Bridging the Early Literacy Gulf

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**ABSTRACT**

This study assessed the impact of public library initiated early literacy training for in-home childcare workers. The results of this research demonstrate that, in this context, public libraries can play a significant role in bridging the large gap between children’s difficulty and success in learning to read. The researchers used a pretest-posttest experimental design with childcare workers randomly assigned. The intervention consisted of training treatment group childcare providers in early literacy principles and activities that could foster specific early literacy skills. The training was provided by staff of the Pierce County [WA] Library System. The impact was assessed through two different methods. The providers responded to pre-post surveys about their early literacy knowledge and activities within their childcare. These surveys were examined for any change between the pre and postsurvey responses. The impact on the 86 three and four year olds within the childcares was measured through a pre and post one-on-one assessment using Early Literacy Skills Assessment (ELSA) developed by Highscope. Researchers from the University of Washington Information School trained library staff in data collection methods, provided guidance in proper research procedures, analyzed data, and reported results.

The intervention had statistically significant results with demonstrated growth in the children’s competence related to 3 of the 4 early literacy principles and in the variety of activities related to literacy principles that the providers implemented. This study begins to fill a research gap because despite a decade of emphasis on early literacy virtually no scientific studies relating to libraries’ impact on early literacy competency exist. Such studies are essential to libraries both in program planning and in securing financial support.

**KEYWORDS**

Early literacy, libraries, experimental design, childcare, preschool, reading readiness.

**INTRODUCTION**

To participate fully in society and the workplace in 2020, citizens will need powerful literacy abilities that until now have been achieved by only a small percentage of the population (International Reading Association, 1996). The issue becomes clear when faced with the statistic that approximately 11 million Americans are illiterate (Institute of Education Statistics, 2007). Therefore there is a large gulf in society with regard to literacy skills; the root of which, for many, lies in childhood. Finding ways to help children be successful in learning to read is crucial to bridging this gulf. One way to help bridge this literacy gulf is to get children ready to read through exposure to early literacy activities that have been identified as predictive of reading success. In fact, starting in the cradle, children must be exposed to specific language and literacy practices in order to improve their later competitive competence as readers (Kuhl, 2010). Bridging the gulf from lack of literacy to literacy is an essential step toward achieving success in information seeking, use, and creation.

By exposing young children to activities structured around early literacy principles caregivers are contributing to a positive impact on later literacy development. Since 2004, with the development of the American Library Association’s Every Child Ready to Read (ECRR) program, public libraries have been systematically infusing early literacy principles in their children’s programs. However, libraries are only reaching a portion of children through these programs as many children who attend childcare during the week may not be given the opportunity to go to library programs.

In this study, modeled after a study done by the Carroll County Library in Maryland, the Pierce County Library (PCL) (WA) attempted to bridge this particular gulf by
offering early literacy training and kits to in-home childcare workers and measuring the impact of this intervention. In their application to the Boeing Foundation, one of the project’s funders, the PCL noted that in the state of Washington, half of all children registered for childcare in the state attend in-home childcare. As a result, a large portion of the children in the state of Washington may not have the preparation they need as emerging readers. Discovering whether a program like this has an impact is important as it will enable libraries to perceive non-traditional ways that they can play a role in bridging the literacy gulf in society.

RESEARCH QUESTIONS
The overall questions in this research study were:
1) Will children attending in-home daycares whose providers have received resources and early literacy training from a public library improve significantly on early literacy skills? If so, to what extent?
2) Will these children demonstrate greater growth in literacy levels than children whose providers do not have this training? If so, to what extent?
3) Will in-home daycare workers who received resources and trainings incorporate more early literacy activities for the children in their care? If so, to what extent?

LITERATURE REVIEW
A large portion of the early literacy research can be examined by looking at two meta-analyses of early or emergent literacy research: the report of the National Reading Panel, Teaching Children to Read, and the report from the National Early Literacy Panel, Developing Early Literacy. The terms emergent literacy and early literacy are both supported in this research literature and are often used interchangeably within this area of research and in this paper.

