

Sustained Effects of Participation in Imagination Library

Ann Harvey, Ed.D.
College of Education
Western New Mexico University

Abstract

The Imagination Library (IL), an organization which promoted literacy by mailing high-quality, age-appropriate picture books to newborns each month until they were five years old. Parents enrolled the children in the program and responded to annual surveys about family literacy practices. According to the self-reported results of the surveys, parents read aloud more often to their children after receiving the books in the mail. The school effects of this additional time with exposure to books were tested by this researcher. First graders were grouped by their enrollment in the IL program. Two groups of 15 students were chosen randomly from the total group of 80 first graders; a group which participated in the IL program, and a group that did not participate in the program. The first grade Dynamic Indicators of Basic Early Literacy Skills (DIBELS) test was used to measure these specific competencies: letter naming, phoneme segmentation fluency, nonsense word fluency, and oral reading fluency, which included speed, accuracy, and comprehensions of the main idea. Fourteen sets of test scores were compared to find the difference between the mean scores of the two groups. Using an analysis of variance with $\alpha = .10$, the mean scores of the IL students were found to be higher, but not significantly higher, on all the subtests except two. The grade level competen-

cy pass rate was also compared for the two groups. The IL pass rate for grade-level requirements was 72 percent while the pass rate for non-IL students was 55 percent.

Key words: emergent literacy, DIBELS scores for Southwest NM, first grade readers.

The goal of the Grant County, New Mexico, Imagination Library has been to deliver high-quality, age-appropriate books monthly to homes of local children from birth to age five and thereby promote experiences with language and reading. Children's exposure to as many as 60 books was intended to establish school readiness. Any parent was able to enroll a child in the program by supplying a mailing address and pledging to read to the child. The program was governed and funded locally while receiving administrative support from the national Dolly Parton IL Program. A parent survey, crafted locally with a template from the National Center for Education Statistics about reading frequency and behavior, served to evaluate the program. To this point, no vehicle to measure school effects of the IL program existed. This research served as an additional measure of the program's vision, which is to promote school readiness by increasing family literacy time.

Low reading scores have been resistant to school improvement in the state.

The 2014 National Assessment of Educational Progress (NAEP), the U.S. Reading Report Card, reports that Grade 4 of New Mexico Reading scores have remained well below the national average for 20 years despite continued efforts to improve them. According to the New Mexico Public Education Department (2014),

In 2013, the average score of fourth-grade students in New Mexico was 206. This was lower than the average score of 221 for public school students in the nation. The average score of 206 for students in New Mexico in 2013 was not significantly different from their average score, 208, in 2011 and was lower than their average score of 211 in 1992. (p. 1)

Encouraging family literacy activities is an avenue that has yet to be explored. Therefore, it is helpful for policy makers to measure gains made from these efforts and to track their effect on reading scores as pre-school students progress to elementary school.

Literature Review

The connection between reading aloud to young children and their success in school has been validated for several decades (Moerk, 1985; Pellegrini, 1990). Parents who read to their children are supporting and fostering their language development (Bus, van Ijzendoorn, & Pellegrini, 1995) and their early reading development (Haden, Reese, & Fivush, 1996). During book reading, parents have opportunities to explore the patterns that occur in written language with their children. “Familiarity with written language patterns allows children to develop print awareness by knowing what to expect when they begin reading on their

own” (Sell, Imig, & Samiei, 2014, p. 2).

Dialogic Reading, a technique developed by Grover Whitehurst (1994) emphasizing interactive reading with parents and children, has been successful in preparing low-income preschoolers to become readers. The fundamental reading technique in dialogic reading is the PEER sequence. A short interaction between a child and the parent occurs at every turn of the picture-book page. The parent: Prompts the child to comment on the book; Evaluates the child's comment; Expands the child's comment by paraphrasing and elaborating; and Repeats the prompt to make sure the child has learned from the elaboration (Whitehurst, Arnold, Epstein, Angell, Smith, & Fischel, 1994). The intervention of dialogic reading produced a significant difference in the scores of preschoolers taking the Expressive One-Word Picture Vocabulary Test-Revised over those students who had not experienced the intervention practice (Institute of Educational Sciences, Work Works Clearinghouse, 2014).

