d. = 3.16).

Cost Analyses

What monies were spent and what was the overall per pupil expenditure? The 16 North Carolina REA schools received a total of $6,965,262 distributed over the two-year period. The range of
individual school expenditure was from $151,344 (School 2) to $977,307 (School 8), including administrative costs estimated proportionately for schools within districts. Costs by categories are shown in Table 18. On average, the majority of the funding was spent on supplies and materials (approximately 49.97%) for the schools, followed by personnel costs (approximately 31.82% for salaries, plus 5.41% for benefits). Per pupil expenditure was $1,666.

*Was emphasis in budgetary category of expenditure related to student Instructional Reading Level growth?* A repeated measures analysis was done with: time of testing as a within-subject factor (beginning of Year 1 and end of Year 2); Reading Instructional Level as the dependent variable; and by school, Percent of Monies Spent on Workshops, Percent of Monies Spent on Instructional Materials, and Percent of Monies Spent on Personnel as independent variables. Emphasis in budgetary category of expenditure was significantly related to student Instructional Reading growth from the beginning of Year 1 to the end of Year 2. Percent of Monies Spent on Workshops, controlling for the other two covariates, was significantly positively related to student growth, $F(1, 522) = 4.21, p .05$. Although significant, the correlation of Percent of Monies Spent on Workshops with student growth was small, .12 (*Spearman Rho*). Likewise, Percent of Monies Spent of Instructional Materials, controlling for the other two covariates, was significantly positively related to student growth, $F(1, 552) = 6.22, p < .02$. The correlation of Percent of Monies spent on Instructional Materials was also small, .12 (*Spearman Rho*). The third expenditure category, Percent of Monies spent on Personnel, was not significantly related to growth on Instructional Reading Level.

**Major Conclusions and Discussion**

In this section, the main conclusions of the external evaluation study are listed separately, and for most conclusions, a brief discussion is provided.

*a) CONCLUSION: What happened for professional development during the REA implementation?*

- Literacy Facilitators at the 16 REA schools received extensive staff development from the North Carolina DPI, mostly conducted by the North Carolina DPI REA representative, in 23 sessions
totaling approximately 217 contact hours. Major topics covered clearly reflected reading subprocess and instruction domains suggested as important, and based upon what was referenced as scientific research, by the National Reading Panel (National Institute of Child Health and Human Development, 2000), including phonemic awareness, phonics, fluency, comprehension, and vocabulary.

- Classroom teacher staff development was also extensive, ranging from approximately 43 hours to approximately 136 hours across the 16 schools. Topics covered were highly similar to those presented for the Literacy Facilitators, and consequently, also included the major areas considered to be based upon scientific research as suggested in the National Reading Panel report. Topics included, but not necessarily each at all 16 schools were: how to teach writing; phonics and phonological awareness; comprehension; vocabulary and language development; fluency; words’ guided reading; reading theory, development, and research; literacy assessment; REA purposes; classroom organization and management; literacy centers; reading with English-language learners; balanced literacy; at selected schools, Four Blocks and CIERA sessions; and miscellaneous sessions.

Teaching phonics and phonological awareness were among the top four areas of emphasis, and for all but two schools, literacy assessment was also among the top four areas of emphasis. Formats for sessions were highly similar across the 16 schools, with each school using multiple formats, including lecture/presentation, discussion, “make and take,” teacher “practice,” watching videos, watching demonstrations, and discussing articles and books. In a few instances, teachers attended reading conferences, and/or observed in other teachers’ classrooms. Schools using the CIERA framework and/or Four Blocks had special sessions related to those efforts. Most sessions were led by the Literacy Facilitator.

- Staff development could be categorized according to Type of Intervention Reform Effort—Pre-Structured Program, Weakly Scaffolded Process, Pre-Structured Program and Strongly
Scaffolded Process, Pre-Structured Program along with Weakly Scaffolded Process, and No Pre-Structured Program or Scaffolded Process.

**DISCUSSION:** The staff development offered to the Literacy Facilitators by the North Carolina DPI representative was intense and clearly focused on areas of reading instruction that have previously been identified as significant ones for student growth. Staff development at the local schools offered for teachers varied in extensiveness, but at every school the topics tended to mirror the reading instruction topics that Literacy Facilitators covered in their sessions with the North Carolina DPI representative.

b) **CONCLUSION:** *What other reading efforts were simultaneous to the REA intervention?*

- Four different basals were used across the 16 schools. Basal used was not associated with Type of Intervention Reform Effort. All basal authors claimed to target similar reading skills and at least mentioned the importance of explicit instruction. The basals appeared to be primarily distinguished in that one seemed to be more scripted than the others, and not all explicitly referred to research-based practices.

- Between zero and four supplementary reading efforts were ongoing per school, with four being the mode. These included for instance different trade book publishers and using computer software.

c) **CONCLUSION:** *How might classroom reading instruction practices in focal REA schools be characterized and were there relationships between classroom instruction practices and staff development and/or children’s growth in reading?* (The following conclusions apply to the four focal schools only.) Major conclusions were:

- At each school, at least some teachers were already exhibiting instructional behaviors previously considered to be beneficial to student growth in reading, and at every school, at least some positive change occurred over time in emphasizing certain reading subprocesses.

- Four clusters of teacher change emerged. These were teachers who emphasized at least one of the following reading subprocesses more in later REA observations than in initial REA
observations: word-level instruction, phonics/phonological awareness, vocabulary meaning, or comprehension.

- Unexpectedly, teachers who spent less time in staff development sessions had students who tended to show greater change in reading instruction.

- There was a tendency for teachers in a Pre-Structured Program to demonstrate higher Degree of Teacher Change than those in No Pre-Structured Program or Scaffolded Process.

- Children who had moderate- and higher-change teachers tended to make more accelerated Instructional Reading Level progress, as compared to children who had lower-change teachers.

- Children who had moderate-change or higher-change teachers tended to outperform those who had lower-change teachers on Words in Isolation and on Fluency. There was no association with Phonics and Comprehension, and Comprehension percentages fluctuated across Year 2, in a non-significant downward trend.

**DISCUSSION:** The finding that teachers who spent less time in staff development sessions tended to show greater change in selected aspects of reading instruction was surprising, and no obvious explanation for the finding is immediately evident. However, the data provide some support for the contention that that structure of staff development is linked to teacher change and that teacher change is linked to aspects of student reading performance. It is important that such linkages seem supported, although certainly the linkages suggested here are achieved through logical connections rather than completely through statistical manipulation.

A special word or two may be warranted about the non-significant downward trend across Year 2, on average, for Comprehension. First, the range of average percentages appeared to be clearly hovering in what most reading specialists would consider “acceptable.” Second, the non-significant downward trend might have been related to the children’s increasing word recognition abilities and the way that the comprehension scores were obtained. By the end of Year 2, on average, children were reading words more accurately in connected text, allowing them to move to higher and higher levels of
material. Although they could pronounce the words at those higher levels, the materials might have then become harder and harder to understand, and as a result, the non-significant downward trend in Comprehension might be a measurement artifact. Children might have maintained or increased Comprehension if they were reading materials closer to their own grade levels.

d) CONCLUSION: How might children’s growth be characterized?

- Children in both first- and second-grade levels in 9 of the 16 schools made substantial growth on Instructional Reading level in both Year 1 and Year 2, ranging from, on average, 1.09 years growth to an amazing 3.69 years growth in a given year. (Note that Instructional Reading Level scores were not derived for kindergarteners.) In nearly all cases, students, on average, ended the school at or above the level expected for typically developing children in their grade level. In all 16 schools, on average, students ended Year 2 at, or in many cases, well above the level expected for typically developing children.

- No single overall pattern of growth on Instructional Reading level emerged across the 16 schools. Rather, both school and grade mattered in relation to growth. In most schools, in general, children who started REA in first grade made more growth in Year 2 than in Year 1. But, in most schools, in general, children who started REA in second grade made more growth in Year 1 than in Year 2. (There were two school exceptions to these two preceding generalizations.)

- Kindergarteners’ growth on Letter Knowledge, Book and Print Awareness, Phonics, and Phonological Awareness varied according to school. In general, in most schools, kindergarteners ended the year knowing letter names quite well. However, in some schools, the mean percentages for Letter Knowledge at the end of the year were somewhat low, hovering around 70%. For Book and Print Awareness, again, in most schools kindergarteners had reasonably strong book and print awareness at the end of the year, but in some schools, on average, those abilities were somewhat low, hovering again in the 70% range. For Phonics, on average, for
most schools, knowledge tended to be a “moderate” range, hovering from 35% to 77%. In only two schools were end-of-year means for Phonics relatively high, for instance above 80%.

Finally, although on average students’ phonological awareness grew across the year, it was quite low across all schools at the beginning of the year, and at the end of the year, it was still in the moderate range (from 36% to 65%).

**DISCUSSION:** On the whole, students’ Instructional Reading Level gain across the two years was strong, in some cases exceeding the gain that would be expected of typically developing children. This effect is particularly noteworthy given that the REA schools might be considered by many to be high poverty and low performing schools, schools in which contextual circumstances are often thought to make instruction particularly difficult. At the same time, it is important to note that the Instructional Reading Level score, obtained following Clay’s (1993) method, is essentially a reflection of students’ abilities to read words in context, and does not incorporate comprehension per se. So it appears that, on the whole, students made quite significant progress in word reading in context. While comprehension maintenance and development is clearly important, at the primary grade levels, the significance of learning to look at and pronounce words cannot be overemphasized. Research clearly supports word recognition ability as a critical early developmental marker that must be achieved for young readers to continue to grow and move on to integrate increasingly more sophisticated reading processes (Adams, 1990; Chall, 1996; Fitzgerald & Shanahan, 2000)

Regarding the finding that, in most schools, on the whole, grade at year of REA inception mattered with regard to year of greatest gain in Instructional Reading Level, one explanation is that, on the whole, there may be a growth spurt for children when they are at the second grade level.

