ADDRESSING THE EFFECTS OF POVERTY ON EARLY CHILD LANGUAGE DEVELOPMENT: A FEASIBILITY STUDY FOR A NOVEL PARENT LANGUAGE STIMULATION PROGRAM

Emily Rusnak

A Dissertation

Submitted to the Graduate College of Bowling Green State University in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

March 2011

Committee:

Tim Brackenbury, Advisor

Mary Hare,
Graduate Faculty Representative

Lynne Hewitt

Lauren Katz
ABSTRACT

Tim Brackenbury, Advisor

The purpose of this study was to investigate the feasibility of a novel parent language stimulation program for parents of toddlers living in low-income homes. This study was designed to address a gap in the research literature for interventions that target the unique needs of this population.

This pilot study used an abbreviated version of a multiple baseline design with an embedded pretest-posttest design. This method was used to detail outcomes from the intervention that may suggest further research potential with the proposed intervention. Additionally, a qualitative review of the feasibility of the intervention and methods was conducted to determine specific barriers and benefits to the intervention as proposed.

Previous research in child language development suggest that parent lexical diversity, parent responsivity to child communication attempts, parent promotion of language development in the home setting, and parent knowledge of child development are all negatively impacted by low-income status. Additionally, parents in low-income homes are more likely to demonstrate lower feelings of parenting self-efficacy and experience greater levels of parenting stress. In turn, these parent behaviors have been found to impact the types of learning experiences and communication that parents provide to young children throughout their day. The intervention program designed for this study, the Caregiver-Child Language Apprenticeship Program (CcLAP), was created to address these concerns.

Results indicate that parent knowledge of development and parent promotions of development in the home setting, showed some signs of a positive increase after exposure to the intervention, but no other changes were noted in the other parent behaviors measured. Issues of
feasibility with the proposed design were significant, with recruitment and retention of low-income participants emerging as a central barrier to research with this population.

Limitations of the study and future directions for the language stimulation intervention program and related research with low-income families are discussed in light of the current results from this study.
This document is dedicated to:

Bill, my “perfect partner” in crime.

I love you so very much.

Trinity, my newest partner in crime.

Daddy and I are so happy to have you with us in your forever home.

We love you and you teach us how to be better people every day.

My family.

Yes, I’m finally done with school now (I think!).

Much love to you all, y’all.
ACKNOWLEDGMENTS

This dissertation was the culmination of a significant amount of hard work, brainstorming, hashing out, and even arguing, to get to this final, yet beginning, stage of development. There were an incredible number of players who provided support, knowledge, and guidance to my work.

I must first thank my advisor, Tim Brackenbury, for his interest and willingness to take me on as his doctoral student and guide me through this journey. Given that we are both headstrong individuals, somehow you were able to sit through nearly three years of individual readings classes with me, creating a very enjoyable, collegial, and stimulating string of discussions. What’s more is that you even let me stray on my own into the poverty and language development literature (after a few fatherly questions and voiced concerns). That openness and willingness to debate things out (and find a pathway through a LOT of weeds and gaps in the literature) was sincerely and deeply appreciated. The most important day in my graduate program came after you read my first (and terrible) literature review of poverty and language development. You said that it just wasn’t clear to you the connections that I was seeking. Your charge to make greater sense of the literature lead me on a nearly two-year set of readings in literatures far removed from speech-language pathology. So, I’m forever grateful to you for your support of my studies and my research interests, your goofball humor, your friendship…and your granola recipe. It is de-licious!

I must also thank the rest of my dissertation committee, Lynne Hewitt, Lauren Katz, and Mary Hare, for their interest and willingness to work with me on this project and across my entire doctoral program. To Lynne Hewitt, thank you so much for all of your support over the years with my education and your sincere interest in helping me begin to make connections with
colleagues in the field. I am particularly grateful for your willingness to include me in various ASHA tasks over the years. I have met a lot of great colleagues from those activities. I am also grateful for the autism readings course that we had together. I thoroughly enjoyed every minute of it! To Lauren Katz, I am forever grateful for your constant support of my interests since I first began at BG. Your willingness to do a readings class on birth to three literacy issues and on your openness to dig into your well of colleagues for support of my research ideas and research agenda is sincerely and deeply appreciated. You have also shown me how it is possible to live in A2, have kids, and still manage to get a lot of research and teaching done! And please do call me whenever you want a consult on late talkers! I will forever remember all of our conversations via phone, in person, and over a bagel at Panera’s—your support of my research has been tremendous. To Mary Hare, thank you (thank you, thank you!) for your willingness to work with me over the years on my cognate, my prelims, and my dissertation. Most importantly though, I cannot thank you enough for your exceptional guidance and tips on the semantic priming studies over the years. You are the sole reason I did not break every last living piece of research equipment last spring. PsyScope is so not my friend…

I would like to send my sincerest appreciation to a number of entities that supported me over my research for this study. I would like to thank the J. P. Scott Neuroscience Center at BGSU for my fellowship, to allow me to begin my study of poverty and language development two years ago. I’d also like to thank the Department of Communication Sciences and Disorders at BGSU for putting your faith in me with this project and providing me with the doctoral student dissertation fellowship. The time that was spent writing the dissertation proposal, running around trying to find research sites, and beginning my data transcription was the difference in finishing versus not finishing this project when I did. Finally, I’d like to thank the American
Speech-Language-Hearing Foundation for their generous support of my doctoral studies this past year. The grant that was provided helped to purchase all of the materials and equipment that were used for the study and provided a means to cover the financial incentives offered to research participants.

