Pearson
Research Overview

PEARSON

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Pearson Education is committed to using scientific, evidence-based methods in the development of its educational curricula. A research team, comprised of educational research methodologists, has been working with Pearson for seven years to integrate scientific research practices into the development of its curricula. Pearson also collaborates with regional education laboratories, universities, and private research companies to independently evaluate the effectiveness and usability of its curricula. These studies are designed to meet the rigorous standards of the *What Works Clearinghouse*.

Four phases of research are incorporated into the development of each new curriculum. The goal of establishing such extensive research methods is to ensure that every program enables all children to learn the skills and concepts they need for academic success. During the first phase of the research process, previous editions of the curricula are evaluated to determine best instruction and practices as demonstrated by scientific evidence. These practices will be incorporated into the current curricula to begin establishing a scientific research base.

During the second phase, the authors and researchers conduct extensive literature reviews on content, instructional practices, and education standards. The data is synthesized and embedded into the curricula.

During the third phase, formative research is conducted on the curricula under development. Classroom field tests investigate usability, teacher and student feedback, and preliminary curricula effectiveness. School administrators, content specialists, and classroom teachers systematically evaluate the curricula in development.

The final phase of research examines the implementation and effectiveness of the curricula. Independent, randomized control trial studies are conducted to provide scientific evidence of student achievement on standardized assessments. Implementation and best practices are documented throughout the study period to further contribute to the effectiveness of the curricula. Pearson believes that research needs to be ongoing with continual feedback to inform product revisions to meet student and teacher needs.

Opening the World of Learning™ (OWL) Foundational Research

OWL™ is based on thorough knowledge of the research on early language and literacy development and research on social and emotional development. It systematically builds those skills identified as being of critical importance using methods found by research and augmented by "the wisdom of practice" to support development.

The Critical Need for Strong Preschool Programs

At the beginning of the 21st Century there was growing awareness among researchers and policy makers of the importance of the Preschool years to children's long-term educational success. In the final decades of the 20th Century researchers began to describe the early roots of literacy. These roots begin developing long before children enter Kindergarten and are nourished by children's experiences with print, books, and conversations (Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, and Poe, 2003; Snow, Burns, Griffen, Burns, and Griffen, 1998; Whitehurst and Lonigan, 1998). Unfortunately, children from families who have limited economic resources and do not speak English as a first language are disproportionately likely to start Kindergarten behind (Baydar, Brooks-Gunn, and Furstenberg, 1993; Hart and Risley, 1995). Children who start school behind often become poor readers in the early grades and then continue to struggle with reading through their school career (Alexander and Entwistle, 1988; Cunningham and Stanovich, 1997; Juel, 1988; Tabors, Snow, and Dickinson, 2001). Once children fall behind, compensatory education often has only negligible results (McGill-Franzen, A., and Allington, R.L., 1991) and after children reach Grade 3, reading difficulties become increasingly difficult to remediate (Good, R.H., Simmons, D.C., and Smith, S.B., 1998). For example, Cunningham and Stanovich (Cunningham and Stanovich, 1997) found that Grade 1 reading ability was a strong predictor of a variety of Grade 11 measures of reading ability, even when measures of cognitive ability were taken into account.

The Preschool years also are a critical time for children to learn to regulate their own emotions, acquire social skills needed to form relationships with children and adults, and to function as part of a group. During these years children are first learning to manage their emotions and form relationships, their success seems likely to have long-term implications for later personal and social adjustment (R. Pianta, 1999). Furthermore, the emergence of self regulatory skills and social competence is linked to language skills and early literacy (Lonigan, Burgess, and Anthony, 2000). Language, in turn, is foundational to early literacy development (Dickinson et al., 2003; Dickinson et al., 2003; Whitehurst and Lonigan, 1998) as well as to long-term reading comprehension (Tabors et al., 2001; Storch and Whitehurst, 2002).

As evidence has accumulated indicating the importance of the Preschool years, research examining the fine-grained details of classrooms has found that far too often children are not supplied the level of support they need. For example, book reading is far from a universal practice and when done often is not conducted in a way calculated to have optimal benefits (Dickinson and McCabe, 2003). Conversations between teachers and children, the strongest means for building language skills, often are brief and fail to effectively support children's language. These short-comings partly reflect the rapid changes in attitudes regarding the appropriateness of supporting literacy in the Preschool years (Dickinson, 2002).

The tide can be turned. In the years between ages three and five children are rapidly learning language and they are particularly responsive to efforts to bolster their phonemic awareness (Ehri et al., 2001). Preschool classrooms can significantly boost children's language. Teachers who use appropriate complex

forms of language with Preschool children can markedly improve the complexity of children's language (Huttenlocher, Vasilyeva, Cymerman, and Levine, 2002). Effective approaches to book reading foster comprehension and vocabulary learning in ways that can still be detected in the middle grades (Tabors et al., 2001; Dickinson and Smith, 1994). Also, teachers who engage in sustained professional development efforts can adopt new practices that dramatically improve the quality of support they provide for language and literacy—changes that translate into marked improvement in children's learning (Dickinson, Anastasopoulos, Miller, Caswell, and Peisner-Feinberg, 2002). Long-term research has revealed that improvements in the quality of children's Preschool experiences have effects that can be detected even into late adolescence and early adulthood (Tabors et al., 2001; Reynolds et al., 2001; Reynolds, Temple, Robertson, and Mann, 2001; Campbell and Ramey, 1994; Schweinhart, L.J., and Weikart, D.P., 1999). *OWL* takes seriously our obligation to ensure that all Preschool children are given the opportunity to acquire the knowledge, skills and dispositions that will enable them to enter Kindergarten and first grade prepared to take full advantage of the academic programs offered by schools.

