

U.S. Department of Education

Washington, D.C. 20202-5335



**FY 2002 FUND FOR THE IMPROVEMENT OF EDUCATION FINAL PERFORMANCE
REPORT
CFDA # 84.215K
PR/Award # R215K020361
Budget Period # 1
Report Type: Final Performance**

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**U.S. Department of Education
Grant Performance Report Cover Sheet (ED 524B)**

Check only one box per Program Office instructions.

Annual Performance Report Final Performance Report

General Information

1. PR/Award #: **R215K020361**
(Block 5 of the Grant Award Notification.)

2. NCES ID #: 153658
(See Instructions.)

3. Project Title: Fund for the Improvement of Education -- Earmarked Grant Application
(Enter the same title as on the approved application.)

4. Grantee Name*(Block 1 of the Grant Award Notification.):* University of Iowa

5. Grantee Address *(See Instructions.):* 2 GILMORE HALL

City: IOWA CITY State: IA Zip:52242 Zip+4:

| | | | |
|----------------------|---------------|---------------|------------------------------|
| 6. Project Director: | First Name | Last Name | Title |
| | Richard | Hurtig | |
| | Phone #: | Fax #: | Email Address: |
| | (319)335-8730 | (319)335-8851 | RICHARD- HURTIG@UIOWA.EDU |

Reporting Period Information *(See instructions.)*

7. Reporting Period: From: 7/1/2002 To: 6/30/2007 (mm/dd/yyyy)

Budget Expenditures *(To be completed by your Business Office. See instructions. Also see Section B.)*

8. Budget Expenditures

| | Federal Grant Funds | Non-Federal Funds (Match/Cost Share) |
|---|----------------------------|---|
| a. Previous Budget Period | 448,873.00 | 0.00 |
| b. Current Reporting Period | 50,817.00 | 0.00 |
| c. Entire Project Period <i>(For Final Performance Reports only)</i> | 499,690.00 | 0.00 |

Indirect Cost Information *(To be completed by your Business Office. See instructions.)*

9. Indirect Costs

- a. Are you claiming indirect costs under this grant? Yes
 No
- b. If yes, do you have an Indirect Cost Rate Agreement approved by the Federal government? Yes
 No
- c. If yes, provide the following information:
 Period Covered by the Indirect Cost Rate Agreement: From: 7/1/2007 To: 6/30/2010 (mm/dd/yyyy)
 Approving Federal agency: ED Other (Please Specify)
 Type of Rate (For Final Performance Reports Only): Provisional Final Other (Please Specify)
- d. For Restricted Rate Programs (check one) -- Are you using a restricted indirect cost rate that :
- Is included in your approved Indirect Cost Rate Agreement?
 Complies with 34 CFR 76.564(c)(2)?

Human Subjects (See instructions.)

10. Annual Certification of Institutional Review Board (IRB) Approval? Yes No
 N/A

Performance Measures Status and Certification (See instructions.)

11. Performance Measures Status
- a. Are complete data on performance measures for the current budget period included in the Project Status Chart? Yes No
- b. If no, when will the data be available and submitted to the Department? (mm/dd/yyyy)
12. To the best of my knowledge and belief, all data in this performance report are true and correct and the report fully discloses all known weaknesses concerning the accuracy, reliability, and completeness of the data.

| | |
|---|------------------------|
| Name of Authorized Representative: Meredith Hay | Title: VP for Research |
| Signature: | Date: |

Grant Performance Report (ED 524B) Executive Summary Attachment:

Title : Hurtig Executive Summary
 File : H:\HURTIG\muscatine project\ED524B-ExecSummary-final.doc



U.S. Department of Education
Grant Performance Report (ED 524B)
Executive Summary

OMB No. 1890 - 0004
Expiration: 10-31-2007

PR/Award #: (Please Enter)
R215K020361

Given earlier studies that demonstrated an impact of Breakthrough to Literacy, our primary hypothesis was that Breakthrough to Literacy would enhance early language and literacy development compared to current classroom practices in pre-kindergarten through second grade. Specifically, it was predicted that Breakthrough to Literacy participants at each of these grade levels would show greater gains than non-participants on tasks measuring the predictors of reading achievement at the end of the first program year. It was also hypothesized that early gains would be sustained into third grade and lead to higher language and reading comprehension achievement scores among third graders who used versus did not use Breakthrough to Literacy in the early school years. Another question we hoped to address was could Breakthrough to Literacy be differentially effective for children who score lower as opposed to higher on the predictor measures at baseline.

This study included pre-kindergarten, kindergarten, first grade, and second grade students in an Iowa public school district serving a large Title 1 population. Two schools were selected and assigned to either the Breakthrough to Literacy or control intervention conditions. This resulted in 10 classrooms at the Breakthrough to Literacy implementation school and 8 classrooms at the control school. Children who used Breakthrough to Literacy in pre-kindergarten, kindergarten, or first grade during Year 1 of the study were exposed to the program each year thereafter through second grade.

In the first program year, 368 children were assessed at baseline (Fall 2002) and at the end of the academic year (Spring 2003). All participants were assessed at three points: 1) in the fall of the first project year just before intervention begins (baseline); 2) in the spring of the first project year; and 3) in the spring of their third-grade year. The first two assessments provided pretest and posttest data to allow an evaluation of short-term literacy gains as a function of Breakthrough to Literacy or no intervention conditions. The Year 1 baseline assessment battery included the TOLD-P Sentence Imitation, Sound Deletion, Rapid Automatized Naming, and Woodcock- Letter Identification tests. All tests in the battery were administered individually in a single 15-30 minute session. The Year 1 spring testing included all of the tests in the baseline assessment and the Woodcock- Passage Comprehension test.

Follow-up testing was conducted when each Breakthrough to Literacy and control cohort completed third grade. All third graders in Years 2-5 were also assessed with the ITBS, which was administered in groups by classroom teachers but under the supervision of the school district.

Although an in-depth analysis of implementation quality was beyond the scope of this study, a concerted effort nonetheless was made to determine that implementations in each Breakthrough to Literacy classroom met the standards necessary for maintaining integrity of the project design. Standards set by the curriculum developers were assessed by their literacy coaches and Quality Assurance team using the Stages of Implementation Inventory as well as other descriptive and observational measures.

Each implementation classroom was visited multiple times over the course of the study by a trained Breakthrough to Literacy coach. As part of these visits, the coach made a series of observations to assess the extent to which each of the essential practices was being successfully implemented by the teacher. Of the nine teachers in the kindergarten, first and second grades, three teachers implementation the curriculum was judged as unacceptable using the fidelity measures. In addition the literacy coaches noted that adequate provisions to assure that substitute teachers were familiar with the curriculum did not appear to be in place.

Because of our concern about implementation fidelity we expand the study to include examination of the kindergartners' writing in the implementation school. During kindergarten many children begin to generate unconventional spellings of words that demonstrate their developing knowledge of letter-sound relations. These early invented spellings reveal principled knowledge that is central to learning how to write and read, and they may be good indicators of whether children in a classroom are learning aspects of phonological awareness central to developing literacy (Scanlon & Vellutino, 1997). Therefore we decided to investigate whether features such as invented spelling in the daily writing that is an essential practice in Breakthrough to Literacy classrooms could be used as indicators of individual children's progress and of the success of an implementation at the classroom level. We developed a computer aided coding system that allowed us to systematically code a number of aspects of the children's writing including the spelling patterns (<http://www.shc.uiowa.edu/wjshc/research/speechlab/literacy.html>). Exploratory analyses revealed that students of the kindergarten teacher rated as inadequate in implementation of the program were not doing the kind of independent writing and spelling associated with good progress in literacy. This result reinforced other findings regarding the importance of issues related to implementation of Breakthrough to Literacy.

Analysis of the assessment data failed to show an impact of the Breakthrough to Literacy in this setting. Mean total reading scores as measured by the ITBS in third grade were not significantly better for children participating in the Breakthrough to Literacy classrooms during the years preceding third grade than for children participating in the control classrooms. Also there would be a dose effect on the reading outcomes; those children receiving Breakthrough to Literacy for four years did not have better reading levels than those children with fewer years. Finally, contrary to prediction children in the lowest quartile did not show the largest gains.

The results of this study, showing no difference between the experimental and control schools reinforce a profound but too often forgotten conclusion of serious attempts to change teachers and schools for the betterment of children. The conclusion is that local influences surrounding the implementation of any educational initiative have a far larger impact on outcomes than the initiative or program itself. In fact, it has been said that to ask whether “program x” works is the wrong question to ask. Rather, the relevant question for most initiatives, particularly ones that involve already proven programs is, “Can we establish and maintain the conditions that have been shown to be essential for a successful implementation?” In the case of this study, we were, for many reasons unable to establish these conditions. Despite significant attempts by teachers, administrators and the publishers to test Breakthrough to Literacy, various factors foreclosed any likelihood of a good test of the curriculum and its implementation.

The lack of differences in group outcomes in the current study should not be viewed as conclusive evidence that “BTL does not work”. Rather, the results reflect and reinforce the conclusion that the successful implementation of any successful educational initiative demands the focused attention of involved teachers and administrators and the commitment to implement the initiative with integrity. Our experience here reflects the issues clearly illustrated by Slavin & Fashola (1998). Realizing a return on the investment in a literacy curriculum requires consistent effort and a team approach that involves teachers, administrators and publishers and that takes advantage of best practices while adapting to the specific context of each school district.



**U.S. Department of Education
Grant Performance Report (ED 524B)
Project Status Chart**

PR/Award #: **R215K020361**

SECTION A - Project Objectives Information and Related Performance Measures Data (See Instructions. Use as many pages as necessary.)

Project Objective Check if this is a status update for the previous budget period.
Objective 1: Implement Breakthrough to Literacy curriculum at the Pre-Kindergarten through Second grade levels in a Title I school in Eastern Iowa.

| Performance Measure | Measure Type | Quantitative Data | | | |
|---------------------|--------------|-------------------|---|-------------------------|---|
| | | Target | | Actual Performance Data | |
| | | Raw Number | % | Raw Number | % |
| PROJ | | / | | / | |

Explanation of Progress (Include Qualitative Data and Data Collection Information)
 This study included pre-kindergarten, kindergarten, first grade, and second grade students in an Iowa public school district serving a large Title I population. The district was selected on the basis of demographic factors that place students at risk for reading and academic difficulties. Two schools in the district were selected and assigned to either the Breakthrough to Literacy or control intervention conditions. Given the longitudinal design and the enrollments at the Breakthrough to Literacy school, the implementation team and the school administration chose to use all classrooms at each of the 4 grade levels identified above. A similar decision was made to include all children at each of the 4 grade levels at the control school as well. This resulted in 10 classrooms at the Breakthrough to Literacy implementation school and 8 classrooms at the control school.

In the first program year, 368 children were assessed at baseline (Fall 2002) and at the end of the academic year (Spring 2003). Of these 205 were attending the Breakthrough to Literacy school and 162 at the control school. Children who used Breakthrough to Literacy in pre-kindergarten, kindergarten, or first grade during Year 1 of the study were exposed to the program each year thereafter through second grade. All children, at both schools, in the third grade in Years 2-5 of the study

were assessed in the late spring.

The Stages of Implementation Inventory developed by the Breakthrough to Literacy Quality Assurance team was used to assess teacher implementation of Breakthrough to Literacy. This analytical tool assesses implementation quality along several dimensions related to the Breakthrough to Literacy essential practices. For each dimension, the assessment rubric lists a number of teacher activities, each of which is categorized as reflective of ?Minimum?, ?Consistent?, or ?Highly Integrated? implementation. Overall ratings of success on individual dimensions are determined from the proportion of teacher activities that fall into the three ordinal ranking categories. Standards set by the curriculum developers were assessed by their literacy coaches and Quality Assurance team using the Stages of Implementation Inventory as well as other descriptive and observational measures. Each implementation classroom was visited multiple times over the course the first two years of the study by a trained Breakthrough to Literacy coach. As part of these visits, the coach made a series of observations to assess the extent to which each of the essential practices was being successfully implemented by the teacher. Of the nine teachers in the kindergarten, first and second grades, three teachers implementation the curriculum was judged as unacceptable using the fidelity measures. In addition the literacy coaches noted that adequate provisions to assure that substitute teachers were familiar with the curriculum did not appear to be in place. The differences in fidelity of implementation were also corroborated by our supplemental analysis of children's writing samples.



**U.S. Department of Education
Grant Performance Report (ED 524B)
Project Status Chart**

PR/Award #: **R215K020361**

SECTION A - Project Objectives Information and Related Performance Measures Data (See Instructions. Use as many pages as necessary.)

Project Objective Check if this is a status update for the previous budget period.
Objective 2: Perform assessments of children in the implementation and control classrooms to determine if there would be a differential impact of the Breakthrough to Literacy Curriculum.

| Performance Measure | Measure Type | Quantitative Data | | | |
|---------------------|--------------|-------------------|---|-------------------------|---|
| | | Target | | Actual Performance Data | |
| PROJ | | Raw Number | % | Raw Number | % |
| | | | / | | / |

Explanation of Progress (Include Qualitative Data and Data Collection Information)
 All participants were assessed at three points: 1) in the fall of the first project year just before intervention begins (baseline); 2) in the spring of the first project year; and 3) in the spring of their third-grade year. The first two assessments provided pretest and posttest data to allow an evaluation of short-term literacy gains as a function of Breakthrough to Literacy or no intervention conditions. The Year 1 baseline assessment battery included the TOLD-P Sentence Imitation, Sound Deletion, Rapid Automatized Naming, and Woodcock- Letter Identification tests. All tests in the battery were administered individually in a single 15-30 minute session. The Year 1 spring testing included all of the tests in the baseline assessment and the Woodcock-Passage Comprehension test.

Follow-up testing was conducted when each Breakthrough to Literacy and control cohort completed third grade. Accordingly, the second-grade cohort was tested in Year 2, the first-grade cohort in Year 3, the kindergarten cohort in Year 4, and the pre-kindergarten cohort in Year 5. All third graders in Years 2-5 were also assessed with the ITBS, which was administered in groups by classroom teachers but under the supervision of the school district.

The first hypothesis that predicted that the mean total reading scores as measured by the ITBS in third grade would be significantly better for children participating in the Breakthrough to Literacy classrooms during the years preceding third grade than for children participating in the control classrooms was not supported.

The second hypothesis is that there would be a dose effect on the reading outcomes of the participants such that those children receiving Breakthrough to Literacy for four years would have better reading levels than those children with fewer years. This hypothesis was also not supported.

It was also hypothesized that children entering this intervention who are high risk for reading problems would obtain greater benefit than children at low risk. Thus, we predicted that children who fell into the bottom quartile would show the largest gains. We observed comparable gains for children in the lowest quartile at both the implementation and the control schools. Thus, we could not identify an ability related differential impact of Breakthrough to Literacy.



**U.S. Department of Education
Grant Performance Report (ED 524B)
Project Status Chart**

PR/Award #: **R215K020361**

SECTION B - Budget Information (See Instructions. Use as many pages as necessary.)

Title : Hurtig Budget Summary

File : H:\HURTIG\muscatine project\524BSectionB.doc

SECTION C - Additional Information (See Instructions. Use as many pages as necessary.)

Title : Hurtig Final Report

File : H:\HURTIG\muscatine project\524BSectionC.doc



U.S. Department of Education
Grant Performance Report (ED 524B)
Project Status Chart

OMB No. 1890 - 0004
Expiration: 10-31-2007

PR/Award #:
R215K020361

SECTION B - Budget Information *(See Instructions. Use as many pages as necessary.)*

As reported in Item 8a-c of the cover sheet, the final project period expenditures were \$50,817, thus creating total expenditures for the five-year project period of \$499,690.

The rate of spending was approximately equal to the original budget over the five-year project period, with one exception. The original budget allocated 5 percent support for Dr. J. Bruce Tomblin for Years 1-5. While Dr. Tomblin contributed his effort to this project, he did not require salary support. Thus, these monies were re-allocated to additional graduate assistantships. Specifically, 4 student RA's were supported in Years 3, 4 and 5, rather than 2 as originally planned.

This re-allocation of salary to student stipends and tuition support did not impede – but rather enhanced -- project progress and objectives, as there were significant time-consuming tasks such as data collection, scanning and coding.



U.S. Department of Education
Grant Performance Report (ED 524B)
Project Status Chart

OMB No. 1890 - 0004
Expiration: 10-31-2007

PR/Award #:
R215K020361

SECTION C - Additional Information *(See Instructions. Use as many pages as necessary.)*

Objectives

Research has shown that reading acquisition depends on vocabulary, phonological awareness, alphabet understanding, and word recognition skills (Juel, 1991; Snow, Burns, & Griffin, 1998; Stanovich, 1986, 1994). Children who have rich opportunities for early language and reading development are more likely to succeed both in school and in society than children who lack the necessary and sufficient experiences for literacy growth. The present study attempted to investigate the effectiveness of the research-based program Breakthrough to Literacy® in promoting oral language competence and literacy success among pre-kindergarten, kindergarten, first-grade, and second-grade children. In particular we wanted to determine whether the curriculum could be implemented with fidelity in an Iowa school district. Our study design was longitudinal so that we could determine whether Breakthrough to Literacy produces lasting benefits for participants as evidenced by their language and reading comprehension performance at the end of third grade.

Hypotheses and Questions

Given earlier studies that demonstrated an impact of Breakthrough to Literacy, our primary hypothesis was that Breakthrough to Literacy would enhance early language and literacy development compared to current classroom practices in pre-kindergarten through second grade. Specifically, it was predicted that Breakthrough to Literacy participants at each of these grade levels would show greater gains than non-participants on tasks measuring the predictors of reading achievement at the end of the first program year. It was also hypothesized that early gains would be sustained into third grade and lead to higher language and reading comprehension achievement scores among third graders who used versus did not use Breakthrough to Literacy in the early school years. Another question we hoped to address was

could Breakthrough to Literacy be differentially effective for children who score lower as opposed to higher on the predictor measures at baseline.