Report of the National Reading Panel (NRP)
The report of the National Reading Panel (NRP): Teaching Children to Read (NICHD, 2000) was the result of convening a national panel to assess the effectiveness of different approaches used to teach children to read. Despite the fact that it focused on research with kindergarten–third grade children, the NRP report influenced policy and funding opportunities in early literacy development research as well as facilitating changes in educational policy and instruction. The research based principles were transported into the emergent literacy domain. The diversity of the questions was indicative of the interdisciplinary nature of the still fledgling early literacy research field. However, all disciplines involved insisted on rigor of study design.

As the studies were examined, the literacy landscape began to emerge and the common evidenced-based domain across fields was defined, e.g., effectiveness of intervention approaches. Intervention studies constitute a large percentage of the literacy research. The research topography for interventions is often approached from the physical place of where the literacy development activities occur. Three broad categories of locations that exist are:
- the classroom, e.g., preschool or childcare centers (Anthony & Lonigan, 2004; Justice, 2006; Simmons et al., 2007),
- home (Gonzalez & Uging, 2008; Justice, Kaderavek, Bowles, & Grimm, 2005; Roberts, Jurgens, & Burchinal, 2005), and
- Out-of-school environments, e.g., libraries, museums, and physician waiting rooms (Needlman & Silverstein, 2004; Willis, Kabler-Babbitt, & Zuckerman, 2007).

These physical categories are not mutually exclusive. For example, home interventions may include a classroom environment (Constantine, 2004; Curenton, Craig, & Flanigan, 2008; Farver, Xu, Epe, & Lonigan, 2006). Although libraries are recognized in the research as an out-of-school literacy environment, no mention of a research study involving libraries exists in the NRP report.

The interventions may also be grouped by what activity occurs. Interventions are designed to positively impact decoding, reading comprehension, spelling and writing skills related to conventional literacy development. Code-focused interventions, for example, typically include phonological awareness instruction. These studies may also include designs aimed at helping a child develop alphabetic knowledge, print-awareness, and vocabulary. Distinguishing among the effectiveness of these interventions, the NRP Panel wrote, "correlational studies have identified phonemic awareness and letter knowledge as the two best school-entry predictors of how well children will learn to read during their first 2 years in school" (p. 2-1). As described by Whitehurst and Lonigan, “Emergent literacy involves the skills, knowledge, and attitudes that are developmental precursors to conventional forms of reading and writing” (1998, p. 848). In addition to code-focused interventions, enriched play settings (e.g., clapping and singing of letter-word sounds) and shared-reading interventions are prevalent in the literature. Dialogic reading, a method that emphasizes back and forth conversation between adult and child during book reading, is one of the most successful shared reading techniques.

Although many early childhood educators embraced and built upon the findings of the NRP, the need to inventory the early literacy research to identify the skills that are most predictive of later conventional literacy was apparent. The focus on school-age children by the NRP engendered uncertainty about whether the research was correctly applied to preschool children. These questions as well as an increasing interest in and focus on early literacy were addressed by a call for the National Early Literacy Panel to conduct a similar meta-analysis of the early literacy research.
Report of the National Early Literacy Panel (NELP)

Early literacy researchers have made major advances during the past two decades in identifying factors that are predictive of literacy success. However, there were still gaps in the research related to early literacy that is associated with literacy development of children from birth through age five. Therefore, several national agencies stepped forward to fund the NELP to help fill the gap. The NELP was charged with examining empirical research to discover the factors that support early literacy development.

The NELP reported a shortage in scientific studies that could demonstrate correlational evidence between early literacy skills and later predictive literacy development. However, by a rigorous examination of experimental and quasi-experimental studies they were able to identify several variables that can provide correlational value between early literacy skills and later literacy development as follows (2008a) The two with the strongest correlative value, also found in the NRP report to be the most predictive, were:

- alphabet knowledge (AK): knowledge of the names and sounds associated with printed letters;
- phonological awareness (PA): the ability to detect, manipulate, or analyze the auditory aspects of spoken language (including the ability to distinguish or segment words, syllables, or phonemes), independent of meaning.