I also would like to send my sincerest thanks to all of the doctoral students that I’ve worked with over the years at BGSU. Although a fairly small program, we would definitely be rated the largest in terms of support of each other’s interests and loudness levels in terms of air hockey games (oops!). So, to all of you over the years—Derek Daniels (Love you, Double!), Stephanie Hughes (Speeds!!), Biji Phillips, Scott Palasik (Bubby, you are truly my department husband), Eric Swartz (Dash, miss you around), Ramya Konnai (Wams, miss you, too), and the many other students after me, a big huge thanks.

I would also like to take this opportunity to thank my family for their unending support of my educational interests. To my parents, thanks for letting me step off on my first day of kindergarten “and not look back.” I have always had a love of school and a deep love of learning new things, and you all have never, ever said no to anything I wanted to try. Not even tap dancing, though that was thankfully short lived. To Bill…wow. You have been my tireless advocate (and cow prodder) throughout my program. For every time I wanted to just throw in the towel, you were there to make me a cup of tea or kick me in the rear to get over it and try something different. As Billy jokingly said, “Now you’ll be a doctor that never did anybody any good.” Let’s hope I prove him wrong on that one. And to Trinity. I really do want to thank you for coming into our lives this past year. You are young right now and won’t get the significance of mommy finishing her “big ole book”—you are mostly focused on wearing a nice dress to graduation in May. But you truly are a living embodiment of all the things I encounter in my
research, which has been quite the learning experience for me. You’ve been through so much and now you bring so much to our lives. I hope you realize just how much you’ve changed Daddy and me and how grateful we are to have you in our family now.

I would like to also thank the many individuals who lent their hands in the execution of the research study over the past years. First, I would like to thank the research participants in this study for their willingness to open their doors to this project. I would also like to thank the numerous agencies that met with me during the recruitment process and provided substantial support for the recruitment of participants. Finally, I would like to thank the many research assistants (both undergraduate and graduate) who participated in this study—a particularly large shout-out should be made to my graduate research assistant, Judy Reichert, for her amazing language sample transcription and responsivity coding abilities and her general willingness to put in a massive amount of effort to make the data analysis for this project go as smoothly as possible (I owe you, Judy!).

I learned so much from this study, even when it sometimes got confusing and cumbersome, and to all of you above, I am forever grateful.

“In poverty, as in certain propositions in physics, starting conditions are everything. There are no secret economies that nourish the poor; on the contrary, there are a host of special costs.” (p. 27)

—Barbara Ehrenreich, in *Nickel and Dimed: On (Not) Getting By in America*
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER I</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAPTER II</td>
<td>8</td>
</tr>
<tr>
<td>Background Information and Review of the Literature</td>
<td>8</td>
</tr>
<tr>
<td>What is Poverty?</td>
<td>8</td>
</tr>
<tr>
<td>How Poverty Affects Child Development</td>
<td>10</td>
</tr>
<tr>
<td>Parenting in Socioeconomic Hardship</td>
<td>15</td>
</tr>
<tr>
<td>Parenting Beliefs and Goals</td>
<td>17</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>20</td>
</tr>
<tr>
<td>Parent Emotional Health and Knowledge of Child Development</td>
<td>21</td>
</tr>
<tr>
<td>Parenting Styles and Practices</td>
<td>23</td>
</tr>
<tr>
<td>Social-Pragmatic View of Input</td>
<td>23</td>
</tr>
<tr>
<td>Data-Providing View of Input</td>
<td>25</td>
</tr>
<tr>
<td>Language Development and Outcomes for Children Living in Poverty</td>
<td>28</td>
</tr>
<tr>
<td>Language Sufficiency versus Language Enrichment</td>
<td>28</td>
</tr>
<tr>
<td>Poverty and Prelinguistic Communication Skills</td>
<td>30</td>
</tr>
</tbody>
</table>
Poverty and Linguistic Communication ............................................... 33

Morphosyntax .................................................................................. 33

Semantics ......................................................................................... 35

Overview of Current Dissertation Study ............................................ 38

Research Questions and Hypotheses .................................................... 39

Parent Language Stimulation Intervention ........................................ 40

Knowledge of Development .............................................................. 40

Language Stimulation ......................................................................... 41