As for kindergarteners’ growth in Letter Knowledge and Book and Print Awareness, moderate means hovering 70% at the end of the end in some schools seem intuitively lower than what most reading specialists would expect for typically developing children. In at least some REA schools in this study, more intense emergent literacy integration into kindergarten activities might be warranted. Also
worthy of attention is kindergarteners’ relatively low Phonics knowledge (initial consonant sounds) and Phonological Awareness at the end of the year, on the whole. These are two now well-established critical aspects of early reading that, again, must be acquired in order for children to make substantial progress (Ehri, 1991; National Institute of Child Health and Human Development, 2000). It appears that in most REA schools in this study, more intense emphasis on these aspects of reading processes by integrating more instruction in them into daily kindergarten activities might be important to consider. Many would advocate that such integrated instruction should not be done through worksheets or drill, but that explicit instruction, especially that which calls children’s attention to such features, is required for many children (Adams, 1990; Clay, 1993). Also, research clearly supports that children’s involvement with letters and words and books helps not only phonics development, but phonological awareness development as well (Adams, 1990)

e) CONCLUSION: Was there a relationship between Type of REA Intervention Reform Effort and Children’s Reading?

- Across REA Year 1, the schools that implemented both a Pre-Structured Program and Strongly Scaffolded Process made the greatest growth.
- However, across REA Year 2, the schools that implemented the Pre-Structured Program made extremely good growth, substantially more than schools in the other Types, with an overall mean growth of 2.64 years compared to from 1.02 to 2.10 for the remaining Types. Schools using the Pre-Structured Program along with the Weakly Scaffolded Process, on average, made the second highest gain.
- It was especially noteworthy that students in the schools where No Pre-Structured Program or Scaffolded Process was used, on average, showed especially accelerated Instructional Reading Level growth in Year 2 as compared to Year 1.
- For kindergarteners, for Letters, Book and Print Awareness, and Phonics, students in the Pre-Structured Program schools, the Weakly Scaffolded Process schools, and the No Pre-Structured
Program or Scaffolded Process schools tended to show the greatest growth. For Phonological Awareness, results were slightly different, with students in Weakly Scaffolded Process schools, No Pre-Structured Program or Scaffolded Process schools, and Both Pre-Structured Program and Strongly Scaffolded Process schools showing the greatest growth.

DISCUSSION: It appeared that for a strong jumpstart to student growth, using both a Pre-Structured Program and a Strongly Scaffolded Process for staff development had a distinct advantage. But in the long haul, students grew more when they had teachers in schools that used just a Pre-Structured Program, or that combined it with at least a Weakly Scaffolded Process, for staff development. This result is somewhat difficult to interpret in that one would not expect that adding a strongly scaffolded process to a Pre-Structured program would actually weaken the two-year growth trajectory for students. One possible explanation is that through the stronger scaffolding, somehow teachers may have been spending more time in staff development on issues that drew their attention away from the pre-structured program they were trying to implement. In other words, possibly something about strong scaffolding of process restricts teachers’ implementation of the pre-structured program in some way.

Particularly remarkable is that, on the whole, children in the schools with reform type, No Pre-Structured Program or Scaffolded Process, clearly accelerated their progress on Instructional Reading Level in Year 2. It is important to remember that although these schools had no pre-structured program nor did they scaffold teachers’ staff development, teachers did still undergo considerable staff development, and the reading process and instruction topics covered tended to be highly similar to those covered in schools of other reform types. One hopeful inference that could be made is that even in schools where no pre-structured program or scaffolded staff development process is used, staff development which focuses on certain aspects of reading processes and instruction can be at least somewhat effective.

f) CONCLUSION: How does third-graders’ growth on the NC End-of-Grade Reading Test compare to growth in previous years?
• Growth on EOG Achievement Level in REA Year 1 was similar to that of the pre-REA year, but growth in REA Year 2 exceeded that of the previous two years. In the pre-REA year and REA Year 1 students made slightly less than approximately one-quarter of an Achievement Level gain, whereas in REA Year 2, they made slightly more than approximately one-quarter of an Achievement Level gain. Likewise, the increase across the year in percent of students scoring at or above grade level was similar in REA Year 1 (8.00%) to that of the Pre-REA Year (6.00%), but the increase in REA Year 2 (13.30%) was greater than the previous years.

DISCUSSION: The NC EOG analyses provide an additional source of information that can tentatively be interpreted as support for the association between REA interventions and student growth. At the same time, it is important to consider that the groups of students varied across the three analysis years, that school contexts may have shifted over time, and/or that different test items may have influenced outcomes as well.

f) CONCLUSION: Was there a relationship between extent of student participation in REA schools and overall end-of-REA Instructional Reading Level?

• At the four focal schools, after ruling out significant differences in risk factors across two comparison groups of within-program students, one of which had been at the REA school for the entire two years and the other which had only arrived at the end of Year 2 (a very small group), on average, students who were at an REA school for the whole two years attained higher Instructional Reading Levels than did those who were only there at the end of the period.

DISCUSSION: This result provides modest support for the contention that growth at the four focal REA schools was related to the REA intervention. However, it is important to remember that only the four focal schools were included in this analysis, and results may not be generalizable to other REA schools.

g) Cost analyses
• The range of total amounts of money received across the 16 schools was wide (from $151,344 to $977,307, including administrative costs estimated proportionately for schools within district). However, even at the lower end of the range, schools received a significant amount of money. Overall, the highest percent of money was spent on supplies and materials, with personnel costs next in percent of expenditure. Per pupil expenditure was $1,666.

• Both Percent of Monies Spent on Workshops and Percent of Monies Spent on Instructional Materials were significantly related to student growth (from the beginning of Year 1 to the end of Year 2) on Instructional Reading Level, with higher expenditure in both areas tending to be associated with greater growth.

**DISCUSSION:** Clearly, significant amounts of money were provided to schools, perhaps historically unprecedented amounts directed toward enhancing classroom instruction. High expenditure on supplies and materials, which included purchasing children’s books, is likely justifiable in most, if not all, of the 16 REA schools. Prior research supports that “book floods” can be associated with student growth in reading (Neuman, 2002). Wide reading alone can foster students’ vocabulary and conceptual development (Nagy & Scott, 2000; Robbins & Ehri, 1994), and children who have less opportunity to read are at an increasing learning disadvantage over time, compared to peers who have more opportunity to read. As REA research assistants and I were in schools collecting data at the beginning of Year 1, we noted obvious absence of books in many classrooms. Providing children more books to read is one positive outcome of REA expenditure that most reading specialists would applaud.

Although REA was designed to enhance “regular” classroom instruction and not supplementary tutoring programs, it might be worthwhile to consider the REA cost in relation to prior documentation of tutoring program costs. The REA per pupil expenditure was in the low- to mid-range of tutoring program costs provided in prior reports. For instance: some have estimated the cost of Reading Recovery to be about $4,000 per child (Shanahan & Barr, 1995). Book Buddies, a community volunteer program which also involved former graduate students in reading, was estimated at $595 (Invernizzi,
Rosemary, Juel, Richards, 1997), and one investigator estimated the cost of an AmericaReads program, in which college work-study students tutored youngsters, to be approximately $1,068, exclusive of considerable in-kind costs (Fitzgerald, 2001). Coupled with at least some minimal evidence in the external NC REA evaluation of selected effects on children’s reading, the expenditure on “regular” classroom instruction as compared to expenditure on supplementary tutoring, might be considered by many to be particularly worthwhile, given that there is potential for classroom teachers to provide enhanced reading instruction to all children rather than selected children. One added benefit could be reduction in numbers of students who need supplementary tutoring programs.

The association of percent of expenditure on workshops and on instructional materials with student overall growth in Instructional Reading Level is important because it suggests that, at least in these 16 schools, money mattered and that the use of money mattered. One interpretation of the associations is that both staff development and instructional materials, such as books, independent of one another, can make a difference in aspects of students’ reading abilities.

Closure

It is perhaps worth one more level of synthesis of selected findings at the end of this report. Probably the most important issue examined in any functional analysis of an intervention is whether there is evidence of association of the intervention itself with student outcomes. The complex nature of the variety of REA interventions across the schools, as well as the variety of impinging contextual variables and circumstances, make that association extremely hard to address. Some might argue that a “control” group set of schools might have been necessary. However, others would argue that it would have been impractical or perhaps impossible to accomplish such a “control” in a meaningful way because so many factors and variables would need to be accounted for across the control and intervention groups, particularly in light of small funding available for the evaluation study.
In spite of the fact that no such “control” schools were included in the NC REA external evaluation, some collective factors suggest some modest support for the effectiveness of features of the interventions accomplished in at least some of the REA schools. These are:

- The way staff development was done mattered in relation to teacher instructional change, at least this was true in the focal schools. For instance, teachers in focal schools using Pre-Structured Programs tended to demonstrate a higher degree of positive change in their reading instruction than did others.

- Teacher change was positively associated with student growth on Instructional Reading Level and overall student performance on reading Words in Isolation and Fluency, at least in the focal schools.

- The way staff development was done mattered in relation to student growth on Instructional Reading Level, with a Pre-Structured Program associated with greatest student gain in the long run (across all 16 schools).

- Third graders in the last REA year outperformed those in the first REA year and the year preceding REA for growth across the year on the North Carolina End-of-Grade Reading Achievement Level.

- At least in the focal schools, using a very small within-program comparison group, students who had been in an REA school for the entire two years outperformed those who arrived at an REA school at the end of Year 2 on Instructional Reading Level.

Each of the analyses involved in the above list of findings had shortcomings, but collectively, they tend to push toward similar conclusions and suggest some converging evidence of a possible association between features of staff development and aspects of teacher enhancement of reading instruction as well as selected facets of student growth in reading abilities.
References


North Carolina DPI K-2 Assessments.

Pearson Learning Group, 135 South Mount Zion Road, P. O. Box 2500, Lebanon, IN, 46052, www.pearsonlearning.com.


Appendix A: Coding Scheme for Observation Narratives (Definitions from Taylor and Pearson, 2000, pp. 9-17).

