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## Early Reading First

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*Assessments of Twenty-Six Early Childhood Evaluations*  
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# Early Reading First

Early Reading First began in 2001 as a grant program established as part of the No Child Left Behind Act to prepare preschool-aged children to enter formal schooling. Discretionary grants were given to preschools that largely serve low-income families to improve the age-appropriate language and reading skills of children to bolster the schools' already existing programs. ERF was based on prior research, which “shows that a high percentage of children from low-income families attend preschools that may successfully address other developmental domains but often fail to provide the language, cognitive, and early-reading instruction and activities necessary to develop skills to become successful readers.”<sup>1</sup>

John Burghardt and his colleagues at Mathematica Policy Research (“Mathematica team”) conducted a U.S. Department of Education mandated evaluation of Early Reading First that was largely funded by the National Institute for Literacy. The team used a quasi-experimental regression discontinuity design to evaluate the impact of the program on professional development that teachers receive and children's oral language (expressive and receptive language and vocabulary), phonological awareness (rhyming, blending, segmenting), and print and letter knowledge (letter recognition).

The Mathematica team found the program to be successful in improving aspects of classroom environments that were major foci of the ERF program and improving children's print and letter knowledge. They found no impact on children's phonological awareness or oral language. ERF had no significant effects on social emotional development.

There are several concerns regarding the design of the study. The RDD included all sites, not just the sites surrounding the cutpoint. The sample size is small, which could contribute to misleading results. Finally, children in the funded sites differed from children in the unfunded sites on a variety of measures including race and ethnicity, having a language other than English spoken at home, and having foreign-born parents. If the children in the two groups differ, their assessment scores could confound the results of the evaluation and lead to problems with generalizability.

### Program Design

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<sup>1</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007), vii.

The study used a regression-discontinuity design to assess the impact of ERF funding and program support for preschools on the language and literacy preparedness of their children. The U.S. Department of Education (ED) is required to follow a formal process for selecting grantees, and ED has criteria for scoring each application received, and independent reviewers do the scoring. Thirty grants were awarded to applicants with a score of at least seventy-four. Trained staff assessed the language and literacy skills of the children who were participating in the study, and trained observers measured classroom practice in a subsample of study classrooms. Teachers and the principal completed a self-administered questionnaire. Teachers were asked to rate each child's social-emotional behavior. Attendance data was also collected. Parents of the children were interviewed over the telephone. Data was collected twice- Fall 2004 and Spring 2005. Both the funded and unfunded sites used the same data-collection instruments and procedures.

**Program group.** The evaluation sample was composed of a program group and a comparison group. The program group was made up of four-year-olds attending preschool in twenty-eight of the thirty ERF grantee sites. The comparison group was made up of children attending preschool in thirty-seven of the sixty-seven unfunded applicant sites that had the highest application scores and agreed to participate in the study. Approximately three classrooms from each site participated. The study team randomly selected eleven four-year-olds from each class whose parents had provided written consent.

	ERF Funded	Non-ERF Funded	Total
Grantees/unfunded applicants	28	37	65
Preschools	86	75	161
Classrooms assessed	78	91	169
Teachers surveyed	92	102	205
Children assessed	803	855	1658

*Characteristics of children.* Significantly more parents of ERF participants were born outside of the United States than parents of non-ERF participants (39 percent compared to 32 percent). Additionally, significantly fewer parents of ERF participants spoke English as their primary language. There was also a significant difference between the ethnicities of the children, with ERF preschools serving more Hispanic children and fewer white children than non-funded preschools.

	<b>ERF participants</b>	<b>Children in non-ERF preschools</b>	<b>p-value</b>
% of children with household monthly income below \$1,500	34.6	36.9	0.847
% of children with foreign born parents	39.3	32.1	.022
% parents with language other than English spoken at home	50.6	40.8	.001
% of children with parents most frequently speaking language other than English	41.4	34.3	.025
Race or ethnicity of child <sup>a</sup>			0.01
Black	23.8	23.9	
Hispanic	46.2	39.5	
White	22.8	31.1	
% of children with unmarried parents	36.5	42.9	.07
Standardized assessment scores: Print awareness (mean value) <sup>b</sup>	93.6	90.83	0.35
Standardized assessment scores: Expressive vocabulary	82.9	82.8	0.82
Standardized assessment scores: auditory comprehension	91.7	90.5	0.32
Notes: <sup>a</sup> Race and ethnicity percentages were based on a sample of 543 ERF participants and 601 non ERF participants. <sup>b</sup> Standardized assessment scores were based on a sample of 805 ERF participants and 864 non ERF participants.			