Lonigan and Shanahan, in the Executive Summary, outlined five additional early literacy skills identified by NELP that were “moderately correlated with at least one measure of later literacy achievement but either did not maintain this predictive power when other important contextual variables were accounted for or have not yet been evaluated by researchers in this way” (NELP, 2008b, p. 3). The Panel released an additional list of potentially important variables as (2008a).

- concepts about print: knowledge of print conventions (e.g., left–right, front–back) and concepts (book cover, author, text);
- print knowledge: a combination of elements of AK [Alphabet Knowledge], concepts about print, and early decoding;
- reading readiness: usually a combination of AK, concepts of print, vocabulary, memory and PA [Phonological Awareness];
- oral language: the ability to produce or comprehend spoken language (p. viii).

Early Literacy is still an emerging inter-disciplinary domain that is accompanied by debate (Pressley, Duke, & Boling, 2004; Schuele & Boudreau, 2008). Commentaries on the NELP report reflect an understanding that more research is still needed in the area of early literacy (Dickinson, Golinkoff, & Hirsh-Pasek, 2010; Gutiérrez, Zepeda, & Castro, 2010). For example, Dail and Payne "argue that the findings from the National Early Literacy Panel (NELP; 2008) report related to parent involvement and family literacy programs require further clarification" (2010, p. 330).

Public Libraries and Early Literacy

Libraries are invested in providing early literacy programs. These programs are often measured by numerical outputs, e.g., in changes in program attendance, circulation, library use (Gonzalez & Uhing, 2008; Jordan, Snow, & Porche, 2000), and new library card numbers (Bailey, Harrison, & Brooks, 2002). One alternative measurement method that has been implemented during baby and toddler storytimes in public library settings involved participant observation (McKechnie, 2006). Supported through audiorecordings and field notes, McKechnie attempted to capture the children’s perspective of storytimes by observing the naturally occurring behavior (2006). Public libraries have been used in other early literacy investigations; however, they are mostly of a sociocultural perspective and they are not designed as program outcome measurement studies. For example, Van Dusen Howell (2007) used multiple qualitative methods to examine family literacy practices at home and at the public library.

While the research presented here clearly demonstrates that exposure to research-based early literacy interventions is a strong predictor of preparedness for kindergarten and success in elementary education, very little scientific research, almost none in public libraries, has been conducted to assess the effectiveness of the early literacy programs and services provided through public libraries in the United States. As far as can be determined by the researchers, within the peer-reviewed literature, there is a complete absence of experimental or quasi-experimental research related to public libraries and outcomes of early literacy programs. The Carroll County Public Library study after which this study is patterned, the results of which have not yet been published publicly, provides one of the only examples of a public library conducting a scientifically-based evaluative study.

There is a need for research to bridge this gulf of lack of research related to public libraries and outcomes of early literacy programs. Public libraries need to understand if these early literacy efforts are having an impact on children’s readiness to read. Is there a measurable improvement in children’s readiness for kindergarten? It is important to look at how the literacy rates within these areas compare to those where such efforts have not been undertaken. Understanding and knowing more about the impact of their early literacy programs can enable public libraries to continuously improve their programs and to make a case for their position in the early literacy arena. The study presented here is one small step towards bridging this gulf of lack of research examining outcomes of public libraries’ early literacy programs.
METHODS
This study was designed with a pretest-posttest experimental design. It began in the spring of 2010 and continued for a full year until the spring of 2011. The program consisted of an intervention targeting in-home childcare providers and a study of the intervention effects on the caregivers and on the children in their care. The intervention, lasting six months, provided the caregivers with training workshops, early literacy kits, newsletters and additional one-on-one interaction with Pierce County Library System staff. There were two data-collection components to the research study: (1) pre- and post-intervention surveys covering early literacy knowledge and practices were given to in-home childcare providers and (2) the Highscope Early Literacy Skills Assessment (ELSA) was conducted one-on-one with the three and four year olds in these in-home childcares before and after the intervention.

