Summer August 15th, 2018

The Effect of Book Provision on Family Shared Reading Patterns Among Women Participating in the Nurse-Family Partnership

Susan Marie Knutsen

Follow this and additional works at: https://digitalcommons.spu.edu/soe_etd

Part of the Early Childhood Education Commons, and the Language and Literacy Education Commons

Recommended Citation

https://digitalcommons.spu.edu/soe_etd/42

This Dissertation is brought to you for free and open access by the Education, School of at Digital Commons @ SPU. It has been accepted for inclusion in Education Dissertations by an authorized administrator of Digital Commons @ SPU.
The Effect of Book Provision on Family Shared Reading Patterns Among Women
Participating in the Nurse-Family Partnership

Susan M. Knutsen
Seattle Pacific University
The Effect of Book Provision on Family Shared Reading Patterns Among Women Participating in the Nurse-Family Partnership

Susan M. Knutsen

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education

Seattle Pacific University

Approved by

2018

(Dr. William Nagy, Ph.D., Chairman, Dissertation Committee)

(Dr. Jorge Preciado, Ph.D, Committee Member)

(Dr. Scott Beers, Ph.D, Committee Member)

Program authorized to offer degree

Date

SCHOOL OF EDUCATION

FEBRUARY 2019

Dr. Nyaradzo Mvududu, Dean, School of Education
Copyright Page

In presenting this dissertation in partial fulfillment of the requirements for the Doctoral degree at Seattle Pacific University, I agree that the library shall make its copies freely available for inspection. I further agree that extensive copying of this dissertation is allowable only for scholarly purposes, consistent with “fair use” as prescribed in the U.S. Copyright Law. Requests for copying or reproduction of this dissertation may be referred to University Microfilms, 1490 Eisenhower Place, P.O. Box 975, Ann Arbor, MI 48106, to whom the author has granted “the right to reproduce and sell (a) copies of the manuscript in microfilm and/or (b) printed copies of the manuscript from microfilm.”

Signature

Date 02/03/2019
# Table of Contents

**Page**

List of Figures .......................................................................................................................... v

List of Tables ............................................................................................................................ vi

List of Appendices .................................................................................................................. vii

Dedication ................................................................................................................................. viii

Acknowledgments ................................................................................................................... ix

Abstract

Chapter One: Introduction ........................................................................................................ 2

  Purpose of the Study .............................................................................................................. 2

  Background ............................................................................................................................ 4

  Significance of the Study ....................................................................................................... 6

  Research Questions ............................................................................................................... 8

  Structure of the Paper .......................................................................................................... 8

Chapter Two: Literature Review ............................................................................................... 10

  Introduction .......................................................................................................................... 10

  Theoretical Foundation ........................................................................................................ 10

    Home Literacy Model ....................................................................................................... 10

      The Importance of Oral Language .................................................................................. 11

      Language Input .............................................................................................................. 12

      Rare Vocabulary ............................................................................................................ 14

      Labeling While Reading ............................................................................................... 15

      The Literacy Opportunity Gap ....................................................................................... 16
<table>
<thead>
<tr>
<th>Chapter Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Emergent Literacy Model</td>
<td>17</td>
</tr>
<tr>
<td>Infant Directed Speech</td>
<td>18</td>
</tr>
<tr>
<td>Beginning Reading with Infants</td>
<td>20</td>
</tr>
<tr>
<td>Infant Brain Development</td>
<td>21</td>
</tr>
<tr>
<td>Joint Attention</td>
<td>22</td>
</tr>
<tr>
<td>Infants and Media Exposure</td>
<td>23</td>
</tr>
<tr>
<td>Empirical Research</td>
<td>24</td>
</tr>
<tr>
<td>Research on Home Literacy Environment and Oral Language</td>
<td>24</td>
</tr>
<tr>
<td>Correlational Studies on Shared Reading and Oral Language</td>
<td>25</td>
</tr>
<tr>
<td>Shared Book Reading with Infants</td>
<td>29</td>
</tr>
<tr>
<td>Experimental Studies on Shared Reading and Oral Language</td>
<td>30</td>
</tr>
<tr>
<td>Pediatric-Based Book Provision Studies</td>
<td>38</td>
</tr>
<tr>
<td>Book Provision and Oral Language</td>
<td>38</td>
</tr>
<tr>
<td>Changing Parental Shared Reading Behaviors Around Literacy</td>
<td>42</td>
</tr>
<tr>
<td>Experimental Pediatric-Based Book Provision Studies</td>
<td>48</td>
</tr>
<tr>
<td>Non-Pediatric Based Book Provision Interventions</td>
<td>51</td>
</tr>
<tr>
<td>Conclusion</td>
<td>53</td>
</tr>
<tr>
<td>Chapter Three: Research Methodology</td>
<td>54</td>
</tr>
<tr>
<td>Chapter Overview</td>
<td>54</td>
</tr>
<tr>
<td>Research Design</td>
<td>54</td>
</tr>
<tr>
<td>Research Hypotheses</td>
<td>55</td>
</tr>
<tr>
<td>Participants</td>
<td>57</td>
</tr>
<tr>
<td>The Nurse-Family Partnership Organization</td>
<td>58</td>
</tr>
</tbody>
</table>
Protection of Participants ................................................................. 58
Selection and Assignment of Participants ........................................ 59
Instrumentation ........................................................................... 60
Procedure ....................................................................................... 63
Recruitment Procedure ................................................................. 63
Survey Procedure .......................................................................... 63
Intervention Procedure ................................................................. 64
Data Analysis ................................................................................. 66

Chapter Four: Results
Overview ....................................................................................... 69
Research Questions ........................................................................ 69
Descriptive Statistics ..................................................................... 69
Inferential Statistics ....................................................................... 73
Research Question One ............................................................... 73
Results .......................................................................................... 74
Research Question Two ............................................................... 75
Results .......................................................................................... 78
Summary of Results ....................................................................... 78

Chapter Five: Discussion ............................................................... 80
Overview ....................................................................................... 80
Study Rationale ............................................................................. 80
Research Methodology .................................................................. 81
Discussion of the Results ............................................................. 81
Research Question One ................................................................. 81
Research Question Two ................................................................. 83
Study Limitations ........................................................................ 86
Construct Validity ................................................................. 87
External Validity ......................................................................... 88
  Hawthorne Effect ............................................................... 88
  Interviewer (Experimenter) Effect ........................................... 88
Internal Validity ........................................................................... 89
  Testing Effect ........................................................................ 89
  Test Question Sensitization ..................................................... 89
  History Effect .................................................................... 90
  Attrition Bias ................................................................. 90
  Differential Attrition ............................................................ 91
  Social Desirability Response Bias ........................................... 91
Future Research ........................................................................ 92
References .................................................................................. 94
List of Figures

Figure 1: Box Plot of Composite READ Posttest Scores ............................................. 71
List of Tables

Table 1: Pretest-Posttest Control Group Design

Table 2: Demographic Characteristics of Mother

Table 3: Demographic Characteristics of Child

Table 4: Tests of Normality

Table 5: Levene’s Test of Equality of Error Variances

Table 6: Descriptive Statistics for Time 1 and Time 2 Score

Table 7: Means and 5% Trimmed Means

Table 8: Tests of Normality

Table 9: Levene’s Test of Equality of Error Variances

Table 10: Box’s Test of Equality of Covariance Matrices

Table 11: Multivariate Tests

Table 12: Tests of Between-Subjects Effects

Table 13: Omnibus Tests of Model Coefficients

Table 14: Hosmer and Lemeshow Test

Table 15: Model Summary

Table 16: Classification Table

Table 17: Variables in the Equation
List of Appendices

Appendix A: IRB Approval Letter .................................................................111
Appendix B: Recruitment Letter .................................................................112
Appendix C: Consent Form .................................................................113
Appendix D: Baseline StimQ Abridged ..................................................115
Appendix E: Posttest StimQ Abridged ..................................................120
Appendix F: Tips for Parents of Babies ..................................................125
Dedication

For my mom and dad, who always made time to read to me.
Acknowledgments

I have been fortunate to receive encouragement and support from many people over the course of this research study. I owe my deepest gratitude to my Dissertation Chair, Dr. William Nagy for stirring my interest in literacy in the first place. Thank you for your perpetual optimism, your sense of humor, your confidence in me, and for always keeping your door open.

I am grateful to my Dissertation Committee, Dr. Jorge Preciado and Dr. Scott Beers. Thank you both for your flexibility, your feedback, and most of all for the excitement you maintain about the topic of literacy.

I want to thank the nurses and staff of the Nurse-Family Partnership. This study would have not been possible without you. You are extraordinary individuals doing powerful work. I am also deeply indebted to the young women who took part in my study. It was an immense pleasure talking to each of you.

I will always be grateful to my friends, Nalline Baliram and Susan Dryer. Nalline, thank you for consistently being there to help me think through logistical problems, and for coming up with some brilliant answers for them. Susan, thank you for your enthusiasm for me and for your calm guidance on more than one occasion.

Thank you to my family, my parents Norm and Sharon Knutsen, for your steadfast belief in my abilities throughout my life. To my partner Brian, and my daughter Lynn, I am so grateful for your ongoing patience and understanding through this process. Thank you both for being there to remind me of what is truly important in life.
Seattle Pacific University

Abstract

The Effect of Book Provision on Family Shared Reading Patterns Among Women Participating in the Nurse-Family Partnership

Susan M. Knutsen

Chairperson of Dissertation Committee: William Nagy, School of Education

This study sought to determine whether a book provision intervention delivered to low-income mothers participating in the Nurse-Family Partnership had an effect on family shared book reading patterns and family attitudes toward shared book reading. The 25 participants in this study were low-income, first-time mothers, aged 18-25 with infants, newborn to 12 months of age at recruitment (13 male, 12 female, $M = 6.7$ months of age) currently participating in one of three Nurse-Family partnerships in Washington State.

A pretest-posttest experimental design with random assignment was conducted. A mixed factorial analysis of variance found that the book provision intervention had no significant effect on shared book reading patterns as measured by StimQ Infant READ pretest/posttest composite scores. A binary logistic regression, however, found that the presence of the book provision did make a unique statistically significant contribution to the model, recording an odds ratio of 7.4, suggesting the odds of a person reporting a positive Child Centered Literacy Orientation was 7.4 times higher for someone who
received the book provision intervention than for someone who did not receive the intervention, with all other factors being equal.

The finding that the presence of a book provision intervention did have an effect on family attitudes toward shared book reading with this population is hopeful. Interventions that involve book provision have increased family literacy and shared book reading behavior in high-risk populations and have led to increases in children’s oral language development. The provision of literacy interventions to low-income groups is a positive step toward closing the literacy achievement gap.
Chapter One: Introduction

Purpose of the Study

The purpose of this study was to determine the effects of book provision on family shared reading patterns and families’ attitudes toward shared book reading with their child. Specifically, this research study sought to find out whether book provision to low SES women participating in the Nurse-Family Partnership was associated with a change in the frequency of shared book reading with their young children and an increased likelihood of a positive Child Centered Literacy Orientation (CCLO).

Sénéchal (2006) found that children’s shared book reading exposure was related to their kindergarten vocabulary scores, their grade four reading comprehension, and their self-reports of reading for pleasure in later elementary grades. Because oral language is associated with reading achievement, early interventions that target family literacy behaviors are critical to closing the achievement gap.

Literacy interventions that involve book provision have increased family literacy activities and shared book reading behavior in high risk populations and have led to increases in children’s oral language development (Diener, Hobson-Rohrer, & Byington, 2012; Diener, Wright, Julian, & Byington, 2003; High, Hoppman, LaGasse, & Linn, 1998; High, LaGasse, Becker, Ahlgren, & Gardner, 2000; Kumar, Cowan, Erdman, Kaufman, & Hick, 2015; Needlman, Fried, Morley, Taylor, & Zuckerman, 1991; Needlman, Toker, Dreyer, Klass, & Mendelsohn, 2005; Sanders, Gershon, Huffman, & Mendoza, 2000; Weitzman, Roy, Walls, & Tomlin, 2004). Interventions which improve the home literacy environment have closed school readiness gaps between traditionally
higher achieving groups and those who typically enter kindergarten behind (Whaley, Jiang, Gomez, & Jenks, 2011).

The Reach Out and Read intervention, for instance, is a pediatric-based literacy intervention that includes providing books to families of children ages six months to five years at every well-child visit. Needlman, Toker, Dreyer, Klass, and Mendelsohn (2005) found Reach Out and Read participation was associated with higher scores on measures of home literacy orientation. Preschool children whose families have participated in Reach Out and Read interventions have shown greater expressive and receptive language development than non-participating children (Mendelsohn et al., 2001) and Reach Out and Read participation was associated with vocabulary growth in toddlers as young as 18 months of age (High et al., 2000).

Other pediatric-based literacy interventions that involve book provision such as Little by Little in LA County, California, have closed school readiness gaps that existed between English speaking and Spanish-speaking subsets (Whaley et al., 2011). Several countries, aside from the US, such as Bangladesh, Canada, England, Israel, Italy, and the Philippines also use pediatric-based literacy interventions (Fahey & Forman, 2012).

Because many children do not enter formal care until they are four or five years of age, medical providers, whose contact with the family begins at or before the child’s birth, play a critical role in establishing family literacy routines, and in forming family attitudes toward reading that may be passed down to the child and last throughout that child’s life. Stipek, Milburn, Clements, and Daniels (1992) found parent beliefs around literacy do predict parent literacy behavior and DeBaryshe (1995) found a link between parents’ beliefs about literacy and their child’s literacy exposure.
One of the reasons pediatric-based literacy interventions involving book provision are effective is that a trusted pediatrician delivers them. However, models of pediatric-based literacy interventions which utilize nurses rather than doctors have not been studied. The bond that develops between first-time mothers and their nurse-family partner can be powerful. Typically, nurse-partners visit their clients from the time of pregnancy, through the baby’s birth, and into the child’s toddler years.

**Background**

According to the most recent data released by the National Assessment for Educational Progress (NAEP), as of 2017, only a little over a third of fourth and eighth grade students performed at or above grade level reading proficiency (Nation’s Report Card, 2017). Further, the most current information on proficiency levels from the Programme for International Student Assessment (PISA) revealed that 19% of 15-year-old children in the United States were scoring below a level two (basic) in reading (Organization for Economic Cooperation and Development, 2016).

Although children experiencing low reading achievement can come from any socioeconomic status (SES), poor children are particularly at risk for low literacy outcomes and low educational attainment (Hernandez, 2012). Children living in poverty experience vastly different home literacy environments than children living in middle and upper-class homes. As a result, children from low SES backgrounds are also disproportionally represented in groups who experience reading difficulties very early on (Fahey & Forman, 2012).

Until the 1930s, researchers knew little about the factors affecting verbal ability. The invention of the Stanford Binet IQ test shed light on the importance of SES and
home environment on measurements of cognitive ability. Although this IQ test was used by some in the United States to support the idea of genetic superiority of specific races, Alfred Binet himself attributed children’s IQ to both genes and environment. Gordon (1923) used data from Stanford Binet IQ test, tests of school achievement, and records of school attendance and found that children with intellectual disabilities who spent more time in school had higher IQs than those intellectually disabled children who spent less time in school. In 1935, Klineberg documented differences in the IQ scores of urban and rural blacks and found that the longer an individual lived in New York City, the higher his IQ score (Klineberg, 1935).

By the 1940s it became clear that home environment does exert an influence on cognitive ability and specifically, language learning. William Goldfarb (1945) found that the environmental deprivation seen in institutionalized children affected language more than it affected other areas of IQ and development.

Milner (1951) was one of the first researchers to quantify the connection between literacy and socioeconomic characteristics when her study on reading readiness found a .86 correlation between social class and “language IQ.” One of her conclusions was that the higher scoring (and higher SES) children had more books at home and that they were therefore read to more frequently. She also found that the higher a family’s socioeconomic status, the more exposure a child had to conversations and verbal interactions.

Sociologist Basil Bernstein (1961), known for his work on speech codes and the cultural foundations of speech, also noticed that working-class students in his classes
performed notably worse than their middle-class counterparts in language-based subjects, yet performed comparably with higher SES peers in mathematics.

More recently, researchers have determined that disparities in cognitive ability arise early in child’s life, by at least nine months of age (Halle et al., 2009). By 18 months of age, significant and substantial disparities exist in expressive vocabulary and spoken language processing between children from high SES backgrounds and those from low SES backgrounds (Fernald, Marchman, & Weisleder, 2013). These differences persist through primary school (Hart & Risley, 1995) and into adulthood (Pakulak & Neville, 2010).

Because low SES parents have many more obstacles that interfere with engaging in literacy activities with their young children, literacy programs should be put in place as soon as a child is born. Gains that have been made through book provision interventions offer great hope.

**Significance of the Study**

According to the National Center for Child Poverty (Koball & Jiang, 2018), 41% of US children live in low-income homes. Furthermore, 19% live in the lowest poverty bracket (Jiang, Granja, & Koball, 2018). This amounts to 15 million children who are living in dire poverty. The increase in poverty means that unless more is done around early literacy education and intervention, more and more young children will be beginning their schooling with improbable chances of success. Unlike math interventions that can remediate late in a child’s primary education, literacy interventions must begin early. This early remediation is necessary because literacy is the result of cumulative
experience from early in a child’s life (Snow, 2015) and short-term interventions are not likely to close existing gaps.

It is usually not until the third grade when children are discovered to be suffering from reading difficulties. However, reading interventions that start at or after the third grade are often ineffective (Casey, 2010). Children who are not reading at grade level by the third grade are four times as likely to exit high school without a diploma (Hernandez, 2012).

Such children often end up being referred for special education services. Manset-Williamson, St. John, Hu, and Gordon (2002) found that parent self-reports of shared book reading were associated with fewer referrals to special education. Although some current researchers (Breit-Smith, Cabell, & Justice, 2010; Justice, Logan, Isitan, & Sackes, 2016) have found no significant difference between the home literacy environments of children with disabilities and those environments of children without disabilities, the fact remains that students who have low language skills, many of whom are English language learners, are overrepresented in special education (Sullivan, 2011). The misplacement of these students harms them irreparably (Wilkinson & Ortiz, 1986). It also harms the students who legitimately have learning disabilities by diverting funding and resources to children who might not benefit from this kind of specialized assistance.

There are over 90 million adults in the United States who lack the literacy necessary to make sound decisions about healthcare. This lack of literacy affects not only their health but the health of their offspring (National Center for Education Statistics, 2006). Poor adult literacy stems from poor child literacy; it is not surprising that the medical community has taken on early literacy as a healthcare issue.
Literacy interventions such as book provision have been found to be most effective with lower income families. For example, Needlman, Fried, Morley, Taylor, and Zuckerman (1991) found that parents receiving Aid to Families with Dependent Children (AFDC) benefitted the most from receiving books at well-child visits.

Finding better ways to increase family literacy among low SES families involved in the Nurse-Family Partnership program may lead to more programs to help specific populations, such as the young children of adolescent mothers and low-income women, as these populations are at the highest risk for low literacy outcomes.