Ingredients for Successful Literacy Learning

Early literacy covers multiple components including language, phonological awareness, and letter knowledge. These abilities are interrelated so that growth in one capacity supports other abilities. Because these abilities are related, the most effective strategies for supporting development are those that engage children in activities that teach several skills at once. For example, imagine a child who is trying to write a note to her mother saying, "I love you," and her teacher notices her effort. The child has written the "I," having carefully produced a straight line that is the right length. Now she is stuck on "love." Her teacher says the word slowly, drawing out the "L." The child brightens, noting the initial sound and says "Oh /l/," "L" is for /l/! Here the child, with teacher scaffolding, has been helped to develop her phonemic awareness skills, has revealed knowledge of the name of the letter "L" and recognition of the link between "L" and the sound it represents. All of this is done as part of an interaction that validates the child's effort to convey an important message to her mother, thus ever so slightly deepening the bond between teacher and child and affirming the child-parent connection.

Language Development

Extensive research has demonstrated that different language abilities are related to later reading success. Preschool language skills support the emergence of phonemic awareness (Whitehurst and Lonigan, 1998; Lonigan et al., 2000) and by the middle elementary school years play a major role in supporting reading comprehension (Storch and Whitehurst, 2002; Biemiller, 1999; Walker, Greenwood, Hart, and Carta, 1994). Children's skill using and understanding sentences *(syntax)* and extended stretches of language are related to reading success and significant problems with these areas of language often are associated with reading problems (Bishop and Adams, 1990; Scarborough, 2001, Scarborough, 1990, 1991).

The language skills associated with successful reading can be shaped in important ways by children's Preschool classroom experiences. One large study of the effects of child care found that children's language growth was significantly associated with the amount of time they spent talking with and listening to adults, with the most beneficial type of talk being conversations that communicated information (McCartney, 1984). Similarly, in a detailed study of children's experiences in Preschool classrooms, Dickinson (Dickinson, 2001b) found that the amount and quality of conversations that four-year-old children had with their teachers were strongly associated with children's end-of-Kindergarten language and literacy scores. Kindergarten language and literacy levels predict later performance in fourth and seventh grades (Roach and Snow, 2000). Children benefited from conversations with teachers that were sustained, included varied vocabulary, and encouraged children to think and to use language to

communicate ideas and talk about past and future experiences. He also found that children's vocabulary and comprehension abilities were related to the kind of conversations they had as books were read aloud (Dickinson and Smith, 1994; Dickinson, 2001a) (Dickinson and Smith, 1994; 2002). Four-year-old children's syntactic development also has been found to reflect the nature of conversations they have with their teachers, with fall-to-spring growth in the complexity of children's syntax being related to the nature of language used by their teachers (Huttenlocher et al., 2002).

Phonological Awareness

Intense research activity carried out since the 1970's now has established that the ability to focus on and manipulate phonemes is critical to reading success and that skill attending to the sound structure of language during the later Preschool years is an important predictor of later reading success (Adams, 1990; Stanovich, 1986; Stanovich, 1986; Vellutino and Scanlon, 2001; Vellutino and Scanlon, 2001; Wagner et al., 1997). As is the case for other literacy-related skills, there are large, income-related differences in the abilities of children to attend to the sounds of language at the time when children enter Kindergarten (Lonigan, Burgess, Anthony, & Barker, 1998; Dickinson and Snow, 1987).

Later reading problems often are associated with limited phonemic awareness abilities, and some severe deficiencies may be caused by biologically based processing problems. Many more reading problems are caused by deficiencies in instruction, as recent estimates suggest possibly only 1.5% to 6% of children have problems that do not respond easily to early remediation (Torgesen and Burgess, 1998; Scanlon and Vellutino, 1997). It is possible to significantly enhance children's phonemic awareness through instruction. Intervention studies have improved phonemic awareness and later reading achievement (Ball and Blachman, 1991; McGuinness, McGuinness, and Donohue, 1995). Training Preschool children in phonological skills even before beginning reading instruction has also proven effective (Lundbeg, Frost, and Peterson, 1988). Indeed, the review of in their review of the literature on phonemic awareness, the National Reading Panel (Ehri et al., 2001) found that the average impact of the few training studies done with four year olds were more than twice as effective as those done with older children.

Letter Knowledge

Children's ability to name letters also has repeatedly been found to be the best, or one of the best, predictors of later reading (Lonigan et al., 2000; Adams, 1990; Adams, 1990). This finding can be understood if one realizes that the ability to name a letter means that a child has had enough experience with letters to be able to attend to those features that distinguish one letter from the next. When children have "tuned into" letters they begin to notice them in their environment and begin using them to write. Since letter names often carry information about the sounds the letter represents, children often rely on their knowledge of the letters when writing. As children use their knowledge of letters as part of their writing, they analyze the sounds of words thereby engaging in a motivated phonemic awareness activity. Given the close connection between letter name knowledge and phonemic awareness, it is not surprising that the interventions that best foster phonemic awareness those that include use of letters (Ehri et al., 2001; Bus and van Izendoorn, 1999; Schneider, Roth, and Ennemoser, 2000).

Social and Emotional Development

Researchers are increasingly beginning to investigate the interrelationships between cognitive and personal-social domains, because strong language skills help development of children's ability to regulate their own emotions and form relationships with others (Dionne, G., Tremblay, R., Boivin, M., Laplante, D and Perusse, D., 2003) Young children with specific language difficulties tend to have poor social interaction skills and are more likely to be rejected by their peers (Fujiki, M and Brinton, B., 1994; Gertner,

B.L., Rice, M.L., and Hadley, P.A., 1994). The ability to regulate one's emotions and engage in positive and behavior is valued by primary grade teachers (Alexander and Entwistle, 1988; Pallas, Entwisle, and Cadigan, 1987). As a result, such socially competent children are more likely to form close ties to teachers—a factor found to be related to long-term consequences for academic success (Hamre and Pianta, 2001; R. C. Pianta, Hamre, and Stuhlman, 2002).

