

**National Title I Study of  
Implementation and  
Outcomes: Early Childhood  
Language Development**

Section A

July 30, 2010



**MATHEMATICA**  
Policy Research, Inc.

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## **TITLE I RECRUITMENT OMB PACKAGE: SECTION A**

This Office of Management and Budget (OMB) package contains two main sections: Section A, “Justification,” and Section B, “Collection of Information Employing Statistical Methods.” OMB clearance for this project will be sought in two stages. This initial package seeks clearance for the School Data Form (discussed in Section A and attached to this clearance package in Appendix C), our approach for collecting the information necessary to identify the sample, as well as the study sampling plan (described in Section B). A second OMB clearance package will be prepared and submitted in December 2010 to obtain clearance for the full set of data collection instruments for the study (summarized in Section A). The study is submitting the package in two stages because sample identification and recruitment activities must begin before the data collection instruments are developed.

### **A. Justification**

#### **1. Circumstances Necessitating the Collection of the Information**

Learning to read is a fundamental task of the early grades in school. Research has documented the variety of skills and knowledge children need to acquire as they build toward reading comprehension achievement. Language development, background knowledge (basic knowledge of the social, cultural, scientific, and mathematical world), letter recognition and phonological awareness all provide a foundation for skilled reading (National Early Literacy Panel 2008; Snow, Burns, and Griffin 1998; Whitehurst and Lonigan 1998). Language and background knowledge develop from birth as the child interacts with others, though children are exposed to different amounts of language and background knowledge in the home and early care environments (Hart and Risley 1995). Through instruction, children learn to decode, then to read with fluency and growing comprehension. By the end of third grade, most children are making the transition to skilled, fluent

reading that enables them to learn; by fourth grade, students are expected to be able to read to abstract meaning from expository texts in core subjects such as social studies and science.

The 2007 National Assessment of Educational Progress (NAEP) found that 33 percent of fourth-grade students had not achieved a basic level of proficiency in reading (U.S. Department of Education 2009). Children who fail to learn to read by third or fourth grade are at high risk for school dropout, with its negative implications for employment, income, and civic participation over their lifetimes (U.S. Census Bureau 2005). Furthermore, research has identified subgroups of children at high risk of having difficulty learning to read, including children from low-income families and dual-language learners (DLLs) (Rueda and Windmueller 2006; National Research Council 1998; National Research Council and Institute of Medicine 2000).

Since the mid-1990s, efforts to improve reading/language instruction in schools and preschools serving high proportions of children at risk for reading difficulties have centered on the use of scientifically-based reading/language instruction. The Classroom Literacy Interventions and Outcomes in Even Start (CLIO) evaluation of literacy-focused curricula for disadvantaged children in Even Start found no significant impacts on children's language and comprehension outcomes relative to the prevailing curricula used by Even Start programs (Judkins, et al. 2008). Additional studies of similar efforts show some positive effects on letter recognition and decoding skills, fewer effects on language development, and no effects on reading comprehension (Gamse et al. 2008a and b; Jackson et al. 2007; Preschool Curriculum Evaluation Research [PCER] Consortium 2008). While the impacts on letter recognition and decoding may seem encouraging, decoding skill does not itself lead to reading comprehension (Snow et al. 1998; National Institute of Child Health and Human Development 2000; National Early Literacy Panel 2008). For that, language development is critical, and few of the curricula and teaching strategies tested over the past decade have had a positive effect on language development.

Reading experts also note that background knowledge improves the ability to comprehend text (Snow et al. 1998). General knowledge measured in the fall of kindergarten was more strongly associated with reading achievement in grade three than in grade one, which suggests a relationship between reading comprehension and background knowledge (Duncan et al. 2007).

The lack of instructional strategies known to boost language development is important because many children from low-income or dual-language homes arrive at preschool and kindergarten with language and literacy scores well below the average four- or five-year-old (Tarullo et al. 2008; Jackson et al. 2007; Chernoff et al. 2007). Even as students are entering kindergarten, differences in background knowledge exist. These differences are related to various family characteristics, including mother's education, language spoken at home, and home activities such as reading (West et al. 2000). Therefore, closing this gap in language development and background knowledge is critical if disadvantaged children are to attain adequate comprehension skills and succeed in upper elementary school and beyond.

