THE EFFECTS OF A SUPPLEMENTAL EARLY READING INTERVENTION WITH URBAN KINDERGARTEN AND FIRST-GRADE STUDENTS: A PREVENTIVE APPROACH

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate School of
The Ohio State University

By
Shobana Musti-Rao, M. Ed.

The Ohio State University
2005

Dissertation Committee:

Dr. Gwendolyn Cartledge, Advisor

Dr. William L. Heward

Dr. Ralph Gardner

Approved by

Advisor
College of Education
The study investigated the effects of a supplemental early reading intervention program on the phonemic awareness and alphabetic principle skills of students identified as being at-risk for reading failure. Seven kindergarten students and one first-grade student were selected based on low scores on the beginning- and middle-of-year benchmark assessments as measured by the Dynamic Indicators of Basic Literacy Skills (DIBELS) and teacher nominations. The kindergarten instructional assistant and researcher implemented the early reading intervention using a co-teaching format. Target students received twenty minutes of instruction three days a week for sixteen-, twelve-, and eight-weeks. A multiple-baseline-across-subjects design was used to analyze the effects of the instruction on the phoneme segmentation fluency (PSF) and nonsense word fluency (NWF) of target students as measured by DIBELS.

Students made moderate to substantial increases in PSF and NWF as a result of the intervention. The first-grade student moved out of the school before the completion of the study. The end-of-year benchmark assessments revealed that four out of the seven kindergarten students reached “benchmark” and were at grade level, one student needed “strategic” intervention, and two students needed “intensive” intervention at the end of
the study. Teachers, parents, and students provided positive responses for the acceptability, usefulness, and effectiveness of the supplemental reading intervention. Results are discussed in terms of efficacy of the reading program on the essential reading skills of at-risk learners. Implications for practice and directions for future research are discussed.
Dedicated to my parents, my husband, and my daughter
ACKNOWLEDGMENTS

I wish to express my sincere gratitude to my faculty advisor, Dr. Gwendolyn Cartledge, for being a tremendous source of support, encouragement, and guidance throughout my graduate study at The Ohio State University. I have learned a great deal from her and this has helped me grow both personally and professionally. Thanks to her, I have become a better writer, better researcher, and a better teacher.

I thank my committee members, Drs. Ralph Gardner and Bill Heward, for all the academic guidance and encouragement. I am grateful to the staff and students at Hubbard Elementary School for allowing me to work in their school and for making this study possible. A special thanks to Ms. M for her time, patience, and dedication to the students.

I thank my colleagues, Amanda Yurick, Sarah Knebel, Malika Nelson, and Lefki Kourea for being there when I most needed them, for serving as second observers and for helping with data collection.

This acknowledgment will not be complete without thanking my husband, my parents, my parents-in-law, and my daughter for extending their support in helping me pursue and finally complete this endeavor.
VITA

April 20, 1977 ............................... Born – Chennai (Madras), India

1994 ................................. B. S. Zoology, Stella Maris College, India.

1998 ................................. Post Graduate Diploma in Special Education
The Spastics Society of India, Chennai

2000 ................................. M. Ed. Special Education, University of Illinois
at Urbana-Champaign

2000 – 2001 ............................ Special Education Teacher,
SABIS® International School of Cincinnati, OH

2001 – 2002 ............................ Special Education Coordinator,
SABIS® International School of Cincinnati, OH

2002 – Present ........................ Graduate Research Associate, The Ohio State
University

PUBLICATIONS

reading failure: Strategies for collaborating with urban parents. Preventing School

FIELDS OF STUDY

Major Field: Education

Specialization: Special Education
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>v</td>
</tr>
<tr>
<td>Vita</td>
<td>vi</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xiii</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xv</td>
</tr>
<tr>
<td><strong>Chapters:</strong></td>
<td></td>
</tr>
<tr>
<td>1. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Evidence on reading</td>
<td>2</td>
</tr>
<tr>
<td>Phonemic awareness and alphabetic principle</td>
<td>3</td>
</tr>
<tr>
<td>Early intervention</td>
<td>4</td>
</tr>
<tr>
<td>School-based interventions</td>
<td>5</td>
</tr>
<tr>
<td>Purpose of study</td>
<td>7</td>
</tr>
<tr>
<td>Research questions</td>
<td>8</td>
</tr>
<tr>
<td>2. Literature Review</td>
<td>9</td>
</tr>
<tr>
<td>Students at-risk for reading failure</td>
<td>9</td>
</tr>
<tr>
<td>Urban learners</td>
<td>10</td>
</tr>
<tr>
<td>Overrepresentation in special education</td>
<td>12</td>
</tr>
<tr>
<td>A preventative approach to beginning reading instruction</td>
<td>14</td>
</tr>
<tr>
<td>The “right” approach to reading instruction</td>
<td>14</td>
</tr>
<tr>
<td>Effective instruction</td>
<td>17</td>
</tr>
<tr>
<td>Rate of task engagement</td>
<td>18</td>
</tr>
<tr>
<td>Rate of success</td>
<td>18</td>
</tr>
<tr>
<td>Explicit instruction</td>
<td>18</td>
</tr>
<tr>
<td>Early intervention for beginning readers</td>
<td>19</td>
</tr>
<tr>
<td>Phonemic awareness and alphabetic principle</td>
<td>21</td>
</tr>
<tr>
<td>Phonological awareness</td>
<td>22</td>
</tr>
</tbody>
</table>
What research says about the role of phonemic awareness in reading acquisition ......................................................... 23
Focus on phonemic awareness and alphabetic principle........... 25
Focus on components skills of phonemic awareness .......... 29
Focus on instructional approach .......................................... 31
Systems wide approach to beginning reading instruction ........ 33
PRIDE .............................................................................. 34
Hartsfield Elementary change project ................................. 35
Beginning reading programs ................................................ 36
Criteria for a good reading program .................................... 37
Instruction at the phoneme level .......................................... 38
Provide scaffolding ......................................................... 38
Explicit modeling of task prior to student practice ............ 38
Strategically integrating phonological awareness and alphabetic understanding ................................................ 39
Use of concrete materials to represent sounds ................. 40
Supplemental early reading interventions ......................... 42
Linking assessment to instruction ........................................ 44
Monitoring student progress ............................................... 46
Summary ........................................................................... 46

3. Method ........................................................................ 49
Participants ........................................................................ 49
Target students ................................................................... 50
Screening for at-risk markers in reading ......................... 50
Teacher nominations ............................................................ 51
School attendance ............................................................... 51
Parental consent ................................................................. 51
Participating Teachers ......................................................... 58
Setting .............................................................................. 59
Instructional setting .............................................................. 60
LACES program ................................................................. 61
HOSTS .............................................................................. 64
Assessment setting ............................................................... 64
Experimenter and observers ............................................... 65
Dependent measures .......................................................... 66
DIBELS benchmark assessments ......................................... 66
Woodcock Johnson subtests ............................................... 67
Measurement of dependent variables ............................... 68
DIBELS progress monitoring assessments ...................... 68
Curriculum-based measurement ........................................ 69
Interobserver agreement on dependent variables .............. 70
Observer training ............................................................... 71
Procedural integrity measurement ........................................ 72
Social validity measurement .................................................. 73
Materials ................................................................. 74  
  Stopwatch ................................................................. 74
  Presentation sheets and assessment booklets ......................... 74
  ERI kit ...................................................................... 75
  Star card and marker stamps ............................................. 75
Experimental design .......................................................... 75
ERI – The curriculum ......................................................... 76
General procedures .......................................................... 80
  Placement test ............................................................ 81
  Student grouping ........................................................ 82
  Teacher training .......................................................... 83
Experimental conditions ..................................................... 84
  Baseline .................................................................. 84
  Intervention ............................................................... 85
  Data analysis ............................................................. 87

4. Results ........................................................................... 90

  Interobserver agreement .................................................... 90
    IOA on dependent variables ........................................... 91
    IOA on CBM pre- and posttests ..................................... 93
  Procedural integrity ........................................................ 95
  Individual student performance on dependent variables ......... 98
    Student 1: Henry ......................................................... 98
      PSF .................................................................... 99
      NWF .................................................................... 99
      CBM pre- and posttest .............................................. 99
      DIBELS benchmark assessments ................................. 99
      WJ-III pre- and posttest ............................................ 100
    Student 2: Kevin ......................................................... 100
      PSF .................................................................... 100
      NWF .................................................................... 101
      CBM pre- and posttest .............................................. 101
      DIBELS benchmark assessments ................................. 101
      WJ-III pre- and posttest ............................................ 101
    Student 3: Daryl ......................................................... 102
      PSF .................................................................... 102
      NWF .................................................................... 102
      CBM pre- and posttest .............................................. 102
      DIBELS benchmark assessments ................................. 103
      WJ-III pre- and posttest ............................................ 103
    Student 4: Richie ......................................................... 103
      PSF .................................................................... 103
Student satisfaction questionnaire .................................................. 135
  Student 1: Henry ................................................................. 135
  Student 2: Kevin ............................................................... 136
  Student 3: Daryl ............................................................... 136
  Student 4: Richie ............................................................... 136
  Student 5: Zach ............................................................... 136
  Student 6: Isha ................................................................. 136
  Student 7: James ............................................................... 137
  Student 8: Mark ............................................................... 137

5. Discussion ................................................................................. 140

Research question one ............................................................... 140
Research question two ............................................................... 145
Research question three ........................................................... 148
Research question four ............................................................. 151
Research question five ............................................................. 153
Limitations of the study ............................................................. 156
  Duration of instruction ......................................................... 156
  Lack of language assessments ................................................. 156
  Co-teaching format ............................................................. 157
  Student grouping ............................................................... 158
Implications for practice ........................................................... 159
  Identifying students at-risk ................................................. 159
  Providing differentiated instruction ....................................... 160
  Instructional grouping ........................................................ 161
  Teacher training ............................................................... 162
  Systems wide approach ...................................................... 163
  Support and guidance ......................................................... 164
Directions for future research .................................................... 166
Summary .................................................................................... 167

List of references ......................................................................... 170

Appendices ................................................................................. 181

  A. Parent letter for participation ............................................. 182
  B. Parent consent for participation in educational research ....... 185
  C. Teacher participation recruitment letter ............................. 187
  D. Teacher consent for participation in educational research ... 189
  E. Curriculum-based measurement pre- and posttest form ........ 191
  F. Procedural integrity checklist ............................................ 193
  G. Teacher pre-intervention acceptability rating survey .......... 195
  H. Teacher post-intervention acceptability and importance of effects survey ........................................... 197
I. Social validity questionnaire – Teacher form ................................. 199
J. Social validity questionnaire – Parent form (with cover letter) ........ 202
K. Children’s social validity interview .............................................. 205
L. Sample lesson from Scott Foreman Early Reading Intervention...... 207
   Lesson Overview ................................................................. 208
   Activity 1 ............................................................................. 209
   Activity 2 ............................................................................. 210
   Activity 3 ............................................................................. 212
   Activity 4 ............................................................................. 213
   Activity 5 ............................................................................. 214
   Activity 6 ............................................................................. 215
   Activity 7 ............................................................................. 216
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Demographic information of target students</td>
<td>56</td>
</tr>
<tr>
<td>3.2</td>
<td>Background information of participating teachers and instructional assistant</td>
<td>59</td>
</tr>
<tr>
<td>3.3</td>
<td>Literacy Board activities and skills targeted in instruction</td>
<td>63</td>
</tr>
<tr>
<td>3.4</td>
<td>Scott Foresman Early Reading Intervention placement test results</td>
<td>82</td>
</tr>
<tr>
<td>4.1</td>
<td>Interobserver agreement for phoneme segmentation fluency (PSF) and nonsense word fluency (NWF) probes</td>
<td>93</td>
</tr>
<tr>
<td>4.2</td>
<td>Interobserver agreement for pre- and posttest curriculum based measures (CBM)</td>
<td>95</td>
</tr>
<tr>
<td>4.3</td>
<td>Procedural integrity data across instructional groups</td>
<td>96</td>
</tr>
<tr>
<td>4.4</td>
<td>Student baseline and intervention means, standard deviations, effect sizes for DIBELS PSF and NWF; pre- and posttest means and standard deviations on CBM measures</td>
<td>111</td>
</tr>
<tr>
<td>4.5</td>
<td>Results of DIBELS Fall, Winter, and Spring benchmark assessments for target students in Kindergarten</td>
<td>116</td>
</tr>
<tr>
<td>4.6</td>
<td>Results of WJ-III pre- and posttest for target students in Kindergarten</td>
<td>117</td>
</tr>
<tr>
<td>4.7</td>
<td>Group pre- and posttest means and mean gains made by groups</td>
<td>120</td>
</tr>
<tr>
<td>4.8</td>
<td>Results of Pre- and Post-intervention Acceptability Rating Survey</td>
<td>125</td>
</tr>
<tr>
<td>4.9</td>
<td>Results of social validity questionnaire – Teacher form</td>
<td>128</td>
</tr>
<tr>
<td>4.10</td>
<td>Results of social validity questionnaire – Parent form</td>
<td>133</td>
</tr>
</tbody>
</table>
4.11 Summary of parent satisfaction survey ........................................ 134
4.12 Results of social validity student interview ..................................... 139
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Percentage of instructional sessions conducted by both researcher and paraprofessional, researcher only, and paraprofessional only</td>
<td>97</td>
</tr>
<tr>
<td>4.2</td>
<td>Visual representation of baseline and intervention data on PSF and NWF measures for Daryl, Kevin, Zach, and Mark</td>
<td>112</td>
</tr>
<tr>
<td>4.3</td>
<td>Visual representation of baseline and intervention data on PSF and NWF measures for Henry, Richie, James, and Isha</td>
<td>113</td>
</tr>
<tr>
<td>4.4</td>
<td>Weekly CBM pre- and posttest results for Henry, Kevin, Daryl, and Richie</td>
<td>114</td>
</tr>
<tr>
<td>4.5</td>
<td>Weekly CBM pre- and posttest results for Zach, Isha, James, and Mark</td>
<td>109</td>
</tr>
<tr>
<td>4.6</td>
<td>Pre- and posttest means on benchmark assessments for “Intervention” and “No Intervention” groups</td>
<td>121</td>
</tr>
<tr>
<td>4.7</td>
<td>Pre- and posttest means on WJ-III subtests for “Intervention” and “No Intervention” groups</td>
<td>122</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

The national statistics on the reading performance of students in schools is not promising. Reading underachievement is a severe problem in schools serving children from minority and economically disadvantaged households. Good, Gruba, and Kaminski (2001) report that nearly 70% of fourth-grade students from the schools with the highest levels of poverty failed to achieve even partial mastery of basic reading skills. Students in high poverty urban areas are at greatest risk for reading failure (Washington, 2001; Foorman & Moats, 2004). Low achieving schools are typically characterized by high teacher turnover, inconsistent leadership, high level of student mobility, low expectation for staff and students, and limited resources. In general, public education has been ineffective in teaching all children to read (Torgesen, 2002). Failure to read during the elementary school years reduces one’s chances of success in life (Lane & Mercer, 1999). Students who read below grade level at the end of first grade are more likely to perform below grade level in reading at the end of fourth grade (Bursuck, Munk, Nelson, & Curran, 2002). According to Juel (1988), the probability that a child would remain a poor reader at the end of fourth grade, if the child was a poor reader at the end of first grade is .88.
Evidence on Reading

Reading has been one of the most researched topics in education today. There is general consensus that one of the best ways to combat the issues of reading failure is to intervene as early as possible. Converging evidence from 20 years of research has addressed the content, format, and timing of early reading intervention for all children (Foorman & Moats, 2004). Research suggests that all students, including students with mild disabilities, can become competent readers when provided with appropriate instruction (Mathes & Torgesen, 1998). Foorman and Moats contend that one of the most effective approaches to early intervention is prevention. A preventative approach to reading should compass: (a) early identification of children at risk of reading failure, (b) explicit, intensive, and systematic instruction on core pre-reading and reading skills, and (c) continued support beyond initial instruction (Mathes & Torgesen, 1998). Good reading instruction that is explicit, intensive, and systematic is critical for at-risk learners, and needs to be an integral part of their education. Explicit instruction refers to teaching specific reading skills such as phonemic awareness, alphabetic principle, fluency, vocabulary, and comprehension to help students acquire the knowledge to decode print. Intensive instruction includes providing a greater number of teaching and learning opportunities with increased repetition of previously learned skills. Systematic instruction is the careful structuring of instruction such that one skill builds upon a previously taught skill. While long-term effects of preventive instruction depend largely on the support for reading improvement provided after the commencement of instruction, immediate outcomes for preventive instruction presents the possibility of bringing “the word-level
reading skills of children at-risk for reading failure within the average range by the end of first or second grade” (Torgesen, 2002, p. 18).

The 2000 report from the National Reading Panel (NRP) on the status of reading in school’s today has provoked a nation-wide initiative to establish standards that ensure reading achievement for all students by the end of third or fourth grade. This has led to the resurgence of reading intervention programs that focus on teaching literacy skills as early as preschool and kindergarten. There is general consensus among educators that in order to prevent reading failure, children attaining proficiency in reading should be top priority in schools. Additionally, there is agreement that there should be early, explicit, and direct instruction in pre-reading skills. The NRP identified five key topics for intensive study. One of these topics, Alphabetics, comprised of phonemic awareness instruction and phonics instruction, an area central to learning to read. Phonemic awareness in combination with phonics instruction share a strong empirical base in beginning reading instruction (Ball & Blachman, 1991; Foorman & Moats, 2004).

**Phonemic Awareness and Alphabetic Principle**

Converging evidence from research on phonemic awareness and its role in reading acquisition provide optimism and hope. The evidence suggests that phonemic awareness can be taught to children as early as preschool and kindergarten through explicit, systematic instruction. However, in order to “break the code” children need to establish an understanding of the alphabetic principle along with phonemic awareness. Alphabetic principle refers to the ability to associate sounds with letters and use these letters to form words. Therefore, “phonemic awareness underpins the acquisition of the alphabetic principle and hence of reading skill” (Byrne, & Fielding-Barnsley, 1990, p. 18).
Scott and Kameenui (1994) describe alphabetic understanding as being concerned with the “mapping of print to speech” and establishing a clear link between a letter and a sound. Mastery of the alphabetic principle is one of the ingredients for reading success. Vellutino (1991) contends that phonemic awareness is a prerequisite for alphabetic understanding, and alphabetic mapping is in turn believed to be a prerequisite for learning to identify individual words and learning to read. Hence, the combination of phonemic awareness and alphabetic understanding are critical components of early reading instruction.

**Early Intervention**

Using a variety of methods, researchers have intervened with students in kindergarten and first grade identified as being at risk for later reading problems. One such method is to assess the students’ fluency in specific prereading skills (e.g., initial sounds in words and letter sounds). Fluency in this context refers to the ability to orally produce multiple exemplars on a given task. Some of the reliable and valid predictors to identify students at risk of reading difficulties are phonological awareness and letter sounds, rapid naming of letters, and word reading. Foorman & Moats (2004) contend that “the predictive validity of phonological tasks depends on how and when these skills were assessed” (p. 53). For example, blending onset and rimes in kindergarten are predictive of first grade reading, while phoneme segmenting and blending in first grade is predictive of end of year reading. The letter-sound knowledge requires the understanding of the alphabetic principle (Speece, Mills, Ritchey, & Hillman, 2003).
Foorman and Moats (2004) aptly summarize research on reading interventions as follows:

- Phonemic awareness, letter sounds, rapid naming of letters, vocabulary and word recognition have been identified as valid and reliable predictors of risk.
- Early intervention in kindergarten through second grade is more effective than later intervention.
- The content of instruction in early intervention should differ from classroom instruction in that it should be more systematic and intensive.
- Finally, small group instruction can be as effective as one-on-one instruction when implemented by well trained teachers.

School-based Interventions

The No Child Left Behind Act’s (NCLB; 2001) emphasis on empirically validated strategies has resulted in the development of several commercial based reading programs (e.g., Headsprout Early Reading Program, http://www.headsprout.com and Scott Foresman Early Reading Intervention, Simmons & Kame’enui, 2003.). However, there is no general consensus on which beginning program to use or the process schools should follow to develop research-based programs (Baker & Smith, 2001). Independent studies that investigate the effects of commercial reading programs based on empirically validated instructional principles in school settings will certainly contribute to the literature on effective reading programs. A common complaint in education is that teacher educators conduct most research, often with limited collaboration with classroom teachers (Greenwood & Maheady, 1997). This has not only resulted in the research to practice gap, but has also resulted in the limited sustainability of effective instructional
strategies at the completion of a research study. Effective translation of research findings to practice requires arrangement of the learning environment with minimal differences between the researcher- and practitioner-implemented practices. Baker and Smith report that more research is being “carried out by teacher-researchers in an effort to increase the ecological validity of findings” (p. 316). Another alternative to bridging the research to practice gap is for the researcher and practitioner to collaborate on implementing a reading program. Such a collaboration will not only improve the quality of implementation, but will also allow practitioners and researchers to make modifications to the program in alignment with student needs without compromising the integrity of intervention.

Several factors such as time management and resource allocation need to be considered when implementing a reading program. With the increased demands placed on the classroom teacher, it may not always be feasible for a classroom teacher to implement a supplemental reading program in addition to the core reading instruction for at risk learners. In such a situation, the role of an instructional assistant or paraprofessional can be valuable in providing instruction to students in a small group or one-on-one setting. Although issues of training and delineation of roles and responsibilities between the teacher and paraprofessional need to be identified and addressed, involving a paraprofessional to conduct instruction is a judicious use of resources. Over 500,000 instructional assistants were reported working in schools in 1995; however, “what paraeducators actually do all day are notably absent in the literature” (French & Pickett, 1997, p. 66). Typically, paraprofessionals are hired by school districts to provide instructional support to the teacher and perform clerical tasks.
Paraprofessionals, however, have the potential to provide quality, reading instruction with appropriate training and continued support from researchers. In summary, studies involving paraprofessionals implementing commercial reading programs with students in schools are likely to increase the possibility that teachers will understand the value of such programs and not only incorporate principles of research-based practices in reading instruction (e.g., phonemic awareness, alphabetic principle), but also utilize their personnel resources wisely.

Purpose of the Study

The purpose of the present study was to investigate the effects of a supplemental early reading intervention program on the phonemic awareness and alphabetic principle skills of kindergarten students identified at-risk for reading failure. Specifically, the researcher wished to determine if a supplemental reading program (i.e., ERI – Scott Foresman, 2004), which was co-taught in a small group setting, by the kindergarten instructional assistant and the researcher would substantially reduce the reading risk status of target students. Effects of this intervention on the phoneme segmentation and nonsense word fluency of target students were measured using the Dynamic Indicators of Basic Literacy Skills (DIBELS; Good & Kaminski, 2002) and researcher-developed curriculum based assessments.
Research Questions

The current study was conducted to address the following research questions:

1. What are the effects of supplemental reading instruction (i.e., the Early Reading Intervention - ERI), on the phoneme-segmentation skills of kindergarten and first grade target students as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS)?

2. What are the effects of supplemental reading instruction (i.e., the Early Reading Intervention - ERI), on the letter-sound correspondence and blending skills of kindergarten and first graders as measured by DIBELS?

3. What effect did supplemental instruction (i.e., ERI) have on student benchmark scores?

4. As a measure of social validity, to what extent will classroom teachers view the supplemental instruction as beneficial to their students and effectively administered?

5. To what extent will students and parents rate the supplemental instruction as enjoyable (students) and beneficial (parents and students)?
CHAPTER 2

LITERATURE REVIEW

This chapter reviews the literature on topics including (1) students at risk for reading failure, (2) a preventative approach to beginning reading, (3) phonemic awareness and alphabetic principle, and (4) beginning reading programs/empirically validated strategies. The review will also highlight the importance of the intervention-assessment linkage in early reading instruction. The review will focus on beginning reading instruction as it pertains to urban learners in the primary grades, particularly in kindergarten and first grade.

Students At Risk for Reading Failure

Students are typically at risk because of several environmental factors such as poverty, cultural or linguistic diversity, educational expectations, level of education of family members, and so forth. Students with disabilities, learning and behavioral, are also considered at risk for reading failure. The two groups that have been consistently identified as being at risk for academic failure are: minority children and children who come from low-income households (Washington, 2001). Among the different minority groups, African-American children from low-income families and with low maternal education are reported to be at greatest risk for academic failure. Scott and Kameenui
(1994) contend, “issues of poverty are more strongly associated with educational achievement (e.g., beginning reading) than ethnicity or race” (p. 373). In a synthesis of 27 intervention studies that examined the effects of school-based reading interventions for kindergarten students at-risk for reading difficulties, Cavanaugh, Kim, Wanzek, and Vaughn (2004) found that the common criteria for defining at-risk in the studies reviewed were: low-socioeconomic status (SES), low phonological awareness, a combination of low SES and low phonological awareness, or students with disabilities.

**Urban Learners**

Urban learners are students from diverse racial, ethnic, cultural, linguistic, and socioeconomic backgrounds. However, the majority of the students tend to be non-white from low-income households (Cartledge & Lo, 2005). Students attending high-poverty schools in urban areas constitute a significant faction of the school-age population at risk for reading failure, with students from minority groups constituting the fastest growing group of school-aged students in the United States. These urban learners attend schools in inner cities that are typically characterized by high teacher turnover, low expectations both for teachers and students, inconsistent leadership, and high rates of student mobility (Foorman & Moats, 2004). Although educational reforms have highlighted the problems of educating urban learners, the achievement gap has steadily widened over the last two decades (Kretovics, Faber, & Armaline, 2004). The reading report cards of minority fourth graders are discouraging with 63% of African American, 58% of Hispanic, and 57% of Native American students reading below basic levels compared to 27% of white students (National Center for Educational Statistics, 2001).
Failure to read during the elementary school years has serious long-term consequences that include dropping out of school, frustration leading to problem behaviors, unemployment, increased likelihood of engaging in delinquent acts and encountering the social justice system. D’Andrea (1995) reports that nearly 36% of all African Americans, 25 years and older, do not possess a high school diploma. Riviera, Jackson, and Jackson (1993), as cited in D’Andrea (1995), report that there are more Black youth receiving an education in prisons than in colleges; and about 50 to 60% of African American youth residing in metropolitan cities are unemployed.

Urban learners, including African American students and students from other minority groups, enter kindergarten without the preliteracy experiences and oral language skills needed to facilitate early classroom learning. These are children who show warning signs very early on in their schooling and fall behind their peers academically. Complex environmental and social factors such as neglected, under funded, urban schools with limited community and parental support place students attending these schools in acute risk for limited academic achievement (Davis, 2003). In addition to being disproportionately represented in almost every category of academic failure (Davis, 2003), African American males are referred for special education at a much higher rate than their white counterparts, and are much more likely to be suspended or expelled from school. These early negative school experiences not only contribute to the students’ disengagement with schools, but also widen the achievement gap that exists. Further, “remediation, grade retention, and suspension induce academic failure among Black boys” (Davis, 2003, p. 522).
Overrepresentation in Special Education

The overrepresentation of students from minority groups in special education has received much attention in the literature for over three decades (e.g., Dunn, 1968; Gottlieb, Alter, Gottlieb, & Wishner, 1994; Artiles & Trent, 1994). While African American students are overrepresented in programs for students with mental retardation, a disproportionate number of Hispanic students are placed in programs for students with learning disabilities and speech and language impairments (Artiles & Trent, 1994). Typically, classroom teachers refer students for evaluation; and 85% of all referrals are determined to be eligible to receive special education services (Gottlieb et al, 1994). Therefore, most of the students placed in special education are general education “fallouts.” Artiles and Trent (1994) contend that there is a positive correlation between the proportion of minority students and the overrepresentation issue. That is, the larger the minority population in the school district, the greater the representation of minority students in special education. Gottlieb and colleagues argue that the needs of urban learners placed in special education are so severe that 2 to 3 hours of weekly instruction will not be sufficient for these students to be accommodated in the general education instruction.

Reschly (2002) contends that minority overrepresentation in special education is a silent contributor to the prevalence of learning disability. Many of the students are referred for special education due to their failure to read at grade level. A myriad of factors such as allocation of funding and resources in urban schools, recruitment of highly qualified teachers, distribution of instructional materials and limited resources contribute to less than optimal levels of school functioning. These urban learners who
have the greatest educational needs are least likely to receive a quality education (Cartledge, 2002). Thus, up to 40% of students identified are placed in special education not due to low ability, but because of lack of effective reading instruction. Gottlieb and colleagues (1994) assert that special education for most students in urban schools is a one-way ticket with little or no hope of recourse. Further, the state of urban education has provided students with limited access to intensive instruction outside of special education. The solution, the authors contend, is not educational inclusion but intensive and effective instruction. Students in these urban schools, therefore, become prime candidates for explicit, intensive, and systematic early intervention. Intensive instruction becomes a critical necessity for the success of these children (Mathes & Torgesen, 1998).

Findings from several early childhood interventions projects designed to serve disadvantaged children (e.g., Abecedarian Project (Ramey & Campbell 1991); Perry Preschool Project (Beruetta-Clement et al. 1984); Head Start (McKey et al. 1985) have demonstrated that providing high quality interventions beginning shortly after infancy and continuing until the children enter kindergarten can significantly improve their intellectual and academic performance (Ramey & Ramey, 1992; Campbell & Ramey, 1995; Campbell & Taylor, 1996). In particular, results from the Abecedarian study indicated that children who received early intervention in preschool showed greater academic gains than the children who received later school-age intervention. A follow-up study of the children when they were 15 years of age lends support to the fact that high quality educational experiences in preschool years have long lasting effects that carry on through middle adolescence. Children in the early intervention treatment group demonstrated 50% reduction in the rate of failing a grade during elementary years.
compared to the control group (Ramey & Ramey, 1992). Since almost all children who participated in the Abecedarian study were African American (98%), Campbell and Ramey suggest that the results of the study can be generalized primarily to this population. The authors conclude that providing an intensive, high quality preschool program can significantly reduce early failure among African American children. Foorman and Moats (2004) contend that although we have reached consensus on how best to teach urban learners to read, much less is known about the implementation and sustainability of research validated instructional strategies in these settings. The prevention of reading difficulties in urban learners should be a national research and education priority (Washington, 2001).

A Preventative Approach to Beginning Reading Instruction

One of the ways to combat the issue of academic underachievement and school failure among urban learners is to intervene as early as preschool or kindergarten to prevent reading failure. Before looking at the principles that govern success in beginning reading, it would be important to explore the different approaches to reading that currently exist.

The “Right” Approach to Reading Instruction

The debate over teaching reading has been the source of many intense political and emotional school battles. The majority of methods of reading instruction adopted by schools today fall along a continuum ranging from traditional basal approaches to whole-language approaches (Graves, Juel, & Graves, 2001). Kame’enui (1999) asserted that the debate has consumed the professional community to such an extent that it has become dysfunctional and harmful to the children who are supposed to be served by the debate.
Further, it has led to a dichotomy between proponents of two approaches, namely “phonics-based” and “whole-language.” Proponents of phonics-centered programs emphasize the importance of explicit, direct, and systematic instruction in learning to read. They find it incontrovertible that beginning readers should become proficient in the alphabetic principle, a requirement not acknowledged by their whole-language counterparts. The phonics-based approach or code-based instruction is characterized by activities that promote automaticity in word identification, and adopts the notion that a highly automatized process does not require contextual information for its execution (Vellutino, 1991). The whole-language proponents, on the other hand, believe that reading is a context-driven process. Based on the reading response theory and social constructivist theory (Foorman & Torgesen, 2001), whole-language theorists believe that as a child learns to speak naturally by growing in a language-rich environment, so can he or she read by being immersed in a print-rich environment (Vellutino, 1991). They argue that reading is concerned with gaining access to meaning, therefore, attending to sounds and letters of a writing system simply “trivializes” the very purpose of reading (Kame‘enui, 1999). Findings from the National Research Council (NRC) report entitled, *Preventing Reading Difficulties in Young Children* (1998) and the NRP (2000) report have led several school districts to adopt a combination of literature-based instruction with traditional basal reading programs, calling it a “balanced” reading approach. The balanced approach can be described as an eclectic approach to reading instruction in which teachers blend elements of the various approaches (Graves, Juel, & Graves, 2001). Garan (2001) suggests that the term “balance” is a safe word that no one can be criticized for advocating. Unfortunately, the term is also used differently by different people. The
most widely understood definition of a balanced reading program is when literature and comprehension skills are taught along with systematic phonics (Garan, 2001). Whereas the trend towards promoting a balanced literacy approach continues, the question of what might be the best combination of basic skills instruction and meaningful reading activities still remains unanswered (Connor, Morrison, & Katch, 2004).