Ingredients for Successful Instruction

We have briefly reviewed literature that makes evident the critical need to provide Preschool-aged children programs rich with support for multiple aspects of development. As we discussed research on the development of literacy, we discussed findings that support the instructional principles that guided the development of *OWL*. They are as follows:

Comprehensive Approach

The most effective way to build any single component of children's emerging skills is by addressing all components in an integrated fashion. *OWL* targets all key early literacy abilities and does so in activities that draw upon multiple capacities at the same time.

Focus on Language

OWL places the highest possible priority on supporting children's language learning. The program systematically supports vocabulary learning by embedding attention to vocabulary in the context of meaningful extended discourse such as book reading and teacher-child conversations. Children's vocabulary-learning needs are addressed by specifying key vocabulary for each book and highlighting words for use during teacher-led and child-initiated activities. Children hear words repeatedly in the context of complex language, thus as they are learning words they are building syntactic and discourse skills.

Attention to Phonological Awareness

There can be no question that all children must be helped to attend to the sounds of language. Phonological awareness is supported through exposure-based approaches such as singing and reading predictable books, through teacher-led games designed to help children attend to the sounds of language, and by encouraging child-initiated activity such as writing.

Learning About Letters

Letters are tools that allow children to begin to unlock the mysteries of writing. OWL includes teacher-led games and child-initiated activities that allow children time to experiment with letters as they learn the features that distinguish one letter from the next. Through repeated games and activities, children will gain skill identifying letters by their shape and to quickly associate letters with their names.

Acquiring Social Skills

OWL helps children build skills regulating emotions and relating to others by providing explicit instruction related to these issues. More importantly, discussion of social and emotional issues are woven into discussions of books and conversations about on-going classroom events. Also, children are repeatedly provided group activities designed to hold their interest and motivating child-initiated activities that they can do alone or with others.

A Learning Community

Possibly one of the most important enduring benefits of an effective Preschool program is nurturing in children a desire to learn and a sense of competence as learners. *OWL* strives to help children become self-

sustaining learners by helping them become conscious of words and interested in learning them, to find writing to be an exciting activity they use for their own purposes, to be drawn to books and eager to learn from a variety of different kinds of books.

Conclusion

OWL draws on the wealth of research on early literacy development that has been generated over the past quarter of a decade. It provides an instructional program that is comprehensive, that balances child-initiated with teacher-directed activity as it systematically teaches children skills and concepts that are essential for long-term literacy success. In the coming years we anticipate that research done on the impact of *OWL* will shed new and promising light on the potential Preschool classrooms hold for supporting long-term literacy development.

OWL Summative Research

Pearson strongly believes that its products must demonstrate proven effectiveness in increasing student learning. As such, it contracted with Vanderbilt University's Center for Evaluation Research and Methodology, to evaluate the effectiveness of the *OWL* program. This report summary presents the evaluation design and methods, an assessment of program implementation, student performance results, and a discussion of findings.

Study Design and Goals

Vanderbilt University collaborated with eight Preschools that received Early Reading First (ERF) funding. The Preschool programs that receive ERF funding must conduct an evaluation of their activities, including assessments of students' early literacy and school readiness. In addition, these programs must assess the quality of program implementation. There were no control groups used in the study. However, the study included over 100 teachers and 3,000 children with implementation ranging from two to three years. Data was collected for a range of school years from two years for some sites and up to four years for other sites. The average years of collected data were three years for each site.

The goals of this research effort were to:

1. Determine if children participating in *OWL* programs achieve gains in literacy-related outcomes over their Preschool year
2. Determine the fidelity of implementation achieved across the programs
3. Identify the strategies Preschool programs have taken as they have implemented *OWL*

Participants and Settings

The eight Preschool programs in the sample were located in multiple regions of the United States. and housed in a variety of educational and community settings, including Head Start, public school pre-K programs, and community early childhood programs. Most of the classrooms served four-year-old children, but some served mixed-age groups of three- and four-year-olds. There are 3,627 children in the combined dataset. About 3,000 of these children (49% male) were included in pretest and posttest assessments, and nearly all were from low socioeconomic status families. The average age of the children at the pretest was 4 years, 4 months, with a range from 3-to-5 years.

African American, Hispanic, and recent immigrant children were represented, though there were considerable missing data with regard to the ethnic backgrounds of the children. Among the 1,752 children for whom race/ethnicity was known, which is slightly less than half of the total sample, 36% were Caucasian, 40% were African American, 17% were Hispanic, and 7% were from other minority backgrounds (including recent immigrants from Africa and the Middle East). Several programs were not able to provide background on race/ethnicity at the child level for some cohorts, which accounts for the considerable missing data on this demographic variable. Interviews with program personnel from these sites tell us that they have high proportions of both African American and Latino children. Thus, it is likely that minority children represent a considerable majority of our overall sample.

Home language information was provided for about two-thirds of the Preschoolers in the study. English Language Learners were well represented in most of the Preschool programs, with Spanish being the most common home language among non-English speaking families. Among the over 2,000 children with home language information, 473 (about 20%) were English Language Learners. Interviews supplemented the data provided by program personnel and tell us that half of the programs had non-trivial numbers of English Language Learners: three programs had classrooms in which 20–30% of the children spoke Spanish, another program included a Preschool center described as "largely Spanish speaking," and one program served children representing 22 different home languages. Early Reading First funding gives preference to Preschool programs serving English Language Learners, so it is not surprising that such large numbers of ELLs are represented in our study.