Responsive Communication .............................................................. 42

Promotion of Child Development in the Home Setting ....................... 43

Indirect Treatment Effects ................................................................. 44

Cumulative Risk Status ..................................................................... 44

Intervention Outcomes ...................................................................... 45

Intervention Outcomes Hypotheses .................................................. 45

Assessment of Early Feasibility of Intervention .................................. 46

CHAPTER III .......................................................................................... 47

Methods ............................................................................................ 47
Scoring and Analysis ................................................................. 58

Demographic Information: Child Temperament ................................. 59

Measures ...................................................................................... 59

Carey Toddler Temperament Scale ................................................ 59

Procedures ..................................................................................... 60

Administration .............................................................................. 60

Scoring of Carey Toddler Temperament Scale ................................. 61

Pilot Study for Multiple-Baseline Design ........................................... 62

Measures ...................................................................................... 62

Measure D and vocd ..................................................................... 62

Parent Verbal Social-Pragmatic Acts ................................................. 64

Multiple Baseline Pilot Study Procedure ......................................... 65

Baseline ...................................................................................... 65

Intervention Phase ....................................................................... 66

Multiple Baseline Data Analysis Procedures ................................. 68

Transcription of Parent-Child Interaction Samples ......................... 68

Reliability of Language Sample Transcription ............................... 69
Transcription Cleaning and Coding for \textit{vocd} \ldots 70

Morpheme Coding \ldots 70

Reliability of Morpheme Coding \ldots 71

Maternal Responsivity Coding for Topic-Continuing Replies \ldots 71

Reliability of Maternal Responsivity Coding \ldots 74

Pilot Study for Pretest-Posttest Design \ldots 74

Measures \ldots 74

Parent Knowledge of Child Development \ldots 74

Parent Self-Efficacy \ldots 75

Parenting Stress \ldots 76

Caregiver Stimulation of Child Development in the Home \ldots 77

Pretest-Posttest Procedure \ldots 78

Assessing Early Feasibility of Intervention \ldots 78

Feasibility Procedure \ldots 80

CHAPTER IV \ldots 81

Results \ldots 81
Intervention Outcome Research Question 1: Analyzing Lexical Diversity of Child-Directed Speech Using vocd .......................................................... 81

Intervention Outcome Research Question 2: Analyzing Parent Responsivity Behaviors Using Verbal Social Pragmatic Act Coding ........................................ 82

Intervention Outcome Research Question 3: Parent Knowledge of Development .............................................................................................................. 83

Intervention Outcome Research Question 4: Parent Promotion of Child Development in the Home ................................................................. 84

Intervention Outcome Research Question 5: Parent Self-Efficacy ........................................ 85

Intervention Outcome Research Question 6: Parenting Stress .................................. 85

Assessing Feasibility of Intervention Study Research Question 1 ........................................ 88

Lead Researcher Perception of Feasibility ................................................................. 89

Recruitment Procedures .............................................................................................. 89

Participant Selection Criteria ...................................................................................... 90

Intervention Procedures: Research Setting ................................................................ 92

Instrumentation ............................................................................................................... 94

Data Analysis Procedures in the Lab ........................................................................ 95
Parent Perception of Feasibility ........................................................ 97

CHAPTER V ................................................................................................. 99

Discussion ........................................................................................................ 99

Findings of Current Study ................................................................................... 101

Discussion of Intervention Outcomes ............................................................... 101

Research Question One .................................................................................. 101

Research Question Two ................................................................................. 103

Research Question Three ............................................................................... 105

Research Question Four ................................................................................. 106

Research Question Five ................................................................................. 110

Research Question Six ................................................................................... 112

Discussion of Early Feasibility of Intervention Outcomes .............................. 114

Lead Researcher Perception of Feasibility ....................................................... 115

Recruitment of Participants and Participant Selection Criteria ........... 115

Intervention Procedures: Research Setting ..................................................... 118

Instrumentation ............................................................................................... 120