An optimal time exists for early childhood interventions because of the developmental plasticity of the brain. Children who are at greatest risk tend to show positive gains in many areas of development as a result of interventions at this stage of development. (Camilli, Vargas, & Isaacs, 2007; Janus & Duku, 2007; Son & Morrison, 2010). “Previous research indicates that greater parent-child reading practices predict greater receptive vocabulary, understanding of story and print concepts, and pre-literacy skills among low-income children” (Bracken & Fischel, 2008, p. 51).

If books are available in the home, parents are more likely to participate in reading time with their child (Ridzi, Sylvia, & Singh, 2011). According to a 20-year University of Nevada study by Evans, Kelly, Sfkora, and Trefman (2010), the number of books in the home predicted the level of education of a child more accurately than did the educational level of the parents. “Children of lesser educated parents benefited the most from having books in the home” (Evans, Kelly, Sfkora, & Trefman, 2010, p. 1).

Parents who have enrolled in IL seemingly become more sensitive to the benefits of having a home library. Survey data from Michigan show that family ownership of books increased 54 percent (from 69 to 106 average number of books) during the time children participated in IL while IL books only constituted 16 percent of family book ownership (Lelle, 2011).

Local parent surveys from the past four years suggested a continuing trend that parents spent more time reading to their children after they were enrolled in the IL program than before they were enrolled. The 2013 Grant County Parent Survey produced this information: “the Likert Scale analysis of question 1 revealed that before entering the program, the average family read to their child only three or four times a week with a scaled score of 3.4. After entering the program, the average family read to their child once a day with a scaled score of 4.21 according to question 2” (Harvey, 2014, p. 5).

By interpreting the results of questions 1 and 2, a marked change in family literacy behavior is noted. The parents who read more than once a day rose from 24 percent to 43 percent. The number of parents who never read to their

children shrank from 2.0 percent to zero.

This is consistent with the 2012 survey results, which reported that daily reading rose from 46 percent to 78 percent, while the parents who seldom read to their children dropped from 9.3 to zero. In both years, the percentage of parents who read more than once a day almost doubled. The value of this change in behavior is validated by the National Association for the Education of Young Children (NAEYC) which advises that children be read to every day for 20 minutes (Policy Statement on School Readiness, NAEYC, 2014). By the age of five, the child will have listened to stories for 600 hours. This activity equips children with a vocabulary and a depth of background knowledge that prepares them for success in school.

Low reading scores from the children of New Mexico have been a cause for alarm for the educational policy makers of the state. Despite the state’s per-pupil expenditure of \$9,683 and pupil-teacher ratio of 14.7 teachers for each student, New Mexico’s NAEP scores only rank higher than the District of Columbia and are comparable to those of California, Alaska, Louisiana, and Mississippi. Demographics may be a contributing factor since the New Mexican students are comprised of a large portion of English Language Learners (NM Public Education Department, 2014). Over half of the states’ students qualify for free and reduced lunch. The achievement gap, which seems to be decreasing, still produces average scores for minorities that are 23 points lower than white average scores. Free and reduced school lunch stu-

dents score 27 points lower than students who were not eligible for free and reduced lunch.

While many literacy improvement programs are limited to implementing change in instruction in the schools, few entertain the objective of influencing the family literacy practices of preschoolers. Increased instructional time at home has the potential to raise literacy rates.

Evidence in the literature demonstrated that encouraging family literacy positively affected school achievement. A recent study by the Melbourne Institute of Applied Economic and Social Research, which was controlled for socio-economic factors, found that four- to five-year-olds who were read to three to five times per week had a reading ability equal to children who were six months older and were read to less often. A longitudinal study reviewed the literacy scores of over 4000 students from age four to age eleven. The study showed that reading to children six to seven days a week puts them almost a year ahead of their peers who had not read with their parents. (Kalb, & van Ours, 2013).

Similar research was conducted recently in Shelby County, TN, which tested the sustained effects of students who were exposed to early storybook reading by comparing second grade reading scores. In a study by the Books from Birth program, 170 students who received books were compared to 164 students who did not. Those students who received books had higher second grade reading scores on the Istation Early Reading measure. The scores were significantly higher on vocabulary and reading comprehension when alpha was set at .02. The study controlled for socio-economic status, gender, mobility, and attendance rates (Sell, Imig,

& Samiei, 2014). There was no difference between the spelling scores of the two groups. Higher vocabulary and comprehension scores with lower spelling scores would be expected because frequent reading offers vocabulary words within the context of a story, providing a scaffold for deciphering the meaning of unfamiliar words. If adults discuss the illustrations or help the child identify with the characters, the child is exposed to even more new vocabulary words (Sell, Imig, & Samiei, 2014).