To identify programs and practices associated with better language development, background knowledge, and comprehension outcomes for children in prekindergarten through third grade, the U.S. Department of Education (ED) has requested a national study of Title I schools that focuses on the prekindergarten through third-grade levels and examines the development of language, background knowledge, and comprehension in schools with high and low reading achievement scores. The study is being conducted as a component of the National Assessment of Title I, mandated by Title I, Part E, Section 1501 of the Elementary and Secondary Education Act (see Appendix A).

**Overview of the Study.** In October 2009, ED began working with Mathematica Policy Research, in partnership with Decision Information Resources, Inc. (DIR) and Dr. Timothy Shanahan of the University of Illinois-Chicago, on a national study of 100 Title I schools to identify

school programs and teacher instructional practices associated with improved language development, background knowledge, and comprehension outcomes for children in prekindergarten through third grade. Schools in the study will be divided between those with high and those with low average reading achievement scores. The study will include up to five grade cohorts (prekindergarten, kindergarten, and first through third grades) and classrooms and student samples will be selected for each. ED will make a final decision on the grades to be included based on the availability of funds and considering the input of the study's expert panel (first meeting to be held in early April, 2010).

Data for the full study will be collected on each grade cohort using a battery of student assessments, classroom observations, parent interviews, teacher and administrator questionnaires, and student record reviews. Analyses will estimate which school programs and teacher instructional practices are associated with growth in student outcomes to inform future rigorous evaluations of strategies to improve language and reading comprehension outcomes for at-risk children.

The study will seek to answer the following questions about the growth of children's achievement from preschool through grade three and its association with school programs and instructional practices:

1. How do language development, background knowledge, and comprehension develop across preschool through grade three?
2. What school programs are being used in the sample of schools, and what teacher instructional practices are observed to support children's language development, background knowledge, and comprehension?
3. What school programs are associated with greater student progress in language development, background knowledge, and comprehension?
4. What instructional practices are associated with greater student progress in language development, background knowledge, and comprehension?
5. How does the quality of the home literacy environment interact with teacher instructional practices in predicting children's progress over the school year in language development, background knowledge, and comprehension?



In addition, the study will address the following questions about the methodology of identifying high- and low-performing schools and measuring teaching practices:

6. Can we accurately identify high- and low-performing schools using readily-available school-level performance data and demographic information? Do schools tend to have consistently high- or low-performance across grades and across classrooms? Are third grade assessment measures (typically the first year states collect standardized results) indicative of cumulative school effects in earlier grades?
7. How can researchers measure instructional practices more reliably?

**Study Timeline.** The study began in October 2009 and is a five-year project. The first year (October 2009 to September 2010) involves several activities that set up the study, including selecting and convening an expert panel, identifying student assessments and classroom observation instruments to be used, drafting additional data collection forms, and finalizing the study's design. Preparation for identifying and recruiting the school districts that will be asked to participate will also begin toward the end of the first year. The second year (October 2010 to September 2011) focuses on finalizing data collection forms, sampling and recruiting schools to participate in the study, and developing and finalizing data collection training plans. Data collection begins toward the end of year two and continues into the third year (October 2011 to September 2012). Year four (October 2012 to September 2013) focuses on cleaning the data files and preparing them for analysis, developing analytic variables, refining the analysis plan, analyzing the data, and preparing for the report. The final year of the study (October 2013 to September 2014) will be centered on finalizing the report and preparing the data file for use by other members of the research community.

**Study Sample.** The study sample will be comprised of 100 Title I schools: 50 with consistently high reading achievement scores and 50 with consistently low reading achievement scores. Within each school, we will randomly sample 3 classrooms per grade (prekindergarten through grade three), for a total of 1,500 classrooms. Within each classroom, we will randomly sample 7 students for a

total of 10,500 students (due to student mobility, we expect the spring student sample will decrease to 7,500).