Data Coding and Analysis Procedures in the Lab ........................................ 121
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Environmental Input Mediates Child Development over Time</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>D Values for Lexical Diversity of Parent Utterances</td>
<td>81</td>
</tr>
<tr>
<td>3</td>
<td>Percentage Use of Topic-Continuing Replies</td>
<td>83</td>
</tr>
</tbody>
</table>
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hollingshead Occupational Factor Scale</td>
<td>52</td>
</tr>
<tr>
<td>2</td>
<td>Social and Family Risk Factors to Development</td>
<td>57</td>
</tr>
<tr>
<td>3</td>
<td>Participant Family’s Cumulative Risk Status</td>
<td>58</td>
</tr>
<tr>
<td>4</td>
<td>Quantitative and Qualitative Findings from CTTS</td>
<td>61</td>
</tr>
<tr>
<td>5</td>
<td>Completion of Proposed Intervention Activities in the Pilot Study</td>
<td>67</td>
</tr>
<tr>
<td>6</td>
<td>Phases of Clinical Outcomes Research</td>
<td>79</td>
</tr>
<tr>
<td>7</td>
<td>Maternal Use of Topic-Continuing Replies to Child Communication Attempts</td>
<td>82</td>
</tr>
<tr>
<td>8</td>
<td>Pretest and Posttest Results for KIDI</td>
<td>84</td>
</tr>
<tr>
<td>9</td>
<td>HOME Inventory Scores for Pretest and Posttest Administration</td>
<td>85</td>
</tr>
<tr>
<td>10</td>
<td>Child Domain Scores on PSI for Pretest and Posttest Administration</td>
<td>87</td>
</tr>
<tr>
<td>11</td>
<td>Parent Domain Scores on PSI for Pretest and Posttest Administration</td>
<td>88</td>
</tr>
<tr>
<td>12</td>
<td>Composite Scores for PSI in Pretest and Posttest Administration</td>
<td>88</td>
</tr>
</tbody>
</table>
CHAPTER I

The development of language before school entry has been shown to be strongly related to a host of child outcomes in primary and secondary education (McLoyd 1998; National Institute of Child Health and Human Development [NICHD] Early Childcare Network, 2005). These outcomes are dictated largely by the quality and quantity of language exposure available to children and are affected by many caregiver- and child-related factors (e.g. Farkas & Beron, 2004; Hart & Risley, 1995; Rowe, 2008). Children living in poverty have a much greater likelihood to encounter risk to development, which is associated with poorer developmental outcomes, when compared to their wealthier counterparts. By kindergarten, many children living in poverty are already significantly behind their middle-income peers in oral and written language development (e.g., Durham, Farkas, Hammer, Tomblin, & Catts, 2007; Farkas & Beron, 2004; Lonigan, 2005). This increases the risk for low-income children to fall further behind as they progress in school, and increases the chance of special education placement, lower academic achievement, and school dropout (McLoyd, 1998; Storch & Whitehurst, 2001).

In an effort to understand and address these concerns, many researchers have investigated aspects of the child’s early learning environment, including caregiver, child, and environmental factors, for clues to the mechanisms by which these differences occur (e.g., Bronfenbrenner, 1979; Conger & Donnellan, 2007; Gilger, Ho, Whipple, & Spitz, 2001).

In particular, a significant body of research points to the deleterious effects of poverty on the protective nature of caregiving associated with early child development (Burchinal, Roberts, Hooper, & Zeisel, 2000; Hart & Risley, 1995; Sameroff, Seifer, & Baracas, 1987). This research has demonstrated that when children grow up in poverty, there are less optimal learning conditions available for the child. This provides a “slow start” to the development of critical
school readiness skills, such as a rich semantic and syntactic knowledge base and other emergent literacy behaviors. Two models of human development offer a framework that helps explain how early skills, such as language development, can be affected by conditions of poverty.

Bronfenbrenner’s (1979) ecological systems theory proposes that children’s development is nested within a vast network of interdependent proximal and distal influences on the child. In this model, children are directly affected by the people, activities, or settings that are more proximal to their development, such as primary caregivers or the home environment. Bronfenbrenner also theorized that distal factors, such as culture, religion, and socioeconomic status, are filtered through various aspects of the proximal environment, modifying the ways in which these entities affect child development. Social causation theory builds on this by addressing specific causal pathways between poverty and child development (Conger & Donnellan, 2007). This theory suggests that limited caregiver resources affects parents’ emotional resilience and parenting behaviors, which in turn affects child development.

A significant body of literature supports these theories. First, economic hardship has been found to limit the types of resources that parents have available for child rearing. Parents lack access to various material and developmental supports known to be effective for child development (e.g., Raviv, Kessenich, & Morrison, 2004). Poverty also limits a caregiver’s access to information related to child development (Bronfenbrenner, 1958, as cited in Hoff, Laursen, and Tardif, 2002; Tough, 2008), reducing a caregiver’s ability to gain knowledge about how children grow and learn (Rowe, 2008). Social and economic hardships have also been found to increase parent stress levels (Deater-Deckard, 2004) and increase a parent’s sense of helplessness as they deal with many of the difficult conditions associated with poverty (Elder, Eccles, Ardelt, & Lord, 1995). This reduces a caregiver’s feelings of parenting competence (Raikes &
Thompson, 2005) and reduces parent sensitivity to and support of children’s developmental needs (Hart & Risley, 1995). In particular, poverty negatively affects the ways that parents plan and scaffold learning opportunities for their children (Britto, Brooks-Gunn, & Griffin, 2006). These factors leave caregivers with fewer effective caregiving and coping skills to employ when parenting, particularly when dealing with challenging aspects of child behavior and temperament (Coleman & Karraker, 2003) or creating an effective language-learning environment (Britto, Brooks-Gunn, & Griffin, 2006).