Study Participants
In-home childcare providers were encouraged to participate by the Tacoma-Pierce County Child Care Resources and Referral. Thirty-six eligible in-home childcare providers volunteered to participate. Because the ELSA was designed to assess the literacy skills of 3 and 4 year-olds, only those providers having children of those ages were accepted into the program. These providers and the parents of the children in their care signed consent-to-participate forms. For the pretest-posttest experimental design, providers were randomly assigned to treatment and control groups. Before the intervention and for various discrete reasons, 5 of the daycare workers in the treatment group dropped out. Therefore, of the 31 providers who started the program, 18 were assigned to the control group and 13 to the treatment group. This division resulted in 53 children in the control group and 33 in the treatment group. The children’s age and sex were recorded. No data on race, ethnicity or socioeconomic status of either childcare providers or children were collected because those factors were not a focus of the research study. Although the proportions of males to females and of 3 to 4 year-olds in the control and treatment groups differed somewhat, chi-square tests \( X^2 = 2.7, 1 \text{ df, } p > 0.01 \text{ for age; } X^2 = 0.7, 1 \text{ df, } p > 0.01 \text{ for sex} \) showed these differences to be insignificant. Therefore, although more than three year olds than four year olds were present in both groups when tested for statistical significance, no difference in age or gender between the treatment and control groups was found.

Treatment and Assessment Implementation
The terms used in the Early Literacy Skills Assessment (ELSA), developed by the High/Scope Educational Research Foundation referring to the specific literacy skills was changed on the provider surveys and in their training to reflect the vocabulary that Pierce County Library (PCL) uses in their trainings. Although the terms differ, the concepts they represent are the same; the PCL terms are in parentheses below. In one area, phonological awareness, the terms are identical. ELSA assesses the children in the areas of comprehension (narrative skills), phonological awareness, alphabetic principle (letter awareness), and concepts about print (print awareness). The assessment instrument is a picture book in which 24 questions that probe early literacy skills are embedded; it is used by an assessor with one child at a time. While reading the book, the assessor pauses at pre-determined points to ask the child scripted questions. Based on the child’s answers, the assessor quickly records a score on a standardized form. A video of three trained assessors administering the test to a child with the ‘expert’s’ scores provided at the end of each assessment allows for establishing intercoder reliability. The Highscope Co also established the validity of the test before marketing it.

Two researchers, from the Information School at the University of Washington, held a workshop to train six Pierce County staff members on the administration and scoring of ELSA. These researchers also attended all subsequent gatherings of the childcare workers and received scanned copies of all data collection forms as the data was collected. After the training session, the presurveys were mailed to the childcare workers, and they were contacted by phone to schedule a visit. The six Pierce County staff members were each assigned a portion of the in-home childcares to visit. These visits, done in April and May of 2010, included assessing each child individually with ELSA and answering provider questions.

The treatment group then attended the initial workshop given by the Pierce County Early Childhood Librarians at the end of May 2010. These two librarians also organized, oversaw and participated in all assessment, communication, and data collection activities carried out by Pierce County Library staff and communicated regularly with the University of Washington researchers. The four-hour workshop, held at Pierce County Library, included training on the early literacy skills as well as exposure to activities, for use in their in-home childcares that could foster these early literacy skills. At this workshop the treatment group also received kits of materials to help support the activities and early literacy concepts taught at the workshop. The early literacy kits included a puppet, books, games, magnetic letters, play food, CD of children’s songs.. They also received a folder containing literature on early literacy and rhymes, finger-plays and songs.