*Characteristics of ERF preschools.* Nearly all (95 percent) of ERF preschools combined the ERF grant with other government funding sources, such as state and local education agencies, state child-care funds, and Head Start. Over 40 percent of the ERF preschools received funding from two or more additional sources, while just over 50 percent received additional funding from only one source. There was no significant difference in sources of funding or how funding sources were combined for funded and unfunded sites.

Characteristics of individual schools varied, with 75 percent offering full-day programs, 62 percent having twenty children or fewer per classroom, and 70 percent having a staff-to-child ratio of 1:10 or better.

*Characteristics of teachers.* Three-quarters of teachers in ERF preschools hold bachelor's degrees, and an additional 12 percent hold associate's degrees. The majority of these degrees are in early-childhood education (38 percent), elementary education (22 percent), and education (10 percent). Nearly all teachers (87 percent) have completed college-level courses in early-childhood education or development. Just over three-quarters (79 percent) have completed courses in teaching language and literacy to children, and 67 percent have completed courses in teaching reading to elementary school children. In terms of credentials, "30 percent of teachers held a child-development associate credential, 42 percent held a state-awarded preschool certificate, 67 percent held a teaching certificate or license, and 24 percent held other types of job-related licenses."<sup>2</sup>

When compared to teachers in non-ERF preschools, teachers in ERF preschools had earned significantly more bachelor's degrees, teaching certificates or licenses, and were currently enrolled in teaching-related training. 97 percent of teachers in ERF preschools were women.

**Services.** Early Reading First has provided five rounds of grants, ranging from \$750,000 to \$4.5 million per site for a three-year period. "The national evaluation of ERF focused on the second cohort of grantees from FY 2003, in which the grants totaled approximately \$75 million; the average award was \$2.5 million, and individual awards ranged from \$1,074,846 to \$4,358,750 to be spent over three years."<sup>3</sup> The median grant awarded in the FY 2003 cohort was \$3,549 per preschool child per year.

Professional development was one of the key goals of Early Reading First. Teachers in ERF funded classrooms reported receiving an average of seventy-two hours, or nine days, of professional development the previous year. All teachers in ERF-funded classrooms reported receiving professional development in phonemic and phonological awareness; a large majority reported receiving training in literacy-rich print environments, concepts of print writing and prewriting, oral language, facilitating emergent literacy, alphabetic knowledge, and oral comprehension and cognition. Ninety percent reported receiving training in child assessment, and 75 percent reported receiving training in traditional early-childhood topics.

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<sup>2</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007).

<sup>3</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007).

ERF preschools were required to provide activities and instructional materials designed according to scientifically based reading research for developing children's oral language, phonological awareness, print awareness, and alphabet knowledge. "In ERF preschool classrooms, 39 percent of the teachers reported following one curriculum, and 61 percent reported using a combination of curricula. The most commonly reported curricula in ERF classrooms are Creative Curriculum (reported by 46 percent of teachers) and High/Scope (Educating Young Children) curriculum (reported by 24 percent of teachers)."<sup>4</sup>

According to the Department of Education, funds must be used to:

- "Enhance children's language, cognitive, and early reading skills through professional development for teachers;
- Provide early language and reading development and instructional materials as developed from scientifically based reading research;
- Provide preschool-age children with cognitive learning opportunities in high quality language and literature-rich environments;
- Use screening assessments to effectively identify preschool children who may be at risk for reading failure; and
- Improve existing early childhood programs by integrating scientifically based reading research into all aspects of the program (including instructional materials, teaching strategies, curricula, parent engagement, and professional development)."<sup>5</sup>

**The Evaluation.** The national evaluation addressed the following research questions:

- "What is the impact of ERF on the language and literacy skills of children enrolled in preschools that receive ERF support?
- What is the impact of ERF on the quality of language and literacy instruction, practice, and materials that preschools provide?
- To what extent are variations in ERF program quality and implementation associated with differences in the language and literacy skills of the children served?"<sup>6</sup>

*Selection of grantees.* The ERF grant selection was completed through a two-stage

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<sup>4</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007).

<sup>5</sup>U.S. Department of Education, "Early Reading First," <http://www2.ed.gov/programs/earlyreading/index.html> (accessed July 8, 2011).