Key to the success of any curriculum is the level of administrative buy-in, the implementation of teachers' provisional development and the support provided by the publishers of the curriculum. These real world factors are unfortunately at times beyond the control of the research/assessment team. To that end we needed to document how these factors may have impacted on student outcomes.

Background and Significance

Numerous studies have affirmed the link between early language skills and later reading success. Richer versus poorer preschool literacy environments have been associated with higher pre-reading abilities, e.g., print familiarity, letter recognition, phonemic awareness, vocabulary, and comprehension, at kindergarten entry (Denton et al., 2001). Epidemiological findings have indicated that letter identification, sentence imitation, phonological awareness, and rapid naming skills in kindergarten could reliably predict reading outcomes in second grade (Catts et al., 2001). Vocabulary growth and use at age 3 were strongly related to vocabulary, language, and reading comprehension scores at ages 9-10 (Hart & Risley, 1995). Converging evidence makes it difficult to ignore the prevalence of early vocabulary differences and their pervasive effects on reading and educational success (Baker, Simmons, & Kameenui, 1995; Becker, 1977; Dickinson & Smith; 1994; Hargrave & Sénéchal, 2000). With increasing demands for literacy in a highly technological society (Snow, Burns, & Griffin, 1998), and the President's goal of making every child a reader by the end of third grade, educators and policy-makers face the challenge of providing all children with the quality literacy instruction necessary for subsequent linguistic and reading competence.

Early instructional experiences may be particularly important for disadvantaged children who lack stable literacy models in the home (Hiebert & Pearson, 1999; Snow, Burns, & Griffin, 1998). Denton et al. (2001) found that significantly fewer poverty compared to non-poverty families read, sang, or told stories to their children three or more times per week. Hart and Risley

(1995) reported that children from welfare families heard only half as many words per hour at home as did children from professional families. Bailey (2001) observed that 38% of low-income compared to only 6% of higher-income children obtained “very low” language scores on a kindergarten readiness assessment. In fact, vocabulary knowledge may be the strongest predictor of reading success or failure in children from low-income backgrounds (Becker, 1977, as cited in Baker, Simmons, & Kameenui, 1995).

As Snow (2000) pointed out, disadvantaged children who come to school with impoverished language skills cannot make up these deficits on their own. Without high-quality instruction, they remain at risk for failure and likely to fall further behind their more advantaged peers (Hart & Risley, 1995). The National Research Council (1998, as cited in Quinn, 1999) has identified several key components of excellent language and literacy instruction. In pre-kindergarten, these include songs, nursery rhymes, and alliteration games to stimulate children’s interest in language, focus their attention on speech sounds, and strengthen their vocabulary and pronunciation skills. Parents and teachers should read to children, talk with them about daily experiences, and fill home and classroom environments with books children can explore at their own pace.

In kindergarten, children should continue to build vocabulary and begin to appreciate the communicative function of print. They need to understand that the purpose of reading is to derive meaning from words printed on a page. Realizing this purpose both requires and builds phonological and phonemic awareness: knowing that words can be divided into syllables, syllables can be broken into phonemes, and phonemes can be separated, blended, and rearranged (Adams & Bruck, 1995; Bradley & Bryant, 1983; Liberman et al., 1974; Treiman, 1985).

Studies indicate that phonological awareness increases the ease with which children grasp letter-sound correspondence, or the understanding that words are composed of letters that relate directly to sounds (Adams, 1990; Juel, 1991; Stanovich, 1994). Because alphabetic understanding has been shown to differentiate good and poor readers (Juel, 1991; Adams, 1990), kindergartners should not only learn all upper- and lower-case letters by name and by sound,

they should also begin mapping these sounds to spoken words. Teachers and parents can facilitate this process through explicit instruction in letter-sound correspondence paired with dictation and writing tasks that relate meaningfully to children's lives (Quinn, 1999).

In first grade, children's vocabulary knowledge, phonological and phonemic awareness, and alphabetic understanding both enable and are enriched by mastery of higher-order word recognition and reading comprehension skills (Chard, Simmons, & Kameenui, 1995). First graders need continued instruction in recognizing words based on letter-sound correspondence. They need much practice reading familiar texts silently and aloud to improve fluency and accuracy. Teachers should facilitate frequent discussions that encourage children to extend reading texts, expand their vocabulary, and enhance their comprehension.

The National Research Council (1998) emphasized that children whose earliest experiences have been colored by poverty and its concomitants of teen parenting, domestic violence, substance abuse, inadequate housing, or poor maternal education require these same empirically sound instructional practices that middle-class children already receive or would require in similar circumstances. In defense of equitable instruction, Snow, Burns, and Griffin (1998) reported, "There is little evidence that children experiencing difficulties learning to read, even those with identifiable learning disabilities, need radically different sorts of supports than children at low risk, although they may need much more intensive support."

Equity for children at risk means changing their whole approach to language and learning rather than targeting isolated skill deficits in the context of otherwise healthy development (Hart & Risley, 1995). Teachers can become agents of change with curriculum programs and professional development that support the delivery of basic skills instruction but in an environment that maximizes the amount and quality of adult-child interaction and thereby increases children's exposure to language (Dickinson & Smith, 1994; Hiebert & Pearson, 1999). Hart and Risley (1995) found that teacher mediation in children's experience had a stronger influence than experience itself on the rate of vocabulary growth in children of welfare families. In their observations of a class about to take a field trip, the teacher introduced the site to be visited and talked with the class about the type and purpose of activities that took place there. After the

field trip, the teacher asked children to recall, elaborate on, and extend what they had seen. A play area with relevant props was set up in the classroom for children to act out what they had experienced. At each of these turns, children were encouraged to communicate about their observations in the context of meaningful and engaging activities. As a result, their vocabularies grew (Hart & Risley, 1995). Several experimental studies have confirmed that talking with children about their experiences and what they read has positive and lasting effects on their language development (Biemiller, 1999; Dickinson & Smith, 1994; Whitehurst et al., 1994).

Research Design and Methods:

Participants

This study included pre-kindergarten, kindergarten, first grade, and second grade students in an Iowa public school district. The Muscatine School district was selected on the basis of demographic factors that place students at risk for reading and academic difficulties. Two Title 1 schools in the district will be selected and assigned to either the Breakthrough to Literacy or control intervention conditions. Given the longitudinal design and the enrollments at the Breakthrough to Literacy school the implementation team and the school administration chose to use all classrooms at each of the 4 grade levels identified above. A similar decision was made to include all children at each of the 4 grade levels at the control school as well. This resulted in 10 classrooms at the Breakthrough to Literacy implementation school and 8 classrooms at the control school.

In the first program year, 368 children were assessed at baseline (Fall 2002) and at the end of the academic year (Spring 2003). Of these 205 were attending the Breakthrough to Literacy school and 162 at the control school. Children who used Breakthrough to Literacy in pre-kindergarten, kindergarten, or first grade during Year 1 of the study were exposed to the program each year thereafter through second grade. All children, at both schools, in the third grade in Years 2-5 of the study were assessed in the late spring.

Materials

Baseline Measures. A set of 4 (see Table 1) measures of the child's language and literacy status were obtained during the first semester of the year for all children in the study. These measures were shown by Catts et al. (2001) to be capable of predicting the second grade reading outcomes of kindergarten children at a 93.3% level of accuracy. Thus, these measures provide a very good set of measures of the language-literacy background of the children in the study. These data were used to test whether the classrooms receiving Breakthrough to Literacy contain children that are comparable to those serving as control classrooms.

Table 1. Baseline measures for prediction of end point reading.

| Test | Examples |
|---|---|
| Test of Oral Language Development-Primary: 2 Sentence Imitation | Listening and repeating sentences (Say “She waked to school) |
| Rapid Automatized Naming | Naming animals and their color (blue cow) |
| Sound Deletion | Deletion of syllable or sound in words (What is return with /re/. What is stop without /s/) |
| Letter Identification (Woodcock Reading Mastery) | Naming of letters presented with different case and font |

Follow-up Measures. In the month preceding the end of school during the first year of the study, the baseline measures were re-administered to the children along with the Passage Comprehension (Woodcock Johnson) test that was developed for use with children from kindergarten on to adulthood. Thus, we acknowledged that it may be too difficult for the children in our pre-kindergarten cohort.

Outcome Measures. The Iowa Tests of Basic Skills (ITBS) Level 9 (Hoover et al., 2001) served as our principal outcome measure. These tests are administered by the school district to the children in a group setting. Data obtained by the University of Iowa has shown that the ITBS scores are well correlated with individually administered tests. For instance the Paragraph Comprehension subtest of the Woodcock Reading Mastery test that is individually given correlated .74 with the Total Reading score on the ITBS Level 10 for a group of 414 children.

We had hoped to include a measure of the written discourse skills of these children obtained using the *Iowa Writing Assessment* (Hoover, Hieronymus, Frisbie, Dunbar, 1994). Logistics of coordination with the schools precluded obtaining this data. In its place we obtained writing samples from a subset of children in the Breakthrough to Literacy classrooms at each of the grade levels based on the writing activities that are part of the curriculum’s essential practices.

The Stages of Implementation Inventory developed by the Breakthrough to Literacy Quality Assurance team was used to assess teacher implementation of Breakthrough to Literacy.

This analytical tool assesses implementation quality along several dimensions related to the Breakthrough to Literacy essential practices. For each dimension, the assessment rubric lists a number of teacher activities, each of which is categorized as reflective of “Minimum”, “Consistent”, or “Highly Integrated” implementation. Overall ratings of success on individual dimensions are determined from the proportion of teacher activities that fall into the three ordinal ranking categories.

Assessment Protocol. All participants were assessed at three points: 1) in the fall of the first project year just before intervention begins (baseline); 2) in the spring of the first project year; and 3) in the spring of their third-grade year. The first two assessments provided pretest and posttest data to allow an evaluation of short-term literacy gains as a function of Breakthrough to Literacy or no intervention conditions. The Year 1 assessment battery (see Table 1, above) included the TOLD-P Sentence Imitation, Sound Deletion, Rapid Automatized Naming, and Letter Identification tests. All tests in the battery were administered individually in a single 15-30 minute session. Testing was done by a licensed Speech Language Pathologist and graduate students who had completed at least one year of graduate study at the University of Iowa’s Department of Speech Pathology and Audiology. All were trained by the project investigators to administer the test protocols accurately and consistently. Testing was conducted in a quiet location inside the school buildings.

Follow-up testing was conducted when each Breakthrough to Literacy and control cohort completed third grade. Accordingly, the second-grade cohort was tested in Year 2, the first-grade cohort in Year 3, the kindergarten cohort in Year 4, and the pre-kindergarten cohort in Year 5. All third graders in Years 2-5 were also assessed with the ITBS, which was administered in groups by classroom teachers but under the supervision of the school district. All examiners collecting data throughout the project were blind to the research hypotheses and the specifics of the intervention provided to individual classrooms or children.

Implementation Quality Assessment. Although Breakthrough to Literacy is conceptualized as a homogenous intervention, the program can be broken down into a number of more specific

factors that may vary across classrooms, even within a grade level, to influence implementation outcomes. These variables include the physical aspects of the classroom, the proportion of time children spend in classroom versus computer activities, the balance among computer activities themselves, and the extent to which teachers internalize training material and integrate essential practices with other classroom activities. Whereas an in-depth analysis of implementation quality was beyond the scope of this study, a concerted effort nonetheless was made to determine that implementations in each Breakthrough to Literacy classroom met the standards necessary for maintaining integrity of the project design. Standards set by the curriculum developers were assessed by their literacy coaches and Quality Assurance team using the Stages of Implementation Inventory as well as other descriptive and observational measures.

Exploratory analysis of children's writing. During kindergarten many children begin to generate unconventional spellings of words that demonstrate their developing knowledge of letter-sound relations. These early invented spellings reveal principled knowledge that is central to learning how to write and read, and they may be good indicators of whether children in a classroom are learning aspects of phonological awareness central to developing literacy (Scanlon & Vellutino, 1997). Therefore we decided to investigate whether features such as invented spelling in the daily writing that is an essential practice in Breakthrough to Literacy classrooms could be used as indicators of individual children's progress and of the success of an implementation at the classroom level.

We developed a computer aided coding systems that allowed us to systematically code a number of aspects of the children's writing including the spelling patterns. The full coding manual is available at (<http://www.shc.uiowa.edu/wjshc/research/speechlab/literacy.html>).

Findings:

Analysis: The research design that we employed may be viewed as a quasi-randomized concurrent control study in which children attending the school selected to implement Breakthrough to Literacy can be viewed as the treated sample and those attending the school

without the Breakthrough to Literacy intervention served as controls wherein these children receive the ambient traditional educational services. The fact that the schools within the school district were selected to have comparable students in terms of socio-economic indicators should provide for a controlled comparison of case and control classrooms. The extent to which school selection resulted in comparable groups prior to initiation of the study was determined by a comparison of scores on the baseline measures described earlier.

Implementation Fidelity: Each implementation classroom was visited multiple times over the course the first two years of the study by a trained Breakthrough to Literacy coach. As part of these visits, the coach made a series of observations to assess the extent to which each of the essential practices was being successfully implemented by the teacher. Of the nine teachers in the kindergarten, first and second grades, three teachers implementation the curriculum was judged as unacceptable using the fidelity measures. In addition the literacy coaches noted that adequate provisions to assure that substitute teachers were familiar with the curriculum did not appear to be in place.

Baseline Assessments:

Letter Identification: Figure 1 and Table 2 present the results of the Letter Identification test Scores can range from 0-51. Analysis of Variance did not reveal a significant difference between implementation and control schools. As can be seen scores are comparable across the two schools.

Figure 1. Letter identification- fall

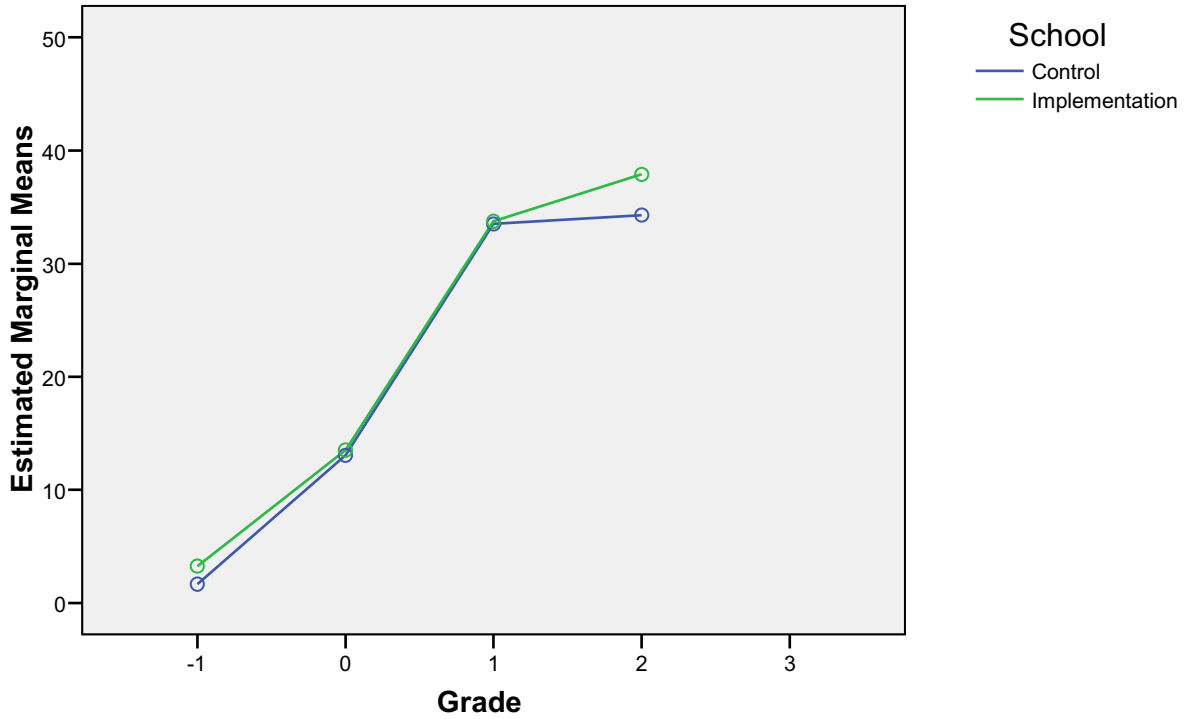


Table 2. Letter Identification- fall

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 1.667 | 2.287 | -2.834 | 6.168 |
| | 0 | 13.063 | 1.400 | 10.306 | 15.819 |
| | 1 | 33.500 | 1.168 | 31.201 | 35.799 |
| | 2 | 34.289 | 1.285 | 31.760 | 36.819 |
| Implementation-1 | -1 | 3.267 | 2.045 | -.759 | 7.292 |
| | 0 | 13.532 | 1.155 | 11.258 | 15.806 |
| | 1 | 33.743 | 1.339 | 31.107 | 36.378 |
| | 2 | 37.889 | 1.078 | 35.767 | 40.011 |

Table 3 provides the grade equivalencies for the performance on the Letter Identification test. In both schools all but the second graders' scores appear to fall into appropriate grade equivalencies.

Table 3 Letter Identification Grade Equivalency- fall

| School | Grade | Mean | Grade Equivalence |
|----------------|-------|--------|-------------------|
| Control | -1 | 1.667 | K.0 |
| Control | 0 | 13.063 | K.0 |
| Control | 1 | 33.500 | 1.1 |
| Control | 2 | 34.289 | 1.2 |
| Implementation | -1 | 3.267 | K.0 |
| Implementation | 0 | 13.532 | K.0 |
| Implementation | 1 | 33.743 | 1.1 |
| Implementation | 2 | 37.889 | 1.5 |

Sound Deletion: Figure 2 and Table 4 present the results of the Sound Deletion test. Scores can range from 0-21. Analysis of Variance did not reveal a significant difference between implementation and control schools. As can be seen scores are comparable across the two

schools.