**Data Collection Plan.** As part of recruitment, we will use the School Data Form (see Appendix C) to collect data from districts on selected schools. Items include whether the school is a Title I school, number of students enrolled in prekindergarten through third grade, percent of students eligible for free or reduced-price lunch, percent of third graders classified as reading proficient based on state assessments, and recent or expected substantial changes in school administration or student demographics. These data will confirm that the information collected from previously existing data sources on the schools is accurate, and that the selected schools meet the study's eligibility criteria (see Section B for a description of eligibility criteria and the school selection process). At the time schools are selected, the most recent data on school characteristics will reflect the 2007-2008 school year. Therefore, we will ask a small set of questions (e.g., enrollments by grade, percent of students eligible for free or reduced-price lunch) in order to update the information that is available through the Common Core of Data. We will also ask district staff to indicate whether each of the selected schools is a Title I school and that it has students enrolled in each of prekindergarten through third grade in order to confirm that the school meets the study's eligibility criteria. It is important that we know if a school has changed substantially (e.g., new principal, undergoing restructuring, substantial increase in enrollment) from what was known about the school when the samples of low performing and high performing schools were selected, because changes of this type could have an impact on school programs, teaching practices, and student achievement. Additional items on the School Data Form include whether the prekindergarten and kindergarten classes are half-day, a full day, or both, and the percent of students classified as English language learners. The study should include schools that vary along these dimensions, so this information will be taken into account in sampling schools.

The full-scale study includes several complementary data collection efforts that will support answers to the study’s research questions. Table 1 lists the timing of the different data collections, and a brief description of each is provided below:

**Table 1. Timing of Data Collection for Title I ECLD**

Data Collection Activity	Fall 2011	Spring 2012
Principal survey	X	
Teacher survey		X
Parent interview		X
Teacher-student report		X
School records		X
Student assessments	X	X
Classroom observations	X	X

- **Principal survey.** Hard copy surveys will be administered to 100 principals in fall 2011. Questions will address instructional reading programs and practices used from prekindergarten through grade three; curricula used in prekindergarten and grade three, particularly those to support language development and early reading; the extent to which curriculum and instructional programs are coordinated in prekindergarten program/classes and in the kindergarten through grade three classes in the school; supports for struggling readers; and professional development (related to reading and general teaching practices) available to teachers.
- **Teacher survey.** Web-based surveys will be completed by 1,500 teachers in spring 2012. Items will focus on teacher background, credentials, professional development, reading programs used, books/readers used in the classroom, reading instructional activities and teaching strategies, support for struggling readers and dual language learners (DLLs), and general behavior of children in the classroom, such as disruption and cooperation.
- **Parent interview.** Telephone surveys will be conducted with 7,500 parents in spring 2012. Items will address family resources and risk factors, including parent education, employment status, income level, marital status, race/ethnicity, and language spoken in the home; home literacy environment, including reading to the child and availability of literacy materials; and parental and family involvement with students’ education, including help with homework and providing children with out-of-home enrichment activities.
- **Teacher-student report.** The study will use a web-based report to collect student-level data from teachers on individual child engagement/attention, instructional grouping for reading, special placement and receipt of services, support for reading, and disruptive behavior. These data will be collected in spring 2012. A total of 7,500 teacher-student reports will be completed.

- **School records.** The study will collect school records data for all children in the study in spring 2012. The data will be collected electronically and will include the date each child began at the school, receipt of special education services, grade repetition, standardized test scores, and attendance.
- **Student assessments.** The study will assess the language development, background knowledge, and comprehension of 7,500 students in the 1,500 classrooms participating in the study. A computer-assisted, one-on-one assessment will be administered to all prekindergarten through third grade students in fall 2011 and again in spring 2012 to measure these outcomes. An additional group-level assessment will be used to assess reading comprehension for second and third grades in fall 2011 and spring 2012.
- **Classroom observations.** Each of the 1,500 classrooms in the study will be observed twice during the 2011-2012 school year: once in fall 2011 and again in spring 2012. These measures will assess the emotional supportiveness or positive climate of the classroom, teacher language modeling and support for learning, and approaches to supporting children’s language development, comprehension of oral and written information (i.e., listening and reading comprehension, respectively), and expansion of background knowledge.