<sup>6</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007).

process for FY 2003. First, invitations to submit short pre-applications were sent to applicants. The U.S. Department of Education received approximately 700 pre-applications. A peer review panel then met to evaluate and score each pre-application, and the 125 highest scoring pre-applicants were invited to submit full applications. Of these, 124 pre-applicants submitted full applications, consisting of a description of the project's content, a narrative addressing the selection criteria, a budget, and a budget narrative for consideration of grant funding. A different peer review panel evaluated the completed applications, with extra consideration for “(a) applicants that were partnerships between at least state education agencies or local education agencies and preschools not under administrative control of local education agencies, and (b) applicants serving significant numbers of children with special needs, including those with disabilities and limited English proficiency.”<sup>7</sup> Additionally, Congress required that ERF grantees to be located in school districts that meet two requirements: high percentage of children in kindergarten through third grade needing reading improvement and location in low-income communities. Thirty highest scoring applicants received grants in October 2003, with implementation expected to commence in January 2004. It is not clear if this cohort differs in any measurable ways from previous and proceeding grant recipients.

*Selection of Experimental Group.* Of the 30 ERF-funded sites, 28 were selected to participate in the study, due to two sites voluntarily leaving the program. The control group was made up of thirty-seven of the ninety-four total unfunded applicants. When selecting the control group, the twenty-three sites with the lowest scores (below 42.4) were excluded. Five additional sites were excluded, as they received ERF grants the subsequent year. Three sites were excluded due to failure to meet criteria for inclusion in the study. The scores for funded sites ranged from 74.2 to 94.7, and the scores for unfunded sites ranged from 42.3 to 73.8, out of a possible 100. Individual preschools were selected from each site, with eighty-six preschools from funded sites and seventy-five preschools from unfunded sites agreeing to participate. Approximately three classrooms from each preschool were randomly selected, and eleven four-year old students per classroom were selected, based on parental consent for participation.

## Major Findings

The evaluation found ERF had a positive impact on print and letter knowledge. There was no significant impact on phonological awareness, oral language, or socioemotional development. ERF also positively impacted curricula and assessment practices, quality of preschool environment, and quality of language and early literacy environment.

**Cognitive.** ERF significantly impacted print and letter knowledge as indicated by standard scores on the Pre-CTOPP print awareness, which measures print concepts, letter and

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<sup>7</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007), 3.

word discrimination, letter identification, and letter-sound recognition. The effect size was 0.34 standard deviations. “Comparison of the regression-adjusted standard scores for children in the unfunded sites to the national norms for this subtest indicates that in the absence of ERF, children in the ERF sites would have scored about 3 percentage points below the national average of 100; with exposure to ERF, their average score of 102.69 was slightly above the national average for this subtest.”<sup>8</sup>

It is debated how effective ERF was in improving print and letter knowledge, as the standardized, unadjusted means show insignificant differences between the funded and unfunded sites. When taking into account subgroups, one might be significant by chance (“multiple comparisons”).

Phonological awareness is defined as knowledge of word and letter sounds, fundamental skills needed for reading. The Elision subtest of the Pre-CTOPPP was used to measure phonological awareness by testing “the child's ability to isolate and drop a syllable or phoneme from a word.”<sup>9</sup> There was no significant difference between scores in the funded and unfunded sites.

The Expressive One-Word Picture Vocabulary Test and the Auditory Comprehension subtest of the Preschool Language Scale, Fourth Edition were used to measure oral language skills. There was no significant difference between scores in the funded and unfunded sites. The authors state that ERF's impact on the standard score of expressive vocabulary is small and not statistically significant. ERF's impact on auditory comprehension was not statistically significant.

**School readiness/performance.** Data apparently either not collected or not reported.

**Socioemotional development.** The authors evaluated the impact on social-emotional development in response to concerns that ERF might have detrimental effects in this domain if it caused teachers to exclude areas of child development in order to focus on early literacy skills. Three subscales of the thirty-item Social Competence and Behavior Evaluation were used to assess impact on social-emotional development. The three subscales included a social-competence subscale, an anger-aggression subscale, and an anxiety-withdrawal subscale. ERF had no impact on socioemotional skills. Subgroup analysis was completed by gender, race and ethnicity, primary language spoken at home, parental education, whether the school received

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<sup>8</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007).

<sup>9</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007), 65.



Head Start funding, and whether the preschool was full-time or part-time. There was no statistical significance between subgroups.