Thus, many aspects of the child’s learning environment are affected by poverty, which has a negative effect on the language stimulation provided by caregivers. Caregivers living in lower socioeconomic conditions have been found to provide less gestural and verbal stimulation to their children (Hart & Risley, 1995; Rowe, 2008). Low-income caregivers are also more likely to exhibit more authoritarian parenting practices during parent-child interactions (Bornstein, Hahn, Suwalsky, & Haynes, 2003; Kaiser & Delaney, 1996). This limited early language stimulation has, not surprisingly, been found to exert a negative influence on the language development of children before the age of 5. Children evidence differences in communication skills across socioeconomic (SES) groups as early as 14 months of age (Rowe, 2008) and show significant differences in semantic and morphosyntactic development by age 3 (Farkas & Beron, 2004; Hart & Risley, 1995; Vasilyeva, Waterfall, & Huttenlocher, 2008). These differences establish a comparably weaker language foundation on which later language and emergent literacy behaviors are constructed. Once children are required to use their knowledge of oral language for reading and writing activities, children from low-income homes are found to be deficient in skills such as print knowledge and phonological sensitivity, from as early as 2 years of age (Lonigan, Burgess, Anthony, & Barker, 1998). Consequently, long-term exposure to
conditions of poverty triggers a negative cascading effect on development. Children living in poverty face increased risk for lower than expected academic achievement, referrals to special education services, and long-term academic failure (McLoyd, 1998; Storch & Whitehurst, 2001).

To combat these issues, early intervention opportunities have been developed to meet the complex needs of children and their families living in poverty. Early intervention can be an effective way to promote protective factors for early child development (that is, factors known to positively affect development) via engagement of both the parent and child in the intervention process. Policy groups have advocated for a model early childhood system that incorporates a strong emphasis on parent education as part of an interrelated set of programmatic offerings (Zero to Three, 2009). These services are recommended to emerge from the already present mandated early intervention system (Zero to Three, 2009), of which speech-language pathologists (SLPs) play a strong role. Several large-scale early interventions for children under age 3 have been created to address the needs of families living in poverty (e.g., Early Head Start, Infant Health and Development Program, Abecedarian Project, Parents as Teachers). These interventions concentrate on parent- and child-directed intervention targets across a broad range of early developmental domains. Previous efficacy studies of large scale interventions for children under 3 and their families living in poverty have found that caregiver and child outcomes improve significantly with intervention (e.g., Brooks-Gunn, Liaw, and Klebanov, 1992; Raikes & Love, 2002; Ramey & Campbell, 1984). However, these types of programs do not incorporate the use of SLPs in interventions with parents and children, limiting the scope of information low-income caregivers receive about language development and language facilitation. This leaves many interventions reliant on other related professionals or paraprofessionals to address the language needs of children and families living in poverty. Thus,
most programs do not have interventionists who can speak to the complex nature of language
development or can provide caregivers with language-specific interventions that directly address
parents’ knowledge and skills related to language stimulation.

One of the limiting factors in the current early intervention scenario is the relative lack of
SLPs serving the early language needs of children living in poverty. Speech-language
pathologists are not typically involved in preventative models of early intervention for children
under the age of 3, such as those seen in the field of education, though prevention falls under our
scope of practice (American Speech-Language-Hearing Association, 2008). Instead, SLPs are
called upon to provide services to children once there is evidence of significant failure in either
communication or literacy skills. Response to Intervention (RtI) has been proposed as a means
by which children are provided high-quality services before being considered for special
education and other related services. Unfortunately, RtI models appear uniquely focused on the
needs of school-age children, particularly those that would otherwise be labeled as having a
learning disability (Hale, 2008). This lack of preventative response to at-risk early development
keeps speech-language pathologists outside of the current discussion for early intervention
services for children and families living in poverty—a particularly surprising fact, as a large
number of these same children will eventually arrive on SLP caseloads later in their development
with language learning disabilities.

Until now there have been only limited attempts at creating evidence-based, small-scale
preventative language interventions that target the unique needs of children under age 3 and their
families living in poverty (i.e., Verbal Interaction Project—Madden, Levenstein, & Levenstein,
1976; Tips About Talk—Oetting, Pruitt, & Roy, 2006; Dialogic Reading—Valdez-Menchaca &
Whitehurst, 1992). Given that many of the developmental concerns related to poverty can be
traced back to early language and literacy learning opportunities in the home, it would be beneficial to have appropriate targeted interventions that could be implemented early in development with primary caregivers. Large-scale interventions have attempted to meet this need, but many of the interventions that target language development are not implemented before children enter preschool. This creates an imperfect prevention scenario, where early childhood interventionists play a game of “catch-up” with children’s already significantly delayed development. Moreover, many of these preschool interventions often provide little direct intervention with primary caregivers, relying instead on secondary caregivers (e.g., preschool teachers, daycare workers) to provide the necessary language and literacy stimulation.