For over a decade, Middleton, Ohio, schools have produced literacy scores ranked in the bottom seven percent of the schools. Despite offering after-school tutoring and enrichment programs, the school administrators had neglected to concentrate on early childhood literacy until 2008. The IL program was initiated to fill this gap. In order to test the early effects of the program, the Kindergarten Readiness Assessment-Literacy (KRA-L) which was administered to entering kindergarteners was used to compare the scores of two groups. The IL group was made up of 69 students whose parents indicated that they had participated in the program. The average score for this group was 17.88 versus an average score of 17.16 for the 535 non-participating students. Thus, the IL students had a 4.2 percent better performance than the non-participating group (Gorton, 2010). The following year's test produced stronger results in favor of the IL group. The IL students scored an average of 18.8 (19 is adequate) on the 29-point test. These IL scores were 15 percent higher than the average score of those not participating which was 16.34 (Gorton,

2011).

The Tennessee Board of Regents conducted a web-based survey of 150 teachers who evaluated 320 entry-level kindergarteners divided into groups of those who had participated in the IL program and those who had not. A five-point rating scale was used to measure overall learning preparedness including reading, thinking, listening, and social skills. “Teachers were asked to consider all students in each group as a whole, and compare the students to those in previous classes” (Tennessee Board of Regents, 2008b, p. 2). While the study was not controlled for other preschool experiences, the results produced higher scores for the IL group over the four measures. The Reading Skills subtest showed the biggest gains, where IL students scored .86 points higher on a scale of 5.

TBR Study (Tennessee Board of Regents, 2008b)	IL	Non-IL	Difference
Reading Skills	3.47	2.61	.86
Speaking Skills	3.40	2.79	.61
Thinking Skills	3.46	2.73	.73
Social Skills	3.31	2.80	.51

Results

Using an analysis of variance with $\alpha = .10$ (Hinkle, Wiersma, & Jurs, 1982, p. 251), the mean scores of the IL group were higher, but not significantly higher, than the non-IL group in all of the 14 subtests but two: the beginning of the year Phonemic Segmentation Fluency

subtest, and the end of the year Oral Reading Retelling subtest.

The largest gains of the IL participants over the non-IL participants appeared in the end of year Nonsense Fluency tests. The Nonsense Word Fluency 1 subtest produced an $F = 2.418$ with a critical value of 2.66 and the Nonsense Word Fluency 2 subtest produced an $F = 2.453$ and a critical value of 2.66. In order to score high on this test, the student must be able to match sounds to symbols and blend letter patterns that they have not encountered before. Another subtest which produced a much higher score for the IL participants over the non-IL participants was the middle of the year Oral Reading Accuracy subtest with an $F = 1.93$ and critical value of 2.66.

Students read a passage aloud for one minute. Errors are counted when words are omitted or substituted. A hesitation of more than three seconds is also scored as an error. Words self-corrected within three seconds are scored as accurate. The number of correct words per minute is then calculated as the oral reading fluency score (DIBELS Description, 2015). The results suggest that IL participants are better oral readers.

The grade-level competency pass rate was also compared for the two groups. The IL pass rate for grade-level requirements was 72 percent while the pass rate for non-IL students was 55 percent.

Discussion

The first grade DIBELS test, which was routinely administered to all students, was used as a measure of reading readiness

for the purpose of this study. Fifteen students were randomly selected from the group which participated in the IL and 15 students were also randomly selected from the group which did not participate in the IL program. The random student scores were selected from a group of 80 age-group peers. Subtests which were administered several times during the school year were: Letter Naming, Phoneme Segmentation Fluency, Nonsense Word Fluency, and Oral Reading Fluency which measured speed, accuracy, and comprehension of the main idea. Using an analysis of variance with $\alpha = .10$ (Hinkle, Wiersma, & Jurs, 1982, p.251), the mean scores of 14 sets of test scores from the IL group and the non-IL group were compared. Of these, the IL group's mean scores were higher, but not significantly higher, on all but two of the subtests.

The grade level competency pass rate was also compared for the two groups. The pass rate was investigated to mark the progress of the group toward the state goal of reading on grade level by the end of third grade.