**Research Questions**

This study examined the effect of book provision on the family shared reading patterns and the attitudes about shared book reading among women participating in the Nurse-Family Partnership. The following research questions are presented:

**Research Question 1:** Does a book provision intervention with women participating in the Nurse-Family Partnership have an effect on shared book reading patterns as measured by pretest/posttest StimQ2 Infant (Revised) READ composite scores?

**Research Question 2:** Does the presence of a book provision intervention with women participating in the Nurse-Family Partnership predict Posttest Child Centered Literacy Orientation scores?

**Structure of the Paper**

This dissertation is organized into chapters entitled Introduction, Literature Review, Research Methodology, Results, and Discussion.
Chapter Two includes an overview of models of language and literacy acquisition. The mechanisms through which shared book reading influences child language and literacy are briefly reviewed. Chapter Two also includes a review of the literature on shared book reading and its associations with oral language and emergent literacy, as well as a review of the literature on pediatric-based book provision interventions and their effect on home literacy environment and oral language development.

Chapter Three gives a description of the research methodology for this study. Null and alternative hypotheses are provided, as well as information about participant selection and assignment, instrumentation, and the statistical methods utilized.

Chapter Four provides a summary of the study results. Descriptive statistics are presented, and the main findings are displayed.

Chapter Five presents a discussion of the findings, as well as the limitations of the study and recommendations for future research.
Chapter Two

Literature Review

Introduction

Research has confirmed the importance of shared book reading with children for developing oral language skills, for developing emergent literacy skills, and for increasing later academic reading achievement. Deficiencies in oral language skills, which are more likely to appear among children from low SES homes and homes where English is not the first language, may contribute to later reading problems in primary school (Fernald & Weisleder, 2011), extending through secondary and post-secondary schooling (Biemiller, 2007). Right now, while 41% of children under the age of three live in low-income families - 19% living below the federal poverty line (Koball & Jiang, 2018) - and as attaining a degree in higher education becomes increasingly important for the future of these children, promoting literacy in economically disadvantaged families is a key step toward helping to level the playing field for these children upon school entry. The American Academy of Pediatrics recommends that shared book reading begin at birth (American Academy of Pediatrics, 2018).

Theoretical Foundation

**Home literacy model.** The home literacy model (Sénéchal, 2006) stipulates that within a home literacy environment there are two types of literacy activities – formal activities and informal activities – which may or may not coexist. These distinct types of literacy activities are associated with distinct outcomes.

Formal literacy activities such as explicit teaching help children to develop early literacy skills like letter knowledge, invented spelling, and early reading (Sénéchal &
LeFevre, 2002). Informal literacy activities such as shared book reading help children to develop their oral language skills (i.e., receptive and expressive vocabulary), including the comprehension of morphologically complex words (Sénéchal, Pagan, Lever, & Ouellette, 2008).

A child’s oral language development is crucial for his/her ability to understand and produce the syntactic and semantic components of language. Manifestations of oral language include listening comprehension, grammar production, and the ability to define words. When shared book reading is interactive and scaffolded through contexts such as dialogic reading, children also experience gains in the ability to process and structure narratives (Lever & Sénéchal, 2011).

Researchers have observed evidence supporting the home literacy model in studies of French-speaking families, Korean-speaking families, and Spanish-speaking families (Sénéchal, 2006). Within this model, the mechanisms through which shared book reading exerts its influence on child language are considered.

**The importance of oral language.** Different literacy skills contribute to reading at various stages of reading development (Lonigan, Schatschneider, & Westberg, 2008). Whitehurst and Lonigan (1998) theorized that while print knowledge and phonemic awareness play a key role in beginning reading at the stage in which a child is starting to decode, later in grade school it is the child’s oral language skills which determine reading accuracy and comprehension.

Storch and Whitehurst (2002) studied 626 four-year-old children from a New York Head Start program and found a child’s reading ability in first and second grade was associated with that child’s code-related skills in kindergarten. However, a child’s
reading comprehension in third and fourth grade was influenced by three variables: prior reading ability, current reading accuracy, and current language skills.

Evans, Shaw, and Bell (2000) and Sénéchal and LeFevre (2002) also found that in grades one and two the relationship between oral language and reading skill was non-significant. Somewhere during grade two, reading becomes more complex, and code-related skills start to weaken in influence. By third and fourth grade, oral language skills emerge as more critical to proficient reading.

Language input. Language input, the language data that a child is provided, is associated with that child’s understanding and production of syntax complexity. Language input may be one way that shared book reading influences language development since a parent’s speech may be the most diverse and abstract in the shared book reading context than it is in any other parent-child interaction (Crain-Thoreson, Dahlin, & Powell, 2001). According to Crain-Thoreson, Dahlin, and Powell (2001), during shared book reading, parents utilize a greater mean length of utterance, and their verbal responses and expressions of abstract concepts are more frequent than they are in parent-child playtime situations or other parent-child conversations.

This idea that language input facilitates mastery of syntactic structure is demonstrated in the work of Huttenlocher, Vasilyeva, Cymerman, and Levine (2002) who found a relationship between children’s mastery of multiclause sentences and the number of noun phrases uttered by their caregivers. In the past, positive findings from studies on the relationship between language input and children’s syntactic mastery could be attributed to genetic factors since researchers used parent-child dyads for research. Researchers thought that assessments of growth in school environments might only
reflect the fact that highly educated parents are more likely to send their children to higher quality schools. To separate out these factors, Huttenlocher et al. (2002) in a two-part study, audio-recorded teacher speech in 40 classrooms from 17 preschools in the Chicago area for an entire school year to determine if children’s mastery of complex syntax was related to their teacher’s input of complex syntax.

The 305 children of mixed socioeconomic status, including both children from high-income backgrounds and children enrolled in Head Start, participating in the study were assessed at the beginning of the year. Classroom observations were conducted to evaluate not only the syntactic input of the teacher but the overall quality of teaching as measured by the National Association for the Education of Young Children (NAEYC) checklist.

Researchers found there was a .42 correlation between the proportion of complex sentences in teacher speech (specifically, the proportion of multiclause sentences and the average number of noun phrases per sentence) and the syntactic growth of the children in those teachers’ classes. There was no correlation between children’s syntactic skill at the beginning of the school year and their teacher’s syntactically complex input. Nor was SES related to skill growth during the school year, even though it was related to starting skill level as one would expect.

It is not only the structure of the language that parents use when they speak to their children that contributes to oral language, but the number of words parents speak to them. Zimmerman et al. (2009) studied 250 families with a Language Environment Analysis (LENA) device to measure child language exposure, exposure to media, and adult-child conversational turns. They found that each 1,000-word increment in adult
word-count translated to a .44 increase in the child’s language development score. For every 100 conversational turns, the child’s language score went up 1.92 points.

**Rare vocabulary.** Although the complexity of sentences spoken to children and the number of words a child hears are important, some researchers (Hirsh-Pasek et al., 2015) have posited that exposure to quality of vocabulary (e.g., the diversity of words and complexity of vocabulary) specifically, is what matters most for children’s language growth. Indeed, what we know about vocabulary within child-directed speech elucidates the means through which shared book reading fosters vocabulary growth.

Hirsh-Pasek et al. (2015) studied the interactions of low-income mother-child dyads at 24 months of age and expressive language at 36 months of age and found that, although words spoken per minute by the parent accounted for some of the variance in expressive language at age three, it was the quality of this speech that had the most robust predictive value. Pan, Rowe, Singer, and Snow (2005) also found children whose mothers used a more diverse vocabulary demonstrated a faster, straighter, language growth trajectory between 14 and 36 months of age than those children whose mothers utilized less diversity in vocabulary. When compared to maternal verbosity, word type diversity was a stronger predictor of child vocabulary production.

Children’s literature contains 50% more novel words than the typical mainstream television show (Hayes & Ahrens, 1988). The shared book reading experience helps children understand the meanings of these unfamiliar words. Beals (1997) found that the presence of semantic support strategies at the introduction of novel vocabulary held the strongest associations to later vocabulary measures. Specifically, she discovered that child-directed speech involving novel words typically varied among families regarding
the quality of information and semantic support that the environment provided. She found that when a rare word was introduced within a conversation, a parent’s strategy (whether it provided support in the form of physical or social context, semantic support, or prior knowledge) contributed to the child’s vocabulary test scores. Those children who were exposed to the most informative presentations of rare words during mealtime conversations during their preschool years scored higher on later vocabulary measures. Exposure to rare vocabulary within uninformative discussions had no association with vocabulary scores. Since shared book reading is by its very nature supported by pictures and context, it makes sense that its frequency is associated with the development of expressive and receptive vocabulary skills.

**Labeling while reading.** Using home environment analysis including audio and video-recordings of six-month-old infants and their caregivers, Bergelson and Aslin (2017) found that rates of object-utterance co-presence (i.e., the labeling of a present object) positively correlated with in-lab tests of comprehension. This finding suggests that babies younger than six months of age can learn words and process the meanings of these words through their parent’s and caregiver’s labeling practices during reading. Research also indicates that the earlier this is practiced the better since children who advance earlier with language exhibit a steeper language growth trajectory throughout their childhood.

Fernald, Perfors, and Marchman (2006), for example, analyzed the growth trajectories of 59 infants from primarily white, English speaking, middle class homes, in a looking-while-listening (LWL) activity at 15, 18, 21, and 25 months of age to investigate the stability of measures of speech processing speed and accuracy, as well as
the relationship of these measures to vocabulary growth and grammar acquisition. They found that those children with faster mean reaction times for recognition of spoken words had a more accelerated growth curve across their second year of life. The researchers also found that those 25-month-old children with higher accuracy scores earlier in life had larger vocabulary development than those children who scored lower on accuracy.

**The literacy opportunity gap.** What researchers have learned about infant-directed speech, language input, and vocabulary also help to explain the literacy achievement gap. Shared book reading may be of critical importance to children living in poverty because these children experience a different language environment than those in which their higher SES counterparts are raised.

Research on parent talk to children shows profound SES-based differences in the vocabulary to which children are exposed. Hart and Risley (1995) found that children from lower socioeconomic families heard fewer than 100 different words in one hour, whereas higher SES children heard 500 different words in an hour. By the time a child living in poverty is three years old, he/she has heard fewer words than the number of words that the high SES child has himself/herself spoken (Hart & Risley, 1995).

Illustrating how shared book reading can help to remedy SES-based differences in language exposure, a study by Hoff-Ginsberg (1991) on mother-child interactions and social class differences found that there were significant differences between the mothers during adult-directed speech (higher SES mothers used more and longer utterances and richer vocabulary). However, when interacting with their 18-29-month-old child, women from both groups used a higher rate of speech during shared book reading and dressing than they did during play and mealtimes. Both groups, regardless of SES, produced
significantly more root words and significantly longer utterances while reading books with their child than in any other activity. In general, regarding syntactic complexity, lexical diversity, and the most topic-continuing responses, the context of shared book reading seemed to balance out the differences otherwise apparent in these children’s language environments.

**The emergent literacy model.** Marie Clay introduced the theory of emergent literacy in 1966. Its foundation is the theory that literacy arises within children before they are taught to read. Rather than focus on just decoding, the emergent literacy model emphasizes the skills of speaking and listening, as well as reading and writing. According to Sulzby and Teale (1991), a child’s emergent literacy is built from the collection of the skills, knowledge, and beliefs surrounding literacy and language that children begin to acquire from birth. Whitehurst and Lonigan (1998) saw emergent literacy as two interdependent domains: “inside-out” and “outside-in,” both of which are influenced by different literacy experiences at different developmental stages in a child’s life. “Outside-in” skills include knowledge of language, narrative, as well as conceptual, and background knowledge, and the conventions of print – knowledge outside of the word, upon which comprehension of the text depends. “Inside-out” skills, on the other hand, include rules surrounding matching letters to sounds and syntactic awareness. Emergent literacy conceives of reading as a developmental continuum, with each component encompassing a complex developmental sequence on its own trajectory. This view stands in contrast to earlier ideas of “Reading Readiness,” which assert that children must master specific skills before they are ready to read and that this “learning to read” is a single event (Whitehurst & Lonigan, 1998).
The emergent literacy framework emphasizes the qualities of a child’s home literacy environment, including the informal social environment and the language skills that begin to develop at birth. Emergent literacy theorists believe that the language environment – starting in infancy – lays the foundation for ultimate literacy achievement (Whitehurst & Lonigan, 1998). Since these skills begin very early in the child's life and serve as predictors of later reading attainment, the more developed these skills are, the sooner the child will be on the path to reading, and the more effectively a child will read (Whitehurst & Lonigan, 1998).

**Infant directed speech.** Researchers have long known that deprivation of verbal interaction can irreversibly harm the language development of children. But even infants who are exposed to some language may face developmental standstills if they are not exposed to *enough* verbal stimulation. For instance, Goldfarb (1945) studied babies placed in orphanages before the age of six months. He found that these orphans, after being placed with a family later in childhood, showed quick growth in social skills and motor development within the first seven months of placement. However, their language skills remained stunted for as long as eight and a half years after placement into a foster home.

What researchers have learned about how children’s language experiences during infancy promote both receptive and expressive vocabulary, as well as strengthen language processing skills, helps us understand how shared book reading impacts oral language development. Research on infant-directed speech, for instance, highlights the way that mothers talk to their infants, using repetition, conversational strategies, and a reliance on child feedback (Fernald & Simon, 1984; Snow, 1972). Recent research
(Bergelson & Aslin, 2017) using eye-tracking technology with six-month-old babies around semantically related versus unrelated image trials has shed light on how a child’s first words are not isolated but are understood within a larger structure of meaning.

Infant-directed speech is thought to be pivotal to language learning as it is drastically different from adult-directed speech in its slower rhythm, higher pitch, exaggerated intonation, and stretched out vowel sounds (Fernald & Simon, 1984). The characteristics of this speech, also known as motherese or parentese, have been found in Arabic, Comanche, English, German, Gilyak, Marathi, and Spanish, all very different languages (Ferguson, 1964), as well as in tonal languages, such as Mandarin, and in the languages spoken by people living in remote villages in non-literate societies. Researchers believe parentese is a universal characteristic of human cultures (Bryant & Barrett, 2007; Grieser & Kuhl, 1988).

The prosodic characteristics of parentese provide not only attentional and affective benefits to the infant but contribute linguistic benefits as well, assisting in speech perception and the awareness of syntactic structures within others’ speech. Liu, Kuhl, and Tsao (2003) found that expanded vowel space – a measure of speech clarity found in the infant-directed speech of Mandarin-speaking Chinese mothers – was associated with the baby’s overall performance on tests of speech perception. The greater the vowel space, the better the baby did on this measure, and this held for both 6-8-month old children as well as 10-12-month-old children and was not attributable to mothers’ SES.

Researchers have found that disparities in cognitive development show up before a child turns one and these developmental disparities are statistically significant (Halle et
At nine months of age, babies from low-income families are on average one-fifth of a standard deviation below the mean of higher-income babies on cognitive assessments. These seemingly small SES-based differences become striking by the age of two. To address these achievement gaps that show up early, literacy interventions should start at birth.

**Beginning reading with infants.** Burgess, Hecht, and Lonigan (2002) found that the earlier a parent initiates shared book reading with their child, the better their child’s language skills. Other researchers (DeBaryshe, 1993; Sénéchal, LeFevre, Hudson, & Lawson, 1996) have found that reading exposure initiated early is a better predictor of language outcomes than are measures of current family literacy patterns. DeBaryshe (1993) found that among suburban two-year-old children, those children whose mothers reported beginning reading with them earlier scored the highest on receptive language. In her study, this “age of onset” variable was the most important predictor of skills in oral language, and this was irrespective of the age of child’s first word or the age of child’s first phrase.

Indeed, many parenting interventions are maximized when initiated before a baby is six months of age. Cates et al. (2012) conducted a study of 320 low-income, post-partum mothers to assess levels of early cognitive stimulation in the home and infant pre-verbal communication at six months, and toddler language at two years. Cates et al. (2012) found that early cognitive stimulation within the parent-child interaction – including shared book reading and other practices in the home literacy environment – was positively associated with preverbal infant communication (infant behaviors including: eye-gaze following, expression of emotion, and making bids for the attention
of others). Infant preverbal communication levels were, in turn, directly associated with
toddler language.

Liu (2014) used a longitudinal correlational design to explore the long-term
relationship between the maternal “utterances” (specifically, lexical features and acoustic
features such as vowel space or acoustic stretching among phonetic units) by Taiwanese
Mandarin-speaking mothers during shared book reading with their infants and the
language abilities of the children at five years of age. She found maternal speech features
predicted children’s language skill at age five.

In a recent study, Cates (2017) found that reading with infants was associated
with positive effects four years later. Specifically, the quality of families’ reading
sessions with their newborns, as measured by conversations parents had while reading
with their infants, strongly predicted early reading skills at age four. This study was a
longitudinal analysis of mother-child pairs containing children aged six, 14, 24, and 54
months to determine if book reading quantity and quality influenced child expressive and
receptive vocabulary, emergent literacy, and early reading. At six months of age, scores
on the StimQ READ Quantity and Quality (a measure of home literacy environment
including frequency and quality of reading sessions) served as predictors of expressive
vocabulary at 54 months. StimQ READ Quality subscale scores at six months predicted
early reading at 54 months and were correlated with a pattern of increased receptive
vocabulary.

**Infant brain development.** Infancy is a time when brain growth is amplified
(Knudsen, 2004). According to Mampe, Friederici, Christophe, and Wermke (2009),
auditory learning begins in utero, as early as the third trimester, as reflected in studies on
the vocal preferences of newborns. Although the abdominal barrier mutes phonetic aspects of language, newborns can memorize the melody contour in music and language and show a preference for their mother’s voice and their mother’s language over other voices and languages. Further, studies on foreign language exposure in infancy suggest that the time between six and twelve months of age is an exceptionally sensitive period for phonetic processing (Kuhl, Tsao, Liu, Zhang, & deBoer, 2001).

To explore the long-term impact on brain development that results from cognitively enriched environments during infancy and preschool, Hutton et al. (2015) studied the brain activation in three to five-year-old children listening to stories. Children in his study underwent blood oxygen level dependent functional MRI (BOLDfMRI) while performing story-listening tasks. Researchers found children with higher StimQ-P READ scores (a measure that may be consistent throughout early childhood) showed greater activation in the part of the brain associated with semantic processing. Researchers did not find a significant association between this activation and other StimQ subscale scores, indicating this particular type of biological embedding was specifically connected to a background of book-sharing practices.

**Joint attention.** The facilitation of an infant’s development of joint attention is another way in which shared book reading may affect cognitive skills and oral language. Joint attention in one’s early infancy is the process of sharing visual attention by focusing on what the parent or caregiver is focused on. It is an important developmental process of which parents are the primary facilitators. Without joint attention between the infant and the caregiver, spoken words will not foster the learning of word-object associations. Even before joint attention is apparent, at around nine months of age, shared book reading can
help facilitate its development via gestures, eye contact, and focused interaction between parent and child. Farrant and Zubrick (2013) studied Australian infants and found children who had lower scores of joint attention at nine months of age had significantly lower receptive vocabulary scores at four and a half to five years of age than those children who scored high on joint attention measures.