Figure 2. Sound Deletion- fall

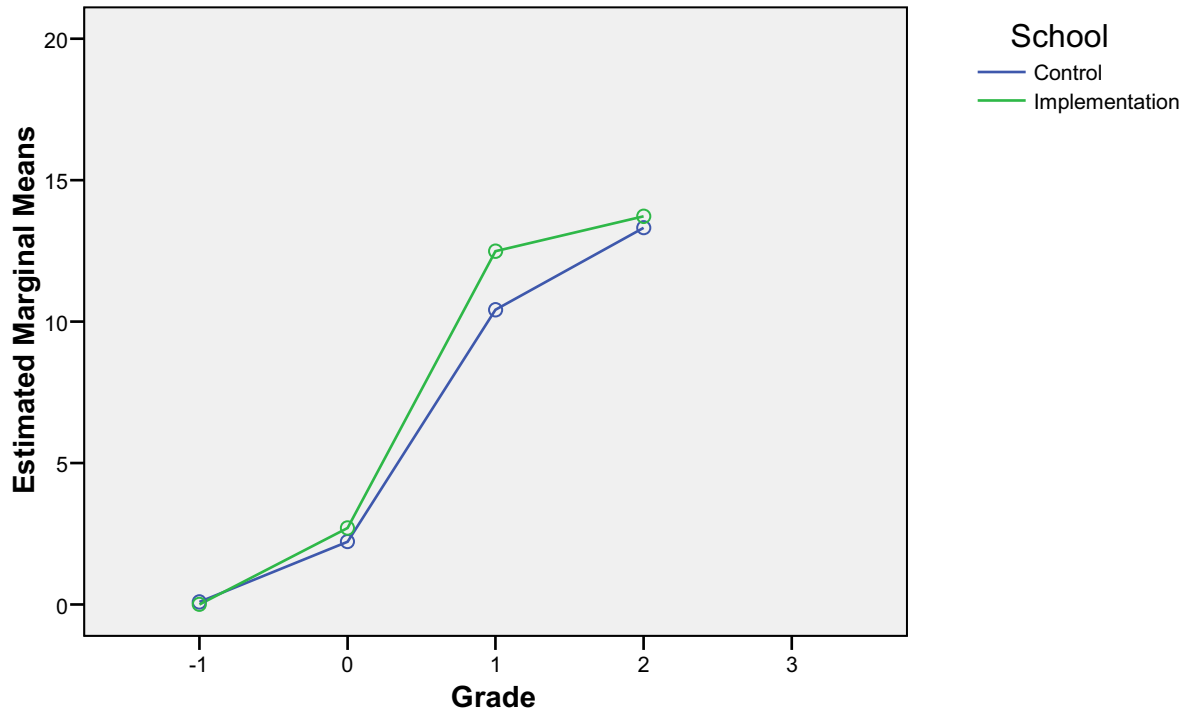


Table 4. Sound Deletion-fall

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | .083 | 1.722 | -3.307 | 3.474 |
| | 0 | 2.219 | 1.055 | .143 | 4.295 |
| | 1 | 10.413 | .880 | 8.681 | 12.145 |
| | 2 | 13.316 | .968 | 11.411 | 15.221 |
| | . | . | . | . | . |
| Implementation-1 | -1 | .000 | 1.541 | -3.032 | 3.032 |
| | 0 | 2.702 | .870 | .989 | 4.415 |
| | 1 | 12.486 | 1.009 | 10.501 | 14.471 |
| | 2 | 13.722 | .812 | 12.124 | 15.320 |

Sentence Imitation: Figure 3 and Table 5 present the results of the Sentence Imitation test. Scores can range from 0-30. Analysis of Variance did not reveal a significant difference between implementation and control schools. As can be seen scores are comparable across the two schools.

Figure 3 Sentence Imitation-fall

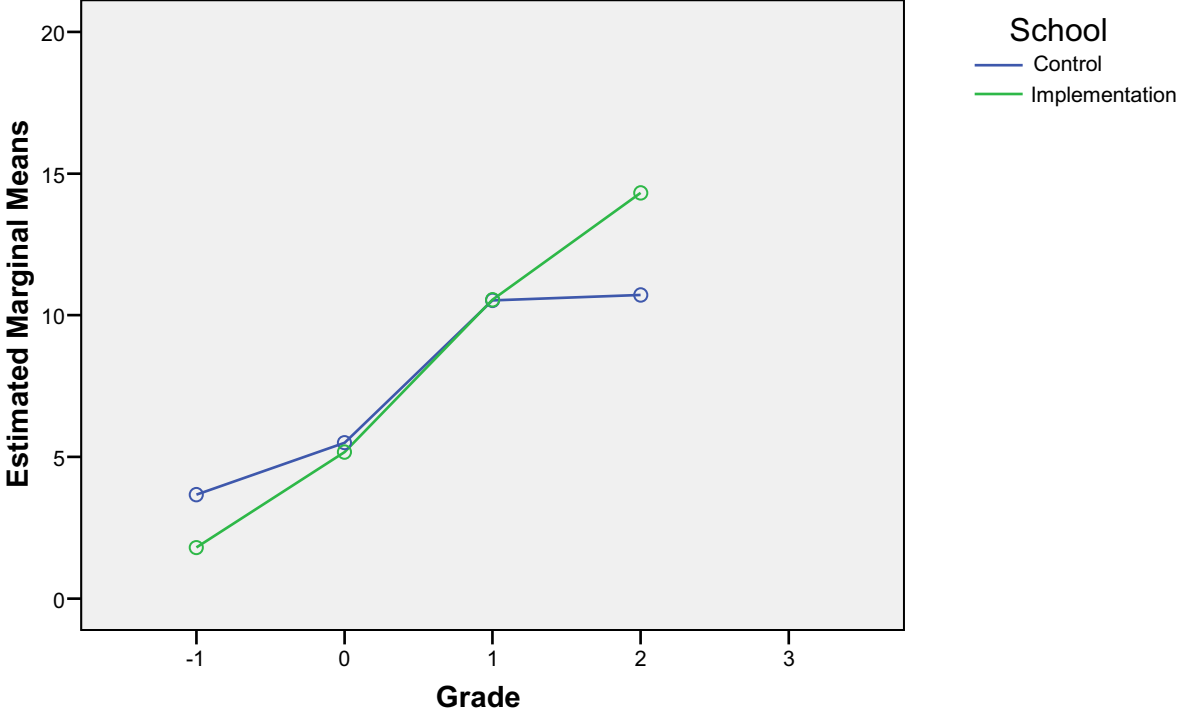


Table 5 Sentence Imitation-fall

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 3.667 | 1.744 | .233 | 7.100 |
| | 0 | 5.500 | 1.068 | 3.398 | 7.602 |
| | 1 | 10.522 | .891 | 8.768 | 12.275 |
| | 2 | 10.711 | .980 | 8.781 | 12.640 |
| | . | . | . | . | . |
| Implementation-1 | -1 | 1.800 | 1.560 | -1.271 | 4.871 |
| | 0 | 5.170 | .881 | 3.435 | 6.905 |
| | 1 | 10.543 | 1.021 | 8.533 | 12.553 |
| | 2 | 14.315 | .822 | 12.696 | 15.933 |

Rapid Naming-Time: Figure 4 and Table 6 present the results of the Rapid Naming test in terms of seconds to complete the task. Analysis of Variance did not reveal a significant difference between implementation and control schools. As can be seen scores are comparable across the two schools; The children in Pre-K at the control school exhibited a much larger range of scores and the lower mean can be attributed to a few individuals and the fact that the Pre-K sample only included 12 children at this school.

Figure 4 Rapid Naming (seconds) - fall

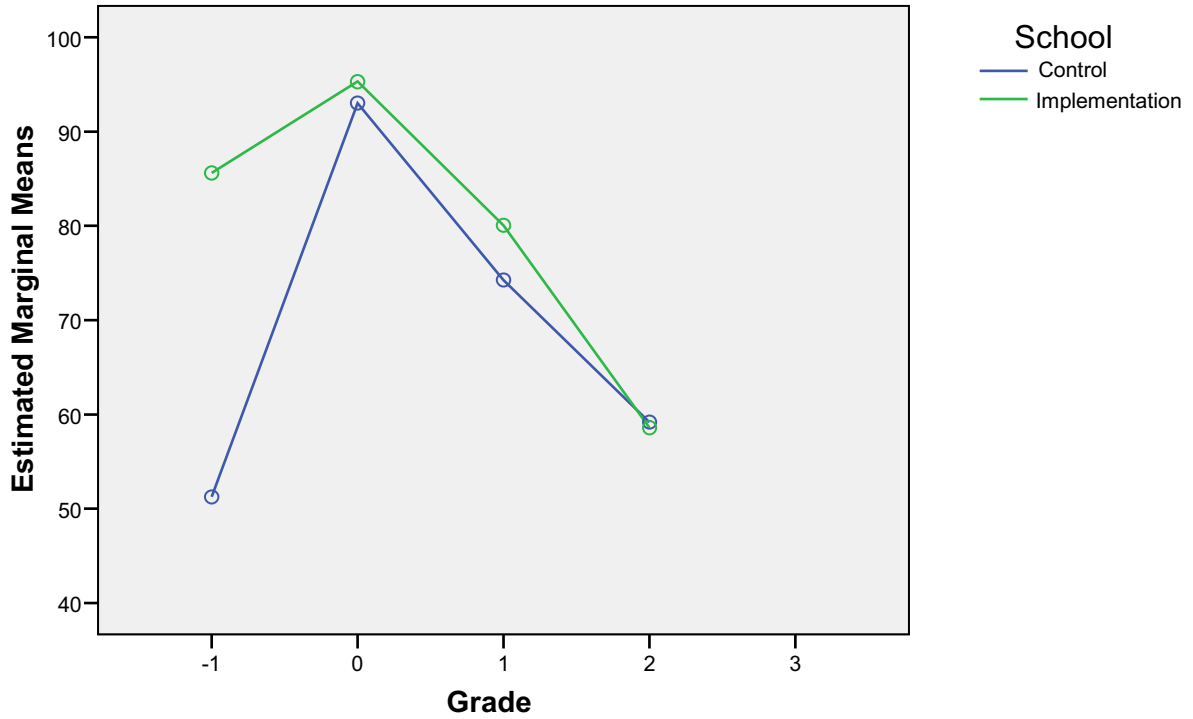


Table 6 Rapid Naming Time- fall

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 51.250 | 10.773 | 30.047 | 72.453 |
| | 0 | 93.031 | 6.597 | 80.047 | 106.015 |
| | 1 | 74.261 | 5.502 | 63.432 | 85.090 |
| | 2 | 59.184 | 6.054 | 47.269 | 71.099 |
| Implementation_1 | -1 | 85.600 | 9.635 | 66.636 | 104.564 |
| | 0 | 95.298 | 5.443 | 84.584 | 106.011 |
| | 1 | 80.057 | 6.308 | 67.642 | 92.472 |
| | 2 | 58.593 | 5.078 | 48.598 | 68.588 |

Rapid Naming-Errors: Figure 5 and Table 7 present the results of the Rapid Naming test in terms of mean number of naming errors. Analysis of Variance did reveal a significant grade by school interaction ($F= 13.105, p<001$). As can be seen scores are comparable across the two schools for the kindergarteners, first and second graders; As with the Rapid Naming-Time score the children in Pre-K at the control school exhibited a much larger range of scores and the lower mean can be attributed to a few individuals and the fact that the Pre-K sample only included 12 children at this school.

Figure 5 Rapid Naming (errors) - fall

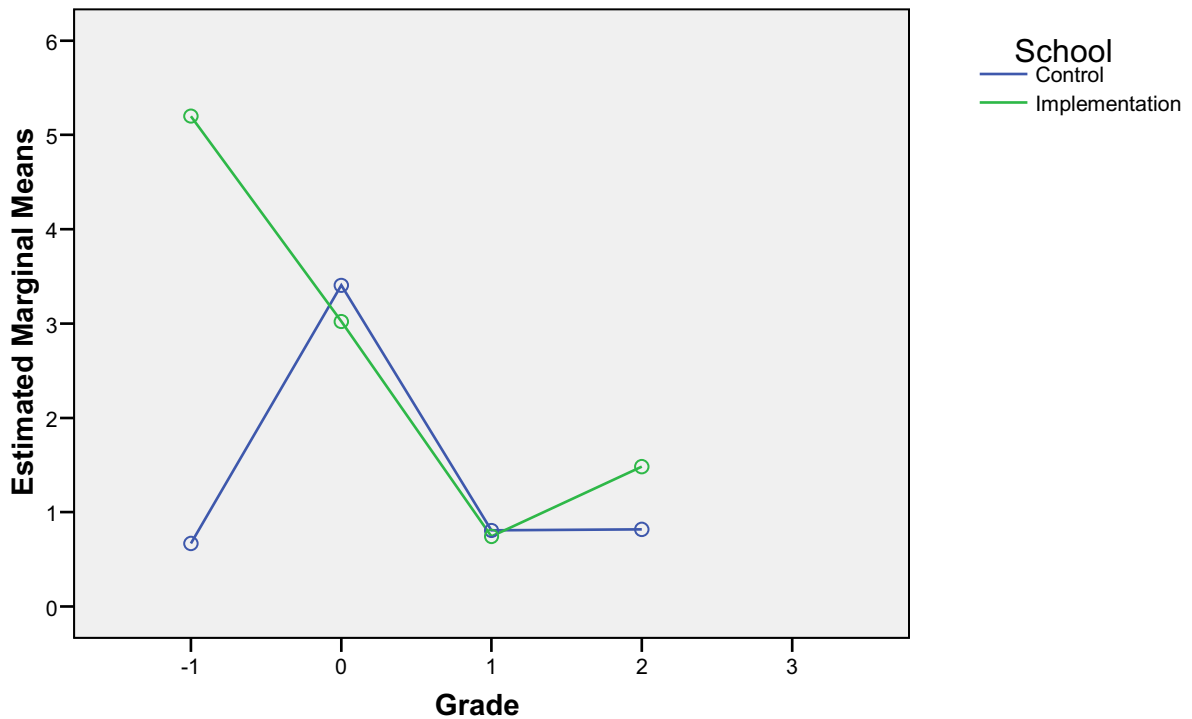


Table 7 Random Naming (errors)-fall

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|-------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | .667 | .780 | -.869 | 2.202 |
| | 0 | 3.406 | .478 | 2.466 | 4.347 |
| | 1 | .804 | .399 | .020 | 1.589 |
| | 2 | .816 | .438 | -.047 | 1.679 |
| | . | . | . | . | . |
| Implementation-1 | | 5.200 | .698 | 3.826 | 6.574 |
| | 0 | 3.021 | .394 | 2.245 | 3.797 |
| | 1 | .743 | .457 | -.156 | 1.642 |
| | 2 | 1.481 | .368 | .758 | 2.205 |

End of Year One Assessments:

Letter Identification: Figure 6 and Table 8 present the results of the Letter Identification test Scores can range from 0-51. Analysis of Variance did not reveal a significant difference between implementation and control schools. As can be seen scores are comparable across the two schools.

Figure 6 Letter Identification- spring

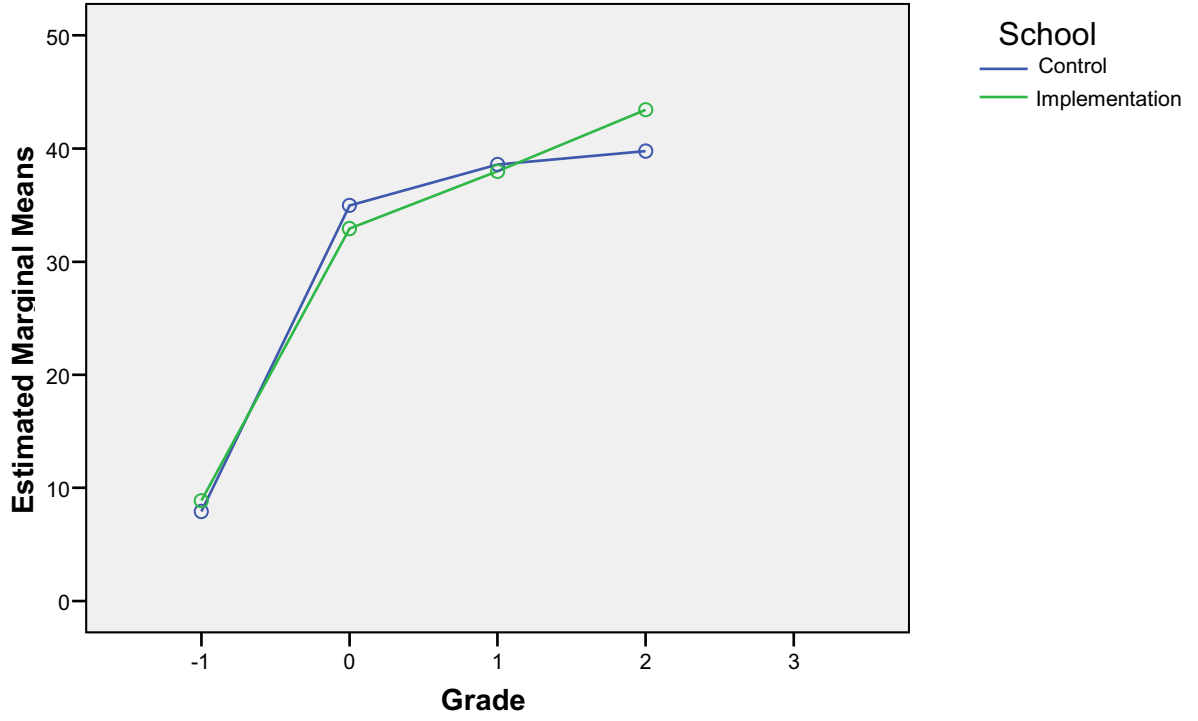


Table 8 Letter Identification- spring

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 7.917 | 1.373 | 5.215 | 10.619 |
| | 0 | 34.969 | .841 | 33.314 | 36.623 |
| | 1 | 38.587 | .701 | 37.207 | 39.967 |
| | 2 | 39.769 | .761 | 38.271 | 41.268 |
| Implementation-1 | -1 | 8.867 | 1.228 | 6.450 | 11.283 |
| | 0 | 32.915 | .694 | 31.550 | 34.280 |
| | 1 | 37.971 | .804 | 36.389 | 39.553 |
| | 2 | 43.426 | .647 | 42.152 | 44.700 |

Table 9 provides the grade equivalencies for the performance on the Letter Identification testing the late spring. In both schools The first and the second graders' scores appear to fall below the appropriate grade equivalencies.