Population of the study

The Southwest New Mexico area served by this project was rural, with 7.4 people per square mile having an average per-capita annual income of \$21,726. Sixty-nine percent of the area students are eligible for free and reduced-price lunch and 73 percent identified themselves as having Latino origins, according to the New Mexico Standard Based Assessment report. Therefore, rural poverty is the pervasive element of this minority population, with six percent of the population composed of children under the age of five. Literacy remains to be a challenge in this area because 69 percent of parents with children under age six have less than a

high school diploma and are economically poor. "The population of fourth grade students with a below proficient reading level is 79 percent" (Barbara Bush Foundation for Family Literacy, 2014, p. 1).

The assessment instrument

The DIBELS tests are a set of procedures and measures researched by the University of Oregon for assessing the acquisition of early literacy skills from kindergarten through sixth grade. Used regularly to monitor early literacy skills, the tests are individually administered for one minute (Good & Kaminski, 2015).

The Letter Naming Fluency subtest assessed the speed of letter naming and was administered only during the beginning of the year. The alternate-form reliability was 0.92 while the criterion-related validity was 0.72 (Bakerson, & Gotherberg, 2006).

The Phoneme Segmentation Fluency subtest measured the child's skill in breaking words into individual phonemes. Alternate-form reliability was 0.88 while the criterion-related validity when compared with the Woodcock Johnson Battery (WJB) was 0.73.

The Nonsense Word Fluency subtest had an alternate-form reliability of 0.88 and a criterion-related validity (WJB) of 0.54 and addressed the child's ability with sound-symbol knowledge by measuring phonic decoding skills.

Oral passage reading rate and accuracy was measured by the Oral Reading Fluency subtest. Comprehension of the main idea was measured by the Oral Reading Retelling Fluency subtest. These tests have an alternate-form reliability of 0.68 with a criterion-

related validity (WJB) of 0.72. Bakerson and Gotherbery (2006) reported that DIBELS measured the construct of early literacy and is an instrument with moderate validity and reliability.

Limitation of the study

Student scores were taken from five different classrooms. The individual teachers in each classroom administered the tests. Although the teachers were trained to be objective examiners during a professional development conference, a difference between methods might have influenced the outcome. While the study was controlled for mobility, it was not controlled for socio-economic effects, age, or gender differences.

The sample size of 15 students studied in the research was relatively small. Therefore, alpha was set at .10. This study was not controlled for pre-school attendance or Response-to-Invention (RtI) activities. The result of this sample group represents an isolated, rural Latino population and therefore might not be generalized to the whole population.

Conclusion and Future Study

The IL students scored higher, but not significantly higher, in 12 of the 14 subtests used in the study. The pass rate for grade-level requirements was 72 percent while the pass rate for non-IL students was 55 percent. The IL effect was large enough to be called substantively important and positive. These findings, while not conclusive, suggest that IL students were better able to specifically match sounds to symbols of print and were better able to read orally than students who had not been enrolled in the program.

By the end of the first grade, IL students

scored higher than the non-IL participating students on the majority of the DIBELS subtests measuring early literacy skills. Since a portion of the first grade class received six weeks of additional instruction by starting school in July, the results which proved not to be statistically significant were not surprising. Low-achieving students were identified in an early screening and received extra instruction as a result of the RtI. The study did not control for the extra instruction or other measures of RtI. Additional research is needed to control for the influences of RtI. Given the consistently higher scores of the IL group, it is evident that the IL program fulfills its mission by providing more books to young children and encouraging more emphasis on family reading time. Additionally, the efforts made by the IL program to support the early vocabulary development and pre-literacy skills of infants, toddlers, and young children pay dividends that may extend well beyond kindergarten entry into reading development across the first years of elementary school. Continued efforts for funding the IL should be embraced by the community and policy makers.