**Level 1: WHO—Who in the classroom is providing instruction?**
- Classroom Teacher—classroom teacher providing instruction
- Teacher Assistant—instructional assistant providing instruction

**Level 2: GROUPING—What instructional groupings do you see?**
- Whole Class—all of the children, or more than 10
- Small Group—children in 2 or more groups, or a group of under 10
- Pairs—children with a partner
- Individual—children working independently
- Other—children are in group(s) other than above

**Level 3: MAJOR FOCUS—What major academic area is being instructed?**
- Reading—includes comprehension, reading, word recognition, writing in response to reading, literature study, and reading vocabulary
- Composition—writing to communicate ideas, learning to write, writer’s workshop, and report or creative writing
- Spelling—study of spelling words or rules for spelling
- Handwriting—learning or practicing how to print or write in cursive
- Language—aspects of Language Arts not included above (grammar, mechanics, oral expression)
- Other—academic focus not in literacy

**Level 4: ACTIVITY—What is the specific activity of the classroom teacher?**
- Reading connected text—children are reading, (silent, choral, turn-taking)
- Listening to text—children are listening (teacher is reading)
- Vocabulary—children discussing or working with word meanings
- Meaning of Text—lower level
  - For talk—talk about the meaning of text with low-level interpretation
  - For writing—same as previous, except for writing
- Meaning of Text—higher level
  - For talk—talk about meaning at a high-level of interpretation or beyond the text
  - For writing—same as previous, except for writing
- Comprehension Skill—comprehension activity at a lower-level of thinking (such as traditional skill work like identifying the main idea, fact-opinion, or cause-effect)
- Comprehension Strategy—comprehension strategy that will transfer to other reading, such as reciprocal teaching, questioning the author, summarizing, or predicting
- Writing—children are writing ideas, focus is on composition
- Exchange Ideas/Oral Production—expression of ideas not related to text
- Word Identification—focus is on identifying words, including when the teacher identifies unknown words, or reviews words prior to reading
- Sight Words—drilling on sight words
- Phonics
  - Letter sound—focus on sound/symbol correspondences
  - Letter by letter—focus on decoding letter by letter
  - Onset/rime—focus on decoding by onset/rime or by analogy
  - Multisyllabic—focus on decoding multisyllabic words
- Word Recognition Strategies—focus on use of strategies by students to figure out words while reading, often prompted by teacher
• Phonemic awareness—focus on identifying sounds in words or blending sounds as an oral activity
• Letter Identification—focus on letter name identification
• Spelling—focus on how to spell words
• Other—literacy focus other than one listed above

Level 5: MATERIAL—What materials are teacher(s) and students using for this activity?
• Textbook, narrative—school textbook such as basal reader with narrative focus
• Textbook, information—school textbook with informational focus
• Narrative trade book—narrative trade or picture book
• Informational Trade Book—informational trade book, reference book, newspaper, or Weekly Reader
• Student writing—student writing is being used
• Board/chart—board, chart or card is being used
• Worksheet—worksheet, workbook page, sheet of paper, or individual white boards
• Oral Presentation—activity is presented orally without any other materials from this level
• Pictures—pictures or photographs are used
• Video/Film—videotape, movie, film, or filmstrip
• Computer—all looking at one computer or multiple computers
• Other—materials other than those described above

Level 6: TEACHER INTERACTION
• Tell/give info—telling or giving information to students
• Modeling—explicitly showing or demonstrating the steps to do something
• Recitation—back and forth question and answer for the purpose of answering questions, not discussion
• Discussion—discussion which may or may not be teacher-led with students expressing and offering their own ideas
• Coaching/scaffolding—prompting or providing support that will transfer to other situations as students attempt to perform a strategy or answer a question
• Listening/watching—teacher is listening and/or watching and providing feedback
• Reading aloud—teacher is reading aloud to students
• Check work—teacher is checking students’ work
• Assessment—teacher engages in questioning, explaining, or giving direction for the purpose of assessing student performance
• Other—interaction style other than what is listed above

Level 7: EXPECTED PUPIL RESPONSE
• Reading—students are to be reading
• Orally responding—students respond orally (chorally, with partners, or responding with a group)
• Listening—students are to be only listening
• Writing—students are to be writing words, sentences, paragraphs
• Manipulating—children are to be using their hands, other than writing
• Other—a form of responding not listed above
Appendix B

Note: Population demographics for the city/town/village where each school is located are from U.S. Census Bureau, Census 2000), unless otherwise noted. School demographics were provided by the North Carolina Department of Public Instruction for the 2001-2002 school year, unless otherwise noted.

School 1

School 1 is located in an area where in the late 19th and early 20th centuries, textile industries became the mainstay of the economy. One of the largest textile makers in the world was established in the area and continues to provide employment opportunities today. The city where School 1 is located is moderate in size with a population of 44,917. Sixty-six percent of the population is Caucasian of European descent and 25% is African-American. The area also has a growing Latino population, with 10% identified as Latino. Of the 18,280 households in the area, 45% are family households consisting of married couples. Fifty-nine percent of the homes are occupied by homeowners, while 41% of homes and apartments are occupied by renters. The median income is $35,301. Common occupations include: management, professional, and related occupations; sales and office occupations; and production, transportation, and material moving occupations.

School 1 served 606 students in pre-kindergarten through grade five during the 2001-2002 school year. The student population was divided relatively equally among grade levels with approximately 100 students at each grade level in Kindergarten through grade 3. The student population at School 1 is quite diverse. During the 2001-2002 school year, 46% of the students was African-American, 19% was Caucasian of European descent, 32% was Latino, and 3% was from other ethnicities. The English Language Learner (ELL) population has increased considerably over the past few years, from 9% in the 1997-98 school year to 32% in the 2001-2002 school year. In the 2001-2002 school year, 82% of the students received free or reduced lunch. The student population at School 1 was also quite transient with 19% of the total population either entering or withdrawing during the 2001-
2002 school year. In 2001-2002, 75% of parents’ highest level of education was completion of high school, 5% had either a community college or trade school diploma, and 4% had a four-year degree.

**School 2**

Although the city where School 2 is located has experienced substantial growth over the past century, it is still a small town of 12,833. Located near the textile industries in central North Carolina, the town is also home to a host of other industries including hosiery, plastics, electronics, and metal works. Seventy-three percent of the population is Caucasian of European descent, 22% is African-American, and 10% of the population is Latino. Forty-four percent of the 5,241 households in the community are family households with married couples. Median household income is $35,706. Common occupations include management, professional, and related occupations; sales and office occupations; and production, transportation, and material moving occupations.

School 2 is one 19 elementary schools in a 32 school system. The student population of School 2 consisted of 336 students in pre-kindergarten to 5th grades during the 2001-2002 school year. During that same year, 43% of the students were Caucasian of European descent, 33% were African-American, and 23% were Latino. From 1997-1998 to 2001-2002, the ELL population grew considerably increasing from 5% to 23%. Sixty-eight percent of the student population received free or reduced price lunches during the 2001-2002 school year. The student population at School 2 is quite transient with 20% of the students entering or withdrawing during the 2001-2002 academic year. Over half of the students live in single-parent homes (54%). In 2001-2002, 56% of parents’ highest level of education was completion of high school, 12% had either a community college or trade school diploma, and 17% had a four-year or graduate school degree.

**School 3**

School 3 is located in a large city of 540,828 people. There are over 1,000,000 people in the county. The city’s population has grown 36% over the last decade to reach its current level. In 2001-2002 School 3 served 596 children from its neighborhood and is a community base for local support
programs such as the Department of Social Services and the Dispute Settlement Program. This school would likely be considered by many as an inner-city school (School 3’s School Improvement Plan, 2000). Sixty-four percent of the population is Caucasian of European descent, 28% is African-American, and 7% is Latino. The city’s average child poverty rate (14.7%; Census 2000) is lower than the state average (18.6%, Census 2000), and much lower than the (North Carolina Department of Public Instruction). The median income for the city was $38,553.

The demographics of the student body in School 3 stand in contrast to those of the city within which it is located. Seventy-six percent of School 3’s 2001-2002 student body was African-American, 2% was Caucasian of European descent, and 22% was Latino. Ninety-one percent of children at School 3 qualified for free and reduced lunch in 2001-2002. The average household income for families attending School 3 ranged between $7,000 and $12,000 dollars annually. In 2001-2002, 61% of parents’ highest level of education was completion of high school, 18% had either a community college or trade school diploma, and 5% had a four-year degree.

**School 4**

School 4 is located in a town where the main industry during the early years and for over a century was textile mills. The first cotton mill was erected in 1839, and several more were built over the next several decades. More recently the town has begun to grow rapidly, but its history as an old mill village is evident. The population of the community where School 4 is located 11,237 people. Since 1990, the town’s population has grown 26%, averaging an annual growth of almost 3%. Seventy-three percent of the population is Caucasian of European descent, 18% are African-American, and about 6% percent are Latino. Fifty-four percent of the 4,112 households consist of married couple families. Median household income is $40,697. Common occupations include: management, professional, and related occupations; and sales and office occupations.

The total school enrollment in the 2001-2002 school year was 526 students in Kindergarten through fifth grade. In 2001-2002 62% of the students were Caucasian of European descent, 29% were
African-American, and 5% were of Latino descent. During the 2001-2002 school year, 46% of the students at School 4 received free or reduced meals. About 16% of the students transferred or withdrew during the 2001-2002 school year. In 2001-2002, 39% of parents’ highest level of education was completion of high school, 32% had either a community college or trade school diploma, and 24% had a four-year or graduate school degree.

School 5

School 5 is located near a military base in the sixth largest city in North Carolina with a population of over 121,015 people. The city is relatively ethnically diverse with 53% identified as Caucasian of European descent, 34% African-American, 7% Latino, 3% Asian and Pacific Islanders, and 1% Native Americans. Forty-five percent of the 48,414 households consist of married couples with families, and 21% of the households are single-parent households. Median household income is $36,287. Common occupations include management, professional, and related occupations; sales and office occupations; and service occupations.

During the 2001-2002 school year, the school population of was 550 students. In 2001-2002, 86% of the students were African-American, 11% were Caucasian of European descent, and 1% were Latino. In 2001-2002, 87% of the students at School 5 participated in the free or reduced lunch program. In 2001-2002, 65% of parents’ highest level of education was completion of high school, 19% had either a community college or trade school diploma, and 4% had a four-year or graduate school degree.

School 6

School 6 is located in the same community as School 4.

During the 2001-2002 school year School 6 served 159 students. During that year 61% of the students were African-American, 28% were Caucasian of European descent, and 9% were of Latino descent. Most of the students (90%) at School 6 participated in the free or reduced lunch program during the 2001-2002 school year. In 2001-2002, 54% of parents’ highest level of education was
completion of high school, 15% had either a community college or trade school diploma, and 4% had a four-year degree.

School 7

Within the county, School 7 is located in a small city with a population of 66,277, and a median income of $36,924 (U.S. Census Bureau, Census 2000). Eighty-three percent of the county’s population is Caucasian of European descent. Eighteen percent of children in the county live at or below the nation’s poverty level.

During the 2001-2002 school year, School 7 served 435 students in kindergarten through grade five. During 2001-2002, 61% of the students were African-American, 34% were Caucasian of European descent, and 4% were of Latino descent. In 2001-2002, 93% of the students participated in the free or reduced lunch program. Transience was also an issue for School 7 with 106 students entering during 2001-2002 and a similar number withdrawing. In 2001-2002, 54% of parents’ highest level of education was completion of high school, 11% had either a community college or trade school diploma, and 2% had a four-year degree.