From another vantage point, SLPs are uniquely suited to work with primary caregivers on improving language stimulation in the child’s natural early learning environment. SLPs are already providing a substantial amount of small-scale language- and literacy-based interventions through the federal early intervention system for children with diagnosed delays and disorders (Hebbeler et al., 2007). These small-scale interventions are more flexible in incorporating intervention components that can meet the individualized needs of children, their families, and their communities (National Research Council and Institute of Medicine, 2000). Importantly, SLPs are uniquely trained to work with caregivers and children both individually and in small groups. They are also well-suited to deal with many issues known to interact with SES level, such as dialect use, bilingualism, and non-dominant cultural or religious beliefs. These factors establish a significant need for SLPs to engage in the dialogue surrounding early learning and poverty, and add our field’s knowledgeable voice into the discussion started by other related disciplines.
To this end, the current research study, a preventative language-based intervention for parents and toddlers living in poverty, was designed to continue this discussion. In particular, this study will investigate the feasibility of a new language stimulation program that targets several areas of parenting skills known to be affected by poverty. These include a parent’s knowledge of language development and child temperament, parent lexical diversity and responsivity during parent-child interactions, and promotion of language learning in the child’s natural environment.
CHAPTER II

Background Information and Review of the Literature

Poverty is a multifactorial entity, and thus is a complex concept to relate to developmental trends in child development. Several distinct literatures will be reviewed to help explain the relationship between poverty and language development and provide a more cohesive picture of how variations in child language development are ultimately associated with conditions of poverty. These areas include the overall construct of poverty, theoretical support for mechanisms of risk to development, the role of parents in fostering early development, and the communication and language skills of children living in poverty.

What is Poverty?

Poverty is a term we initially attach to those living in distant, under-developed countries, and is often not believed to exist in industrialized and post-industrialized nations. In the U.S., we are often sheltered from issues of poverty, outside of happenstance exchanges with a homeless person or a heart-wrenching sound byte in the media about children living in urban slums or an unreachable “Appalachian holler.” However, poverty is a ubiquitous entity, crossing all cultural, racial, and governmental borders. There are two major classifications for the construct of poverty that help provide a basis on which different communities and societies around the world can more effectively address the needs of this diverse population.

*Extreme*, or *absolute, poverty* describes a state where one does not have the means necessary to adequately acquire food, clothing, and shelter. This is typically described as living on less than approximately one to two dollars per day (Katz, Corlyon, La Placa, & Hunter, 2007; Sachs, 2006; World Bank, 2011). This type of poverty is found primarily in undeveloped or developing nations, and is estimated to affect approximately 1.4 billion people (Sachs, 2006; World Bank, 2011). On the other hand, *relative poverty* is a term that describes a state where one
does not have the means necessary to “obtain the types of diet, participate in the activities and have the living conditions and amenities that are customary, or are at least widely encouraged or approved, in the societies to which they belong” (Townsend, 1979, p.31; in Katz et al., 2007). This type of poverty is found primarily in developed nations, such as the United States and western Europe. In the U.S., this population has been further subdivided into those that are deemed 

*poor* (i.e., living on income at or below 100% of the established federal poverty level) or 

*low-income* (i.e., those living on income up to 200% of the federal poverty level) (Fisher, 1992; National Center for Children in Poverty [NCCP], 2007a).

Of the population of people who are either designated as poor or low-income in the U.S., a significant number are children, particularly those under the age of 6 (NCCP, 2007b). The NCCP estimates that in 2007 there were approximately 24 million children under the age of 6 living in the United States. Out of that population, five million children (20%) live in homes that are designated as poor, while 10.5 million (43%) are found to live in low-income homes. Also, large differences have been noted in the number of children living in poverty across various racial and ethnic backgrounds. The NCCP noted that while Caucasian children made up the largest *number* of children represented as low-SES (4.0 million or 30% of all Caucasian children birth to 6), there is a disproportionately large *percentage* of some children with minority status in this population (63% of Hispanic, 64% of Black/African-American, and 68% of Native-American children are from low-income homes). These data suggest that relative poverty affects nearly half of the children in this country, and children from minority backgrounds have a much greater likelihood of growing up low-income. Moreover, almost half of those children grow up poor, facing significant barriers to financial and other related resources that are known to support health and human development.
How Poverty Affects Child Development

Though interesting, statistics about the prevalence of children living in poverty do not explain nor provide a mechanism by which poverty, or low-SES, exerts its influence on child development. Research has found that there are a number of risks and/or protective factors that are associated with individuals’ social and economic positions within a community (e.g., Burchinal, Roberts, Hooper, & Zeisel, 2000). Socioeconomic status is viewed as a global measure of a person’s, family’s, or group’s standing in a socially stratified system, where access to key societal resources—education, occupational or social prestige, income, and wealth—are dictated by one’s standing in that system (Bornstein et al., 2003). As such, SES is a powerful context in which child development is shaped through a parent’s ability to access and utilize community and societal resources (Bornstein et al., 2003). Bronfenbrenner’s (1979) ecological systems theory suggests that differences in SES could explain some of the variation noted in child development. In this model, children are developmentally situated, or “nested,” in an interdependent network of systems that directly and indirectly affect their development. This network is established through systematic patterning of activities, interactions, social roles, and settings in which the child develops (Bronfenbrenner, 1979). Most importantly, Bronfenbrenner theorized that a child’s interactions in the daily environment are one of the most powerful factors in shaping the manner and course of human development.