Table 9 Letter Identification Grade Equivalency- spring

| School | Grade | Mean | Grade Equivalence |
|----------------|-------|--------|-------------------|
| Control | -1 | 1.667 | K.0 |
| Control | 0 | 13.063 | K.0 |
| Control | 1 | 33.500 | 1.2 |
| Control | 2 | 34.289 | 1.3 |
| Implementation | -1 | 3.267 | K.0 |
| Implementation | 0 | 13.532 | K.0 |
| Implementation | 1 | 33.743 | 1.2 |
| Implementation | 2 | 37.889 | 1.7 |

Figure 7 and Table 10 show the results in terms of a by subject comparison of the fall and spring assessments. There was no effect of school but the kindergartners showed a significantly greater growth in their Letter ID scores ($F=62.42$, $p<001$).

Figure 7 delta Letter Identification

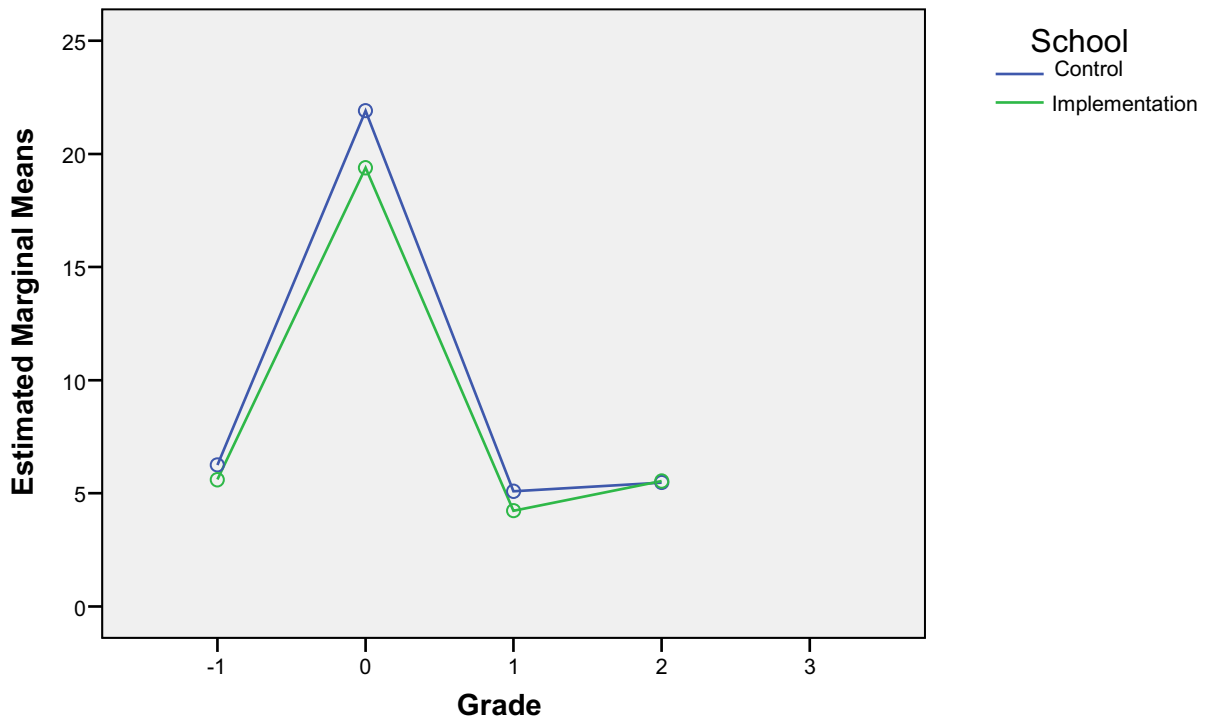


Table10 delta Letter Identification

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 6.250 | 2.182 | 1.956 | 10.544 |
| | 0 | 21.906 | 1.336 | 19.277 | 24.536 |
| | 1 | 5.087 | 1.114 | 2.894 | 7.280 |
| | 2 | 5.474 | 1.226 | 3.061 | 7.887 |
| Implementation-1 | -1 | 5.600 | 1.951 | 1.759 | 9.441 |
| | 0 | 19.383 | 1.102 | 17.213 | 21.553 |
| | 1 | 4.229 | 1.277 | 1.714 | 6.743 |
| | 2 | 5.537 | 1.028 | 3.513 | 7.561 |

Sound Deletion: Figure 8 and Table 11 present the results of the Sound Deletion test. Scores can range from 0-21. Analysis of Variance revealed a significant difference between implementation and control schools ($F=69.71$, $p<001$). This effect appears to be due to enhanced performance of the second graders in the implementation school. Yet overall the scores are comparable across the two schools.

Figure 8 Sound Deletion- spring

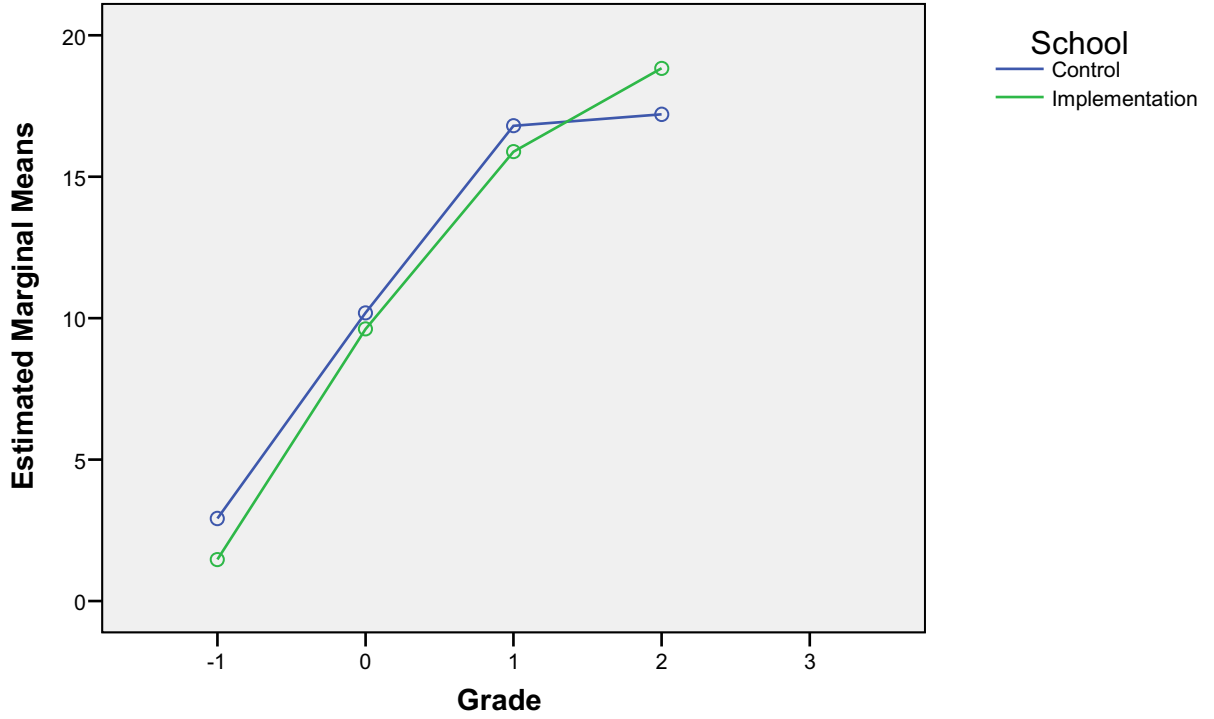


Table 11 Sound Deletion- spring

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 2.917 | 1.504 | -.043 | 5.876 |
| | 0 | 10.188 | .921 | 8.375 | 12.000 |
| | 1 | 16.804 | .768 | 15.293 | 18.316 |
| | 2 | 17.205 | .834 | 15.564 | 18.847 |
| Implementation-1 | -1 | 1.467 | 1.345 | -1.180 | 4.114 |
| | 0 | 9.617 | .760 | 8.122 | 11.112 |
| | 1 | 15.886 | .880 | 14.153 | 17.619 |
| | 2 | 18.833 | .709 | 17.438 | 20.228 |

Figure 9 and Table 11 show the results in terms of a by subject comparison of the fall and spring assessments. There was no significant effect of school, though the first graders in the implementation school show a markedly lower gain.

Figure 9 delta Sound Deletion

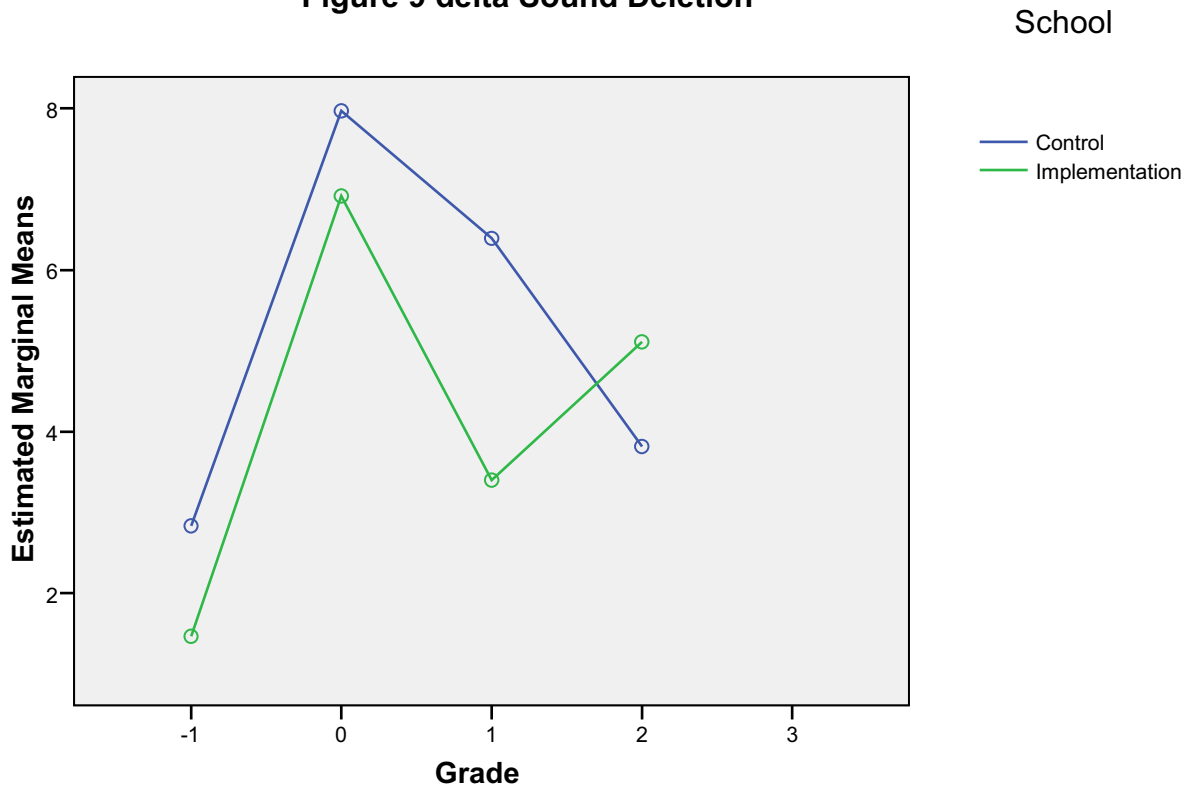


Table 11 delta Sound Deletion

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|----------------|---------|-------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 2.833 | 1.674 | -.462 | 6.129 |
| | 0 | 7.969 | 1.025 | 5.951 | 9.987 |
| | 1 | 6.391 | .855 | 4.708 | 8.074 |
| | 2 | 3.816 | .941 | 1.964 | 5.668 |
| | 3 | . | . | . | . |
| Implementation | -1 | 1.467 | 1.498 | -1.481 | 4.414 |
| | 0 | 6.915 | .846 | 5.250 | 8.580 |
| | 1 | 3.400 | .980 | 1.470 | 5.330 |
| | 2 | 5.111 | .789 | 3.558 | 6.665 |

Sentence Imitation: Figure 10 and Table 12 present the results of the Sentence Imitation test. Scores can range from 0-30. Analysis of Variance did not reveal a significant difference between implementation and control schools. As can be seen scores are comparable across the two schools.

Figure 10 Sentence Imitation- spring

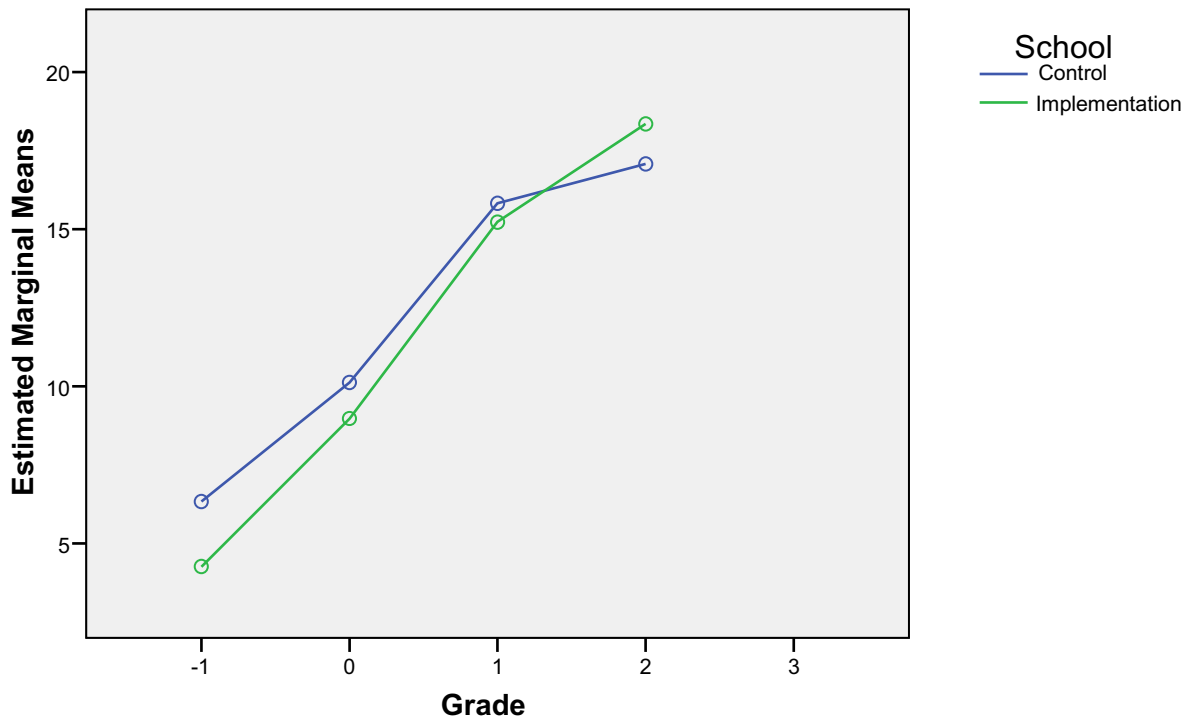


Table 12 Sentence Imitation- spring

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 6.333 | 1.841 | 2.711 | 9.956 |
| | 0 | 10.125 | 1.127 | 7.907 | 12.343 |
| | 1 | 15.826 | .940 | 13.976 | 17.676 |
| | 2 | 17.077 | 1.021 | 15.067 | 19.086 |
| Implementation-1 | -1 | 4.267 | 1.646 | 1.026 | 7.507 |
| | 0 | 8.979 | .930 | 7.148 | 10.809 |
| | 1 | 15.229 | 1.078 | 13.107 | 17.350 |
| | 2 | 18.352 | .868 | 16.644 | 20.060 |

Figure 11 and Table 13 show the results in terms of a by subject comparison of the fall and spring assessments. There was no overall significant effect by school, the second graders in the control school showed a markedly higher gain.