School 8

School 8 is located in the same community as School 7.

During the 2001-2002 school year, School 8 served 365 students in kindergarten through fifth grade. In the 2001-2002 school year, 25% were Caucasian of European descent, 73% were African American, and 1% were Latino. During 2001-2002, 97% of the students received free or reduced meals. Transience was also an issue for School 8 with 71 students entering during 2001-2002 and a similar number withdrawing. In 2001-2002, 65% of parents’ highest level of education was completion of high school, 6% had a community college diploma, and 1% had a four-year or graduate degree.

School 9

School 9 is located in rural North Carolina between two small towns. The town which serves as the postal address for School 9 has a population of approximately 692 and is 56% Caucasian of
European descent, 43% African-American individuals, and 1% “other.” The population of the other nearby town is 25% Caucasian of European descent, 74% African-American, and 1% “other.” The median household income is approximately $23,182. The major occupations of residents of both towns are factory workers, sales, and service providers.

School 9 served a population of 565 students in 2001-2002, with 0 students withdrawing and 61 students entering. During the 2001-2002 school year 14% were Caucasian of European descent, 84% were African-American, 14% Caucasian of European descent, and 0.5% were Latino. In 2001-2002, 83% of the students participated in the free or reduced lunches. In 2001-2002, 67% of parents’ highest level of education was completion of high school, 19% had a community college or trade school diploma, and 6% had a four-year or graduate degree.

School 10

School 10 is located in a town that once served as the one of the world’s largest producer of peanuts. Now, however, many, if not most, of this rural town’s current residents are now employed by local businesses or factories in nearby towns. The town in which School 10 is located has had a dramatic decrease in population over the last 10 years. According to the 1990 U. S. Census Data, the town’s population was 6,742, but, in 2000, the population was only 2,347. According to 2000 U.S. Census, 19% of the residents in the community of School 10 were Caucasian of European descent, 79% were African-Americans, and 1% were Latino. The median household income for the town is approximately $19,762.

During the 2001-2002 school year School 10 served 536 students in grades K-5. During 2001-2002, student ethnicity was 1% Caucasian of European descent, children of African-American descent, 98% African American, 1% Latino. In 2001-2002, 90% of students received free or reduced lunch. In 2001-2002, 90% of the students were from families living below poverty, and 95% were from single-parent homes. In 2001-2002, School 10 had an incredibly low attrition rate with 0 students withdrawing in 2001-2002 and 18 students entering. In 2001-2002, 62% of parents’ highest level of education was
completion of high school, 23% had a community college or trade school diploma, and 4% had a four-year or graduate degree.

School 11

School 11 is located in a small rural town, nearby School 9, with a population of approximately 692. Fifty-four percent of residents are Caucasian of European descent, 43% are African American, and 1% are Latino. The median household income is approximately $23,182. Most individuals commute to larger, surrounding towns to work in manufacturing plants producing, textiles, garments, paper, engines, health supplies, and poultry products. Some jobs within the town’s limits include work at lumber and pulpwood mills, farming, construction, retail, and utility operations.

School 11 served 198 students during the 2001-2002 school year. During 2001-2002, 4% of the student body was Caucasian of European descent, and 96% was African American. During 2001-2002, 93% of students received free or reduced lunch. In 2001-2002, 33 students entered the school, while only 6 left. In 2001-2002, 76% of parents’ highest level of education was completion of high school, 18% had either a community college or trade school diploma, and 5% held a four-year degree.

School 12

School 12 is located in a small town with a population of 2,362. It is located in the same county as School 11, and like School 11, most of the area surrounding and containing the community is impoverished and rural. Over the past 10 years, the economy has steadily declined. Major occupations in the area now include farming and factory work, with the majority of employed residents working at factories located in surrounding towns. Thirty percent of residents are Caucasian of European descent, 68% are African American, and 2% are Latino.

School 12 is unique in that it is the only primary school in its local school district. The school served 181 students in 2001-2002. In 2001-2002, the student body was 2% Caucasian of European descent, 97% African-American, and .5% Latino. Ninety-four percent of 2000-2001 students received free or reduced lunch. (Parent education levels were not available.)
School 13 is located in a rural, coastal town that contains historic landmarks. While such landmarks provide some tourism income for the town, it remains an economically depressed area. The town where School 13 is located has approximately 975 residents. The median family income is $13,700, and the per capita income is about $8,200. The major occupations for residents in the town are fishing, farming, and forestry (U.S. Census Bureau, Census 1990).

School 13 served 280 students in kindergarten through fifth grade in 2001-2002. In 2001-2002, 43% of students were Caucasian of European descent, 53% were African American, and 4% were Latino. Seventy-four percent of students participated in the free or reduced lunch program in 2001-2002. School 12 had a low attrition rate with 0 students withdrawing in 2001-2002 and only 4 students entering in the same year. In 2001-2002, 63% of parents’ highest level of education was completion of high school, 21% had a community college or trade school diploma, and 6% had a four-year degree.

School 14

School 14 is located in a very small and isolated town that depends upon tourism to support its economy. The median income is $34,315, and the major occupations for residents are managerial occupations related to tourism and fishing, farming, and forestry. Other sources of income include production, craft or repair occupations, service occupations, and sales occupations.

The community surrounding School 14 had approximately 769 residents in 2000. At the time of the 1990 Census data collection, all of these residents were Caucasian of European descent. Of these residents, 18% did not complete high school, 39% held a high school diploma, 12% held a Bachelor’s degree, and 3% held a graduate or professional degree (U.S. Census Bureau, Census 1990).

School 14 is unique in that it serves a K-12 population and is the only public school in the area. During 2001-2002 the school served 83 students, and of these 81% were Caucasian of European descent, 3% were African-American, and 16% Latino. In 2001-2002, 90% of students qualified for free or reduced lunch. In 2001-2002 School 14 has a low attrition rate with 0 students withdrawing and only
In 2001-2002, 48% of parents’ highest level of education was completion of high school, 17% had a community college or trade school diploma, and 32% had a four-year or graduate degree.

**School 15**

School 15 is located in a rural area of Eastern North Carolina. The town population is 278. Forty-eight percent of the residents are Caucasian of European descent, 49% are African-American, and 2% are Latino. Seventy-four percent of the county’s 13,723 residents own homes. Median income for the town that School 15 is located in is $20,888. One major industry, county agencies, and agriculture are the largest sources of employment. (Statistics on adults’ education levels were not available.)

During the 2001-2002 school year, School 15 served 185 students in kindergarten through grade 6. The student body was 46% Caucasian of European descent, 51% African-American students, and 3% Latino students. Forty-one percent of students received free or reduced lunch during the 2000-2001 school year. In 2001-2002, 65% of parents’ highest level of education was completion of high school, 17% had a community college or trade school diploma, and 3% had a four-year degree.

**School 16**

School 16 is located in the same county and school system as School 15. The town population is 4,107. The median income for the town is $17,287.

In 2001-2002, School 16 served 735 students in kindergarten through grade four. Twenty-one percent of the student body was Caucasian of European descent, 77% was African American, and 2% was Latino. Seventy-six percent of 2001-2002 students received free or reduced lunch. In 2001-2002, 72% of parents’ highest level of education was completion of high school, 10% had a community college or trade school diploma, and 7% had a four-year or graduate degree.
Table 1
*Data Collection for All 16 Schools, with Additional Collection at Four Focal Schools Highlighted, and Timeline.*

<table>
<thead>
<tr>
<th>Category of Measure</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning</td>
<td>Middle</td>
</tr>
<tr>
<td>Child Tests</td>
<td>All 16</td>
<td>4 Focal</td>
</tr>
<tr>
<td>Child, Teacher, Literacy Facilitator, Principal Demographics</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>Literacy Facilitator Questionnaires</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>Principal Questionnaires</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>Literacy Facilitator Interviews</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>Principal Interviews</td>
<td>Focal</td>
<td></td>
</tr>
<tr>
<td>Focal Teacher Individual Interviews</td>
<td>Focal</td>
<td>Focal</td>
</tr>
<tr>
<td>Focal Teacher Focus-Group Interviews</td>
<td>Focal</td>
<td>Focal</td>
</tr>
<tr>
<td>Classroom Observations</td>
<td>Focal</td>
<td>Focal</td>
</tr>
<tr>
<td>Focal Teacher Logs</td>
<td>Focal</td>
<td>Focal</td>
</tr>
<tr>
<td>NC End-of-Third-Grade Scores</td>
<td>All (from DPI)</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Source</td>
<td>Procedure</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>-----------</td>
</tr>
<tr>
<td>CHILDREN’S READING ABILITY VARIABLES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Book and Print Awareness</td>
<td>Book and Print Awareness modified slightly from Concepts of Print (Clay, 1993; NC DPI K-2 Assessments)</td>
<td>Students did several tasks, such as point to the place in a book to begin reading. Test measures book handling concepts, print conventions, concepts of letter and word, and visual analysis. Possible raw score range 0 to 20, converted to percent correct.</td>
</tr>
<tr>
<td>Letter Name Knowledge</td>
<td>Lower Case Letter Knowledge (part of Letter Identification test (Clay, 1993; NC DPI K-2 Assessments))</td>
<td>Students looked at a list of lower case letters (including typescript a and g) and named them. Possible raw score range 0 to 28, converted to percent correct.</td>
</tr>
<tr>
<td>Phonological Awareness</td>
<td>Phonological Awareness (modified slightly from Wake County, NC, Schools; NC DPI K-2 Assessments)</td>
<td>This 25-item measure assesses the ability to: hear words as words (e.g., count words in sentences), hear parts in words (e.g., rhyme), and hear individual sounds in words (phoneme segmenting). Examiner provided an example and then student replied. E.g., “I’m going to say two words that rhyme—man, fan. Now it’s your turn. Do these words rhyme? Store, more.” Possible raw score range 0 to 25, converted to percent correct.</td>
</tr>
<tr>
<td>Knowledge of the Alphabetic Principle</td>
<td>Hearing Sounds in Words (Clay, 1993; Johnston, 1992)</td>
<td>Teacher slowly read a lengthy sentence containing 37 sounds. Students wrote letters for any sounds. A response was correct if there was a letter written for a sound in a word regardless of the letter was correct. Possible raw score range 0 to 37, converted to percent correct.</td>
</tr>
<tr>
<td>Knowledge of Correct Letters for Sounds</td>
<td>Hearing Sounds in Words (Clay, 1993)</td>
<td>Same measure as described for Knowledge of the Alphabetic Principle, but scored for correct letter for a given sound. Possible raw score range 0 to 37, converted to percent correct.</td>
</tr>
<tr>
<td>Reading Words in Isolation</td>
<td>Dolch Basic Sight Vocabulary (Barr et al., 1995; Dolch, 1936; NC DPI K-2 Assessments)</td>
<td>Students looked at lists of words and said them aloud. Lists were in order of difficulty. If more than two words were missed on a list, then a lower list (or lists) was read. A word was scored correct if the student pronounced it correctly in three seconds or less. Raw score was number of words read correctly plus any unread words on lower lists (assuming that if students could read harder lists, they could also read lower lists). Possible raw score range 0 to 220, converted to percent correct.</td>
</tr>
</tbody>
</table>
Variables, Sources, Procedures, and Reliability Estimates