Although the debate has spanned over nearly two decades and will continue for many more years to come, children in school today continue to experience the downward spiral of the “Matthew Effect.” Stanovich (1986) makes a biblical analogy as it applies to reading. Children who enter school with rich literary experiences and come in contact with effective instruction are more likely to find success in reading than children who enter school lacking in some essential literary experiences and come in contact with ineffective instruction. These children tend to fall further behind their peers and have difficulty catching up to their peers. Although many issues regarding these approaches still remain unresolved, what we do know is that we cannot afford to spend any more time trying to determine why children are failing to read. We also know that waiting for children to show difficulties in reading is not prudent either. Kame’enui (1993) emphasizes the need to “move forward by designing, implementing, and validating instructional programs and interventions for children with diverse learning and curricular needs” (p. 376). It is important that we identify the precursors to the learning problems and take preventative measures to reduce the incidence of reading failure. Denton, Foorman, & Mathes (2003) describe the classroom reading instruction of five schools that offer research-based classroom reading instruction. These schools have been reported as being among the few to have “beaten the odds” and have been successful in their
efforts. The authors suggest that the success of schools implementing different reading programs underscores and reiterates the importance of looking beyond the instructional approach to other factors and variables that may influence the effectiveness of a reading program. The five schools described in their article had a common thread running through them. First, all schools felt a sense of urgency and commitment in trying to remedy the low scores in reading for their students. Each of the schools had strong leadership and accountability on the part of teachers and administrators who shared clear goals for school-wide literacy. Teachers were trained thoroughly in the reading approach used, and monitored student progress on an ongoing basis throughout the school year. Instruction in these schools was targeted to meet the unique needs of diverse learners by using a wide range of instructional and grouping formats. Finally, each of the schools adopted a “no excuses” policy where educators were constantly reevaluating their teaching methods as opposed to placing blame on the students, parents, or other extraneous factors in the environment.

*Effective Instruction*

The fifth technical report produced for the National Center to Improve the Tools of Educators at the University of Oregon (Ellis & Worthington, 1994) consolidated empirically validated effective teaching principles derived from research from diverse theories (behavioral, cognitive, social-learning etc.) to establish broad-based principles that characterize current knowledge about effective teaching. Some of the critical instructional variables that characterize effective instruction are rate of task engagement, rate of success, and explicit instruction.
Rate of task engagement. Students learn more when they are actively engaged during an instructional task. One way to increase student engagement is to give students frequent opportunities to respond (OTR; Sutherland, Alder, & Gunter, 2003). Also, task engagement rate is bound to increase as the teacher actively directs the instructional session providing students with opportunities to be engaged. As a dependent measure, Gunter & Denny (1998) suggest that OTR is more sensitive to changes and can be used across academic domains to make comparison of intervention outcomes. Sutherland et al (2003) document the guidelines set by the Council for Exceptional Children (CEC) regarding the optimal rates of OTR as eliciting 4-6 responses per minute for new materials with at least 80% accuracy in responding, and 8-12 responses per minute with 90% accuracy during independent practice.

Rate of success. The basic tenet of this principle is that all students can learn when given sufficient time and appropriate instruction (Ellis & Worthington, 1994). The rate of success at which a student completes a task depends on the match between the student’s current level of performance and task assignment. If the task is too difficult, learning cannot be achieved. Therefore it is important that materials are presented at the student’s instructional level.

Explicit instruction. A pivotal instructional variable in effective instruction is explicit instruction. This variable not only impacts student achievement but also leads to independent, self-regulated learning. Explicit instruction involves (i) setting goals and objectives for a lesson, (ii) providing lessons that are clear, accurate, and rich in example and demonstrate a particular task, (iii) providing guided practice to complete a task, (iv) providing immediate explicit and corrective feedback so that students don’t practice
errors, (v) providing students with independent practice, and (vi) conducting periodic reviews to reinforce previously learned concepts and materials (Ellis & Worthington, 1994; Stein, Carnine, & Dixon, 1998; Good, Simmons, & Smith, 1998). An important aspect of explicit instruction is not to proceed to new materials until students have established mastery on previously presented materials. Also, student’s behavior must be reinforced in a highly consistent and rewarding manner to facilitate learning through systematic and corrective feedback (Kame’enui et al, 2002).

In a study conducted to examine the interaction between first graders’ literacy skills and classroom instructional practices, Connor, Morrison, and Katch (2004) found that students with weaker decoding skills in the Fall showed the stronger gains in decoding with teacher-managed explicit instruction (TME), whereas students who started with stronger decoding skills made lower decoding skill growth in the same classrooms. The results of the study provided support to the assertion that teacher-managed explicit decoding instruction is more effective in increasing students’ decoding skills than both teacher-managed implicit decoding instruction (TMI) and child-managed explicit instruction (CME). The latter two were shown to be ineffective in changing students’ decoding skills.

**Early Intervention for Beginning Readers**

The report from the National Reading Panel (2000) documented that effective reading instruction begins early and includes instruction in the development of specific reading skills. Three organizational principles that facilitate beginning reading success are as follows:
1. Prevention and early intervention are supremely more effective and efficient than later intervention and remediation for ensuring reading success.

2. Prevention and early intervention must be anchored to the school as the host environment and the primary context for improving student reading performance.

3. Prevention and early intervention pedagogy, programs, and procedures should be based on trustworthy scientific evidence.

(Institute for Development of Educational Achievement, 2002).

In addition to these organizational principles, Kame’enui (1993) and Simmons and Kame’enui (1998) propose a conceptual framework derived from six pedagogical principles that were consolidated by researchers at the National Center to Improve the Tools of Educators (NCITE) at the University of Oregon. The framework can be used to inform our decision-making process in developing early reading experiences for students at-risk of reading failure. (Detailed information on all six guiding principles can be found in Simmons and Kame’enui, 1998). One of the principles that traverses academic domains, but is particularly relevant to reading instruction is “Big Ideas.” This principle is based on the assumption that not all curricular objectives and instructional activities carry equal weight in terms of their contribution to learning. Since instructional time is considered a precious commodity (Kame’enui, 1993), more important information needs to be taught before less important information, and if there is more than one way of teaching a concept then the more efficient way should be employed. Big ideas are used in beginning reading to refer to “a set of unifying curriculum activities necessary for successful beginning reading” (Scott & Kame’enui, 1994, p. 377). These activities serve
as instructional anchors that “provide learners enormous capacity to identify printed
words and translate alphabetic code into meaningful language” (p.377). Coyne,
Kame’enui, and Simmons (2001) contend that phonemic awareness, alphabetic
understanding, and automaticity with the code should serve as the framework for
beginning reading instruction.

Phonemic Awareness and Alphabetic Principle

The terms phonological awareness, phonemic awareness and phonics are used
interchangeably; however, a distinction is warranted prior to further discussion.
Phonemic awareness refers to the ability to manipulate phonemes in spoken words. It is a
prerequisite to alphabetic understanding (making the connection of print to speech).
Phonemes are the smallest units of spoken language. Hence, phonemic awareness is an
auditory skill and does not require knowledge of print. Phonological awareness is a more
encompassing term that not only refers to the focus on phonemes, but also syllables,
onsets and rimes. An onset is the part of the syllable that precedes the vowel, whereas a
rime is the part of the syllable that consists of its vowel and any consonant sounds that
come after it. For example in the word truck, the sound /tr/ is the onset and /uck/ is the
rime. Phonics, on the other hand, is a method of teaching reading that places emphasis on
the acquisition of letter-sound correspondences and their application in reading and
spelling words. Alphabetic principle refers to the ability to associate sounds with letters
and use these letters to form words. In other words, it is the understanding that letters in
written words stand for sounds in spoken words (Stahl & Murray, 1994).
**Phonological Awareness**

The importance of phonological awareness in learning to read has become an established fact. Research not only shows a strong positive correlation between phonological awareness and learning to read, but it appears that phonological awareness plays a causal role in reading acquisition. In other words, good phonological awareness has a significant influence on learning to read. Smith, Simmons, and Kame’enui (1998) report evidence to support the relationship between phonological awareness and reading acquisition. Some underscoring details are listed below.

1. The phonological processing ability explains significant differences between good and poor readers.
2. Phonological awareness has a causal and a reciprocal relation to reading acquisition. That is, phonological awareness facilitates reading and is facilitated by reading instruction.
3. Deficits and delays in phonological awareness can be reliably identified and measured in young children.
4. Phonological awareness is teachable and should be taught explicitly rather than leaving it to develop in the absence of explicit instruction.

(Smith, Simmons, & Kame’enui, 1998, p. 108).

Children develop basic phonological understanding by attending to critical skills in phonemic awareness that fall along a continuum of tasks varying in difficulty. According to Adams (1990), the tasks used to measure phonological awareness can be conceptualized under five levels of difficulty. Having an ear for the sounds in words demonstrated by the ability to remember familiar rhymes would make up the first level.
A second level requires the ability to recognize and sort patterns of rhymes and alliteration in words. A third level consists of the understanding that syllables can be divided into phonemes. Tasks that require full segmentation of words into component phonemes constitute the fourth level. A fifth level, the most difficult of all, requires phoneme addition and deletion (i.e., phoneme manipulation).

Stahl and Murray (1994) propose an alternate to conceptualizing (and measuring) phonological awareness to examine its relation with reading. Instead of measuring the construct in terms of difference between tasks (e.g., segmenting, blending), they believe it can be described in terms of linguistic complexity. That is, manipulating onset and rimes, manipulating phonemes at the beginning or at the end of a word, manipulating phonemes within an onset cluster would be some examples of the linguistic complexity involved in phonological awareness. However, instruction at the phoneme level has been shown to be most effective in beginning reading instruction (Good, Simmons, and Smith, 1998).

*What Research Says About the Role of Phonemic Awareness in Reading Acquisition*

Several studies have gathered converging evidence that phonemic awareness is a critical skill in the acquisition of reading (Ball & Blachman, 1991; Iversen & Tunmer, 1993; Juel, 1988; Lundberg, Frost, & Petersen, 1988). Research by Perfetti, Beck, Bell, and Hughes (1987) suggest a mutually supportive relationship between phonemic awareness and learning to read. That is, just as phonemic awareness facilitates reading, meaningful reading instruction facilitates phonemic awareness (Stahl & Murray, 1994; Nichols, Rupley, Rickelman, & Algozzine, 2004). Whereas a basic level of phonemic awareness may be necessary for beginning reading, as reading develops the student
becomes more sensitive to the sounds in words and is better able to manipulate sounds at
the phoneme level (Hempenstall, 2002). However, it has also been asserted that
phonemic awareness alone is not sufficient for reading acquisition. Alphabetic principle
is required for readers to read novel word forms based on their constituent letters (Perfetti
et al, 1987). Phonemic awareness and letter-sound knowledge are needed in combination
to promote the acquisition of reading (Byrne & Fielding, 1989; Juel, 1988). In studying
the relationship of phonemic awareness to reading ability, instruction in letter-sound
correspondence invariably becomes an integral part of the program. Without letter-sound
correspondence and decoding, reading cannot be achieved. Therefore studies looking at
both these areas provide a clearer understanding of the role of phonemic awareness alone
and in combination with other variables in beginning reading skills.

The success of a reading intervention is dependent on a wide array of variables
that interlock to produce effective results. In their review of 27 intervention studies,
Cavanaugh et al (2004) found that the variables that resulted in most consistent moderate
to high effect sizes were: (a) phonemic awareness instruction, (b) small group
instructional format, (c) frequency of intervention (number of times per week), (d)
intensity of intervention (number of minutes per session), (e) duration of intervention
(number of weeks of intervention), and (f) researcher-implemented or researcher-trained
instruction. A majority of studies in the area of beginning reading instruction have been
conducted using group designs and inferential statistics. The studies are characterized by
large sample sizes using a pre- and post-test design where participants are randomly
assigned to one or more treatment groups. Since the differential effects of the intervention
on individual students cannot be derived from group studies, inferences can be made only at the group level.

*Focus on phonemic awareness and alphabetic principle.*

Ball and Blachman (1991) evaluated the effects of phonemic segmentation instruction and training in letter names and letter sounds on the reading and spelling skills of thirty kindergarteners. The students were randomly assigned to one of three groups: (1) phoneme segmentation group that received instruction in segmentation, (2) letter names and letter sounds, language activities group that received instruction in letter sounds and names only, and (3) a control group. Students who received phoneme segmentation training significantly outperformed students in the language activities groups and the control group on three items included in the phoneme segmentation test, as well as on the ability to read on Woodcock post-test measures and spelling tasks. Students in this group were also able to generalize the skills to untrained segmentation tasks. In contrast, students who received only letter-sound instruction did not show improvement in segmentation skills. Authors concluded that when taught in combination with letter-name and letter-sound instruction, phonemic awareness instruction can have an immediate impact on reading and spelling skills. In a longitudinal study that followed about 400 children from kindergarten to second grade who received training in metalinguistic skills involving segmentation and synthesis of phonemes, Lundberg, Frost, and Petersen (1988) found that phonological awareness can be developed before reading ability and that phonological awareness at the phoneme level facilitates subsequent reading acquisition. However, explicit instruction in these skills seemed to be a crucial factor in the success of the program.
In a series of experiments, Byrne and Fielding-Barnsley (1989) worked with preliterate children between ages 3-5 to study the acquisition of the alphabetic principle. Children were able to perform better on transfer tasks when they had a clear understanding of phonemes and their particular association with letters in words. Children were able to transfer phoneme identity and phoneme segmentation skills to unknown tasks. The study provided support to the assertion that both phonemic awareness and letter-sound knowledge are necessary for successful early reading. In a subsequent study to determine the influence of two components of phonemic awareness (phoneme identity across words and phoneme segmentation within words), Byrne and Fielding-Barnsley (1990) found evidence that favored phoneme identity over segmentation due to its ease of implementation. The authors also contend that there is a stronger relationship between phoneme identity and alphabetic principle. Phoneme identity refers to the ability to identify that the words sun and sat begin with the same sound. Evidence from this study also supported the dual effect of phonemic awareness and alphabetic principle on beginning reading. In a follow-up study, Byrne and Fielding-Barnsley (1993) found that explicit training in phoneme identity heightens phonemic awareness skills among preschool children, and children who enter elementary school with an understanding of the principle of phoneme identity have an added advantage in reading and spelling at the end of first-grade than children who have not had such training.
Iversen and Tunmer (1993) compared the effects of the regular Reading Recovery program, a modified Reading Recovery program, and standard reading intervention on a group of first-graders. The modified program included explicit instruction in phonological recoding skills in addition to the Reading Recovery lessons. The specific tasks included phonemic awareness and nonsense-word reading. Results revealed that systematic instruction in phonological recoding was more effective than standard instruction, and students performed better on reading and writing tasks. The authors established a progressive relationship between these components stating that awareness of the phonological components facilitates the development of phonological decoding skills, and decoding skills are in turn responsible for word recognition which is in turn primarily responsible for the development of the ability to read in connected text.

Foorman, Novy, Francis, and Liberman (1991) explored the relation between phoneme segmentation, word reading, and spelling among 80 first graders assigned to two groups. One group received less letter-sound correspondence training (less-LS) and the other group received more letter-sound instruction (more-LS). Results revealed that students in the more-LS group read regular words at an accelerated rate compared to that of less-LS students. They had developed knowledge of orthographic strategies, whereas students in the less-LS group were still developing these strategies. Juel and Minden-Cupp (2000) found that students in two classrooms who received direct instruction in phonemic awareness and phonics with practice with decodable texts performed, on average, at higher levels in reading at the end of first grade than students in the two classrooms who received reading instruction with the use of trade books.
In a seven-month study, Simmons, Kame’enui, Harn, Thomas, Edwards et al (2003) investigated the effects of kindergarten reading programs on the early reading outcomes of children identified at-risk based on skills in phonological awareness and letter knowledge. The study involved 96 kindergarten students from seven elementary schools. Students who scored below the 20th percentile in phonological awareness and letter knowledge skills were randomly assigned to one of three interventions, all of which focused on teaching skills in phonological awareness and alphabetic principle. One of the experimental interventions (Optimize + Spelling) was deliberately constructed to emphasize these target skills through explicit and systematic instruction that provided students with multiple opportunities to respond. Students received 30 minutes of supplemental instruction five days a week for seven months. The results of the experimental study revealed that students who received Optimize + Spelling intervention displayed faster learning rates and higher end-of-year levels for target skills. In addition to moving the lowest group of students to proficiency scores, the Optimize + Spelling intervention showed statistically significant differences on spelling, letter-dictation, word-attack, word-identification, and oral reading fluency. The Scott Foresman’s Early Reading Intervention (ERI), a commercial byproduct of the Optimize + Spelling intervention, is one such reading curriculum that targets the code emphasis and high specificity needed in an effective intervention program. Research shows that 97% of kindergarten students taught using the ERI experienced faster achievement rates and were able to sustain that level of achievement into second grade (Simmons & Kame’enui, 2003).
In a quantitative analysis, Snider (1997) explored the relationship between phonemic awareness skills in kindergarten and reading achievement at the end of second grade. The results provided support to previous research confirming the predictive value of phonemic awareness to later reading ability. Phonemic awareness training has not only shown positive impact on reading and spelling skills but also on writing skills. Eldredge and Baird (1996) compared the writing products of first graders who were taught using a structured writing approach with the writing products of first graders taught to write using a holistic approach. The structured approach included training on how to segment sounds in certain words, and to write them. Instruction was focused on teaching students to write sounds, then words, then sentences and eventually composition. In contrast, writing in the whole language approach involved children writing stories and journals together as a group for a period of time. Students in the structured group scored significantly higher than students in the whole language group. They exhibited better overall quality of writing compositions as measured by the Deiderich Scale.

*Focus on component skills of phonemic awareness.*

There has been no conclusive evidence indicating that a specific phonological skill component contributes more effectively to reading acquisition than another. Segmentation (phonemic analysis) and blending (phonemic synthesis) are two skills believed to be required for beginning reading (Hempenstall, 2002). Other critical skills commonly associated with phonemic awareness are sound isolation and sound deletion. It is not clear which of these skills precede reading and which are a result of reading; however, Scott and Kame’enui (1994) report that the ability to isolate a phoneme in a
word precedes the ability to read words. In examining the importance of linguistic complexity and task differences in measuring phonological awareness, Stahl and Murray (1994) found that phoneme isolation was the easiest task, followed by blending, deletion, and segmentation.

Yeh (2003) evaluated two approaches for teaching phonemic awareness to children in Head Start classrooms. Forty-four children from low-income and minority groups participated in the study. One approach included activities in rhyming and alliteration (rhyming group) and the other approach included activities in blending, substitution and sounding out words (segmentation group). The results suggest that phoneme segmentation and blending activities were more effective in teaching phonemic awareness skills than the rhyming and alliteration activities. The results of the study provide support to Coyne, Kame’enui, and Simmons’ (2001) earlier assertion that blending and segmenting are two fundamental skills in phonemic awareness instruction. Byrne and Fielding-Barnsley (1989, 1990) favor phoneme identity over phoneme segmentation in teaching phonemic awareness, primarily because it is easier to teach than segmentation.

In a more recent study, Hatcher, Hulme, and Snowling (2004) compared the effectiveness of a structured reading program (control group) with three programs that in addition included explicit training in phonemes, rhymes, or both phonemes and rhymes. Four hundred and ten students were randomly assigned to one of three intervention groups or a control group. The authors reported that for the sample of at-risk children, the level of phonemic awareness they had achieved at the end of the intervention was a more powerful predictor of their performance on both word and nonword reading than their
level of rhyme skills that were irrelevant to the prediction of reading skills. The authors concluded that skills at the phoneme level, rather than rhyme, are directly linked to children learning to read. Additionally, phonemic skills are asserted to be a stronger predictor of early reading acquisition than onset-rime awareness (Hatcher, Hulme, & Snowling, 2004). However, Juel and Minden-Cupp (2000) recommend that instruction should focus on teaching phonological skills at the syllable and onset/rimes level instead of at the phoneme level. They believe that once children respond automatically to rime patterns, it is the knowledge of rimes that helps children chunk and decode unknown words. Although we have established that phonemic awareness is a critical skill in the acquisition of reading, it is not clear which of the individual skill components are more crucial than others. Clearly more research focusing on the differential effects of component skills on phonemic awareness is needed.

*Focus on the instructional approach.*

As mentioned earlier, preventative measures are one of the solutions to the reading problems that students face in schools today. Torgesen, Wagner, Rashotte, Rose, Lindamood et al. (1999) conducted a study to examine the effectiveness of three instructional approaches for the prevention of reading disabilities in students with weak phonological skills. One hundred eighty students in kindergarten from 13 elementary schools were selected based on the lowest combined scores obtained on the letter naming task, phonemic elision task, and a verbal intelligence score above 75. Two of the interventions varied in their intensity of phonemic decoding, one represented explicit instruction in phonemic awareness and the other represented embedded phonic instruction. The third intervention represented the regular classroom reading approach.
Students were randomly assigned in one of four conditions including a control group. Teachers and teacher aides were trained to provide twenty minutes of supplemental instruction in a one-on-one tutorial basis for two and a half years, beginning in the second semester of kindergarten. Results of the study indicated that the intervention with the greater emphasis on phonemic awareness produced significantly stronger outcomes than the other interventions. Students in the explicit phonics intervention group were stronger on word level reading skills than students in the other groups. The authors concluded that systematic and explicit instruction in phonemic awareness and phonetic decoding skills is essential in an early reading program.

In a carefully controlled prevention study, Foorman, Fletcher, Francis, Schatschneider, & Mehta (1998) contrasted three instructional approaches with 285 first and second graders attending a Title I urban school. The three interventions were direct instruction in letter-sound correspondence (DC), less direct instruction in systematic spelling patterns embedded in connected text (EC), and indirect, incidental instruction in alphabetic code in embedded text (IC). Students were instructed in one of three approaches for 90-minutes daily during the language arts period. The findings of the study supported the importance of early intervention for the development of reading skills in early first and second grades, and showed that students who received direct instruction in alphabetic principle were reading at a significantly faster rate than students taught using the implicit approach following intervention.

The effects of intervention on phonemic awareness and word recognition depend largely on the type of instructional approach that is employed. O’Shaughnessy and Swanson (2000) evaluated the effectiveness of two reading interventions in a public
school setting with second grade students. Both interventions were designed to increase phonological awareness in children but differed from each other in the (a) approach to instruction, (b) instructional unit, and (c) emphasis of instruction. The one approach, Phonological Awareness Training (PAT), included isolated skill instruction using oral language activities measured with the phoneme as the unit of analysis. The other approach, Word Analogy Training (WAT), aimed at increasing phonological awareness using contextualized written language activities directed at the onsets and rimes as the unit of analysis. The two experimental groups were compared to each other and to an alternate group that received mathematics training. The results indicated that students who received instruction with both approaches performed better than students in the comparison math group. Findings from this study suggest that phonological awareness can be heightened directly through systematic oral language activities and indirectly through written language activities. Students in both treatment groups were able to transfer their newly acquired skills to novel reading material. Examination of the unit of analysis indicated that phonological awareness training that focused on both phonemes and onsets and rimes resulted in substantial growth in phonological awareness and word identification skills in mid-year second-grade students with serious reading difficulties.

*Systems Wide Approach to Beginning Reading Instruction*

In order to bring about a dramatic improvement in the reading scores of children, adoption of a school- or district-wide initiative to prevention and intervention efforts is necessary. Such an approach will ensure that all students in the building are taught to read, including students at risk for reading failure and reading disabilities. The success of such a model is dependent on three interrelated areas:
(1) the school wide establishment of long-term reading goals and intermediate performance benchmarks,
(2) the early identification and frequent monitoring of students experiencing reading difficulties, and
(3) the development of coordinated and differentiated instructional interventions for the full range of learners.

(Coyne, Kameenui, & Simmons, 2001, p. 69).

Two projects that adopted a systems wide approach to improving the reading performance of students are Project PRIDE (Preventing and Remediating Reading Problems Through Early Identification and Direction Teaching of Early Literacy Skills) in Rockford, Illinois and a change project in Hartsfield Elementary School in Tallahassee, Florida.

PRIDE. This project was designed to prevent reading problems in at-risk children using scientifically validated practices in three high-poverty schools in an urban Midwestern school district. Bursuck, Smith, Munk, Damer, et al (2004) compared the effects of the project on student beginning reading in the three PRIDE schools and a comparable control school. In addition to providing systematic, explicit instruction in key early literacy skills (e.g., PA, alphabetic principle, and so forth), PRIDE also included a multitiered approach to instruction, where “student support is offered along a continuum of intensities, or instructional tiers, that delivers maximum access to general education programs while at the same time providing more intensive instruction if it is needed” (p. 305). Tier 1 was the general education beginning reading program (Hardcourt or Open Court) delivered by the classroom teacher using a whole-class instructional approach.
Tier 2 consisted of providing students with extra practice on essential reading skills, delivered in small groups of 2 to 8 students. Students were selected based on their performance on curriculum-based assessments. Instruction in this tier was provided by a variety of staff including classroom teachers, special education teachers, Title I teachers, and paraprofessionals. Students who had failed to make progress on PRIDE assessments with the extra help in Tier 2 were placed in Tier 3. The third tier consisted of students needing intensive reading instruction for 30 to 50 minutes daily in small groups of 2 to 5 students using the Reading Mastery program. Results for the first three years of PRIDE indicates that the PRIDE group outperformed the control group on a number of measures. More students in the PRIDE groups were in the benchmark category and fewer in the at-risk category for Nonsense Word Fluency and Oral Reading fluency measures. The authors concluded that a range of instructional strategies varying in intensity is essential to meet the varied needs of children in urban settings.

*Hartsfield Elementary Change Project.* Hartsfield’s student body was 60% minority (predominantly African American) with almost 60% receiving free or reduced lunches. The reading scores of students were bleak with many of the students performing from 1.5 to 2 grade levels below their current grade placement. The project involved taking drastic steps to make changes to the way the school approached reading instruction. The *Open Court* reading program was put in place for students in grades K-2, and *Reading Mastery* was in place for students in grades 3, 4, and 5. Among the first graders, the percent of children with word reading skills below the 25th percentile dropped from 31.8 at the end of the first year of the project to 3.7 at the end of fifth year (King & Torgesen, 2000). The project staff made several important curricular decisions
based on data collected on student performance. For example, the project staff found that several children in second grade were ill prepared for third grade level work. The SRA Fast Cycle Reading program was implemented beginning mid-year of second grade. This was continued through six weeks of summer where the students received two reading sessions per day using the SRA program.

Two essential ingredients in the success of a systems-wide approach to beginning reading instruction are professional development and data based decision-making. The PRIDE project conducted professional development by way of after-school workshops and summer institutes for all teachers involved in instruction delivery. A unique feature of their professional development was “demonstration teaching.” In such a situation, the coach took over a reading group to show the teacher how to implement a certain strategy. Teachers in Hartsfield Elementary underwent training to implement Reading Mastery using the Direct Instruction teaching model. Both projects used student performance data as the standard for making instructional and curricular decisions. The importance of linking assessment results to instruction cannot be overemphasized. Greenwood and Maheady (1997) implore that measurable change in student performance be considered as the gold standard for making judgments about effective instruction.

Beginning Reading Programs

Much is now known about both the influence and impact of phonemic awareness on beginning reading skills. Effective instructional principles that facilitate the development of a reading program have been identified and a framework for effective instruction has been developed. Nelson, Benner, and Gonzalez (2005) conceptualize readings programs adopted by schools on three general levels. The first level comprises
the core reading program, typically used to teach reading to all students in the school. At
the second level are supplementary reading programs, used by teachers to provide
additional support to students on some specific skills (e.g., phonemic awareness, letter-
sound correspondence, fluency). Finally, interventions (remedial and preventative) are
used by teachers to meet the individual needs of students with or at-risk of developing
reading difficulties. However, supplemental reading programs can be used to provide
both remedial and preventative interventions. Typically, remedial instruction is aimed at
students who have fallen behind their peers. In order for these students to catch up with
their peers, remedial instruction must function with optimum efficiency (Baker, Young,
& Martin, 1990).

Incorporating what research says about reading instruction into commercial
reading programs has become a multi-million dollar business. The No Child Left Behind
Act’s (2001) emphasis on empirically validated strategies has led several publishers to
advertise their products as including “research-based” methods. In reviewing reading
programs, it is beneficial to list the criteria that make up a good instructional program for
beginning readers. These criteria are based on the information gathered from previously
conducted research and certain guiding instructional principles for beginning reading.
*Criteria for a Good Reading Program*

Good, Simmons, and Smith (1998) describe five features that characterize
effective interventions in beginning reading that can be used as a consumer’s guide to
selecting programs with a greater likelihood of success.
Instruction at the phoneme level. Not all programs that include phonological activities teach skills at the phoneme level. Some may provide instruction at the syllable and onset/rime level. While several activities can start out with larger units, it is important that instruction for preschool and kindergarten students be included at the phoneme level. Activities should include phoneme isolation, deletion, blending, and segmenting.

Provide scaffolding. Mediated scaffolding is one of the instructional principles that “refers to the personal guidance, assistance, and support that teachers, materials, or tasks provide a learner during the initial stages of beginning reading instruction.” (Coyne, Kame’enui, & Simmons, 2001, p. 67). In the context of a reading program, scaffolding requires providing students with “orchestrated instructional examples” (Good, Simmons & Smith, 1998) to facilitate learning. The examples provided will not only demonstrate or illustrate the concept but also provide repeated practice for that concept. For example, in identifying the initial phoneme in words, the student will be given multiple words with the same phoneme until that specific initial sound is established.

Explicit modeling of task prior to student practice. This feature is in line with the third instructional principle called conspicuous strategies. Conspicuous instruction has been found to produce greater effects in beginning reading than implicit or embedded instruction. Coyne, Kame’enui, and Simmons (2001) describe three characteristics designed to teach the phonological strategies of blending and segmenting. (i) Teachers model the skills by overtly drawing attention to sounds within words, (ii) Teachers provide students with multiple opportunities to respond once the skills are modeled, and (iii) Students are allowed to practice and manipulate sounds with concrete representations.
such as moving tiles into boxes that represent the sounds in words. Good and colleagues (1998) contend that many commercial programs “test the ability to perform a phonological awareness task in contrast to explicitly teaching the task” (p. 64). The following example illustrates the explicit instruction model.

Teacher holds up the letter “m” and says, “The name of this letter is m. Say the name of the letter with me.” [Students says “m”]. “Good, what is the name of this letter?” [Student says “m”].

In this example the teacher models the correct response, provides the student opportunity to practice with the teacher, and then allows for independent response from the student. In contrast, instruction that is not explicit will include instruction without prior modeling. For example, the teacher will ask, “what is the name of the letter?” without any prior instruction.

Strategically integrating phonological awareness and alphabetic understanding.

A reading program is considered effective only if instruction in phonological awareness transitions to effective reading instruction with the integration of instruction in letter-sound correspondence (Good, Simmons, & Smith, 1998). Research has also clearly indicated the combined effect of these two components for successful reading. Strategic integration requires planning and sequencing of interrelated tasks to promote skillful word reading. Building upon the above example of explicit instruction, an example of integrating phonemic awareness with letter-sound correspondence is as follows:

“The first sound in apple is /aaa/. Say the first sound with me” [Student says /aaa/]. “Good, what is the first sound in apple?” [Students says /aaa/]. “The letter ‘a’ makes the /aaa/ sound.”
Including a writing component to the above example where the student traces or writes the letter “a” is also an example of strategically integrating phonologic and alphabetic skills.