**Health.** Data apparently either not collected or not reported.

**Behavior.** Data apparently either not collected or not reported.

**Crime/delinquency.** Data apparently either not collected or not reported.

**Early/nonmarital births.** Data apparently either not collected or not reported.

**Quality of preschool classroom.** The researchers used a number of different quality measures, such as general teaching behavior, lesson planning, quality and organization of activity centers, quality of team teaching, and math concepts. These measures have been found in previous research to be correlated with increased cognitive skills and emotional development in children. ERF had positive impacts on each domain of general quality of preschool classrooms except adequacy of supervision.

**Quality of language and early literacy environment.** Several measures of language and early literacy aspects of teacher practices were taken. Overall, ERF classrooms scored a 2.7 out of a possible 4 on the TBRS in the fall and 2.6 in the spring. Subscales of the TBRS evaluated oral language use by the lead teacher, book-reading practices, phonological awareness activities, print and letter knowledge, written expression, child portfolios, and dynamic assessment. ERF had significant positive impacts on all domains of classroom language, early literacy, and assessment practices. Book-reading practices were rated higher in ERF classrooms than they would have been in the absence of ERF; however, there was no impact on the number of reading sessions.

**Effects on parents.** Data apparently either not collected or reported.

**Benefit-cost findings.** The estimated average cost per child served in ERF classrooms ranged from \$2,500 to \$3,500.

### **Overall Assessment**

ERF produced mixed results. While a number of teacher and classroom outcome measures significantly improved, only print and letter knowledge for children increased. ERF had no effect on phonological awareness or oral language. According to Pullen and Justice, “Early literacy skills, such as phonological awareness and letter knowledge, represent the best predictors of later achievement in reading, and oral language is highly correlated with emergent literacy

knowledge.”<sup>10</sup> With only one of these domains improving, it is unlikely ERF had significant impact on overall early literacy.

**Program Theory.** ERF was created based on the 1998 National Research Council Preventing Reading Difficulties in Young Children report that showed a high percentage of children from low-income families attend preschools that do not adequately provide language, cognitive, and early-reading instruction needed to become successful readers. The theory is that grants to school districts and other entities that serve three- to five-year-olds from low-income families can be used to provide professional development to teachers and better services to children to ensure preparedness to enter kindergarten.

Early Reading First has two key elements: (1) the use of scientifically based methods for teaching, defined as applying rigorous, systematic, and objective procedures to obtain valid and reliable knowledge, and (2) the goal of enhanced professional development that is continuous, intensive, and classroom focused.

There seems to be a disconnect between enhancement of teachers' professional development and the children's school readiness. Although ERF significantly impacted teachers' knowledge and skills, the program significantly impacted children's print and letter knowledge and had no impact on phonological awareness and oral language skills. If teachers' abilities and skills are increasing, but children's early literacy skills are not improving, there could be a flaw in the program theory. ERF might not significantly improve early literacy.

**Program Implementation.** The evaluation did not discuss how ERF funding was implemented in each preschool classroom at the sites. Because of this, it cannot be determined if each site adequately used the ERF funding.

Classrooms were randomly selected to participate in the evaluation. The probability of selection was proportional to the number of four-year-olds who were estimated to be enrolled in each classroom. Consent of the school director and teacher of the classroom was obtained.

Consent forms were distributed to all children in participating classrooms. Up to fifteen children were randomly selected from each classroom.

Some classrooms and children selected into the sample refused to participate in the study, and not all that consented completed all surveys, assessments, and observations. The base classroom weights were not adjusted. The adjusted weight for each child outcome is based on the assumption that nonresponse was random within a classroom and equal for 3- and 4- year olds.

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<sup>10</sup>Paige C. Pullen, and Laura M. Justice, “Enhancing Phonological Awareness, Print Awareness, and Oral Language Skills in Preschool Children,” *Intervention in School and Clinic* 39, no. 2 (2003): 95.

**Assessing Randomization.** Randomization was not utilized in this evaluation.

**Assessing statistical controls in experimental and nonexperimental evaluations.**

The true linearity of the functional form is critical in RD. The evaluators write, “For some classroom outcomes, it was difficult to identify the correct functional-form specification. These variables tend to be binary outcomes that are typically either always 1 or always 0 within a site and include whether specific phonological awareness activities were observed in the classroom and whether the teacher used specific curricula or child assessments.”<sup>11</sup> Because of this issue, the impact estimates for these outcomes vary substantially by specification and are not robust. However, the evaluators write that functional form is linear for measures of phonological awareness, print and letter knowledge, and oral language skills.