Figure 11 delta Sentence Imitation

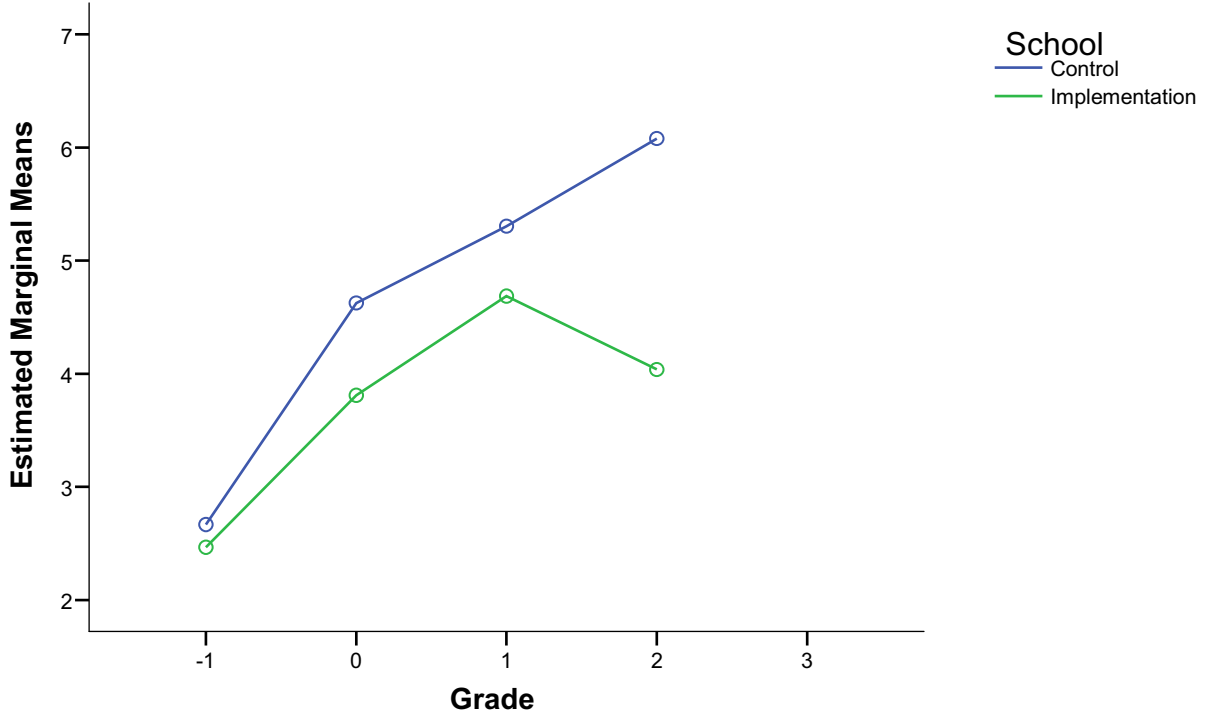


Table 13 Delta Sentence Imitation

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|----------------|---------|-------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 2.667 | 1.272 | .163 | 5.170 |
| | 0 | 4.625 | .779 | 3.092 | 6.158 |
| | 1 | 5.304 | .650 | 4.026 | 6.583 |
| | 2 | 6.079 | .715 | 4.672 | 7.486 |
| Implementation | -1 | 2.467 | 1.138 | .228 | 4.706 |
| | 0 | 3.809 | .643 | 2.544 | 5.073 |
| | 1 | 4.686 | .745 | 3.220 | 6.151 |
| | 2 | 4.037 | .600 | 2.857 | 5.217 |

Rapid Naming-Time: Figure 12 and Table 14 present the results of the Rapid Naming test in terms of seconds to complete the task. Analysis of Variance did not reveal a significant difference between implementation and control schools.

Figure 12 Rapid Naming (seconds) - spring

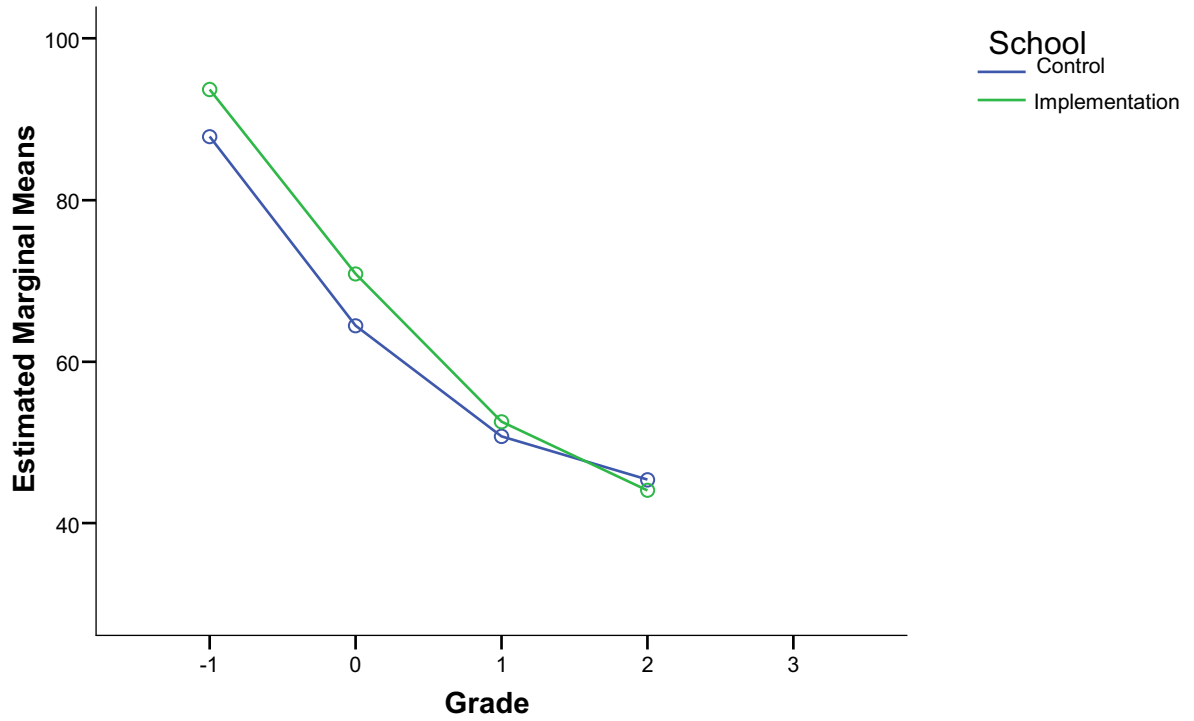


Table 14 Rapid Naming (seconds) - spring

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 87.833 | 5.107 | 77.782 | 97.885 |
| | 0 | 64.438 | 3.127 | 58.282 | 70.593 |
| | 1 | 50.739 | 2.608 | 45.605 | 55.873 |
| | 2 | 45.385 | 2.833 | 39.809 | 50.960 |
| Implementation-1 | -1 | 93.667 | 4.568 | 84.676 | 102.657 |
| | 0 | 70.851 | 2.581 | 65.772 | 75.930 |
| | 1 | 52.543 | 2.990 | 46.657 | 58.429 |
| | 2 | 44.074 | 2.408 | 39.336 | 48.813 |

Rapid Naming-Errors: Figure 13 and Table 15 present the results of the Rapid Naming test in terms of mean number of naming errors. Analysis of Variance did not reveal a significant effect by school. The preschoolers in the implementation school produced markedly more errors than did the preschoolers in the control school. As can be seen scores are comparable across the two schools for the kindergarteners, first and second graders.

Figure 13 Rapid Naming- Errors- spring

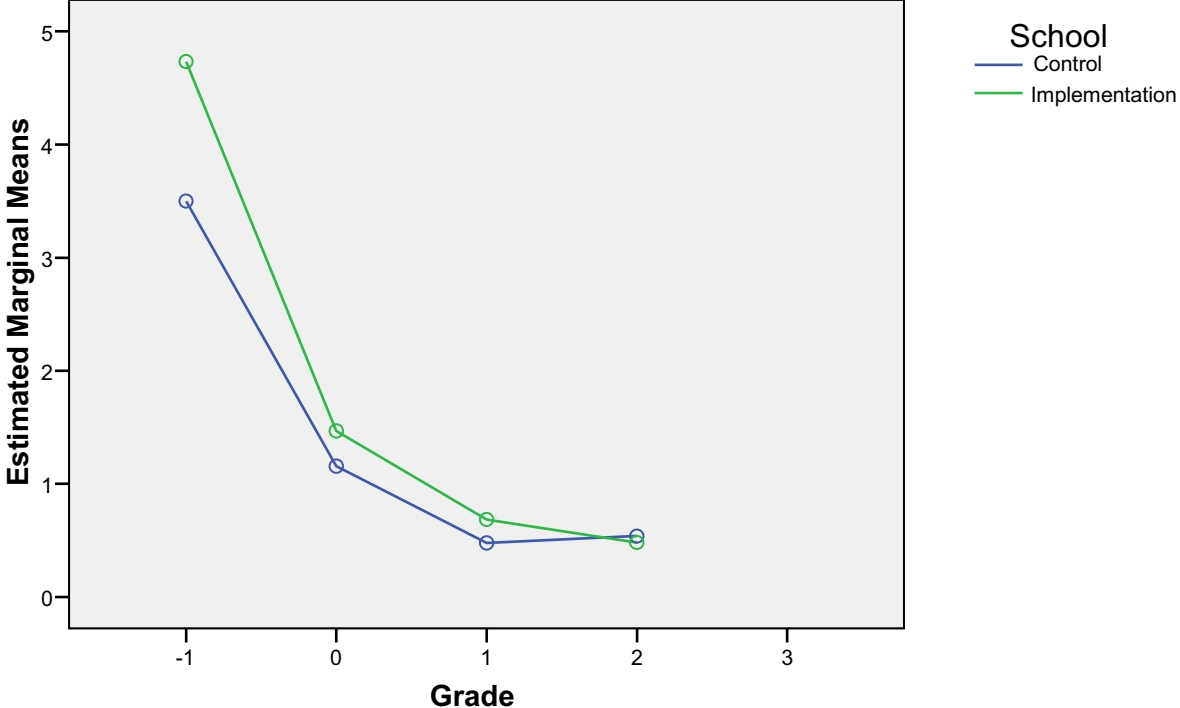


Table 15 Rapid Naming-Errors- spring

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|------------------|---------|-------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 3.500 | .596 | 2.327 | 4.673 |
| | 0 | 1.156 | .365 | .438 | 1.875 |
| | 1 | .478 | .304 | -.121 | 1.078 |
| | 2 | .538 | .331 | -.112 | 1.189 |
| | . | . | . | . | . |
| Implementation-1 | | 4.733 | .533 | 3.684 | 5.783 |
| | 0 | 1.468 | .301 | .875 | 2.061 |
| | 1 | .686 | .349 | -.001 | 1.373 |
| | 2 | .481 | .281 | -.072 | 1.035 |

Passage Comprehension: Figure 14 and Table 16 present the results of the Passage Comprehension test which was administered in the spring of the first year. Scores can range from 0 to 68. Analysis of Variance did not reveal a significant effect by school.

Figure 14 Passage Comprehension- spring

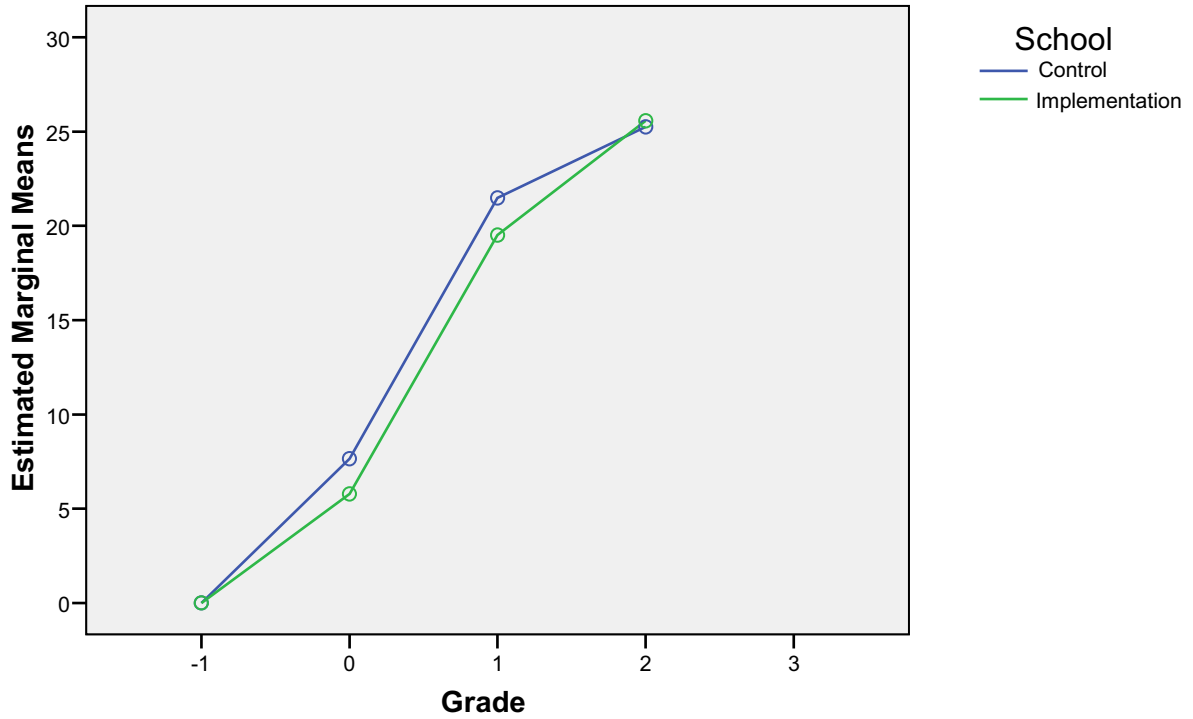


Table 16 Passage Comprehension- spring

| School | Grade-# | Mean | Std. Error | 95% Confidence Interval | |
|----------------|---------|-----------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | -1 | 1.78E-015 | 1.871 | -3.683 | 3.683 |
| | 0 | 7.656 | 1.146 | 5.401 | 9.912 |
| | 1 | 21.489 | .966 | 19.587 | 23.391 |
| | 2 | 25.256 | 1.038 | 23.213 | 27.299 |
| Implementation | -1 | 3.55E-015 | 1.674 | -3.294 | 3.294 |
| | 0 | 5.787 | .946 | 3.926 | 7.648 |
| | 1 | 19.514 | 1.096 | 17.358 | 21.671 |
| | 2 | 25.574 | .882 | 23.838 | 27.310 |

Table 17 provides the grade equivalencies for the performance on the Passage Comprehension testing the late spring. In both schools Kindergarteners and first graders appear to be performing well while the second graders' scores appear to falling a bit below the appropriate grade equivalencies.

Table 17 Passage Comprehension Grade Equivalency- spring

| School | Grade | Mean | Grade Equivalence |
|----------------|-------|-----------|-------------------|
| Control | -1 | 1.78E-015 | K.0 |
| Control | 0 | 7.656 | 1.1 |
| Control | 1 | 21.489 | 2.1 |
| Control | 2 | 25.256 | 2.5 |
| Implementation | -1 | 3.55E-015 | K.0 |
| Implementation | 0 | 5.787 | 1.0 |
| Implementation | 1 | 19.514 | 2.0 |
| Implementation | 2 | 25.574 | 2.7 |

Third Grade Outcomes Assessments:

For years 2 through 5 of the study (2004-2007), all third graders in both the implementation and control schools were given the same test battery used in the testing in the spring of the first year. As we could not control for persistence in either school, we opted to test all children regardless of whether they had or had not been in the initial cohort of children tested during the first year.

Letter Identification: Figure 15 and Table 18 present the results of the Letter Identification test Scores can range from 0-51. Analysis of Variance revealed a significant difference between implementation and control schools ($F=17.508, p<001$) and a significant cohort year effect ($F=3.76, p<.02$). It appears that the performance in the implementation school in 2005 and 2007 was markedly lower than in 2004 and 2006. It should be noted that since the children in these third

grade cohorts included a combination of newly enrolled children and children that had attended these schools in earlier years, it may be that these children contributed to the lower scores.

Figure 15 Letter Identification-3rd Grade

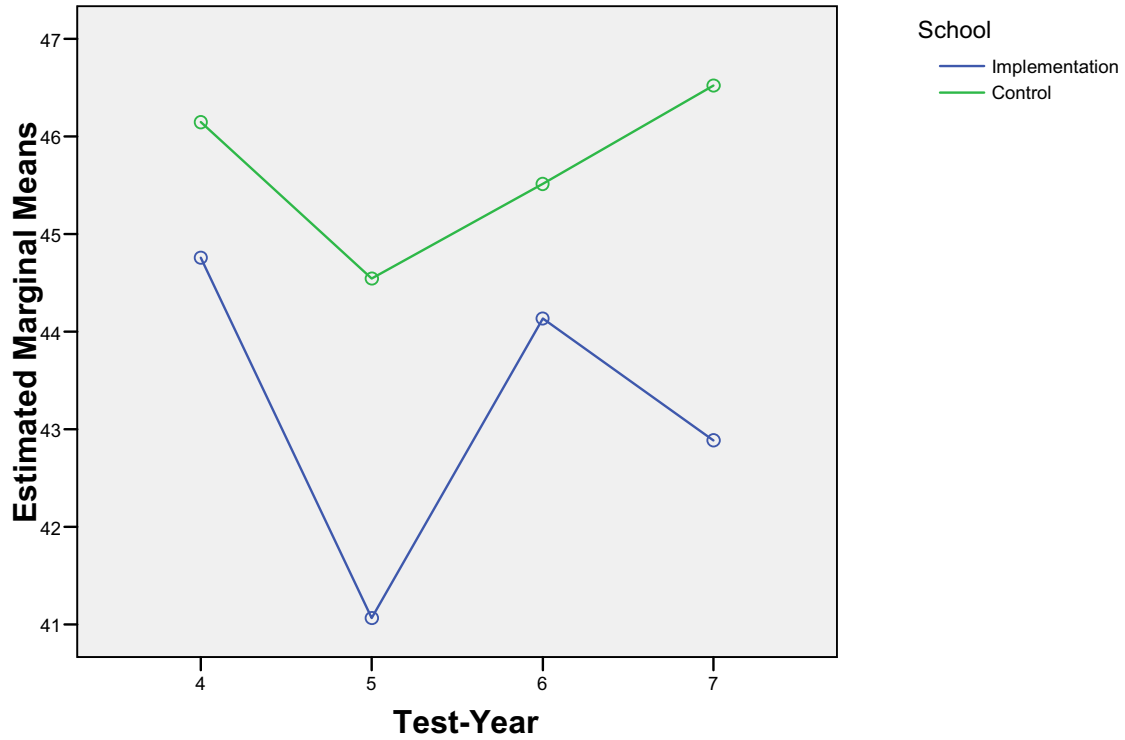


Table 18 Letter Identification-3rd Grade

| School-ID | Test-Year | Mean | Std. Error | 95% Confidence Interval | |
|----------------|-----------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Implementation | 4 | 44.758 | .721 | 43.340 | 46.176 |
| | 5 | 41.067 | .846 | 39.402 | 42.731 |
| | 6 | 44.135 | .787 | 42.586 | 45.683 |
| | 7 | 42.886 | .856 | 41.203 | 44.569 |
| Control | 4 | 46.146 | .887 | 44.403 | 47.890 |
| | 5 | 44.543 | .837 | 42.897 | 46.189 |
| | 6 | 45.513 | .909 | 43.725 | 47.300 |
| | 7 | 46.521 | .819 | 44.910 | 48.132 |

Sound Deletion: Figure 16 and Table 19 present the results of the Sound Deletion test. Scores can range from 0-21. Analysis of Variance did not reveal a significant difference between implementation and control schools. As can be seen scores are comparable across the two schools.