Although the Pierce County Program, mirroring the ALA’s Every Child Ready to Read, includes six early literacy skills, ELSA assesses only four of these skills. The two other early literacy skills, print motivation and vocabulary, were included in the childcare providers’ training but were not assessed in the research study.

During the intervention period the treatment group received 10 newsletters via email that included additional activities.
for developing early literacy skills with their children, some of which were contributed by the providers themselves. In September 2010, a Pierce County staff member contacted the treatment group by phone to conduct a midway interview. In this phone interview the caregivers were asked for feedback on the materials from the kit, whether they found the ideas from the newsletters helpful and whether they had noticed any growth in their children’s early literacy skills. In October 2010, the treatment group attended a second half-day workshop led by the same Pierce County Library staff. At this workshop the caregivers were given a chance to talk about their experiences thus far and ask questions about the kits and the activities. They were also exposed to new activities that can help to foster early literacy skills.

In December 2010, the Pierce County staff members went again to the in-home childcare to do the post assessment with the children using ELSA. Following the post assessment the control and treatment in-home caregivers were sent separate final surveys asking about their early literacy skills knowledge and practices now incorporated in the in-home childcare and the effect the training had on the treatment group.

**Statistical Analysis**

Several different inferential statistical tests were used to analyze the data in this project. Paired samples t-tests and Wilcoxon matched-pairs signed ranks tests were employed to evaluate pretest and posttest ELSA score differences for the control and treatment groups. Alpha was set at 0.01 to ensure a 99% probability that the results of these statistical analyses do not occur by chance. Another way that the ELSA results were used to assess the effect of the intervention on the children in the treatment group was to aggregate raw ELSA scores into one of three Highsmith standardized levels for each skill. The Wilcoxon matched pairs-signed ranks tests, appropriate for data that is not normally distributed, were used for pretest-posttest statistical comparison for childcare workers.

<table>
<thead>
<tr>
<th>Group</th>
<th>Population</th>
<th>Number Before Intervention</th>
<th>Number After Intervention</th>
<th>Completion Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Children</td>
<td>53</td>
<td>40</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td>Providers</td>
<td>18</td>
<td>15</td>
<td>83%</td>
</tr>
<tr>
<td>Treatment</td>
<td>Children</td>
<td>33</td>
<td>23</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>Providers</td>
<td>13</td>
<td>10</td>
<td>80%</td>
</tr>
</tbody>
</table>

**Table 1. Numbers of Children and Providers Completing the Pierce County Library Emergent Readers Literacy Training and Assessment Program**

**DATA ANALYSIS**

Through attrition, the number of participants in both the treatment group and the control group changed from spring of 2010 to winter of 2011 (see Table 1).

**Early Literacy Skills Assessment (ELSA) Results**

An ELSA score for each of the early literacy skills is obtained by summing the scores on the indicator items, which are mapped to each skill.

**Concepts About Print (print awareness):**
- Orientation
- Story beginning
- Direction of text
- Book Parts

**Phonological Awareness:**
- Rhyming
- Segmentation
- Phonemic awareness

**Alphabetic Principles (letter knowledge):**
- Sense of word
- Alphabet letter recognition
- Letter-sound Correspondence

**Comprehension (narrative skills):**
- Prediction
- Retelling
- Connection to real life

Pretest and posttest ELSA scores were obtained for 40 control-group children and 23 treatment-group children. However, for statistical analysis, the number of children in each group was equalized. Parametric statistical procedures for comparing groups are sensitive to violations of the homogeneity of variances assumption; similarly, nonparametric procedures for testing for differences in proportions are sensitive to low expected frequencies. These problems are less likely to occur when sample sizes are equal. Thus a simple random sample of 23 children was selected from the control group for comparison to the 23 treatment-group children. Statistical analyses (t tests, Mann-Whitney U tests, and F tests) demonstrated that the random sample of 23 children was an accurate representation of the full set of 40 children in the control group in terms of central tendency and variation of each variable.