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
<th>Procedure Description</th>
<th>Reliability Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonics Knowledge</td>
<td>Phonics (adapted from Shefelbine, 1995)</td>
<td>Students looked at letters and letter combinations on lists while the examiner prompted with statements such as, “Look at these letters, and tell me how they sound,” and “Tell me the long sounds of these letters.” Items included consonants, consonant digraphs, long and short vowels, consonant blends, r-controlled vowels, and common phonograms (e.g., ad, ame). Possible raw score range 0 to 67, converted to percent correct.</td>
<td>.92 (within 5 points)</td>
</tr>
<tr>
<td>Instructional Reading Level</td>
<td>Oral Reading (Barr et al., 1995; Clay, 1993; NC DPI K-2 Assessments)</td>
<td>Students read aloud increasingly difficult graded passages (from the Bader Reading and Language Inventory [Bader &amp; Weisendanger, 1994]) while the examiner recorded “miscues” on a separate copy of the passage. Using Clay’s (1993) method, Instructional Reading Level was the highest level at which the student read with at least 90% word recognition accuracy.</td>
<td>.86 (perfect agreement); .95 (within one level)</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Oral Reading (Barr et al., 1995; Clay, 1993)</td>
<td>First students did the oral reading procedure described above. Then for the instructional reading level passage, the examiner asked the comprehension questions listed in the Bader &amp; Weisendanger (1994) . . . Inventory. Percent correctly answered questions was computed.</td>
<td>.83 (within 5 points)</td>
</tr>
<tr>
<td>Fluency</td>
<td>Oral Reading (Barr et al., 1995; Clay, 1993)</td>
<td>During Oral Reading (described above) on the instructional reading level passage, the examiner timed the student’s reading for one minute, marking a line after the last word read during the one minute (Deno, 1985; Fuchs, &amp; Fuchs, 1989; Fuchs, Fuchs, &amp; Hamlett, 1989). Score was the number of words read correctly in one minute.</td>
<td>.92 (within 5 points)</td>
</tr>
<tr>
<td>Attitude toward Reading</td>
<td>Attitude toward Reading (Fitzgerald, 2001; Fitzgerald et al., 2002)</td>
<td>The child looked at a question while the examiner read it (e.g., “How do you feel when it’s time for reading in school?”) and then circled one face from a continuum of faces with varying degrees of smiles to frowns. Score was the mean across items and could range from 1 to 5.</td>
<td>.95 (within .5 points)</td>
</tr>
</tbody>
</table>
Table 3  
*Summaries of Selected Variables for the 16 School Communities.*

<table>
<thead>
<tr>
<th>School</th>
<th>City/Community</th>
<th>Size</th>
<th>Median Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>44,917</td>
<td>35,301</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>12,833</td>
<td>35,706</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>540,828</td>
<td>38,553</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>11,237</td>
<td>40,697</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>121,015</td>
<td>36,287</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>11,237</td>
<td>40,697</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>66,277</td>
<td>36,924</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>66,277</td>
<td>36,924</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>692</td>
<td>23,182</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>2,347</td>
<td>19,762</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>692</td>
<td>23,182</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>2,362</td>
<td>21,094</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>975</td>
<td>13,700</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>769</td>
<td>34,315</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>278</td>
<td>20,883</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>4,107</td>
<td>17,287</td>
</tr>
</tbody>
</table>

Note. All information is from the U.S. Census Bureau, Census 2000 except for the information for School 13, that comes from the U.S. Census Bureau, 1990 Census because it was not available in the 2000 Census.
Table 4
Ethnicity and Free/Reduced Lunch Percentages by Schools.

<table>
<thead>
<tr>
<th>School</th>
<th>Enrollment</th>
<th>White</th>
<th>Black</th>
<th>Latino</th>
<th>Other</th>
<th>Lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>606</td>
<td>19</td>
<td>46</td>
<td>32</td>
<td>3</td>
<td>82</td>
</tr>
<tr>
<td>2</td>
<td>336</td>
<td>43</td>
<td>33</td>
<td>23</td>
<td>0</td>
<td>68</td>
</tr>
<tr>
<td>3</td>
<td>596</td>
<td>2</td>
<td>76</td>
<td>22</td>
<td>0</td>
<td>91</td>
</tr>
<tr>
<td>4</td>
<td>526</td>
<td>62</td>
<td>29</td>
<td>5</td>
<td>2</td>
<td>46</td>
</tr>
<tr>
<td>5</td>
<td>550</td>
<td>11</td>
<td>86</td>
<td>1</td>
<td>2</td>
<td>87</td>
</tr>
<tr>
<td>6</td>
<td>159</td>
<td>28</td>
<td>61</td>
<td>9</td>
<td>0</td>
<td>90</td>
</tr>
<tr>
<td>7</td>
<td>435</td>
<td>34</td>
<td>61</td>
<td>4</td>
<td>1</td>
<td>93</td>
</tr>
<tr>
<td>8</td>
<td>365</td>
<td>25</td>
<td>73</td>
<td>1</td>
<td>1</td>
<td>97</td>
</tr>
<tr>
<td>9</td>
<td>565</td>
<td>14</td>
<td>84</td>
<td>0</td>
<td>0</td>
<td>83</td>
</tr>
<tr>
<td>10</td>
<td>536</td>
<td>1</td>
<td>98</td>
<td>1</td>
<td>0</td>
<td>90</td>
</tr>
<tr>
<td>11</td>
<td>198</td>
<td>4</td>
<td>96</td>
<td>0</td>
<td>0</td>
<td>93</td>
</tr>
<tr>
<td>12</td>
<td>181 (a primary school)</td>
<td>2</td>
<td>97</td>
<td>1</td>
<td>0</td>
<td>94</td>
</tr>
<tr>
<td>13</td>
<td>280</td>
<td>43</td>
<td>53</td>
<td>4</td>
<td>0</td>
<td>74</td>
</tr>
<tr>
<td>14</td>
<td>83 (a K-12 school)</td>
<td>81</td>
<td>3</td>
<td>16</td>
<td>0</td>
<td>--^a</td>
</tr>
<tr>
<td>15</td>
<td>185</td>
<td>46</td>
<td>51</td>
<td>3</td>
<td>0</td>
<td>41</td>
</tr>
<tr>
<td>16</td>
<td>735</td>
<td>21</td>
<td>77</td>
<td>2</td>
<td>0</td>
<td>76</td>
</tr>
</tbody>
</table>

Note: Information from this table was provided by the NC DPI for the academic year 2001-2002. Percents for ethnicity do not add to 100% due to rounding. ^aMeals are not offered at this school.
### Table 5

**Descriptions of Basals Used in the 16 Schools.**

<table>
<thead>
<tr>
<th>Basal</th>
<th>Purposes/Goals</th>
<th>Skills Targeted</th>
<th>Extent of Explicit Instruction</th>
<th>Extent to Which Instruction Scripted</th>
<th>Mention of “Scientifically Based”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Court Reading</td>
<td>Focus on mastering phonics skills to get beyond “distractions” of decoding in order to focus on comprehension</td>
<td>Phonemic Awareness, Phonics, Word Knowledge, Comprehension Skills and Strategies, Inquiry Skills/Knowledge, Writing, Language Arts Skills and Strategies; “Logical progression”</td>
<td>Publisher states the series is grounded in systematic, explicit instruction</td>
<td>Scripted, except for some areas of Language Arts</td>
<td>Publisher states that the series is based on scientific research and nearly 40 years of experience (with no citations given)</td>
</tr>
<tr>
<td>Scott Foresman Reading</td>
<td>“Partnership through training” Designed to meet the major instructional needs of students in reading</td>
<td>Phonemic Awareness, Phonics, Fluency, Vocabulary, Comprehension</td>
<td>Publishers refer to explicit instruction in small homogeneous groups</td>
<td>Not scripted. Manual provides guidance in explicit instruction</td>
<td>Publisher refers to an evidence base</td>
</tr>
<tr>
<td>McGraw-Hill Reading</td>
<td>Helping students to become “skillful readers,” and Motivation mentioned (Other: Revolves around weekly literature selection with lesson plans, with additional “decodable” stories)</td>
<td>Phonics, Phonological awareness, Decoding, Vocabulary, Comprehension</td>
<td>Publisher states that direct explicit instruction leads to reading success</td>
<td>Not scripted. Manual provides guidance in explicit instruction</td>
<td>Not mentioned</td>
</tr>
<tr>
<td>Harcourt Brace Collections</td>
<td>“Balanced, comprehensive program” to help students become fluent lifelong readers</td>
<td>Oral language, Phonological Awareness, Comprehension, Letter-sound Knowledge, Vocabulary, Writing</td>
<td>Systematic phonics instruction also mentioned</td>
<td>Scripted for phonological awareness and letter-sound knowledge</td>
<td>Publisher states the series is founded upon research-based instruction and practice (with no citations given)</td>
</tr>
</tbody>
</table>

Note. “Skills Targeted” are listed in the order in which they are mentioned or emphasized by the publisher.
### Table 6. Mean Percents for Selected Observation Variables, Averaged across Teachers within Focal Schools, for the First Two and Last Two Observations.