*Use of concrete materials to represent sounds.* The reading programs should include materials that provide common visual stimuli. The materials need to be consistent across activities and letters to keep the attention between the teacher and student constant. Good et al (1998) suggest “concrete materials scaffold the difficulty of phonological awareness by attending to the transitory nature of sound, the abstract characteristics of isolated sounds, and the need to hold phonological information in memory” (p. 65). Concrete representation involves using a neutral object to represent a sound instead of asking the student to isolate the first sound away from the rest of the word in their mind and then say the first sound aloud. A common example of a segmenting activity using concrete materials is to move letter tiles or objects into boxes as sounds in a word are pronounced, an activity commonly called “Say-it-and-move-it.” Other examples include individuals letters printed on cards for students to trace over the letters with their fingers, letter tiles, magnetic letters, and so on.

In addition to the above five features, Santi, Menchetti, and Edwards (2004) recommend including the features of a program that enhance ease of use and delivery of instruction in the review of reading programs. According to the authors, program characteristics such as inclusion of program materials, recommended instructional group size, provision of supplementary activities, recommended instructional time need to be taken into consideration.
Group size has been an important instructional feature that has been associated with effective outcomes in reading (Vaughn et al., 2003). Vaughn and colleagues studied the effects of three grouping formats – 1:1, 1:3, and 1:10 - on the reading outcomes of second-grade struggling readers. The authors found that both 1:1 and 1:3 were highly effective group sizes for supplemental reading instruction. Students in the 1:1 and 1:3 groups yielded higher scores on all outcomes measures. However, 1:1 group was not superior to the 1:3 group on any outcome measure. The authors concluded that both 1:1 and 1:3 are effective group sizes for supplemental reading instruction. The inherent advantages of providing instruction in small group or one-on-one settings over larger group instruction are lower teacher to student ratios that result in greater instructional time for students. Moreover, smaller groups allow for greater opportunities for students to respond, frequent praise, greater opportunities for prompting and reinforcement (Becker, Engleman, Carnine, & Maggs, 1982, as cited in Baker, Young, & Martin, 1990). Actual instructional time is another variable to consider while programming for instruction. Although the exact amount of time required to deliver instruction in phonemic awareness is unclear, the NRP report recommended that about 30 minutes of the school day should be spent in teaching PA skills; and daily instruction in PA in kindergarten has been recommended.

Santi, Menchetti, and Edwards (2004) compared eight kindergarten phonemic awareness programs based on research validated instructional principles. The programs were selected based on their commercial availability with a direct and explicit instructional approach to teach PA skills. All eight programs were designed to supplement already existing core-reading programs. On an optimistic note, all eight
programs incorporated many of the research-based practices like using modeling, sequencing tasks from easy to difficult, and generalizing instruction to print. However, some of the weaknesses found across the eight programs were the exclusion of (a) all materials needed for instruction, (b) supplementary and home enrichment materials, (c) specific feedback techniques, and (d) practice and review activities. Teachers need to take into consideration these instructional features when selecting a reading program that will best meet their students’ needs. Instruction is not complete without evidence that clearly shows its effectiveness.

Supplemental Early Reading Interventions

Several studies have been conducted either evaluating the effectiveness of a particular commercially available reading program or comparing the effectiveness of one program against another. This review will focus on research that has used reading programs to provide supplemental/ remedial reading instruction to elementary school-aged children.

Jitendra, Edwards, Starosta, Sacks et al (2004) evaluated the effectiveness of Read Well, a supplemental reading program, on 7 first-, second-, third-grade students and 5 second-, and third-grade students using a multiple probe across participants design. The students were identified by the teachers as poor readers and were classified as having learning disabilities, having attention-deficit disorder, or being English language learners. The students received one-on-one instruction 4 days a week for 20-40 minutes per lesson. Results indicated that the program was effective in improving the word reading and decoding skills of all students as evidenced by moderate to large effect sizes.
In a more recent study, Nelson, Benner, and Gonzalez (2005) identified 36 kindergarten students at risk of emotional disabilities and reading problems using a three-step screening process to evaluate the outcomes of a prereading preventive intervention program called *Stepping Stones to Literacy*. The intervention focused on critical prereading skills like phonological awareness and letter identification. The 18 students in the experimental group received supplemental instruction in addition to the kindergarten reading instruction. The supplemental program included scripted lessons delivered by trained tutors in a one-to-one format. With the exception of a small number of students who were nonresponders (i.e., students who failed to show satisfactory gains in: phonological awareness (3 or 17%); word reading (1 or 6%); and rapid naming skills (3 or 17%); students who received *Stepping Stones to Literacy* showed statistically significant gains in all three dependent measures. The authors concluded that interventions that focus exclusively on fundamental prereading skills are effective.

Samanich (2003) examined the effects of direct, small group instruction in phonemic awareness and letter-sound knowledge using the *Scott Foresman Early Reading Intervention* (ERI; Simmons & Kame‘enui, 2003) with nine kindergarten students. A multiple baseline across subjects design was implemented over an eight-, ten-, or twelve-week period. Students received 30 minutes of direct instruction in small groups three days of the week. The results indicated that students made statistically significant gains in letter and word recognition as measured by the Woodcock Johnson Tests of Achievement – Third Revision. Further, the intervention positively influenced the attainment of critical benchmarks as measured by the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS; Good & Kaminski, 2002). The findings of the study
provided support for the efficacy of direct, explicit, and systematic early reading instruction to teach phonemic awareness and letter-sound correspondence as early as kindergarten.

Early reading intervention efforts require the accurate identification of students at risk for reading failure. If the expectation is that early reading intervention will drastically change the reading trajectories of students identified at risk, the linkage of assessment and intervention becomes an essential component of universal instructional design.

Linking Assessment to Instruction

Foorman, Breier, & Fletcher (2003) contend that one of the major impediments to scaling-up effective early reading interventions is the lack of training in teacher education programs in how to use the results of assessment to inform instruction. Assessment is one of the essential components of effective instruction because it not only aids in identifying the students’ academic strengths and weaknesses, but also verifies the existence of a problem, if any. Information obtained from assessments is critical to the process of instructional planning and progress monitoring (Ager & Newcomer, 2003). Kauffman (2005) makes a distinction between assessment and testing to clarify that they are not one and the same. According to Kauffman, testing focuses on a single behavior or skill under controlled conditions whereas assessment encompasses a broader range of techniques to collect data to support decision-making. The different types of assessments used in education are standardized achievement tests, criterion-referenced measures, curriculum-based measures, ratings scales and checklists, and anecdotal data. Standardized and norm-referenced assessments provide information on the student’s level of performance in comparison to his/her norm group (Kauffman, 2005). However, these assessments do
not “provide much information about just what a student should be taught.” (p.134).

Curriculum-based measures are of particular importance in guiding decision-making for delivering effective instruction. As the name suggests, curriculum-based assessment refers to a procedure used to gather information about a student’s performance in the curriculum. Kauffman suggested that curriculum-based measurement is particularly useful for teachers who want to use measures that reflect their own instruction.

Implementing an early reading intervention is one step of the task towards preventing reading failure, and assessing whether the interventions are having the desired effects on students is another step. Good, Simmons, and Smith (1998) contend that there are three main shortcomings in the current reading assessment practices. First, the current measures assess reading indirectly. Secondly, students are assessed infrequently. Finally, student progress is seldom assessed. The authors declare, “Effective academic interventions are predicated on the linkage of assessment to intervention” (p. 66).

Progressive monitoring of student’s performance requires on-going assessments to collect information on students through every stage of intervention, and also modify instruction based on students’ progress. The advantage of curriculum-based measures is that it assesses students’ abilities at the instructional level thus providing a clear indication of the level of task difficulty for the student. However, direct and periodic measures such as reading CBM cannot identify children early enough to prevent reading failure (Good, Simmons, & Smith, 1998). A stronger assessment system that directly measures vital early literacy skills is needed.
Using a different approach to assessment to address the above-mentioned shortcomings, Good and Kaminski (1996) developed the Dynamic Indicators of Basic Literacy Skills (DIBELS). The DIBELS measures allow for continued evaluation of students’ literacy skills. They are sensitive to changes in student performance as a result of intervention. The measures are easy to administer, capable of repeated administration, time efficient, and cost effective, therefore, providing a fast and efficient indication of students’ academic welfare.

Monitoring Student Progress

Effective instruction also involves monitoring individual student progress. In order for any intervention to be successful, the intervention implemented should directly cater to the instructional needs of individual students. Monitoring the progress of individual students will help determine the effectiveness of the intervention, and help target more intensive interventions for students who are not responsive to universal interventions. The term “non-responders” has been used to refer to students for whom a particular intervention has not yielded desired results. Good, Simmons, and Smith (1998) contend that the status of reading failure is so grave that we cannot afford to settle for a less than 100% response rate. If an intervention does not change a student’s reading trajectory to indicate an upward slope, then that intervention should be deemed ineffective for that child and a change in the intervention is warranted. Such an approach to reading instruction will ensure that all students receive appropriate interventions and are not left behind.
Summary

There is a wealth of information on what entails successful reading interventions, how to implement such interventions, and with whom to target these interventions. Phonemic awareness is a critical skill in reading acquisition. Its combined effect with alphabetic principle is a reliable predictor of later reading skills. Phonological skill deficits can be reliably identified and measured among young children, and children as early as preschool and kindergarten can be taught these critical skills. The authorities on phonemic awareness contend that in order for phonemic awareness instruction to be effective in facilitating reading acquisition, instruction needs to explicitly teach the mapping of letters to phonemes. Urban children at risk of reading failure will benefit most from intensive, explicit, and systematic instruction in basic literacy skills.

Translating valid research to effective classroom practices is a rewarding task for all when successfully accomplished. A school-wide approach to reading prevention and early intervention promoting research based reading instruction will ensure that students receive systematic and consistent instruction as they progress from one grade level to the next. Most of the studies included in the meta-analysis conducted by the Alphabets subgroup of the National Reading Panel (NRP, 2000) occurred outside of the classrooms through pull-out programs and experimental settings. With the passing of the No Child Left Behind Act (2001) there have been a number of commercial reading programs that claim to incorporate research-validated practices. However, independent studies that have examined the effects of these specific programs on student population in actual kindergarten and first grade classrooms by school personnel are limited. Conducting quality research to study the effectiveness of commercial reading programs for beginning
readers will not only provide evidence for program efficacy in a specific setting, but will also help teachers and administrators in selecting the appropriate reading curriculum to match the academic and curricular needs of their student body.
CHAPTER 3

METHOD

This chapter describes the methods used to conduct the study. The topics include participants, settings, experimenter and observers, definitions and measurement of dependent variables, assessments, observer training, interobserver agreement, treatment integrity measurement, materials, social validity measurement, experimental design, experimental conditions and procedures.

Participants

The participants for this study were eight students selected from two kindergarten and one first grade classrooms within an urban elementary school. The kindergarten instructional assistant (IA) participated in the study in the role of a co-teacher along with the primary researcher. The kindergarten and first grade classroom teachers consented to participate in the study. The following describes the target students, instructional assistant, researcher, and classroom teachers.
Target Students

The students were selected based on the results of screening for at-risk markers in reading, teacher nominations, school attendance, and parental consent.

Screening for at-risk markers in reading: All students in kindergarten and first grade were administered the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Fall/Autumn benchmark assessments. Students in kindergarten were assessed on (i) Letter Naming Fluency (LNF), and (ii) Initial Sound Fluency (ISF). Students in first grade were assessed on (i) Letter Naming Fluency (LNF), (ii) Phoneme Segmentation Fluency (PSF), and (ii) Nonsense Word Fluency (NWF). Students scoring below the 25th percentile on these measures and identified as needing intensive or strategic intervention by the DIBELS score reporting system were short-listed as participants for the study. In January of the school year, the students in kindergarten and first grade were administered the Winter benchmark assessments. Students in kindergarten were assessed on (i) Letter Naming Fluency (LNF), (ii) Initial Sound Fluency (ISF), (iii) Phoneme Segmentation Fluency (PSF), and (iii) Nonsense Word Fluency (NWF). Students in first grade were assessed on (i) Phoneme Segmentation Fluency (PSF), (ii) Nonsense Word Fluency (NWF), and (iii) Oral Reading Fluency (DORF). Based on the results of the Winter benchmark assessments, additional students who exhibited strong at-risk markers were identified as possible participants for the study.
Teacher nominations. The kindergarten and first grade teachers were asked to nominate students who exhibited poor reading skills and who needed additional reading instruction. The reading skills typically included were letter naming, identifying the letter sounds, identifying the initial and/or final sounds in words, and segmenting the sounds in words.

School attendance. School attendance records were reviewed to additionally exclude students with potentially poor attendance.

Parental consent. A letter was sent to parents of the potential target students to obtain written consent for their children to participate in the study (See Appendices A and B for parent letter and consent form). Children whose parents refused to provide the written consent were not included in the study.

Based on the above four criteria, eight students were selected from kindergarten and first grade classrooms. Seven out of the eight students were from a kindergarten classroom in an urban elementary school consisting of one classroom teacher, one part-time teacher, one full-time instructional assistant, one part-time instructional assistant, and 26 students. One out of the eight target students attended first grade in the same urban elementary school as did the rest of the students in the study. Each target student is described in detail below.

Henry (Student 1) was a five-year-old African American male attending kindergarten in an urban elementary school. Prior to enrolling in kindergarten, Henry attended a Headstart program four days a week. At the beginning of the school year, Student 1 scored a zero (mean = 8.9; range = 0 – 22) on the Initial Sound Fluency (ISF) measure of the DIBELS benchmark assessment and a raw score of 3 (mean = 13.5; range
= 0 – 52) in Letter Naming Fluency (NWF). The DIBELS data system generated instructional recommendations for students based on the benchmark scores. The data system indicated that Henry needed intensive instruction. The middle of the year benchmark assessments administered just four months later and prior to starting intervention also indicated that Henry needed intensive instruction.

Kevin (Student 2) was a five-year-old African American male attending kindergarten in an urban elementary school. He attended preschool prior to enrolling in kindergarten. Kevin scored 6 points (mean = 8.9; range = 0-22) on the ISF measure and a raw score of zero (mean = 13.5; range = 0-52) on the LNF measure placing him in the “at risk” status. The instructional recommendation for Kevin on both the beginning and middle of year benchmark assessments indicated that he needed intensive instruction.

Daryl (Student 3) was a six-year-old African American male attending first grade in an urban elementary school. He attended kindergarten in another school within the same school district. During his kindergarten year, Daryl attended three different schools. His report card from kindergarten indicated that he did a great job in counting, but needed extra help with his letters and letter sounds. Daryl scored a zero (mean = 45.4; range = 0-73) on the LNF measure. He scored at the 1st percentile (raw score = 0; mean = 30.4; range = 0-50) on the Phoneme Segmentation Fluency (PSF) measure, and at the 2nd percentile (raw score = 0; mean = 35; range = 0-62) on the Nonsense Word Fluency (NWF) measure. These scores placed him in the “at risk” category for future reading failure. His performance on both the beginning and middle of year benchmark assessments indicated that intensive instruction was needed. At the time of the study,
Daryl was referred for special education services. The school psychologist had completed the evaluations and the identification process was under way.

Richie (Student 4) was a five-year-old African American male attending kindergarten in an urban elementary school. Richie had attended preschool prior to enrolling in kindergarten. At the beginning of the school year, Richie was identified with speech or language impairment and was receiving speech therapy three times a week. The Clinical Evaluation of Language Fundamentals – P (Semel, Wiig, & Secord, 1995) was administered to Richie as part of the special education evaluation process. A score of 100 is considered the average with a typical range of 85 – 115. Richie obtained a receptive language score of 69 indicating a moderate to severe delay in receptive language and an expressive language score of 75 indicating a moderate delay in expressive language. The Remediation of Common Phonological Processes Test (Dugatkin, 1967) revealed that Richie had a significant phonological disorder characterized by stopping, cluster reduction, and gliding. His placement was in the general education classroom with special education or related services provided outside the general education classroom for less than 21% of the time. Richie received a score of 9 (mean = 8.9; range = 0-22) on the ISF measure, and a score of 2 (mean = 13.5; range = 0-52) on the LNF beginning of year benchmark assessments. Although the beginning of year benchmark assessments indicated that Richie needed strategic intervention, the middle of year benchmark scores placed him in the “at risk” category needing intensive instruction.

Zach (Student 5) was a five-year-old African American male attending kindergarten in an urban elementary school. He attended a Headstart program prior to attending kindergarten. Zach was born in Germany. His records indicated that German
was his first language. School records indicated that Zach performed marginally on the Developmental Disorders Screening Report, with a note stating that the student’s speech needed to be monitored and re-screened in March. Zach obtained a raw score of 9 (mean = 8.9; range = 0-22) on the ISF measure and a raw score of 0 (mean = 13.5; range = 0-52) on the LNF beginning benchmark assessment. Although the instructional recommendation based on the beginning benchmark indicated that Zach needed strategic intervention, the middle of year benchmark scores indicated the need for intensive instruction. At the time of the study, Zach was concurrently participating in a behavioral intervention study conducted by another doctoral student from the university.

Isha (Student 6) was a five-year-old African American female attending kindergarten in an urban elementary school. She did not attend preschool prior to attending kindergarten. Isha obtained a score of 16 (mean = 8.9; range = 0-22) on the ISF measure and a score of 0 (mean = 13.5; range = 0-52) on the LNF beginning benchmark assessment. The instructional recommendation on both beginning and middle of year benchmark assessments indicated the need for strategic intervention.

James (Student 7) was a five-year-old African American male attending kindergarten in an urban elementary school. He obtained a score of 8 (mean = 8.9; range = 0-22) on the ISF measure and a score of 4 (mean = 13.5; range = 0-52) on the LNF beginning benchmark assessment. The instructional recommendation based on beginning and middle of year benchmark assessments was strategic intervention.

Mark (Student 8) was a five-year-old African American male attending kindergarten in an urban elementary school. Mark was enrolled in a Pre-K setting prior to attending kindergarten. He obtained a raw score of 6 (mean = 8.9; range = 0-22) on the
ISF measure and a raw score of 18 (mean = 13.5; range = 0-52) on the LNF beginning benchmark assessment. Although the instructional recommendation based on the beginning benchmark indicated that Mark needed strategic intervention, the middle of year benchmark scores indicated the need for intensive instruction.

The demographic information for the eight target students is presented in Table 3.1.
<table>
<thead>
<tr>
<th>Student</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudo name</td>
<td>Henry</td>
<td>Kevin</td>
<td>Daryl</td>
<td>Richie</td>
</tr>
<tr>
<td>Date of birth</td>
<td>07-12-1999</td>
<td>09-25-1999</td>
<td>01-10-1998</td>
<td>04-16-1999</td>
</tr>
<tr>
<td>Age&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Grade</td>
<td>K</td>
<td>K</td>
<td>1</td>
<td>K</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>Male</td>
<td>Male</td>
<td>Male</td>
</tr>
<tr>
<td>Race</td>
<td>African American</td>
<td>African American</td>
<td>African American</td>
<td>African American</td>
</tr>
<tr>
<td>Disability</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Speech or Language Impairment</td>
</tr>
<tr>
<td>Medications</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Parents</td>
<td>Both parents</td>
<td>Father only</td>
<td>Mother only</td>
<td>Both parents</td>
</tr>
<tr>
<td>Instructional setting (LRE)</td>
<td>100% general education classroom</td>
<td>100% general education classroom</td>
<td>100% general education classroom</td>
<td>General education with related services&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Attended Preschool/Headstart Program</td>
<td>Yes</td>
<td>Yes</td>
<td>No&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 3.1: Demographic information of target students

<sup>a</sup> Refers to the age of the student at the beginning of the study (January 2005).
<sup>b</sup> General education placement with special education or related services provided outside the general education classroom for less than 21% of the time.
<sup>c</sup> Student 3 did not attend preschool, but attended kindergarten
<sup>d</sup> Refers to the instructional recommendation based on the results of the winter benchmark assessments. The data was generated by the DIBELS data system at the beginning of the study (January 2005)
Table 3.1 continued

<table>
<thead>
<tr>
<th>Student</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudo name</td>
<td>Zach</td>
<td>Isha</td>
<td>James</td>
<td>Mark</td>
</tr>
<tr>
<td>Date of birth</td>
<td>08-31-1999</td>
<td>01-01-1999</td>
<td>02-13-1999</td>
<td>04-07-1999</td>
</tr>
<tr>
<td>Age&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Grade</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Male</td>
</tr>
<tr>
<td>Race</td>
<td>African American</td>
<td>African American</td>
<td>African American</td>
<td>African American</td>
</tr>
<tr>
<td>Disability</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Medications</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Parents</td>
<td>Mother only</td>
<td>Mother only</td>
<td>Both parents</td>
<td>Mother only</td>
</tr>
<tr>
<td>Instructional setting (LRE)</td>
<td>100% general education classroom</td>
<td>100% general education classroom</td>
<td>100% general education classroom</td>
<td>100% general education classroom</td>
</tr>
<tr>
<td>Attended Preschool/Headstart Program</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Instructional recommendations&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Intensive – Needs substantial intervention</td>
<td>Strategic – Needs additional intervention</td>
<td>Strategic – Needs additional intervention</td>
<td>Intensive – Needs substantial intervention</td>
</tr>
</tbody>
</table>

<sup>a</sup> Refers to the age of the student at the beginning of the study (January 2005).
<sup>d</sup> Refers to the instructional recommendation based on the results of the winter benchmark assessments. The data was generated by the DIBELS data system at the beginning of the study (January 2005).
Participating Teachers

Two full-time classroom teachers participated in the study with agreement to conduct the study with students from their classroom. One full-time instructional assistant from the kindergarten classroom participated in the study with agreement to provide instruction to the target students in a co-teaching format with the researcher (see teacher recruitment letter and consent form in Appendices C and D). The full-time kindergarten classroom teacher was a Caucasian female certified in elementary education. She has a Bachelors degree in Art Education and a Masters degree in Elementary Education. She taught preschool for six years prior to teaching kindergarten in the present school district.

The first grade teacher was a Caucasian female certified in elementary education. She has a Bachelors degree in Education and a Masters degree in the Art of Education. At the time of the study, this teacher was writing her National Board Certification exams. She was in her fifth year of teaching. The instructional assistant, Ms. M, was an African American female. She had a high school diploma and had taken some classes in early childhood education in the local community college. She managed a daycare from home for two years. She has been working as a teacher’s assistant for eight years, and has been in the present school district for five years. Ms. M works summers in a program for teenagers, and says that she is very active in her own children’s school.

A summary of the background information of participating teachers and the instructional assistant is presented in Table 3.2.
Table 3.2: Background information of participating teachers and instructional assistant

<table>
<thead>
<tr>
<th></th>
<th>Teacher 1</th>
<th>Teacher 2</th>
<th>Instructional Assistant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
</tr>
<tr>
<td>Race</td>
<td>Caucasian</td>
<td>Caucasian</td>
<td>African American</td>
</tr>
<tr>
<td>Type of certification</td>
<td>Elementary education</td>
<td>Elementary education</td>
<td>None</td>
</tr>
<tr>
<td>Assigned classroom and grade level (# of students)</td>
<td>Kindergarten general education (26)</td>
<td>1st grade general education (29)</td>
<td>Kindergarten general education (26)</td>
</tr>
<tr>
<td>Total years of teaching experience (# of years in current school district)</td>
<td>11 (5)</td>
<td>5 (5)</td>
<td>8 (5)</td>
</tr>
</tbody>
</table>

Setting

This study was conducted in an urban public elementary school within a large public school district consisting of 64,873 students in 148 schools. The school was located about two miles south of a major university and was involved in a model school project, “Culturally Responsive Instruction for African American Males: Reducing Disciplinary and SED Referrals,” sponsored by the U.S. Department of Education. The school had an enrollment of 236 students, grades preschool through fifth. Of the 236 students, 72% (N= 170) were African American, 27% (N= 65) were Caucasian, Hispanic, or Asian. Students eligible for free and reduced lunch accounted for 46% of total school enrollment (N=109). Approximately 13% of the students were identified as having
special needs, including 22 students with mental retardation or learning disabilities (MR/LD), and 8 with serious emotional disturbances (SED).

The instructional setting and the assessment settings are described as follows.

*Instructional Setting*

The supplemental reading instruction for the eight target students took place in one of the two kindergarten classrooms during the morning session of the school day. A typical day in the kindergarten classroom began with the students signing in their names on a sheet of paper as they entered the classroom. All kindergarten students participated in a fold-book coloring activity from 9:00 a.m. to 9:15 a.m. at which time the instructional assistant, Ms. M, took the attendance and lunch count. The 26 students were divided into two groups (higher and lower) based on their reading levels. The kindergarten teacher taught the LACES (Literacy Across Columbus Elementary Schools) literacy board with the higher group from 9:15 a.m. to 9:35 a.m. while the lower group was sent to the second kindergarten classroom to engage in group activity with the part-time instructional assistant. At 9:35 a.m. the lower group received LACES instruction from the kindergarten teacher and the higher group was engaged in the group activity with the part-time instructional assistant. The instructional setting for the present study took place in the second classroom, where the part-time instructional assistant supervised class activities.

The researcher and Ms. M provided instruction to target students in small groups around a rectangular table (5’ X 2’). Instruction for the three intervention groups took place between 9:00 a.m. and 10:00 a.m. The order in which the groups received instruction was counterbalanced to eliminate any sequence effects. Target students
participated in supplemental instruction for 20 minutes three days a week on Mondays, Wednesdays, and Fridays. All target students participated in the HOSTS program on Tuesday and Thursday mornings for half an hour. The LACES reading program and the HOSTS program are described in detail as follows.

**LACES (Literacy Across Columbus Elementary Schools) Program.** The Columbus Public Schools developed the LACES reading curriculum based on research-based practices and district specific data. The curriculum was developed to reflect the National Reading Panel report, the Ohio Department of Education Academic Content Standards for English Language Arts, and the Grade Level Indicators (GLI) for each standard. The program provided multi-level instruction and intervention so that students are instructed at the appropriate level. The different components of the program included: (a) Literacy Board, (b) Read Aloud, (c) Reading, (d) Enrichment and Re-teaching, and (e) Daily Language and Oral Reading Analysis. The LACES program was scheduled for a two-hour block in the mornings. A typical day started with the Literacy Board instruction assigned for 20 minutes. At this time, emphasis was placed on phonemic awareness, word study and spelling, letter formation, fluency, phonics, word wall, and letter formation. The next ten minutes was assigned to Read Aloud with focus on fluency, genre, reading strategies, and exposure to multicultural literature. The third part of the program provided ten minutes of Vocabulary instruction. The next 30 minutes was dedicated to Reading instruction. Teachers provided modeling and explicit instruction in reading accompanied by guided practice and immediate feedback. The reading component also included comprehension and questioning strategies. The Enrichment and Re-teaching component was taught in individual, small group, or whole group formats for 20 minutes of the
reading block. The last component, Daily Language and Oral Reading Analysis, was divided into two sections. During the Daily Language section, the teacher conducted a mini lesson on writing conventions. The students were then assigned a writing activity that was a response to text, based on the day’s story. While students were involved in writing, the teachers conducted an Oral Reading Analysis by listening to 3-5 students per day.

The Literacy Board activities carried out during the first part of the LACES program is most relevant to the instruction provided in this study. The activities included in the Literacy Board are similar to target skills emphasized in the ERI program. The specific activities covered during the Literacy Board period and the target skills learned as a result of these activities are listed in Table 3.3.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Target Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phoneme isolation</td>
<td>To recognize individual sounds in words. Particularly, to identify a specific sound at the beginning, middle or end of a word.</td>
</tr>
<tr>
<td>Sound sentence</td>
<td>To hear the same sounds in different words in a sentence.</td>
</tr>
<tr>
<td>Phoneme categorization</td>
<td>Given three different picture cards (two with the same sound, and one with a different sound); students identify a sound that does not belong.</td>
</tr>
<tr>
<td>Moving My Mouth</td>
<td>To understand the shape of the mouth when making a sound.</td>
</tr>
<tr>
<td>Phoneme blending</td>
<td>To recognize the individual phonemes and combine words to make a word. This includes the <em>snail way</em> (segmenting sounds separately in words), the <em>bird way</em> (blending the individual sounds in words), and the <em>rabbit way</em> (the whole word is read with fluency).</td>
</tr>
<tr>
<td>Phoneme and grapheme –</td>
<td></td>
</tr>
<tr>
<td>Substitution</td>
<td>To substitute one sound for another to create a word.</td>
</tr>
<tr>
<td>Addition</td>
<td>To add a sound to make a new word from an existing word.</td>
</tr>
<tr>
<td>Deletion</td>
<td>To read the word that remains when a phoneme/sound is removed.</td>
</tr>
<tr>
<td>Onsets and Rimes</td>
<td>To work with the beginning consonants and use of word families to sound out words.</td>
</tr>
<tr>
<td>Introduce the shape</td>
<td>To practice the formation of upper and lower-case letters.</td>
</tr>
<tr>
<td>Name chart</td>
<td>Practice their first and last names and the names of their classmates.</td>
</tr>
<tr>
<td>Student words</td>
<td>To generate a list of words which begin or end with a specific sound.</td>
</tr>
<tr>
<td>Rhyming words</td>
<td>To identify and complete rhyming words and patterns.</td>
</tr>
<tr>
<td>Clap syllables</td>
<td>To distinguish the number of syllables in words by using rhythmic clapping.</td>
</tr>
<tr>
<td>Decodable text</td>
<td>To sound out words <em>snail, bird</em>, and <em>rabbit way</em>.</td>
</tr>
<tr>
<td>Word wall</td>
<td>To read the words on the Literacy Board Word Wall.</td>
</tr>
</tbody>
</table>

Table 3.3: Literacy Board activities and skills targeted in instruction
HOSTS. In an effort to improve the reading readiness of kindergarten children in the Columbus Public Schools, the Ohio State University’s P-12 program designed a tutoring program for kindergarten students. The structured program used HOSTS to provide the reading readiness skills for all kindergarten children in seventeen Columbus Public Schools. The staff and faculty at OSU were given release time to tutor in two of the schools. A total of 200 volunteers participated in the program on one of two days in the schools (Tuesday or Thursday). Children were pre-tested to determine their strengths and deficiencies in order to determine the needs of their individual lessons. The students in kindergarten received half an hour of one-on-one instruction in reading readiness skills.

Each child had a three-pocket folder that provided materials and activities on the student’s instructional level. The first pocket included books that the tutor read to the student. The purpose of this exercise was to instill an appreciation and love of reading achieved through modeling and tutor-child interaction. The second pocket focused on building a foundation for reading and writing through activities that involve letter-sound correspondence. The third pocket included activities that are sequential and developmental, placing emphasis on skills that the student has yet to master.

Assessment Setting

The target students were pulled out of class once a day for five days during baseline condition and once a week during the intervention condition. The assessments were administered in the hallway outside the kindergarten classroom. A table in the shape of a semi-circle was placed against the wall between the two kindergarten classrooms. Assessments were administered usually on a Friday afternoon around 12:45 p.m. The
noise levels in the hallway at that time varied but did not substantially interfere with the assessment process. The data collector paused assessments when announcements were being made over the intercom system or when a class of students were standing less than two feet away from the testing area.

Experimenter and Observers

The primary investigator for this study was a doctoral candidate in special education with an emphasis on applied behavior analysis at The Ohio State University. She has a Bachelor of Science degree in Zoology from Stella Maris College, India, and a Masters of Education degree in Special Education (moderate and severe disabilities) from the University of Illinois at Urbana-Champaign. She worked as a program coordinator at an adult day habilitation program in Brooklyn, NY before working as a special education teacher at an inner-city charter school in the Cincinnati area. She has been involved in conducting academic based research studies in this urban elementary school for the past three years. In addition to providing the entire observer training sessions and monitoring the research conditions, she also served as the co-implementer of the reading program for this study. She also served as primary data collector for this study.