## 2. Purposes and Uses of the Data

Table 2 lists the study’s research questions and the data collection that will support answers to each question.

**Table 2. Research Questions and Data Collection Methods**

Research Question	Data Collection Method
1. How do language development, background knowledge, and comprehension develop across preschool through grade three?	<ul style="list-style-type: none"> <li>• Student assessments</li> </ul>
2. What school programs are being used in the sample of schools, and what teacher instructional practices are observed to support children’s language development, background knowledge, and comprehension?	<ul style="list-style-type: none"> <li>• Principal survey</li> <li>• Classroom observations</li> <li>• Teacher survey</li> </ul>
3. What school programs are associated with greater student progress in language development, background knowledge, and comprehension?	<ul style="list-style-type: none"> <li>• Principal survey</li> <li>• Student assessments</li> </ul>
4. What instructional practices are associated with greater student progress in language development, background knowledge, and comprehension?	<ul style="list-style-type: none"> <li>• Classroom observations</li> <li>• Teacher survey</li> <li>• Student assessments</li> </ul>

Research Question	Data Collection Method
5. How does the quality of the home literacy environment interact with teacher instructional practices in predicting children's progress over the school year in language development, background knowledge, and comprehension?	<ul style="list-style-type: none"> <li>• Parent interview</li> <li>• Teacher survey</li> <li>• Classroom observations</li> <li>• Student assessments</li> </ul>
6. Can we accurately identify high- and low-performing schools using readily-available school-level performance data and demographic information? Do schools tend to have consistently high- or low-performance across grades and across classrooms? Are third grade assessment measures (typically the first year states collect standardized results) indicative of cumulative school effects in earlier grades?	<ul style="list-style-type: none"> <li>• Student assessments</li> <li>• Classroom observations</li> </ul>
7. How can researchers measure teaching practices more reliably?	<ul style="list-style-type: none"> <li>• Classroom observations</li> </ul>

Note: Not included in the table are the Teacher-Student Report and School Records. These instruments will collect data on items that will be used as covariates in the analysis.

The data collected will identify promising programs and practices for student reading outcomes. Future studies could focus on evaluating the impacts of these practices on language and comprehension outcomes for at-risk children in the early years of school. In addition, the study will provide important information about how to (1) accurately identify high- and low-performing schools and (2) measure instructional practices reliably.

### 3. Use of Technology to Reduce Burden

The data collection plan was designed to obtain reliable information efficiently while minimizing the burden on respondents. Consistent with that goal, information will be gathered from existing data sources, where feasible. To reduce the burden on school districts and school administrators, the Common Core of Data (CCD) will be a primary source of data on the school characteristics used when designing and selecting the school sample, and that will be used to describe the characteristics of the sample or as covariates in the analyses. The School Data Form (Appendix C) is limited to a small set of questions that are required to update the information on

schools before the final sample is finalized. Data on these characteristics is either not available through the CCD or other sources or will not be available for the 2010-2011 school year at the time the sample is finalized.

Additional existing data sources will include students' school records and scores for school-administered tests. This information will be obtained in the form of computer files, if a school prefers this method. If it is too burdensome or not possible for a school to provide this information as a computer file, schools will be asked to provide copies of the relevant information, which will be coded by the study team.

The teacher survey and teacher-student report are both web-based data collections, and the school records will be collected electronically to reduce burden on teachers and school staff. The parent interview is a computer-assisted telephone interview (CATI). The use of web-based and CATI data collection instruments reduces respondent burden by facilitating routing and skip patterns. The principal survey is hard copy; however, with only 100 principals participating in the study, the cost of developing a CATI or web-based survey outweighs the benefits.