<table>
<thead>
<tr>
<th></th>
<th>School 1 Observations 1 and 2</th>
<th>School 1 Observations 5 and 6</th>
<th>School 3 Observations 1 and 2</th>
<th>School 3 Observations 5 and 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole class</td>
<td>43.50</td>
<td>66.32</td>
<td>77.38</td>
<td>59.02</td>
</tr>
<tr>
<td>Small group</td>
<td>67.17</td>
<td>36.37</td>
<td>35.83</td>
<td>75.68</td>
</tr>
<tr>
<td>Coaching</td>
<td>68.67</td>
<td>68.37</td>
<td>32.83</td>
<td>27.25</td>
</tr>
<tr>
<td>Telling</td>
<td>43.67</td>
<td>32.97</td>
<td>48.33</td>
<td>25.18</td>
</tr>
<tr>
<td>Higher-level comprehension questioning</td>
<td>12.33</td>
<td>13.89</td>
<td>2.38</td>
<td>11.80</td>
</tr>
<tr>
<td>Lower-level comprehension questioning</td>
<td>45.33</td>
<td>2.19</td>
<td>25.60</td>
<td>34.48</td>
</tr>
<tr>
<td>Active student responding</td>
<td>82.50</td>
<td>83.48</td>
<td>78.81</td>
<td>75.73</td>
</tr>
<tr>
<td>Passive student responding</td>
<td>17.50</td>
<td>5.60</td>
<td>25.67</td>
<td>48.23</td>
</tr>
<tr>
<td>Vocabulary meaning</td>
<td>17.50</td>
<td>16.53</td>
<td>21.15</td>
<td>24.28</td>
</tr>
<tr>
<td>Word-level</td>
<td>60.83</td>
<td>27.01</td>
<td>64.13</td>
<td>55.50</td>
</tr>
<tr>
<td>Phonics/phonological awareness</td>
<td>21.17</td>
<td>5.56</td>
<td>57.50</td>
<td>24.72</td>
</tr>
<tr>
<td>Comprehension strategy/skill</td>
<td>7.33</td>
<td>9.72</td>
<td>0.00</td>
<td>8.35</td>
</tr>
<tr>
<td></td>
<td>School 5</td>
<td></td>
<td>School 10</td>
<td></td>
</tr>
<tr>
<td>Whole class</td>
<td>100.00</td>
<td>85.65</td>
<td>88.90</td>
<td>70.85</td>
</tr>
<tr>
<td>Small group</td>
<td>0.00</td>
<td>26.62</td>
<td>19.43</td>
<td>44.08</td>
</tr>
<tr>
<td>Coaching</td>
<td>62.00</td>
<td>24.92</td>
<td>20.83</td>
<td>30.18</td>
</tr>
<tr>
<td>Telling</td>
<td>29.00</td>
<td>36.30</td>
<td>48.85</td>
<td>0.00</td>
</tr>
<tr>
<td>Higher-level comprehension questioning</td>
<td>4.83</td>
<td>10.90</td>
<td>20.83</td>
<td>0.00</td>
</tr>
<tr>
<td>Lower-level comprehension questioning</td>
<td>26.33</td>
<td>41.08</td>
<td>32.23</td>
<td>18.75</td>
</tr>
<tr>
<td>Active student responding</td>
<td>91.17</td>
<td>80.25</td>
<td>62.48</td>
<td>94.25</td>
</tr>
<tr>
<td>Passive student responding</td>
<td>8.83</td>
<td>19.76</td>
<td>37.53</td>
<td>5.75</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>3.33</td>
<td>16.79</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Word-level</td>
<td>55.00</td>
<td>14.12</td>
<td>24.98</td>
<td>29.18</td>
</tr>
<tr>
<td>Phonics/phonological awareness</td>
<td>38.17</td>
<td>37.27</td>
<td>5.55</td>
<td>76.78</td>
</tr>
<tr>
<td>Comprehension strategy/skill</td>
<td>4.17</td>
<td>11.34</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Note.** Percents are of total observed segments within observations in which the variable was observed.
Table 7. Means (SD) for Reading Words in Isolation and Phonics Knowledge for Children of Eleven Focal Teachers at Year 1 Beginning and at Year 2 End.

<table>
<thead>
<tr>
<th>Degree of Teacher Change</th>
<th>Reading Words in Isolation</th>
<th>Phonics Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning Y1</td>
<td>End Y2</td>
</tr>
<tr>
<td>1</td>
<td>16.75(8.66)</td>
<td>88.69(4.37)</td>
</tr>
<tr>
<td>2</td>
<td>44.54(6.33)</td>
<td>99.58(3.19)</td>
</tr>
<tr>
<td>3</td>
<td>34.40(5.48)</td>
<td>90.62(2.77)</td>
</tr>
</tbody>
</table>

Note. For degree of teacher change 1 = lower-change, 2 = moderate-change, and 3 = higher-change.
Table 8. *Means*(SD) for Comprehension and Fluency for Children of Eleven Focal Teachers for Beginning, Middle and End of Year Two.

<table>
<thead>
<tr>
<th>Degree of Teacher Change</th>
<th>Comprehension</th>
<th></th>
<th></th>
<th>Fluency</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning</td>
<td>Middle</td>
<td>End</td>
<td>Mean</td>
<td>Beginning</td>
<td>Middle</td>
</tr>
<tr>
<td>1</td>
<td>84.18(31.20)</td>
<td>78.85(30.52)</td>
<td>89.91(13.62)</td>
<td>84.31</td>
<td>42.64(17.91)</td>
<td>56.82(21.39)</td>
</tr>
<tr>
<td>2</td>
<td>82.75(25.87)</td>
<td>75.61(30.33)</td>
<td>65.20(28.16)</td>
<td>74.52</td>
<td>79.14(51.17)</td>
<td>81.00(32.16)</td>
</tr>
<tr>
<td>3</td>
<td>83.78(20.66)</td>
<td>72.99(27.45)</td>
<td>61.77(25.50)</td>
<td>72.85</td>
<td>49.46(20.26)</td>
<td>63.19(18.91)</td>
</tr>
<tr>
<td>Marginal Mean</td>
<td>83.59(24.13)</td>
<td>74.98(28.42)</td>
<td>68.78(26.38)</td>
<td></td>
<td>56.14(34.08)</td>
<td>66.71(24.99)</td>
</tr>
</tbody>
</table>

Note. For degree of teacher change 1 = lower-change, 2 = moderate-change, and 3 = higher-change.
Table 9. *Instructional Reading Level Means (and Standard Deviations) for Schools by Grade for Years 1 and 2 and for Annual Growth.*

<table>
<thead>
<tr>
<th>School</th>
<th>Year 1</th>
<th>Year 1</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 2</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Nº)</td>
<td>Beginning</td>
<td>End</td>
<td>Growth</td>
<td>Beginning</td>
<td>End</td>
</tr>
<tr>
<td>1</td>
<td>1-2</td>
<td>0.05(0.10)</td>
<td>1.39(1.49)</td>
<td>1.34</td>
<td>2.16(1.70)</td>
<td>3.77(2.93)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>1.24(2.04)</td>
<td>2.70(2.89)</td>
<td>1.46</td>
<td>3.55(3.95)</td>
<td>4.07(3.96)</td>
</tr>
<tr>
<td>2</td>
<td>1-2</td>
<td>0.52(1.73)</td>
<td>2.17(2.24)</td>
<td>1.65</td>
<td>2.60(1.98)</td>
<td>4.92(3.55)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>2.26(2.41)</td>
<td>3.63(3.47)</td>
<td>1.37</td>
<td>4.18(3.32)</td>
<td>6.15(4.08)</td>
</tr>
<tr>
<td>3</td>
<td>1-2</td>
<td>0.16(0.26)</td>
<td>1.83(1.64)</td>
<td>1.67</td>
<td>2.34(1.50)</td>
<td>5.71(3.43)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>1.24(1.90)</td>
<td>2.58(2.42)</td>
<td>1.34</td>
<td>3.17(3.00)</td>
<td>6.86(3.98)</td>
</tr>
<tr>
<td>4</td>
<td>1-2</td>
<td>0.21(0.49)</td>
<td>1.86(1.80)</td>
<td>1.65</td>
<td>3.90(3.27)</td>
<td>5.95(2.90)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>2.39(1.68)</td>
<td>5.06(1.98)</td>
<td>2.67</td>
<td>7.03(2.95)</td>
<td>9.16(2.57)</td>
</tr>
<tr>
<td>5</td>
<td>1-2</td>
<td>0.02(0.07)</td>
<td>0.38(0.82)</td>
<td>0.36</td>
<td>0.71(1.08)</td>
<td>2.59(1.82)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>1.14(1.12)</td>
<td>3.95(2.59)</td>
<td>2.81</td>
<td>4.82(2.88)</td>
<td>7.13(2.81)</td>
</tr>
<tr>
<td>6</td>
<td>1-2</td>
<td>0.00(0.00)</td>
<td>0.43(0.92)</td>
<td>0.43</td>
<td>1.00(1.31)</td>
<td>1.80(1.74)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>1.67(2.02)</td>
<td>3.33(0.58)</td>
<td>1.66</td>
<td>4.00(0.00)</td>
<td>5.00(1.73)</td>
</tr>
<tr>
<td>7</td>
<td>1-2</td>
<td>0.08(0.12)</td>
<td>2.13(1.47)</td>
<td>2.05</td>
<td>2.78(1.43)</td>
<td>3.95(1.30)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>2.29(2.17)</td>
<td>4.38(2.73)</td>
<td>2.09</td>
<td>5.40(3.66)</td>
<td>6.96(4.04)</td>
</tr>
<tr>
<td>8</td>
<td>1-2</td>
<td>0.00(0.00)</td>
<td>0.46(0.78)</td>
<td>0.46</td>
<td>0.54(0.37)</td>
<td>3.04(1.45)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>1.30(2.13)</td>
<td>2.88(1.93)</td>
<td>1.58</td>
<td>3.09(1.99)</td>
<td>4.11(2.30)</td>
</tr>
<tr>
<td>9</td>
<td>1-2</td>
<td>0.32(1.06)</td>
<td>1.27(2.23)</td>
<td>0.95</td>
<td>1.88(3.15)</td>
<td>3.11(3.69)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>1.43(1.80)</td>
<td>3.43(2.29)</td>
<td>2.00</td>
<td>4.58(3.22)</td>
<td>5.53(3.50)</td>
</tr>
<tr>
<td>10</td>
<td>1-2</td>
<td>0.14(0.51)</td>
<td>1.44(1.67)</td>
<td>1.30</td>
<td>1.99(2.15)</td>
<td>5.45(3.32)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>1.05(1.46)</td>
<td>3.01(2.23)</td>
<td>1.96</td>
<td>3.79(2.93)</td>
<td>6.73(3.82)</td>
</tr>
<tr>
<td>11</td>
<td>1-2</td>
<td>0.41(0.79)</td>
<td>1.50(1.64)</td>
<td>1.09</td>
<td>2.45(2.94)</td>
<td>3.84(2.19)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>0.61(1.28)</td>
<td>1.97(2.64)</td>
<td>1.36</td>
<td>2.69(2.90)</td>
<td>3.94(2.38)</td>
</tr>
<tr>
<td>12</td>
<td>1-2</td>
<td>0.42(1.09)</td>
<td>1.58(1.75)</td>
<td>1.16</td>
<td>3.04(2.48)</td>
<td>6.27(3.20)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>2.27(1.94)</td>
<td>5.11(2.39)</td>
<td>2.84</td>
<td>7.46(3.28)</td>
<td>10.57(1.37)</td>
</tr>
<tr>
<td>13</td>
<td>1-2</td>
<td>0.19(0.18)</td>
<td>2.63(1.30)</td>
<td>2.44</td>
<td>3.63(1.77)</td>
<td>4.13(1.89)</td>
</tr>
<tr>
<td></td>
<td>2-3</td>
<td>2.75(2.07)</td>
<td>5.67(2.75)</td>
<td>2.92</td>
<td>6.56(3.40)</td>
<td>7.72(4.06)</td>
</tr>
</tbody>
</table>