Two other university students served as second observers or interobservers. One student served as the primary interobserver for the curriculum-based pretest and posttest measures, and collected data on treatment integrity. She was a graduate student working towards a Master of Arts degree in special education at The Ohio State University. She had a Bachelors degree in early childhood special education and had experience working with children in their primary years. The second university student served as the primary interobserver for collecting data on the DIBELS dependent measures. She was a graduate
student working towards a Master of Education degree in special education at The Ohio State University. She had graduated from The Ohio State University’s undergraduate special education program and was student teaching in the local public school district.

Dependent Measures

The DIBELS benchmark assessments were administered during the Beginning (Autumn), Middle (Winter), and End (Spring) of the school year. The results of the beginning benchmark assessments were used to identify students at-risk for reading failure. The middle benchmark assessments were used to identify any additional students who were not identified during the initial assessments and to verify the assessments for those students who had been previously targeted. Two subtests from the Woodcock Johnson Tests of Achievement – Third Revision (WJ-III) were administered to all students in kindergarten and first grade including the target students. The DIBELS benchmark and WJ-III measures are described in further detail.

DIBELS Benchmark Assessment

All kindergarten students were assessed on early literacy skills three times during the school year (Fall, Winter, and Spring). However, all first grade students were assessed only two times during the school year (i.e., Fall and Winter). Daryl, the only student from first grade who participated in this study moved two weeks before the study’s completion. Therefore, students in first grade were not administered the end of year benchmark assessments. The subtests administered differed for students in kindergarten and first grade. Students in kindergarten were assessed on (i) Letter Naming Fluency (LNF), and (ii) Initial Sound Fluency (ISF). Students in first grade were assessed on (i) Letter Naming Fluency (LNF), (ii) Phoneme Segmentation Fluency (PSF), and (ii)
Nonsense Word Fluency (NWF). In January of the school year, the students in kindergarten and first grade were administered the Winter benchmark assessments. Students in kindergarten were assessed on (i) Letter Naming Fluency (LNF), (ii) Initial Sound Fluency (ISF), (iii) Phoneme Segmentation Fluency (PSF), and (iii) Nonsense Word Fluency (NWF). Students in first grade were assessed on (i) Phoneme Segmentation Fluency (PSF), (ii) Nonsense Word Fluency (NWF), and (iii) Oral Reading Fluency (DORF). In May of the school year, kindergarten students were administered the Spring benchmark assessments, on (i) Letter Naming Fluency (LNF), (ii) Phoneme Segmentation Fluency (PSF), and (iii) Nonsense Word Fluency (NWF).

*Woodcock Johnson Letter-Word Identification and Word Attack Subtests*

All students in kindergarten and first grade including target students were assessed on the Letter-Word identification subtest and the Word Attack subtest of the Woodcock Johnson Test of Achievement Third Revision (WJ-III) at the beginning of the study. Again, due to Daryl’s dropping out of the study no first graders were assessed at the end of the study. The Letter-Word identification measures the student’s word identification skills. The subtest has a median reliability of .91 in the 5 to 19 age range. The Word Attack subtest measures students’ “skill in applying phonic and structural analysis to the pronunciation of unfamiliar printed words” (Woodcock, McGrew, & Mather, 2001, p. 14). The Word Attack subtest is reported to have a median reliability of .87 in the 5 to 19 age range. These two subtests were administered to the students two times during the study as a pre- and post-test measure.
Measurement of Dependent Variables

The two primary dependent variables for the study were the PSF and NWF subtests of the DIBELS assessments.

*DIBELS Progress Monitoring Assessments* Target students were assessed on two primary dependent measures every day for one week during baseline condition and once a week during intervention condition. The progress monitoring assessments for kindergarten and first grade that served as the primary dependent variables for the study were Phoneme-segmentation Fluency (PSF), and Nonsense Word Fluency (NWF). Target students were assessed individually on the two subtests of the DIBELS assessment. The assessments included one-minute probes on each of the subtests.

The PSF task required the student to orally produce the individual phonemes of each word presented by the examiner. The words given by the examiner typically contained three to four phonemes. For example, if the examiner said “sam,” the student received three points for saying “/s/ /a/ /m/”. If the students said, “/s/ /am/” he or she received two points for producing two complete phoneme units, and no points were awarded if the students said /sam/ as one sound unit. The PSF took about 2 minutes to administer and the examiner recorded the number of correctly produced phonemes in a one-minute timed period. Twenty alternate forms of the PSF measure were administered during weekly probes.

For the NWF measure, each student was presented with a letter-sized paper containing randomly ordered VC (vowel-consonant) and CVC (consonant-vowel-consonant) words. The student was asked to produce the individual sound of each letter or read the whole word. For example, given the word raj, the student could say “/r/ /a/ /j/”
or the student could say “raj” in order to get the maximum three points for the word. The NWF also took about two minutes to administer and had twenty alternate forms for progress monitoring.

*Curriculum-Based Measurement (CBM).* In addition to the DIBELS dependent measures, target students were administered a pre- and post-test that measured the students’ performance on specific skills introduced during instruction. Each letter of the alphabet was introduced during instruction spanning across 3-6 lessons depending on the place of the lesson within the *Scott Foresman Early Reading Intervention* (ERI) curriculum. For example, letters introduced in part 1 of the ERI program spanned across three lessons, and letters introduced in part 2 of the program spanned across six lessons. The students were administered a pretest just before a letter was introduced, and administered a posttest at the end of the lesson for a specific letter (See Appendix E). This assessment served as a direct measure of the students’ performance on phonemic awareness and alphabetic principle skills as a result of the ERI program. Specifically, the pre- and post-test assessed if the student was able to: (a) name the letter, (b) produce the letter sound, (c) identify the initial sounds when orally presented with a word, and (d) identify the letter by pointing to it when presented with a letter sound (e.g., Point to the letter that makes the /mmmm/ sound.” The score on the CBM was calculated as a percentage to keep the unit of measurement constant throughout the study.
Interobserver Agreement on Dependent Variables

The interobserver agreement for reading behavior that included the two progress monitoring assessments, namely PSF and NWF; and the CBM pre- and post-tests were measured on at least 30% of assessment sessions for each target student. The second observer sat about four feet away from the primary observer such that the target student was placed in between the two data collectors. The second observer was given a copy of the data collection sheet to mark student responses. On the DIBELS measures, the observers were required to underline the phonemes produced by the students in the segmentation tasks and underline the correct letter sounds produced in the NWF task. The primary investigator recorded the correct number of phonemes produced in one minute for the PSF measure, and the correct number of letter sounds produced in one minute for the NWF measure. The second observer independently scored the number of phonemes produced correctly per minute for the PSF measure and the number of letter sounds produced correctly per minute for the NWF measure. On the PSF measure, the two observers were considered to be in agreement if they identified the same phonemes in the words presented. For example, if one observer scored the phonemes in the word *mat* as /m/ /a/ /t/ and the other observer scored the word as /m/ /a/ /t/ then the word is considered as a disagreement. Agreement was defined as observers recording the same responses (e.g., same phonemes or letter sounds), and disagreement was defined as observers recording different responses for the same probe item. On the NWF measure, agreement was defined as both observers scoring the letter sounds as correct by underlining the letter (e.g., h), and incorrect by drawing a line through the letter (e.g., s). The percentage agreement was calculated using the following formulas.
IOA for PSF = Agreement on number of correctly produced phonemes \times 100 \quad \text{Total number of phonemes (Agreement + Disagreement)}

IOA for NWF = Agreement on number of correctly produced letter sounds \times 100 \quad \text{Total number of nonsense words presented (Agreement + Disagreement)}

On the CBM measures, the observers were required to circle the trial for correct responses and cross out the trial for incorrect responses. Agreement was defined as the observers circling the same trial and disagreement was defined as one observer circling a trial and the other observer crossing out the same trial or vice versa. The percentage of agreement on the pre- and post-test curriculum based measured was calculated by using the formula:

\[
\frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \% \text{ of agreement}
\]

Observer Training

The primary investigator of this study trained the second observer(s) prior to the commencement of the study on DIBELS and CBM measures. The training for the dependent measures included an overview of sounds of the letters of the alphabet, practice of phoneme segmentation tasks, practice of producing sounds, and practice in scoring segmentation and letter-sounds tasks on mock trials. The second observer for DIBELS measure gained practiced in scoring the student responses on a copy of the data collection booklet. The training continued until the observers met a minimum agreement criterion of 85% on PSF and 95% on NWF. Observer training for the CBM involved an overview of the research-developed CBM worksheet, the purpose of the measurement and the various component skills that were targeted for assessment. The training
continued until the observers met an agreement criterion of 100% on the pre- or post-test measures. Initially, the second observer(s) watched the first observer score the different trials, followed by an explanation or rationale for a particular rating (i.e., correct or incorrect response). The two observers then simultaneously but independently scored the student responses on the recording form, and subsequently discussed any disagreements.

**Procedural Integrity Measurement**

The degree to which the independent variable has been implemented as intended in the definition is known as procedural integrity (Gresham, Gansle, & Noell, 1993). It is also “a powerful means of providing feedback to teachers” (O’Shaughnessy et al, 2002, p. 13). The second observer observed the IA and/or researcher providing reading instruction and scored the treatment integrity checklist (Appendix F) to ensure that the various components of the intervention were being implemented with fidelity. The session integrity was calculated by dividing the number of components or steps implemented by the total number of steps in the intervention and then multiplying by 100. Integrity data was collected on at least 35% of the sessions for each intervention group. In the event that the integrity data dropped below 90% accuracy, the contingency plan was for the primary investigator to discuss the components of the intervention with the instructional assistant and if necessary, conduct booster training sessions.

In applied behavior analysis, it is important to collect interobserver agreement measures on the occurrence or nonoccurrence of the independent variable (Cooper, Heron, & Heward, 1987). Therefore, on at least 30% of the instructional sessions, a third observer collected interobserver agreement data using the same procedural integrity checklist. This was done to strengthen the reliability of the treatment integrity data and to
ensure that the intervention was being implemented as intended. In addition to integrity data, the researcher collected data on the duration of sessions and whether the sessions were being conducted by the researcher and IA (R/IA), researcher only (R), or IA only (IA).

Social Validity Measurement

The purpose of social validity assessments is to evaluate the acceptability or viability of a programmed intervention, i.e. to anticipate the rejection of a specific intervention (Schwartz & Baer, 1991). It is important to gather social validity data from both teachers and students because the likeability of an intervention directly affects whether or not teachers will implement the instructional procedures in the future. Similarly, if students do not like participating in an intervention then they will be less likely to respond favorably and reap benefits from instruction.

One means of conducting social validity data is by consumer satisfaction questionnaires. Ms. M, who was the co-implementer of the intervention, was given a questionnaire to complete prior to and at the completion of the study. The Teacher Pre-Intervention Acceptability Rating Survey (Lane & Beebe-Frankenberger, 2004; Appendix G) is a 12-item checklist on a 7-point Likert Scale. It was given to her after she received information on the reading intervention and had undergone training on how to implement the ERI. The Teacher Post-Intervention Acceptability and Importance of Effects Survey (Lane & Beebe-Frankenberger, 2004; Appendix H), a 14-item checklist on a 7-point Likert Scale, was given to Ms. M at the end of the study. The two classroom teachers received a social validity questionnaire – Teacher form (Appendix I) at the end of the study. The questionnaire consisted of a nine-item checklist on a 5-point Likert Scale
ranging from “Strongly Agree” to “Strongly Disagree.” There were two open-ended questions with space for written responses and comments. The parent social validity questionnaire (Appendix J) included a five-item checklist on a 5-point Likert Scale ranging from “Strongly Agree” to “Strongly Disagree.” The parent form also had two open-ended questions with space provided for written responses and comments. The target students were given a modified version of the Children’s Social Validity Interview (CSVI; Lane, 1997; Appendix K). The CSVI was constructed to evaluate the social validity from the student perspective. The semi-structured interview consists of a combination of open-ended and close-ended items that measure the acceptability of the intervention, the skills that they acquired, and the extent to which they reportedly use the newly acquired skills.

Materials

Stopwatch

A stopwatch was used to time the one-minute assessments. For the PSF measure, the stopwatch was started after the experimenter presented the students with the first word, and stopped at the end of 1 minute. For the NWF measure, the stopwatch was started when the students started to produce the letter sounds and stopped at the end of 1 minute.

Presentation sheets and assessment booklets

Each target student had an individual assessment booklet for the PSF, NWF, and benchmark measures. The data collector recorded the scores of the subtests on each booklet. The presentation sheets and booklets were downloaded and printed from the official DIBELS website.
**ERI kit**

The Scott Foresman ERI kit was used to provide instructions. The kit consists of teacher resource packets, alphabet cards, letter cards, game boards, letter tiles, and other content related materials. In addition to the ERI kit, the researcher used game cubes (dice) and game markers that were not included in the kit.

**Star card and marker stamps**

Each student had a star card consisting of 10 X 4 squares. The markers were used to stamp the student’s star cards when the teacher/researcher reinforced a student’s appropriate responding behavior.

**Experimental Design**

A multiple baseline across students design was used to assess the effects of the Early Reading Intervention program on the phoneme-segmentation and nonsense word fluency of kindergarten and first grade students at-risk of reading failure. The advantage of using this design is that it does not require withdrawal of treatment, and can be used for more than one student needing the same intervention (Cooper, Heron, & Heward, 1987). Another advantage to using this design is that the concurrent measurement of two or more subjects is useful in assessing the occurrence of generalization (Cooper, Heron, & Heward, 1987).
ERI – The Curriculum

The *Scott Foresman Early Reading Intervention* (ERI; Simmons & Kame’enui, 2003) is based on *Project Optimize*, a five-year longitudinal study conducted at the University of Oregon’s Institute for Development of Educational Achievement. The ERI is characterized by an optimum level of code emphasis and high specificity needed for the bottom 25% of kindergarteners to reach benchmark goals in reading and maintain them over time. The lessons are activity-based and include carefully planned sequences of skills. The program has 126 lessons to be implemented as 30 minutes of supplemental instruction per day delivered in small groups of 2-5 students. The ERI curriculum is packaged in a program box that consists of all instructional materials needed for instruction, both for teachers and students. One of the most important resources available for teachers is the teacher’s guide.

Four teacher’s guides are included for the four parts of the program. These guides are user-friendly and designed to minimize the time it takes to prepare for each group. Each lesson begins with an overview of (a) the materials needed for each activity, (b) a description of the activities planned as part of the lesson, and (c) an estimate of the amount of time for each activity. Each of the activities in the lesson is described in detail with a “To Do” column that provides direction of things for the teacher to do during the activity and a “To Say” column with a script that contains the direct and explicit instructions to be delivered to the students. The lesson format also includes immediate error correction and reteaching strategies for students who may respond incorrectly during the lesson.
Other teacher and student resources that are included in the ERI kit are:

1. **Teacher resource package.** This includes additional teacher-friendly resources that accompany various activities of the each lesson.

2. **Assessment handbook.** The assessment handbook contains the placement test, four progress-monitoring tests, progress-monitoring checklists, and an exit test.

3. **Diz the Dinosaur.** The teacher can use the dinosaur puppet with moveable mouth and arms to help implement instruction in any lesson. However, there are specific lessons in which Diz features in the script.

4. **Diz student storybooks.** The program contains 10 decodable storybooks with 6 copies of each book for students to practice their sound-spelling patterns. These books are not used until Part 4 of the program.

5. **Wipe-on/ Wipe-off cards.** Several activities in the lessons include a writing component where students get the opportunity to integrate the phonologic, alphabetic, and orthographic skills introduced to them. The wipe-on/ wipe-off cards serve as dry-erase boards for practicing writing letters and words. In the current study, dry-erase boards were used in place of the wipe-on/ wipe-off cards.

6. **Student activity books.** The ERI kit also includes student worksheets for every lesson. Since no photocopying is required, this reduces the teachers’ preparation time considerably.

In addition to the teacher and student resources, the program kit is packaged with manipulatives like alphabet cards for learning letter names and sounds, tracing cards for connecting sounds to letters, letter tiles made out of plastic to practice segmenting and blending.
The activities in each lesson focus on alphabetic, phonologic, and orthographic skills in isolation or combination with one or the other areas (i.e., integrated phonologic/alphabetic). The overview of the lesson at the beginning of each lesson indicates the activity and which of the skills it will be targeting. Appendix L provides a sample lesson from Part 1 of the curriculum. The lessons in the different parts follow a similar pattern of skill introduction. A typical ERI lesson begins with introducing the letter name and sound. The lead-model-test paradigm was used to teach the skills as provided in the teacher’s guide. About 2-3 minutes is located to this first activity. Students are taught how to isolate the first sounds in words. They are shown pictures cards of pictures that begin with the sound introduced at the beginning of the lesson. For example, if the letter name and sound introduced in Activity 1, then pictures of man, mouse, map, and mud are introduced. A non-example such as sun is also introduced to facilitate discrimination of sounds. The letter and sound are reintroduced in the third activity for more student practice. The next activity to follow is the “Writer’s Warm-up.” In this activity, the students are taught how to trace the letter and practice writing the letter as they say the sounds of the letter. The activities differ slightly from one lesson to another to provide for a range of stimulus variations and response requirements. Such an experience increases the likelihood that students can generalize the newly taught skills to settings different from that of the instructional setting.
Some of the activities that feature in lessons throughout the program are described briefly. It should be noted that the teacher models each and every activity before requiring the students to practice with the teacher and then perform the task independently.

(a) *Match a picture’s initial sound.* Picture cards for a given letter are piled up on the table next to three different letters. The purpose of the task is for the students to choose the letter that matches with the picture’s first sound.

(b) *Letter cross-out game.* Students are presented with an activity from the student resource book that contains a page with different letters previously introduced in the program. The purpose of this activity is for the students to cross out the letters on the sheet as the teacher produces the sound for each letter. For example, the teacher says, “The first sound is /mmm/. Cross out the letter for the sound /mmm/.”

(c) *Sound match.* Students are given a card with different pictures. When shown a letter, students have to identify a picture on the card that begins with the sound for the letter and put a marker on it. The purpose of this activity is for students to differentiate one letter from another and isolate the initial sound in the pictures and connect it to the letter presented.

(d) *First sound song.* The teacher shows the students three pictures (e.g., *turkey*, *turtle*, and *top* for the letter *t*) and sings the lyrics to the tune of “Old McDonald Had a Farm.” The lyrics are: “What is the sound that begins these words: *turkey*, *turtle*, *top?* /t/ is the sound that begins these words: *turkey*, *turtle*, *top*. With a /t/ /t/ here and a /t/ /t/ there, here a /t/, there a /t/, everywhere a /t/ /t/. /t/ is the sound that
begins these words: *turkey, turtle, top.*” The students get additionally review of initial sound isolation by participating in this activity.

The rationale for choosing the ERI among the various other commercially available curriculums is based on the following. First, the ERI included all the essential ingredients that not only make up a good reading program (e.g., direct and explicit instruction in phonological awareness and alphabetic principle, teacher and student resources, enrichment materials, immediate error correction and feedback), but is also a research-validated program as indicated by the results of *Project Optimize* (Simmons et al., 2003). Second, with the exception of research conducted by the authors (i.e., *Project Optimize*), and a dissertation study (Samanich, 2003), the researcher was not aware of any independent studies conducted in the school setting to evaluate the effects of the ERI with kindergarten students at-risk of reading failure. Furthermore, the researcher is not aware of the use of the ERI with inner-city minority (i.e., African American) learners. A third consideration is the fact that the ERI complements the DIBELS. This gave the researcher a coordinated assessment and intervention package designed to address early literacy development for at-risk learners.

General Procedures

Three things had to be completed before collecting baseline data. First, the target students were administered the Scott Foresman ERI’s placement test to determine the starting point in the curriculum. Second, the students were grouped based on their performance on the placement test. Finally, the researcher trained the instructional assistant, Ms. M, on the implementation of the ERI program.
Placement Test

The placement test was administered to the target students prior to data collection, during the first week of January 2005. At that time, Zach and Mark had not been identified as target students. Therefore, the placement test was administered for Henry, Kevin, Daryl, Richie, Isha, and James. Zach and Mark were administered the placement test on February 24, 2005. At this time, Isha and James were also re-administered the test to determine if there has been any change in the lesson entry point. The placement test was re-administered to Henry on March 3, 2005. The decision to re-administer the placement test for Henry was made based on his performance during weekly progress monitoring probes and the progress he made on phonemic awareness and letter-sound correspondence skills.

The Scott Foreman ERI placement test consists of six parts or subtests. Part A assesses the student’s knowledge of letter names and sounds. Parts B-F assess the student’s proficiency in skills of phonological awareness and alphabetic principle. Based on test performance, the Lesson Placement Chart (Scott Foresman, 2002) provides lesson entry points. For example, if a student scores less than or equal to eight (≤ 8) on Part A and less than or equal to three (≤ 3) on Part B, the recommendation is to begin with Lesson 1. Directions on whether to proceed to the next subtest are based on the student’s score on the previous subtest. For example, if the student scored below 5 on Part B, then the test needs to be stopped. The target students’ performance on each part of the placement test and the recommended lesson entry points are presented in Table 3.4.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Performance (score) on Placement Test</th>
<th>Lesson Entry Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henry*</td>
<td>0 Part A 14 Part B 5 Part C 15 Part D 7 Part E 26 Part F 5 Lesson 1 Part D 10 Part E 16 Part F 6</td>
<td>Lesson 61 Lesson 97</td>
</tr>
<tr>
<td>Kevin</td>
<td>0 Part A 14 Part B 5 Part C 15 Part D 7 Part E 26 Part F 5 Lesson 1 Part D 10 Part E 16 Part F 6</td>
<td>Lesson 1</td>
</tr>
<tr>
<td>Daryl</td>
<td>0 Part A 14 Part B 5 Part C 15 Part D 7 Part E 26 Part F 5 Lesson 1 Part D 10 Part E 16 Part F 6</td>
<td>Lesson 1</td>
</tr>
<tr>
<td>Richie</td>
<td>0 Part A 14 Part B 5 Part C 15 Part D 7 Part E 26 Part F 5 Lesson 1 Part D 10 Part E 16 Part F 6</td>
<td>Lesson 1</td>
</tr>
<tr>
<td>Zach</td>
<td>7 Part A 14 Part B 5 Part C 15 Part D 7 Part E 26 Part F 5 Lesson 1 Part D 10 Part E 16 Part F 6</td>
<td>Lesson 1</td>
</tr>
<tr>
<td>Mark</td>
<td>11 Part A 14 Part B 5 Part C 15 Part D 7 Part E 26 Part F 5 Lesson 1 Part D 10 Part E 16 Part F 6</td>
<td>Lesson 43</td>
</tr>
</tbody>
</table>

*Note.* The asterisk (*) denotes students who were administered the placement test more than once.

Table 3.4. Scott Foresman Early Reading Intervention placement tests results

**Student Grouping**

The target students were assigned to intervention groups based on the results of the placement test and upon receiving parent consent to participate in the study. Henry, Kevin, and Daryl were assigned to the first group to receive instruction starting with Lesson 1. Although Richie’s placement results indicated an entry point of Lesson 1, the researcher did not receive parental consent to participate in the study. Upon receiving

82
parent consent, Richie was placed in the second group to receive intervention along with Zach with an entry point at Lesson 1. Isha, James, and Mark were placed in the third group to receive instruction starting with Lesson 43. Around the 8th week of intervention, the placement test was re-administered for Henry. The lesson entry point was determined to be Lesson 61. Since the rest of the students were at lower lessons, Henry received one-on-one instruction from the researcher starting with Lesson 61.

Teacher Training

The primary researcher trained Ms. M on how to implement the independent variable, the ERI program, in three steps. First, Ms. M was given a videocassette containing a video demonstration of an ERI lesson. This video was part of the ERI kit published by Scott Foresman. The video illustrates a teacher conducting an ERI lesson with three children in a small group format. The video highlights the different activities involved with emphasis on how the materials are presented to the students. Then the researcher showed the different components of the ERI program kit and explained each component, its purpose, and how it is used in a lesson. The researcher placed more emphasis on Parts 1 and 2 of the program as it was most relevant to the instructional level of target students in this study. Finally, the researcher demonstrated how to conduct each activity of a lesson. Ms. M was given the opportunity to observe the researcher model the skills, and to practice the skills along with the researcher. Then, she was given the opportunity to practice the skill independently with immediate feedback. As part of instruction delivery, the importance of providing students with immediate feedback by way of praise (e.g., good answer, good job) or immediate error correction (e.g., the correct sound is “mmm”) was underscored. Further, the researcher modeled how the
students would be reinforced for appropriate responding behavior. The researcher conducted the first two lessons for Group 1 independently with Ms. M observing the instructional group. The rest of the lessons were taught using a co-teaching format.

Experimental Conditions

For the purpose of this study, a three-tiered multiple baseline was used. There were two conditions for each subject. The first was a baseline condition, followed by the intervention condition.

Baseline

During baseline, all target students were engaged in the LACES literacy block each morning as per their class schedules. The kindergarten students were divided into two groups. The target students belonged to one of the two groups. The first group participated in Literacy Board from 9:15 a.m. – 9:35 a.m. and the second group participated in Literacy Board from 9:35 a.m. – 9:55 a.m. In first grade, the students were engaged in Literacy Board activities starting from 10:15 a.m. With the exception of Zach and Mark whose baselines were added in a delayed fashion, target students were administered the DIBELS’ PSF and NWF progress monitoring measures once a day for one week during baseline. Baseline data for Zach and Mark were collected during the 6th week of the study, therefore, they have a delayed baseline.

After stability (or a decreasing trend) in the level of behavior for at least three students was achieved, the ERI intervention program was implemented with the first group of students while the other students remained in baseline (or delayed baseline) condition.
**Intervention**

The first group to enter intervention consisted of Henry, Kevin, and Daryl who reached stable levels of responding in the baseline condition. Instruction began with Lesson 1 of the ERI curriculum. Students received small group reading instruction from the researcher and Ms. M for twenty minutes. As a rule, none of the students missed the Literacy Board activities conducted by the classroom teachers. Therefore, the instruction they received in this study was supplemental to their regular classroom instruction. Probe data were collected once a week during intervention, usually at the end of the week. At this time, baseline data were also collected once a week for students in baseline condition. This was done to keep all the assessments constant across all target students. That is, all students in the study were administered the same form of the progress monitoring PSF and NWF measure each week.

During this study, visual representation of data in graphic format was used to analyze whether a functional relationship between the intervention and the dependent variables was demonstrated. Once stability was established for the first group of students in intervention condition, the reading intervention was applied to the second group of students (Zach and Richie). Likewise, when stable levels of responding (or increasing trend) were observed for the second group of students, intervention was applied to the third group (Isha, James, and Mark). As mentioned earlier, weekly probes were conducted at the end of the week during this condition. If any of the students were absent for more than one session, they participated in a make-up session during the week such that each student received at least two days of instruction each week. The make-up
sessions were typically one-on-one sessions with the researcher. In the event that a student was not present for a make-up session and did not receive at least two days of instruction during the week, probe data were not collected for that student for that particular week. If a student received at least two days of instruction during the week and was absent on Friday, thus, missing the day when weekly data were collected; the probe was administered when the student returned to school on Monday.

During the first 8 minutes of a lesson, the instruction focused on select phonological awareness skills, alphabet understanding, and word reading. The lessons in Part 1 began with introducing a letter of the alphabet. Emphasis was placed on distinguishing between the letter name and the letter sound. Students were taught the mechanics involved in making a letter sound. For example, the instructor would make the /p/ sound and say “When you say /p/, your lips start out together and then a tiny puff of air comes out of your mouth. Put your lips together and say /p/. Feel the puff of air that comes out of your mouth” (Lesson 4; Scott Foresman, 2004). All activities in the program followed a “lead-model-test” format where the instructor started with introducing the skill. Then the instructor modeled the skill providing practice, and allowed the students to perform the skill independently. Picture cards were presented for each letter and the initial sound in the picture was modeled. For example, the instructor would say, “This is pig. The first sound is /p/, as in pig. The letter “p” makes the /p/ sound.” The letter name and letter sound were re-introduced with practice on tracing the letter on the letter cards provided.
During the next 12-minutes of instruction, emphasis was placed on further development of phonological awareness, writing development, and integrating phonologic awareness and orthography (letter-sound to whole word writing). The students were given a writing task that accompanied each lesson either in the form of worksheets or writing letters from memory on wipe-on/ wipe-off cards. This section of the lesson also involved a discrimination task where students were asked to discriminate two or more letter names and sounds from each other. The students were taught to recognize and identify the first sounds in words. Students receiving instruction in lessons from Part 2 were taught to recognize and identify both the first and last sounds in words. The last activity in the lesson usually involved another writing task with worksheets or wipe-on/ wipe-off boards.

Data Analysis

In addition to analyzing data using the visual inspection method, data were analyzed in terms of mean scores across baseline and intervention phases and individual effect sizes (ES). Comparing mean scores across two phases is used to detect minimal changes in the magnitude of behavior (Lane, Wehby, Menzies, Gregg, Doukas, & Munton, 2002). Effect size, a parametric measure, is used to estimate the magnitude of effect of an intervention. Dunst, Hamby, and Trivette (2004) contend that one of the main purposes of calculating ES in single-subject design studies “is to produce a metric that is comparable to effect sizes computed from data in studies using other types of research designs” (p. 6).
Single-subject-research-design such as the current one where one subject is tested under both experimental and control conditions is an example of correlated designs (Dunlap, Cortina, Vaslow, & Burke, 1996). The term correlation is used in reference to the correlation that occurs between the repeated measures. Researchers have calculated the correlation between the intervention and dependent measures as a popular indicator of the size of the experimental effects (e.g., Bus & Ijzendoorn, 1999). Whereas “large effect sizes are partly an artifact of the way single participant research tends to be conducted” (C. J. Dunst, personal communication, May 6, 2005), an equation that eliminates the influence of the correlation between the measures can be used. Dunst and colleagues suggest two formulas that can be used depending on the “spread of scores” in the baseline and intervention conditions. However, in order to decide which formula to use, a point-biserial correlation (“r”) was calculated between baseline and intervention scores for each target student. The baseline scores were coded zero (0) and the intervention scores were coded one (1). The correlation coefficient “r” was calculated using the formula:

\[ r = \frac{(M_p - M_q)}{\sqrt{pq}} \sqrt{SD} \]  

where:
- \( r \) is the point-biserial correlation coefficient
- \( M_p \) is the mean for scores in intervention
- \( M_q \) is the mean for scores in baseline
- \( SD \) is the standard deviation for scores in both condition
- \( p \) is the proportion of intervention scores
- \( q \) is the proportion of baseline scores
\[ d = \frac{(M_I - M_B)}{\sqrt{SD_p/2(1-r)}} \]  

(2)

where:
- \(M_I\) = mean scores for intervention data
- \(M_B\) = mean scores for baseline data
- \(SD_p\) = pooled standard deviation, and
- \(r\) = correlation coefficient between the baseline and intervention data

According to Cohen’s (1988) guidelines, \(d = .20\) is a small, \(d = .50\) is a medium, and \(d = .80\) is a large effect size. The mean of baseline and intervention condition and the pooled standard deviation were calculated. \(\sqrt{(SD_{B}^2 + SD_{I}^2)/2}\) was the pooled standard deviation (Dunst, Hamby, & Trivette, 2004, p. 6). According to Dunst and colleagues, if the correlation between the baseline vs. intervention conditions and dependent measures is large, the following formula was used to code Cohen’s \(d\).
CHAPTER 4

RESULTS

This chapter presents the results of the effects of a supplemental early reading intervention program on the phonemic awareness and alphabetic principle skills of eight urban students identified as at-risk for reading failure. The results include: (a) interobserver agreement measures, (b) procedural integrity, (c) individual student performance on the dependent variables, including pre- and post-test data, (d) analysis of group data, and (e) social validity measures.