Measures

Multiple measures were used to assess student achievement and program implementation. In order to measure program implementation evaluators collected data through classroom observations or program adminstrator interviews. As part of the Department of Education funding requirements, ERF grantees must collect pretest and posttest assessments on their participating children. All programs collected the Peabody Picture Vocabulary Test version III (PPVT-III), a measure of receptive vocabulary. The PPVT-III is the leading measure of receptive vocabulary for standard English and a screening test of verbal ability published by Pearson Assessment. This individually administered, norm-referenced instrument is offered in two parallel forms—IIIA and IIIB—for reliable testing and retesting. The PPVT-III directly measures vocabulary size, with the rank order of item difficulty being highly correlated with word use frequency. This test also is used as a quick indicator of general cognitive ability, correlating with other measures of linguistic and cognitive development related to school success. In addition, nearly all sites supplemented the PPVT III with additional language and literacy assessments, which varied considerably from site to site. This data was also collected for analyses. Child assessment data and classroom observations were generally collected by professional evaluators who were funded by the ERF grant awards. Most evaluators worked closely with their Preschool programs to identify and track the children over the Preschool year, and to monitor implementation fidelity, but were generally independent of teacher training, coaching, and professional development activities.

Implementation

Two of the programs in this study (Programs C and H) were funded in 2003, prior to the official publication of the *OWL* curriculum. Although program administrators had access to pre-publication copies of the units as they became available at the end of Year One, they did not begin curriculum implementation until Year Two.

Of the programs funded after the curriculum was published, the number of *OWL* curriculum units delivered in Year One varied: Programs F and B did not utilize any full *OWL* Units, but rather sampled some

activities such as story book readings; Program G delivered one full unit at the end of the year; Program D implemented three units; and Programs A and E offered four units during the school year.

Similarly, during Year One, programs differed in how soon after funding they phased in the components of the curriculum: the four Readings; Small Groups; Centers Time; Let's Talk About It; Let's Find Out About It; Songs, Word Play, and Letters (SWPL); and Morning Meeting. One program began to implement all components immediately in the fall and two did not implement any components the first year. The five other programs all began using at least three readings by winter; by spring all of these five began Centers and SWPL. One of these programs did not begin Small Group and Let's Find Out About It until Year Two.

All program directors and the coaches interviewed indicated the challenges inherent in the first year of adopting this new curriculum, as expressed by two of the directors, "The first year (of implementation) is very hard for the teachers because of the learning curve and getting all the materials together!" The director of another program commented, "the first year of full implementation using *OWL* is almost like the first year of teaching: getting through the day, getting stuff together, learning components, putting them all together."

During Year Two and subsequent years for those who completed more than two years, all programs delivered part or all of all six units. Some programs began training teachers in one component of the curriculum at a time; for example, training them in the Story Book Reading component of the curriculum first and then implementing Story Book Readings before tackling the other components of the curriculum. Then they would train the teachers in another component, such as *Songs, Word Play, and Letters* (SWPL) adding that to the daily schedule, and continue building up to the full curriculum over several months.

Some of the programs are intending to continue using *OWL* after completion of their ERF funding. Program C completed its fourth year last year and continued to use *OWL* again this year, five years since the inception of the ERF Program. In a group interview with the program director and three of the coaches, the following comments were enthusiastically made: "We haven't been in classrooms at all this year and the teachers that we know are still using *OWL* are incredible. They are so excited about what they see the children learning, so it has continued on. It is really wonderful… I was just in a classroom where they are reading 'Make Way for Ducklings.' The children were sitting there listening to that as if they had been listening to books like that forever, which of course they haven't. They have learned about the power of reading and listening and the joy of it! So that was wonderful to see. We are strong advocates of this curriculum! We are really pleased with it!"

Student Performance Results

Evaluators conducted several analyses to examine learning gains among *OWL* students. Eight different sites provided PPVT standard scores before and after Preschool on their children. Early Reading First grantees typically receive their first year funds in September and are expected to begin program implementation by January. As a result, most of the programs in our sample did not begin pretesting until December or later in the first implementation year. Though implementation was begun in January of the first year for all programs, the scope of what was implemented varied across programs. Only one program implemented the full curriculum in its first implementation year. In later years, curriculum implementation began at the beginning of the school year, and pretesting was completed as early as possible in the fall. The children in the eight participating Early Reading First programs begin Preschool as low achievers. Overall, the predominantly low socioeconomic status children in our sample start Preschool performing well below the national average in receptive vocabulary.

Overall, 2,174 children were assessed at pretest and posttest on the PPVT-III. On average, children using *OWL* achieved positive gains on receptive vocabulary across all eight Preschool programs in the sample. A second interesting finding from Figure 1 is observed when comparing the year-to-year gains across the different programs. For all eight programs, second-, third-, and fourth-year gains are better than first-year gains. These gains are, in some cases, more than double the gains in the first year of implementation. The larger gains in later implementation years are remarkably consistent and quite robust across the different Preschool programs. Recall that ERF programs typically do not reach full implementation in their first funding year.