**Infants and media exposure.** Another important aspect of shared book reading is that increasing shared book reading interactions may reduce media exposure, which has been found to be associated with decreases in language scores.

Researchers have found not only that infants and toddlers learn language best from socially contingent partners in two-way exchanges, something that cannot be mimicked in pre-recorded, non-socially contingent video (Roseberry, Hirsh-Pasek, & Golinkoff, 2014) but that baby videos, when viewed heavily, may preclude language-fostering types of interactive time with adults.

According to a study on television and video viewing in children under two years of age, 40% of babies by three months of age are regular viewers of television or videos, and 90% of two-year-old children are regularly watching television and videos (Zimmerman, Christakis, & Meltzoff, 2007). Zimmerman, Christakis, and Meltzoff (2007) found that eight to 16-month-old children exposed to videos designed for infants scored lower on the MacArthur-Bates Communicative Development Inventory (MBCDI), a parent report that provides a child’s receptive and expressive vocabulary score, nine months later (at 17 to 24 months old). While reading once a day was associated with an increase of over seven percentile points in eight to 16-month-old children, and 11.72 points in 17 to 24-month-old children, each hour of baby DVD viewing was linked to a
16.99-point decrease in eight to 16-month-old children on the MBCDI. This decrease is equivalent to a difference of about eight words. In a later study on young children and television, Zimmerman et al. (2009) found each hour of television exposure was associated with a 2.68 decrease in language development scores.

**Empirical Research**

**Research on home literacy environment and oral language.** Researchers and theorists have conceptualized home literacy environment in many ways, including models focusing on (a) family characteristics, such as SES, parent resources, and parents’ abilities, (b) passive home literacy characteristics, such as the presence of models of adult literacy use, and (c) active home literacy characteristics, such as a family’s implementation of rhyming games and shared book reading. However, Burgess et al. (2002) found that only those conceptualizations of home literacy environment emphasizing active home literacy variables (e.g., age child is first read to, presence of shared book reading, and interactive literacy-fostering activities) contributed significantly to oral language development. Family characteristics and passive home literacy characteristics did not contribute significantly to oral language development.

Bracken and Fischel (2008) studied family reading practices and early literacy skills in preschool children from low-income families. The parent-child reading interaction score (composed of the frequency of shared book reading, the duration of shared book reading, the child’s age at first shared book reading, the frequency of library visits, and the family’s book ownership) was significantly associated with a child’s receptive vocabulary, as well as with the early literacy skills such as story and print concepts.
**Correlational studies on shared reading and oral language.** Many correlational studies support the idea that shared book reading helps children develop language and emergent literacy skills. Russell, Ukoumunne, Ryder, Golding, and Norwich (2018) found that frequency of shared book reading at age three predicted reading skill at age seven. Stevenson and Fredman (1990) found that children whose parents read to them in preschool were more successful readers at age 13. Crain-Thoreson and Dale (1992) found that shared book reading at two years of age held as a significant predictor of literacy outcomes six months later and two years later. Wells (1985) found a significant correlation between shared book reading frequency at home, when a child is between the ages of one and three years, and that child’s oral language outcomes at five years of age and reading comprehension at seven years of age, as rated by the child’s elementary school teacher.

Despite research support for the link between shared book reading and emergent literacy, in most correlational research, investigators are reliant on self-reports of parent-child reading frequency and event-recall diaries, methods which are subject to the imperfections of memory and vulnerable to social desirability response bias.

In the attempt to overcome this limitation, Sénéchal, LeFevre, Hudson, and Lawson (1996) utilized the work of previous researchers (Cunningham & Stanovich, 1990; Stanovich & West, 1989) who devised a way to assess print exposure that minimized social desirability response bias and reliance on memory. These earlier researchers found that Author Recognition Tests and Title Recognition Tests (ART and TRT) are stronger predictors of reading comprehension than were parental self-reports of reading frequency. The ART and TRT work better to predict reading comprehension.
because they are proxy measures of print exposure. In other words, the ability to recognize titles and authors of children’s books comes from reading children’s books.

Sénéchal et al. (1996) used both parents’ and children’s knowledge of storybook authors and titles (children’s title checklists and children’s author checklists) in their study. The sample included 119 four-year-old children and their middle-class parents. Researchers assessed children with the Peabody Picture Vocabulary Test (PPVT-R) (Dunn & Dunn, 1981), a subtest of the McCarthy Scales (McCarthy, 1970), and the Weschler Preschool Primary Scale (Weschler, 1989). Researchers assessed parents on two measures of storybook exposure: the Children’s Author Checklist (CAC) and the Children’s Title Checklist (CTC).

Sénéchal et al. designed the CTC with the assistance and feedback of librarians, children’s bookstores, general bookstores, and over 100 bestseller lists. Researchers then eliminated fairytales and books that had television or movie versions and kept only titles that were financially accessible to even the lowest income Canadian parents. The final list encompassed a variety of legitimate titles and 49 fictitious titles. All checklists reported high reliability. The team also assessed parents on home literacy activities, such as the frequency of storybook reading, the number of books in the home, and the number of library visits.

Researchers found a positive correlation between parents’ checklist responses and children’s vocabulary scores (.40 for the CTC, .44 for the CAC). Also associated with checklist responses was child interest in reading (.24 for CTC), number of books in the home (.52 for the CTC, .47 for the CAC), and frequency of library visits (.32 for the CTC, .41 for the CAC). However, the self-reports of age of onset of reading, number of
stories read per week, and frequency of solitary reading were not associated with child vocabulary scores.

To rule out the effects of general literacy level, education, and cognitive variables, the researchers utilized a fixed order hierarchical regression to assess contributions of exposure (via recognition scores) after controlling for child age, parent education, parent print exposure, child intelligence, and reported frequency of book reading. Shared booking reading, when entered after everything else, accounted for unique variance in the vocabulary scores of the children.

In a later study, Sénéchal (2006) followed 65 French-Canadian children from kindergarten until grade four. She assessed home literacy in kindergarten along with parent teaching. Sénéchal (2006) also assessed children’s letter-name knowledge, letter-sound knowledge, phoneme awareness, and vocabulary skills. Word recognition, spelling, and phoneme awareness were measured in first grade and reading comprehension, reading fluency, spelling, and reading for pleasure were measured in fourth grade. Sénéchal (2006) found that children’s shared book reading exposure was related to their kindergarten vocabulary scores, their grade four reading comprehension, and their self-reports of reading for pleasure in grade four.

Another correlational study conducted by Sénéchal, Pagan, Lever, and Ouellette (2008) explored the relationship between shared book reading and the comprehension of syntactically complex sentences and morphologically complex words, both of which contribute to future reading achievement. Their sample consisted of 106 kindergarten children from a large Canadian city, average age four years, eight months. Researchers assessed parents via a questionnaire about child literacy experiences which centered on
the frequency of shared book reading. Parents also completed the CTC and the CAC, and the Adults Author Checklist (AAC).

Researchers administered the Expressive Vocabulary Test (Williams, 1997), which requires the child to label items on some questions and generate synonyms for words on other questions. To assess morphological comprehension, researchers gave the grammatical morphemes subtest of the Test for Auditory Comprehension of Language (TACL third edition) (Carrow-Woolfolk, 1985), and to measure syntax comprehension, researchers administered the Elaborated Phrases and Sentences subtest of TACL-3.

From a principal components analysis of the four variables connected to children’s home literacy experiences, one factor was produced which was labeled “shared reading.” This factor was found to be significantly associated with children’s scores of expressive language and children’s comprehension of both syntactically complex sentences and morphologically complex words. Although the relationship between syntactic comprehension proved to be indirect and mediated by parent literacy, the association between child’s exposure to shared reading and that child’s understanding of morphologically complex words held, even after controlling for child intelligence, parent education, and parent literacy (Sénéchal et al., 2008).

Although most of Sénéchal’s studies involved parents of middle-class background and above-average education levels, home literacy activities benefit children from all SES categories. Hood, Conlon, and Andrews (2008) conducted a three-year longitudinal study on the relationship between early home literacy practices, as measured by the Home Literacy Environment Questionnaire and the TRT, and literacy development, specifically, phonological awareness, receptive vocabulary, and reading and spelling in
Caucasian children from low to middle-class families. They found a significant direct path from shared book reading to vocabulary in grade one.

One of the largest meta-analyses on shared reading was conducted by Bus, van IJzendoorn, and Pellegrini (1995). This study included correlational, retrospective, longitudinal, and experimental studies on parent-preschooler shared book reading and its associations with emergent literacy, language growth, and reading achievement. Shared book reading, on average, accounted for 8% of the variance with effects for oral language outcomes the strongest. This finding was true for the full range of SES categories.

**Shared book reading with infants.** Although the research studies on shared book reading and oral language mentioned earlier began with preschoolers and kindergarteners, some researchers set out to investigate the associations between language development and shared book reading that starts earlier in a child’s life. Raikes et al. (2006) studied 2,581 low-income mothers and their infants and found that for native English-speaking children, shared book reading a minimum of several times a week at 14 months of age was significantly associated with vocabulary and comprehension. Reading several times a week at 24 months was significantly associated with vocabulary and the Bayley Mental Development Index (MDI) cognitive and language scores. Daily reading at 14, 24, and 36 months was significantly associated with language and cognition at 36 months. For the Spanish-speaking families, reading daily at any of the three ages was associated with higher language outcomes than was less frequent reading.

Gottfried, Schlackman, Gottfried, and Boutin-Martinez (2015) conducted one of the first studies to show the lasting literacy effects of reading that start within the first years of life. Although not specifically focused on oral language, their longitudinal study
that began with infants demonstrated the impact of shared reading in infancy on ultimate educational attainment.

Using data from the Fullerton Longitudinal Study, Gottfried et al. followed children from one year of age until the children reached the age of 29. From age one to roughly age five, the sample, consisting of 130 children of diverse socioeconomic statuses, were first assessed twice a year, then through primary schooling once a year, and less frequently through middle and high school. Assessments included home literacy variables, along with measures of reading achievement, reading motivation, and educational attainment of both mother and child. When the children reached 29 years of age, 106 participants of the original 130 remained to be queried on their years of education. Results showed that even when controlling for mother’s education, the time that a parent and child spent involved in shared book reading when the child was one year of age continued to show positive effects all the way into adulthood. Specifically, the time spent reading to a child in his or her infancy and toddlerhood was directly related to that child’s reading motivation and achievement during later childhood and indirectly related to reading motivation and achievement in adolescence, and educational attainment in adult life.

Experimental studies on shared reading and oral language. Correlational studies, like those mentioned, suggest a link between shared book reading and the development of language and literacy skills. However, correlational and case studies provide no definitive causal support for the relationship between shared book reading and literacy outcomes.
Experimental studies on shared book reading – studies which aim to manipulate the child’s reading environment – are few. Experimental studies on dialogic reading (DR), however, do offer convincing evidence of shared book reading’s effect on language and literacy outcomes. Dialogic reading is an interactive reading technique based on the research of Grover Whitehurst (Whitehurst et al., 1988). Specifically, experimental studies involving DR have shown unequivocally that variations in parent reading do affect child language outcomes.

Whitehurst et al. (1988), for instance, trained parents of typically developing middle-class children aged 21 to 35 months in evocative techniques, feedback, and skill dependent scaffolding. After just four weeks of enhanced shared book reading training, children from the experimental group showed significantly increased gains on the Illinois Test of Psycholinguistic Abilities (ITPA) (Kirk, McCarthy, & Kirk, 1968) and the Expressive One Word Picture Vocabulary Test (EOWVT) than children who were read to as frequently by parents not trained in DR.

Extending this model to a study with typically developing but low language ability, monolingual, Spanish-speaking two-year-old children from a low-income daycare in Tepic, Mexico, Valdez-Menchaca and Whitehurst (1992) experimented to compare a dialogic reading intervention group to a non-literacy intervention group. Specifically, children in the intervention group experienced one-on-one shared book reading sessions lasting 10 to 12 minutes every weekday for six to seven weeks with the teacher (a graduate student) using language evocative strategies (“wh” questions, corrections, expansions, and praise); the children in the other group experienced one-on-one art activities. Children from the literacy group showed significantly higher performance on
the PPVT-R, the EOWPVT, and the ITPA, growth which equated to 3.3 months (PPVT-R), 7.3 months (EOWPVT), and 8.2 months’ (ITPA) worth of growth and generated an average effect size of 1.56 (Cohen’s d) across the three tests.

In 1994, researchers found comparable results with two to three-year-old children from middle and upper SES homes where regular shared book reading was already happening (Arnold, Lonigan, Whitehurst, & Epstein, 1994). Children whose parents were video-trained in dialogic reading strategies outperformed both the group of parents who were trained in person in DR and the group that was not trained in DR, on standardized language outcome measures. Interestingly, in this study, the in-person trained DR group and the non-DR trained group differed on only one of the four tests that were used as outcome measures.

In a 1998 experimental study to determine the most effective setting for implementation of DR, Lonigan and Whitehurst (1998) used three treatment groups (home-only, home-plus-school, and school-only) to determine whether DR delivered by parents versus DR delivered by teachers would be more effective for low-income three and four-year-old children. The DR delivered by teachers took place in the child’s preschool in groups of five or fewer children in daily sessions for 10 minutes a session. During the study, preschool centers were rated for compliance and grouped into high compliance centers and low compliance centers.

At the end of the intervention, school-only groups from low compliance centers scored lower than the control group on measures of expressive vocabulary. The home-only group outscored both the school-only group, the school-plus-home group, and the control group on measures of verbal expression. There were no significant differences
between groups for measures of the PPVT. Even in the high compliance centers – those centers who were observed to implement the intervention with both frequency and fidelity – the home-only group outperformed the school-only group in post-test language measures including mean length of utterance, number of words spoken, along with three different measures of semantic complexity. Home-only students also outperformed both the school-only and the school-plus-home groups on the verbal expression measure (Lonigan & Whitehurst, 1998).

This finding, along with other findings such as the research on adult-child language interactions mentioned earlier, suggests that both individualized scaffolding as well as a child’s opportunity to respond, play a part in the effectiveness of shared book reading and emphasize the importance of the home setting and the parent’s involvement for developing oral language skills from shared book reading.

Although most DR studies are conducted with preschoolers and toddlers, Vally, Murray, Tomlinson, and Cooper (2015) conducted an experimental study with African babies from an impoverished settlement in Cape Town, South Africa to explore the effects of a DR-like intervention (“Book Sharing Training”) on child language development and sustained attention (Vally, Murray, Tomlinson, & Cooper, 2015). After two months of weekly training sessions by native speaking community members, babies whose mothers were assigned to the experimental group outperformed babies whose mothers were assigned to the control group on the translated MacArthur-Bates CDI, measures of language comprehension modeled after the PPVT-R, and measures of infant attention. All effect sizes were of medium to large magnitude.
Many experimental dialogic reading studies do find positive results for the effects of shared book reading and language outcomes. However, these results may not generalize to untrained parents who may or may not be using interactive strategies in their shared book reading with their child.

To determine if there are direct causal effects on child language development from shared book reading with untrained parents versus the absence of such reading, a researcher would need to instruct control group families to forgo reading with their children, an act that over a period may be detrimental to those children. Perhaps, for this reason, many of the experimental studies on the effects of simple shared book reading occur within schools.

Feitelson, Kita, and Goldstein (1986), for instance, explored the effects of reading fiction stories (in this case a 15-volume series featuring Kofiko, a mischievous monkey) by regular teachers on the emergent literacy skills of first graders living in an impoverished region of Haifa, Israel. The teachers assigned to the experimental group were asked to read the Kofiko stories aloud to their class for 20 minutes for five days of the six-day school week. The teachers in the control group were asked to continue with regular literacy activities during this time. The intervention ran for six months – from December to June. Upon retesting, the children who had experienced the storybook intervention showed gains in not only their technical reading skill and reading comprehension, but also in their oral language measures, such as vocabulary and mean length of utterance. When adjusting for pretest scores, the differences were statistically significant.
Phillips, Norris, Mason, and Kerr (1990) randomly assigned 18 classes from 12 schools in Newfoundland, Canada, to one of four groups (three treatment groups and one control group) to assess the effects of using “Little Books” (McCormick & Mason, 1990) on children’s reading readiness, language, and listening. “Little Books” are children’s storybooks that contain pictures which facilitate the learning of unfamiliar words and concepts and are specifically designed for interactive reading. Like the Lonigan and Whitehurst (1998) study Phillips et al. (1990) utilized a home-only, school-only, and home-plus-school group. Gains were significantly higher for the treatment groups on measures of emergent literacy (with the greatest for the home-only group) than for the control group. Of note is that the lowest scoring students at baseline benefitted the most from the books’ use at home, whereas those children who scored the highest on their pretest were helped the most from the school-only treatment.

In response to reading difficulties among Arab Elementary School students who learn to speak a local dialect different from the literary Arabic they are expected to read from books, Feitelson, Goldstein, Iraqi, and Share (1993) conducted an experimental study with children from 12 kindergarten classes within a low-income Arab town in Israel. Kindergarten teachers assigned to the intervention group were required to read stories in FusHa (literary Arabic) to the children for 20 minutes at the end of each day for five months. The stories read were popular children’s stories and folktales translated and adapted to FusHa. The control group was exposed to the regular curriculum from the Israeli Ministry of Education.

Reading stories in FusHa was a controversial intervention as the teachers felt that five-year old children were too young to be exposed to literary Arabic (Feitelson et al.,
1993). At the end of the five months, kindergarteners in the intervention group significantly outperformed the children in the control group on narrative production elements of language, as well as measures of expressive and receptive language, with the treatment explaining 44% of the variance. Intervention children used richer vocabulary and utilized more multiclause sentences on measures involving telling stories.

Despite the difficulty researchers have controlling reading behaviors at home, some researchers have conducted experimental studies where intervention group mothers are instructed to read to their children, while comparison group mothers are not instructed to do anything. Irwin (1960), for instance, conducted an experimental study with babies from low-income monolingual families in Iowa City, Iowa that spanned from the baby’s thirteenth month until the child reached two and a half years of age. Mothers in the experimental group were asked to spend 15 to 20 minutes in shared book reading with their 13-month-old child with books provided by the researcher. Control group mothers were not provided books, nor was reading mentioned to them. Every two months, between the child’s thirteenth month and the child’s thirtieth month, the researcher came to the family home to observe the child’s language (specifically, measuring phoneme-type frequency). Although no differences were found in phoneme-type frequency scores between experimental and control children within the 13-17 month age range, after the child’s seventeenth month of age, the children in the experimental group significantly outscored the control group children on phoneme-type frequency. The intervention group’s scores continued to be significantly higher through the child’s thirtieth month of age.
Donachy (1976) sought to explore the effects of a four-month home reading program on three and four-year-old children of an urban area of Renfrewshire, Scotland. The researcher provided experimental group mothers with books and a written list of activities involving vocabulary, numbers, size, and time concepts, which the mother could engage the child in at home. Experimental group mothers were asked to spend 30 minutes daily on the storybook and activities. Control group mothers were given no instructions regarding home reading. At the end of the intervention, children from the experimental group made significantly greater gains on both the Stanford-Binet and the comprehension and expressive tests of the Reynell Developmental Language Scales (Reynell, 1969).