Interobserver Agreement

Interobserver agreement (IOA) data were collected throughout the study on the (a) two dependent variables (phoneme-segmentation fluency and nonsense word fluency), and (b) pre- and post-test curriculum based measures. IOA data were collected on 47.6% (10 out of 21) of weekly probes across study conditions. The data were reported in terms of baseline and intervention conditions for the two dependent variables, and only in terms of intervention condition for the pre- and post-test CBM.
IOA on Dependent Variables

The IOAs for Henry were not collected on any of the five probes in the baseline condition. However, agreement data were collected on 6 out of 16 (37.5%) probes in the intervention condition. The mean agreement in intervention was 98.7% (range = 92-100) on the PSF measure, and 98.8% (range = 96-100) on the NWF measure. The IOA for Kevin on PSF and NWF measures were collected on 2 out of 5 progress monitoring probes during the baseline condition (i.e., 40%) and 5 out of 16 probes during the intervention condition (i.e., 31.3%). The mean agreement during baseline for both the PSF and NWF measure was 100%. The mean agreement during intervention for the PSF measure was 95.8% (range = 86-100), whereas the mean agreement for the NWF measure was 99.2% (range = 96-100). As shown in Table 4.1, the IOA data for Daryl were collected on two out of the five probes in baseline (i.e., 40%) and 5 out of 14 probes in the intervention condition (i.e., 35.7%). In baseline, the mean agreement on the PSF measure was 100% (range = none) and the mean agreement on the NWF measure was 100% (range = none). In intervention, the mean agreement on the PSF measure was 92.6% (range = 85 – 100%) and the mean agreement on the NWF measure was 97% (range = 92 – 100%). For Richie, IOA data were collected on 2 out of 5 probes in baseline (i.e., 22.2%). The mean agreements on the PSF and NWF measures were 100% (range = none). Agreement data were collected on 6 out of 12 probes in the intervention condition (i.e., 50%). The mean agreement in intervention was 100% on the PSF measure, and 100% on the NWF measure.
For Zach, IOA data were collected on zero out of 5 probes in baseline. However, agreement data were collected on 50% (i.e., 6 out of 12) probes in the intervention condition. The mean agreement in intervention was 92.3% (range = 85-100) on the PSF measure, and 96% (range = 93-100) on the NWF measure. The IOA data for Isha were collected on 5 out of 13 probes in baseline (i.e., 38.5%) and 3 out of 8 probes in the intervention condition (i.e., 37.5%). In baseline, the mean agreement on PSF measure was 89.6% (range = 77 – 100%) and the mean agreement on NWF measure was 96.4% (range = 90 – 100%). In intervention, the mean agreement on PSF measure was 84.6% (range = 81-88) and the mean agreement on the NWF measure was 100%.

For James, IOA data were collected on 3 out of 13 baseline probes (i.e., 23.1%) and 3 out of 8 intervention probes (i.e., 37.5%). The mean agreement on both baseline PSF and NWF probes was 100% (range = none). In the intervention condition, the mean agreement on PSF measure was 92.3% (range = 88-100) and mean agreement on NWF measure was 97% (range = 94-100). The IOA data for Mark were collected on 1 out of 13 baseline probes (i.e., 7%) and 4 out of 8 intervention probes (i.e., 50%). The percentage agreement on the one baseline probe was 86% on the PSF measure and 90% on the NWF measure. The mean agreement in intervention was 92.5% (range = 87-100) on PSF and 99.5% (range = 98-100) on NWF.

Table 4.1 presents the overall IOA data for each student with information on the number of probes when data were collected, percentage of probes collected, mean agreement, and range during both baseline and intervention progress monitoring probes on PSF and NWF measures.
Table 4.1: Interobserver agreement for phoneme-segmentation fluency (PSF) and nonsense word fluency (NWF) probes.

<table>
<thead>
<tr>
<th>Student</th>
<th>Collected/ Total</th>
<th>PSF Measure</th>
<th>NWF Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean %</td>
</tr>
<tr>
<td>Henry</td>
<td>6/21</td>
<td>28.6</td>
<td>98.7</td>
</tr>
<tr>
<td>Kevin</td>
<td>7/21</td>
<td>33.3</td>
<td>97</td>
</tr>
<tr>
<td>Daryl</td>
<td>7/18</td>
<td>38.9</td>
<td>94.7</td>
</tr>
<tr>
<td>Richie</td>
<td>8/21</td>
<td>38.1</td>
<td>100</td>
</tr>
<tr>
<td>Zach</td>
<td>6/21</td>
<td>28.6</td>
<td>92.3</td>
</tr>
<tr>
<td>Isha</td>
<td>8/21</td>
<td>38.1</td>
<td>87.8</td>
</tr>
<tr>
<td>James</td>
<td>6/21</td>
<td>28.6</td>
<td>96.2</td>
</tr>
<tr>
<td>Mark</td>
<td>5/21</td>
<td>23.8</td>
<td>91.2</td>
</tr>
</tbody>
</table>

A total of ten letters were introduced to Henry in intervention. IOA data for Henry were collected on 2 out of 10 pretests (i.e., 20%) and 3 out of 10 posttests (i.e., 30%). There was 100% mean agreement on both pre-and posttest measures. A total of 10 letters were introduced to Kevin. For Kevin, agreement data were collected on 40% (i.e., 4 out of 10) of pretest measures and 40% (i.e., 4 out of 10) of posttest measures. Data indicated
a 100% agreement on both pre- and posttest measures. A total of ten letters were introduced to Daryl during the course of study in intervention. IOA data for Daryl were collected on 4 out of 10 pretests (i.e., 40%) and 3 out of 9 posttests (i.e., 33.3%). There was a mean agreement of 98% (range = 91-100) on the pretest measure and 100% agreement on the posttest scores. Out of a total of 9 letters introduced to Richie, IOA data were collected on 3 out of 9 pretests (i.e., 33.3%) and 4 out of 9 posttests (i.e., 44.4%). The results reveal that there was 100% agreement on both measures.

A total of 9 letters were introduced to Zach while in the intervention condition. IOA data for Zach were collected on 3 out of 9 pretests (i.e., 33.3%) and 4 out of 9 posttests (i.e., 44.4). Results indicate 100% agreement on both pretest and posttest measures. Out of a total of 3 letters introduced to Isha, IOA data were collected on 1 out of 3 pretests (i.e., 33.3%) and 1 out of 3 posttests (i.e., 33.3%). The results reveal that there was 100% agreement on both measures. A total of 3 letters were introduced to James while in intervention condition. IOA data for James were collected on 1 out of 3 pretests (i.e., 33.3%) and 1 out of 3 posttests (i.e., 33.3%). Data indicate a 100% agreement on both pretest and posttest measures. Out of a total of 3 letters introduced to Mark, IOA data were collected on 1 out of 3 pretest and posttest measures (i.e., 33.3%) with 100% agreement on both measures.
Table 4.2: Interobserver agreement for pre- and posttest curriculum based measures (CBM).

<table>
<thead>
<tr>
<th>Student</th>
<th>Pretest CBM</th>
<th></th>
<th>Posttest CBM</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Collected/ Total</td>
<td>Mean % Agreement</td>
<td></td>
<td>Collected/ Total</td>
</tr>
<tr>
<td>Henry</td>
<td>2/12</td>
<td>20</td>
<td>100</td>
<td>3/10</td>
</tr>
<tr>
<td>Kevin</td>
<td>4/10</td>
<td>40</td>
<td>100</td>
<td>4/10</td>
</tr>
<tr>
<td>Daryl</td>
<td>4/10</td>
<td>40</td>
<td>98</td>
<td>3/9</td>
</tr>
<tr>
<td>Richie</td>
<td>3/9</td>
<td>33.3</td>
<td>100</td>
<td>4/9</td>
</tr>
<tr>
<td>Zach</td>
<td>3/9</td>
<td>33.3</td>
<td>100</td>
<td>4/9</td>
</tr>
<tr>
<td>Isha</td>
<td>1/3</td>
<td>33.3</td>
<td>100</td>
<td>1/3</td>
</tr>
<tr>
<td>James</td>
<td>1/3</td>
<td>33.3</td>
<td>100</td>
<td>1/3</td>
</tr>
<tr>
<td>Mark</td>
<td>1/3</td>
<td>33.3</td>
<td>100</td>
<td>1/3</td>
</tr>
</tbody>
</table>

Procedural Integrity

A second observer collected procedural integrity data on a total of 41.4% of the instructional sessions across groups (i.e., 36 out of 87 sessions). The data reflect instructional lessons conducted in the intervention condition. A procedural integrity checklist (see Appendix F) was used to check whether the intervention was implemented as planned. Integrity data with the percentage of accuracy according to instructional groups are presented in Table 4.3. Group 1 was observed on 14 of 36 instructional sessions (i.e., 38.9%) and resulted in 100% integrity. Group 2 was observed on 11 of 31
instructional sessions (i.e., 35.5%) with a mean accuracy of 100%. Group 3 was observed on 11 of 20 instructional sessions (i.e., 55%) and a mean accuracy of 98.9% (range = 87.5-100) was recorded. One of the sessions for Group 3 was conducted with 87.5% integrity. The session lasted 25 minutes in duration. That is, it exceeded the 20 min (+ or – 3 minute) criteria and hence the session was scored as 7 out of 8 steps being completed with integrity.

<table>
<thead>
<tr>
<th>Group</th>
<th>Collected/Total #</th>
<th>Collected/Total %</th>
<th>Accuracy %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14/36</td>
<td>38.9</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>11/31</td>
<td>35.5</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>11/20</td>
<td>55.0</td>
<td>98.9 (87.5-100)</td>
</tr>
</tbody>
</table>

Table 4.3: Procedural integrity data across instructional groups.

Out of a total of 36 instructional sessions in intervention for which procedural integrity data were collected, a third observer collected interobserver agreement data on 11 of the sessions (i.e., 30.6%). There was 100% agreement between the two observers. In addition to collecting integrity data, the experimenter collected data on (a) the duration of the sessions, and (b) the percentage of sessions conducted by the researcher only, by paraprofessional only, and by both researcher and paraprofessional.
The data are presented in Figure 4.1. Across all the instructional sessions conducted, the mean duration of the sessions was 21 minutes with a range between 14 minutes and 25 minutes.

![Figure 4.1: Percentage of instructional sessions conducted by researcher and paraprofessional, researcher only, and paraprofessional only.](image)

For Group 1, the researcher and instructional assistant conducted 22 out of the 36 sessions in a co-teaching format (i.e., 61.1%). Out of the remaining 13 sessions, the researcher taught 11 (36.7%) sessions and the IA conducted 2 (8.3%) sessions independently. Out of a total of 31 sessions for Group 2, 59.3% (16 out of 31) lessons were taught in a co-teaching format. The researcher taught 9 lessons independently (i.e., 33.3%) and the IA taught 4 lessons independently (i.e., 14.8%). For Group 3, the
researcher and IA taught 11 out of the 20 lessons together (i.e., 55%). The researcher conducted 7 out of the 20 sessions independently (i.e., 35%), and the IA conducted 2 sessions independently (i.e., 10%).

Individual Student Performance on Dependent Variables

The two dependent variables measured as progress monitoring probes throughout the study were the *DIBELS Phoneme-Segmentation Fluency* (PSF) and *Nonsense Word Fluency* (NWF) measures. The target students received five probes (one probe per day) during baseline condition and one probe every week during intervention condition. The results for each student are reported in terms of their performance on (1) PSF, (2) NWF, (3) CBM pre- and posttest, (4) Woodcock Johnson Tests of Achievement – Third Revision (WJ-III), and (5) DIBELS Benchmark Assessment.

*Student 1: Henry*

Henry participated in a total of 41 instructional sessions, with 100% attendance. He started with Lesson 1 of the Scott Foresman ERI. However, because Henry made substantial gains in phonemic awareness and letter-sound correspondence skills throughout the study, he was administered the placement test on two other occasions after beginning instruction. For example, at the end of Lesson 18, results of the placement test revealed that Henry’s point of entry into the program was at Lesson 61. Henry received one-on-one instruction from Lesson 61 to Lesson 72, which was the last lesson in Part 2 of the reading program. Henry scored 100% on the exit test for Part 2. Re-administration of the placement test at that time placed Henry at Lesson 97. He received one-on-one instruction from the researcher from Lesson 97 and ended the program with Lesson 101.
**PSF.** Visual inspection of Henry’s data shows a steep upward slope during intervention compared to near zero levels of responding in baseline condition (See Figure 4.3). Henry scored a mean of 0.6 (range = 0-3; SD = 1.3) in baseline. Intervention data show a steady increase initially followed by a dramatic increase in scores when he was producing at least 40 phonemes per minute consecutively on the last seven progress monitoring probes (probes 14 to 21). Henry produced a mean of 25.9 phonemes per minute (range = 6-43; 15.6) in the intervention condition. Inspection of effect sizes revealed a large effect for the PSF measure (i.e., 2.00).

**NWF.** Henry’s baseline data shows that he did not identify any letter sounds indicated by zero levels of responding. However, in intervention, Henry’s data shows a gradual upward trend. He identified a mean of 27.3 letter sounds per minute (range = 6-44; SD = 11.0). The NWF effect size was 2.42 indicating a large effect.

**CBM pre- and posttest.** A total of 10 letters were introduced to Henry during the course of lessons taught in the intervention condition. Results of the pretests show an average score of 88.3% (range = 8-100; SD = 28.8). Posttest scores show that Henry scored 100% on all ten tests.

**DIBELS benchmark assessments.** Henry’s performance on the Winter and Spring benchmark assessments administered in January and Spring of the school year are presented in Table 4.5. The instructional recommendation generated by the DIBELS data system based on Henry’s scores on the Winter benchmarks was “Intensive – Needs Substantial Interventions.” He identified 6 initial sounds in the Initial Sound Fluency (ISF) task and identified 24 letter names on the Letter Naming Fluency (LNF). He obtained zero scores on the PSF and NWF tasks in January. Henry made dramatic gains.
on the Spring benchmark assessments by identifying 56 letter names, producing 52 phonemes, and identifying 44 letter sounds per minute. These gains were substantiated with an instructional recommendation indicating that Henry reached “Benchmark” and was “At Grade Level.” Specifically, Henry’s status on the PSF and NWF measures were determined as “established” and “low risk” on the Spring assessments as compared to “at risk” status on both measures on the Winter assessments.

*WJ-III pre- and posttest.* The pre- and posttest scores for the Letter-Word Identification and Word Attack subtests are shown in Table 4.5. Henry made considerable gains on the Letter-Word Identification posttest, obtaining a grade equivalent score of 1.7 in comparison to below kindergarten scores on the pretest. Henry’s performance on the Word Attack pretest was below kindergarten level. However, his performance gains on the Word Attack were much higher, scoring at the second grade first month level at the end of kindergarten.

*Student 2: Kevin*

Kevin participated in 32 instructional lessons out of a total of 36 lessons, with an absenteeism percentage of 11.1%. Kevin started with Lesson 1 of the Scott Foresman ERI and ended the program with Lesson 36.

*PSF.* Baseline scores on the PSF measure indicate a mean score of 0.6 (range = 0 – 1). A visual analysis of Kevin’s data shows a gradual ascending trend in intervention, producing segmenting words at a mean rate of 11 phonemes per minute (range = 0 – 25). Inspection of effect sizes show that the intervention had a large effect (i.e., 1.78) on the phoneme segmentation fluency for Kevin.
NWF. Kevin made moderate gains in identifying the letter sounds in the intervention condition when presented with nonsense words in comparison to zero levels of responding during baseline. On average, Kevin produced 10 letter sounds per minute (range = 0 – 20) in intervention probes. The magnitude of effect of intervention was large with effect sizes equal to 1.76 for the NWF measure.

CBM pre- and posttest. A total of 10 letters were introduced to Kevin in intervention. Pretest scores indicate a mean performance of 47.2% (range = 17-83; SD = 24.1). Kevin got an average score of 94.3% on the posttest (range = 75-100; SD = 7.9).

DIBELS benchmark assessments. According Kevin’s Winter assessments, he needed intensive interventions based on scores of 10 letter names on the LNF measure and zero on both PSF and NWF measures. Whereas his scores on the Spring assessments show moderate increases to 25 letter names on LNF, 27 phonemes on PSF, and 22 letter sounds on NWF; the end of the year instructional recommendation indicated that his needs were “Intensive – with substantial interventions.” Kevin did not reach end of year benchmarks on any of the measures, continuing him in the “at risk” status on the reading trajectory.

WJ-III pre- and posttest. As shown in Table 4.5, Kevin’s performance on the posttest of the Letter-Word identification subtest revealed that he made modest gains with a grade equivalent score of K.8 (raw score = 15) as compared to a grade equivalent performance of below kindergarten level (raw score = 6) on the pretest. On the Word Attack pretest, Kevin scored below kindergarten levels; however, his grade equivalent score on the posttest was 1.0 (raw score = 3) indicating that he is close to where he needs to be at the end of kindergarten.
Student 3: Daryl

Daryl participated in 31 out of a total of 34 instructional lessons, with an absenteeism percentage of 8.8%. Daryl started with Lesson 1 of the Scott Foresman ERI and ended the program with Lesson 34. He moved out of the school after being in intervention for 14 weeks. Due to the unexpected move, data are not available for the DIBELS benchmark assessments and WJ-III tests.

PSF. A visual inspection of Daryl’s baseline shows zero levels of responding with a gradual increase in scores in intervention where he attained stable levels of responding. In baseline, Daryl produced zero phonemes on all five probes. However, he produced phonemes at a mean rate of 8.6 (range = 1-16; SD = 4.8) in intervention. The PSF effect size was 2.03 indicating a large effect of intervention.

NWF. Daryl’s NWF data in Figure 4.2 indicates overlapping data points with his performance on the PSF measure. Similar to the PSF measure, Daryl’s baseline data shows zero levels of responding indicated that he did not produce any letter sounds when presented with nonsense words. In intervention, Daryl identified a mean of 9.5 letter sounds (range = 0-17; SD = 5.9). Although the visual data show that Daryl made moderate gains in intervention, calculation of effect size indicates that the intervention had a large effect (ES = 1.92).

CBM pre- and posttest. A total of 10 letters were introduced to Daryl in intervention, however, he was posttested on only 9 out of the 10 letters. Daryl moved out of the school before the posttest was administered for the last letter (“o”). His pretests mean score was 50% (range = 25-100; SD: 29.1), and posttests mean of the nine tests administered was 96.3% (range = 75-100; SD = 8.4).
DIBELS benchmark assessments. Not available.

WJ-III pre- and posttest. Not available.

Student 4: Richie

Richie participated in 26 instructional lessons out of a total of 31 lessons, with an absenteeism percentage of 16.1%. Richie started with Lesson 1 of the Scott Foresman ERI and ended the program with Lesson 31.

PSF. Richie’s baseline scores show a flat-line with zero levels of responding. However, in intervention, his scores indicate a slow yet steady increase; producing a mean of 3 phonemes per minute (range = 0 – 8; SD = 3.0). The effect size calculation revealed a score of 1.35 for the PSF measure.

NWF. Similar to the PSF measure, Richie’s baseline scores in Figure 4.3. in the NWF measure show zero levels of responding. Data in intervention show a gradual ascending trend, supported by a large effect size of 1.43. In intervention, he identified letter sounds at a mean rate of 6 sounds per minute (range = 0 – 19; SD = 5.7).

CBM pre- and posttest. Nine letters were introduced to Richie in intervention. In his pretests, he scored a mean of 29.1% (range = 8-50; SD = 14.8). His posttests score mean was 93.6% (range = 75-100; SD = 10.8).

DIBELS benchmark assessments. Although, Richie showed modest increase in posttest scores as compared to the pretest scores on the benchmark assessments, the instructional recommendation generated by the DIBELS data system indicated that at the end of the year his needs were “intensive” needing substantial interventions. Richie scored zero on the Winter LNF, PSF, and NWF measures; however, his scores were 21, 10, and 17 on the Spring assessments.
WJ-III pre- and posttest. Richie’s performance on the Letter-Word Identification posttest revealed a grade equivalent score of K.8 as compared to performing below kindergarten level on the pretest. Although there was only one point increase on the Word Attack posttest (raw score = 3) than the pretest (raw score = 2), the grade equivalent scale placed him at the first grade level (i.e., 1.0) compared to a grade equivalent score of K.3 on the pretest.

Student 5: Zach

Zach participated in 31 instructional lessons out of a total of 31 lessons, with 100% attendance. He started with Lesson 1 of the Scott Foresman ERI and ended the program with Lesson 31.

PSF. As seen in Figure 4.2, Zach’s baseline data on this measure shows zero levels of responding with a steady increase in intervention. In intervention, Zach produced phonemes at a mean rate of 14.3 (range = 5-26; SD = 6.1). This increase in data was supported by large effect size of 2.22 on the PSF measure.

NWF. In baseline condition, Zach attained stable levels of responding with a mean score of 4.8 letter sounds per minute (range = 3-6; SD = 1.3). His intervention data show an upward trend with a mean score of 18.7 (range = 11-28; SD = 6.1). Calculation of effect sizes indicated that the intervention had a large effect with a score of 2.16.

CBM pre- and posttest. A total of 9 letters were introduced during the course of intervention. Zach’s pretest scores were generally high with a mean of 90.6% (range = 58-100; SD = 15.8). The mean of posttest scores was 99.1% (range = 92-100; SD = 2.7).
**DIBELS benchmark assessments.** Zach performed considerably better on the posttest assessments than the pretest assessments. In January, Zach identified 5 letters on the LNF measure, but got zero scores on the PSF and NWF measures. These scores placed him in the “at risk” status needing “intensive” instruction. In May, he showed marked increase in performance on the end-of-year benchmark assessments. As shown in Table 4.5, he named 32 letters, produced 29 phonemes, and identified 33 letter sounds. Although Zach did not reach end of the year goals on the LNF (goal = 40 letter names) and PSF (goal = 35 phonemes) measures, he reached benchmark on the NWF measure by exceeding the goal of 25 letter sounds. The instructional recommendation for Zach at the end of the year indicated that he needed “strategic” intervention.

**WJ-III pre- and posttest.** Zach’s posttest scores on both subtests of the Woodcock Johnson Tests of Achievement are promising. He obtained a grade equivalent score of 1.0 (raw score = 18) on the Letter-Word Identification subtest and 1.4 (raw score = 4) on the Word Attack subtest. These posttest scores are higher than the pretest raw scores of 3 and 0 placing him below kindergarten level (i.e., < K.0) on the grade equivalent scores.

**Student 6: Isha**

Isha participated in 18 instructional lessons out of a total of 20 lessons, with an absenteeism percentage of 10%. She started with Lesson 43 of the Scott Foresman ERI and ended the program with Lesson 62.

**PSF.** A visual analysis of Isha’s data shows a steep upward trend in intervention in comparison to stable levels of responding in baseline. Isha responded at a mean rate of 9.5 phonemes per minute in baseline scoring between 3 to 15 phonemes (SD = 2.9). In intervention, there was a dramatic increase in data when she produced phonemes at a
mean rate of 42.7 (range = 25-56; SD = 11.9). Effect sizes for the PSF measure were calculated at 1.77 indicating a large effect.

NWF. Baseline data for the NWF measure were more variable than the PSF measure. The variability of baseline as evidenced by a standard deviation of 7.4 can be seen in Figure 4.2. Isha identified a mean of 13 letter sounds (range = 0-26; SD = 7.4) in baseline and identified a mean of 38.7 letter sounds (range = 35-66; SD = 3.7) in intervention. In comparison to baseline data, Isha’s intervention data show stable levels of responding as supported by the standard deviation of 3.7. The effect size for NWF measure was calculated to be 2.21, again, indicating a large effect.

CBM pre- and posttest. Due to the point of lesson entry in the ERI program, a total of 3 letters were introduced to Isha. As shown in Table 4.4, she scored a mean of 80.7% on her pretests (range = 50-100; SD = 26.9) and scored a mean of 97.3% on her posttests (range = 92-100; SD = 4.6).

DIBELS benchmark assessments. The instructional recommendation on the January assessments indicated that Isha needed “strategic” interventions. She obtained scores of 33 letter names, 8 phonemes, and 2 letter sounds on the LNF, PSF, and NWF measures. As presented in Table 4.5, Isha made substantial gains on the three measures on the Spring assessments, with the greatest gains on the PSF measure. She named 46 letters, produced 55 phonemes, and identified 39 letter sounds, meeting end-of-year goals on each of these measures. Isha’s performance on the PSF task was higher than any of the target and non-target students in her class, performing in the 97th percentile. Isha was one of the four students who reached “Benchmark” and was performing at grade level by the end of the study.
**WJ-III pre- and posttest.** As seen in Table 4.5, Isha was performing below the kindergarten level on both the Letter-Word Identification and the Word Attack subtests of the WJ-III Tests of Achievement. She obtained a raw score of 4 on the Letter-Word and 0 on the Word Attack tests. Isha made greater gains on the posttest as indicated by higher raw scores of 24 (grade equivalent = 1.5) on the Letter-Word and 5 (grade equivalent = 1.6) on the Word-Attack subtest.

**Student 7: James**

James participated in 19 instructional lessons out of a total of 20 lessons, with an absenteeism percentage of 5%. Like Isha, he started with Lesson 43 of the Scott Foresman ERI and ended the program with Lesson 62.

**PSF.** As seen in Table 4.3, James’ baseline data show stable levels of responding with a mean score of 2.4 phonemes per minute (range = 0-6; SD = 2.8). Intervention data reveal an accelerating trend for the PSF measure. James produced a mean of 30.6 phonemes per minute (range = 11-46; SD = 14.0). The magnitude of intervention was strong as evidenced by PSF effect size of 1.87.

**NWF.** James’ performance on the NWF measure shows a gradual increasing trend in baseline condition. However, an upward trend is seen with data in intervention. James identified a mean of 19 letter sounds per minute (range = 5-36; SD = 10.6) in baseline and a mean of 48.6 letter sounds per minute (range = 35-57; SD = 11.8) in intervention. The magnitude of effect was calculated at 1.72 indicating a strong intervention effect.
**CBM pre- and posttest.** A total of 3 letters were introduced to James in intervention. As seen in Table 4.4, his performance on the pretests is represented by a mean of 75% (range = 33-100; SD = 36.6). James’s scored 100% on all three posttest measures.

**DIBELS benchmark assessments.** On the Winter benchmark assessments, James identified 4 initial sounds, 31 letter names, 0 phonemes, and 5 letter sounds. His performance on the phoneme-segmentation and the nonsense word fluency tasks placed him in the “at risk” category for future reading failure. The instructional recommendation indicated that she needed “strategic” intervention. James made considerable gains on the May assessments compared to the Winter assessments. He obtained a score of 54 letter names, 46 phonemes, and 55 letter sounds, surpassing the end-of-year goals of 40, 35, and 25 respectively. James reached “Benchmark” at the end of the year and was performing at grade level.

**WJ-III pre- and posttest.** James’s increase in scores on the DIBELS benchmark assessments are mirrored on the WJ-III subtests. His performance on the Letter-Word Identification and Word Attack posttest reflected substantial gains compared to pretest scores. James obtained a grade equivalent score of 1.5 (raw score = 24) on the Letter-Word Identification posttest and a grade equivalent score of 2.2 (raw score = 10) on the Word Attack posttest. These scores are higher than pretest scores which had indicated a below grade level performance.
Student 8: Mark

Mark participated in 19 out of a total of 20 instructional lessons, with an absenteeism percentage of 5%. Mark started with Lesson 43 of the Scott Foresman ERI and ended the program with Lesson 62.

PSF. As mentioned in Chapter 3, Mark had a delayed baseline condition. Data in Figure 4.2 show variability on the PSF measure in baseline condition where he produced phonemes at a mean rate of 16 (range = 7-27; SD = 5.6). There was a dramatic increase in levels of responding in intervention with an accelerating trend. Mark produced a mean of 40 phonemes per minute (range = 32-56; SD = 7.9). The intervention had a strong effect as evidenced by an effect size of 1.87.

NWF. In baseline condition, Mark attained stable levels of responding with a mean score of 13.8 letter sounds per minute (range = 6-23; SD = 5.6). His intervention data show an upward trend with a mean score of 33.4 (range = 24-44; SD = 5.2). Calculation of effect sizes indicated that the intervention had a large effect with a score of 1.84.

CBM pre- and posttest. As with Isha and James in the third instructional group, a total of three letters were introduced in intervention. The mean on pretest measures was 69.3% (range = 58-63; SD = 12.7) and the mean on posttest measures was 97.3% (range = 92-100; SD = 4.6).

DIBELS benchmark assessments. Mark’s performance on the Spring benchmark assessments indicated that he reached “Benchmark” and was performing “at grade level.” Mark obtained scores of 40 letter names, 46 phonemes, and 38 letter sounds, reaching the end-of-year goals on the LNF, PSF, and NWF measures. These May assessment results
reflect dramatic gains from the January assessments that indicated that Mark needed “intensive” interventions. He obtained low scores of 4 initial sounds, 18 letter names, 2 phonemes, and 7 letter sounds that placed him in the “at risk” category for reading failure.

WJ-III pre- and posttest. On the pretest, Mark obtained a grade equivalent score of K.2 (raw score = 10) on Letter-Word Identification, and a grade equivalent score of <K.0 (raw score = 1) on Word Attack subtests. Following intervention, Mark made considerable gains on the posttest scores. Results of the posttest indicate that Mark was performing at the first grade first month grade equivalent level (raw score = 19) on Letter-Word Identification and at the second grade level (raw score = 8) on the Word Attack subtest.
<table>
<thead>
<tr>
<th>Student</th>
<th>DIBELS PSF</th>
<th>DIBELS NWF</th>
<th>CBM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B&lt;sup&gt;1&lt;/sup&gt;</td>
<td>I&lt;sup&gt;2&lt;/sup&gt;</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>ES&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Henry</td>
<td>0.6 (1.3)</td>
<td>25.9 (15.6)</td>
<td>2.0</td>
</tr>
<tr>
<td>Kevin</td>
<td>0.6 (1.3)</td>
<td>11.1 (7.6)</td>
<td>1.8</td>
</tr>
<tr>
<td>Daryl</td>
<td>0 (4.8)</td>
<td>8.6 (5.9)</td>
<td>2.0</td>
</tr>
<tr>
<td>Richie</td>
<td>0 (3.0)</td>
<td>2.9 (5.7)</td>
<td>1.4</td>
</tr>
<tr>
<td>Zach</td>
<td>0 (6.1)</td>
<td>14.3 (1.3)</td>
<td>2.2</td>
</tr>
<tr>
<td>Isha</td>
<td>9.5 (2.9)</td>
<td>42.7 (11.9)</td>
<td>1.8</td>
</tr>
<tr>
<td>James</td>
<td>2.4 (2.8)</td>
<td>30.6 (14.0)</td>
<td>1.6</td>
</tr>
<tr>
<td>Mark</td>
<td>16 (5.6)</td>
<td>40.0 (7.9)</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Table 4.4: Student baseline and intervention means, standard deviation, effect sizes for DIBELS PSF and NWF measures; pre- and posttest means and standard deviation on CBM measures.