Children are centrally placed in Bronfenbrenner’s model, as seen in Appendix A. Each child is said to actively engage in the developmental process through their own individual sets of biological influences and development of skills over time (i.e., ontogeny). Some biological influences, such as temperament or inherited aspects of cognitive abilities, are expressed when children interact with the environment around them (Gilger, Ho, Whipple, & Spitz, 2001; Noel,
Peterson, & Jesso, 2007). As children develop, these biological influences, along with skills and knowledge the child has acquired, bidirectionally affect the interactions that children have within various proximal systems of development (Lerner, Rothbaum, Boulos, & Castellino, 2002; Sameroff & Chandler, 1975). These proximal systems, called microsystems, consist of the child’s interactions with individuals, activities, and settings in the child’s immediate environment. Examples of this system would be interactions with a caregiver in the home environment or at daycare. In particular, primary caregivers, a central focus in the proximal system, are viewed as exceptionally influential agents in the development of a child (Bornstein et al., 2003; Conger & Donnellan, 2007; Hoff, Laursen, & Tardif, 2002). This is attributable to their ability to interact regularly with the child, shape the child’s learning environment, and mediate any positive or negative influences from entities outside of the home. Microsystems of development can also interact with each other, in what is called the mesosystem. When two or more microsystems interact (e.g., a parent and a daycare worker), they are able to influence each other, which, in turn, influences the development of the child.

As you move more distally from the child in this model, connections to child development become decidedly more indirect. The exosystem level includes indirect connections that children have with the broader community in which they reside. Importantly, exosystems (e.g., a parent’s workplace or neighborhood) have the potential to positively or negatively affect microsystems of development. This can change the manner in which aspects of a microsystem engage the child. Finally, macrosystems of development are the most distal systems in the developmental network. Macrosystems are not visible entities unto themselves, like caregivers, doctors, or neighborhoods; instead, macrosystems are consistent patterns noted in the form and content of developmental influences that occur across the micro-, meso-, and exosystems. These
can best be described as an amalgamation of various contexts that affect development and include such constructs as religion, law, culture, and socioeconomic status. Thus, when viewed within an ecological model, SES is more of a “meta” view of the various contexts in which child development occurs, and not a singular construct in and of itself. SES can be conceptualized in this model as a collection of ecological subsystem differences that vary as a function of social and economic forces within the life of a child. For children under the age of 5, macrosystemic differences arise from the exosystems in which caregivers are involved, the mesosystemic interactions that occur on behalf of the child, and, most importantly, on the ways in which caregivers and other microsystem players interact directly with children to affect their development.

Therefore, in a simple model of development, one can view a child’s chronological progression from their current state of skill acquisition to later outcomes as being mediated primarily by input from the environment, as seen in Figure 1 below. For children under the age of 5, most of this input is provided, or at least dictated, by primary caregivers. The environmental input available to children has been found to vary across SES levels, primarily as a function of differences in parenting practices (Conger & Donnellan, 2007; Mistry, Biensanz, Chien, Howes, & Benner, 2008).

Figure 1

*Environmental Input Mediates Child Development over Time*

As a complement to Bronfenbrenner’s ecological systems theory, social causation theory proffers that many of the conditions in which human development occurs are related to a person’s status in a society (Conger & Donnellan, 2007). In particular, social causation theory...
suggests that parents provide a conduit in the proximal environment through which social and economic risk is channeled to the developing child. The social causation theory provides two separate models that suggest that optimal conditions for child development are dictated by two specific features that relate to parenting practices—a caregiver’s access to resources and a caregiver’s exposure to stress-related risk.

First, the family investments model states that a family’s socioeconomic status affects the resources, or capital, available to caregivers; this situation, in turn, affects the material and developmental investments caregivers make to child development (see figure in Appendix B). In this model, SES is shaped through three types of capital accessible to families—financial, human, and social. Financial capital is a type of resource that is most often conceptualized as work-related income and other financial assets. Human capital is described as a person’s knowledge and skills that have been acquired through educational and training opportunities. Finally, social capital is a resource that is available through a person’s access to various personal and professional contacts, which helps dictate one’s social and occupational prestige. These resources are seen as the basis for effective parenting of children by allowing caregivers to provide adequate material and developmental supports when sufficient resources are available (Conger & Donnellan, 2007). As such, the child-rearing context can be negatively affected by a reduction in resources available to parents, which can function independently of other macrosystemic constructs, such as a person’s race, ethnicity, or culture (Hoff, Laursen, & Tardiff, 2002).