A 1973 quasi-experimental study (Highberger & Brooks, 1973) assigned two intact Head Start Centers in a rural low-income area of East Tennessee to a treatment and control group. Experimental group mothers were asked to read to their child for 15 minutes a day for 17 weeks, and children were given a different library book to take home each week. Mothers of children in the control group were neither encouraged nor discouraged to read, and their treatment involved borrowing toys from a toy library each week. After the 17 weeks, the treatment group significantly outscored the control group on the PPVT.

In another home-reading study, Swinson (1985) randomly assigned two groups of mothers of three to four-year-old children from the same preschool in a low-income area of England to investigate the effects of an eight-month intervention of simple daily shared book reading on language skills and school readiness. The researcher invited intervention group mothers to a meeting where they were shown a video about how to
make reading enjoyable. Mothers were not told anything specific other than to “enjoy” a book at home every night with their child. An informational booklet on the same subject went home with them. Intervention mothers could choose a book to check out regularly. Comparison group mothers were excluded from the project and did not know about the meetings or activities of the intervention group. Children from the experimental group showed significantly higher gains on the English Picture Vocabulary Test (Brimer & Dunn, 1962), along with scales measuring verbal comprehension and naming vocabulary. Control group children showed very little change on these measures.

Weisleder et al. (2017) conducted a cluster-randomized trial in Brazil to investigate the effect of a parenting program that focused on book sharing among low-income families attending child care centers in a high-poverty city in the Northern part of the country. The study included 566 families with two to four-year old children in 12 child care clusters. For nine months, intervention families were permitted to borrow children’s books every week and attend parent trainings on how to read aloud to their children. At the end of the study, intervention children scored significantly higher on receptive vocabulary, working memory, and IQ.

**Pediatric-based book provision studies.** The most well-known pediatric-based book provision intervention is Reach Out and Read, which began in 1989, at Boston City Hospital. Reach Out and Read capitalizes on the idea of starting families reading early, as early as birth.

**Book provision and oral language.** Mendelsohn et al. (2001) conducted a causal-comparative study to investigate the effect of a Reach Out and Read program on both child vocabulary and home literacy environment with Latino and Black families. The
researchers’ sample included 122 two to six-year-old children and their parents who were either Latino or Black. All families spoke either English or Spanish at home. Forty-nine participants were in the intervention group attending the clinic which had provided a literacy support program based on Reach Out and Read for three years, and 73 participants were in the comparison group who may or may not have had limited exposure to a Reach Out and Read-like program.

The intervention component included four parts: (a) clinic volunteers on floor mats modeling reading activities in the clinic waiting room, (b) clinic volunteers approaching families in the clinic waiting room to discuss the importance of reading, (c) clinic pediatricians counseling about the importance of reading during the family’s well-child visit, and (d) clinic pediatricians giving a book at each well-child visit.

Researchers administered to all participant parents the StimQ READ subscale and their child was given the Receptive One-Word Picture Vocabulary Tests (ROWPVT) (Gardner, 1985) and the Expressive One-Word Picture Vocabulary Tests (EOWPVT) (Gardner, 1990). Parents were also asked to recall the number of literacy promoting events they experienced at the clinic.

The StimQ READ subscale scores and vocabulary test scores of the intervention clinic and the comparison clinic were compared via t-test. To assess the relationship between Reach Out and Read dosage and child vocabulary, a Pearson correlation was performed for each case, and a multiple regression was conducted after adjusting for possible confounding variables.

Mendelsohn et al. (2001) found that intervention parents read to their child on average one day more per week than the comparison group parents. The intervention
children’s receptive vocabulary scores were 9.7 points higher than comparison group
children’s receptive vocabulary scores. In a multiple regression that adjusted for ten
confounding variables, children from the intervention families scored significantly higher
on receptive and expressive vocabulary – the equivalent of six months and three months,
respectively. As for the dose-effect, researchers found that each literacy promoting
interaction was associated with a .2 increase in expressive vocabulary score and a .4
increase in receptive vocabulary score. There was a statistically significant correlation
of .20 ($p = .03$) between the number of clinic-based literacy events reported by the
parents and reading activities at home.

Theriot et al. (2003) also demonstrated a dose-effect for the Reach Out and Read
components of anticipatory guidance and number of books given at well-child visits. She
and her colleagues sampled primarily low-income African American participants, using
anticipatory guidance and the number of books given at well-child visits as predictor
variables and child vocabulary scores (on the PPVT – III and EOWPVT – R) as the
outcome variables. Researchers found that the number of well-child visits that included
anticipatory guidance plus book provision was a significant predictor of scores on both
the PPVT-III and EOWPVT-R.

In a similar pediatric-based book provision study that explored Child Centered
Literacy Orientation (CCLO) along with vocabulary outcomes, Sharif, Rieber, and Ozuah
(2002) studied 200 parent-child pairs at two health centers in a low SES region located in
the South Bronx. One clinic’s clients had experienced the Reach Out and Read
intervention for three years, while the other clinic’s clients had no exposure to this
intervention. Although Reach Out and Read includes three components, the participants
of this study only experienced the counseling by the doctor and the provision of a book at every well-child visit.

Immediately following recruitment, parent participants were administered a demographic interview, and children, mean age 3.8, were administered (a) the EOWPVT to measure expressive vocabulary, (b) the ROWPVT to measure receptive vocabulary, (c) the test of Home Literacy Orientation, (d) 10 questions including Needlman’s three open-ended questions to assess Child Centered Literacy Orientation, and (e) the StimQ-READ subscale to measure home literacy activities.

Researchers found that exposure to counseling and book provision was associated with more developed receptive vocabularies, higher scores on Child Centered Literacy Orientation, and higher scores on the StimQ-READ subscale.

In other research exploring Reach Out and Read and emergent literacy, and focusing on Spanish-speaking immigrants, Diener, Hobson-Rohrer, and Byington (2012) conducted a correlational study comprised of 40 children, average age 5.3 years and not yet in kindergarten, who started the Reach Out and Read program at six months of age. All participant mothers were Spanish-speaking immigrants, mostly from Mexico, with incomes below the federal poverty level. In this study, the Reach Out and Read intervention consisted of three components: (a) the provision of Spanish language baby books, eventually transitioning to bilingual books, (b) counseling by the primary-care physician with emphasis on dialogic strategies, and (c) the presence of a clinic library with a bilingual librarian.

Researchers reviewed medical records to determine each participant’s number of well-child visits. Mothers were interviewed about book reading activities, book
ownership, Reach Out and Read exposure, and library use. Researchers evaluated children’s emergent literacy skills in print awareness, and writing samples were taken. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) (Kaminski, 2002) – a measure which assesses early literacy – was given to assess phonemic awareness through measurements of initial sound fluency and letter naming fluency. Each child’s kindergarten teacher was asked to assess the child’s emergent literacy during the kindergarten year using the Kindergarten Teacher Questionnaire Part C from the Department of Education Early Childhood Longitudinal Study-K (ECLS-K) on 12 indicators of language and early literacy.

Researchers found that exposure to the three components (counseling, book provision, and a library located inside the clinic) was associated with higher scores on print awareness and phonemic awareness, and a greater likelihood of a child being rated by his/her kindergarten teacher as average, above average, or far above average, when compared with non-study children of the same age.

**Changing parental shared reading behaviors around literacy.** Changing parental behaviors around home literacy starts with changing parental beliefs about the importance of shared book reading. DeBaryshe (1995), for example, found that mothers who perceived their roles regarding home literacy as more important also reported more frequent shared book reading with their child, and with their child’s greater literacy exposure in general. In a 1995 study of Head Start children, DeBaryshe (1995) found mothers’ beliefs were again related to frequency of reported book sharing and more discussion between parent and child during shared book reading. She also found that
there was a .48 correlation between maternal beliefs about the importance of literacy and child reading interest.

This change in attitudes and beliefs is the primary aim of pediatric-based book provision interventions. By providing a children’s book at every well-child visit, doctors emphasize to parents the importance of reading books with their child. Physicians hope that parents do not see the books as gifts, but rather as a prescription for themselves and their child.

In the earliest study on the relationship between book provision and changes in behavior around shared reading, Needlman et al. (1991) conducted a nested case-control study to determine whether exposure to a clinic-based literacy intervention would be related to increased scores on literacy orientation as measured by a 24 hour activity-recall diary which included everything the respondents did with their child during a 24 hour period, open-ended questions about their child’s three favorite activities, and finally, questions about the use of books with their child.

The literacy program included three components: (a) a clinic volunteer reading aloud in the waiting room, (b) counseling by a clinic doctor, and (c) the provision of a book at every well-child visit. Because only 6% of this sample had experienced all three of the components, researchers were able to consider each element separately to determine which components of the literacy program were associated with the most change in a family’s shared reading behavior. Researchers found that there was no association between waiting room read-alouds or physician guidance and measures of literacy orientation. However, there was a relationship between being given a book at the most recent well-child visit and the scores of literacy orientation. Those parents who were
provided with books were four times as likely to score positively on the literacy orientation measure than parents who did not receive books.

Among the several components of the traditional Reach Out and Read Intervention, the provision of the book itself appears to be the most important for changing parental shared reading behavior. The physicians in Sanders, Gershon, Huffman, and Mendoza’s (2000) study, to explore the effect of book provision and frequency of book sharing, wrote prescriptions for parents to read to their child for 10 minutes a day. This prescription was given at every well-child visit along with a developmentally appropriate board book. The participants in this causal-comparative study were 125 primarily immigrant Hispanic parents of two to five-year-old children. Researchers used a survey question about book provision to determine exposure to the intervention (i.e., whether participants had been given books by their pediatrician and if so, how many). Because the program was only in its third month of implementation, the researchers could separate those parents who had exposure (i.e., those who were in the intervention group) – 54% – and those who had not had exposure (i.e., those who were in the comparison group) – 46%.

Sanders et al. found that parents who received the book and the prescription for reading at every well-child visit were more than three times as likely to report frequent book sharing (defined as more than three days per week) than parents who had not been recipients of books and prescriptions. Reading as a favorite activity, however, was not related to which group the participants were in, nor was the number of children’s books in the home associated with the intervention. A parent’s education or level of English was not related to the frequency of book sharing scores, nor was the family’s years of
residence, or the child’s daycare enrollment. Significantly, parents who were exposed to as little as one prescription/book were more likely to report greater frequency of book sharing.

In one of the only pediatric-based book provision studies that included pediatric nurse practitioners, High, Hopmann, LaGasse, and Linn (1998) sought to investigate whether provision of a book along with educational material developed by the researchers influenced measures of Child Centered Literacy Orientation in low-income, mostly single-mother families with children one year to three years of age.

The historical control group was composed of 51 families who had attended the clinic before the institution of the book provision program. The treatment group consisted of 100 families who joined the clinic after the beginning of the program and who therefore received the book provision treatment. Both groups were low-income and racially diverse.

Intervention parents received two books at the two most recent well-child visits. At the children’s well-child visit, pediatric residents and pediatric nurse practitioners discussed educational materials which outlined why, how, and when reading should take place, as well as strategies which focused on the importance of bedtime reading. In this study, discussions of the importance of shared reading were tied to bedtime rituals and these rituals’ potential to reduce bedtime struggles and night-time waking and thus increase independent child sleeping. The interest in literacy was not disclosed to the subjects.

Approximately one month after the family’s last well-child visit, an 8 to 12-minute interview was administered using Robert Needlman’s CCLO measure (Needlman
et al., 1991), plus a sleep habits questionnaire. Three questions measured Child Centered Literacy Orientation:

1. What are your child’s three favorite activities (besides eating and sleeping)?
2. What are your three favorite activities to do with your child?
3. How many nights each week do you share books with your child?

Child Centered Literacy Orientation was present if the response to one or more of the two open-ended questions mentioned reading, or if the parent reported sharing books with their child at least six nights per week.

Researchers found intervention effects regardless of the child’s age or the parent’s educational level. Although the treatment group families only received two books plus educational materials, treatment group families were significantly more likely to demonstrate positive CCLO. Sixty-nine percent of the treatment group compared to 33% of the comparison group scored positively on the CCLO measure.

To investigate the effects of a pediatric-based book provision intervention on Home Literacy Orientation with populations other than Spanish and English-speaking families, Silverstein, Iverson, and Lozano (2002) conducted a causal-comparative study with a multicultural, low-income population from the Harborview Children and Teens Clinic at Seattle’s Harborview Medical Center. Clients of this clinic, many of whom are immigrants from both Africa and Asia, come from 20 language groups. Using a historical control, researchers compared two cohorts (one baseline group whose data were collected before the implementation of the program, and one post-intervention group who had seen a doctor at the clinic at least once after the implementation of the program). The sample contained 14 language groups including Oromo, Somali, Spanish, Tigrinyan, Vietnamese,
and English. The intervention included three components of the Reach Out and Read program: (a) waiting room volunteers who modeled book sharing with children, (b) literacy guidance for parents by their physician, and (c) a baby book written in English provided at the well-child visit. Families of children six months to five and a half years of age were asked to take a 30-item survey surrounding topics such as television viewing habits, home activities, and bedtime rituals. Within the 30 questions were questions which assessed the components of Needlman’s measure for CCLO (Needlman et al., 1991) along with questions which measured the frequency of shared book reading.

For the English-speaking participants, the percentage of parents who indicated reading as one of their child’s favorite activities went from 7% in the baseline group to 30% in the treatment group. The percentage of parents who indicated reading with their child as one of their favorite activities went from 33% in the baseline group to 58% in the treatment group. Sixty-three percent of the baseline group implemented bedtime reading; for the treatment group, this percentage was 93%.

For families who did not speak English as their native language, those who reported shared book reading as one of their favorite activities was 11% in the baseline group compared to 27% in the treatment group. The percentage of families who implemented shared book reading at bedtime at least once per week was 36% in the baseline group and 56% in the treatment group. In addition, the percentage of families who shared books at least once a week during times other than bedtime was 60% in the baseline group, compared to 76% in the treatment group.

In 2005, 16 years after the first Reach Out and Read program began, Needlman et al. (2005) sought to determine if Reach Out and Read continued to be implemented
effectively. The researchers also wanted to learn whether the intervention was more effective among specific ethnic or socioeconomic groups. Researchers recruited 1,647 participants, parents of children six months to six years old, across the United States, from 19 different sites in 10 different states. Using Needlman’s 3-question measure of Child Centered Literacy Orientation, along with questions taken from the StimQ READ, they found that participants exposed to the Reach Out and Read program engaged in shared book reading with their children more days per week than those who were not exposed to the intervention (4.7 +/- 2.3 days versus 4.4 +/- 2.5 days) (p < .01). The exposure to Reach Out and Read was also correlated with higher literacy support summary scores (a composite score created by select StimQ READ questions and Needlman’s measure of Child Centered Literacy Orientation), for those parents who had less than a twelfth-grade education. Higher literacy support summary scores associated with Reach Out and Read were also present among African-American and Latino families but not white families. The Reach Out and Read intervention was associated with higher parent reports of shared book reading as a factor contributing to their child’s success in school (OR 1.5, 95% CI, 1.2 – 1.8) and higher parent reports of shared book reading as one of their or their child’s three favorite activities (OR 1.4, 95% CI, 1.2-1.8).

In this study, researchers randomly assigned 205 low-income families into a literacy intervention group \((n = 106)\) and a control group \((n = 99)\), based on whether they enrolled at the clinic on an even day or an odd day.

Initial interviews were focused on questions about play activities and sleep habits; the researchers did not disclose the study’s true focus on literacy. Intervention families received an infant board book, a handout about the benefits of reading, and a mention by the doctor about the importance of shared book reading for the baby’s development.

After three well-child visits, or by the 22-month follow up, the families were re-interviewed using a shortened version of the first interview. Children were also assessed with the MacArthur-Bates Communicative Development Inventory.

The researchers found statistically significant differences between the control group and the intervention group. The families exposed to the book provision intervention participated in more shared book reading, rated shared book reading as more favorable, and reported higher rates of shared book reading at bedtime. Children whose parents were exposed to the book provision intervention also scored higher than the control group on the MacArthur-Bates CDI.

Golova, Alario, Vivier, Rodriguez, and High (1999) conducted a prospective randomized controlled trial to determine the effect of Reach Out and Read on family reading behaviors and attitudes.

The subjects were 135 low-income Spanish-speaking single mothers with limited English proficiency. Subjects were randomly assigned to either the intervention group \((n = 65)\) or the control group \((n = 70)\).
The intervention group received all the components of the Reach Out and Read program: (a) clinic volunteers reading in the clinic waiting room, (b) clinic volunteers approaching families in the clinic waiting room to discuss the importance of reading, (c) clinic pediatricians counseling about the importance of reading during the family’s well-child visit, and (d) clinic pediatricians giving a book at each well-child visit.

All books were Spanish/English bilingual, and handouts were bilingual and written at the fifth-grade reading level. At the end of the study, none of the control group parents surveyed indicated the pediatrician discussed that parents should be reading books with their child. Control group parents were also verified to have received no books or handouts.

After three consecutive visits, 122 parents were re-interviewed on the shortened 55 item version of the baseline interview. Fifteen literacy items remained interspersed between questions about play, sleep, and television. The primary dependent variable was the number of days per week parents read books to their child, parent enjoyment of book reading with their child, and the number of child and adult books in the home. The researchers found that significantly more intervention group parents reported reading books with their children in comparison to control group parents (64% versus 4%). Forty-three percent of the treatment group versus 13% of the control group reported parent-child book sharing as one of their three favorite activities.

Kumar, Cowan, Erdman, Kaufman, and Hick (2015) conducted a randomized trial in a Young Families Program (YFP) clinic in downtown Toronto, Canada with teenaged mothers to determine the effect of the Reach Out and Read model on family reading patterns as measured by the three-question measure of CCLO. A second dependent
variable was maternal depression since other researchers have found a strong association between maternal depression experienced by mothers and decreased language development in the offspring of those women (Kumar et al., 2015). The Beck Depression Inventory-IA was utilized for this.

The subjects were 30 teenaged mothers with children 6-20 months of age. Treatment group parents received a new book, and advice revolving around shared book reading with their child from a librarian, as well as a library card. Families in the control group received their regular care.

At the end of the intervention, the treatment group was significantly more likely to report shared book reading as a favorite activity. Mothers from the treatment group were two and a half times as likely to read to their child three days a week and treatment group mothers were more than seven times as likely to report reading as a favorite activity of their child. Treatment group mothers were five times as likely to rate shared book reading as one of their favorite things to do with their child. The treatment group also scored substantially lower on the depression inventory, although this difference was not statistically significant (due to the small sample size).