<sup>1</sup> Baseline
<sup>2</sup> Intervention
<sup>3</sup> Effect size
Figure 4.2: Visual representation of baseline and intervention data on PSF and NWF measures for Daryl, Kevin, Zach, and Mark

Note. Break in x-axis denotes Spring break.
Figure 4.3: Visual representation of baseline and intervention data on PSF and NWF measures for Henry, Richie, James, and Isha

Note. Break in x-axis denotes Spring break.
Figure 4.4: Weekly CBM pre- and post-test results for Henry, Kevin, Daryl, and Richie
Figure 4.5: Weekly CBM pre- and post-test results for Zach, Isha, James, and Mark
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Henry</td>
<td>0</td>
<td>3</td>
<td>Intensive</td>
<td>6</td>
<td>24</td>
<td>0</td>
<td>0</td>
<td>Intensive</td>
<td>56</td>
<td>52</td>
<td>44</td>
<td>Benchmark</td>
</tr>
<tr>
<td>Kevin</td>
<td>6</td>
<td>0</td>
<td>Intensive</td>
<td>7</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>Intensive</td>
<td>25</td>
<td>27</td>
<td>22</td>
<td>Intensive</td>
</tr>
<tr>
<td>Richie</td>
<td>9</td>
<td>2</td>
<td>Strategic</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Intensive</td>
<td>21</td>
<td>10</td>
<td>17</td>
<td>Intensive</td>
</tr>
<tr>
<td>Zach</td>
<td>9</td>
<td>0</td>
<td>Strategic</td>
<td>16</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>Intensive</td>
<td>32</td>
<td>29</td>
<td>33</td>
<td>Strategic</td>
</tr>
<tr>
<td>Isha</td>
<td>16</td>
<td>0</td>
<td>Strategic</td>
<td>9</td>
<td>33</td>
<td>8</td>
<td>2</td>
<td>Strategic</td>
<td>46</td>
<td>55</td>
<td>39</td>
<td>Benchmark</td>
</tr>
<tr>
<td>James</td>
<td>8</td>
<td>4</td>
<td>Strategic</td>
<td>4</td>
<td>31</td>
<td>0</td>
<td>5</td>
<td>Strategic</td>
<td>54</td>
<td>46</td>
<td>55</td>
<td>Benchmark</td>
</tr>
<tr>
<td>Mark</td>
<td>6</td>
<td>18</td>
<td>Strategic</td>
<td>4</td>
<td>18</td>
<td>2</td>
<td>7</td>
<td>Intensive</td>
<td>40</td>
<td>46</td>
<td>38</td>
<td>Benchmark</td>
</tr>
</tbody>
</table>

Table 4.5: Results of DIBELS Fall, Winter, and Spring Benchmark Assessments for target students in Kindergarten

¹ Initial Sound Fluency; Fall Goal: 8 initial sound, Winter Goal: 25 initial sounds
² Letter Naming Fluency; Fall Goal: 8 letter names, Winter Goal: 27 letter names, Spring Goal: 40 letter names
³ Instructional Recommendations: Intensive – Needs substantial interventions, Strategic – Additional intervention, Benchmark – At grade level
⁴ Phoneme Segmentation Fluency; Winter Goal: 18 phonemes, Spring Goal: 35 phonemes
⁵ Nonsense Word Fluency; Winter Goal: 13 letter sounds, Spring Goal: 25 letter sounds
Table 4.6. Results of WJ-III pre- and posttest for target students in Kindergarten

<table>
<thead>
<tr>
<th>Student</th>
<th>WJ-III Letter-Word Id</th>
<th>WJ-III Word Attack</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest(^1)</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Sc(^2)</td>
<td>GE(^3)</td>
</tr>
<tr>
<td>Henry</td>
<td>2</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td>Kevin</td>
<td>6</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td>Richie</td>
<td>2</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td>Zach</td>
<td>3</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td>Isha</td>
<td>4</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td>James</td>
<td>7</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td>Mark</td>
<td>10</td>
<td>K.2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>K.3</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>&lt; K.0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>&lt; K.0</td>
</tr>
</tbody>
</table>

Group Analysis of Data

Although analysis of data at the individual level is inherent with single-subject research, that is, experimental control is said to have been achieved if the desired change in target behavior is observed only with the systematic manipulation of the independent variable; analyzing data in terms of group means also provide for interesting comparisons between students who received the intervention and students who did not receive the intervention. It must be noted that the students in this study comprised of a purposive sample, wherein students were deliberately selected based on their low performance on

---

\(^1\) Pretest conducted in September 2004; Posttest in May 2005  
\(^2\) Raw Score  
\(^3\) Grade Equivalent Score
DIBELS benchmark assessments and pretest scores on Letter-Word Identification and Word-Attack subtests of the Woodcock Johnson Tests of Achievement – Third Revision. Since students were not randomly assigned to intervention (treatment) and no intervention (control) groups, results presented should be considered at a descriptive level and interpreted accordingly.

Pre- and posttest data were available for a total of 23 students in kindergarten. The performance of students who received intervention (n = 7) was compared to the students who did not participate in the intervention (n = 16). The data are presented according to each dependent measure. For the purpose of reporting the results of the DIBELS benchmark assessments, the January assessments will be referred to as the “pretest” and the May assessments will be the “posttest.”

**DIBELS Benchmark Assessments**

All students in kindergarten were assessed three times during the school year, in Fall, Winter, and Spring of kindergarten. The group pre- and posttest means for students in the “intervention” and “no intervention” groups are displayed in Figure 4.7. The average gains made by the two groups from January to May assessments were calculated by subtracting the posttest means by the pretest mean. On the *Letter Naming Fluency* (LNF) measure, the mean score in January for the “intervention” group was 17.3, whereas the “no intervention” group scored a mean of 36.5 letter names. In comparison, on the May assessments, the “intervention” group obtained a mean of 39.1 letter names, whereas the “no intervention” group obtained a mean of 46.9 letter names. Thus the “intervention” group made an average gain of 21.8 responses per minute in a four month period, in comparison to an average increase of 10.4 responses per minute made by the
“no intervention” group. On the PSF measure, the “intervention” group started out with a lower score (mean = 1.4) than the “no intervention” group that scored a mean of 9.8 phonemes in January. However, the “intervention” group surpassed the “no intervention” group by a difference of 2.1 points. That is, the “intervention” group mean on the May PSF assessment was 33.5 and the “no intervention” group mean on the same measure was 31.4. As shown in Table 4.7, the group that received ERI made a mean gain of 32.1 responses per minute on PSF in comparison to a mean gain of 21.6 responses per minute made by the group that did not receive the ERI. The “intervention” group also made substantial gains on the NWF measure as evidenced by an increase of 31.7 responses per minute in comparison to an increase of 18.3 responses per minute by the “no intervention” group.

WJ-III Subtests

Similar trends were observed with the WJ-III subtests. The posttest was administered approximately seven months after the pretest. The “intervention” group made an average gain of 15.5 points on the Letter-Word Identification subtest whereas the “no intervention” group made a mean gain of 13.4 points. The difference in gains made by the two groups on the Word Attack subtest was not as large as on the other measures. The group that received ERI made a mean gain of 5.1 points on Word Attack while the group that did not receive the ERI made gains averaging 4.4 points.
<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention/ ERI</th>
<th>No Intervention/ ERI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jan</td>
<td>May</td>
</tr>
<tr>
<td>Letter Naming Fluency</td>
<td>17.3</td>
<td>39.1</td>
</tr>
<tr>
<td>Phoneme Segmentation Fluency</td>
<td>1.4</td>
<td>33.5</td>
</tr>
<tr>
<td>Nonsense Word Fluency</td>
<td>2.0</td>
<td>33.7</td>
</tr>
<tr>
<td>Letter-Word Identification</td>
<td>4.9</td>
<td>20.4</td>
</tr>
<tr>
<td>Word Attack</td>
<td>0.9</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 4.7: Group pre- and posttest means and mean gains made by groups
Figure 4.6: Pre- and posttest means on benchmark assessments for “Intervention” and “No Intervention” groups
Figure 4.7: Pre- and posttest means on WJ-III subtests for “Intervention” and “No Intervention” groups
Social Validity Measurement

Measuring social validity is an important aspect of evaluating research in applied behavior analysis (Cooper, Heron, & Heward, 1987). In this study, teachers and parents were asked to complete consumer satisfaction questionnaires to determine the appropriateness and usefulness of the target skills, the appropriateness of procedures and the outcomes of the study. Target students were interviewed to obtain their opinion about the reading intervention and whether participating in the small group instruction had helped them learn new skills.

Implementer Questionnaire

At the beginning of the study, the instructional assistant, Ms. M, completed a Teacher Pre-Intervention Acceptability Rating Survey (Appendix G) after undergoing training on how to implement the ERI. At the end of the study, Ms. M was given the Teacher Post-Intervention Acceptability and Importance of Effects Survey (Appendix H) to complete at her available time. The two forms were completed approximately four months apart. The post-intervention question had two more items than the pre-intervention questionnaire that asked whether the person would use the intervention again when needed, and if he/she would recommend the intervention to others. In general, Ms. M rated the intervention positively at both times; however, she gave higher ratings (i.e., strongly agree) for most items on the post-intervention survey as compared to the pre-intervention survey. The rating scales were based on a 7-point Likert Scale with the following ratings:

1 – strongly disagree, 2 – disagree, 3 – neutral: leaning towards disagree, 4 – neutral, 5 – neutral: leaning towards agree, 6 – Agree, and 7 – Strongly Agree.
An item-by-item response is presented in Table 4. Although at the beginning of the study, Ms. M felt that the reading intervention did not fit into her schedule (rating = 2), by the end of the study she gave a neutral response with a rating of 4. Ms. M provided a neutral response (rating = 4) on 4 out of 12 items (33%) in the pre-intervention survey. She was neutral on whether the ERI would: (a) supplement the classroom instruction, (b) be a fair way to handle the problem, (c) be appropriate given the problem, and (d) be suitable given the classroom culture. Her opinion at the end of the study did not change dramatically on three of the four items. At the end of the study, she agreed that the intervention supplemented the classroom intervention (rating = 6); however, gave a rating of 5 (neutral: leaning towards agree) on whether the ERI was (a) a fair way to handle the problem, (b) appropriate given the problem, and (c) suitable given the classroom culture.

At the end of the study, Ms. M “agreed” (rating = 6) that the intervention was: (a) easy to implement, (b) within her skill level to implement, and (c) acceptable to other students. She also agreed that the intervention improved the students’ skill and had improved students’ overall performance. Ms. M gave a rating of 6 (“Agree”) to the two additional items on the post-intervention survey suggesting that she would use the intervention again when needed and she would recommend it to others. Although, Ms. M did not provide additional comments on either of the two rating surveys, anecdotal information from informal conversations with the researcher suggested that Ms. M was satisfied with the outcomes of the intervention to such an extent that she has requested that the School Principal purchase the ERI for next year. She expressed her interest in continuing to conduct reading instruction in small groups in the next academic year with her kindergarten students.
<table>
<thead>
<tr>
<th>Item</th>
<th>Pre-Intervention Rating</th>
<th>Post-Intervention Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>The reading intervention:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Fit into my regular schedule</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2. Supplemented my current classroom interventions</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>3. Taught important skills</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>4. Was a fair way to handle the problem</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Was appropriate given the problem</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Was suitable given the classroom culture</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Was easy to implement</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. Was within my skill level to implement</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. Improved the student’s skill</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. Was acceptable to other students</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11. Will have lasting positive effects</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12. Improved the students’ overall performance</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13. Is one I will use again when needed</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>14. Is one I will recommend to others</td>
<td>-</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 4.8: Results of Pre- and Post-Intervention Acceptability Rating Survey

Teacher Satisfaction Questionnaire

At the end of the study, the kindergarten and first grade classroom teacher were given the teacher form of the social validity questionnaire (Appendix I). The items on the questionnaire were similar to the items on the Post-Intervention Acceptability and Importance of Effects Survey with some changes. The teachers were given a list of students from their class who participated in the study and were asked to rate the effectiveness of the intervention for each student on a scale of 1 to 5, with 1 indicating

\[\text{Item not included on pre-intervention survey}\]
that the intervention was not at all effective to a rating of 5 indicating that the intervention was very effective. For the remainder of the items on the questionnaire, the teachers rated their responses on a 5-point Likert Scale with a rating of 5 indicating strong agreement to the given statement and a rating of 1 indicating strong disagreement. At the end, there were three open-ended questions in the teacher form. The teachers’ responses are shown in Table 4.9.

Teacher 1. The teacher satisfaction questionnaire was completed and returned by Teacher 1. Overall, Teacher 1 “agreed” (rating = 4) to questions 1 through 8 about the reading intervention. Particularly, she “agreed” that the reading intervention (a) fit into her regular schedule, (b) supplemented her current classroom interventions, (c) taught important skills, (d) is one she will use again when needed, (e) is one she will permit to continue if taught by someone else, (f) is one she will permit to continue if taught by her instructional assistant, and (g) is one she will recommend to others. When asked to rate the effectiveness of the intervention, Teacher 1 indicated that the intervention was “very effective” (rating = 5) for Henry, “moderately effective” (rating = 4) for Zach, Isha, James, and Mark; and “somewhat effective” (rating = 2) for Kevin and Richie. In response to the open-ended question asking what were some things she liked about the intervention, Teacher 1 responded that she liked the focus on one letter and the review aspect of the program. However, Teacher 1 shared that she did not like the fact that letters being taught did not correspond to the letters that were being introduced in the LACES program. Teacher 1 indicated that the school was interested in using the program in the forthcoming academic year, but wanted to adapt the program such that it fit more meaningfully with the LACES framework.
Teacher 2. Although Daryl moved out of the school before the completion of the study, the first grade teacher was asked to complete the questionnaire. Teacher 2 had neutral responses (rating = 3) to items 1 and 8, suggesting that she neither agreed nor disagreed that the intervention fit into her regular schedule, and the intervention was one she would recommend to others. She “strongly agreed” (rating = 5) that the intervention taught important skills and “agreed” (rating = 4) that the intervention (a) supplemented her classroom instruction, (b) was a fair way to handle the problem, (c) will have lasting positive effects, (d) is one she will use again when needed, (e) is one she will permit to continue if taught by someone else, (f) is one she will permit to continue if taught by her instructional assistant. Teacher 2 indicated that she thought the intervention was “somewhat effective” (rating = 2) for Daryl. In response to the open-ended questions, Teacher 2 expressed that the one-on-one intervention for Daryl was one of the things she liked about the intervention program. However, in response to what she did not like about the intervention program, Teacher 2 indicated that communication of activities and results should have been shared more often.
Item | 1 | 2 | 3 | 4 | 5
--- | --- | --- | --- | --- | ---
The reading intervention: | SD | D | N | A | SA
1. Fit into my regular schedule | T2 | T1 | | | |
2. Supplemented my current classroom interventions | | | T1 T2 | | |
3. Taught important skills | | | T1 T2 | | |
4. Was a fair way to handle the problem | | | T1 T2 | | |
5. Was suitable given the classroom culture | | | T1 T2 | | |
6. Will have lasting positive effects | | | T1 T2 | | |
7. Is one I will use again when needed | | | T1 T2 | | |
8. Is one I will permit to continue if taught by someone else | | | T1 T2 | | |
9. Is one I will permit to continue if taught by my instructional assistant | | | T1 T2 | | |
10. Is one I will recommend to others | | | | | T2 |
11. Rate the effectiveness of the intervention for: | NE | SE | N | MD | VE
- Henry | | | | | T1
- Kevin | | | | T1 | |
- Daryl | | | T2 | | |
- Richie | | | | T1 | |
- Zach | | | | T1 | |
- Isha | | | T1 | | |
- James | | | | T1 | |
- Mark | | | | | T1
11. What are some things you liked about the intervention and why?
   T1: “I liked the intense focus on one letter and the review aspect (going over previously learned letters). I also liked that the format resembled the LACES lit. board format – so it was something the students were used to.
   T2: “Daryl needed one-on-one intervention daily.”
12. What are some things you did not like about the intervention and why?
   T1: “I did not like that the letters being taught did not correspond to the letters being taught in LACES. In the future I would teach the letters in the order that they are taught in LACES.”
   T2: “Communication of activities and results should have been shared more often.”

Table 4.9: Results of social validity questionnaire – Teacher form

---

1 SD – Strong Disagree, D – Disagree, N – Neutral, A- Agree, SA – Strongly Agree
2 NE – Not at all Effective, SE – Somewhat Effective, N – Neutral, ME – Moderately Effective, VE – Very Effective
Table 4.8 continued

13. Additional comments:

T1: “We are interested in using the program next year – but we want to adapt it to fit into the LACES framework in a more meaningful way. (If we are working on letter A, A in LACES we would also do it during the intervention). I liked that many of the students involved in the intervention became much more confident in themselves. They volunteered to participate and answer questions much more readily – especially during the Literacy Board segment of LACES.”

T2: None

*Parent Satisfaction Questionnaire*

The parents of each target student, with the exception of Daryl, were provided with a copy of the parent form of the social validity questionnaire (Appendix J) along with a cover letter explaining the purpose of the questionnaire. The researcher received five out of the seven questionnaires completed by a parent or guardian with a 71.4% response rate. The parents’ responses to items on the questionnaire are presented in Table 4.10. The parents were asked to respond to six questions using a 5-point Likert Scale and two open-ended questions. The parent responses to the six questions were weighted on a scale from 1 to 5 and the mean rating for each response was calculated to determine the mean group response.

*Parent 1.* Henry returned the parent questionnaire completed by his father. In response to whether the parent felt that their child needed academic support to be successful at school and particularly needed additional instruction in reading, Parent 1 “agreed” that at the beginning of the study, Henry needed additional instruction in
reading. Parent 1 “agreed” that supplemental reading program was an effective way to address the child’s reading problems. Parent 1 “strongly agreed” that the Early Reading Intervention has been effective in teaching his child some key reading skills. The parent “agreed” that he would like his child to continue receiving supplemental reading instruction next year, and “strongly agreed” that he was glad his child participated in the reading intervention program.

**Parent 2.** Kevin brought back the completed parent questionnaire. Kevin’s grandmother had completed the questionnaire. Parent 2 provided a “neutral” response to item that asked if the parent felt that their child needed academic support to be successful at school. However, Parent 2 “agreed” that at the beginning of the year, their child needed additional instruction in reading. Although, no additional written comments were provided, Parent 2 “agreed” that (a) the supplemental reading program is an effective way to address the child’s reading problems, (b) the Early Reading Intervention has been effective in teaching some key reading skills, (c) they would like for their child to continue receiving supplemental reading instruction next year, and (d) they were glad that their child participated in the reading intervention program.

**Parent 3.** A parent questionnaire was not completed for Daryl due to his sudden move before the completion of the study.

**Parent 4.** Non-respondent.

**Parent 5.** Zach returned the questionnaire that was completed by his mother. Parent 5 “strongly agreed” that at the beginning of the school year, her child needed both academic support and additional instruction in reading. Parent 5 “strongly agreed” to the remaining items on the questionnaire that asked about the effectiveness of the
intervention. Parent 4 indicated that she would like her child to continue receiving supplemental reading instruction next year and that she was glad that he participated in the reading intervention program. In response to what are some changes that the parent observed in their child’s reading ability at the end of the year as compared to the beginning of the school year, Parent 4 reported that her child did not understand the concept of reading but can now “affectively” sound out words and recognize words. [Note: The parent meant to use the term “effectively” in place of “affectively” in the above sentence.]

Parent 6. Isha’s mother completed the parent questionnaire. Similar to Parent 4, Parent 6 “strongly agreed” to all the six items on the questionnaire. Especially, Parent 6 “strongly agreed” that the Early Reading Intervention has been effective in teaching her child some key reading skills. The parent supplemented her response by adding that her child’s skills have greatly improved and believes that her child will be reading at the second grade level.


Parent 8. Mark returned the parent questionnaire completed by his mother. Parent 8 “agreed” that at the beginning of the school year her child needed academic support to be successful at school. She “strongly agreed” that her child needed additional instruction in reading. Whereas Parent 8 “agreed” that the supplemental reading program was an effective way to address her child’s reading problems, she had neither agreed nor disagreed to whether the Early Reading Intervention was effective in teaching her child some key reading skills. Parent 8 “strongly agreed” that she would like her child to continue receiving supplemental reading instruction next year and she was glad that her
child participated in the reading intervention program. Parent 8 commented that her child might need one-on-one help at times.
1. At the beginning of the school year, I felt that my child needed academic support to be more successful at school
   - Strongly Disagree: P2
   - Disagree: P1, P8
   - Neutral: P5, P6

2. At the beginning of the school year, I felt that my child needed additional instruction in reading
   - Strongly Disagree: P5, P8, P6
   - Disagree: P1, P2
   - Neutral: P5, P6

3. I feel that the supplemental reading program is an effective way to address my child’s reading problems (if any)
   - Strongly Disagree: P1, P2, P8
   - Disagree: P5, P6

4. I feel that the Early Reading Intervention has been effective in teaching my child some key reading skills (e.g., letter names, letter sounds, phonemic awareness)
   - Strongly Disagree: P8
   - Disagree: P2
   - Neutral: P1, P5, P6

5. I would like my child to continue receiving supplemental reading instruction next year
   - Strongly Disagree: P1, P5, P8, P6
   - Disagree: P2
   - Neutral: P5, P6

6. I am glad my child participated in the reading intervention program this year
   - Strongly Disagree: P1, P5, P6, P8
   - Disagree: P2
   - Neutral: P5, P6

7. What are some changes you see in your child’s reading ability now as compared to the beginning of the school year?
   - P1: “better letter and syllable recognition!”
   - P2: N/A
   - P5: Zach “really didn’t understand the concept of reading but now he can affectively sound out words, recognize words, and etc.”
   - P6: “My child enjoys reading very much. Her skills have greatly improved.”
   - P8: “none”

8. Additional comments:
   - P1: N/A
   - P2: N/A
   - P5: “I hope this continues on in the future, it really aided Zach. Thank you!”
   - P6: “I believe that Isha will be reading at the second grade level.”
   - P8: “may need one on one help at times.”

Table 4.10: Results of social validity questionnaire – parent form

133
Overall, the mean group responses as shown in Table 4.11 ranged from “agree” to “strongly agree.” That is, all parents who responded seemed to be in agreement that their children needed additional academic support at the beginning of the school year, and the early reading intervention was an effective way to address their reading problems. The parents felt that the ERI was effective in teaching their children some key reading skills and strongly agreed that they would like their child to continue receiving such instruction next year.

<table>
<thead>
<tr>
<th>Item</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>P5</th>
<th>P6</th>
<th>P7</th>
<th>P8</th>
<th>Mean</th>
<th>Response Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>3</td>
<td>-</td>
<td>NR</td>
<td>5</td>
<td>5</td>
<td>NR</td>
<td>4</td>
<td>4.2</td>
<td>Agree</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>4</td>
<td>-</td>
<td>NR</td>
<td>5</td>
<td>5</td>
<td>NR</td>
<td>5</td>
<td>4.6</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>4</td>
<td>-</td>
<td>NR</td>
<td>5</td>
<td>5</td>
<td>NR</td>
<td>4</td>
<td>4.4</td>
<td>Agree</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>4</td>
<td>-</td>
<td>NR</td>
<td>5</td>
<td>5</td>
<td>NR</td>
<td>3</td>
<td>4.4</td>
<td>Agree</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>4</td>
<td>-</td>
<td>NR</td>
<td>5</td>
<td>5</td>
<td>NR</td>
<td>5</td>
<td>4.6</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>4</td>
<td>-</td>
<td>NR</td>
<td>5</td>
<td>5</td>
<td>NR</td>
<td>5</td>
<td>4.8</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

Table 4.11: Summary of parent satisfaction survey
Student Satisfaction Questionnaire

The second observer used a modified version of the *Children’s Social Validity Interview* (CSVI; Lane, 1997; Appendix K) to interview the seven out of eight target students available at the end of the study. The semi-structured interviews were conducted to measure the acceptability of intervention components, the types of skills learned, and the extent to which the student reportedly uses the newly acquired skills. Students were asked four “Yes/No” questions, six question that required them to answer on a 3-point scale that included “Not much”, “A little”, and “A lot.” Students’ responses to the questions in the interview are described below.

**Student 1: Henry.** In response to whether he liked being in the special group, Henry said, “No.” When asked why he didn’t like being in the group, he said, “It had hard words.” Henry indicated that he liked spending time with Ms. M and the researcher and liked learning new skills “a lot.” He responded that he liked earning rewards and stars “a little.” Henry felt that he learned important things like “big words.” He indicated “Yes” to whether he used the skills he learned in the special group, but couldn’t tell where he used these skills. In response to whether he wished the program could have lasted longer, Henry responded with a “yes” and said he would like to have met for another year.

**Student 2: Kevin.** Kevin responded with less ambiguity than Henry. He indicated that he liked being part of the special group, and liked playing games the best. Kevin not only liked being part of the group, but also indicated that he liked spending time with Ms. M and the researcher, earning rewards/ stars, and learning new skills “a lot.” However, when asked if he felt he learned important things, Kevin said, “no.” Kevin indicated that
he learned things that will help him “a lot” in doing better work in school and at home. He indicated that he used the skills he learned with Ms. G, his classroom teacher who also taught reading. Kevin indicated that he wished the special group had lasted “a little bit” longer.

Student 3: Daryl. Daryl moved out of the school before the interviews, hence, social validity information was not available.

Student 4: Richie. On the Student Participant Interview, Richie responded positively to questions pertaining to his participation in the special group. He indicated that he liked “doing the letters” the best about the group. Richie liked being part of the group, spending time with Ms. M and the researcher in the group, earning rewards/stars, and learning new skills “a lot.” When asked about some important things that he learned, he said, “words.” When asked to clarify what he meant, he said that he liked saying the letters (of the alphabet). Richie shared that the special group/program was fun.

Student 5: Zach. In response to whether he liked being in the special group/program, Zach responded with a “yes.” He shared that he liked the letters the best. He indicated that he liked being part of the group, spending time with Ms. M and the researcher, earning rewards/stars, and learning new skills “a lot.” He reported that he learned important things like ABC’s and words. Zach indicated that he learned things that would help him “a lot” both at school and at home. Zach wished the group could have lasted longer, at least until his sixth birthday in August!

Student 6: Isha. Like many of the other target students, Isha indicated that she liked being in the special group. Playing games was an activity she liked the best, she said. Isha responded that she liked being part of the group, spending time with the
teachers, earning rewards/ stars, and learning new skills “a lot.” She felt that she learned important things, however, when asked the most important thing(s) she learned, Isha said, “do words.” Isha reported that she learned things that would help her “a little” do better work in school and at home. She acknowledged that she used the newly acquired skills both at home and at school. She wished the special group lasted for another two years. Isha indicated that she “liked doing work and fun stuff.”

Student 7: James. In response to the questions on the interview, James gave positive responses for all questions. He indicated that he liked being part of the special group. He liked writing words and tracing the words the best. James liked being part of the special group, spending time with Ms. M and the researcher, earning rewards/ stars, and learning new skills “a lot.” He felt that he learned important things, but didn’t respond to what the “things” he learned were. James reported that he learned things that would help “a lot” in doing better in school and at home. He shared that he used the skills learned in the special group, especially when doing homework. James indicated that he wished the group lasted longer. When asked how much longer, he said “a whole bunch” longer. He also shared that he liked rolling dice when playing the games.

Student 8: Mark. Mark responded that he liked being part of the special group. Saying the sounds was something he liked best about the group. Mark indicated that he liked spending time with Ms. M and the researcher in the group, earning rewards/ stars, and learning new skills “a lot.” He felt that he learned important things, things like saying sounds and words. Mark acknowledged that the things he learned help him “a lot” in doing better work in school and at home. He said he used the skills he learned in the group when he is the room with Ms. G (the teacher who conducts reading instruction).
Mark reported that he wished the group lasted forever, and that he liked the pictures presented in the group.

An item-by-item summary of responses to yes/no and multiple-choice items are summarized in Table 4. 12.
Multiple-choice questions.

Did you like:

A. Being part of the group?
B. Spending time with Ms. M and the researcher?
C. Earning rewards/ stars?
D. Learning new skills?

Multiple-choice questions.

Did you learn things that will help you do better work:

A. In school
B. At home

Yes/ No Questions.

A. Did you like being in this special group/ program?
B. Do you feel you learned important things?
C. Do you use the skills that you learned in the special program/ group?
D. Do you wish the group/ program could have lasted longer?

Table 4.12: Results of social validity student interview.
CHAPTER 5

DISCUSSION

This study examined the effects of a prevention-based early reading intervention on the phonemic awareness and letter-sound correspondence skills of seven kindergarten students and one first-grade student attending an urban elementary school. The students were identified as being “at risk” for reading failure based on benchmark assessments administered at the beginning of the school year. The students received supplemental reading instruction in small group or one-on-one settings. This chapter provides a discussion of the results as it relates to the five research questions. Limitations of the study, implication for practice, and directions for future research are discussed. The chapter concludes with a summary of the study.

Research Question One

What are the effects of supplemental reading instruction (i.e., the Early Reading Intervention - ERI), on the phoneme-segmentation skills of kindergarten and first grade target students as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS)?
A review of the data for each of the eight target student (Figures 4.2 and 4.3), using a multiple-baseline-across-subjects design, show that the ERI had positive effects on the phoneme segmentation fluency of all eight target students. During the baseline condition, students in the first group exhibited stable and low levels of responding on the PSF task. Daryl and Kevin, in particular, showed zero or low levels of responding in baseline. Henry, on the other hand, had a slight increase in data on the last probe in baseline condition; however, his mean score during baseline was similar to Kevin (i.e., 0.6 phonemes). There was a gradual yet steady increase in Henry’s data once the intervention was implemented. Although not as dramatic as Henry’s data, Daryl and Kevin’s intervention data also showed an accelerating trend. Kevin continued to respond at zero levels shortly after entering intervention condition, however, a change in responding was observed by the fourth week in intervention. While Henry, Kevin, and Daryl were in intervention, Richie, Zach, Isha, James, and Mark’s data in baseline condition remained unchanged. That is, the students continued to exhibit stable levels of responding. The fact that the baseline data for these students did not change provide strong evidence of internal validity that the changes seen in Henry, Kevin, and Daryl’s responding behavior were in fact due to the intervention.

Richie and Zach were the next to enter the intervention condition. As seen with Kevin, a change in Richie’s responding behavior was not observed until the fourth week into intervention. There was an immediate change in Zach’s data in the intervention condition showing an increase in the phoneme segmentation task. A similar pattern was evidenced when the final group of students (Isha, James, and Mark) entered the intervention condition. That is, there was an increase or upward trend in levels of
responding with the phoneme-segmentation fluency. A functional relationship was seen between the independent variable and the dependent variable (phoneme segmentation fluency). The data across the eight target students show evidence of prediction, verification, and replication of the positive effects of the ERI on students’ phoneme segmentation fluency skills. Particularly, the change in student responding upon entering intervention is a verification of the prediction that there would be no change or increase in student responding until the intervention was implemented. This pattern seen across all target students is evidence of replication of results. James’ data is particularly interesting where although his data was variable it reached a steady state in baseline; however, there was a steep increase in data in intervention condition with no overlapping data points.

In addition to the visual inspection of data, results of mean baseline and intervention scores on the PSF measure (Table 4.4) indicate that with the exception of Richie who made the least progress, the target students made substantial gains in phoneme segmentation fluency upon receiving direct, explicit, and systematic instruction in phonological skills. These findings lend support to the contention that phonemic awareness can be taught to students as early as kindergarten. It must be noted that the target students were receiving the ERI in small groups in addition to the regular classroom reading intervention. These students were receiving phonemic awareness training as part of the LACES reading curriculum on a daily basis, and supplemental reading instruction in small groups three days a week. The gains observed with target students upon entering intervention makes a strong case for differentiated instruction. The target students were selected based on their poor levels of performance on the phoneme segmentation task. All seven-kindergarten students were categorized as being in the
“deficit” range for the PSF task at the start of the study. At the end of the study, four of the seven students (i.e., Henry, Isha, James, Mark) were no longer in the “deficit” range as they exceeded the end of year goal of 35 phonemes per minute. Kevin, Richie, and Zach were in the “emerging” category at the end of the study.

Although Richie’s limited progress in phoneme segmentation fluency cannot be attributed directly to his deficits in language skills, particularly receptive language skills; his data lend support to the assertion that there is a relationship between oral language knowledge/ability and early reading (Roth, Speece, & Cooper, 2002; Menyuk et al, 1991), and that children with language impairment may have slower ability of processing linguistic units (Menyuk et al, 1991). Richie was receiving speech therapy and explicit instruction in phonemic awareness; however, these interventions did not result in substantial gains with the phoneme segmentation task. Typically, it is a challenge for these students to bring to awareness the various aspects of language and the phoneme segmentation task required the auditory awareness of the phoneme as the linguistic unit. Richie made limited progress on this auditory task in comparison to the gains made by his peers. Rather than attribute his low performance to his speech and language impairment, Richie needs intensive instruction on a daily basis throughout the school year in order to successfully acquire reading skills. Varying the intensity of instruction based on students’ need is one form of differentiated instruction (Coyne et al, 2004).
Although descriptive in nature, comparison of group means of students who received the ERI and students who did not receive the ERI provides compelling evidence about the effectiveness of the intervention (see Figure 4.6). That is, the ERI students performed lower than their non-ERI peers on the winter PSF benchmark assessment, but outperformed their non-ERI peers on the spring PSF benchmark assessments. As shown in Table 4.6, the ERI group made a percentage gain of 95.8% in the four month period in comparison to the non-ERI group that made a percentage gain of 68.8%.