Figure 1 PPVT Standard Score Gains by Program and Implementation Year

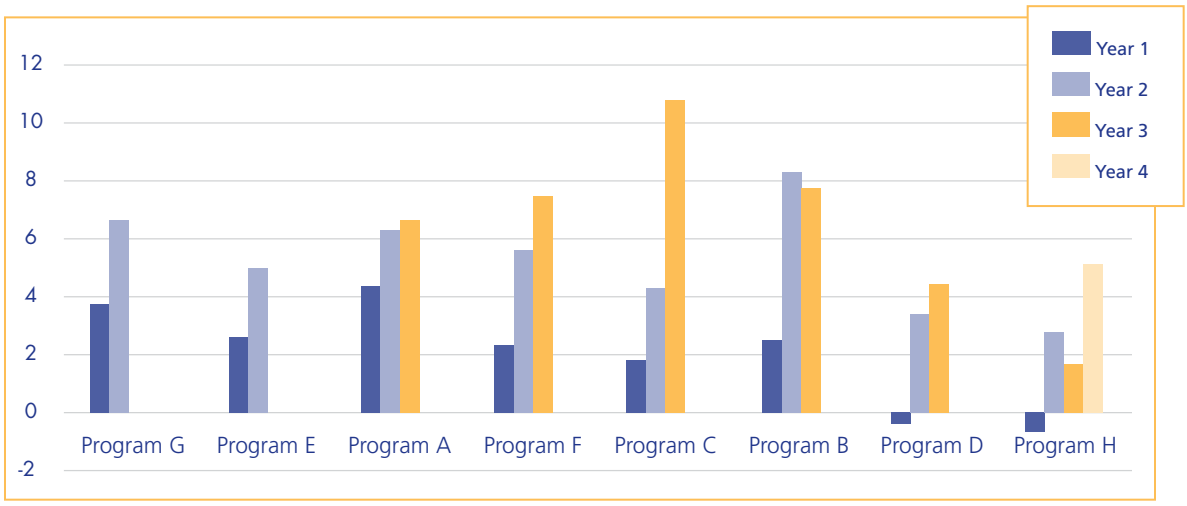

Table 1 below presents the pretest and posttest means, gain scores, and standardized mean gain effect sizes for the PPVT-III. These gains are illustrated graphically in Figure 1 above. Though gains were observed across all programs, the posttest average reached the 100 mark on the Peabody Picture Vocabulary Test for only two programs. Program B in its first and third implementation years, and Program D in its second and third years, achieved averages of slightly over 100 on the PPVT. Thus, although children were clearly achieving gains in receptive vocabulary in Preschool, many children in our sample were still low achievers when they entered Kindergarten.

Table 1. Mean Pretest and Posttest Standard Scores on the PPVT by Program and Implementation Year

		Pretest Mean	Posttest Mean	Gain	Mean Gain Effect Size	n
Program A	Year 1	83.9	88.0	4.1	.28	208
	Year 2	80.8	87.0	6.2	.40	242
	Year 3	82.1	88.6	6.5	.43	235
Program B	Year 1	99.5	101.7	2.2	.12	104
	Year 2	91.6	99.7	8.1	.51	72
	Year 3	94.4	102.3	7.9	.55	74
Program C	Year 1	94.1	96.0	1.9	.14	68
	Year 2	91.2	95.3	4.1	.32	53
	Year 3	77.2	87.9	10.7	.55	86
Program D	Year 1	99.7	99.6	-0.1	-.01	115
	Year 2	96.9	100.3	3.4	.25	129
	Year 3	97.4	101.6	4.2	.40	115
Program E	Year 1	90.8	93.3	2.5	.12	253
	Year 2	94.3	99.3	5	.31	249
Program F	Year 1	86.7	88.9	2.2	.17	140
	Year 2	82.8	88.4	5.6	.36	122
	Year 3	82.2	89.6	7.4	.54	115
Program G	Year 1	83.8	87.6	3.8	.31	151
	Year 2	83.2	89.7	6.5	.52	191
Program H	Year 1	95.0	94.6	-0.4	-.04	22
	Year 2	91.4	94.2	2.8	.20	33
	Year 3	95.4	97.2	1.8	.13	46
	Year 4	89.2	94.0	4.8	.36	124
OVERALL	Year 1	90.0	92.6	2.6	.15	1061
	Year 2	88.0	93.5	5.5	.35	1091
	Year 3	86.4	93.0	6.6	.41	671
	Year 4	89.2	94.0	4.8	.36	124

Next evaluators analyzed the PPVT-III scores broken down by the different demographic subgroups. Keep in mind that not all programs were able to provide this information, so observed differences between demographic and language groups must be interpreted with caution. It was already proven that students using the *OWL* program demonstrated significant gains in achievement. The following sections will concentrate on if these gains differ by student demographic subgroups.

Pretest and posttest PPVT-III

Standard scores for boys and girls for the Two Year Implementation group were analyzed. Within each implementation year and from Year 1 to Year 2, the results were quite consistent. Differences between boys and girls at both pretest and posttest were slight, and gains were about equivalent for both boys and girls, with smaller gains in Year 1 for both groups. With the Two Year Implementation group, differences between boys and girls at both pretest and posttest were slight, and gains were about equivalent for both boys and girls. Table 2 on the next page shows the mean pretest and posttest PPVT-III standard scores and gains for the various demographic subgroups for programs with three years of implementation. Results indicate *OWL* is an effective program for all students regardless of gender.

In addition to gender, evaluators also broke down student gains by ethnicity. Overall, White children started and finished Preschool achieving higher than their minority peers. With the exception of White children in Year 1, all groups evidenced gain over their Preschool year. This was particularly so for the minority groups, who clearly achieved greater gains than their majority peers. Hispanic children, who started much lower than their peers, achieved the largest gains on average, and this differential gain was larger in both Year 2 and Year 3. Many of the Hispanic and other minority students were also English Language Learners, and they appeared to make large gains in vocabulary over their Preschool year as they began to acquire English.

As with the race/ethnicity breakdowns, data on home language were limited, though they evidenced a similar pattern to the comparisons across ethnic backgrounds. English Language Learners began Preschool significantly behind their English-speaking peers in terms of receptive vocabulary, on average scoring 10–20 points lower, depending on the year. But, they made greater gains over their Preschool year than the English speakers. The gains achieved by the ELL children in the later implementation years surpassed those of their English speaking peers by a large margin.

These findings suggest that the *OWL* program generated similar outcomes regardless of gender, ethnicity, or English language learner status.