All of the individual student assessments will be conducted using the computer-assisted personal interview (CAPI). This approach has many advantages, including marginally reducing the length of the assessment since the assessor does not have to interrupt the flow of the assessment to calculate stopping points. Assessors can move more quickly through the assessment because complicated rules about which item or set of items comes next are controlled by the instrument software. Both of these features reduce burden and errors, and improve the quality of the data and the accuracy of the child's scores.

#### **4. Efforts to Avoid Duplication**

No equivalent sources of data exist for the study. Several studies collect data on classroom practices and children's language development, background knowledge, and comprehension (for

example, the Head Start Family and Child Experiences Survey (FACES), the Early Childhood Longitudinal Study—Kindergarten Class of 1998-99 (ECLS-K), and the Early Childhood Longitudinal Study—Birth Cohort (ECLS-B), but they are limited in several ways. The FACES study collects information through observations of general classroom practices, but does not focus specifically on practices targeted at reading. ECLS-K also gathers information on teacher practices, but the data are collected through a teacher self-report and not at the level required for this study. ECLS-B does not fully assess background knowledge that would support later reading comprehension.

## **5. Methods to Minimize Burden on Small Entities**

The primary entities for the study are school districts and schools. Burden is minimized for all respondents by requesting only the minimum data required to meet the study's objectives. The burden on districts and schools will also be minimized through careful specification of information needs, restriction of questions to generally available information, and the design of the data collection strategy. The study's expert panel will review all data requirements before the full OMB package is submitted in December 2010.

## **6. Consequences of Not Collecting Data**

The data collection plan described in this submission is necessary for conducting ED's National Title I Study of Implementation and Outcomes: Early Childhood Language Development and, consistent with the goal of Title I legislation, may help identify programs and practices to improve language development and comprehension outcomes for at-risk children. The study represents an important next step in developing a systematic and rigorous evaluation agenda in the areas of early childhood and early reading.

## 7. Special Circumstances

There are no special circumstances associated with this data collection.

## 8. Federal Register Announcement and Consultation

### a. Federal Register Announcement

A 60-day notice was published in the Federal Register with an end date of April 14, 2010. No public comments were received.

### b. Consultations Outside the Agency

The study team has contacted members of its Expert Panel for advice on various aspects of the study design and data collection instruments. Their feedback was obtained through in-person meetings and telephone conversations. Members of the Expert Panel for this study include:

**Table 3. Expert Panel Members**

Expert Panel Member	Organizational Affiliation
Thomas Cook	Professor of Sociology, Psychology, Education and Social Policy, Northwestern University
David Dickinson	Professor of Education, Vanderbilt University
Barbara Foorman	Francis Eppes Professor of Education, Florida State University
Christopher Lonigan	Professor, Florida State University
Charles Perfetti	Distinguished University Professor of Psychology, University of Pittsburgh
Ray Reutzell	Emma Eccles Jones Endowed Chair and Distinguished Professor of Early Childhood Education, Utah State University
Don Rock	Senior Research Scientist, Educational Testing Service
Christopher Schatschneider	Associate Professor, Florida State University
Catherine Snow	Henry Lee Shattuck Professor of Education, Harvard University

Throughout the study, the team will consult with the panel on additional issues that would benefit from their input, such as selection of assessments, evaluation methodology, and study design.



## **9. Payments of Gifts**

We do not intend to provide a payment or gift to respondents to the School Data Form. We realize, however, that participation in the full study will place demands on each of the participants. Payments will be similar to those offered to respondents to comparable instruments in other studies. A complete description of incentives will be included in the OMB package submitted in December 2010.

## **10. Assurances of Confidentiality**

None of the information collected will be reported or published in a manner that would identify individual respondents. Responses to this data collection will be used only for statistical purposes. The reports prepared for this study will summarize findings across the sample and will not associate responses with a specific district, school, or individual.