Deficits in phonological awareness have been identified as a source of reading difficulties. However, recent research has identified deficits in naming speed as being related to difficulties in learning to read (Wolf & Bowers, 1999). Studies have shown that students who have deficits in both phonological awareness and naming speed have significantly lower reading scores than students who have deficits in only one of these areas. Although rapid naming of letters was not a primary dependent variable in the current study, students were administered the Letter Naming Fluency (LNF; DIBELS, 2002) as part of the winter and spring benchmark assessments.

As shown in Table 4.5, it is interesting to note that out of the seven kindergarten students, three students (i.e., Kevin, Richie, and Zach) performed poorly on the LNF task on both winter and spring assessments. Kevin, Richie, and Zach not only failed to reach the spring goal of 40 letter names, but also failed to reach the winter goal of 27 letter names. These three students performed poorly and failed to reach goal on the PSF task and hence did not reach “benchmark” at the end of the year. In contrast, although Henry did not reach goal of the LNF in winter, he reached the spring goal. A pattern can be seen
where students who were proficient in rapid letter naming and phoneme segmentation tasks were the students who reached “benchmark” at the end of the year. These data provide support to the double-deficit hypothesis that the additive effect of deficits in both phonological awareness and letter naming can contribute to difficulties in learning to read. However, further research with both LNF and PSF as the primary dependent variables is needed to contribute to the research base.

Research Question Two

*What are the effects of supplemental reading instruction (i.e., the Early Reading Intervention - ERI), on the letter-sound correspondence and blending skills of kindergarten and first graders as measured by DIBELS?*

With the exception of James, whose data showed an increasing trend in baseline condition, data paths in Figure 4.2 and 4.3 show that the ERI had a positive effect on target students’ nonsense word fluency skills. Henry, Kevin, Daryl, and Richie’s baseline scores indicate zero levels of responding. However, a change in responding behavior is observed for Henry and Richie during the first week of intervention, and for Daryl during the second week of starting intervention. Similar to his performance on the PSF task, Kevin’s data evidence an increasing trend starting in the fifth week of intervention. With the exception of James, the data paths in baseline and intervention for all students indicate that a functional relationship was established between the ERI and the dependent variable (nonsense word fluency). James’s data on the NWF task showed an increasing upward trend during baseline. His performance continued to increase with intervention. By the end of the study, James identified over 60 letter sounds per minute. Although a
functional relationship could not be established for James’ NWF, it may be safe to assume that the intervention provided impetus for James to such high and rapid levels of responding. The data across the eight target students show evidence of prediction, verification, and replication of the positive effects of the ERI on students’ nonsense word fluency skills.

As mentioned earlier, letter naming and phonological awareness have been identified as the two best predictors of reading abilities in children. More recently, researchers are investigating the efficacy of letter-sound fluency as a predictor of future reading ability (Speece, Mills, Ritchey, & Hillman, 2003). Nonsense word fluency (NWF) measure, as used in this study, is known to be one type of letter-sound fluency task. Kaminski and Good (1998) report a predictive validity coefficient of .82 with NWF probes given in January of first grade with an oral reading fluency measure in spring of first grade. A letter-sound knowledge task such as the NWF measure not only requires knowledge of the letter names, but also requires an understanding of the alphabetic principle (i.e., grapheme-phoneme relations). In a study to assess the validity of the LNF and NWF measures as predictors of reading achievement, the authors concluded that NWF and LNF are valid measures of early reading status. Specifically, NWF is valid for children in the spring of kindergarten (Speece et al., 2003).
Ehri (1983), as cited in Speece et al. (2003), reported, “it was nearly impossible to teach prereaders the sounds of letters for which they did not already know the letter names” (p. 224). Comparing the results of LNF and NWF winter and spring assessments, provides strong support to the assertion that students need explicit instruction in letter sounds in order to acquire the skill. For example, prior to instruction, knowledge of letter names did not automatically correspond to knowledge of letter sounds. Students like James and Isha who reached the mid-year goal of 27 letter names on the LNF task could not identify letter sounds on the NWF task. However, following explicit and systematic instruction on these skills, using the ERI curriculum, all students were able to identify letter sounds in the NWF task as evidenced by spring benchmark scores. Five out of the seven students reached the end-of-year goal of 25 letter sounds per minute on the NWF task. Kevin and Richie did not reach their goal, but made substantial gains in comparison to their winter performance score of zero.

A comparison of group means for the ERI group and non-ERI group (see Table 4.6 and Figure 4.6) revealed that although the ERI students as a group performed lower than the non-ERI group on the winter benchmark assessments, they surpassed the performance of the non-ERI group on the spring benchmark assessments. The ERI group made a percentage gain of 94.1% in comparison to the non-ERI that made a percentage gain of 55.6% in a four month period.

Each student differs in his or her response to instruction. Al Otaiba and Fuchs (2002) described learner characteristics of children who were unresponsive to generally effective early literacy instruction. The authors reported that about 8 to 80 percent of
students in the 23 studies they reviewed were nonresponders. However, it should be noted that the definition used to define unresponsiveness varied across studies. Based on the gains made by students in this study, Kevin and particularly Richie, could be considered as nonresponders. Since performance level is said to be insensitive to students’ growth, it may be more meaningful to discuss treatment unresponsiveness as it relates to treatment duration, treatment intensity, and skill levels of trainer rather than to learner characteristics (Al Otaiba & Fuchs, 2002). Said differently, instead of suggesting that Richie and Kevin were unresponsive to instruction due to the phonological deficits or letter-knowledge deficits, it can be speculated that these students would have made greater gains if they received daily intensive instruction, throughout the school year by a highly trained teacher.

Research Question Three

*What effect did supplemental instruction (i.e., ERI) have on student benchmark scores?*

With the exception of Daryl, benchmark assessments were administered three times during the school year to all kindergarten students. The Autumn assessments were administered in October, Winter assessments in January (just prior to collecting baseline data), and Spring assessments were administered in May (following the completion of study). The DIBELS benchmark goals were established by combining a level of skill and a timeline for acquisition of the skill as it related to the “big ideas” in beginning reading (Good, Simmons, & Kame’enui, 2001). For example, PSF provided an indication of phonological awareness skills necessary by spring of kindergarten. Good, Simmons, and Kame’enui contend that in addition to knowing which skills are critical for early reading,
it is important that teachers also know how proficient the students should be in these skills. The DIBELS benchmark goals serve as indicators to inform instruction.

As presented in Table 4.5, five out of the seven students needed strategic intervention as recommended by the DIBELS data system and two students needed intensive instruction in the Fall. None of the target students reached goal on both Initial Sound Fluency (ISF) and Letter Naming Fluency (LNF) at the beginning of Kindergarten. On the winter assessments, five out of the seven kindergarten students needed intensive instruction as recommended by the DIBELS data system. These students were considered “at risk” for future reading difficulties based on their performance on the Initial Sound Fluency (ISF), Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF). Isha and James needed strategic instruction. Although the winter assessments were administered three months after the autumn assessments, the students’ scores did not change substantially or at a commensurate pace, thus continuing them in the “at risk” status. For example, Henry identified zero initial sounds and 3 letter names in the fall. At the winter assessment, Henry identified 6 initial sounds and 24 letter names. Similarly, Kevin scored 6 initial sounds and zero letter names in the Fall, and his scores increased minimally to 7 initial sounds and 10 letter names in the Winter. The limited progress or lack of progress on the ISF and LNF measures from Fall in Winter for the target students makes a strong case for the need to intervene as early as possible after an initial screening at the beginning of the year. These students were receiving instruction in reading with the LACES curriculum, however, that instruction was not intensive enough for the students make progress towards meeting the winter goals.
On the other hand, the increases in students scores evidenced from Winter to Spring assessments was substantial. At the end of the study, four out of the seven students (i.e., Henry, Isha, James, and Mark) reached “benchmark” goals on LNF, PSF, and NWF measures. Zach reached end-of-the-year goals on the NWF measure with a recommendation for “strategic” intervention. Kevin and Richie did not reach goal on all three measures placing them in the “at risk” status needing intensive instruction. Overall, the supplemental instruction (i.e., ERI) provided three days a week for 8-16 weeks was effective in helping four students reach benchmark goals. The instruction provided in this study was probably too small a dose to dramatically change the reading trajectories for students like Richie and Kevin in the coming academic year, but it does appear to have been an important factor in the decision-making process on grade retention or promotion. In March of the school year, the classroom teacher, assistant teacher, and school principal were seriously considering retaining Kevin and Richie; however, the progress these two students made from the ERI instruction, led the school personnel to decide not to retain these two students. As verified by the school personnel, the instruction Richie and Kevin received during this study provides a starting point for more intensive instruction. The results of the study indicate that these students can be taught critical skills, and that the increased intensity and duration of such interventions for students like Kevin and Richie cannot be overemphasized. As noted by O’Connor, Jenkins, and Slocum (1995), “efficiency of instruction is important for all children and critical for children at risk for reading failure, who may have more to learn in less time than their peers” (p. 214). It would be wise to concentrate teaching efforts on the specific skills as they relate to the
“big ideas” in beginning reading in order to improve the developmental reading trajectories of these students.

Research Question Four

As a measure of social validity, to what extent will classroom teachers view the supplemental instruction as beneficial to their students and effectively administered?

Two participating teachers and one instructional assistant (IA) returned the completed social validity questionnaires. In general, the responses obtained from the teachers and IA were positive regarding the appropriateness and usefulness of the target skills, the appropriateness of procedures and the outcomes of the study. Particularly, the kindergarten teacher reported that she liked the intense focus on one letter at a time and the review aspect where all previously learned letters were reviewed regularly. She agreed that she would continue the reading intervention if taught by her instructional assistant, and would recommend the instruction to others. In contrast, the first grade teacher agreed that she would continue the reading intervention if taught by an instructional assistant, but was neutral in her response to whether she would recommend the program to others. In response to what they did not like about the intervention, the kindergarten teacher reported that she did not like that the letters taught during ERI and the letters taught with the LACES program occurred at different times. The first grade teacher felt that the activities and results of the program should have been shared more often. One interpretation of this slight difference in opinion can be attributed to the level of teacher involvement in the study. The kindergarten teacher was in close proximity to the ERI setting (i.e., adjacent classroom) and had seven students who participated in
instruction. Therefore the kindergarten teacher had the opportunity to observe and interact more often with the researcher on a regular basis. On the other hand, the first grade teacher was busy with classroom instruction at the time when Daryl, her first grader, participated in the ERI. She never got the opportunity to observe the reading instruction first-hand. Although the researcher shared Daryl’s progress with her, the teacher was not present for any of the periodic meetings. Shortly after Daryl moved out of the school two weeks before the completion of the study, the first grade teacher went on maternity leave. Since the ERI is designed to be a “pull out” instructional program, typically taught by someone other than the classroom teacher, the opportunities to thoroughly inform the teachers of the lessons or pupil progress are often limited. Nevertheless, the classroom teacher’s role is critical to reinforcing these skills and to maintaining the cooperation needed to continue the student in the treatment. Therefore, a more conscious effort needed to be made in this study and in future interventions to involve the classroom teacher, even if the teacher has only one student participating in the study.

The IA, Ms. M, agreed that the reading intervention was effective in improving the students’ overall performance. She indicated that she would use the reading intervention again and would recommend it to others. On several occasions, Ms. M stated that she was very pleased with the progress that the students were making with the reading instruction. She liked the scripted lessons the best as they gave her a consistent way to introduce the letter names and sounds, and also provided systematic error correction. As a result of her participation in the study and the gains that the students made, Ms. M made a request to the principal that she receive a copy of this curriculum to
continue instruction with the “at risk” kindergarten students in the next academic year. Based on the end-of-the-year conversation between the school and the university project staff, it is highly likely that the early reading intervention efforts will continue in the kindergarten classroom next year.

Prevention in the form of differentiated classroom instruction is one of the most effective forms of early intervention (Foorman & Moats, 2004). However, one of the persistent problems is engaging the classroom teachers in continuous progress monitoring and linking the results of the assessment to instruction. In the event that the classroom teachers cannot be released from their large-group instructional activities to provide differentiated instruction to students who need small group instruction or one-on-one instruction, employing instructional assistants to assume this role is a viable alternative. Integrity measures collected during the co-teaching sessions and also when the IA taught independently revealed that the intervention was implemented with strong fidelity.

Research Question Five

To what extent will students and parents rate the supplemental instruction as enjoyable (students) and beneficial (parents and students)?

Five out of the seven kindergarten parents returned the completed parent form of the social validity questionnaires. Seven target students were interviewed at the end of the study. The responses from the parents regarding the goals and outcomes of the early reading intervention were very positive. Parents’ strongly agreed that their children needed additional instruction in reading at the beginning of the school year and that the ERI was effective in teaching their children some key reading skills. All parents who
responded expressed an interest for their children to continue receiving supplemental reading instruction next year and were glad that their child participated in the program. Although the parents did not observe their children engaged in reading instruction, many of them saw their children making progress. One parent commented that earlier her son didn’t understand the concept of reading but now she felt that he could sound out and recognize words. Another parent acknowledged that his son exhibited better letter and syllable recognition as a result of the ERI. One parent felt that her child had made so much improvement that she suspected that her child might be reading at the second grade level.

The seven students expressed positive attitudes towards the reading groups. The students acknowledged that they learned important things like “saying sounds and words,” “do words,” and “Abc’s and words.” Henry was the only student who responded that he did not like being in the special program. Henry was one student who participated in small group instruction for the first six weeks in intervention and then received one-on-one instruction by the researcher. One possible reason for his less than positive response may have been due to the fact that most of his instruction was not in a group and this meant that Henry had no opportunity to remain off task. This may also have been a reason for his response, “it had hard words.” Needless to say, the active responding and increased on-task behavior that Henry engaged in during instruction paid off superbly as noted by the tremendous gains he made during the course of the study. Although outside the bounds of this study, the remarkable gains made by Henry raises the question of whether the other students similarly would have increased their scores if taught individually instead of in small groups. Individualized instruction allows for many more
opportunities to respond to the academic material; an opportunity that might be especially beneficial for slower students like Kevin and Richie. One possibility in a future study is to resort to individualized instruction for those students who fail to reach winter benchmarks after the first semester of instruction. All seven students indicated that they enjoyed spending time with Ms. M and the researcher in the group; they liked earning rewards and stars, and liked learning new skills. The students also uniformly reported that they wished the special group lasted longer.

The instructional materials such as picture cards, alphabet cards, letter tiles, games and accompanying activities of the ERI curriculum were attractive to the students. They particularly liked playing the games that was a learning activity in itself. In general, students thought the ERI group was fun and they learned important “stuff.” The ERI in small group instruction was unique with its various components and stood out among other class activities to such an extent that non-target students approached the researcher and IA almost during every lesson to ask if they could be part of the group. The instruction in this study was provided during “intervention time” of the LACES literacy block. This time came to be available due to staffing issues. However, if providing differentiated instruction is built into the literacy instruction on a school-wide basis, then more students who have “strategic” and “intensive” instruction needs can benefit from participating in such a group.
Limitations of the Study

Despite the positive effects of the ERI on the students’ phonemic awareness and alphabetic principle, this study presents some limitations that warrant further discussion.

Duration of Instruction

The ERI curriculum is prescribed for 30 minutes a day on a daily basis. Due to several practical constraints like time available to work in the school settings, students in this study received instruction three times a week with each session lasting about 20 minutes. Implementing the ERI with fewer than the prescribed weekly lessons is a limitation of this study. It would interesting to see if the results would have been even more positive, particularly for those students who failed to reach benchmark, if they had received systematic instruction on a daily basis for the entire 30 minute period, for 8 instead of 4 months. This shortened allocated time forced the researcher to truncate the lessons. For example, because certain activities in a lesson take primacy over other activities and more time needs to be spent on some activities than others, the game that accompanied the fourth activity in each lesson had to be deleted on most days. That is, the researcher skipped playing the game and played it only if there was additional time. Eliminating the game meant the students lost a few more opportunities to make academic responses.

Lack of Language Assessments

Another limitation of the study is the lack of language assessments conducted prior to and at the end of the study to determine if: (a) students had the age-appropriate language skills (both expressive and receptive) to participate in this study, and (b) the extent to which, if any, instruction in phonemic awareness contributed to the students’
language skills. Roth, Speece, and Cooper (2002) contend that in addition to the influence of phonemic awareness on reading, structural language comprising of semantics, morphology, and syntax is related to the development of reading ability. In a longitudinal study to clarify the relationship between oral language and beginning reading with 88 kindergarteners, the authors reported that although phonological awareness skill measured in kindergarten predicted word and pseudoword reading in first and second grades, it did not predict reading comprehension in first and second grades. In fact, Speece et al found that semantic knowledge in combination with print awareness was a more compelling predictor of reading comprehension in first and second grades than phonological awareness. Since it has been ascertained that there is a relation between a child’s degree of language delay and the degree of reading ability, a standardized assessment such as the Peabody Picture Vocabulary Test – Revised (PPVT; Dunn & Dunn, 1981) that measures receptive and expressive vocabulary can help assess the possibility that a student’s lack of progress with phonemic awareness instruction is due to language deficits. Similarly, a hearing test at the beginning of the study for kindergarten students will also eliminate auditory difficulties as the inability to bring to awareness the sounds in words.

Co-teaching Format

In any professional development or teacher training session, the time spent in modeling instruction or training the teachers is often limited. In this study the co-teaching format where the researcher and instructional assistant conducted the ERI lessons is a limitation in some respects. In its initial stages, the intention of the study was for the researcher to train the instructional assistant who would later conduct sessions.
independently. However, due to the fact that the IA could not be freed from other duties on certain days and finding a substitute would be difficult, the researcher assumed the role of a co-teacher. There are two explanations for why the co-teaching continued for a four-month period. First, it was done to maintain a certain degree of consistency in the delivery of instruction. Second and most importantly, it was done so that the students were not “shortchanged” from receiving the help they needed to acquire reading skills. In an ideal situation, the co-teaching format would have involved one or two weeks of training period, after which point the IA would have independently implemented the instruction. The students receiving instruction solely from the IA would have provided a more natural learning environment than to receive instruction from both the IA and the researcher. Furthermore, it is important to study if the ERI, implemented by regular school personnel, would produce similar findings.

Student Grouping

Although the study was designed to provide instruction in small groups, due to higher performance levels, Henry received most of his instruction in a one-on-one setting. It can be argued that the individualized attention that Henry received during the study may have contributed to the dramatic gains in both PSF and NWF tasks. Whereas having children with varied instructional needs is common on all classrooms, finding the resources (i.e., time and persons) to cater to the student’s needs is not always easy to find. Due to the limited time allotted for reading instruction, it was not possible for the IA to spend an additional 20 minutes with Henry. In order to maintain continuity, the researcher worked with Henry individually. Allocating resources within the classroom more wisely will address personnel shortage issues in the future.
Implications for Practice

The findings of this study have important classroom implications for effective instruction and the prevention of learning problems in young children. This section is organized into the following topics: (a) identifying students at-risk, (b) providing differentiated instruction, (c) instructional grouping, (d) teacher training, (e) school wide approach, and (f) support and guidance.

Identifying Students At-risk

Findings from reading research indicate that delays in phonological awareness and deficits in reading can be reliably identified and measured in young children (Smith, Simmons, & Kame’enui, 1998; Hatcher, Hulmes, & Snowling, 2004). The importance of identifying at-risk learners in urban schools cannot be overstated, since many evidence serious language delays upon entering school. Intense specialized instruction should be reserved for those with deficits, since skill sufficient students are not likely to benefit from this additional instruction. Hatcher and colleagues contend that the three variables important in identifying children at risk of reading failure are phonological awareness, letter knowledge, and vocabulary. Thus, teachers in elementary grades should conduct a series of skill-specific assessments to assess students’ skill level in phonemic awareness. An assessment measure such as the Dynamic Indicators of Basic Literacy Skills (DIBELS) (Good & Kaminski, 2002) can be used as a screening measure to identify students who need intensive instruction in basic literacy skills. When completed at the beginning of the school year, teachers can group their students based on their instructional needs and provide intensive instruction to those identified as at-risk. For example, based on the Fall benchmark scores, target students in this study should have
received intensive instruction beginning in the Fall instead of the Winter. Teachers may need to tap into resources outside the classroom to provide differentiated instruction for at risk students.

*Providing Differentiated Instruction*

Coyne, Kameenui, Simmons, and Harn (2004) provide an excellent case for the need for differentiated classroom instruction. A “one size fits all” approach may not be appropriate with the wide range of performance that exists in schools today. For example, Henry, Kevin, and Daryl started with Part 1 – Lesson 1 and Isha, James, and Mark started with Part 2 – Lesson 43. The students were placed in the respective groups based on their performance on the ERI’s placement test. If Isha, James, and Mark received instruction from lessons in Part 1 it would be redundant and a waste of valuable instructional time. By the same token, presenting Kevin and Daryl with instruction from Part 2 or 3 prior to their mastering the material in Part 1 would be a futile experience. Foorman et al (1998) propose a classroom change model that is characterized by providing the best possible instruction in the classroom to minimize the need for remedial services. The authors make reference to Slavin et al’s continuous progress models in which the students are placed in groups based on skill levels with the provision of being regrouped upon making progress. For example, Henry had to be moved from his initial group to receive individualized instruction based on his progress on dependent measures. Assessing students periodically and linking the intervention to the results of the assessment becomes an essential element of effective instruction.
Another way to differentiate instruction is to vary the intensity of instructional support (Coyne et al., 2004). For example, students who have already mastered phonological and alphabetic skills can receive minimal support in these skills as review or practice in comparison to other students who may need more intensive instruction in order to gain mastery over the skills. In urban classrooms where more than 50% of the students evidence a need for such instruction, it may be necessary to prepare additional personnel such as teacher assistants to aid in providing this instruction to students.

**Instructional Grouping**

The teacher-to-student ratio in an instructional setting plays an important role in students’ learning outcomes. Evidence supports the efficacy of small group instruction in general education classrooms, special education classrooms, and supplemental reading programs (Vaughn, Linan-Thompson, Kouzekanani, Bryant, Dickson et al., 2003). The size of the intervention group has direct implications on the available resources and the number of students who can receive individualized instruction at one given time. In an effort to maximize time and resources, teachers need to group students in their class in order to cater to the specific needs of the students in each group. Small group instructional formats not only allow more students to receive supplemental instruction, but also provide opportunities for increased academic responses and academic engaged time. More research that investigates the effectiveness of one-on-one versus small group instruction on reading outcomes is needed to ascertain the optimal type of instructional grouping for supplemental reading programs. Again, considering the greater need in urban classrooms, teacher assistants might be prepared and employed to help serve in this capacity. For example, while the classroom teacher is teaching a small group of students...
on how to segment phonemes within a word, the teacher assistant can be involved with another group of students who need to learn how to identify the initial sounds (phonemes) in words. As an alternative, as shown in this study, if the classroom teacher is engaged in large group instruction, then the instructional assistant can conduct reading interventions for small groups of students who need more intensive help.

_Teacher Training_

The dichotomy brought about by the reading wars of whole-language versus phonics based approaches is perpetuated when general education teachers are prepared in holistic teaching methods despite research on phonemic awareness showing that direct instruction in teaching the critical phonological skills is most effective. Without providing explicit training, when teachers were asked to implement some of the commonly suggested phonemic awareness classroom activities, Abbott, Walton, and Greenwood (2002) found that experienced teachers lacked the basic knowledge of phonemic awareness concepts and skills and thus were unable to implement the corresponding instructional activities. Because all teachers, both in general and special education, must be prepared in instructional methods that foster student learning in beginning reading instruction, teacher preparation programs need to include direct instruction strategies that include essential components of explicit and systematic methods. As Kame’enui (1993) aptly said, “before reading educators collaborate with ‘other service providers,’ they must collaborate with one another” (p. 382).

Although Ms. M was trained to implement the reading intervention in this study, more training and practice on the small yet important components of instructional delivery (i.e., delivering praise, pacing) would be needed if she were to teach
independently. The literature on teacher efficacy suggests that teachers’ perceptions of preparedness and knowledge of the subject area play an important role in improving students’ outcomes. Teachers need to “possess the foundational knowledge necessary for providing early systematic reading instruction” (Bos, Mather, Dickson, Podhajski et al., 2001). Also, if instructional assistants are considered for fulfilling the role of reading instructors, then the training would encompass not only theoretical information about the process of reading but also the practical “know how” of teaching students. These issues need to be addressed at both the preservice and inservice levels.

**Systems Wide Approach**

In order to bring about a dramatic improvement in the reading scores of children in urban schools, districts need to develop school-wide initiatives for preventing reading failure. Directing efforts to improve reading performance system wide will ensure that all students in every building are taught to read, including students at risk for reading failure and reading disabilities. The success of such a model is dependent on three interrelated areas:

(4) the school-wide establishment of long-term reading goals and intermediate performance benchmarks,

(5) the early identification and frequent monitoring of students experiencing reading difficulties, and

(6) the development of coordinated and differentiated instructional interventions for the full range of learners.

(Coyne, Kame’enui, & Simmons, 2001, p. 69)
Central database. A database that includes results of periodic assessments conducted at the individual, classroom, and schoolwide level will enable each school to make informed decisions about the effectiveness of their reading programs beginning in kindergarten. A school district can gain valuable information on the effectiveness of procedures at the individual, school-wide, and district level. This accountability allows schools to be better prepared to respond to the individual needs of the children and step back to view the magnitude of the problem at hand. A review of the database across classrooms will also serve as a “spot check” on whether the programs are being implemented as intended by the teachers. For instance, if students in one first-grade classroom are showing no progress in targeted skills, supervisors/administrators would conduct more detailed investigations to ensure that the teacher is implementing the program with fidelity. Progressive monitoring on a weekly basis is imperative in urban settings. Valuable teaching time cannot be wasted and these students require effective intense instruction if there is any hope that they will become competent readers.

Support and Guidance

One of the many reasons for the gap that exists between research and practice results from teachers not having the time or the resources to read and translate research activities into effective step-by-step classroom strategies. One forum for teachers to gain access to such procedures is in their teacher training programs. The other forum is one- to two-day inservice workshops organized by school districts. However, once the inservice consultants leave, teachers are on their own to “figure things out.” Instead, if school districts employ a person specifically to carry out the role of a coach or consultant, then teachers will more effectively implement the new practices. For example, phonemic
knowledge that there are three phonemes in the word *ship* does not come easily even to adults (Perfetti, Beck, Bell, & Hughes, 1987). Teachers will have to undergo training in the phonemic structure of language before taking up the task of teaching children. Therefore, coaches or consultants play a critical role in urban school reading reform. They must not only be highly knowledgeable in teaching phonemic awareness skills but also be skillful in working with teachers using the same lead-model-test paradigm prescribed for instruction. Just as students need guided support in learning new concepts, teachers also need constant support and feedback on new instructional methods to ensure maximum effectiveness.

One of the common themes among schools that “beat the odds” is strong instructional leadership and accountability (Denton, Foorman, & Mathes, 2003). Leadership can come directly from the principal or the reading specialist/coach who works with teams of teachers on a regular basis to review the goals, analyze the assessment results, collectively arrive at next steps and design a plan of action. The leader will also ensure that teachers are given positive and constructive feedback and are acknowledged and rewarded for their efforts. Urban schools, which are noted for frequent turnover in administrative staff, need to be committed to securing “highly qualified” instructional leaders who are retained in these positions for a sufficient period to substantially improve the reading performance of their students. The support and guidance provided by the leaders can help retain and motivate highly qualified teachers.
Directions for Future Research

Conducting independent studies to evaluate the effects of commercially available, empirically validated, supplemental reading programs is of particular interest to educators, administrators, and policy makers. There is no end to studying the different components of evidence-based reading instruction. However, some directions for future research as an offshoot from this study are identified and discussed. One direction for future research is for the reading program to be implemented by highly trained teachers or paraprofessionals on a daily basis, starting at the beginning of kindergarten and following-up with these students through first and second grade. Such an investigation can serve as a longitudinal study to examine the role of instruction within the realm of the three levels of prevention (i.e., primary, secondary, and tertiary), and to examine the percentage of students who will read at grade level in second grade.

Academic failure, especially in the area of reading exacerbates the behavior problems in students as early as kindergarten and first grade. Although the exact nature of the relationship between low-achievement and behavior problems is unknown, Kauffman (1997; as cited in Gable, Hendrickson, Tonelson, & Van Acker, 2002) asserts that the two go hand-in-hand. Learning difficulties and social/ emotional problems in children are said to develop concurrently (O’Shaughnessy, Lane, Gresham, & Beebe-Frankenberger, 2002). General and specific patterns of disruptive behavior enter the students’ repertoire during the early elementary years and increase in severity depending on other negative school experiences. Another interesting direction for future research is to measure the effects of the early reading intervention on the behavior of students identified as at-risk for both academic and behavioral problems. The notion that patterns of disruptive

166
behavior become apparent due to the student’s frustration with the academic content can be examined. For students identified as at-risk for both academic and behavior problems, the hypothesis that improvements in the academic domain will result in improvements in the behavioral domain can be tested in such a study.

Fuchs, Fuchs, Thompson, Al Otaiba, Yen et al (2001) demonstrated that combining phonological awareness training with decoding instruction strengthens beginning reading performance in kindergarten students. The authors designed the decoding instruction in the form of peer-mediated instruction. A direction for future research in the area of beginning reading instruction for at risk learners is to provide supplemental reading instruction using an evidence-based reading program and complementing that with review of letter names and letter sounds practice in a peer-tutoring format. Fuchs et al suggest that using peer tutoring with young children has the potential for accelerating student achievement with its various components that comply with general principles of effective instruction (i.e., frequent opportunities to respond, immediate error correction and feedback, reinforcement and praise). A final direction for research is to conduct the reading intervention programs with preschool children and study students’ growth in reading through second grade.

Summary

This study describes the effects of supplemental reading instruction on critical beginning reading skills of eight kindergarten and first-grade students at risk of reading failure. The students were selected based on their low scores on the beginning-of-the-year benchmark assessments and teacher nominations. The researcher collaborated with the kindergarten instructional assistant to provide the reading instruction in a small group
setting. Target students received twenty minutes of supplemental instruction using the Early Reading Intervention (ERI) three days a week for 16, 12, or 8 weeks. A multiple-baseline-across-subjects design was used to analyze the effects of the instruction on students’ phoneme segmentation fluency (PSF) and nonsense word fluency (NWF) skills.

The results of the study showed that all target students made substantial gains in the area of phonemic awareness and alphabetic principle. The first grade student moved out of the school prior to the completion of the study. Four of the seven kindergarten students reached end-of-the-year benchmark goals and were identified as performing “at grade level” at the end of the study. Of the remaining three students, one student needed “strategic” intervention and two students continued to need “intensive” instruction at the end of the study. Social validity assessments in the form of teacher and parent satisfaction surveys revealed that both the teachers and parents acknowledged the importance of providing additional reading instruction for the identified students. They attested to the effectiveness of the intervention as evidenced by student gains resulting from study participation. Interviews with the students revealed that all but one student enjoyed participating in the special reading group and felt that they learned important things.

This study examined the effects of a commercially available reading program on essential reading skills of kindergarten and first-grade students at risk for reading failure. This study contributes to existing research on the importance of early intervention in reading in more than one way. First, the study extends previous research by affirming the importance of phonemic awareness instruction in reading instruction. This investigation is one among a handful of studies attempting to bridge the research to practice gap by involving the kindergarten instructional assistant in providing instruction. Measurement
of treatment integrity revealed that with appropriate training and guidance, instructional assistants could be valuable resources in delivery of reading instruction for students at risk of reading failure. Finally, the outcomes of this study stand testimony to the fact that even “hard-to-teach” students can be taught how to read with explicit, intensive, and systematic instruction that comply with general principles of effective instruction.