Table 2. Pretest and Posttest PPVT Means and Gains by Demographic Subgroups: Three Year Implementation Group

		Pretest	Posttest	Gain	n
Boys	Year 1	91.0	93.1	2.1	293
	Year 2	86.9	92.3	5.4	312
	Year 3	85.7	93.0	7.3	345
Girls	Year 1	92.8	95.5	2.7	282
	Year 2	87.3	92.4	5.1	338
	Year 3	87.2	92.7	5.5	319
		Pretest	Posttest	Gain	n
White	Year 1	99.4	99.1	-0.3	127
	Year 2	96.1	99.8	3.7	145
	Year 3	97.3	100.7	3.4	154
African American	Year 1	88.0	90.8	2.8	100
	Year 2	84.3	89.4	5.1	204
	Year 3	84.8	90.4	5.6	207
Hispanic	Year 1	72.4	76.6	4.2	11
	Year 2	69.4	73.5	4.1	31
	Year 3	62.5	76.3	13.8	56
Other	Year 1	89.2	91.2	2.0	23
	Year 2	81.4	90.8	9.4	27
	Year 3	86.1	94.0	7.9	21
		Pretest	Posttest	Gain	N
English-speaking	Year 1	95.1	97.0	1.9	339
	Year 2	89.6	94.9	5.3	356
	Year 3	87.0	92.9	5.9	352
ELL	Year 1	82.3	85.5	3.2	31
	Year 2	72.8	79.5	6.7	53
	Year 3	71.0	82.1	11.1	188

* Race/ethnicity: 51% missing of overall samples and Home Language: 74% missing over all samples

Evaluators also summarized the results for the several other language and literacy outcomes available for our sample of Preschool children. The other outcomes that were available for two or more programs were standardized within site and grouped into four broad categories: (1) Language [not including PPVT-III], (2) Alphabet Knowledge, (3) Print Concepts and Writing, and (4) Phonological Awareness (the individual instruments within these categories were described above). Because all the composite outcome variables were standardized, the reporting format here focuses on gains. The mean gain effect sizes and sample sizes for the broad outcome categories are presented in Tables 3 and 4.

Table 3. Pretest-Posttest Gain Effect Sizes for Language and Literacy Outcomes by Year of Implementation: Two Year Implementation Group

		Gain Effect Size	n
Language	Year 1	.52	487
	Year 2	.79	463
Alphabet Knowledge	Year 1	.50	576
	Year 2	.89	514
Print Concepts	Year 1	.63	411
	Year 2	.71	427
Phonological Awareness	Year 1	.44	629
	Year 2	.67	591

Table 3. Pretest-Posttest Gain Effect Sizes for Language and Literacy Outcomes by Year of Implementation: Three Year Implementation Group

		Gain Effect Size	n
Language	Year 1	.46	220
	Year 2	.62	206
	Year 3	.58	194
Alphabet Knowledge	Year 1	.47	412
	Year 2	.91	430
	Year 3	1.04	390
Print Concepts	Year 1	.59	504
	Year 2	.70	492
	Year 3	.79	467
Phonological Awareness	Year 1	.41	390
	Year 2	.67	366
	Year 3	.89	342

Children in both cohorts (Year 1 and Year 2) achieved gains on all language and literacy outcomes over their Preschool year. Furthermore, the gains for the second cohort of children were larger than the gains for the first cohort for all outcomes. With the exception of the Language category, children experienced gains on all language and literacy constructs in each year of implementation and those gains increased from year to year. This effect is remarkably consistent across the different language and literacy outcomes and parallels the findings presented earlier for the PPVT-III. In addition, the effect size values are not trivial. The gains for Alphabet Knowledge and Phonological Awareness are quite substantial for the programs with three years of data. The difference between the first year of implementation, in which most programs implemented very little of the curriculum, versus later years, suggests that as more of *OWL* was delivered to children, greater gains were achieved.

Teachers and parents had positive experiences with children using *OWL*. In one program, a recent immigrant mother was reported to have commented that "this is real school" and was delighted that her child did not need to go into an ELL classroom the following year. Program staff commented on the learning gains exhibited by some children during interviews:

"I was at an IEP recently. One of my lowest children knew 16 uppercase and 12 lowercase, which really isn't so low."

"I have a child who gets many related services. He knows 24 uppercase now and I almost fell out of my chair. I'm so proud of him."

"'Let's Find Out About It' helped my global language, how I teach/speak to children. It taught me how to get that vocabulary all day long. Kids aren't afraid to ask."

Parents even noticed changes in their children. The program directors we interviewed reported several parent comments:

"One parent said she was floored at what her children were doing."

"A parent mentioned how one child was comparing different spellings between Hannaford and her name."

"A younger girl is doing homework along with her other siblings. Sometimes she even copies their homework to practice."

"I had parents asking if the children were too prepared."

Discussion

The *OWL* Consortium Project has accumulated quantitative and qualitative information on eight Preschool programs implementing the *OWL* curriculum. Summarized here is the Preschool progress of over 3,000 children and their more than 100 teachers. On average, the children participating in the Preschool programs we studied were low achievers, many performing below the national average on the PPVT –III at the beginning of Preschool. However, on average, children achieved gains in receptive and other language, alphabet knowledge, print concepts, and phonological awareness over their Preschool year. The Preschool children in *OWL* classrooms made progress in early literacy and language, but many were still low performers when they began Kindergarten.

Observational data from the classrooms and qualitative information from interviews provided strong evidence that implementation of the curriculum improved over time. The interviews suggested that Year Two implementation was improved over Year One, both in terms of the quantity of *OWL* units delivered and the quality with which they were delivered. *OWL* Implementation Fidelity Checklist and Literacy Environment Checklist scores both increased over time. For programs with three years, the improvements in curriculum implementation appear to be sustained in later years.

The clear improvements in implementation quality from the first year of (minimal) implementation to later years of (full) implementation were paralleled by increasing achievement gains for the Preschool children. Second-, third- and fourth-year gains were better than first-year gains for all programs and all outcomes. These gains were, in some cases, more than double the gains in the first year of implementation.