Random assignment to control and treatment groups is assumed to ensure the equivalence of the groups before the treatment group is exposed to the intervention. This assumption was tested by comparing the groups’ pretest ELSA scores using the independent samples t-test and the Mann-Whitney U test. There were no significant differences; therefore, the 2 groups were considered to be equal on each of the 4 early literacy skills before the intervention.
Table 2. Pre- and Posttest Average ELSA Skill Scores for Control and Treatment Groups. SD = standard deviation, IQR = interquartile range.

<table>
<thead>
<tr>
<th>ELSA Skill</th>
<th>Control Group N=23</th>
<th>Treatment Group N=23</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Mean = 6.6</td>
<td>Mean = 7.3</td>
</tr>
<tr>
<td></td>
<td>SD = 5.0</td>
<td>SD = 4.8</td>
</tr>
<tr>
<td>Phonological Awareness</td>
<td>Median = 4</td>
<td>Median = 6</td>
</tr>
<tr>
<td></td>
<td>IQR = 2</td>
<td>IQR = 8</td>
</tr>
<tr>
<td>Alphabetic Principle</td>
<td>Median = 7</td>
<td>Median = 11</td>
</tr>
<tr>
<td></td>
<td>IQR = 24</td>
<td>IQR = 29</td>
</tr>
<tr>
<td>Concepts about Print</td>
<td>Mean = 11.3</td>
<td>Mean = 13.1</td>
</tr>
<tr>
<td></td>
<td>SD = 2.8</td>
<td>SD = 3.6</td>
</tr>
</tbody>
</table>

Table 3. Results of Tests for Differences between Pre- and Posttest ELSA Scores in Treatment and Control Groups.

Pre- and posttest ELSA scores for the control and treatment groups are summarized in Table 2. No significant differences between pre- and posttest scores were found in the control group. In the treatment group however, significant pre- and posttest differences were found on 3 of the 4 skills: phonological awareness, alphabetic principle (letter knowledge), and concepts about print (print awareness).

ELSA scores aggregated into 3 levels are described below. The range of scores for each skill differs for these levels. For example the range of low to high for phonological awareness is 0 – 19 while for alphabetic principle it is 0 - 60.

Level 1: Early Emergent – Exploration
Children explore books, play with sounds, look at and handle letters, and use words to convey ideas and experiences.

Level 2: Emergent – Awareness
Children begin to pay particular attention to book parts, print conventions, sounds that make up words and letter names. They use an increasing number of words to convey meaning and to talk about the immediate past and future.

Level 3: Competent Emergent – Application
Children test their own theories as they “read” books, experiment with sounds that make up words, and recognize and use letters. Their growing vocabularies enable them to express increasingly complex ideas and narratives.

For all four principles more children in the treatment group were at Level 3 in the posttest compared to those in the control group and more children in the treatment group compared to the control group were at Level 2 in the posttest on all of the literacy principles other than concepts about print (print awareness). However the latter is because substantially more were at Level 3 in the treatment group.

Looking at the data the other way, fewer children in the treatment group were at Level 1 posttest on all literacy principles than those in the control group.

Another way to look at the literacy levels of the children is to compare the percentage of children who “grew” by 1 and 2 levels in relation to each principle (see Tables 4, 5, 6, and 7). Once again it can be seen that in all areas, more treatment group children moved up 1 or 2 levels than control group children.

Table 4. Children Increasing 1 or 2 Levels Pretest to Posttest in Comprehension

<table>
<thead>
<tr>
<th>Level Increase</th>
<th>Control</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>17.4%</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>4.3%</td>
</tr>
</tbody>
</table>

Table 5. Children Increasing 1 or 2 Levels Pretest to Posttest in Phonological Awareness

<table>
<thead>
<tr>
<th>Level Increase</th>
<th>Control</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>34.8%</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>4.3%</td>
</tr>
</tbody>
</table>
significant change for either control group or treatment group providers.