Non-pediatric based book provision interventions. Whaley, Jiang, Gomez, and Jenks (2011) conducted a study of the Little by Little (LBL) program, a Women Infants and Children (WIC) based literacy intervention in LA County, California. This program is based on the Reach Out and Read model. Researchers sought to investigate the program’s effect on school readiness and home literacy environment. The subjects were 405 families assigned to either the control group \((n = 200)\), a two-year intervention group \((n = 103)\), and a four-year intervention group \((n = 102)\).
The two intervention groups received the LBL program involving: (a) counseling by a WIC staff member using prewritten scripts that address the development of a particular age and encouragement of daily verbal interactions, (b) provision of a brief handout on the developmental milestones of their child’s age-group, and (c) provision of a developmentally appropriate book or toy.

From ages newborn to five years, children received an average of 22 items, out of which 16 items were books. Children received an average of four books per year in English or Spanish.

Using the Bracken Basic Concept Scale-Revised (Bracken, 1998) and the Home Observation for Measurement of the Environment (HOME) (Caldwell & Bradley, 1984) and using the mother’s employment status, education, and child’s age as covariates in the analysis, researchers found that the Spanish-speaking subset, although scoring lower than the English-speaking subset at two years of intervention, had almost caught up after four years of the treatment, closing the large gap that existed between the English-speaking and the Spanish-speaking subset.

Structural equation modeling demonstrated that the LBL intervention’s effect on school readiness was mediated through improvements to the home literacy environment. Gaps that existed for both school readiness scores and the home literacy environment scores disappeared among participants in the four-year intervention group. Interestingly, after two years of the treatment, the scores plateaued for the English-speaking group yet continued to increase for the Spanish speakers.
Conclusion

Researchers have accumulated many positive findings concerning the effectiveness of shared book reading on child language as well as the impact of book provision interventions on family attitudes and behaviors toward shared book reading. The systematic and properly executed provision of books to low-income groups is a positive step toward closing the literacy achievement gap. Whether these interventions are delivered by doctors or others who serve families with young children, such programs seem to hold great promise.

The purpose of the present study was to investigate the effect of book provision on the shared reading patterns and attitudes toward shared book reading of women participating in the Nurse-Family Partnership. It is hoped that the knowledge gained from this study can assist practitioners and policymakers in determining how and under what conditions these delivery models can be expanded to populations like the one under study.
Chapter Three

Research Methodology

Chapter Overview

The purpose of this study was to determine the effect of book provision on family shared reading patterns and families’ attitudes toward shared book reading with their child.

Pediatric-based book provision interventions such as Reach Out and Read have been shown to be successful for improving both the home literacy environment and the oral language outcomes of high-risk populations. However, so far, book provision interventions have not been implemented systematically with home-visiting programs such as the Nurse-Family Partnership, nor have there been studies involving book provision interventions with home-visiting programs.

In this chapter, a description of the research design used for this study, along with research questions and null and alternative hypotheses will be outlined. The participants who were studied, as well as their selection and assignment, will be discussed. The investigator will explain the instrumentation used, as well as the statistical methods utilized.

Research Design

The researcher used a pretest-posttest control group design with random assignment as shown in Table 1. The independent variable was the group assignment of (a) treatment group or (b) comparison group. Treatment group mothers received four new, high quality, developmentally appropriate, baby books each month over a two to
three-month period – totaling eight books in all – from their visiting nurse. Comparison group mothers did not receive these books.

Table 1

_Pretest-Posttest Control Group Design_

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th>Intervention</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>R₁</td>
<td>O</td>
<td>X</td>
<td>O</td>
</tr>
<tr>
<td>R₂</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
</tbody>
</table>

_Note_. R₁ = Random assignment to Experimental Group; R₂ = Random assignment to Control Group.

A pretest was used to determine if there were pre-existing differences between groups as well as to measure baseline scores on attitudes toward shared book reading and family reading practices.

**Research Hypotheses**

The following research questions are presented along with their corresponding null and alternative hypotheses.

Research Question 1: Does a book provision intervention with women participating in the Nurse-Family Partnership affect shared book reading patterns as measured by pretest/posttest StimQ₂ Infant (Revised) READ composite scores?

Research Question 1_a: Is there a statistically significant main effect of time (as measured by pretest-posttest scores) on participant StimQ₂ Infant (Revised) READ composite score?

\[ H₀ = \text{There is no statistically significant effect for time on the measure of StimQ₂ Infant Revised READ composite score.} \]
H₁ = There is a statistically significant effect for time on the measure of StimQ₂ Infant Revised READ composite score.

Research Question 1b: Is there a statistically significant main effect of group (treatment or comparison group) on participant StimQ₂ Infant (Revised) READ composite score?

H₀ = There is no statistically significant main effect for group (book and no-book) on the measure of StimQ₂ Infant Revised READ composite score.

H₁ = There is a statistically significant main effect for group (book and non-book) on the measure of StimQ₂ Infant Revised READ composite score.

Research Question 1c: Is there a statistically significant interaction effect between time and group on participant StimQ₂ Infant (Revised) READ composite score?

H₀ = There is no statistically significant interaction effect between time and group on the measure of StimQ₂ Infant Revised READ composite score.

H₁ = There is a statistically significant interaction effect between time and group on the measure of StimQ₂ Infant Revised READ composite score.

Research Question 2: Does the presence of a book provision intervention with women participating in the Nurse-Family Partnership predict posttest Child Centered Literacy Orientation scores?

H₀ = Pretest Child Centered Literacy Orientation score and group (book and no book) do not predict Posttest Child Centered Literacy Orientation score.

H₁ = Pretest Child Centered Literacy Orientation score and group (book and no book) do predict Posttest Child Centered Literacy Orientation score.
Participants

Participants in this study were 25, low-income, first-time mothers, aged 18-25 with infants, newborn to 12 months at recruitment (13 male, 12 female, $M = 6.7$ months of age). All mothers were enrolled in the Nurse-Family Partnership, nurse visiting program, at one of three Nurse-Family Partnership agencies within Washington State. Participants at the three implementing agencies spoke either Spanish or English. Demographic characteristics of the mothers in the sample are shown in Table 2. Child demographics are shown in Table 3.

Table 2

<table>
<thead>
<tr>
<th>Demographic Characteristics of Mother</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother’s Highest Level of Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GED</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>11th grade</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>12th Grade</td>
<td>11</td>
<td>44</td>
</tr>
<tr>
<td>Some College</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>AA or 2-year degree</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BA+</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td><strong>Languages Spoken at Home</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>17</td>
<td>68</td>
</tr>
<tr>
<td>Spanish only</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Spanish and English</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Zula and English</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>French, Bambara, English</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>Ethnicity of Mother</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Latina</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>White</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Native American</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Mixed Heritage</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Biracial</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>
Table 3

Demographic Characteristics of Child

<table>
<thead>
<tr>
<th>Child’s Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn to three months old</td>
<td>7</td>
<td>28</td>
</tr>
<tr>
<td>Three months to six months</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Six months to nine months</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Nine months to 12 months old</td>
<td>9</td>
<td>36</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Child’s Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>13</td>
<td>52.0</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>48.0</td>
</tr>
</tbody>
</table>

The Nurse-Family Partnership organization. The Nurse-Family Partnership was founded by David Olds in 1977 in Elmira, New York. It holds as one of its primary goals improving the health and development of children at risk of abuse and neglect. It initially had three goals: (a) to improve fetal outcomes by assisting low-income, high-risk mothers with diet, as well as alcohol and drug abstention, (b) to improve new mothers’ skills in nurturing, and (c) to assist new mothers with making healthier life choices. The program, now nationwide, has been shown to reduce child abuse, child neglect, and child injuries, decrease maternal smoking, and improve child cognitive outcomes, as well as decrease participants’ subsequent unplanned pregnancies (Nurse-Family Partnership, 2017).

Protection of participants. The study posed no risks to participants beyond those arising from routine life-events. Each participant’s visiting registered nurse (RN) gave her client an explanation of the study and its procedures upon the client’s recruitment to
the study. Those participants who expressed interest to their RN signed a consent form. Consent forms were collected by the researcher once or twice a week. At the receipt of each participant’s consent form, the researcher assigned a study ID code, created by Google random number generator, and assigned participants to the intervention and comparison group in alternating order.

All data were stored in a locked and secure location. During the survey, participants were informed that they may choose not to answer any question they wish to skip and that they may discontinue the study at any time. Further, the researcher collected only the information necessary to achieve the study’s objective, and questions did not include personally identifying information. All participants received a ten-dollar gift card to Walmart, Amazon, Target, or Fred Meyer, depending on their choice, after the completion of their posttest. Comparison group participants received their gift card with their eight books after the completion of their posttest.

**Selection and assignment of participants.** Within this sample, random assignment to treatment or comparison group was implemented based on the order of a participant’s recruitment. Since recruitment was staggered and distributed over a 5-month period, from late July 2017 until early January 2018, the researcher received consent forms, a few at a time, from each site. Participant number 1 was placed into the intervention group, participant number 2 was placed into the comparison group, and so on. This assignment strategy ensured that each nurse had an equal chance of having intervention group participants and comparison group participants on her caseload.
**Instrumentation**

Two instruments were used: The StimQ2 Infant Revised Questionnaire (Mendelsohn, Cates, Johnson, Weisleder, & Dreyer, 2016) and Robert Needlman’s three-question survey to assess Child Centered Literacy Orientation (Needlman et al., 1991). The StimQ2 Infant Questionnaire utilizes a 43-point scale that measures cognitive stimulation in the home environment. The questionnaire is designed to be administered to the primary caregiver in families of infants aged five months to 12 months. Although the researcher had caregivers with children under five months of age, she continued to use the StimQ2 Infant Revised, since the three READ subscale sections were the only sections that were scored. The StimQ2 focuses on only those activities that the primary caregiver does with the infant and explicitly asks her to answer for herself only (NYU Medical Center, 2001).

The StimQ2 Infant Revised consists of four subscales: (a) READ Subscale, (b) Parental Involvement in Developmental Advance (PIDA) subscale, (c) Availability of Learning Materials (ALM) subscale, and (d) Parental Verbal Responsivity (PVR) subscale. The StimQ is a measure of the cognitive home environment and is based on the Home Observation for Measurement of the Environment (HOME) (Caldwell & Bradley, 1984), an inventory which requires clinicians to do home observations. The HOME has been found to be highly correlated with child cognitive outcomes. The StimQ2 Infant Revised questionnaire has been validated for use in low SES populations in both English and Spanish. The StimQ2 questionnaire has good test-retest reliability, good internal consistency, as well as predictive validity (Dreyer, Mendelsohn, & Tamis-LeMonda, 1996).
There are three sections of the StimQ Infant Revised READ subscale: Quantity of Reading, Diversity of Reading Materials, and Quality of Reading. The Quantity subscale section asks respondents if they read baby or children’s books to their infant. If the respondent says yes, the interviewer asks the respondent to name some books that the respondent has at home and reads to her baby. Three questions then follow to assess how many days a week the respondent reads baby books to the child and what time of day or evening this happens.

The Diversity subscale section contains six questions that ask respondents if they read infant books to their infant that teach about the following: shapes, things around the home, toys and favorite items, animals, pictures of babies, and rhyming words.

The Quality subscale section asks respondents four questions that assess the respondent’s behavior during reading sessions. For example, “While you read to your child, do you point to the pictures and name them or describe them?” “Do you ask your child questions about the pictures in books and try to have a conversation? For example, ‘What is that called?’ or ‘What color is this?’”

The last part of the survey consisted of Robert Needlman’s three open-ended questions to assess Child Centered Literacy Orientation.

The idea of Child Centered Literacy Orientation was formulated by Robert Needlman et al. (1991) when researchers measured a family’s literacy orientation with two questions. The first question asked whether the family had looked at a book with their child in the last 24 hours, and the second question asked if shared book reading was one their child’s three favorite things to do. Later in 1998, High and her colleagues (High et al., 1998) used another variation of this set of questions for their measure of Child
Centered Literacy Orientation by asking parents the questions: (a) What are your three favorite activities to do with your child? (b) What are your child’s three favorite activities? And, (c) How many nights each week do you share books with your child to prepare your child for sleep? More recently, researchers have replaced the third question with one that is designed to measure a parent’s acknowledgment of the importance of reading: “Some people think it is important to do things with their children to prepare them for learning in school. Are there any special things that you do with your child to help prepare your child for school? If yes, what are the three most important things you do?”

The variations of this measure have been used in numerous studies of Reach Out and Read interventions (Diener et al., 2012; Diener et al., 2003; High et al., 1998; High, et al., 2000; Kumar et al., 2015; Needlman et al., 1991; Needlman et al., 2005; Sanders et al., 2000; Weitzman et al., 2004). Both CCLO and its former conceptualizations (including “Home Literacy Orientation,” or “Literacy Orientation”) have been documented as a dichotomous score that was recorded as either present or absent.

The CCLO measure that the investigator used for the study utilized the following questions:

1. What are your child’s three favorite things to do, besides eating and sleeping?
2. What are your three favorite things to do with your child?
3. Some people think it is important to do things with their children to prepare them for learning in school. Are there any special things that you do with your child to help prepare your child for school? If yes, what are the three most important things you do?
Procedure

Recruitment procedure. Between late July 2017 and early January 2018, with the help of participating RNs, the researcher recruited 35 families with children zero to 12 months of age who were clients of one of three Nurse-Family Partnership agencies within Washington State. During recruitment, eligible clients were approached by their visiting RN, and asked if they were interested in participating in the research study about “activities parents do with their young children.” The study’s specific focus on literacy was not disclosed. Families were eligible to be recruited into the study if their child was between 0-12 months at the time of recruitment. Some of the recruited women had another month of pregnancy to finish, so their baseline interviews were delayed until at least two weeks after their babies were born. The ten nurses from the three participating sites were sufficiently oriented to the study design.

Upon consent, participants were randomized into the intervention or comparison group based on when the investigator received their consent form; even numbers were assigned to the comparison group and odd numbers were assigned to the intervention group. Participants were de-identified using a Google random number generator which generated a four-digit identification number between 0 and 5,000.

Survey procedure. During the phone interview, the participant’s assigned group (intervention or comparison) was unknown to the interviewer. To disguise the study’s true focus on home literacy attitudes and practices, the interviewer began each interview by stating, “This questionnaire is designed to find out about the various kinds of activities you do with your child and how those activities change as your child ages and grows.” The interview included five demographic questions (race/ethnicity, highest level of
education, language(s) spoken at home, and age and gender of the child) followed by questions taken from the StimQ Infant (Revised) PIDA subscale, READ subscale, PVR subscale, and Robert Needlman's three open-ended questions, in that order. Open-ended questions did not mention books, so the respondent was not prompted to talk about books or answer in a way she thought might be desired by the interviewer.

The three sections of the READ Subscale and Needlman’s three open-ended questions were the only sections scored. The researcher structured the interviews to both begin and end with non-literacy questions so that participants would come away from the interview remembering those questions the most. This structure better assured the second interview would not be vulnerable to the testing effect (i.e., participants becoming test-wise). Also, because the questionnaire was stated to be about “activities parents do with their young children and how those activities change as the child ages and grows,” participants should not have felt compelled to answer in specific ways to the questions that concerned book sharing. Non-literacy related questions included questions about parental involvement in developmental advance (for example, “Do you teach your child to press buttons or turn knobs, or has the baby learned to do this on her/his own?”), and parental verbal responsivity (for example, “Some parents talk to their infants about their surroundings and what is happening around them. Have you started to talk to your baby in this way?”). Because of the structure of the interview, and because the book provision was not perceived as connected to the researcher, it was hoped that the participants would not succumb to social desirability response bias.

**Intervention procedure.** After each treatment group participant’s baseline interview, treatment group participants received eight books total during a two to three-
month period. These books were given to participants by their RN and were perceived as coming from the Nurse-Family Partnership organization. Books were given at varying intervals by the RN depending on the visiting schedule but approximated four per month. The first four books included *The Very Hungry Caterpillar*, *Goodnight Moon*, *Brown Bear Brown Bear*, and *Global Babies* in Spanish or English language versions depending on the language spoken at home. Month two books included *How Kind, I like it When*, *Baby Animals Black and White*, and *Smile*, or Spanish alternatives since not all titles have Spanish language versions. All titles were chosen from the Reach Out and Read approved list for developmentally appropriate books. All books provided are simply written and contain culturally diverse illustrations. Substitutions were made if the investigator learned (during the interview) that the participant already had one or more of the titles provided.

Books were placed in two-gallon sized zip-lock bags with the client’s name on the front. Included in the first bag was a colorful, laminated handout from Reading Rockets entitled “Tips for Parents with Babies” which encourages reading from birth and gives practical advice about how to instate reading into a baby’s daily routine. The informational sheet is written in English or Spanish at a seventh-grade reading level. For 12 weeks, treatment group participants received the intervention while the comparison group did not receive the intervention.

Approximately 2-3 months after each participant’s baseline interview, study participants were re-interviewed with the same two measures. For treatment group participants, the researcher did not re-survey until confirmation was received from the RN that the treatment participant had received all of her books.
Data Analysis

Of the 35 participants who were recruited from late July 2017 to early January 2018, eight participants left the study before their posttest data could be collected (six from the comparison group; two from the treatment group). This attrition rate is not unusual for this population, as many clients of the Nurse-Family Partnership end their participation with the agency when their life situations change. Life situations changed for a few of the participants, according to the nurses, and other participants simply changed their minds or did not give reasons for leaving the study. In addition to those eight participants who left the study, the data from two treatment group participants who completed the study were removed after it was discovered that their month two books had never been provided to them by their nurse-partner.

This left an analytic sample of 25 participants with infants between the ages of two weeks and 12 months (13 male, $M = 6.7$ months, $SD = 4.1$, range = .5-12). Of this sample, 13 were assigned to the intervention group (six male, $M = 7.7$ months, $SD = 1.1$, range = 1-12 months) and 12 remained from the comparison group (seven male, $M = 5.5$ months, $SD = 1.0$, range = 1-12 months).

Because in an experimental design the only difference between the treatment group and the comparison group is the group status, demographic characteristics should be balanced between groups. An imbalance may lead to a bias in treatment effect. The investigator randomized assignment within each of the three sites. Although child gender was balanced between groups, the comparison group children were slightly younger on average than the treatment group children. The educational level of the treatment group
was also slightly higher than that of the comparison group, but both groups averaged 12 years of education (a twelfth-grade level).

The data were analyzed using SPSS version 25. For the continuous data (StimQ Infant READ composite pretest and posttest scores), a mixed factorial analysis of variance was conducted using time as the within-participant variable and group as the between-participant variable. Descriptive data were analyzed to ensure that parametric procedures were appropriate. Assumptions for the mixed factorial ANOVA include the general assumptions of ANOVA: (a) the dependent variable is continuous scale variable, (b) observations are independent, (c) the dependent variable is normally distributed, and (d) the variability of scores shows homogeneity (Field, 2013). The additional assumption for the mixed factorial ANOVA is that the data possess homogeneity of intercorrelation, i.e., the pattern of intercorrelations among the levels of the within-subject variable (time) should be the same. (This is the Box’s Statistic from the ANOVA output.) Normality was assessed by histogram and both Kolmogorov-Smirnov and Shapiro-Wilk tests of normality as shown in Table 4. Homogeneity of variance was assessed through scatterplots and Levene’s test for equality of variance as shown in Table 5.