Mathematica and its subcontractors follow the confidentiality and data protection requirements of IES (The Education Sciences Reform Act of 2002, Title I, Part E, Section 183), which requires “All collection, maintenance, use, and wise dissemination of data by the Institute” to “conform with the requirements of section 552 of title 5, United States Code, the confidentiality standards of subsection (c) of this section, and sections 444 and 445 of the General Education Provision Act (20 U.S.C. 1232g, 1232h).” These citations refer to the Privacy Act, the Family Educational Rights and Privacy Act, and the Protection of Pupil Rights Amendment. In addition for student information, “The Director shall ensure that all individually identifiable information about students, their academic achievements, their families, and information with respect to individual schools, shall remain confidential in accordance with section 552a of title 5, United States Code, the confidentiality standards of subsection (c) of this section, and sections 444 and 445 of the General Education Provision Act.” Subsection (c) of section 183 referenced above requires the Director of IES to “develop and enforce standards designed to protect the confidentiality of persons in the collection,

reporting, and publication of data”. Subsection (d) of section 183 prohibits disclosure of individually identifiable information, as well as making any publishing or communicating of individually identifiable information by employees or staff a felony.

Every data collector will be required to sign a pledge to protect the privacy of respondent data and to ensure the security of the assessment materials (see Appendix D for a copy of Mathematica’s Confidentiality Pledge). The pledge indicates that any violation or unauthorized disclosure may result in legal action or other sanctions by Mathematica, including the termination of employment. A discussion of human subject protection will be a part of the interviewer/assessor training. A copy of the signed pledges will be kept on file and will, upon request, be submitted to ED.

When reporting the results, data will be presented only in aggregate form, so that individuals and institutions will not be identified. A statement to this effect will be included on the parental consent forms. The teacher survey, principal survey, and parent survey will include a reminder about privacy in compliance with the legislation (P.L. 93-579). When data are collected through in-person or telephone interviews, respondents will be reminded about the privacy protections and their right to refuse to answer questions.

## **11. Additional Justification for Sensitive Questions**

The parent interview will include questions about household income, home language, family composition and parent education, which some may view as sensitive items. We will use these data and data from other parent interview questions as covariates in the analyses to adjust for factors related to students’ language development, background knowledge, and reading comprehension or to their self-selection into a preschool program or school. Parents will be reminded about the privacy of the information and the voluntary nature of the interview prior to asking any potentially sensitive questions.

## 12. Estimates of Hours Burden

As part of the recruitment process, districts will be asked to complete a School Data Form (see Appendix C). We are asking districts to verify the schools' Title I status, provide the number of students in prekindergarten through third grade and indicate whether there is more than one class per grade, report the percent of students eligible for free or reduced price lunch, report the percent of students classified as English language learners (ELL), report the percent of third graders classified as reading proficient on state assessments in the most recent school year, and provide information on any recent or expected substantial changes in school administration or student demographics. We estimate it will take approximately 2.25 hours on average for district staff to fill out the information for the schools in the district. The total estimated burden for all sixteen districts is 36 hours (see Table 4).

**Table 4. Estimate of Hours Burden**

Instrument	Respondent	Number of Respondents	Estimated Time to Complete	Total Estimated Burden
School Data Form	Districts	16	2.25 hours per respondent	36 hours

Estimates of burden for participation in the full study will be provided in the OMB package submitted in December 2010.

## 13. Estimates of Cost Burden to Respondents

There are no additional respondent costs associated with this data collection, other than the time estimated as burden for district staff to provide the study team with information collected on the School Data Form.

#### 14. Estimates for Annual Costs to the Federal Government

The estimated average annual cost of the study over the five years of the base contract is \$1,008,397, or a total estimated cost of \$5,041,983 for the base contract of data collection for prekindergarten students. The study also includes five options for additional data collection efforts. These optional tasks include data collection for kindergarten, first, second, and third graders, as well as an audiotaping option. The estimated cost of the optional tasks across the five years is \$8,058,995. The total estimated cost of the study (base contract plus options) is \$13,100,978, an annual cost of \$2,620,196 across five years.