(Table cont’d.)
Table 9. *Reading Instructional Level Means (and Standard Deviations) for Schools by Grade for Years 1 and 2 and for Annual Growth.*

(continuation)

<table>
<thead>
<tr>
<th>School</th>
<th>Grade (N&lt;sup&gt;a&lt;/sup&gt;)</th>
<th>Year 1</th>
<th>Year 1</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 2</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beginning</td>
<td>End</td>
<td>Growth</td>
<td>Beginning</td>
<td>End</td>
<td>Growth</td>
</tr>
<tr>
<td>14</td>
<td>1-2 (4)</td>
<td>0.00(0.00)</td>
<td>0.19(0.24)</td>
<td>0.19</td>
<td>0.63(0.92)</td>
<td>2.13(2.31)</td>
<td>1.50</td>
</tr>
<tr>
<td></td>
<td>2-3 (5)</td>
<td>2.15(1.82)</td>
<td>6.00(3.59)</td>
<td>3.85</td>
<td>6.80(3.62)</td>
<td>8.00(3.79)</td>
<td>1.20</td>
</tr>
<tr>
<td>15</td>
<td>1-2 (7)</td>
<td>0.64(1.49)</td>
<td>2.29(3.63)</td>
<td>1.65</td>
<td>2.75(3.57)</td>
<td>5.57(4.19)</td>
<td>2.82</td>
</tr>
<tr>
<td></td>
<td>2-3 (5)</td>
<td>1.60(2.48)</td>
<td>4.40(2.07)</td>
<td>2.80</td>
<td>4.90(2.61)</td>
<td>7.00(3.30)</td>
<td>2.10</td>
</tr>
<tr>
<td>16</td>
<td>1-2 (44)</td>
<td>0.26(0.66)</td>
<td>1.55(1.95)</td>
<td>1.29</td>
<td>2.22(2.54)</td>
<td>3.58(3.36)</td>
<td>1.36</td>
</tr>
<tr>
<td></td>
<td>2-3 (39)</td>
<td>2.10(1.84)</td>
<td>3.71(2.54)</td>
<td>1.61</td>
<td>4.94(3.24)</td>
<td>7.76(3.49)</td>
<td>2.82</td>
</tr>
</tbody>
</table>

Note. Instructional Reading Level was not assessed in Kindergarten. An Instructional Reading Level score of “0” indicates that a student did not pass even the lowest reading passage; .25 indicates approximately a pre-primer level, which is, for typically developing students, achieved around the beginning of first grade; .50 indicates approximately a primer level, achieved by typically developing students around the middle of first grade; 1.00 indicates approximately first grade level; 2.00 indicates approximately second grade level; and so on. A grade of 1-2 indicates a student that was in first grade in Year 1 and second grade in Year 2. A grade of 2-3 indicates a student that was in second grade in Year 1 and third grade in Year 2. *N’s are for students included in the analyses for overall growth in Instructional Reading Level.
Table 10. Kindergarten Letter Knowledge and Book and Print Awareness Means (SD) for Schools and for Growth for REA Year 1.

<table>
<thead>
<tr>
<th>School</th>
<th>Letter Knowledge</th>
<th>Book and Print Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning</td>
<td>End</td>
</tr>
<tr>
<td>1</td>
<td>25.33(27.96)</td>
<td>82.59(21.97)</td>
</tr>
<tr>
<td>2</td>
<td>30.46(33.20)</td>
<td>81.59(20.77)</td>
</tr>
<tr>
<td>3</td>
<td>46.64(33.39)</td>
<td>86.02(21.15)</td>
</tr>
<tr>
<td>4</td>
<td>45.00(38.53)</td>
<td>84.85(19.01)</td>
</tr>
<tr>
<td>5</td>
<td>10.06(24.01)</td>
<td>87.44(20.64)</td>
</tr>
<tr>
<td>6</td>
<td>39.25(32.88)</td>
<td>74.63(26.02)</td>
</tr>
<tr>
<td>7</td>
<td>20.12(29.23)</td>
<td>90.00(10.35)</td>
</tr>
<tr>
<td>8</td>
<td>24.36(33.66)</td>
<td>86.91(27.15)</td>
</tr>
<tr>
<td>9</td>
<td>35.50(30.34)</td>
<td>85.08(17.78)</td>
</tr>
<tr>
<td>10</td>
<td>55.30(28.93)</td>
<td>90.89(17.85)</td>
</tr>
<tr>
<td>11</td>
<td>68.33(16.18)</td>
<td>94.00(3.69)</td>
</tr>
<tr>
<td>12</td>
<td>25.52(28.37)</td>
<td>86.91(22.11)</td>
</tr>
<tr>
<td>13</td>
<td>76.48(15.99)</td>
<td>96.43(6.27)</td>
</tr>
<tr>
<td>14</td>
<td>30.70(18.49)</td>
<td>73.60(23.49)</td>
</tr>
<tr>
<td>15</td>
<td>54.38(38.81)</td>
<td>71.82(30.06)</td>
</tr>
<tr>
<td>16</td>
<td>50.38(29.26)</td>
<td>85.42(15.13)</td>
</tr>
</tbody>
</table>
Table 11. *Kindergarten Phonics and Phonological Awareness Means(SD) for Schools and for Annual Growth for REA Year 1.*

<table>
<thead>
<tr>
<th>School</th>
<th>Phonics</th>
<th></th>
<th></th>
<th>Phonological Awareness</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning</td>
<td>End</td>
<td>Growth</td>
<td>Beginning</td>
<td>End</td>
<td>Growth</td>
</tr>
<tr>
<td>1</td>
<td>2.83(8.24)</td>
<td>63.48(31.95)</td>
<td>60.66</td>
<td>4.10(4.10)</td>
<td>43.20(20.64)</td>
<td>39.10</td>
</tr>
<tr>
<td>2</td>
<td>8.62(18.68)</td>
<td>57.97(30.17)</td>
<td>49.35</td>
<td>18.54(18.60)</td>
<td>46.15(18.38)</td>
<td>27.62</td>
</tr>
<tr>
<td>3</td>
<td>10.60(16.59)</td>
<td>79.82(24.51)</td>
<td>69.22</td>
<td>33.12(16.47)</td>
<td>64.11(27.98)</td>
<td>30.99</td>
</tr>
<tr>
<td>4</td>
<td>19.10(31.50)</td>
<td>68.83(29.26)</td>
<td>49.73</td>
<td>26.48(19.64)</td>
<td>58.31(18.94)</td>
<td>31.83</td>
</tr>
<tr>
<td>5</td>
<td>0.24(1.30)</td>
<td>75.73(25.47)</td>
<td>75.49</td>
<td>28.41(16.40)</td>
<td>60.72(19.87)</td>
<td>32.31</td>
</tr>
<tr>
<td>6</td>
<td>0.50(1.41)</td>
<td>46.50(31.79)</td>
<td>46.00</td>
<td>24.00(8.82)</td>
<td>47.00(24.45)</td>
<td>23.00</td>
</tr>
<tr>
<td>7</td>
<td>4.59(17.20)</td>
<td>72.59(15.60)</td>
<td>68.00</td>
<td>14.59(10.67)</td>
<td>65.41(21.49)</td>
<td>50.82</td>
</tr>
<tr>
<td>8</td>
<td>2.91(5.74)</td>
<td>73.64(33.10)</td>
<td>70.72</td>
<td>16.82(11.57)</td>
<td>36.00(20.08)</td>
<td>19.18</td>
</tr>
<tr>
<td>9</td>
<td>10.92(13.45)</td>
<td>69.53(28.09)</td>
<td>58.61</td>
<td>21.24(12.02)</td>
<td>57.18(19.69)</td>
<td>35.94</td>
</tr>
<tr>
<td>10</td>
<td>14.79(20.90)</td>
<td>83.15(22.55)</td>
<td>68.35</td>
<td>22.71(11.90)</td>
<td>38.51(16.24)</td>
<td>15.80</td>
</tr>
<tr>
<td>11</td>
<td>32.67(13.82)</td>
<td>76.67(17.65)</td>
<td>44.00</td>
<td>36.00(11.87)</td>
<td>60.00(19.27)</td>
<td>24.00</td>
</tr>
<tr>
<td>12</td>
<td>4.84(12.41)</td>
<td>84.89(26.25)</td>
<td>80.05</td>
<td>18.57(13.00)</td>
<td>42.00(17.31)</td>
<td>23.43</td>
</tr>
<tr>
<td>13</td>
<td>11.90(16.29)</td>
<td>69.33(24.05)</td>
<td>57.43</td>
<td>22.67(11.23)</td>
<td>64.67(21.36)</td>
<td>42.00</td>
</tr>
<tr>
<td>14</td>
<td>2.14(3.18)</td>
<td>34.98(13.91)</td>
<td>32.84</td>
<td>16.80(10.73)</td>
<td>47.20(6.57)</td>
<td>30.40</td>
</tr>
<tr>
<td>15</td>
<td>24.25(35.41)</td>
<td>59.73(40.81)</td>
<td>35.48</td>
<td>38.00(25.10)</td>
<td>63.60(17.63)</td>
<td>25.60</td>
</tr>
<tr>
<td>16</td>
<td>19.15(26.15)</td>
<td>70.83(23.31)</td>
<td>51.69</td>
<td>20.92(12.02)</td>
<td>44.77(19.83)</td>
<td>23.85</td>
</tr>
</tbody>
</table>
Table 12. *Reading Instructional Level Means (and Standard Deviations) and Growth by Type of Reform across Year 1 and Year 2.*