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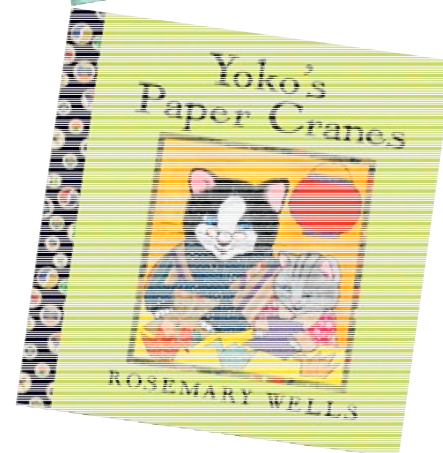
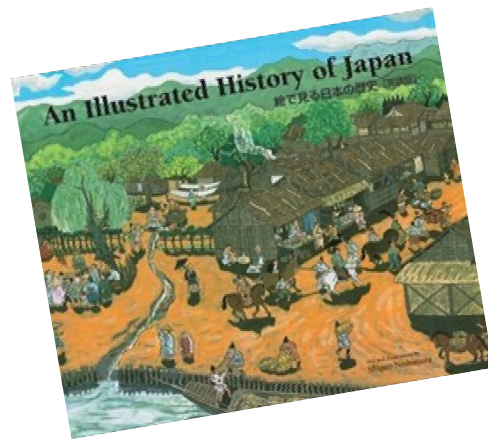
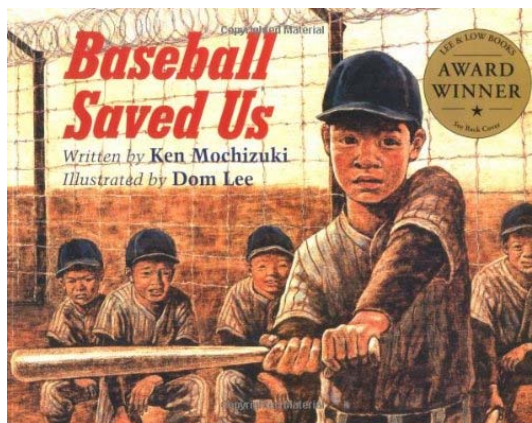


Table 1

Means and Standard Deviations for IL first grade DIBELS subtests compared to non-IL first grade DIBELS subtest

Tests	n	Mean	Standard Deviation	Range
Letter Naming				
Beginning of the Year IL	15	50	15.13	21-70
Beginning of the Year No IL	15	47	6.11	38-58
Phonemic Segmentation Fluency				
Beginning of the Year IL	15	45.53	9.12	31-61
Beginning of the Year No IL	15	47.2	7.93	33-64
Nonsense Word Fluency 1				
Beginning of the Year IL	15	46.8	25.96	13-93
Beginning of the Year No IL	15	38.06	15.21	16-71
Middle of the Year IL	15	83.47	36.63	33-143
Middle of the Year No IL	15	70.33	28.70	22-109
End of the Year IL	15	99.6	35.03	47-143
End of the Year No IL	15	90.86	25.77	60-143
Nonsense Word Fluency 2				
Beginning of the Year IL	15	7.86	11.16	0-30
Beginning of the Year No IL	15	7.26	6.74	0-24
Middle of the Year IL	15	26.46	14.28	4-50
Middle of the Year No IL	15	21.53	10.99	5-38
End of the Year IL	15	33.67	13.29	14-50
End of the Year No IL	15	30.4	10.30	15-50
Oral Reading Fluency 1				
Middle of the Year IL	15	47.26	34.92	14-121
Middle of the Year No IL	15	42.8	26.91	12-93
End of the Year IL	15	72.06	32.84	31-131
End of the Year No IL	15	66.06	25.52	22-115
Oral Reading Accuracy 2				
Middle of the Year IL	15	87.33	10.73	64-99
Middle of the Year No IL	15	86.6	13.18	50-99
End of the Year IL	15	96.13	3.52	89-100

Table 2

ANOVA for scores from first grade students enrolled in IL and non- IL

Subtest	<i>F</i>	<i>Fcv</i>
Beginning of the Year		
Letter Naming	0.247	2.66
Phonemic Segmentation Fluency	0.786	2.66
Nonsense Word Fluency 1	0.125	2.66
Nonsense Word Fluency 2	0.683	2.66
Middle of the Year		
Nonsense Word Fluency 1	0.195	2.66
Nonsense Word Fluency 2	0.067	2.66
Oral Reading Fluency 1	0.02	2.66
Oral Reading Accuracy 2	1.93	2.66
Oral Reading Retell 3	0.78	2.66
End of the Year IL		
Nonsense Word Fluency 1	2.418	2.66
Nonsense Word Fluency 2	2.453	2.66
Oral Reading Fluency 1	0.047	2.66
Oral Reading Accuracy 2	0.80	2.66
Oral Reading Retell 3	1.62	2.66
*p<.10 **p<.05		