Control and treatment group providers were similar in the frequency of communicating with parents, in use of the public library, in encouraging child interaction in pretend play, in their commitment to joining in this play, and in numbers of books and storytimes they held.

One area in which the treatment group providers exhibited a statistically significant positive change was in number and variety of pretend play activities they provided, which may have had some influence on the children’s development of literacy through increased interaction with peers and teachers.

Midway Interview/Treatment Group Providers

Questions on the midway interview solicited responses only from treatment group providers as some of the questions were about resources and newsletters provided only to that group. The interviewer queried the providers regarding the usefulness of the materials and any gain the providers had noticed in early literacy skills. Following are three responses illustrating how the providers and children used the materials to promote various early literacy principles:

Alphabetic Principle (Letter Knowledge)
“She made up alphabet cards and had the children match the play food with the alphabet letter that the food begins with.”

Phonological Awareness
“Their awareness is just so improved since this program.”

Rhyming is a skill that has specifically improved in the children.”

Concepts about Print (Print Awareness)
“They go to books more often - especially during choice time. My older ones are sitting the younger ones down and reading to them - holding the books, turning the pages the right way.”

DISCUSSION

Major Findings

The Pierce County Emergent Readers Literacy and Training Program treatment or intervention, the training of childcare providers in early literacy principles, had a significant impact on:
- the outcomes for children regarding demonstrated growth in competence related to early literacy principles and
- the variety of activities related to literacy principles that the providers implemented.

Early literacy researchers made major advances during the past two decades in identifying factors that are predictive of literacy successes in school-aged children. The National Early Literacy Panel’s (NELP) was charged with reviewing

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### Table 6. Children Increasing 1 or 2 Levels Pretest to Posttest in Alphabetic Principle

<table>
<thead>
<tr>
<th>Level Increase</th>
<th>Control</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td>26.1%</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

### Table 7. Children Increasing 1 or 2 Levels Pretest to Posttest in Concepts about Print

<table>
<thead>
<tr>
<th>Level Increase</th>
<th>Control</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percentage</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>17.4%</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>4.3%</td>
</tr>
</tbody>
</table>
empirical research to discover the factors that support early literacy development. The NELP (2008) focused its attention on determining what the skills and abilities of young children (age birth through five years or kindergarten) are that predict later reading, writing, or spelling outcomes. The two principles that were found to have the highest predictive value for children entering kindergarten for reading success were what have been referred to in this study as alphabetic principle (letter knowledge) and phonological awareness. Concepts about print (print awareness) were also found to be important as was comprehension (narrative skills), vocabulary, and other skills. Following publication of the NELP Report, Paris and Luo (2010) criticized it, noting that early literacy skills could and should be viewed as constrained (that is important for beginning readers, but then lessening in importance) and unconstrained (gaining more importance as a child matures as a reader). Both alphabetic knowledge (letter knowledge) and phonological awareness were among the constrained skills while comprehension (narrative skills) and vocabulary were among those found to have a longer term impact.

Placing the outcomes for children who were in the Pierce County treatment group in this context, it is clear that:

- Two of the early literacy principles upon which the children in the treatment group improved with an extremely high level of confidence, i.e., alphabetic knowledge (letter knowledge) and phonological awareness, are among those most essential for predicting success as children begin to read.
- Concepts about print (print awareness) are also ‘constrained skills,’ extremely important for beginning readers. This is the other skill upon which the children in the treatment group improved with an extremely high level of confidence.
- Comprehension (narrative skills) is more complex and is considered an ‘unconstrained’ skill. It is not surprising that neither group improved here in a statistically significant manner. There is likely no end to growth for a reader who excels at comprehension.

The impact of this early literacy training on the children can also be seen when examining the three levels for each skill that the children fit into based on their raw score. The three levels (defined above) are Early Emergent, Emergent and Competent Emergent. For all four principles more children in the treatment group were at Level 3—Competent Emergent and for 3 principles more were at Level 2—Emergent in the posttest compared to those in the control group. This is particularly positive given the short duration of the study and the fact that most children were still 3 when it was concluded. Children, according to the ELSA norming, are expected to do better as they mature.