Current OWL Evaluation

In addition to the *OWL* Consortium Project conducted by Vanderbilt University, Pearson continues to evaluate the effectiveness of the *OWL* program by partnering with WestEd to conduct a second evaluation. This study, currently being conducted, consists of four geographically and demograhically

diverse sites. All study sites have been using the *OWL* program for at least one year. The main goals of this evaluation are to address the following key research questions:

1. What is the impact of the *OWL* program on student early literacy as measured by reliable and valid assessment tools? Do students in Preschools implementing *OWL* make greater gains than comparable students?
2. Do subpopulations of students benefit more from *OWL* than others? (e.g., English learners, low SES)
3. What factors contribute to the ability of teachers to implement *OWL* with high fidelity?

WestEd will employ a rigorous quasi-experimental, matched comparison study to assess the implementation and effectiveness of the *OWL* early literacy program. Quasi-experiments do not use random assignment of participants to intervention and control groups but instead depend on applying appropriate measurement and statistical controls to nonequivalent groups in order to determine intervention impacts on the outcomes of interest. The design relies on a matching process (cluster analysis) to create a viable comparison group. The quasi-experimental design includes two conditions: (1) a treatment group comprising of approximately 400 Preschoolers in early learning programs implementing *OWL*; and 2) a matched comparison group of approximately 400 Preschoolers.

Measures of both implementation and impact will be selected or developed for use in the evaluation. These measures of classroom observations and implementation fidelity logs will assess the implementation of the *OWL* program and online teachers surveys are being utilized to gain a deeper understanding of the factors contributing to the ability of teachers to implement the *OWL* program with high fidelity. Children's literacy skills will be measured using the *Peabody Picture Vocabulary Test-Third Edition, Receptive* (PPVT-III). The PPVT-III has demonstrated good reliability and validity as a measure of children's emerging literacy and pre-reading skills and is a required Government and Performance Results Act (GPRA) indicator for Early Reading First (ERF) grantees. The PPVT-III directly measures vocabulary size, with the rank order of item difficulty being highly correlated with word use frequency. This test also is used as a quick indicator of general cognitive ability, correlating with other measures of linguistic and cognitive development related to school success. Pretest data will be collected in early fall 2008 and posttest data collected in late spring 2009.

The final report of this evaluation will be available in September 2009.

References

Adams, M. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT press.

Alexander, K. L., and Entwistle, D. R. (1988). Achievement in the first two years of school: Patterns and processes. *Monographs of the Society for Research in Child Development*. Chicago, IL: University of Chicago Press.

Ball, E. W., and Blachman, B. A. (1991). Does phoneme awareness training in kindergarten make a difference in early word recognition and developmental spelling? *Reading Research Quarterly,* XXVI, 49–66.

Baydar, N., Brooks-Gunn, J., and Furstenberg, F. F. (1993). Early warning signs of functional illiteracy: Predictors in childhood and adolescence. *Child Development,* 815–829.

Biemiller, A. (1999). *Language and reading success.* Cambridge, MA: Brookline Books.

Bus, A. G., and van Izendoorn, M. H. (1999). Phonological awareness and early reading: A meta-analysis of experimental training studies. *Journal of Educational Psychology,* 91, 403–414.

Campbell, F. A., and Ramey, C. T. (1994). Effects of early intervention on intellectual and academic achievement: A follow-up study of children from low-income families. *Child Development,* 65, 684–698.

Cunningham, A. E., and Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental psychology,* 33(6), 934–945.

Dickinson, D. K. (2002). Shifting images of developmentally appropriate practice as seen through different lenses. *Educational Researcher,* 31(1), 26–32.

Dickinson, D. K. (2001a). Book reading in Preschool classrooms: Is recommended practice common? In D. K. Dickinson, and P. O. Tabors (Eds.), *Beginning literacy with language: Young children learning at home and school* (pp. 175–203). Baltimore, MD: Brookes Publishing.

Dickinson, D. K. (2001b). Putting the pieces together: The impact of Preschool on children's language and literacy development in kindergarten. In D. K. Dickinson, and P. O. Tabors (Eds.), *Beginning literacy with language: Young children learning at home and school* (pp. 257–287). Baltimore, MD: Brookes Publishing.

Dickinson, D. K., Anastasopoulos, L., Miller, C. M., Caswell, L., and Peisner-Feinberg, E. (2002). Enhancing Preschool children's language, literacy and social development through an in-service professional development approach. *Annual Conference of the American Education Research Association.*

Dickinson, D. K., and McCabe, A. (2003). A framework for examining book reading in early childhood classrooms. In A. van Kleeck, E. B. Bauer and S. Stahl (Eds.), *On reading books to children: Parents and teachers* (pp. 95–113). Hillsdale, NJ: Lawrence Erlbaum.

Dickinson, D. K., McCabe, A., Anastasopoulos, L., Peisner-Feinberg, E., and Poe, M. D. (2003). The comprehensive language approach to early literacy: The interrelationships among vocabulary, phonological sensitivity, and print knowledge among Preschool-aged children. *Journal of Educational Psychology,* 95(3), 465–481.

Dickinson, D. K., and Smith, M. W. (1994). Long-term effects of Preschool teachers' book readings on low-income children's vocabulary and story comprehension. *Reading Research Quarterly,* 29(2), 104–122.

Dickinson, D. K., and Snow, C. E. (1987). Interrelationships among prereading and oral language skills in kindergartners from two social classes. *Early Childhood Research Quarterly,* 2, 1–25.

Dionne, G., Tremblay, R., Boivin, M., Laplante, D., and Perusse, D. (2003). Physical aggression and expressive vocabulary in 19-month-old twins. *Developmental Psychology,* 39(2), 261–273.

Ehri, L. C., Nunes, S. R., Willows, D. M., Schuster, B. V., Yaghoub-Zadeh, Z., and Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's meta-analysis. *Reading Research Quarterly,* pp. 250–287.