Figure 16 Sound Deletion- 3rd Grade

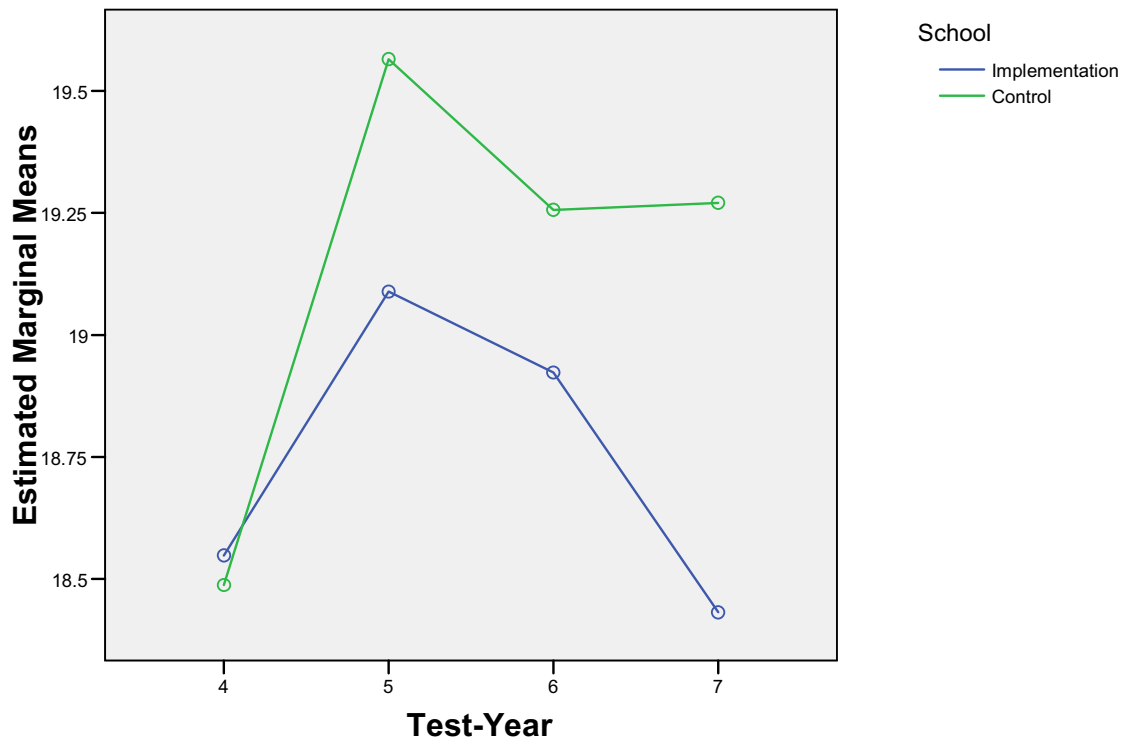


Table 19 Sound Deletion 3rd Grade

| School-ID | Test-Year | Mean | Std. Error | 95% Confidence Interval | |
|----------------|-----------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Control | 4 | 18.548 | .416 | 17.730 | 19.367 |
| | 5 | 19.089 | .489 | 18.128 | 20.050 |
| | 6 | 18.923 | .455 | 18.029 | 19.817 |
| | 7 | 18.432 | .494 | 17.460 | 19.404 |
| Implementation | 4 | 18.488 | .512 | 17.481 | 19.495 |
| | 5 | 19.565 | .483 | 18.615 | 20.516 |
| | 6 | 19.256 | .525 | 18.224 | 20.289 |
| | 7 | 19.271 | .473 | 18.340 | 20.201 |

Sentence Imitation: Figure 17 and Table 20 present the results of the Sentence Imitation test.

Scores can range from 0-30. Analysis of Variance did not reveal a significant difference between implementation and control schools. Notice that the scores between years and schools fall within a one test item difference.

Figure 17 Sentence Imitation- 3rd Grade

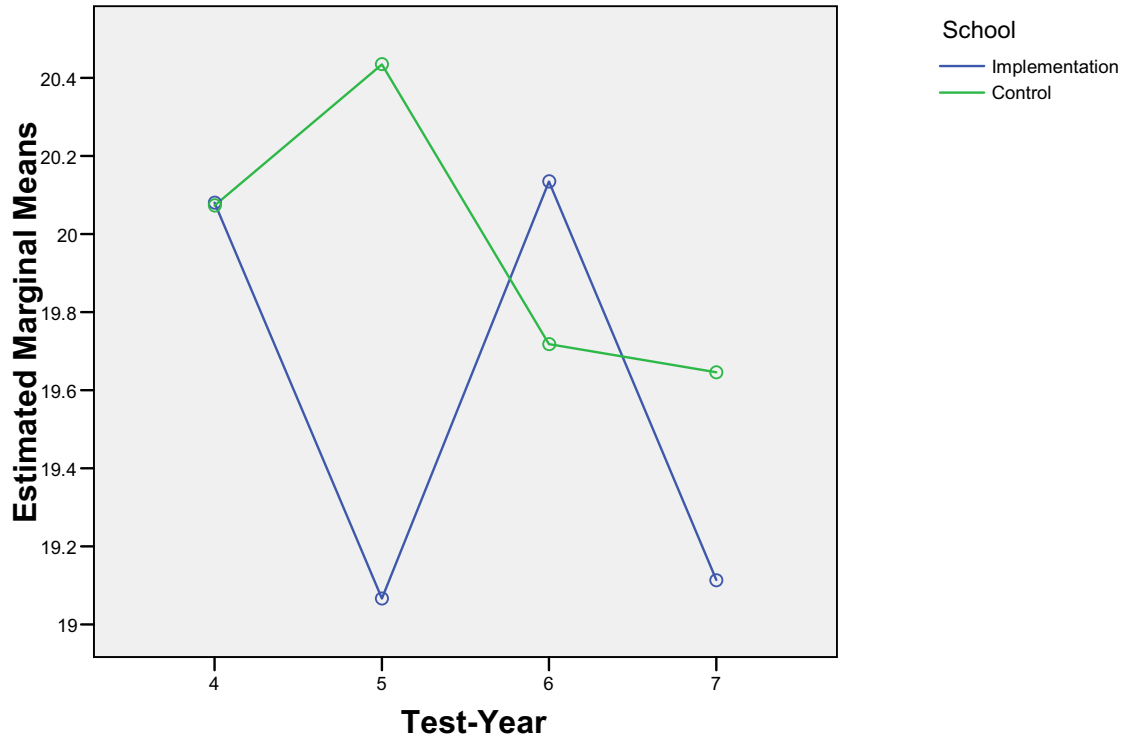


Table 20 Sentence Imitation-3rd Grade

| School-ID | Test-Year | Mean | Std. Error | 95% Confidence Interval | |
|----------------|-----------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Implementation | 4 | 20.081 | .826 | 18.455 | 21.706 |
| | 5 | 19.067 | .970 | 17.159 | 20.974 |
| | 6 | 20.135 | .902 | 18.360 | 21.909 |
| | 7 | 19.114 | .981 | 17.184 | 21.043 |
| Control | 4 | 20.073 | 1.016 | 18.075 | 22.072 |
| | 5 | 20.435 | .959 | 18.548 | 22.322 |
| | 6 | 19.718 | 1.042 | 17.669 | 21.767 |
| | 7 | 19.646 | .939 | 17.799 | 21.493 |

Rapid Naming-Time: Figure 18 and Table 21 present the results of the Rapid Naming test in terms of seconds to complete the task. Analysis of Variance did not reveal a significant difference

between implementation and control schools. The children in the 2006 and 2007 cohorts at the implementation school appear to be taking longer at the Rapid Naming while no trend is apparent in the control school children across all four years.

Figure 18 Rapid Naming (seconds)-3rd Grade

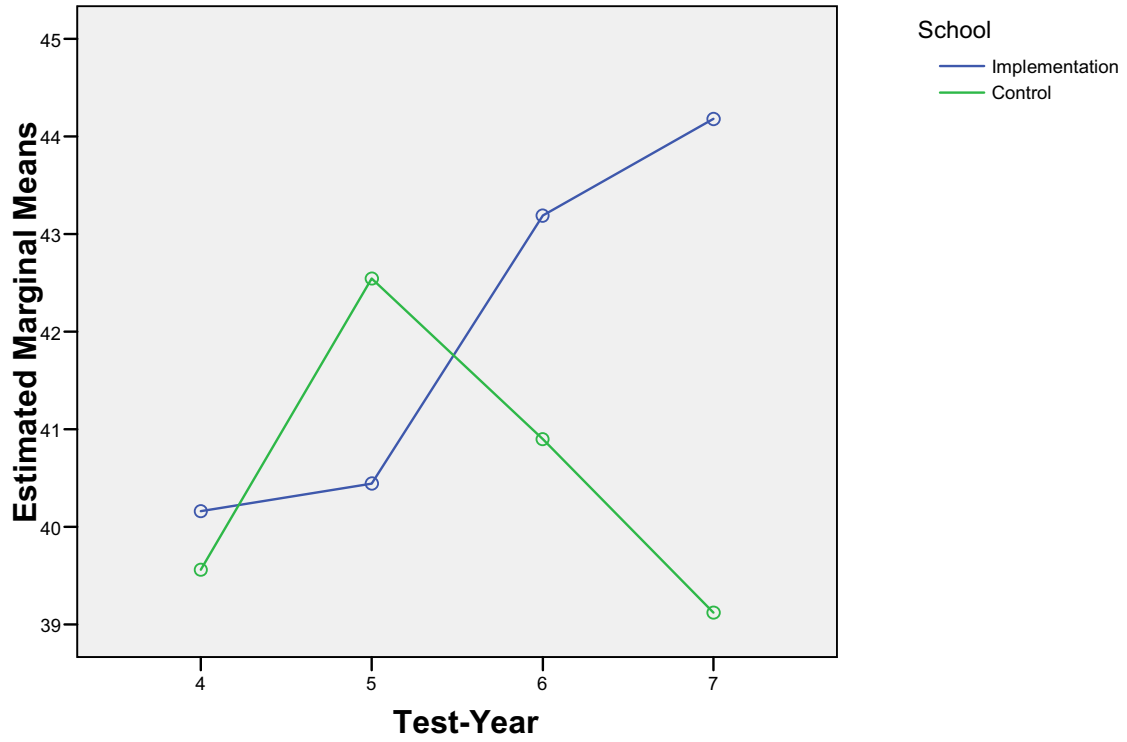


Table 21 Rapid Naming (seconds) -3rd Grade

| School-ID | Test-Year | Mean | Std. Error | 95% Confidence Interval | |
|----------------|-----------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Implementation | 4 | 40.161 | 1.260 | 37.683 | 42.639 |
| | 5 | 40.444 | 1.479 | 37.536 | 43.353 |
| | 6 | 43.189 | 1.376 | 40.483 | 45.895 |
| | 7 | 44.178 | 1.496 | 41.236 | 47.119 |
| Control | 4 | 39.561 | 1.550 | 36.514 | 42.608 |
| | 5 | 42.543 | 1.463 | 39.667 | 45.420 |
| | 6 | 40.897 | 1.589 | 37.773 | 44.022 |
| | 7 | 39.122 | 1.432 | 36.306 | 41.938 |

Rapid Naming-Errors: Figure 19 and Table 22 present the results of the Rapid Naming test in terms of mean number of naming errors. Analysis of Variance did not reveal a significant effect by school. Note that the mean number of errors for children in each school over the four years was less than 1.

Figure 19 Rapid Naming-Errors- 3rd Grade

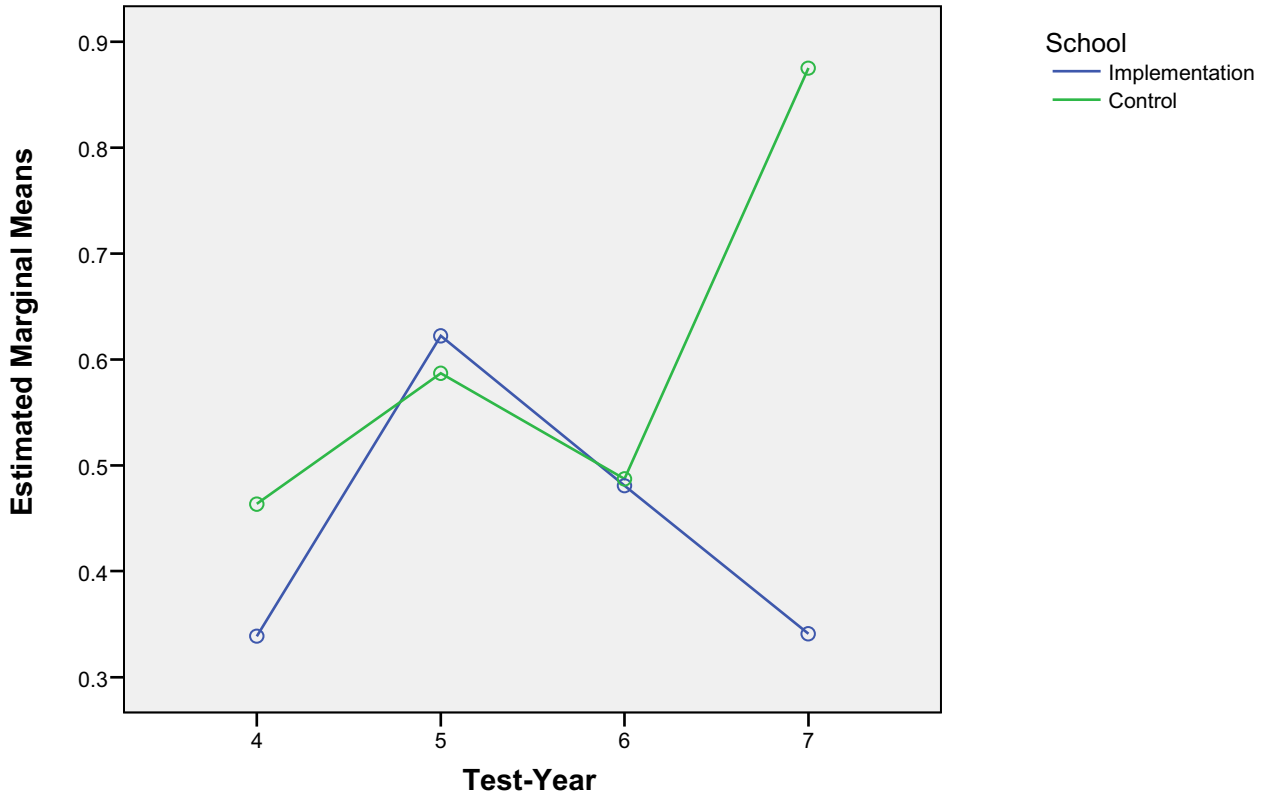


Table 21 Rapid Naming-Errors- 3rd Grade

| School-ID | Test-Year | Mean | Std. Error | 95% Confidence Interval | |
|----------------|-----------|------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Implementation | 4 | .339 | .165 | .015 | .663 |
| | 5 | .622 | .193 | .242 | 1.003 |
| | 6 | .481 | .180 | .127 | .835 |
| | 7 | .341 | .196 | -.044 | .726 |
| Control | 4 | .463 | .203 | .065 | .862 |
| | 5 | .587 | .191 | .211 | .963 |
| | 6 | .487 | .208 | .078 | .896 |
| | 7 | .875 | .187 | .507 | 1.243 |

Passage Comprehension: Figure 20 and Table 22 present the results of the Passage Comprehension test. Scores can range from 0 to 68. Analysis of Variance did not reveal a significant effect by school. A significant effect of year was observed ($F=15.708, p<.001$). Performance on this test showed a marked increase from 2004 to 2005 in children at both schools.