<table>
<thead>
<tr>
<th>Reform Type (N)</th>
<th>Beginning Year 1</th>
<th>Year 1 Growth</th>
<th>End Year 1</th>
<th>Year 2 Growth</th>
<th>Beginning Year 2</th>
<th>Summer Growth</th>
<th>End Year 2</th>
<th>Year 2 Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(161)</td>
<td>0.79(0.12)</td>
<td>1.61</td>
<td>2.40(0.20)</td>
<td>1.61</td>
<td>3.03(0.25)</td>
<td>0.63</td>
<td>5.67(0.29)</td>
<td>2.64</td>
</tr>
<tr>
<td>2(43)</td>
<td>1.13(0.24)</td>
<td>1.69</td>
<td>2.82(0.38)</td>
<td>1.69</td>
<td>3.36(0.47)</td>
<td>0.54</td>
<td>4.79(0.56)</td>
<td>1.43</td>
</tr>
<tr>
<td>3(26)</td>
<td>1.42(0.31)</td>
<td>2.53</td>
<td>3.95(0.49)</td>
<td>2.53</td>
<td>4.79(0.61)</td>
<td>0.84</td>
<td>5.81(0.72)</td>
<td>1.02</td>
</tr>
<tr>
<td>4(95)</td>
<td>1.11(0.16)</td>
<td>1.53</td>
<td>2.64(0.26)</td>
<td>1.53</td>
<td>3.52(0.32)</td>
<td>0.88</td>
<td>5.62(0.38)</td>
<td>2.10</td>
</tr>
<tr>
<td>5(214)</td>
<td>0.84(0.11)</td>
<td>1.57</td>
<td>2.41(0.17)</td>
<td>1.57</td>
<td>3.52(0.21)</td>
<td>1.11</td>
<td>5.46(0.25)</td>
<td>1.94</td>
</tr>
</tbody>
</table>

Note. Reform Type 1 = Pre-Structured Program; 2 = Weakly Scaffolded Process; 3 = both Pre-Structured Program and strongly Scaffolded Process; 4 = Pre-Structured Program along with weakly Scaffolded Process; 5 = No Pre-Structured Program or Scaffolded Process.
Table 13. *Kindergarten Letter Knowledge, Book and Print Awareness, Phonics, and Phonological Awareness Means (SD) and Annual Growth for Type of Intervention Reform Effort During REA Year 1.*

<table>
<thead>
<tr>
<th>Reform Type(N)</th>
<th>Letter Knowledge</th>
<th>Book and Print Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning</td>
<td>Ending</td>
</tr>
<tr>
<td>1(77)</td>
<td>34.07(34.51)</td>
<td>88.02(19.46)</td>
</tr>
<tr>
<td>2(28)</td>
<td>21.79(30.50)</td>
<td>88.79(18.41)</td>
</tr>
<tr>
<td>3(17)</td>
<td>63.02(26.90)</td>
<td>89.72(16.73)</td>
</tr>
<tr>
<td>4(58)</td>
<td>51.07(30.76)</td>
<td>83.07(18.93)</td>
</tr>
<tr>
<td>5(139)</td>
<td>37.19(33.00)</td>
<td>84.45(20.42)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reform Type(N)</th>
<th>Phonics</th>
<th>Phonological Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning</td>
<td>Ending</td>
</tr>
<tr>
<td>1(77)</td>
<td>8.27(17.19)</td>
<td>76.10(26.25)</td>
</tr>
<tr>
<td>2(28)</td>
<td>3.93(13.72)</td>
<td>73.00(23.46)</td>
</tr>
<tr>
<td>3(17)</td>
<td>9.03(14.35)</td>
<td>59.23(26.58)</td>
</tr>
<tr>
<td>4(58)</td>
<td>20.03(27.67)</td>
<td>68.92(27.00)</td>
</tr>
<tr>
<td>5(139)</td>
<td>9.97(19.33)</td>
<td>70.03(29.53)</td>
</tr>
</tbody>
</table>

Note. Reform Type 1 = Pre-Structured Program; 2 = Weakly Scaffolded Process; 3 = both Pre-Structured Program and strongly Scaffolded Process; 4 = Pre-Structured Program along with weakly Scaffolded Process; 5 = No Pre-Structured Program or Scaffolded Process.
Table 14. *Rank Orders for Type of Intervention Reform Effort for Kindergarteners Mean Growth on Letter Knowledge, Book and Print Awareness, Phonics, and Phonological Awareness.*

<table>
<thead>
<tr>
<th>Reform Type</th>
<th>Letter Knowledge Mean Growth</th>
<th>Book and Print Awareness Mean Growth</th>
<th>Phonics Mean Growth</th>
<th>Phonological Awareness Mean Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>67.00</td>
<td>49.11</td>
<td>2</td>
<td>69.07</td>
</tr>
<tr>
<td>1</td>
<td>53.95</td>
<td>38.05</td>
<td>1</td>
<td>67.83</td>
</tr>
<tr>
<td>5</td>
<td>47.27</td>
<td>31.44</td>
<td>5</td>
<td>60.06</td>
</tr>
<tr>
<td>4</td>
<td>32.01</td>
<td>35.00</td>
<td>3</td>
<td>50.20</td>
</tr>
<tr>
<td>3</td>
<td>26.70</td>
<td>24.07</td>
<td>4</td>
<td>48.89</td>
</tr>
</tbody>
</table>

Note. Reform Type 1 = Pre-Structured Program; 2 = Weakly Scaffolded Process; 3 = both Pre-Structured Program and strongly Scaffolded Process; 4 = Pre-Structured Program along with weakly Scaffolded Process; 5 = No Pre-Structured Program or Scaffolded Process.
Table 15. Third Grade North Carolina End-of-Grade Achievement Level Means (SD) for Beginning of Year, End of Year and Yearly Growth, for Pre-REA, REA Year 1, and REA Year 2.

<table>
<thead>
<tr>
<th>Year</th>
<th>Beginning of Year</th>
<th>End of Year</th>
<th>Mean Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-REA</td>
<td>2.58(.89)</td>
<td>2.79(.87)</td>
<td>0.21</td>
</tr>
<tr>
<td>REA Year 1</td>
<td>2.71(.85)</td>
<td>2.90(.88)</td>
<td>0.19</td>
</tr>
<tr>
<td>REA Year 2</td>
<td>2.62(.90)</td>
<td>2.91(.89)</td>
<td>0.29</td>
</tr>
</tbody>
</table>

Note. Mean growth was calculated by subtracting the pretest score from the end-of-year score.
Table 16. *Percents of Third Grade Students At or Above Grade Level for End-of-Grade Reading Achievement Levels for Pre-REA, REA Year 1, and REA Year 2.*

<table>
<thead>
<tr>
<th>Year</th>
<th>Beginning of Year</th>
<th>End of Year</th>
<th>Percent Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-REA</td>
<td>56.70</td>
<td>62.70</td>
<td>6.00</td>
</tr>
<tr>
<td>REA Year 1</td>
<td>60.20</td>
<td>68.20</td>
<td>8.00</td>
</tr>
<tr>
<td>REA Year 2</td>
<td>55.90</td>
<td>69.20</td>
<td>13.30</td>
</tr>
</tbody>
</table>
### Table 17. Means (SD) for End-of-Year -2 Instructional Reading Level by Treatment and by Grade at End of Year 2.

<table>
<thead>
<tr>
<th>Grade at End of Year 2 (N)</th>
<th>Full Treatment</th>
<th>N</th>
<th>Low Treatment</th>
<th>N</th>
<th>Marginal Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>2(116)</td>
<td>4.37(3.16)</td>
<td>107</td>
<td>1.83(2.12)</td>
<td>9</td>
<td>4.17</td>
</tr>
<tr>
<td>3(114)</td>
<td>6.31(3.79)</td>
<td>108</td>
<td>4.79(3.78)</td>
<td>6</td>
<td>6.23</td>
</tr>
<tr>
<td>Marginal means</td>
<td>5.35</td>
<td></td>
<td>3.02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 18. Approximate REA Intervention Costs by Budget Category and Total Across the 16 REA schools and across Year 1 and Year 2.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Percent of Total Costs</th>
<th>Dollar Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary costs</td>
<td>31.82</td>
<td>US$2,216,483</td>
</tr>
<tr>
<td>Employee Benefits</td>
<td>5.41</td>
<td>376,738</td>
</tr>
<tr>
<td>Purchased Services</td>
<td>8.15</td>
<td>567,278</td>
</tr>
<tr>
<td>Supplies and Materials</td>
<td>49.97</td>
<td>3,480,575</td>
</tr>
<tr>
<td>Capital Outlay</td>
<td>4.16</td>
<td>289,719</td>
</tr>
<tr>
<td>Other</td>
<td>0.49</td>
<td>34,469</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100.00</strong></td>
<td><strong>$6,965,262</strong></td>
</tr>
<tr>
<td>Approximate cost per student, (4,180 students)</td>
<td></td>
<td>$1,666.33</td>
</tr>
</tbody>
</table>
Figure 1. Interaction of Degree of Teacher Change With Children’s Instructional Reading Level For Children of Eleven Focal Teachers.
Figure 2. Growth for Instructional Reading Level in Year 2 Minus Growth in Year 1 by Grade Sequence and School.
Figure 3. *Letter Knowledge Growth for Higher-Growth and Lower-Growth Schools for Kindergarten During REA Year 1.*
Figure 4. Growth in Book and Print Awareness for Higher-Growth and Lower-Growth Schools in Kindergarten During REA Year 1.
Figure 5. *Growth on Phonics for Higher-Growth and Lower-Growth Schools in Kindergarten During REA Year 1.*
Figure 6. Growth in Phonological Awareness for Higher-Growth and Lower-Growth Schools in Kindergarten During REA Year 1.
Figure 7. *Growth for Instructional Reading Level by Type of REA Intervention Reform Effort.*

Note. Reform Type 1 = Pre-Structured Program; 2 = Weakly Scaffolded Process; 3 = both Pre-Structured Program and strongly Scaffolded Process; 4 = Pre-Structured Program along with weakly Scaffolded Process; 5 = No Pre-Structured Program or Scaffolded Process.
Figure 8. Growth in Third Grade North Carolina End-of-Grade Test in Reading (Achievement Level Scores) Prior to REA, During REA Year 1, and During REA Year 2.