It is possible to conclude from the data that offering early literacy training to the caregivers had a positive impact on the early literacy development of the children in their care.

The responses of both groups of childcare providers on which they were in close agreement demonstrate that they all are committed to an environment that supports literacy, all having book collections, using the library, and reading regularly to children. However, some differences did exist in their responses. Comparing the growth of the treatment group providers in using a greater variety of activities than did the control group related to phonological awareness, alphabetic principle (letter knowledge), and comprehension (narrative skills) as well as the specific comments about observed change in children’s behaviors, it seems likely to conclude that the training provided through the Pierce County Library System as well as the frequent contacts and ongoing curriculum and activity suggestions through regular newsletters, had an impact on the children’s readiness-to-read.

The skill of the Pierce County trainers and the enthusiasm of the treatment group childcare providers for the resources provided to them and their commitment to incorporating these resources into their childcare setting is clear, and it is likely that this commitment and enthusiasm contributed to the success in helping children grow in their ability as emerging readers.

Limitations
All studies have some limitations, and this one is no exception. Limitations are not to be equated with weaknesses of the study; they are rather the parameters within which the study was conducted. The fact that a random sample was taken of the in-home childcare providers who volunteered for the study lessens concern about some of the variables for which there could be no control. The study was conducted in a geographic area that is largely suburban and rural with a few urban locations, and it is not known how these settings might have affected the learning of either the teachers or the children. No data were obtained about socio-economic status or race of either providers or children. There were, however, quite a few more three year olds than four year olds, even at the end of the study, but their proportions in the treatment and the control groups were found not to be significantly different. The preponderance of younger children might have lessened the progress either group made but there is no reason to suspect it would have been different in the treatment and control groups. Other factors also might have had an impact on the outcomes. For example, six Pierce County Library staff tested the children on the pretest and there were three new staff added as testers for the posttest. Although the Early Learning Librarian tested the same children pre and post intervention, other staff members did not necessarily test the same children. This variability in testers might have had some impact on the scores, even though all staff were trained and there was demonstrable
intercoder reliability. The time during which the intervention took place, six months, was relatively short, shorter than that in the previous Carroll County study, and a longer period of time might have produced even more stellar results for the treatment group. Also the study started in the summer when there was more absenteeism due to vacations and other family activities; three of the six months of the study took place in the summer months. Finally, the results of the study can only be generalized to the population from which the random sample was chosen, although the results do have implications for early literacy programs elsewhere.

IMPLICATIONS
This study had a successful and positive outcome both for the childcare providers and for the children who participated. It was demonstrated that library staff could provide training for in-home childcare workers in early literacy principles and activities that would result in children better prepared as emergent readers. Since many of the children were still three at the end of the study, it is expected that they will continue to gain skill and confidence as they approach school age., the Pierce County study can provide an example to be adopted and adapted for public libraries in other communities. There is a great desire by both librarians and the general public to know training childcare providers and others in early literacy principles can make a difference. It is encouraging that there have now been two randomized studies, Carroll County MD and Pierce County WA, in which statistically significant results occurred for each of the four early literacy principles when library training for childcare workers took place. More studies of this type will continue to build confidence in the efficacy of the public library's extended role in preparing children for success in school and will continue to show that public libraries should play an important role in bridging the early literacy gulf. It is also positive to see that assessment of these programs can be done using scientific research methods. Certainly the most important outcome of this study is that public librarians, school officials, parents, teachers, and other community members can have an increased and research-documented confidence that public libraries do help to bridge this early literacy gulf and therefore make a difference in the lives and learning of young children. And the children themselves, with this kind of assistance, will be better prepared to learn to read competently as well as to achieve success in information seeking, use, and creation.

REFERENCES