Table 4

<table>
<thead>
<tr>
<th>Tests of Normality</th>
<th>Kolmogorov-Smirnov</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>df</td>
</tr>
<tr>
<td>Time 1 Composite READ score</td>
<td>.167</td>
<td>25</td>
</tr>
<tr>
<td>Time 2 Composite READ Score</td>
<td>.173</td>
<td>25</td>
</tr>
</tbody>
</table>
Table 5

Levene’s Test of Equality of Error Variances

<table>
<thead>
<tr>
<th></th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1 Composite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reading score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on Mean</td>
<td>.526</td>
<td>1</td>
<td>23</td>
<td>.476</td>
</tr>
<tr>
<td>Based on Median</td>
<td>.469</td>
<td>1</td>
<td>23</td>
<td>.500</td>
</tr>
<tr>
<td>Based on Median and</td>
<td>.469</td>
<td>1</td>
<td>22.863</td>
<td>.500</td>
</tr>
<tr>
<td>with adjusted df</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on trimmed mean</td>
<td>.544</td>
<td>1</td>
<td>23</td>
<td>.468</td>
</tr>
<tr>
<td>Time 2 Composite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on Mean</td>
<td>2.204</td>
<td>1</td>
<td>23</td>
<td>.151</td>
</tr>
<tr>
<td>Based on Median</td>
<td>1.954</td>
<td>1</td>
<td>23</td>
<td>.175</td>
</tr>
<tr>
<td>Based on Median and</td>
<td>1.954</td>
<td>1</td>
<td>22.905</td>
<td>.176</td>
</tr>
<tr>
<td>with adjusted df</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on trimmed mean</td>
<td>2.224</td>
<td>1</td>
<td>23</td>
<td>.149</td>
</tr>
</tbody>
</table>

In past studies (High et al., 1998; High et al., 2000), Needlman’s three open-ended questions have been entered as a composite dichotomous score for Child Centered Literacy Orientation (CCLO). CCLO is evident if the answer to one or more of the three open-ended questions is positive. For questions 1, 2, and 3, participant responses are positive if the respondent mentions “books” or “reading.” If the participant does not answer any of these three positively, the CCLO is not evident. Other literacy practices such as teaching the alphabet, singing alphabet songs, or teaching reading skills do not qualify as positive for CCLO.

For categorical data on Child Centered Literacy Orientation, a binary logistic regression was run. The results of these statistical tests are found in Chapter 4.
Chapter Four: Results

Overview

In this chapter, the results of the statistical analyses are presented for each of the research questions. Descriptive statistics are presented including measures of central tendency and tests of assumptions. Descriptive statistics are presented in Table 6, Table 7, and Table 8, as well as Figure 1. After this, the inferential statistical analyses are presented along with their significance for each of the questions posed.

Research Questions

The first research question that was investigated was: Does a book provision intervention with women participating in the Nurse-Family Partnership affect shared book reading patterns as measured by pretest/posttest StimQ2 Infant (Revised) READ composite scores? This question was addressed by using a mixed factorial analysis of variance with time as the within-participant variable and group as the between-participant variable. Significance was analyzed at a .05 alpha level.

The second question to be explored was: Does the presence of a book provision intervention with women participating in the Nurse-Family Partnership predict positive Child Centered Literacy Orientation as measured by Needlman’s three-question measure of CCLO? This research question was tested with a binary logistic regression to determine if the variables pretest CCLO and group assignment could predict posttest CCLO.

Descriptive Statistics

Before the inferential statistical analysis was conducted, continuous and categorical data were screened for errors, missing values, and outliers. There were no
missing values or errors. The researcher’s check for normality revealed that her participants’ pretest StimQ2 Infant (Revised) READ composite scores ($M = 9.64, SD = 5.4$) had a skewness and kurtosis value of less than one and were therefore reasonably normally distributed.

The participants’ posttest StimQ2 Infant (Revised) READ composite scores ($M = 12.08, SD = 4.2$) had a negative skewness value of 1.3 (see Table 6). This means that posttest scores from the sample tended to cluster at the high end of the graph, although they did not suggest a ceiling effect. The mode presented for the posttest was 15, yet the highest score that a participant could receive was 19. No participant scored a 19, and only one participant scored an 18.

The participants’ posttest StimQ2 Infant (Revised) READ composite scores also yielded a positive kurtosis value of 1.5 indicating that there may have been infrequent but extreme score deviations. Although the boxplot (Figure 1) indicated outliers, the trimmed mean and mean score (see Table 7) were similar, meaning that the extreme scores were not inappropriately influential. Also, because the scores were valid scores and not mistakes, it was decided to retain them. Although the Shapiro-Wilk test was significant, Kolmogorov-Smirnov indicated that neither pretest scores, nor posttest scores, violated the assumption of normality (Table 8). Further, ANOVA is robust to violations of normality when group sizes are equal (Field, 2013, p. 444). From the Levene’s test of equality (Table 9), the significance level was greater than .05 (nonsignificant) for both Levene’s test values and therefore the assumption of homogeneity of error variances had not been violated.
Table 6

*Descriptive Statistics for Time 1 and Time 2*

<table>
<thead>
<tr>
<th>StimQ READ Composite Score</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Minimum</td>
<td>Maximum</td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>Skewness</td>
</tr>
<tr>
<td>Composite READ Pretest score</td>
<td>25</td>
<td>0</td>
<td>17</td>
<td>9.64</td>
<td>5.407</td>
<td>-.638</td>
</tr>
<tr>
<td>Composite READ Posttest score</td>
<td>25</td>
<td>0</td>
<td>18</td>
<td>12.08</td>
<td>4.271</td>
<td>-1.336</td>
</tr>
</tbody>
</table>

*Figure 1.* Box plot of composite READ posttest score.
Table 7

*Means and 5% Trimmed Means*

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Pretest Composite READ score</th>
<th>Posttest Composite READ score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>9.64</td>
<td>12.08</td>
</tr>
<tr>
<td>Std. Error</td>
<td>1.081</td>
<td>.854</td>
</tr>
<tr>
<td>95% Confidence Interval for Mean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Bound</td>
<td>7.41</td>
<td>10.32</td>
</tr>
<tr>
<td>Upper Bound</td>
<td>11.87</td>
<td>13.84</td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>9.77</td>
<td>12.40</td>
</tr>
</tbody>
</table>

Table 8

*Tests of Normality*

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Kolmogorov-Smirnov</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistic</td>
<td>df</td>
<td>Sig.</td>
</tr>
<tr>
<td>Time 1 Composite READ score</td>
<td>.167</td>
<td>25</td>
</tr>
<tr>
<td>Time 2 Composite READ Score</td>
<td>.173</td>
<td>25</td>
</tr>
</tbody>
</table>
Table 9

*Levene’s Test of Equality of Error Variances*

<table>
<thead>
<tr>
<th></th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time 1 Composite reading score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on Mean</td>
<td>.526</td>
<td>1</td>
<td>23</td>
<td>.476</td>
</tr>
<tr>
<td>Based on Median</td>
<td>.469</td>
<td>1</td>
<td>23</td>
<td>.500</td>
</tr>
<tr>
<td>Based on Median and with adjusted df</td>
<td>.469</td>
<td>1</td>
<td>22.863</td>
<td>.500</td>
</tr>
<tr>
<td>Based on trimmed mean</td>
<td>.544</td>
<td>1</td>
<td>23</td>
<td>.468</td>
</tr>
<tr>
<td><strong>Time 2 Composite Score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on Mean</td>
<td>2.204</td>
<td>1</td>
<td>23</td>
<td>.151</td>
</tr>
<tr>
<td>Based on Median</td>
<td>1.954</td>
<td>1</td>
<td>23</td>
<td>.175</td>
</tr>
<tr>
<td>Based on Median and with adjusted df</td>
<td>1.954</td>
<td>1</td>
<td>22.905</td>
<td>.176</td>
</tr>
<tr>
<td>Based on trimmed mean</td>
<td>2.224</td>
<td>1</td>
<td>23</td>
<td>.149</td>
</tr>
</tbody>
</table>

**Inferential Statistics**

**Research question one.** A Box’s test of equality of covariance matrices (see Table 10) was conducted showing a significance value greater than .001 \((p = .431)\), which means that the covariance was equal across groups.

Table 10

*Box’s Test of Equality of Covariance Matrices*

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Box’s M</td>
<td>3.040</td>
</tr>
<tr>
<td>(F)</td>
<td>.918</td>
</tr>
<tr>
<td>(df1)</td>
<td>3</td>
</tr>
<tr>
<td>(df2)</td>
<td>124907.102</td>
</tr>
<tr>
<td>Sig.</td>
<td>.431</td>
</tr>
</tbody>
</table>
Results. A mixed factorial analysis of variance with time as the within-participant variable and group as the between-participant variable was conducted to investigate whether a book provision intervention with women participating in the Nurse-Family Partnership had an effect on shared book reading patterns as measured by pretest/posttest StimQ2 Infant (Revised) READ composite scores. There was no significant interaction effect between group and time, Wilks’ lambda = .985, $F(1, 23) = .340, p = .565$, partial eta squared = .015. There was no main effect for time, Wilks’ lambda = .865, $F(1, 23) = 3.5, p = .071$, partial eta squared = .135 (see Table 11). And there was no main effect for group, $F(1, 23) = 1.2, p = .27$, partial eta squared .051 (see Table 12). The investigator did not reject the null hypothesis. In other words, a book provision intervention had no significant effect on shared book reading patterns with women participating in the Nurse-Family Partnership.

Table 11

Multivariate Tests$^a$

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>$F$</th>
<th>Hypothesis $df$</th>
<th>Error $df$</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai’s Trace</td>
<td>.135</td>
<td>3.577$^b$</td>
<td>1.000</td>
<td>23.000</td>
<td>.071</td>
<td>.135</td>
</tr>
<tr>
<td>Wilks’ Lambda</td>
<td>.865</td>
<td>3.577$^b$</td>
<td>1.000</td>
<td>23.000</td>
<td>.071</td>
<td>.135</td>
</tr>
<tr>
<td>Hotelling’s Trace</td>
<td>.156</td>
<td>3.577$^b$</td>
<td>1.000</td>
<td>23.000</td>
<td>.071</td>
<td>.135</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
<td>.156</td>
<td>3.577$^b$</td>
<td>1.000</td>
<td>23.000</td>
<td>.071</td>
<td>.135</td>
</tr>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai’s Trace</td>
<td>.015</td>
<td>.340$^b$</td>
<td>1.000</td>
<td>23.000</td>
<td>.565</td>
<td>.015</td>
</tr>
<tr>
<td>Wilks’ Lambda</td>
<td>.985</td>
<td>.340$^b$</td>
<td>1.000</td>
<td>23.000</td>
<td>.565</td>
<td>.015</td>
</tr>
<tr>
<td>Hotelling’s Trace</td>
<td>.015</td>
<td>.340$^b$</td>
<td>1.000</td>
<td>23.000</td>
<td>.565</td>
<td>.015</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
<td>.015</td>
<td>.340$^b$</td>
<td>1.000</td>
<td>23.000</td>
<td>.565</td>
<td>.015</td>
</tr>
</tbody>
</table>
Table 12

Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5851.735</td>
<td>1</td>
<td>5851.735</td>
<td>212.829</td>
<td>.000</td>
<td>.902</td>
</tr>
<tr>
<td>Group</td>
<td>34.135</td>
<td>1</td>
<td>34.135</td>
<td>1.242</td>
<td>.277</td>
<td>.051</td>
</tr>
<tr>
<td>Error</td>
<td>632.385</td>
<td>23</td>
<td>27.495</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Research question two.** To test the question, “Does the presence of a book provision intervention with women participating in the Nurse-Family Partnership predict posttest Child Centered Literacy Orientation scores?” a binary logistic regression was run. The goodness of fit test showed a significant value of .013. The chi square value was 8.71 with two degrees of freedom (see Table 13). The Hosmer and Lemeshow test was non-significant at .59 indicating support for the model (see Table 14). The Model Summary Table (see Table 15) showed the Cox & Snell R Square and the Nagelkerke R Square, which indicated variation accounted for by the model. The values of .294 and .394 indicated that between 29.4 and 39.4 percent of the variability was explained by the variables pretest CCLO and group assignment. The Classification Table (see Table 16) indicated how well the model predicted the correct outcome (positive CCLO or negative CCLO) for each case. The model accurately classified 72% of cases. Specifically, the model correctly classified 85.7% of the participants who scored positively on CCLO.
Table 13

**Omnibus Tests of Model Coefficients**

<table>
<thead>
<tr>
<th></th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>8.710</td>
<td>2</td>
<td>.013</td>
</tr>
<tr>
<td>Block</td>
<td>8.710</td>
<td>2</td>
<td>.013</td>
</tr>
<tr>
<td>Model</td>
<td>8.710</td>
<td>2</td>
<td>.013</td>
</tr>
</tbody>
</table>

Table 14

**Hosmer and Lemeshow Test**

<table>
<thead>
<tr>
<th></th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.040</td>
<td>2</td>
<td>.594</td>
</tr>
</tbody>
</table>

Table 15

**Model Summary**

<table>
<thead>
<tr>
<th></th>
<th>-2 Log</th>
<th>Cox &amp; Snell R Square</th>
<th>Nagelkerke R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>25.586a</td>
<td>.294</td>
<td>.394</td>
</tr>
</tbody>
</table>

*a*Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.
Table 16

Classification Table

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 2 CCLO as yes/no</td>
<td>Negative Child Centered Literacy Orientation</td>
<td>6</td>
</tr>
<tr>
<td>Step 1</td>
<td>Positive Child Centered Literacy Orientation</td>
<td>2</td>
</tr>
</tbody>
</table>

Overall Percentage 72.0

*Note.* The cut value is .500.

Table 17

Variables in the Equation

<table>
<thead>
<tr>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95% C.I. for EXP(B)</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Time 1 CCLO yes/no(1)</td>
<td>1.911</td>
<td>1.069</td>
<td>3.199</td>
<td>1</td>
<td>.074</td>
<td>6.761</td>
<td>.833</td>
</tr>
<tr>
<td></td>
<td>Treatment or Comparison(1)</td>
<td>2.004</td>
<td>1.001</td>
<td>4.003</td>
<td>1</td>
<td>.045</td>
<td>7.417</td>
<td>1.042</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>.819</td>
<td>3.080</td>
<td>1</td>
<td>.079</td>
<td>.237</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Variable(s) entered on step 1: Time 1 CCLO yes/no, Treatment or Comparison.*

The Wald test (see Table 17) revealed that only one variable in this model (group assignment) contributed significantly to the predictive ability of the model (treatment or comparison, *p* = .045). The B value for this variable was positive, indicating the direction of the relationship. In this case, the presence of the book provision treatment increased the likelihood of a positive CCLO response. The Exp (B) column showed the odds ratio for each of the independent variables. The number represents the change in the odds of
being in one of the categories of outcome when the value of the predictor increases by one unit. In this case, with a dichotomous variable, the odds of a person reporting a positive CCLO was 7.4 times higher for someone who was in the treatment than for someone who was not in the treatment with all other factors being equal.

**Results.** A binary logistic regression was conducted to evaluate the effect of pretest Child Centered Literacy Orientation scores and group assignment on the likelihood that participants would score positively on the Child Centered Literacy Orientation posttest. This model consisted of two independent variables (pretest CCLO and group assignment). This model was statistically significant, $\chi^2 (2, N = 25) = 8.7, p < .05$, suggesting that this model can differentiate between participants with positive CCLO and participants with negative CCLO. The full model explained 29.4 and 39.4 percent of the variability in posttest CCLO scores (Cox and Snell R Square, Nagelkerke R Square, respectively) and correctly classified 72% of the cases. Only group assignment made a unique statistically significant contribution to the model, recording an odds ratio of 7.4, and suggesting the odds of a person reporting a positive CCLO was 7.4 times higher for someone who was in the treatment than for someone who was not in the treatment with all other factors being equal.

**Summary of Results**

A mixed factorial analysis of variance with time as the within-participant variable and group as the between-participant variable was conducted to answer the question: Does a book provision intervention with women participating in the Nurse-Family Partnership have an effect on shared book reading patterns as measured by pretest/posttest StimQ2 Infant (Revised) READ composite scores? The test showed that
there were no significant main effects for time and group, nor was there an interaction effect. Therefore, the researcher did not reject the null hypothesis.

A binary logistic regression was conducted to answer the second research question: Does the presence of a book provision intervention with women participating in the Nurse-Family Partnership predict participants’ posttest CCLO scores? There was a statistically significant finding from this test indicating that the presence of the book provision intervention did predict positive CCLO. Specifically, intervention participants who received the book provision intervention were more likely to score positively on the posttest CCLO measure. Therefore, for this question, the researcher can reject the null hypothesis.

The next chapter will summarize the intent of the study, the methods used, and the significance of the research findings. Limitations of this research along with suggestions for future research will be explored.
Chapter Five
Discussion

Overview

The purpose of this study was to determine the effect of book provision on family shared reading patterns and families’ attitudes toward shared book reading with their child. The researcher hoped to find out whether providing high-quality baby books to low-income, first-time mothers participating in the Nurse-Family Partnership would lead to more frequent, and higher quality, shared book reading as measured by the StimQ2 Infant (Revised) READ composite scores. The researcher also hoped to determine if book provision would improve a participant’s attitude toward shared book reading, as measured by Needlman’s three-question measure of Child Centered Literacy Orientation.

Study Rationale

This study is important because children from low SES backgrounds are over-represented in groups who experience reading difficulties very early on (Fahey & Forman, 2012). These early difficulties may lead to low literacy, low educational attainment (Hernandez, 2012), and negative life outcomes such as poor health, poverty, and incarceration (Sum, Khatiwada, & McLaughlin, 2009).

Supporting low SES groups by creating and perfecting programs that promote literacy behavior and may improve attitudes surrounding home literacy can help increase shared book reading, which when implemented early in a child’s life may improve his/her oral language development (Bus, van IJzendoorn, & Pellegrini, 1995; Frijters, Barron, & Brunello, 2000; Gottfried, Schlackman, Gottfried, & Boutin-Martinez, 2015; Larson, Russ, Nelson, Olson, & Halfon, 2015; Raikes et al., 2006; Sénéchal, 2006; Sénéchal et
al., 2008) and ultimately increase his/her reading proficiency once he/she enters primary school (Storch & Whitehurst, 2002; Whitehurst & Lonigan, 1998).

The number of children living in poverty is rising (Jiang, Granja, & Koball, 2018). This means that more children will be prone to SES-based disparities in cognitive ability and language which may arise before a child is one year old (Halle et al., 2009).