The estimated cost of the base plus contract options for components of the study is (Table 5):

**Table 5. Estimated Cost of Study Components**

Study Component	Estimated Cost
Study Design	\$725,079
Expert Panel, Management	\$455,827
Instrument Development/OMB Package	\$718,987
Site Selection and Recruitment	\$374,557
Data Collection	\$10,249,103
Analysis and Reporting	\$1,033,248

The estimated cost of the observational measures, including instrument development, observer training, and data collection for this component, is \$ 3,769,853.

#### 15. Reasons for Program Changes or Adjustments

This is a new study.

#### 16. Plans for Tabulation and Publication of Results

The analytic strategies will be aligned with the study's research questions (Section A.1, Overview of the Study). Specifically, the analyses are designed to: (1) describe how language

development, background knowledge, and comprehension develop during the school year from preschool through grade three (research question 1); (2) describe the school programs and classroom practices used to support children's language development, background knowledge, and comprehension outcomes (research question 2); (3) analyze the relationships between school programs and teacher practices and children's progress in language development, background knowledge, and comprehension (research questions 3 and 4); and (4) explore how the quality of the home literacy environment interacts with teaching practices to predict children's progress in language development, background knowledge, and reading achievement (research question 5). In addition, we will address methodological questions about (1) identifying high- and low-performing schools based on readily-available data on school-level performance and student demographics (research question 6); and (2) how to measure instructional practices more reliably (research question 7).

Direct child assessments will provide data on children's language development, background knowledge, and comprehension at the beginning and end of the school year. Information on school programs and teacher practices will draw on principal and teacher interviews and structured observations of the classrooms. Parent interviews will provide information about the home literacy environment and other family background information.

Analyses will employ a variety of methods, including cross-sectional and longitudinal approaches, descriptive statistics (means, percentages), simple tests of differences across subgroups and over time (*t*-tests, *chi*-square tests), and multivariate analysis (regression analysis, hierarchical linear modeling). The first two research questions can be answered by calculating averages and percentages of children, classrooms, or programs falling into various categories; comparisons of these averages across subgroups; and changes in children's outcomes over time. More complex analyses of the relationships among school programs and teaching practices and children's

development that address questions three through five can be done through hierarchical linear modeling (HLM).

For questions about the characteristics of teachers and children, the development of children's language, background knowledge, and comprehension over the school year, and the types of school programs and teacher practices found in the sample of schools, we will calculate averages and percentages. For example, we will calculate the average scores on the language development assessment for preschool-age children in the fall and spring and the average gain score between fall and spring. Similarly, we will calculate the percentage of schools using particular reading curricula in preschool (for example, *Opening the World of Learning*). For all descriptive analyses, we will calculate standard errors, taking into account multilevel sampling and clustering at the appropriate level (school, classroom, and child). We will use analysis weights taking into account complex multilevel sampling and nonresponse at each level.

Analyses of the relationships between school programs, teacher practices, and children's development will use a value-added HLM approach that links student achievement with practices and programs in the study schools and classrooms, while properly accounting for the nested structure of the data, prior student achievement, and other confounding factors. The study's main analytic models will be estimated by grade, using the scores obtained from fall and spring study-administered assessments of language development, background knowledge, and listening or reading comprehension. The models will include controls for the students' pretest performance, teacher demographics, and other potential confounds.

The main independent variables of interest are the observed teaching practices, such as the quality and complexity of the teacher's language use, minutes of instruction in components of reading instruction, and mode of instruction. Because we will include a number of practice measures, we will use factor analysis to reduce the number of variables to a smaller number of

factors. The factor analysis will generate factor scores—that is, estimates of scores that would have been received on each of the identified factors had they been estimated directly—for classrooms and schools. These estimated factor scores are typically more reliable than the score of the individual observed variables.

In addition, by reducing the number of variables to be estimated, we should be able to estimate the relationship between teacher practices and student learning more precisely. We will assess the predictive validity of the factor scores by examining the extent to which they are significantly associated with differences in student learning across study schools and classrooms (having controlled for confounding factors). Significant factors will signal which programs and practices best help predict which schools and classes generate higher student achievement, and thus may deserve further study.