Fujiki, M., and Brinton, B. (1994). Social competence and language impairment in children. In R. V. W. M. L. Rice (Ed.), *Specific Language Impairments in Children* (pp. 123–144)

Gertner, B.L., Rice, M.L., and Hadley, P.A. (1994). Influence of communicative competence on peer preferences in a Preschool classroom. *Journal of Speech & Hearing Research,* 37(4), 913–923.

Good, R.H., Simmons, D.C., and Smith, S.B. (1998). Effective academic interventions in the United States: Evaluating and enhancing the acquisition of early reading skills. *Educational & Child Psychology,* 15(1), 56–70.

Hamre, B. K., and Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development,* 72, 625–638.

Hart, B., and Risley, T. (1995). *Meaningful differences in the everyday lives of American children.* Baltimore, MD: Brookes Publishing.

Huttenlocher, J., Vasilyeva, M., Cymerman, E., and Levine, S. (2002). Language input and child syntax. *Cognitive Psychology,* 45, 337–375.

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grade. *Journal of Educational Psychology,* 80, 437–447.

Lonigan, C. J., Burgess, S. R., and Anthony, J. L. (2000). Development of emergent literacy and early reading skills in Preschool children: Evidence from a latent-variable longitudinal study. *Developmental Psychology,* 36(5), 506–613.

Lonigan, C. J., Burgess, S. R., Anthony, J. L., and Barker, T. A. (1998). Development of phonological sensitivity in 2- to 5-year-old children. *Journal of Educational Psychology,* 294–311.

Lundbeg, I., Frost, J., and Peterson, O. (1988). Effects of an extensive program for stimulating phonological awareness in Preschool children. *Reading Research Quarterly,* 23, 263–285.

McCartney, K. (1984). Effect of quality day care environment on children's language development. *Developmental Psychology,* 20, 244–260.

McGill-Franzen, A., and Allington, R.L. (1991). The gridlock of low reading achievement: Perspectives on practice and policy. *Remedial & Special Education,* 12 (3), 20–30.

McGuinness, D., McGuinness, C., and Donohue, J. (1995). Phonological training and the alphabet principle: Evidence of reciprocal causality. *Reading Research Quarterly,* 30, 830–852.

Pallas, A. M., Entwisle, D. R., and Cadigan, D. (1987). Children who do exceptionally well in first grade. *Sociology of Education,* 60, 256–271.

Pianta, R. (1999). *Enhancing relationships between children and teachers.* Washington, DC: American Psychological Association.

Pianta, R. C., Hamre, B., and Stuhlman, M. (2002). Relationships between teachers and children. In G. E. Miller (Ed.), *Comprehensive Handbook of Psychology.* New York: Wiley.

Reynolds, A. J., Temple, J. A., Robertson, D. L., and Mann, E. A. (2001). Long-term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15-year follow-up of low-income children in public schools. *Journal of the American Medical Association,* 285, 2339–2346.

Roach, K., and Snow, C. E. (2000). What predicts 4th grade reading comprehension? *Annual Meeting of the American Education Research Association.*

Scanlon, D. M., and Vellutino, F. R. (1997). A comparison of the instructional backgrounds and cognitive profiles or poor, average, and good readers who were initially identified as at risk for reading failure. *Scientific Studies of Reading,* 1, 191–216.

Schneider, B., Roth, E., and Ennemoser, M. (2000). Training phonological skills and letter knowledge in children at risk for dyslexia: A comparison of three kindergarten intervention programs. *Journal of Educational Psychology,* 92, 284–295.

Schweinhart, L.J., and Weikart, D.P. (1999). The advantages of High/Scope: Helping children lead successful lives. *Educational Leadership,* 57, 76–77.

Snow, C. E., Burns, M. S., Griffen, P., Burns, M. S., and Griffen, P. (1998). *Preventing reading difficulties in young children.* Washington, DC: National Research Council, National Academy Press.

Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly,* 360–407.

Storch, S. A., and Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal structural model. *Developmental psychology,* 38, 934–947.

Tabors, P. O., Snow, C. E., and Dickinson, D. K. (2001). Homes and schools together: Supporting language and literacy development. In D. K. Dickinson, and P. O. Tabors (Eds.), *Beginning literacy with language: Young children learning at home and school* (pp. 313–334). Baltimore, MD: Brookes Publishing.

Torgesen, J. K., and Burgess, S. R. (1998). Consistency of reading-related phonological processes throughout early childhood: Evidence from longitudinal-correlational and instructional studies. In J. L. Metsala, and L. C. Ehri (Eds.), *Word recognition in beginning literacy* (pp. 161–188). Mahwah, NJ: Erlbaum.

Vellutino, F. R., and Scanlon, D. M. (2001). Emergent literacy skills, early instruction, and individual differences as determinants of difficulties in learning to read: The case for early intervention. In S. B. Neuman, and D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 295–321). New York: Guilford Press.

Wagner, R. K., Torgesen, J. K., Rashotte, C. A., Hecht, S. A., Barker, T. A., and Burgess, S. R., et al. (1997). Changing relations between phonological processing abilities and word-level reading as children develop from beginning to skilled readers: A 5-year longitudinal study. *Developmental Psychology,* 33, 468–479.

Walker, D., Greenwood, C., Hart, B., and Carta, J. (1994). Prediction of school outcomes based on early language production and socioeconomic factors. *Child Development,* 65, 606–621.

Whitehurst, G. J., and Lonigan, C. J. (1998). Child development and emergent literacy. *Child development,* 69(3), 848–872.

Wilson, S.J, Morse, A. B., and Dickinson, D. K. (2009). Examining the Effectiveness of *OWL* as used in ERF Projects: Final Report of Results from the *OWL* Consortium Project. *Center for Evaluation Research and Methodology: Vanderbilt Institute for Public Policy Studies.* January 2009.

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