The participants in this study were 25 low-income, first-time mothers, aged 18-25 with infants, newborn to 12 months at recruitment, participating in three Nurse-Family Partnership agencies in Washington State. Women participating in the Nurse-Family Partnership are an especially vulnerable group as many of these women are still in their teen years and are raising children in environments of financial hardship.

Literacy interventions such as book provision have been found to be most effective with lower income families (Needlman et al., 1991); yet, there has been no systematic literacy intervention involving book provision with families participating in the Nurse-Family Partnership.

**Research Methodology**

For this study, a pretest-posttest control group design with random assignment was conducted. The independent variable was the presence or absence of the book provision intervention. The two dependent variables were the StimQ Infant (Revised) READ composite scores and participant scores on Needlman’s three-question measure of Child Centered Literacy Orientation.

**Discussion of the Results**

**Research question one.** The first research question was: Does a book provision intervention with women participating in the Nurse-Family Partnership have an effect on
shared book reading patterns as measured by pretest/posttest StimQ Infant (Revised) READ composite scores?

A mixed factorial analysis of variance with time as the within-participant variable and group as the between-participant variable was conducted. Statistical analysis showed that there was no main effect for group. In other words, a book provision intervention had no significant effect on shared book reading patterns with women participating in the Nurse-Family Partnership.

The results for this question diverged from the results of other book provision studies that used StimQ READ to measure shared book reading patterns. Mendelsohn et al. (2001), for example, found that book provision with a population of Latino and Black families was associated with a statistically significant increase in shared book reading as measured by the StimQ READ subscale. After an average of four books, this gain in family shared book reading amounted to one day more a week for the intervention families. A Pearson correlation was run to assess the relationship between literacy event dosage (specifically, how many literacy-promoting contacts the family had with the clinic) and home literacy activities. Researchers found a statistically significant yet small correlation of .20 (p = .03) between the number of literacy-promoting contacts reported by the families, and literacy-promoting home activities as measured by the StimQ READ subscale.

In the book provision study by Sharif et al. (2002), analysis of StimQ READ scores revealed a statistically significant difference between the percentage of intervention and control group families who reported never having read to the child (this was 15% for non-Reach Out and Read clinic parents versus 5% for the Reach Out and
Read clinic parents) \( p < .05 \), but no significant difference for days per week of shared book reading or composite StimQ READ scores.

On the other hand, in Needlman et al.’s (2005) study of Reach Out and Read, the intervention averaged a higher number of days of shared book reading \( 4.7 \pm 2.3 \) than did the comparison group \( 4.4 \pm 2.5 \) \( p < .01 \). Families exposed to the Reach Out and Read intervention reported increased literacy-related practices, including shared book reading more than three days a week (odds ratio [OR] 1.4, 95% confidence interval [CI] 1.2-1.9).

**Research question two.** The second research question was: Does the presence of a book provision intervention with women participating in the Nurse-Family Partnership predict attitudes about shared book reading as assessed by Needlman’s three-question measure of Child Centered Literacy Orientation? For this, the researcher sought to determine if the variables Child Centered Literacy Orientation pretest score and group assignment (book provision or no book provision) could predict CCLO posttest scores. A binary logistic regression was run to assess the effect of pretest Child Centered Literacy Orientation scores and group assignment on the likelihood that participants would score positively on the Child Centered Literacy Orientation posttest. This model was statistically significant and accurately classified 72% of the cases. Group assignment made a unique statistically significant contribution to the model, recording an odds ratio of 7.4, suggesting the odds of a person reporting a positive CCLO was 7.4 times higher for someone who was in the treatment group than for someone who was not in the treatment group with all other factors being equal.
This finding concerning book provision and its effect on CCLO supports other book provision studies that found an association between the presence of book provision and improvements in the attitudes of families surrounding literacy. In High et al. (1998), researchers found significant positive effects on CCLO after receiving books and pediatrician guidance around home literacy. Specifically, 69% percent of the intervention clinic group scored positive on CCLO, whereas only 33% of the non-intervention clinic group scored positively on that measure.

The randomized trial by High et al. (2000) investigating book provision found a 40% increase in positive CCLO responses among treatment group participants, as compared to a 16% increase among participants of the comparison group. There was a statistically significant increase in parents who mentioned books as one of their child’s three favorite things to do, and who cited books or shared reading with their child as one of their own three favorite things to do ($p = .02$ and $p = .003$, respectively).

Similarly, Sharif et al. (2002) found that families who were exposed to the book provision program were significantly more likely to report reading as one of their child’s three favorite activities (21% versus 11%, $p = .05$).

Silverstein et al. (2002) found statistically significant increases in adult reports of reading as one of their child’s three favorite activities. Among their English-speaking cohort, this percentage went from 7% for the baseline group to 30% for the treatment group ($p = .02$). Needlman et al. (2005) found that the Reach Out and Read intervention was associated with greater parent reports of books as a top three favorite activity (OR 1.4, 95% CI, 1.2 - 1.8) and parental reports of reading aloud as contributing to academic success (OR 1.5, 95% CI, 1.2 - 1.8).
Numerous differences exist between the book provision study with the Nurse-Family Partnership and those prior studies that linked book provision to increased StimQ READ scores and positive CCLO. First, the sample size in prior studies was much larger. The smallest samples in the studies reviewed had at least 122 participants (Mendelsohn et al., 2001) with the other studies ranging from 151 to 200 participants (High et al., 1998; High et al., 2000; Sharif, Rieber, & Ozuah, 2002; Silverstein, Iverson, & Lozano, 2002). Needlman et al. (2005) had 1,647 participants in his national study. For the study with the Nurse-Family Partnership, recruitment was a formidable challenge. The researcher was only able to recruit a small number of participants, even after extending the recruitment phase through January. Of those 35 participants recruited, ten left the study.

The second difference between the present study and prior studies is the length of the intervention. This study’s intervention lasted three months during which time participants received eight books. Although some other book provision interventions provided as few as four books, all the participants in prior studies experienced the intervention for a longer timeframe than participants in this study. Prior studies’ interventions averaged a year in duration. The shortest – 10 months (High et al., 2000) to the longest – three years (Sharif et al., 2002).

Another critical difference between this study and prior studies rests with the assignment of participants. Aside from High et al. (2000), most book provision studies were implemented with pre-existing groups, were causal-comparative, or correlational, with no baseline measures (High et al., 1998; Mendelsohn et al., 2001; Needlman et al., 2005; Sharif et al., 2002; Silverstein et al., 2002). The researcher in the present study was
able, however, to randomly assign participants to intervention or comparison groups at recruitment. The researcher was also able to collect baseline data on all participants.

A final fundamental difference between this study and most prior studies concerns those who were responsible for delivering the books to the families. Most of the participating pediatricians in prior studies were trained in Reach Out and Read “Anticipatory Guidance” or similar practices. All physicians who work in Reach Out and Read clinics must undergo several hours of training, as well as yearly maintenance trainings. They have invested themselves in the intervention and they believe in its importance.

The nurses in the present study who delivered the book provision intervention at the Nurse-Family Partnership, however, did not have the same investment and may have had many more critical issues they needed to prioritize, involving the health and safety of the babies and mothers that they served. The nurses who work for the Nurse-Family Partnership have an extremely challenging task. For the young mothers in their care, these nurses serve as more than medical advisors. They serve as guidance counselors on issues of employment and education; they are mentors, advocates, social workers, and personal confidantes during times of crisis. Moreover, they do this job against a backdrop of chaotic households, frequent relocations, child custody issues, and protection orders.

**Study Limitations**

Aside from the limitations of sample size, intervention duration, and the particularly vulnerable characteristics of this sample, the study may have suffered from other constraints.
Construct validity. Issues of construct validity surface when a researcher’s instrument does not measure what he/she intends for it to measure (Gall, Borg, & Gall, 1996). The StimQ Infant measurement was designed in the 1970s, and despite its 2016 revision, still appears more geared toward families of an earlier generation. For instance, to get a maximum score on the Quantity subscale, a respondent must report reading to their child at bedtime at minimum five times per week. Many of the mothers interviewed for this study did very little bedtime reading. A respondent could read as frequently as seven times a week and still not get the maximum score on this section because the shared book reading took place during the day. Respondents also lost points on the questions: “Do you read nursery rhymes such as Mother Goose or other simple rhyming books to your child?” And, “Do you tell your child folktales or other made up stories without using a book?”

Although Needlman’s measure of CCLO is a good measure of family attitudes toward literacy, it measures two separate things: (a) a parent and child’s enjoyment of shared book reading (questions 1 and 2) and (b) a parent’s acknowledgment that reading is important for a child’s ultimate academic development (question 3). Further, the measure of CCLO may produce a score of 0, 1, 2, or 3, but utilization of CCLO as a dichotomous variable, as prior researchers have done, does not permit a researcher to establish distinctions between a higher level of positive CCLO (participants who score a three on the measure) and the lower level of positive CCLO (participants who score a one). According to the CCLO, a Child Centered Literacy Orientation is something one has, or does not have. The history of its use has not acknowledged that there may be distinct levels of CCLO, nor does recording it as a dichotomous variable recognize that a
participant may have gone from a score of one on the CCLO pretest to a score of three on the CCLO posttest.

**External validity.** If a study has external validity, its results should be generalizable to the larger population, in this case, the population of families involved in the Nurse-Family Partnership. Even with random assignment and pretesting, one threat to the external validity of the study is the voluntary nature of selection. The women who agreed to be in a study ostensibly about “activities parents do with their young children” may have been distinctively different from those women who declined to participate. Researchers have shown that study volunteers are characteristically different from the general population (Rosnow & Rosenthal, 1976).

**Hawthorne effect.** Another occurrence which may weaken external validity is the presence of the Hawthorne effect. The Hawthorne effect occurs when participants’ knowledge that they are in a study alters their behavior for the better. In the case of this study, participants did not know they were in a literacy intervention, but the fact that data were collected on them may have altered their behavior. Further, receiving regular gifts of baby books from their RN may have also altered the treatment participants’ behavior. Of interest is that six of the eight participants who left the study early were participants assigned to the comparison group. These participants were not receiving books or getting “special attention” through book provision from their nurse, while the others had been receiving monthly gifts.

**Interviewer (experimenter) effect.** An Interviewer effect is the effect of respondents misreporting their attitude or behavior in response to an in-person interview or phone-survey due to characteristics of the interviewer or due to the type or subject of
the questions asked. Some researchers have found interviewer variance to be lower with factual questions such as the yes/no questions like those on the StimQ (Collins & Butcher, 1983). However other researchers have found that yes/no questions are no less vulnerable to interviewer effects (Groves & Magilavy, 1986). Interviewer variance has also been found to be accentuated by questions that may be emotionally charged. This emotional aspect has been found especially with self-reports of behaviors (Anderson, Silver, & Abramson, 1988). Additionally, some studies have found when evaluating phone versus in-person interviewing, cooperation and response rate is higher with in-person interviews than with phone interviews (Herman, 1977). All these effects may have influenced the data collected.

**Internal Validity.** If a study has high internal validity, this means that the effect that is being measured (in this case changed CCLO scores and changes in the frequency of shared book reading parents did with their child) was the result of the book provision intervention and not the result of another variable.

**Testing effect.** A Testing effect is the product of participants becoming “test-wise.” Despite the reminders that the survey was about “activities people do with their young children,” it is possible that many of the study’s participants made the connection between the delivery of the books and the fact that they were in a study. This knowledge may have affected their answers to the literacy questions in either a positive or negative direction.

**Test question sensitization.** The StimQ Infant (Revised) READ instrument itself may have contributed to behavior change among both groups in that the questions were uniformly framed so that “yes” was always the more desirable option. In other words,
being asked, “When you read to your child do you point to pictures and name them or describe them” (Question 2, Book Reading Quality subscale section) for example, this may have nudge mothers from both groups into practicing this behavior more frequently with their child.

**History effect.** History effect refers to the effect that specific events that occur within the course of a research study may have on the study outcomes. Because the first interviews started in September, eighty percent of the posttests were administered between early December and the beginning of January, a busy time of the year for this group since it was the holiday season. The holiday season can be a time when family routines are extremely disrupted. For many of the participants in the study, extended family may have been in town; or alternatively, participant-families may have left town. Many families during the holidays are too busy to get shared book reading done. During December many of the participants in this study were on vacation and asked the researcher to wait until they returned home to conduct their second interview. Having been back only a day or so may have influenced how the questions around routine shared book reading were answered. Had the intervention spanned a larger timeframe these seasonal impacts would have been minimized.

**Attrition bias.** Attrition bias is a type of selection bias caused by the loss of specific participants. In this study, there was an overall attrition rate of 28.5%. This level of attrition is not unusual in the Nurse-Family Partnership population, and the characteristics of those participants who left the study are not expected to be much different from those who were asked to participate but declined in the first place. However, it is possible that differential attrition biased the results.
**Differential attrition.** Differential attrition can occur when a participant who consents to participate in a study is then knowingly assigned to a group they find less desirable. Seventy percent of those who discontinued this study were comparison group participants. In the case of this study, participants were not told which group they were in, and nurses were instructed not to disclose this information. Nevertheless, receiving books from their RNs may have contributed to the acquiescence of the treatment group. General attrition could have been combatted by offering a larger monetary incentive.

**Social desirability response bias.** Social desirability response bias is present when a respondent misreports her response to a question to appear more favorable to the interviewer. This bias is one of the limitations of using self-report measures for assessing shared book reading behaviors. In many shared book reading studies that found small correlations between shared book reading and language outcomes, shared book reading was measured by self-reports of reading frequency (Crane-Thoreson & Dale, 1992; Dunn & Dunn, 1981). Other researchers utilizing self-report measures have found varying results (Bus et al., 1995). Sénéchal et al. (1996) found that recognition checklists predicted child vocabulary better than parental self-reports of reading frequency. DeBaryshe (1995) in her study on beliefs around literacy and literacy behavior used self-reports of behavior. Although literacy beliefs predicted self-reports of behavior, neither predicted vocabulary scores. In other words, parents who believe that literacy is important may report more shared book reading than is happening. If the study’s participants had over-reported shared book reading frequency during the pre-intervention measure, it might have obscured any growth that occurred because of the intervention.
Future Research

Researchers should continue to search for ways to design, perfect, and deliver programs that promote literacy behavior and improve attitudes surrounding home literacy. For low SES parents of young children, and especially the vulnerable populations such as those served by the Nurse-Family Partnership, these programs are critical.

Future research on book provision interventions should focus on long-term, randomized controlled trials, with large sample sizes. Further, these interventions should start with parents of newborns and include an anticipatory guidance component. Ideally, studies involving clients of the Nurse-Family Partnership should originate from within the NFP organization and be conducted by researchers collaborating with the organization for at least one year. This way, nurses can be trained in anticipatory guidance and the researcher can control book provision and other organizational aspects of the study.

Most importantly, researchers should not lose hope when confronting only small improvements to behaviors and attitudes from literacy interventions, or when encountering no results at all. Like many other parenting practices, shared book reading behavior is passed down from one generation to the next. Sinclair, McCleery, Koepsell, Zuckerman, and Stevenson (2018) found that mothers who reported having been read to as a child were more likely to have baby books in their home and were more likely to have already begun reading with their baby at two weeks old. Mothers who had not been read to as a child, however, reported that shared reading was not a favorite activity and were more likely to be non-readers in general. For this reason, it remains imperative to
continue a patient but determined pursuit of more innovative and efficient methods to encourage those parents who are less likely to begin reading with their child to begin reading with their child from birth.
References


London, England: NFER.


Appendix A

IRB Approval Letter

May 19, 2017

Subject: IRB Approval – IRB # 161706014 (Exempt Review)

Dear Ms. Knutsen:

Your research project “A quasi-experimental design to study the effect of book provision on family shared reading patterns among women participating in the nurse family partnership” has been approved. This study was approved under exempt review as it meets the requirement of “no more than minimal risk” as stated in the SPU IRB User Guidelines (2012, p. 5).

Your approval is in effect until what time any methods of the study change substantively. If changes are made in your data collection methodology, you will need to renew your IRB application. Your study has been assigned IRB number 161706014.

To complete your documents please add the IRB # to your study’s written recruitment material and invitation to participate in the research project.

Best wishes in the completion of your research.

Sincerely,

[Signature]
John B. Bond, Ed.D.
SOE IRB Coordinator
Professor of Educational Leadership

Cc: Dr. Bill Nagy
Appendix B

Recruitment Letter

Engaging the culture, changing the world

Seattle Pacific
UNIVERSITY

RECRUITMENT LETTER
IRB# 161706014

Investigators:
Principal Investigator: Susan Knutsen (206) 819-1054 knutss@spu.edu
Faculty Sponsor: William Nagy wngaty@spu.edu

January 1, 2018

Dear NFP Participant,

My name is Susan Knutsen and I am a student from the education department at Seattle Pacific University. I am writing to invite you to participate in my research study about activities parents do with their child. You are eligible to be in this study because you are a participant in the Nurse Family Partnership. As a thank you for participating in this study, you will receive a $10.00 gift card to Walmart, Amazon, Target or Fred Meyer at the completion of the second phone survey of the study.

If you decide to participate in this study, you will be asked to participate in a 10 minute interview this Winter and another interview two months after the first interview. To preserve confidentiality of your information, all participant’s names will be de-identified with random numbers.

Please know that participating in my study is voluntary. You can choose to be in the study or not. If you choose to participate, you may skip any questions you do not want to answer. If you would like to participate in the study, please sign the attached consent form. If you have any questions about the study, please email or contact me at:

Susan Knutsen
206-819-1054
knutss@spu.edu

Thank you very much.

Sincerely,

Susan Knutsen

[Signature]

Copies to: Participant, Principal Investigator
Appendix C

Informed Consent

INFORMED CONSENT

Investigators:
Principal Investigator: Susan Knoten (304) 819-1054 knotten@spu.edu
Faculty Sponsor: William Nagy emsagp@spu.edu

PURPOSE
My name is Susan Knoten and I am a graduate student from the education department at Seattle Pacific University. I am writing to invite you to participate in my research study about activities parents do with their child. You are eligible to be in this study because you are a participant in the Nurse Family Partnership. The number of people that will be part of this research is 20-50.

PROCEDURES
If you decide to participate in this study, you will be asked to participate in a 10 minute interview this winter and another interview two months after the first. If you choose to participate, you may skip any questions you do not want to answer. To preserve confidentiality of your information, all participants’ names will be de-identified with random numbers.

BENEFITS
We do not anticipate direct benefits to you for participating in this study; however, by studying the activities parents do with their young child, knowledge can be gained that will help organizations that work with families better address the needs of families.

PARTICIPATION AND ALTERNATIVES TO PARTICIPATION
Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at anytime without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed. Likewise, the researcher may terminate your participation in the study at any time.

CONFIDENTIALITY
The information in the study records will be kept confidential. Data will be stored securely and will be made available only to persons conducting the study unless you specifically give permission in writing to do otherwise. No reference will be made in oral or written reports that could link you to the study.
SUBJECT RIGHTS
If you have questions at any time about the study or the procedures, you may contact the Principal Investigator, Susan Knutsen at knutsen@spu.edu and 206-819-1054. If you have questions about your rights as a participant, contact the SPU Institutional Review Board Chair at 206-281-2201 or irb@spu.edu.