Table 6 illustrates how the association between practices and students' outcomes may be displayed. The estimates and statistical significance of the factor scores, which represent the associations of classroom and school programs and practices with student outcomes, are the focus of this study.

**Table 6. Association between Factor Scores and Student's Language Development, Grade X**

	Student Language Development Outcome 1		Student Language Development Outcome 2	
	Coefficient (s.e.)	p-value	Coefficient (s.e.)	p-value
Classroom Practices				
Factor Score 1				
Factor Score 2				
School Practices				
Factor Score 3				
Factor Score 4				

Notes: †  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$

In addition to the results included in this table, the models controlled for the relevant pretest, student, classroom, and school covariates.

The data from the study will also be used to answer methodological questions about how to accurately identify high- and low-performing schools and how to improve the reliability of instructional practice measures.

Education policymakers and practitioners seek to identify schools on the high and low ends of performance for distinct purposes. High-performing schools have been identified to offer best-practice models. Low-performing schools have been identified for significant intervention.

This study will identify consistently high- and low-performing schools for the sample using publicly-available information on school proficiency levels on state-administered 3rd grade reading assessments and the percentage of students eligible for free or reduced price lunch. School performance will be measured by overall reading proficiency levels measured across a three-year span and by the extent to which a school exceeds or fails to meet expectations of proficiency levels, conditional on the students' level of economic disadvantage (that is, a residual measure from a regression model).

Information we collect in the study will help examine how consistently low- or high-performing these schools are. Using the student-level measures that are comparable across schools and more sensitive than the state assessment measures used to identify high- and low-performing schools for the study, we will measure how consistent each school's performance is, both across pre-kindergarten through grade 3 on average and within these grades. We will measure the distribution of student growth associated with teachers within a school and with each grade level and analyze the extent to which student growth in each grade can predict whether the school was identified as high or low performing. We will analyze whether the teaching practices that are associated in the study's analyses with greater student growth can predict whether the school is classified as high- or low-performing.



Past research has often shown a weak association between measures of teaching practices collected through intensive observation and student outcomes. Reliability of classroom observation measures, or the ability of the measure to provide stable and consistent judgments about the quality of instruction, has been cited as a key issue that may explain the weak measured relationships between teaching practices and student learning in previous studies.

The study team is developing an observation instrument (protocol for conducting observations and rubrics for assessing the observations), training materials, and training procedures designed to measure teaching practices more reliably than has been done in past studies. The rubric will have more "anchors" explaining clearly how to score each dimension; will include more dimensions of practice to distinguish different aspects of teaching; offer participatory training designed to increase understanding and confidence in using the measure and making scoring judgments; and require high levels of exact agreement for certification in coding videotaped classroom situations and actual classrooms. Thus, the observation measure and training materials represent an important contribution to the study of teacher quality and student learning. The study will discuss the observational protocol and measure, and its reliability compared with other classroom measures. It will analyze inter-rater reliability as well as the variation across observations for a single teacher during the year. It will discuss how the measure, training materials, and training procedures were all designed to improve reliability, highlighting differences from measures used in previous studies and lessons learned in this study. Recommendations for improving the reliability of teaching practice measures in future studies will be included.

**Publication Plans.** The study is currently scheduled to prepare one report summarizing the analyses and findings. The report will present the descriptive findings on the extent of children's development during the school year and the school programs and teacher practices found across the schools in the sample. The report will also present the multivariate analyses and findings on the

association between teacher practices, school programs and the growth of children's language development, background knowledge, and comprehension outcomes, as well as the findings from the methodological studies. The draft of the final report is due to ED in September 2013.

**17. Approval to Not Display the OMB Expiration Date**

The study will display the OMB expiration date on all respondent materials and study instruments.

**18. Explanation of Exceptions**

No exceptions of the certification statement are being sought.

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