This study utilized a “sharp” design, in which all sites with grant application scores of seventy-four or higher received ERF funding while all sites with scores below seventy-four did not. In order for this design to be valid, sites' scores and the cut-point for grant funding must be determined independently of one another, so that the evaluator cannot manipulate scores in order to ensure a site does or does not receive funding. According to the authors, this manipulation by scorers was unlikely because the cut-point for determining ERF recipients was not determined until after all applications had been submitted and scored. Thus, it is concluded that this was a valid design.

Another issue is the absence of true baseline values. Fall assessments were collected one to four months into the school year. If fall assessments were collected late into the school year, impact estimates may not be as high as they should be, as the baseline assessment was taken too close to the second assessment. The baseline assessment could already be correlated with the treatment.

The range of scores on the application for ERF funding was rather broad, as opposed to including sites in the study that fell just above or below the cutpoint. One reason the range of scores is unusually broad is site nonresponse bias. As previously discussed, twenty-eight of the thirty funded sites agreed to participate in the evaluation study. However, only thirty-seven of the sixty-two unfunded sites were recruited for participation. While the researchers attest the distribution of applicant scores is similar for the participants and nonparticipants, nonresponse bias can still impact the estimation outcomes.

The range of scores is broad in order to produce an adequate sample size. The RD design should only compare sites that fall just above and just below the cut-point. According to Bloom, “The second characteristic of regression discontinuity analysis - local randomization - is based on

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<sup>11</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007), 81.

the premise that differences between candidates who just miss and just make a threshold are random...Any difference in subsequent mean outcomes must therefore be caused by treatment."<sup>12</sup> When a broad range of scores is used, the differences between sites may no longer be random.

Children in the funded sites differed from children in the unfunded sites on many measures, including race and ethnicity, having a language other than English spoken at home, and having foreign born parents. These differences could cause misleading results. Children who are learning English as a second language may have greater difficulties acquiring early literacy skills. Subgroup analysis indicates that differences between Hispanic, White non-Hispanic, and Black non-Hispanic children are not statistically significant.

**Sample size.** The experimental group was composed of 803 children from 78 classrooms in 83 preschools in 28 of 30 ERF-funded sites. The control group was composed of 855 children from 91 classrooms in 75 preschools in 37 of 67 unfunded sites. The unfunded sites utilized were ERF applicants with the highest application scores who agreed to participate in the study.

It is not discussed if the characteristics of children used in this analysis are similar to the overall make-up of ERF funded and unfunded sites. If the sample is not representative, misleading impact estimates will occur, either inflating or deflating the actual impact of ERF.

Additionally, only four-year-olds were included in the study, despite the fact that these sites serve three-year-olds and five-year-olds as well. It is not stated whether or not four-year-olds participated in preschool the year prior. If children in the program group were more likely to have completed a year of preschool than their comparison group counterparts, the results could be misleading.

**Attrition.** Two sites originally awarded ERF funding voluntarily dropped out of the program; however, they were not included in this study.

**Data Collection.** Data were collected in the fall of 2004 and the spring of 2005.

**Child Assessments.** Trained staff directly assessed the language and literacy skills of the children in three domains: print and letter knowledge, phonological awareness, and oral language. Four instruments were used to collect this data. The Pre-LAS screened the children for English proficiency with internal consistency reliability between 0.86 and 0.90. The Preschool Comprehensive Test of Phonological and Print Processing measured print and letter knowledge with an internal reliability of 0.95 and a test-retest reliability of 0.89. The Expressive One-Word Picture Vocabulary Scale measured expressive vocabulary with internal consistency reliability

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<sup>12</sup>Howard S. Bloom, *Modern Regression Discontinuity Analysis*, MDRC Working Papers on Research Methodology (New York, MDRC, December 2009).

coefficients of 0.96-0.98 and test-retest reliability of 0.95. The Preschool Language Scale measured auditory comprehension with internal consistency reliability coefficients of 0.83-0.90 and test-retest reliability of 0.83-0.91. Trained staff also measured the social-emotional behavior of the children using the Social Competence & Behavior Evaluation (30-item), which has internal consistency reliability coefficients of 0.85-0.92. In the fall of 2004, Spanish-speaking children who did not pass the pre-LAS were assessed in Spanish; however, all children were assessed in English in the spring of 2005.