Figure 20 Passage Comprehension- 3rd Grade

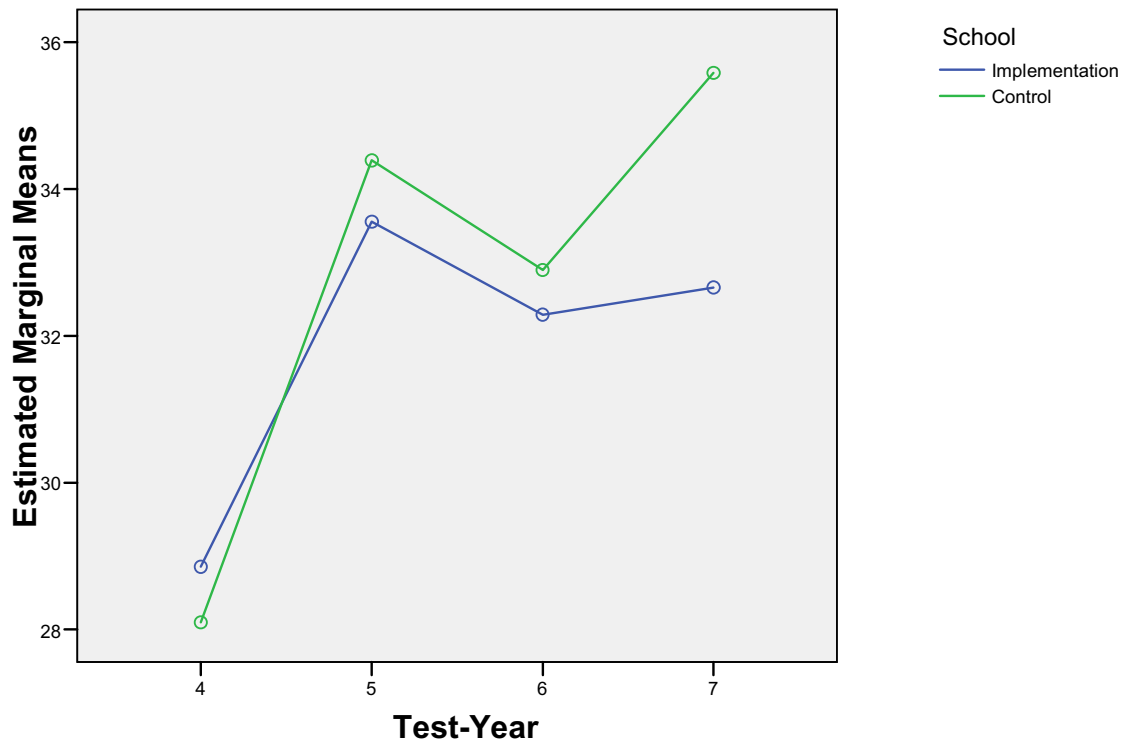


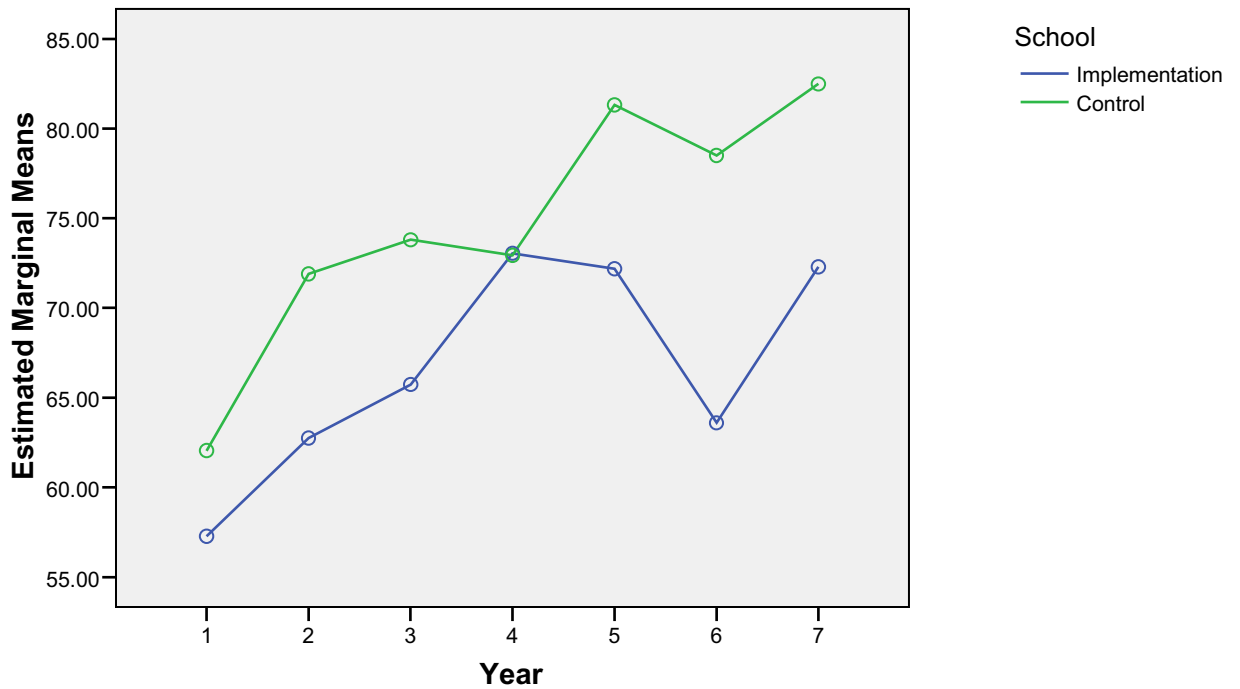
Table 22 Passage Comprehension- 3rd Grade

| School-ID | Test-Year | Mean | Std. Error | 95% Confidence Interval | |
|----------------|-----------|--------|------------|-------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Implementation | 4 | 28.855 | .829 | 27.225 | 30.485 |
| | 5 | 33.556 | .973 | 31.642 | 35.469 |
| | 6 | 32.288 | .905 | 30.509 | 34.068 |
| | 7 | 32.659 | .984 | 30.724 | 34.594 |
| Control | 4 | 28.098 | 1.019 | 26.093 | 30.102 |
| | 5 | 34.391 | .962 | 32.499 | 36.284 |
| | 6 | 32.897 | 1.045 | 30.842 | 34.953 |
| | 7 | 35.583 | .942 | 33.731 | 37.436 |

ITBS Proficiency: The school district provided ITBS Reading proficiency data for both the implementation and the control schools for 2001 through 2007. The ITBS was administered for grades 2 through 5 for the entire time interval. Test results are available for first graders starting in 2003 for children in the implementation school and in 2004 in the control school. The data reported are the percentage of children scoring at the 41 percentile or higher. IRB protocol restrictions precluded the investigators from getting individual children's ITBS scores.

Figure 21 shows the percentage of children performing at or above the proficiency criterion in the implementation and control school across all grades taking the test. The control school proficiency levels showed a significant improvement over the study interval ($F=6.68$, $p<.001$). By comparison no significant trend was obtained for the implementation school. It should be noted that given the high number of second language learners in both schools and the number of children in this sample, it is possible for a relatively small increase in the number of children scoring below the 41st percentile to skew the schools results.

Figure 21 ITBS-Proficiency- % children



Figures 22- 26 provide a breakdown of the ITBS proficiency data by grade. As with the school totals we need to be cautious in interpreting the results. It should also be noted that we have no way of determining what percentage of children in a given grade cohort in a particular year also contributed to subsequent grade cohorts in the following years. As is apparent from this grade by grade break down, more of the control school children appeared to achieve proficiency than did the children in the implementation school.

Figure 22 ITBS-Proficiency- Grade 1

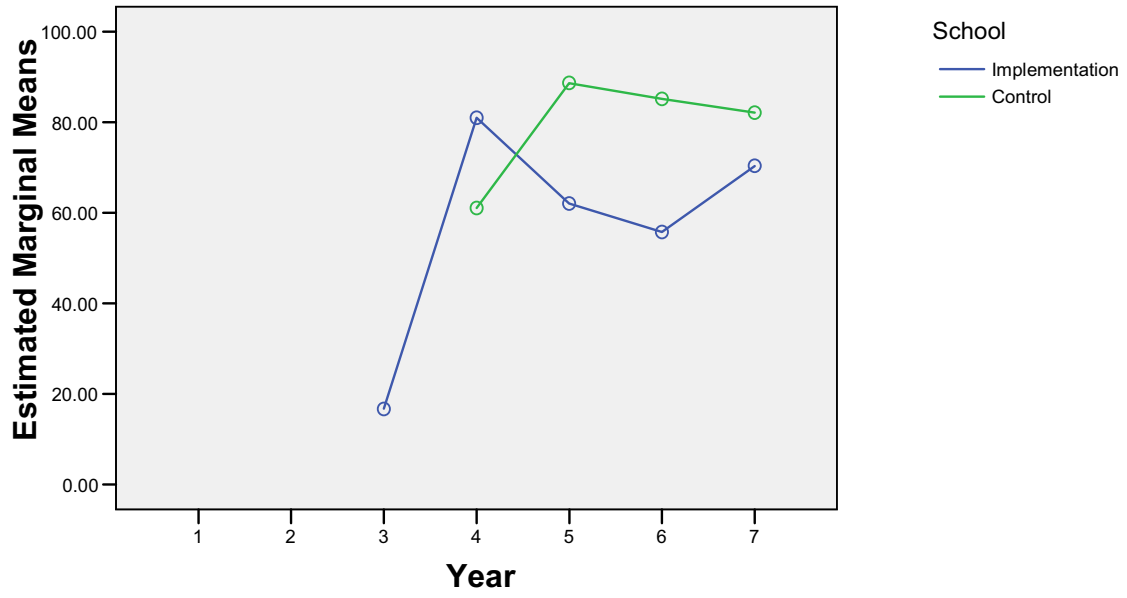


Figure 23 ITBS-Proficiency- Grade 2

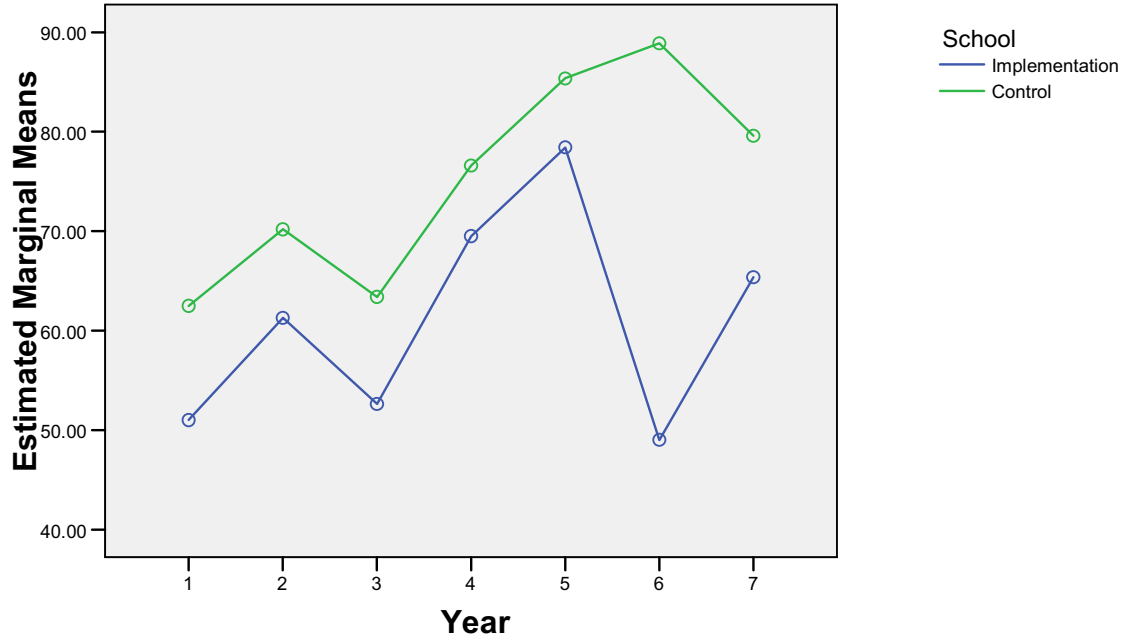


Figure 24 ITBS- Proficiency- Grade 3

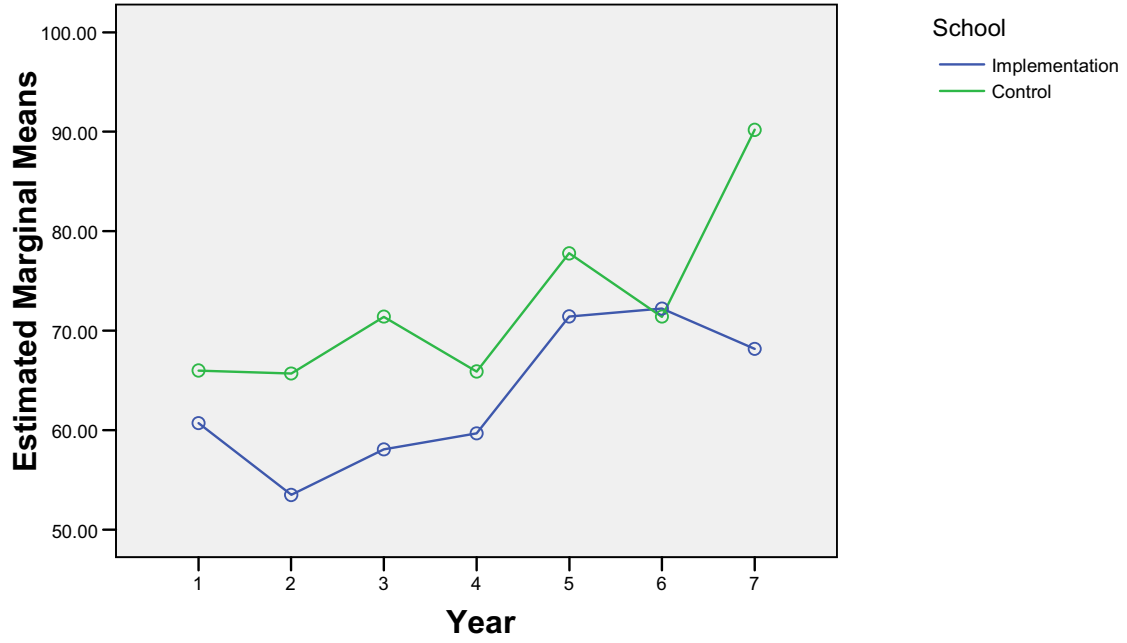


Figure 25 ITBS-Proficiency- Grade 4

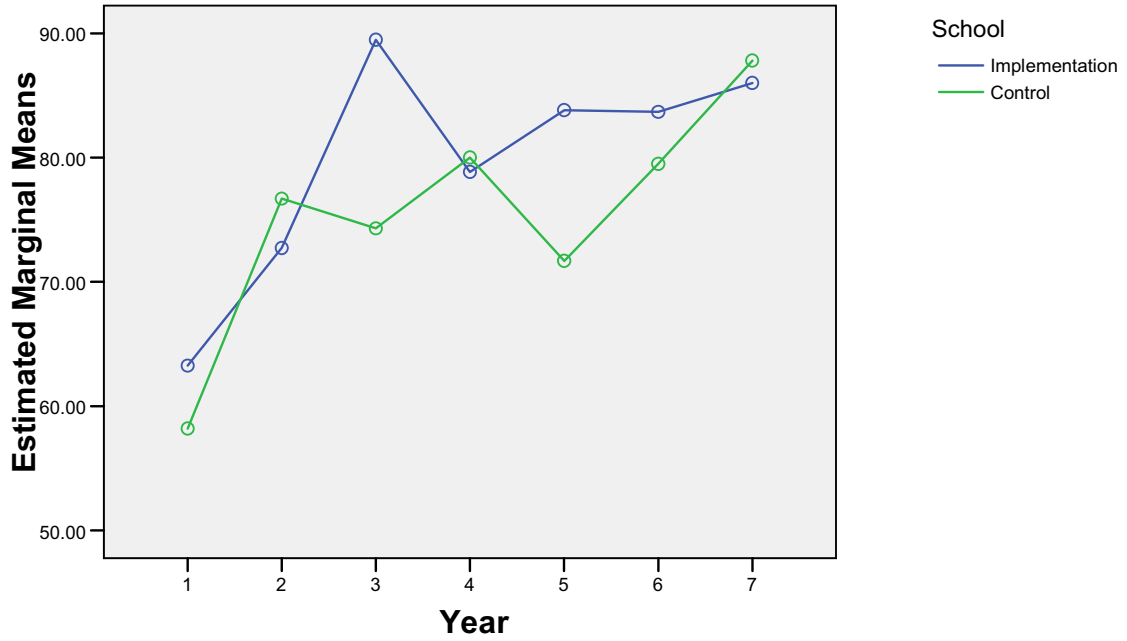
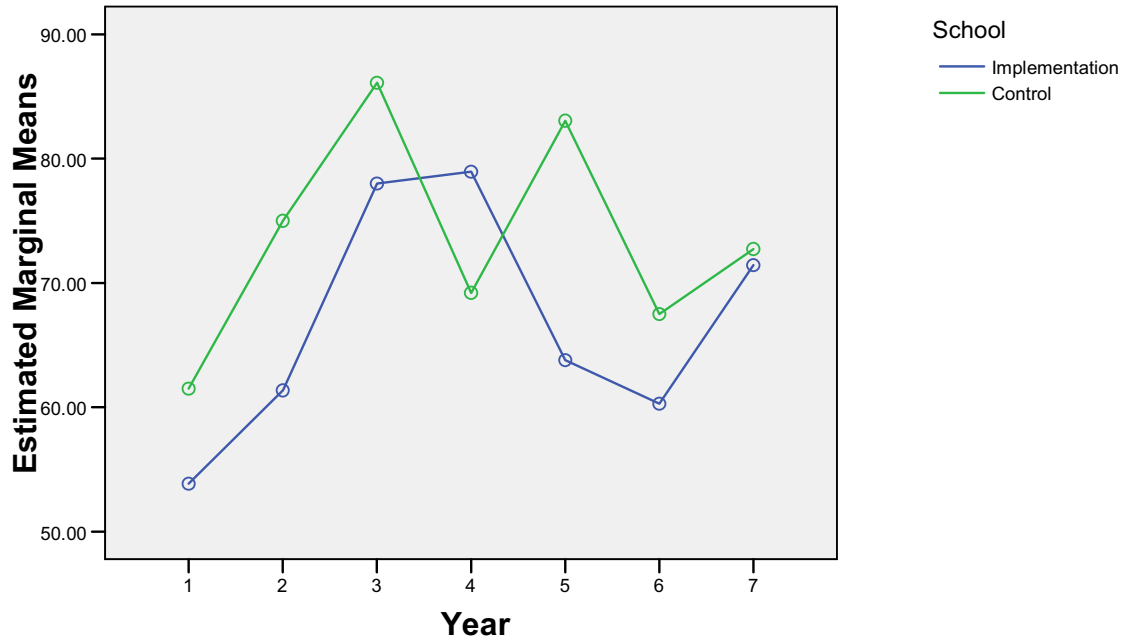


Figure 26 ITBS- Proficiency- Grade 5



Analysis of Writing Samples: Monthly writing samples from 3 kindergarten classes in the implementation school were collected and scored to determine whether ordinary BTL classroom assignments could be used to evaluate progress in writing. Teachers were asked to submit copies of the final writing assignments for a designated week each month. Analyses were based on 7 sets of writing samples. Analyses done on the subgroup who had complete data ($n = 25$ children with 7 samples) were confirmed with analyses for the full data set ($n = 56$ children), and patterns were similar. Writing samples were scanned into an electronic database and scored independently by two speech pathology students who established acceptable inter-rater reliability for most codes, including those discussed here. Coders could not know what words were available in the classroom for a child to copy or which spellings a teacher might have dictated. Therefore, we assumed that incorrect spellings were more likely to be the child's original work

and more likely to show emergence of an understanding of letter-sound associations. Correctly spelled words also could have been produced independently, but, at the aggregate level, we guessed that counting correct and inventive spellings separately might tell us something useful about what was happening in different classes and about individual children's progress. This prediction was fulfilled.