CONSENT
Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in this research project and agree to participate in this study. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities.

I have read the above information and agree to participate in this study. I have received a copy of this form.

<table>
<thead>
<tr>
<th>Participant’s name (print)</th>
<th>Researcher’s name (print)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant’s signature</td>
<td>Researcher’s signature</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Date</td>
</tr>
</tbody>
</table>

Copies to: Participant  Principal Investigator

http://www.spu.edu/orgs/irb/
Appendix D

Baseline StimQ Abridged

StimQ- Infant Abridged version

De-identification number

Date: __/__/____

Interviewer: _______________

Caregiver interviewed:
Mother ___ Father ___ Other ___

Gender of child: M/F

Age of child __________

Note to interviewer: For every “Yes” answer, ask the caregiver for examples or additional details about the activity. Give credit only if the caregiver can provide examples or additional details about the activity.

General Introduction: Say to the caregiver: This questionnaire is designed to find out about the different kinds of activities that you and your child do together and how those activities change as your child ages and grows. We know that caregivers have lots to do, at work, in the home, and for the family, and that it is often hard to find time to play and read together. Many caregivers don’t do more than a few of these activities and some don’t have the time to do any. I know that many people (including relatives, teachers, friends, babysitters, and siblings) also may have the opportunity to play important roles for your child. However, in this questionnaire, I am only interested in the kinds of activities that you provide for your child.

In order to get credit for a “yes” answer, the caregiver must give an example of a specific activity that demonstrates the teaching asked about in the question and must have done this more than once or twice.

<table>
<thead>
<tr>
<th>Caregiver Response</th>
<th>Score (Y=1,N=0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIDA Scale: Parental Involvement in Developmental Advance (Teaching)</td>
<td></td>
</tr>
<tr>
<td>1. Do you play with your child and show her/him how to pile up baby blocks or use other toys that stack up in a tower, or has the baby learned to do this on her/his own?</td>
<td>Y N</td>
</tr>
<tr>
<td>2. Do you teach your child to press buttons or turn knobs, or has the baby learned to do this on her/his own?</td>
<td>Y N</td>
</tr>
<tr>
<td>3. Do you play with your child and show her/him how to put blocks and other things in a container such as a plastic box, beaker or can?</td>
<td>Y N</td>
</tr>
</tbody>
</table>

Abridged version of StimQ is taken from StimQ - Infant ©2016 and used with permission from author
Alan L. Mendelsohn MD, Carolyn K. Cates PhD, Matthew Johnson, PhD, Adriana Woldieber PhD, Bernard Dreyer MD NYU School of Medicine
<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Do you play rolling ball games with your baby while sitting on the floor or bed?</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td><strong>READ SCALE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>StimQ Core: Reading, Teaching, Verbal Responsivity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>READ SCALE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>QUANTITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ask: Do you ever read baby or children’s books to your infant? If caregiver says “No”, skip remaining items and score all as zero.</td>
<td>Y N</td>
<td>No points</td>
</tr>
<tr>
<td>1. Name some children’s books that you have at home and read to your child. (After caregiver names some books) ask: How many books altogether do you have at home that you read to your child?</td>
<td>No books named</td>
<td></td>
</tr>
<tr>
<td>2. How many days each week do you read children’s books to your child?</td>
<td>Score: 0-6 Enter 0; 1-12 Enter 1; 13-24 Enter 2; 25-49 Enter 3; 50+ Enter 4</td>
<td></td>
</tr>
<tr>
<td>3. Do you read a book together with your child at bedtime? If yes, ask: How many days per week?</td>
<td>Enter # from 0 to 7; Score: 0-4 Enter 0; 5-9 Enter 1</td>
<td></td>
</tr>
<tr>
<td>4. Do you read books together with your child at times of day other than bedtime? If yes, ask: How many days per week?</td>
<td>Enter # from 0 to 7; Score: 0-4 Enter 0; 5-9 Enter 1</td>
<td></td>
</tr>
<tr>
<td><strong>Bookreading Quantity Subdimension Score</strong></td>
<td>Sum scores for items #1-4</td>
<td></td>
</tr>
<tr>
<td><strong>B. Diversity of Bookreading Concepts/Content</strong></td>
<td>(Y=1, N=0)</td>
<td></td>
</tr>
<tr>
<td><strong>Caregiver Response Score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do you read books to your child especially made for infants that teach about simple shapes such as squares, circle, and triangles?</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>6. Do you read books to your child especially made for infants that teach about things around the house (chair, table, bed, book, etc.)?</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>7. Do you read books to your child that show toys and favorite things (for example: ball or rattle)?</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>8. Do you read books to your child about animals?</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>9. Do you read books to your child that contain photographs of babies?</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>10. Do you read nursery rhymes such as Mother Goose or other simple rhyming books to your child?</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td><strong>Diversity of Bookreading Concepts/Content Subtotal</strong></td>
<td>Sum scores for items #5-10</td>
<td></td>
</tr>
</tbody>
</table>

Abridged version of StimQ is taken from StimQ2 - Infant ©2016 and used with permission from author
Alan L. Mendelsohn MD, Carolyn B. Cates PhD, Matthew Johnson, PhD, Adriana Werieden PhD, Bernard Dreyer MD NYU School of Medicine
### Bookreading Quality Subdimension

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Do you read books to your child that include simple stories for young babies? More than once a week?</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>12. While you read to your child, do you point to pictures and name them or describe them? Give credit for “most of the time.”</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>13. Do you ask your child questions about the pictures in books and try to have a conversation, for example, “What is that called?” or “What color is it?” Give credit for “most of the time.”</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>14. Do you talk to your child about feelings and emotions of characters in books? (Must have done this more than once or twice.)</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

### Calculation of READ Scale Score

Add A, B, C

---

### A. Parental Verbal Responsivity During Everyday Routines Subdimension

In order to get credit for a “yes” answer, the caregiver must engage in the interaction described on a regular basis (defined below for each question), not just once or twice, or occasionally.

Caregiver Response Score (as directed): Y=1, N=0

<table>
<thead>
<tr>
<th>Question</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Some parents talk to their infants about their surroundings and what is happening around them. Have you started to talk to your baby in this way?</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>2. Do you have the opportunity to point to things around the house and name them for your child? Give credit if parent says this happens on most days.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>3. Do you have the chance to point out the names, the colors or the sizes of items in the grocery store when taking your child there? Give credit for “most of the time”.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>4. Do you usually talk to your baby while you are feeding her/him and tell her/him about what is going on? Do not give credit for coaxing the child to eat or for telling the child to be careful, etc. Give credit for “most of the time”.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>5. Do you talk to your child while doing chores/housework? Give credit if caregiver says this happens on most days.</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

---

Abridged version of StimQ is taken from StimQ2 - Infant ©2016 and used with permission from author

Alan L. Mendelsohn MD, Carolyn B. Cates PhD, Matthew Johnson, PhD, Adriana Weinieden PhD, Bernard Dreyer MD NYU School of Medicine
### StimQ- Infant Abridged version

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6. When your baby practices making sounds, does she/he practice most of the time alone or with you? Give credit if caregiver says that the baby practices with caregiver on most days.</td>
<td>Alone</td>
<td>With you Both equally</td>
</tr>
<tr>
<td>7. Do you tell your child stories (such as folktales, made up stories without using a book, or stories about activities you have done together in the past)? Give credit if this takes place on a regular basis (several days per week), not just once or twice, or occasionally.</td>
<td>Y N</td>
<td></td>
</tr>
</tbody>
</table>
StimQ- Infant Abridged version

Needelman’s Three Questions

1. What are your child’s three favorite things to do, besides eating and sleeping?

2. What are your three favorite things to do with your child?

3. Some people think it is important to do things with their children to prepare them for learning in school. Are there any special things that you do with your child to help prepare your child for school? If yes, what are the three most important things you do?

I have three last demographic questions to ask:

What do you consider your ethnicity

What languages are spoken at home

What is your highest level of education

Thank you very much for doing this survey. Because this is a questionnaire designed to investigate the kinds of activities people do with their children and how those activities change over time, I will be re-contacting you in two months. In the meantime keep up the great work and have a wonderful day!

Abridged version of StimQ is taken from StimQ2 - Infant ©2016 and used with permission from author
Alan L. Mendelsohn MD, Carolyn & Cates PhD, Matthew Johnson, PhD, Adriana Weisleder PhD, Bernard Dreyer MD NYU School of Medicine
Appendix E

Posttest StimQ Abridged

PP
StimQ - Infant Abridged version

De-identification number __________

Date: ______/____/______

Interviewer: __________________

Caregiver interviewed:
__Mother, ___Father, ___Other, ______

Gender of child: M/F

Age of child __________

Note to interviewer: For every “Yes” answer, ask the caregiver for examples or additional details about the activity. Give credit only if the caregiver can provide examples or additional details about the activity.

General Introduction: Say to the caregiver: As you may recall this questionnaire is designed to find out about the different kinds of activities that you and your child do together and how those activities change as your child ages and grows. We know that caregivers have lots to do, at work, in the home, and for the family, and that it is often hard to find time to play and read together. Many caregivers don’t do more than a few of these activities, and some don’t have the time to do any. I know that many people (including relatives, teachers, friends, babysitters, and siblings) also may have the opportunity to play important roles for your child. However, in this questionnaire, I am only interested in the kinds of activities that you provide for your child.

In order to get credit for a “yes” answer, the caregiver must give an example of a specific activity that demonstrates the teaching asked about in the question and must have done this more than once or twice.

<table>
<thead>
<tr>
<th>Caregiver Response</th>
<th>Score (Y=1, N=0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIDA Scale: Parental Involvement in Developmental Advance (Teaching)</td>
<td></td>
</tr>
<tr>
<td>1. Do you play with your child and show her/him how to pile up baby blocks or use other toys that stack up in a tower, or has the baby learned to do this on her/his own?</td>
<td>Y N</td>
</tr>
<tr>
<td>2. Do you teach your child to press buttons or turn knobs, or has the baby learned to do this on her/his own?</td>
<td>Y N</td>
</tr>
<tr>
<td>3. Do you play with your child and show her/him how to put blocks and other things in a container such as a plastic box, beaker or can?</td>
<td>Y N</td>
</tr>
</tbody>
</table>

Abridged version of StimQ is taken from StimQ - Infant ©2016 and used with permission from author

Alan L. Mendelsohn MD, Carolyn B. Gaten PhD, Matthew Johnson, PhD, Adriana Wondner PhD, Bernad Dreyer MD NYU School of Medicine
<table>
<thead>
<tr>
<th>4. Do you play rolling ball games with your baby while sitting on the floor or bed?</th>
<th>Y N</th>
</tr>
</thead>
</table>
| **READ SCALE:**  
  **StimQ Core: Reading, Teaching, Verbal Responsivity**  
  **READ SCALE:**  
  **QUANTITY**  
  Ask: Do you ever read baby or children’s books to your infant? If caregiver says “No”, skip remaining items and score all as zero. | Y N | No points |
| 1. Name some children’s books that you have at home and read to your child.  
  (After caregiver names some books) ask: How many books altogether do you have at home that you read to your child? | Scoring: (0) Enter 0; 1-9=Enter 0; 10-39=Enter 1, 10; 40-99=Enter 2; 100-49=Enter 3, 50=Enter 4 | ___ books named |
| 2. How many days each week do you read children’s books to your child? | Scoring: 0: Enter 0; 1-2: Enter 1; 3-4: Enter 2; 5+: Enter 3 | ___ days |
| 3. Do you read a book together with your child at bedtime? If yes, ask: How many days per week? | Enter # from 0 to 7; Scoring: 0-4: Enter 0; 5+: Enter 2 | ___ days |
| 4. Do you read books together with your child at times other than bedtime? If yes, ask: How many days per week? | Enter # from 0 to 7; Scoring: 0-4: Enter 0; 5+: Enter 2 | Y N ___ no. ___ days |

**Bookreading Quantity Subdimension Score**  
Sum scores for Items 1-4

| **8. Diversity of Bookreading Concepts/Content**  
  **Caregiver Response Score**  
  *(Y=1, N=0)* |  |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Do you read books to your child especially made for infants that teach about simple shapes such as squares, circle, and triangles?</td>
<td>Y N</td>
</tr>
<tr>
<td>6. Do you read books to your child especially made for infants that teach about things around the house (chair, table, bed, book, etc.)?</td>
<td>Y N</td>
</tr>
<tr>
<td>7. Do you read books to your child that show toys and favorite things (for example: ball or rattle)?</td>
<td>Y N</td>
</tr>
<tr>
<td>8. Do you read books to your child about animals?</td>
<td>Y N</td>
</tr>
<tr>
<td>9. Do you read books to your child that contain photographs of babies?</td>
<td>Y N</td>
</tr>
<tr>
<td>10. Do you read nursery rhymes such as Mother Goose or other simple rhyming books to your child?</td>
<td>Y N</td>
</tr>
</tbody>
</table>

**Diversity of Bookreading Concepts/Content Subtotal**  
Sum scores for Items 5-10

---

Abridged version of StimQ is taken from StimQ - Infant ©2016 and used with permission from author  
Alan L. Mendelssohn MD, Carolyn & Cates PhD, Matthew Johnson, PhD, Adriana Veliz-Macias PhD, Bernard Dreyer MD NYU School of Medicine
### c. Bookreading Quality Subdimension

<table>
<thead>
<tr>
<th>Item</th>
<th>Y</th>
<th>N</th>
<th>( N=0 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Do you read books to your child that include simple stories for young babies? More than once a week?</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>12. While you read to your child, do you point to pictures and name them or describe them? Give credit for “most of the time.”</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>13. Do you ask your child questions about the pictures in books and try to have a conversation, for example, “What is that called?” or “What color is it?” Give credit for “most of the time.”</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>14. Do you talk to your child about feelings and emotions of characters in books? (Must have done this more than once or twice.)</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

### C. Bookreading Quality Subdimension Score ()

**Calculation of READ Scale Score**

Add scores for items 12-14.

<table>
<thead>
<tr>
<th>Add A, B, C</th>
<th>Add A, B, C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### A. Parental Verbal Responsivity During Everyday Routines Subdimension

In order to get credit for a “yes” answer, the caregiver must engage in the interaction described on a regular basis (defined below for each question), not just once or twice, or occasionally.

**Caregiver Response Score (as directed): \( Y=1, N=0 \)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Some parents talk to their infants about their surroundings and what is happening around them. Have you started to talk to your baby in this way?</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>2. Do you have the opportunity to point to things around the house and name them for your child? Give credit if parent says this happens on most days.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>3. Do you have the chance to point out the names, the colors or the sizes of items in the grocery store when taking your child there? Give credit for “most of the time”.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>4. Do you usually talk to your baby while you are feeding her/him and tell her/him about what is going on? Do not give credit for coaxing the child to eat or for telling the child to be careful, etc. Give credit for “most of the time”.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>5. Do you talk to your child while doing chores/housework? Give credit if caregiver says this happens on most days.</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

---

Abridged version of StimQ is taken from StimQ - Infant ©2016 and used with permission from author

Alan L. Mendelsohn MD, Carolyn & Cates PhD, Matthew Johnson, PhD, Adriana Woldegebriel PhD, Bernard Dreyer MD NYU School of Medicine
### StimQ - Infant Abridged version

<table>
<thead>
<tr>
<th></th>
<th>6. When your baby practices making sounds, does she/he practice most of the time alone or with you? Give credit if caregiver says that the baby practices with caregiver on most days.</th>
<th>Alone</th>
<th>With you</th>
<th>Both equally</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7. Do you tell your child stories (such as folktales, made up stories without using a book, or stories about activities you have done together in the past)? Give credit if this takes place on a regular basis (several days per week), not just once or twice, or occasionally.</td>
<td></td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

*Abridged version of StimQ is taken from StimQ2 - Infant ©2016 and used with permission from author*

Alan L. Mendelson MD, Carolyn B. Cates PhD, Matthew Johnson, PhD, Adriana Weideler PhD, Bernard Breyer MD NYU School of Medicine
Needelman's Three Questions

1. What are your child's three favorite things to do, besides eating and sleeping?

2. What are your three favorite things to do with your child?

3. Some people think it is important to do things with their children to prepare them for learning in school. Are there any special things that you do with your child to help prepare your child for school? If yes, what are the three most important things you do?

I have three last demographic questions to ask:

What do you consider your ethnicity?
What languages are spoken at home?
What is your highest level of education?

Thank you very much for doing this survey. Your participation in this survey is complete. Thank you so much for participating. If you can let me know what kind of a gift card works best for you:

Amazon
Target
Walmart
FredMeyer

What is the Name of your Nurse Partner so that I can give her the gift card?

Keep up the great work and have a wonderful day!

Abridged version of StimQ is taken from StimQ2 - Infant ©2016 and used with permission from author
Alan L. Mendelssohn MD, Carolyn & Gates PhD, Matthew Johnson, PhD, Adriana Weltleder PhD, Bernard Dreyer MD NYU School of Medicine
Appendix F

Tips for Parents of Babies

- **Snuggle up with a book**
  When you hold your baby close and look at a book together, your baby will enjoy the snuggling and hearing your voice as well as the story. Feeling safe and secure with you while looking at a book builds your baby’s confidence and love of reading.

- **Choose baby-friendly books**
  Books with bright and bold or high-contrast illustrations are easier for young babies to see, and will grab their attention. Books made of cloth or soft plastic (for the bathtub) or “board books” with sturdy cardboard pages are easier for a baby to handle.

- **Keep books where your baby can reach them**
  Make sure books are as easy to reach, hold, and look at as toys. Remember, a baby will do with a book what he does with everything else—put it in his mouth. And that’s exactly what he’s supposed to do, so you may only want to put chewable books within reach.

- **Talk with your baby—all day long**
  Describe the weather or which apples you are choosing at the grocery. Talk about the pictures in a book or things you see on a walk. Ask questions. By listening, your child learns words, ideas, and how language works.

- **Encourage your baby’s coos, growls, and gurgles**
  They are your baby’s way of communicating with you, and are important first steps toward speech. Encourage attempts to mimic you. The more your baby practices making sounds, the clearer they will become. Go ahead and moo, woof and honk!

- **Give baby a hand!**
  Encourage your baby to pick up crackers or peas, touch noses and toes, point to pictures and grab toys. The muscles in those little hands will grow strong, agile, and ready to turn pages.

- **Develop a daily routine (and make reading a part of it)**
  Routines can soothe a baby and let a baby learn to predict what will happen next. The ability to predict is important when your child is older and is reading independently.

- **Sing, Read, Repeat**
  Read favorite stories and sing favorite songs over and over again. Repeated fun with books will strengthen language development and positive feelings about reading.

- **“Read” your baby**
  Pay attention to how your baby reacts to the book you are reading. Stop if your baby isn’t enjoying the story and try another book or another time.

Visit [www.ReadingRockets.org](http://www.ReadingRockets.org) for more information on how you can launch a child into a bright future through reading.