APPENDICES
APPENDIX A

PARENT LETTER FOR PARTICIPATION
October 20, 2004

Dear Parent:

I am a professor in the college of education at The Ohio State University. My doctoral student, Shobana Musti, and I will be conducting a research project in your child's school. We wish to see if the use of academic instruction in essential reading skills, particularly instruction in phonemic awareness and alphabetic principle, will bring about improvements in both academic achievement and social adjustment. The focus of our project is to improve the reading scores of students in kindergarten and first grade. We will be using a prevention-based reading curriculum that provides instruction in some key areas of beginning reading.

We hope these strategies will prevent reading failure and help children to be more socially and academically successful in school. Your child’s classroom teacher and instructional aide will be closely involved in conducting the project, teaching and monitoring your child’s performance in reading skills. Your child will not be removed from any classroom instruction and will not lose any academic instructional time.

We also are requesting permission to videotape/photograph your child’s classroom. The purpose of these pictures is to demonstrate specific teaching and behavioral management strategies used by your child’s teacher. They will not be used to identify your child in any way. The tapes will be used in our teaching seminars to show other teachers how to implement these strategies. We need to demonstrate the use of these strategies in actual classrooms. If you do not consent to the photographs, we will locate your child outside the range of the camera but your child will remain in the classroom and continue with the classroom instructional activities.

We will review your child’s school records, and conduct periodic assessments to monitor his/her performance throughout the study. Data collected on your child will include both academic and social behavior. If available, we will get from your child’s classroom teacher the district-wide test scores. All information collected about your child will be confidential. No one other than the researchers will use this information and your child will not be identified in any way to others.

Both at the middle and before the end of the school year, we will ask parents to complete a questionnaire on how effective you feel this project was on your child’s academic and social performance. We expect the questionnaire to take about 10 minutes to complete. We will also interview your child to determine how your child feels about the behavior
management procedure. This informal interview will take approximately 15 minutes to complete and it will not take away any of your child’s academic learning time.

We are requesting your permission so that we might use your child’s academic and social performance as data in this study. We also are asking permission to include your child in our classroom videotapes or photographs. Permission is purely voluntary and the decision not to permit this access will not affect the way your child will be treated or graded at school. Should you consent, please know that you can choose to withdraw your permission at any time during this project. If you have questions, please feel free to contact me at 292-7629. Thank you for your attention and cooperation.

Sincerely,

Gwendolyn Cartledge, Ph.D.
Professor
APPENDIX B

PARENT CONSENT FOR PARTICIPATION IN EDUCATIONAL RESEARCH
CONSENT FOR PARTICIPATION IN SOCIAL AND BEHAVIORAL RESEARCH

Protocol title: “Improving the School Success for Urban Learners.”

Protocol number: Pending

Principal Investigator: Gwendolyn Cartledge

I consent to my child’s participation in research being conducted by Dr. Gwendolyn Cartledge of The Ohio State University and her assistants and associates.

The investigators have explained the purpose of the study, the procedures that will be followed, and the amount of time it will take. I understand the possible benefits, if any, of my child’s participation.

I know that my child can choose not to participate without penalty to me and/or my child. If I agree to participate, I can withdraw my child from the study at any time, and there will be no penalty.

I consent to the use of videotapes and photographs. I understand that these pictures will only be used to demonstrate classroom teaching practices. My child will not be identified by name and my child will be depicted in these tapes in positive ways.

I consent to the use of the following information from my child’s school records and academic records: attendance, individualized education plan (if any), medical reports (if any), classroom test scores, and benchmark evaluations.

I have had a chance to ask questions and to obtain answers to my questions. I can contact the investigators at (614) 292-7629. If I have questions about my rights as a research participant, I can call the Office of Research Risks Protection at (614) 688-4792.

I have read this form. I sign it freely and voluntarily. A copy has been given to me.

Print the name of the participant: ____________________________________________

Date: _____________________________  Signed: _____________________________

(Participant)

Signed: __________________________

(Principal Investigator or his/her authorized representative)

Signed: __________________________

(Person authorized to consent for participant, if required)

Witness: __________________________

(When required)
APPENDIX C

TEACHER PARTICIATION RECRUITMENT LETTER
October 20, 2004

Hubbard Elementary School
Columbus, Ohio 43215

Dear Teacher:

As you are aware, we are conducting a model research/inservice project designed to reduce disciplinary and SED referrals and to increase the school success of at-risk students in your school. One research component of this project is to conduct academic interventions for students at-risk of reading failure and study the effects of such intervention on both academic and social behavior. This letter is to request your participation in this research component of the project. It means you will be willing to implement the early reading intervention in your classroom for students who need intensive reading instruction.

My doctoral student, Shobana Musti, and I will be in collaboration with you on the assessment procedures, intervention development, implementation, and evaluation process. We will assist you in developing specific strategies that we all feel will best meet the needs of your students for this purpose. We will help you design the materials, where needed, and assist you in the classroom application. Shobana will visit you weekly, as needed, to assist with the implementation and to consult with you about the effects. One or two university students will also visit your classroom several times a week to collect data on student academic and social behaviors. In order to obtain comprehensive information about the behavior of your students selected for this research project, we will review your students’ school records, request their academic performance from you, and conduct interviews with your students.

We also hope to make videotapes and to take photographs of these strategies. We anticipate that setting up and implementing the research project will take 18 to 20 weeks. We plan to get parent permission to collect pupil data and to take pictures within your classroom. Both at the beginning and completion of the project we would like for you to complete a questionnaire evaluating its effects. Participation is totally voluntary and you should feel free to withdraw at any time. If you choose not to participate, it will not affect your position or involvement in other aspects of the project in any way.

I am available to discuss this research project with you in detail. You may reach me by telephone at 292-7629 or by e-mail at Cartledge.1@osu.edu. I look forward to discussing this with you further.

Sincerely,

Gwendolyn Cartledge
Professor and Principal Investigator
APPENDIX D

TEACHER CONSENT FORM FOR PARTICIPATION IN EDUCATIONAL RESEARCH
CONSENT FOR PARTICIPATION IN SOCIAL AND BEHAVIORAL RESEARCH

Protocol title: “Improving the School Success for Urban Learners.”

Protocol number: Pending

Principal Investigator: Gwendolyn Cartledge

I consent to my participation in research being conducted by Dr. Gwendolyn Cartledge of The Ohio State University and her assistants and associates.

The investigator has explained the purpose of the study, the procedures that will be followed, and the amount of time it will take. I understand the possible benefits, if any, of my participation.

I know that I can choose not to participate without penalty to me. If I agree to participate, I can withdraw from the study at any time, and there will be no penalty.

I consent to the use of videotapes and photographs. I understand that the tapes will be used for demonstration of classroom teaching practices for this project. I also consent to the use of the following information from my students’ academic records: test scores on the academic materials and other means of academic evaluations.

I have had a chance to ask questions and to obtain answers to my questions. I can contact the investigators at (614) 292-7629. If I have questions about my rights as a research participant, I can call the Office of Research Risks Protection at (614) 688-4792.

I have read this form or I have had it read to me. I sign it freely and voluntarily. A copy has been given to me.

Print the name of the participant:

____________________________________________________________

Date:  _____________________________________  Signed:  _______________________________________

Signed:  ___________________________________  Signed:  _______________________________________

(Principal Investigator or his/her authorized representative)  (Person authorized to consent for participant, if required)

Witness:  __________________________________

(When required)
APPENDIX E

CURRICULUM-BASED MEASUREMENT PRE- AND POSTTEST FORM
Weekly Pre- and Posttest Form

Student: ______________________ Grade: ___________ Intervention Week #: ____

Recording: Primary IOA ERI Lesson#: _____ Letter: _________

Note to tester: This is a generic test form. Present materials (letter cards, picture cards, letter tiles, etc.) that correspond to each lesson in the ERI you intend to target for assessment. **Circle** the trial if student responds correctly, and **place a cross mark** if student responds incorrectly.

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
</tbody>
</table>

1. What is the name of this letter? (3 trials)
   *You can present #1 and #2 in any order at any time during the assessment.*

2. What is the sound for this letter? (3 trials)

3. **Select 3 picture cards for this week’s target letter**
   This is a ________. What is this? (Student responds)
   What is the first sound in ____________?

4. **Present student with 3 letters.**
   Point to the letter that makes the “______” sound.

Total number of trials presented: __________

Total number of correct responses

Percentage correct = (Number of correct response / Total number of trials presented) \times 100

192
APPENDIX F

PROCEDURAL INTEGRITY CHECKLIST
**Procedural Integrity Checklist**

Implementer: _______________________  Observer: _______________________

Date: ____________  Time: ____________  Session: ______  Student group: ________

**Instructions:**

1. Time the length of the session as you collect procedural integrity data.
2. Indicate whether the implementer performs each of the following steps by checking the appropriate box.
3. Write comments, observations, or suggestions for improvement in the space provided.

<table>
<thead>
<tr>
<th>Step Description</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follows script</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Models the skill, provides practice before individually assessing student on skill (For example, says “The name of this letter is “m.” Say the name of the letter with me: “m.” What is the name of the letter?”)</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Uses manipulatives (e.g., alphabet cards, picture cards) as outlined in the lesson</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Provides immediate feedback/ error-correction (Example: says “Good” for correct responses, and provides correct response for incorrect responses)</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Provides students with individual turns when script requires it</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Delivers error-correction according to script</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Provides reinforcement (star card) approximately once every 5 minutes for appropriate behavior</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Delivers 20 minutes of lesson (+ or – 3 minutes) for group or at least 15 minutes for individual session</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

**Session Integrity =** \[\text{Number of steps completed} \times 100 \div \text{Total number of steps (8)}\]

Notes/ Comments: ________________________________________________________________

194
APPENDIX G

TEACHER PRE-INTERVENTION ACCEPTABILITY RATING SURVEY
Teacher Pre-Intervention Acceptability Rating Survey

Date: ______________   Intervention: **Early Reading Intervention**

Teacher: ______________   Grade Level: _______________________

For each item, please circle the number that most closely represents your opinion about the proposed intervention.

<table>
<thead>
<tr>
<th>The proposed intervention will:</th>
<th>Strongly Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fit into my regular schedule</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Supplement current classroom interventions</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Teach important skills</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Be a fair way to handle the problem</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Be appropriate given the problem</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Be suitable given the classroom culture</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Be easy to implement</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Be within my skill level to implement</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Improve the student’s skill</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Be acceptable to other students</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Have lasting positive effects</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Improve student’s overall performance</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments/ Opinions: __________________________________________________________

______________________________________________________________
APPENDIX H

TEACHER POST-INTERVENTION ACCEPTABILITY AND IMPORTANCE OF EFFECTS SURVEY
Teacher Post-Intervention Acceptability and Importance of Effects Survey

Date: ______________  Intervention: **Early Reading Intervention**

Teacher: _______________  Grade Level: _______________________

For each item, please circle the number that most closely represents your opinion about the proposed intervention.

<table>
<thead>
<tr>
<th>The reading intervention:</th>
<th>Strongly Disagree</th>
<th>Neutral</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fit into my regular schedule</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Supplemented my current classroom interventions</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Taught important skills</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Was a fair way to handle the problem</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Was appropriate given the problem</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Was suitable given the classroom culture</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Was easy to implement</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Was within my skill level to implement</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Improved the student’s skill</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Was acceptable to other students</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Will have lasting positive effects</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Improved student’s overall performance</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Is one I will use again when needed</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Is one I will recommend to others</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments/ Opinions: __________________________________________

____________________________________________________________
APPENDIX I

SOCIAL VALIDITY QUESTIONNAIRE – TEACHER FORM
## SOCIAL VALIDITY – TEACHER QUESTIONNAIRE

Teacher: _____________________  Grade: _________________  Date: ____________

Please indicate the extent to which you agree or disagree with each statement below by circling the appropriate number. Please write your responses for items 10-12.

<table>
<thead>
<tr>
<th>The reading intervention:</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fit into my regular schedule</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Supplemented my current classroom interventions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Taught important skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Was a fair way to handle the problem</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Was suitable given the classroom culture</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Will have lasting positive effects</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Is one I will use again when needed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Is one I will permit to continue if taught by someone else</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. Is one I will permit to continue if taught by my instructional assistant</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Is one I will recommend to others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

9. In your opinion, rate the effectiveness of the intervention for:

<table>
<thead>
<tr>
<th>Not at all Effective</th>
<th>Somewhat Effective</th>
<th>Neutral</th>
<th>Moderately Effective</th>
<th>Very Effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student 2</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student 3</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student 4</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student 5</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student 6</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student 7</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student 8</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10. What are some things you liked about the intervention program and why?

11. What are some things you did not like about the intervention program and why?

12. Additional comments:
May 10, 2005

Dear Parent/Guardian

As you are aware, your child has participated in small group instruction that focused on some essential reading skills since January of 2005. Your child was involved in 20 minutes of supplemental reading instruction three days a week. The kindergarten instructional assistant, Ms. _________, along with a graduate student from The Ohio State University, conducted the instruction.

We would like to know your opinion on how the Early Reading Intervention Program, in which your child participated, helped him/her. Please take a few minutes to complete the attached questionnaire. Any additional comments are always welcome.

Please return this questionnaire with your child by May 20th so that we could use your information to assess our reading program. If you have questions or would like to know more about our child’s progress, please feel free to contact me at 292-7629.

Thank you for your time and feedback.

Sincerely,

Project Staff
The Ohio State University
SOCIAL VALIDITY QUESTIONNAIRE – PARENT FORM

Child’s name: _____________________  Date: ____________

Parent’s name: ____________________

Please indicate the extent to which you agree or disagree with each statement below by circling the appropriate response. Please write your responses for items 7 and 8.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. At the beginning of the school year, I felt that my child needed</td>
<td>Strongly</td>
</tr>
<tr>
<td>academic support to be more successful at school</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td></td>
<td>Strongly</td>
</tr>
<tr>
<td>2. At the beginning of the school year, I felt that my child needed</td>
<td>Strongly</td>
</tr>
<tr>
<td>additional instruction in reading</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td></td>
<td>Strongly</td>
</tr>
<tr>
<td>3. I feel that the supplemental reading program is an effective way to</td>
<td>Strongly</td>
</tr>
<tr>
<td>address my child’s reading problems (if any)</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td></td>
<td>Strongly</td>
</tr>
<tr>
<td>4. I feel the Early Reading Intervention has been effective in teaching</td>
<td>Strongly</td>
</tr>
<tr>
<td>my child some key reading skills (e.g., letter names, letter sounds,</td>
<td>Disagree</td>
</tr>
<tr>
<td>phonemic awareness)</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td></td>
<td>Strongly</td>
</tr>
<tr>
<td>5. I would like my child to continue receiving supplemental reading</td>
<td>Strongly</td>
</tr>
<tr>
<td>instruction next year</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td></td>
<td>Strongly</td>
</tr>
<tr>
<td>6. I am glad my child participated in the reading intervention program</td>
<td>Strongly</td>
</tr>
<tr>
<td>this year</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
</tr>
<tr>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td></td>
<td>Strongly</td>
</tr>
</tbody>
</table>

7. What are some changes you see in your child’s reading ability now as compared to the beginning of the school year?

8. Additional comments:
APPENDIX K

CHILDREN’S SOCIAL VALIDITY INTERVIEW
Student Participant Interview

Student Participant: _______________ Interventionist: _______________________
Interviwer: _____________________ Date: _______________________________

1. Did you like being in this special group/program? _____ Yes _____ No

2. What did you like best about this special group/program? __________________________

________________________________________________________________________

3. Did you like………..

<table>
<thead>
<tr>
<th></th>
<th>Not Much</th>
<th>A Little</th>
<th>A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being part of the group?</td>
<td>☹️</td>
<td>☻</td>
<td>☻☻☻</td>
</tr>
<tr>
<td>Spending time with the Ms.</td>
<td>☹️</td>
<td>☻</td>
<td>☻☻☻</td>
</tr>
<tr>
<td>_____ in the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>group?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earning rewards/ stars?</td>
<td>☹️</td>
<td>☻</td>
<td>☻☻☻</td>
</tr>
<tr>
<td>Learning new skills?</td>
<td>☹️</td>
<td>☻</td>
<td>☻☻☻</td>
</tr>
</tbody>
</table>

4. Do you feel you learned important things? _______ Yes _______ No
   If yes, What is/ are the most important thing(s) you learned?
   ______________________________________________________________________

5. Did you learn things that will ………

<table>
<thead>
<tr>
<th></th>
<th>Not Much</th>
<th>A Little</th>
<th>A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help you do better work in school?</td>
<td>☹️</td>
<td>☻</td>
<td>☻☻☻</td>
</tr>
<tr>
<td>Help you at home?</td>
<td>☹️</td>
<td>☻</td>
<td>☻☻☻</td>
</tr>
</tbody>
</table>

   Do you use the skills that you learned in the special program/ group? ____Yes ___ No
   If yes, where do you use these skills? ______________________________________________________________________

6. Do you wish our group/ program could have lasted longer? (Clarify…..meet for more
   time,  like for another week?) _______ Yes ______ No
   If yes, how much longer would you like to have met? __________________________________________

7. Is there anything else you would like to tell me about your special group/ program?
   ______________________________________________________________________
APPENDIX L

SAMPLE LESSON FROM SCOTT FORESMAN

EARLY READING INTERVENTION
Lesson 15 Overview

New Sound /t/
Review Sounds /m/, /p/, /f/, /k/
Key Phonologic Skill Isolate Initial Sound

Phonological Awareness and Alphabetic Understanding

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Alphabetic Introduce /t/</td>
<td>Alphabetic Card: /t/ Letter Card: /t/ (one per child)</td>
<td>1-2 minutes</td>
</tr>
<tr>
<td>2. Integrated Phonologic/Alphabetic Which picture begins with /t/?</td>
<td>Picture Choices: 15-1, 15-2, 15-3 Teacher Resource Package 1 Alphabet Card: /t/</td>
<td>4-5 minutes</td>
</tr>
<tr>
<td>3. Integrated Phonologic/Alphabetic Sound Match with /k/, /f/, /p/, and /m/</td>
<td>Sound Match Cards: 15a – 15e (one card per child) Teacher Resource Package 1 Game markers (four per child/ not provided) Alphabet Cards: c, p, m, f</td>
<td>4-5 minutes</td>
</tr>
<tr>
<td>4. Alphabetic Reinroduce /t/; Be the Teacher game</td>
<td>Alphabet Cards: /t/, /m/, /p/, /f/, /c/</td>
<td>4-5 minutes</td>
</tr>
</tbody>
</table>

Writing and Spelling

<table>
<thead>
<tr>
<th>Activity</th>
<th>Materials</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Writer’s Warm-up Letter Mission: Review /t/, /c/, /f/, /p/, /m/</td>
<td>Letter Mission (one per child) Student Activity Book 1, p. 48 or 49 Tracing Cards: /t/, /c/, /p/, /f/, /m/</td>
<td>2-3 minutes</td>
</tr>
<tr>
<td>6. Integrated Phonologic/Alphabetic Match a Picture’s Initial Sound; Introduce /t/</td>
<td>Picture Cards: all /t/ cards Letter Cards: /t/, /f/, /m/, /c/</td>
<td>2-3 minutes</td>
</tr>
<tr>
<td>7. Phonologic/Spelling Letter Writing Game: Review /t/, /c/, /f/, /p/, /m/</td>
<td>Letter Writing Game (one per child) Student Activity Book 1, p. 50 or 51 Game markers (one per child/ not provided) Game Board 3 Number cube (not provided)</td>
<td>6-8 minutes</td>
</tr>
</tbody>
</table>

Note. From Scott Foresman Early Reading Intervention, Simmons & Kame’enui, 2003.
**Activity 1 Introduce Letter Name and Sound**

*Introduce t /t/**

**Objective:** Children learn and trace *t* /t/**

**Time:** 1-2 minutes

<table>
<thead>
<tr>
<th><strong>To Do</strong></th>
<th><strong>To Say</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduce letter name</strong></td>
<td>Hold up the <em>t</em> Alphabet Card</td>
</tr>
<tr>
<td>Model</td>
<td>The name of this letter is <em>t</em>.</td>
</tr>
<tr>
<td>Lead</td>
<td>Say the name with me.</td>
</tr>
<tr>
<td>Test</td>
<td>What is the name of this letter?</td>
</tr>
<tr>
<td><strong>Introduce letter sound</strong></td>
<td>Continue holding up the <em>t</em> Alphabet Card</td>
</tr>
<tr>
<td>Model</td>
<td>The sound for this letter is /t/, the tip of your tongue touches above your top teeth. Say /t/ and feel the tip of your tongue touch above your top teeth. Say the sound for this letter?</td>
</tr>
<tr>
<td>Lead</td>
<td>What is the sound for this letter?</td>
</tr>
<tr>
<td>Test</td>
<td>What is the sound for this letter?</td>
</tr>
<tr>
<td><strong>Test knowledge of letter name and sound</strong></td>
<td>Continue holding up the <em>t</em> Alphabet Card</td>
</tr>
<tr>
<td>Test</td>
<td>What is the name of this letter?</td>
</tr>
<tr>
<td></td>
<td>What is the sound for this letter?</td>
</tr>
<tr>
<td></td>
<td><strong>Ongoing Assessment</strong></td>
</tr>
<tr>
<td></td>
<td>If..... children make an error, then.....tell them the letter name or sound and have them repeat it. Repeat the test.</td>
</tr>
<tr>
<td><strong>Model tracing t</strong></td>
<td>Distribute the <em>t</em> Letter Cards. Hold up the <em>t</em> Alphabet Card.</td>
</tr>
<tr>
<td>Model</td>
<td>Watch. I’ll trace the letter <em>t</em>.</td>
</tr>
<tr>
<td>Lead</td>
<td>Now you trace the letter <em>t</em> three times with your finger. Say /t/ each time you trace the letter.</td>
</tr>
<tr>
<td></td>
<td><strong>Ongoing Assessment</strong></td>
</tr>
<tr>
<td></td>
<td>If..... children make an error, then.....put your hand over their hand and guide them to trace the letter. Then have children try to trace the letter on their own. Repeat as necessary.</td>
</tr>
</tbody>
</table>
Activity 2 Isolate Initial Sound

*Which Picture Begins with /t/?*
Objective: Children isolate initial /t/ and connect sound to letter

<table>
<thead>
<tr>
<th>Model names of pictures</th>
<th>To Do</th>
<th>To Say</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gather the picture choices. Place Picture Choice 15-1 on the table. Point to <em>fork.</em></td>
<td><strong>This is fork. What is this?</strong> Continue with the remaining pictures: <em>map, teeth, cup, toe, fin.</em> Then test children on all the picture names. For each picture, ask: <strong>What is this?</strong></td>
<td></td>
</tr>
</tbody>
</table>

To introduce the game *Which Picture Begins with /t/?*:

<table>
<thead>
<tr>
<th>Introduce the game Which Picture Begins with /t/?</th>
<th>Now we are going to play a game. I’ll show you a letter. You’ll find the picture that begins with the sound for that letter.</th>
</tr>
</thead>
</table>

Model the game:

| Model the game | Hold up the *t* Alphabet Card | **The name of this letter is t. The sound for this letter is /t/. Remember, when you say /t/, the tip of your tongue touches above your top teeth. Say /t/ and feel the tip of your tongue touch above your top teeth. What is the sound for this letter?** My turn. I’ll show you how to play. Point to each picture in the top row and say: *This is fork, map, teeth. I’ll find the picture that has the first sound /t/.* Point to the *t* Alphabet Card. *Teeth begins with /t/.* Exaggerate the /t/ in teeth. Exaggerate the first sound and say the word: /t/, *teeth.* Model one example with the bottom row: *cup, toe, fin.* |

(Activity 2 continued)
<table>
<thead>
<tr>
<th>Play the game to test knowledge of /t/</th>
<th>Hole up the <em>t</em> Alphabet Card. Display Picture Choice 15-2 (<em>tire, moon, can; maze, fish, tail</em>). Cover up the bottom row. Give individual turns</th>
<th>Test - What is the <strong>sound</strong> for this letter?</th>
</tr>
</thead>
</table>

**Ongoing Assessment**

If..... children make incorrect responses, then....model the correct answer. Review the sound production cue. Have children repeat the correct answer. Go back to the example a second time. If this activity is very difficult, use two pictures.
### Activity 3 **Isolate Initial Sound**

*Sound Match with /k/, /f/, /p/, and /m/*

**Objective:** Children isolate picture’s initial sounds and to letter

**Time:** 4-5 minutes

<table>
<thead>
<tr>
<th><strong>To Do</strong></th>
<th><strong>To Say</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduce the game</strong>&lt;br&gt;Sound Match</td>
<td><strong>Gather Sound Match Cards 15a – 15e and the game markers.</strong></td>
</tr>
<tr>
<td><strong>Today we’re going to play Sound Match. I’ll show you a letter. Then you’ll find the picture on your Sound Match card that begins with the sound for that letter and place a marker on it. Watch carefully because I’m going to show you four different letters. Each person has a different Sound Match card, so we won’t now who’s going to win.</strong></td>
<td><strong>To Do</strong></td>
</tr>
<tr>
<td><strong>Test children on how to play the game</strong></td>
<td><strong>Distribute the Sound Match cards and game markers to children.</strong></td>
</tr>
<tr>
<td><strong>Hold up the c Alphabet Card and point to it.</strong></td>
<td><strong>Have children review the picture names: Before we start, whisper to yourself the name of each picture to be sure you know each one. Raise your hand if you don’t know one and I’ll tell it to you. The picture names are listed below:</strong></td>
</tr>
<tr>
<td><strong>Test</strong></td>
<td><strong>What is the sound for this letter? Find the picture on your Sound Match card that begins with /k/ and put a marker on it.</strong> Have each child name the picture he or she put the marker on. Confirm correct responses and have the whole group repeat the word: <strong>Yes, coat begins with /k/. Everybody, say /k/, coat.</strong></td>
</tr>
<tr>
<td><strong>Play the game to test knowledge of initial sounds</strong></td>
<td><strong>Repeat the game procedure for /m/, /p/, and /f/:</strong></td>
</tr>
<tr>
<td><strong>Let’s continue playing. If you fill up a whole row or column, call out “Sound Match!”</strong> When a child wins, have everyone clear off their Sound Match Cards. Collect the cards, mix them up, and redistribute them. Play a second round, testing the sounds in the following order: /f/, /k/, /m/, /p/:**</td>
<td></td>
</tr>
</tbody>
</table>

### Sound Match Picture Names

- **15a:** tub, tent, coat/ tape, tie, mitt/ paw, toe, fish
- **15b:** tie, tag, pin/ tow, tub, tail. Fork, cap. Mouse
- **15c:** fire, op, pan/ tag, tape, tent/ tie, cat, toe
- **15d:** cut, tae, tail/ man, tag, tub/ fan, tie, pie
- **15e:** moon, cup, tub/ tent, foot, tag/ tail, pig, toe
Activity 4 Review Letter Name and Sound

Reintroduce t /t/; Be the Teacher Game
Objective: Children practice letter name and sound: t /t/

Time: 4-5 minutes

<table>
<thead>
<tr>
<th>Activity</th>
<th>To Do</th>
<th>To Say</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduce the letter name</td>
<td>Hold up the t Alphabet Card</td>
<td>The name of this letter is t. Say the name of this letter with me: t. What is the name of this letter?</td>
</tr>
<tr>
<td>Introduce letter sound</td>
<td>Continue holding up the t Alphabet Card</td>
<td>The sound for this letter is /t/, the tip of your tongue touches above your top teeth. Say /t/ and feel the tip of your tongue touch above your top teeth. Say the sound for this letter? What is the sound for this letter?</td>
</tr>
<tr>
<td>Test knowledge of letter name and sound</td>
<td>Continue holding up the t Alphabet Card</td>
<td>What is the name of this letter? What is the sound for this letter?</td>
</tr>
<tr>
<td>Introduce the game Be the Teacher</td>
<td>Choose a child to be the “teacher.” Give him or her the m, p, f, c, and t Alphabet Cards.</td>
<td>Tell the “teacher” to hold up the first Alphabet Card. Have the “teacher” ask: What is the name of this letter? What is the sound for this letter? Allow the group to respond to each question. If the group answers correctly, have the “teacher” place the Alphabet Card on the table. If… the group makes an error, then…prompt the “teacher” to tell the letter name or sound and place the Alphabet Card at the bottom of the pile. Continue until all the letters and sounds have been identified correctly. Then have the “teacher” give individual turns.</td>
</tr>
</tbody>
</table>

Ongoing Assessment
If… children makes an error, then….tell them the letter name or sound, have them repeat the name or sound, and return to the letter a second time.
Ask individuals: What is the name of this letter? What is the sound for this letter?
### Activity 5 Writer’s Warm-Up

**Letter Mission: Review t, c, f, p, m**
Objective: Children practice writing letters.

| Time: 2-3 minutes |

<table>
<thead>
<tr>
<th><strong>To Do</strong></th>
<th><strong>To Say</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduce the activity</strong></td>
<td>Distribute a Letter Mission to each child.</td>
</tr>
<tr>
<td><strong>We’re going on a letter mission. I’m going to tell you the name of a letter and you’re going to write it. Let’s see if we can help the dog get the bone!</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Model the activity</strong></td>
<td>Hold up a Letter Mission.</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>Let’s do one together. The first letter is t. Watch as I start at the dot and write the letter t. Write a t on your sheet.</td>
</tr>
<tr>
<td><strong>Lead</strong></td>
<td>Now you write the letter t. Start at the dot and write the letter.</td>
</tr>
<tr>
<td><strong>Test</strong></td>
<td>Now write the letter c. Reinforce the group on the letter name: What is the name of the letter you just wrote? Continue with the following: p, m, t, p, f, c</td>
</tr>
<tr>
<td><strong>Ongoing Assessment</strong></td>
<td>If….. the children write the wrong letter or don’t remember a letter, then….show them the tracing card of the correct letter and model tracing the letter. Have them write the letter.</td>
</tr>
</tbody>
</table>
Activity 6 Connect Sound to Letter

Match a Picture’s Initial Sound; Introduce t

Objective: Children connect initial sound to letter.

Time: 2-3 minutes

<table>
<thead>
<tr>
<th>To Do</th>
<th>To Say</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduce the activity</td>
<td>Gather the picture cards and the letter cards.</td>
</tr>
<tr>
<td>Model the activity</td>
<td>Place the tire Picture Card on the table.</td>
</tr>
<tr>
<td>Test knowledge of initial sound /t/</td>
<td>Display the top Picture Card.</td>
</tr>
</tbody>
</table>

Ongoing Assessment

If... children make an error, then... model the answer, have them repeat it, and return to the picture card a second time.
### Activity 7 Connect Sound to Letter

**Letter Writing Game: Review t, c, f, p, m**

Objective: Children connect initial sound to letter

| Time: 6-8 minutes |

<table>
<thead>
<tr>
<th>To Do</th>
<th>To Say</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduce the letter name</strong></td>
<td>Hold up a Letter Writing Game. Point to each letter and ask: What is the name of this letter? What is the sound for this letter?</td>
</tr>
</tbody>
</table>

| Introduce the Letter Writing Game | Distribute a Letter Writing Game to each child We’re going to play a letter writing game. I’ll say a word and you’ll write the letter that goes with the word’s first sound. Then someone will roll the number cube and move his or her marker on the game board. |

| Model the game | Place a Letter Writing Game to each child Model Let’s do one together. The first word is tape. The first sound in tape is /t/. I’m going to write the letter for the same sound as the /t/ in tape. Write a t in the t column. Now you write the letter for the sound /t/. Start at the dot and write the letter. That’s right, t is the letter for /t/ like the /t/ in tape. |

| Play the game to test children on t, c, f, p, and m | Dictate words from the Word Bank below. Vary the order. Test The next word is carrot. What is the first sound in carrot? That’s right, /k/ is the first sound in carrot. Now write the letter for the sound /k/ like the /k/ in carrot. Start at the dot and write the letter. Everyone, what’s the name of the letter you wrote? What’s the sound for that letter? |

After everyone has written the letter, have one child roll the number cube and advance his or her marker on the game board. Continue the game until all the letters have been written.

**Word Bank**

tie cap feather paw moon
tire cup fork popcorn mug
carrot fox pool mountain

(Activity 7 continued)
If children make an error, then model the letter name and sound, have children repeat them, and have children write the correct letter.