Writing features particularly useful in evaluating individuals and classrooms were counts of two forms of invented spelling that revealed children's understanding of letter-sound relations and that showed substantial growth across the year. These were writing words using first and last consonant and writing words with indication of the vocalic nucleus. These and other writing features showed growth across the kindergarten year that differed among individual children and classrooms. Despite monthly fluctuations, overall growth patterns were similar to those obtained in studies of writing done under controlled conditions.

Classroom differences. Use of invented spellings paralleled a difference in how the classroom teachers were rated by the program's literacy coach in fidelity of their implementation of the BTL curriculum. Teacher 1 received a lower rating than the other teachers, and the literacy coach noted that she was poor at individualizing her teaching in response to differences in the children's abilities. Her students also produced writing samples that suggested they were copying sentences using a model frame rather than writing independently. Invented spelling scores were lower in this class and did not show much progress across the year. These observed classroom differences in use of invented spelling support the literacy coach's ratings and might indicate that Teacher 1's students were learning less than those in the other classrooms about letter-sound correspondences—an important part of the BTL curriculum.

Individual children's progress. Some children in each class started at a more advanced level than others, and children starting at the same point differed greatly in where they ended. For the children who had a full set of 7 samples, most feature scores co-varied. If a child's samples contained many recognizable words, they also were likely to contain high numbers of correctly spelled words ($r = .79$), invented spellings with first and last nucleus represented ($r = .55$),

invented spellings with vocalic nucleus represented ($r = .54$), spaces ($r = .52$) and verbs ($r = .90$). However, some feature scores did *not* hang together.

Children's scores for mean number of *correctly* spelled words were not correlated at all with any of the inventive spelling measures. Even within classrooms, progress in using correct spelling was distinct from progress in using invented spelling. Thus, our results at both the classroom and the individual level suggest that analyzing classroom writing samples for particular levels of inventive spelling may yield useful indicators of progress in mastering letter-sound correspondences.

The analysis developed in this study is now being applied to a much larger sample as part of a randomized cluster design study being conducted in the Chicago Public Schools (IES, U.S. Department of Education, IES, R305G040145).

Discussion/Conclusions:

The first hypothesis that predicted that the mean total reading scores as measured by the ITBS in third grade would be significantly better for children participating in the Breakthrough to Literacy classrooms during the years preceding third grade than for children participating in the control classrooms was not supported.

The second hypothesis is that there would be a dose effect on the reading outcomes of the participants such that those children receiving Breakthrough to Literacy for four years would have better reading levels than those children with fewer years. This hypothesis was also not supported.

It is also hypothesized that children entering this intervention who are high risk for reading problems will obtain greater benefit than children at low risk. Thus, we predicted that children who fell into the bottom quartile would show the largest gains. We observed comparable gains for children in the lowest quartile at both the implementation and the control schools. So we could not identify an ability related differential impact of Breakthrough to Literacy.

The results of this study, showing no difference between the experimental and control schools reinforce a profound but too often forgotten conclusion of serious attempts to change

teachers and schools for the betterment of children. The conclusion is that local influences surrounding the implementation of any educational initiative have a far larger impact on outcomes than the initiative or program itself. In fact, it has been said that to ask whether “program x” works is the wrong question to ask. Rather, the relevant question for most initiatives, particularly ones that involve already proven programs is, “Can we establish and maintain the conditions that have been shown to be essential for a successful implementation?” In the case of this study, we were, for many reasons unable to establish these conditions. Despite significant attempts by teachers, administrators and the publishers to test Breakthrough to Literacy, various factors foreclosed any likelihood of a good test of the curriculum and its implementation.

Certainly, we cannot say that without these interfering factors the BTL –implementation school would have outperformed the control school. It is clear, however, that the only way to adequately test the efficacy of the curriculum and the implementation model is to assure the integrity of the delivery of the curriculum. In the current study, the integrity of the BTL implementation was compromised by several factors:

- a. The publisher/provider was unable to establish the commitment from the administration and teachers to support a successful implementation. While there was enthusiastic support and interest in receiving the materials and the computers to implement the curriculum, there were challenges in arranging necessary follow up to insure the highest fidelity of implementation. Unfortunately this was evident soon after the start of this project.
- b. Implementation of an additional literacy program during the second year of this project interfered with the implementation of Breakthrough to Literacy. Giving teachers multiple curricula that include a range of activities precludes the effective deployment of those activities on a systematic (daily) basis. Teachers often pick educational activities in terms of some perceived direct link to scores on a mandated standardized assessment rather than on the basis of a comprehensive model of language and literacy development.

This does not mean that BTL or any other curriculum has to be prescriptive, lockstep and not individualized. Any successful curriculum has to be systematically delivered each day by a knowledgeable, well trained and well supported teacher. In the complex ecology of the public schools there may be a variety of factors that preclude a successful implementation of a curriculum. The literacy coach reported that teachers would focus on only a subset of activities, in part because they felt comfortable with them and in part because the limits on effective class time that must be split among competing curricula. For example the Breakthrough to Literacy curriculum suggests that each child has at least 10 minutes of individualized instruction on the computers in the classroom each day. The teachers needed to balance this with taking the entire class to work in a computer lab on materials for Success Maker curriculum. The control school also implemented this latter program and the principal at that school had served as the district's facilitator for that program. Thus the intended difference in the literacy curriculum across the implementation and control schools was not achieved, Arguably, this contributed to the lack of differences between the two schools.

The lack of differences in group outcomes in the current study should not be viewed as conclusive evidence that "BTL does not work". Rather, the results reflect and reinforce the conclusion that the successful implementation of any successful educational initiative demands the focused attention of involved teachers and administrators and the commitment to implement the initiative with integrity. Our experience here reflects the issues clearly illustrated by Slavin & Fashola (1998). Realizing a return on the investment in a literacy curriculum requires consistent effort and a team approach that involves teachers, administrators and publishers and that takes advantage of best practices while adapting to the specific context of each school district.

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Appendix:

The Curriculum: Breakthrough to Literacy

Four Essential Practices

Breakthrough to Literacy is a research-based literacy program for children in pre-kindergarten through second grade. It combines perceptual, behavioral, and environmental predictors in a balanced model of reading success. Perceptual/behavioral predictors include vocabulary, phonological/phonemic awareness, alphabet knowledge, and word recognition. Environmental predictors include hours of lap reading, hours of parent reading, books children own or are in the home, and oral language in the home. While this conceptual framework is comprehensive and systematic, it remains wholly supportive of children's diverse learning needs. It supplies teachers with a flexible structure for embedding explicit vocabulary, phonemic awareness, and phonics instruction in a language and print-rich environment that research has shown to be and predictive of future reading success.

In the classroom and at home, Breakthrough to Literacy gives rise to four essential practices: Book-of-the-Week oral comprehension strategies, daily writing activities, individualized and interactive software lessons, and Take-Me-Home book reading. The relation between critical elements of the essential practices and predictors of reading achievement are summarized in Table A-1 below.

Table A-1. Relation between elements of Breakthrough to Literacy essential practices and predictors of reading achievement.

| Predictor | Critical Elements of Essential Practices |
|---------------------------------|---|
| Vocabulary/Language | Book-of-the-Week Graphic Organizers Oral Language Activities Guided Discussion & Questioning Computer Time in Listen/Tell Stories Home Reading of Take-Me-Home-Books |
| Phonological/Phonemic Awareness | Oral Language, Rhythm, & Music Activities Computer Time & Lessons Completed in Explore Words |
| Alphabet Understanding | Daily Writing Activities (Modeled, Structured, Language-Oriented, Interactive, Guided, Independent) Computer Time & Letter/Sound Mastery in Explore Alphabet |
| Word Recognition | Classroom Use of Pupil and Take-Me-Home Books Computer Time & Ratio of Word Explorations to Stories in Listen/Tell Stories Computer Lesson Progression in Explore Words Home Reading of Take-Me-Home-Books |

Book-of-the-Week Oral Comprehension Strategies:

Book-of-the-Week oral comprehension strategies are designed to build children’s language (listening, speaking, reading, and writing) and thinking skills while simultaneously enriching their experiences with print. These strategies provide teachers with a systematic way to engage children in oral language activities centered on a common topic. Each week, a different book is chosen and read to children every day. Each day, book discussion and activities focus on a different strategy. On Monday, the strategy is “Predict and Read.” Teachers introduce the book’s title, author, and illustrator. Discussion revolves around what children think will happen in the book and, after reading it together, whether the story ended as they thought it would. Tuesday, the strategy is “Remember and Read.” Teachers ask children to recall the book’s title,

characters, and major events. Children may be invited to describe aspects about the book they liked best or role-play based on the book's characters. Repeated readings of a book and explicit instructions for committing material to memory have been found to improve reading fluency and recall in readers at all skill levels (Sindelar, Monda, & O'Shea, 1990). Wednesday, the strategy is "Read, Personalize, and Read Again." Teachers and children review what they had talked about the previous day. Teachers may ask children to tell the group about something in their own lives that reminds them of the story. Thursday, the strategy is "Read and Create." After reviewing the previous days' discussions, children work individually or in groups to extend the current story or create a new, related one. Friday, the strategy is "Read, Summarize, and Celebrate." Children share their new versions of the story with the class.

Book-of-the-Week time gives children multiple opportunities to use language, listen to appropriate language being modeled, learn new concepts, and expand their vocabulary. Devices such as "word webs" and other graphic organizers drive whole-group instruction and help children relate and extend what they have learned. Reading and talking with children daily about the same book creates a predictable situation that enables them to grasp the content more confidently. Knowledge and confidence free them to stretch their imagination and expand their language capacities as they share ideas in conversation with classmates, teachers, and families.

Daily Writing:

An important step in moving from oral language to print is the discovery that print has meaning. Initially, children may learn that a particular red sign with white letters tells a driver to stop. They may recognize their favorite breakfast cereal, candy, or fast-food restaurant by the shape and color of the logo. Or, they may learn to recognize their own names by the perceptual features of the words. Breakthrough to Literacy offers teachers numerous suggestions for modeling writing to strengthen children's word recognition skills by reinforcing associations between spoken and printed words. These include, but are not limited to, labeling picture cut-outs from magazines, catalogs, or newspapers; preparing note card "nametags" to hang on items found in the classroom; dictating pages for personal storybooks; and encouraging children to write and illustrate their own simple books.

Structured writing is another activity that can increase children's knowledge of vocabulary, understanding of language patterns, and internalization of the most common English language structures. In this type of exercise, teachers may write a sentence on the chalkboard but leave out a word. Children are encouraged to brainstorm words for completing the sentence and then talk about why specific words may or may not work.

Individualized and Interactive Software Lessons:

In the Breakthrough to Literacy software curriculum, children spend 10-20 minutes per day exploring stories, words, and the alphabet at their own pace on the computer. Lessons provide explicit instruction in phonics, phonemic awareness, and word recognition, but this instruction is tailored to each child's need for varying amounts of auditory and visual support to make successful connections between sound and print. Computer and Book-of-the-Week activities are designed to be mutually reinforcing. When a teacher selects a title to be the Book-of-the-Week, children may have read it already on the computer and consequently feel confident to talk about it in group discussions. Also, when a Book-of-the-Week is focused on from so many perspectives throughout the week, children may be more motivated to explore it on the computer and in the process extend their alphabet, phonemic awareness, and comprehension abilities.

Take-Me-Home-Books:

The Breakthrough to Literacy program does not begin and end at the classroom door. Take-Me-Home books, or black-and-white versions of the Book-of-the-Week, are sent home with all children every week to read and engage families in the early literacy process. Studies have shown that opportunities to improve their own literacy skills helps parents, particularly mothers with low levels of education, advance their children's literacy and other academic development (Benjamin, 1993). Accordingly, a "Home Connections" guide and video provide families with information and ideas for using Take-Me-Home books to stimulate language and literacy interactions at home. Periodically, a personalized "Parent Letter" is generated on the computer and sent home so parents or guardians can review children's progress in the software curriculum.

Professional Development:

When highly integrated into the classroom environment, Breakthrough to Literacy gives children extensive opportunities to build receptive and expressive vocabulary skills, become more sensitive to language sounds, relate sounds to letters, read words, and ultimately comprehend text. These opportunities do not arise spontaneously, however, from a program that is poorly understood or poorly implemented. Research has shown that the more knowledgeable and skilled teachers are, the more students profit from instruction (Darling-Hammond, 2001). To optimize the implementation and effectiveness of the Breakthrough to Literacy essential practices, the program developers provide literacy coaches with backgrounds in early childhood education to train teachers on the Breakthrough to Literacy model and support their efforts to move children systematically yet comfortably from oral language to print. Professional development includes a full day of on-site training just prior to children's introduction to the program, followed by two more days of training spaced strategically throughout the first year. An additional day of follow-up training is provided during the second year of program implementation. On-site trainings are supplemented by five to nine literacy coach visits to the classroom the first year and four to seven visits the second year.

Breakthrough to Literacy also provides teachers with several tools to help them adapt learning activities to meet children's individual needs. On-going computer reports provide detailed information about each child's progress in the software curriculum. (The third of the first-year teacher trainings focuses on interpreting and using the computer reports to customize instruction.) Numerous teacher resources, including suggestions for small- and large-group instruction and other multidisciplinary materials, are designed to complement existing curricula and classroom themes. Engaging student materials such as Big Books, full-color pupil books, and Take-Me-Home books enrich children's classroom, independent, and family reading experiences.

Effectiveness Data:

Breakthrough to Literacy has been implemented in 5500 classrooms and 1400 schools serving rural, suburban, and urban children in over 37 states. Independent evaluations of the program have been conducted in Dallas, TX; East Chicago, IN; Grand Rapids, MI; and Norfolk, VA. Results have been consistent: Breakthrough to Literacy students performed better than district-selected or historical controls on state assessments and nationally standardized tests.

In 1996-1997, Dallas Public Schools used a quasi-experimental design to examine kindergarten achievement as a function of Breakthrough to Literacy, five other computer-based reading programs, or no computer-based program. The other computer-based programs included Waterford, which was the focus of the study, Success Maker, Ideal Learning, Jostens Learning, and Writing to Read. The participants were predominantly African American or Hispanic children from low socioeconomic backgrounds (86% low-SES for the Breakthrough to Literacy group). On the Iowa Tests of Basic Skills (ITBS) Vocabulary test, Breakthrough to Literacy students scored higher than either the other five computer groups (Mean NCE = 61.0 versus 53.3) or the non-computer group (Mean NCE = 61.0 versus 52.2). Breakthrough to Literacy kindergartners also scored higher on the ITBS Word Analysis test than did kindergartners in the five other computer groups (Mean NCE = 57.9 versus 52.6) and the non-computer group (Mean NCE = 57.9 versus 53.5).

In the 1997-1998, Dallas Public Schools found that Breakthrough to Literacy was particularly beneficial to SOL (Speakers of Other Languages) students (Urrabazo, 1998). Kindergarten and first grade SOL students in Breakthrough to Literacy outperformed SOL students in Waterford, Success Maker, Ideal Learning, Jostens Learning, Writing to Read computer groups as well as students in no-computer groups on the spring administration of the Woodcock-Muñoz Language Survey (WMLS). In addition, the kindergarten SOL group demonstrated the highest pre- to posttest gains of all comparison groups on the WMLS.

In East Chicago, IN and Norfolk, VA, performance differences between students who used Breakthrough to Literacy and those who did not have been long lasting, resulting in higher third-grade outcomes for students who had used the program in kindergarten and/or first grade.

In the fall of 2000, 43% of School City of East Chicago third graders who had used Breakthrough to Literacy in first grade met state standards on the Indiana Statewide Testing for Educational Progress—Plus (ISTEP+) compared to only 18% of third graders who had not used the program in the primary grades.

In 1997-1998, Grand Rapids Public Schools implemented Breakthrough to Literacy in three child development centers and three satellite centers in the district. They used the Work Sampling System (Meisels et al., 1994) to compare pre-reading skills development of children in these centers with that of children in non-participating centers. In the spring of the program year, Breakthrough to Literacy pre-kindergartners showed higher proficiency rates than non-participants on all items in the Language and Literacy subtest of the Work Sampling System. With the exception of one item, Breakthrough participants also showed greater pre- to posttest proficiency gains than non-participants. On some items, e.g., “Follows directions”, a larger percentage of non-participants versus Breakthrough participants began the year at a proficient level, but a larger percentage of Breakthrough versus non-participants ended the year at a proficient level.

In the spring of 2000, the average passing rates for third graders at St. Helena Elementary School in Norfolk City Schools who used Breakthrough to Literacy in kindergarten notably surpassed district averages on Virginia’s high-stakes Standards of Learning (SOL) tests. These performance differences were observed in all content area tests and were particularly impressive given the socioeconomic contrast between the two groups. In the 1999-2000 school year, 87.79% of St. Helena students compared to 68.75% of students district-wide were eligible to receive free or reduced price lunches.

Project Upgrade, conducted for the U.S. Department of Health and Human Services, Administration for Children and Families Child Care Bureau, examined the impacts of three curricula (including Breakthrough to Literacy) and a program of professional development for early language literacy intervention in Miami Dade County Child care Centers. The study found significant impacts on both the children’s development of early literacy skills as well as on teachers’ classroom behaviors.