**Classroom Observations.** Trained members of the study team conducted classroom observations to assess classroom practice, including quality of teacher-child interactions, and the overall quality of the preschool classrooms. Two instruments were used to assess the observation: the Teacher Behavior Rating Scale (TBRs) and eleven items from the Early Childhood Environment Rating Scale-Revised (ECERS-R).

**Surveys.** Teachers and preschool principals or directors also completed surveys developed by the evaluation team, and parents of the children in the study were interviewed. Interviews were also conducted with grantee directors of the twenty-eight ERF preschools to learn about the use of the ERF funds and to obtain background information about the context in which ERF grants were implemented.

**Measurement issues.** There were no apparent issues in regards to the measurement tools utilized.

**Generalizability.** It is unclear if these results could be expected if other sites were to utilize ERF-funding. Because of the Regression Discontinuity design, impact estimates may only generalize to sites that are similar to those with an application score at or around seventy-four.

**Replication.** There have not been subsequent studies that replicate these findings.

**Evaluator's description of findings.** The Mathematica team concluded:

“The main findings of the national evaluation of ERF are that the program had positive, statistically significant impacts on several classroom and teacher outcomes and on one of four child outcomes measured. Specifically, ERF had positive impacts on

- the number of hours of professional development that teachers received and on the use of mentoring as a mode of training;
- aspects of classroom environments and teacher practices that were major focuses of the ERF program, including language environment of the classroom, book-reading practices, the variety of phonological-awareness activities and children's engagement in them, materials and teaching practices to support print and letter knowledge and writing, and the extensiveness and recency of child-assessment practices; and

- other, more general aspects of classroom quality, including the quality of teacher-child interactions, the organization of the classroom, and the planning of activities for children.

With regard to child outcomes, ERF had a positive impact on children's print and letter knowledge but not on phonological awareness or oral language.

ERF neither enhanced nor diminished children's social-emotional development during the preschool year. Patterns of results that were observed for the overall sample were also observed for most subgroups examined.”<sup>13</sup>

**Evaluator's independence.** Early Reading First is being evaluated under mandate by the U.S. Government. The research team consists of a prime contractor, Decision Information Resources, Inc., and two subcontractors, Mathematica Policy Research, Inc., and the Center for Improving the Readiness of Children for Learning and Education. While DIR and MPR have no interests that could impact the findings of the evaluation, CIRCLE developed one of the study's classroom observation measures, advised on the selection of the child assessments, and trained DIR staff to collect class observation and child assessment data. However, CIRCLE did not collect any data.

**Statistical significance/confidence intervals.** All effects were evaluated at the 5 percent significance level.

**Effect Size.** Effect sizes were calculated by dividing the estimated impact by the standard deviation of the outcome measure. The evaluators state the minimum detectable effect size for a child outcome is 0.30 SD and 0.89 SD for a typical classroom outcome.

For child outcomes, ERF significantly impacted only print and letter knowledge, and the effect size was 0.34 SD. Subgroup analysis revealed no significant difference between boys and girls, racial and ethnic groups, English language learners, parental education, and full-time or part-time status of the preschool in any of the three child outcomes. There was a statistical difference in regards to expressive vocabulary when comparing preschools that received no Head Start funding to preschools that did receive Head Start funding, with children in preschools not receiving Head Start funding performing better than children in preschools that did.

For teacher outcomes, ERF significantly impacted teachers' professional development, and the effect size ranged between 0.82–1.04 SD.

For classroom outcomes, ERF significantly impacted the general quality of the classroom.

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<sup>13</sup>Russell Jackson, Ann McCoy, Carol Pistorino, Anna Wilkinson, John Burghardt, Melissa Clark, Christine Ross, Peter Schochet, and Paul Swank, *National Evaluation of Early Reading First: Final Report* (Washington, DC: U.S. Department of Education, 2007), vii.

Teacher-child interactions significantly increased with effect sizes ranging from 0.79–1.12 SD. Organization of the environment significantly increased with effect sizes ranging from 0.82–0.88. Lesson planning significantly increased with a 0.84 SD effect size. ERF also had significant positive impacts on all domains of classroom language, early literacy, and assessment practices with effect sizes ranging from 0.64–1.11 SD.

**Sustained effects.** The study did not measure sustained effects.

**Benefit-cost analysis.** A benefit-cost analysis was not performed.

**Cost-effectiveness analysis.** A cost-effectiveness analysis was not performed.

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