The second theoretical model to emerge from the social causation theory is the family stress model of economic hardship. This model, as seen in Appendix C, proffers that various issues related to economic hardship, such as low-income status, a high debt-to-asset ratio, or
negative financial events, can lead to significant family economic pressures (Conger & Donnellan, 2007). These economic pressures are theorized to instigate emotional and behavioral difficulties for parents, such as parenting stress or conflicts between parents, and lead to reduced parental warmth and sensitivity levels. These psychosocial issues, in turn, affect the nature of how parents interact with their children, leading to less optimal outcomes for child development. Other researchers have suggested that the relationship between economic hardship and child outcomes is mediated more by a parent’s sense of control over their environment—a construct called self-efficacy (Elder, Eccles, Ardelt, & Lord, 1995). Both accounts have been borne out in the literature (Elder et al., 1995), and some studies have found a similarly strong relationship between parent stress and parent self-efficacy (e.g., Raikes & Thompson, 2005); however, some research suggests that outcomes in each version of the model may vary as a result of racial and ethnic cultural contexts (e.g., Elder et al., 1995), due to the overlapping nature of parenting behaviors related to poverty and minority status.

Overall, the two models of social causation theory suggest that the macro-contextual construct of poverty can induce difficulties for parents in providing care for their children. Poverty is theorized to negatively affect all aspects of capital available to caregivers, which moderates the transfer of knowledge, skills, and other resources from parent to child. Poverty is also theorized to exert a negative influence on parents’ ability to cope with stress that emerges from economic hardship and feel in control over their environment, which in turn strains parents’ ability to be responsive to children’s developmental needs. Thus, a host of issues related to poverty—limited income, less educational opportunities and attainments, less job prestige and social standing, greater amounts of stress, and less feeling of control—leave parents with fewer resources from which to draw to invest in the development of their children.
Research over the past several decades has found that conditions of poverty have been associated with a number of risks to child development (e.g., Burchinal et al., 2000; Dubow & Ippolito, 1994; Hooper, Burchinal, Roberts, Zeisel, & Neebe, 1998; Liaw & Brookes-Gunn, 1994). As previously mentioned, low-SES caregivers are not viewed as the origin of risk to development, but are instead seen as a conduit through which other aspects of low SES are transferred to the child’s proximal environment (Hoff, Laursen, & Tardif, 2002). Thus, risk factors related to income status stem from differences in a family’s access to resources, which affect the ways in which caregivers can effectively address the developmental needs of their children (Conger & Donnellan, 2007). A host of risk factors related to parenting have been found to strongly relate to low-SES, which include lower maternal education, higher parenting stress, higher anxiety/depression, and lower stimulation and responsiveness to the child during interactions (Burchinal et al, 2000; Chazan-Cohen et al., 2007; Noel, Peterson, & Jesso, 2007; Raviv, Kessenich, & Morrison, 2004; Sameroff, Seifer, & Barocas, 1987). Other risk factors related to poverty include reduced parent knowledge of child development, lower parent self-efficacy, and more punitive parenting practices, among others (Hart & Risley, 1995; Kaiser & Delaney, 1996; Rowe, 2008).

**Parenting in Socioeconomic Hardship**

Parenting is perhaps one of the most noble, and challenging, activities that we encounter as humans. Parents, and more broadly, caregivers, are afforded the rare opportunity to directly influence the course of child development in the ways in which they shape the child’s environment. The concept of parenting has been heavily investigated across many fields of study related to early childhood development and has been a significant area of research for the influences of poverty on development (e.g., Hoff, Laursen, & Tardif, 2002; Kaiser & Delaney,
1996; Katz et al., 2007). In particular, parenting is seen as a combination of nurturance and socialization of a child (Katz, et al., 2007), through a parent’s ability or willingness to address a child’s physical, emotional, social, and developmental needs (Hoff, Laursen, & Tardif, 2002; Katz et al., 2002). A parent is responsible for a vast majority of the material and developmental investments available to young children, which include the physical environment in which the child lives and grows, parent-child interactions that promote child development, and continuous parent interest and involvement in fostering the long-term success of the child (Bakermans-Kranenburg, van IJzendoorn, & Bradley, 2005).

Though the terms parent and parenting are common in the lexicon of the average citizen, there are many unique and complex aspects that make up this construct. Parenting consists of a caregiver’s beliefs, goals, style, and practices that are relied upon to foster the development of the children in their care (Bakermans-Kranenburg, van IJzendoorn, & Bradley, 2005; Hoff, Laursen, & Tardiff, 2002). Each of these skill areas contributes uniquely to the type of care that children receive and varies as a result of differences in SES level. In particular, research has found that several parenting behaviors act as critical mediators between family SES level and child developmental outcomes (e.g., Deater-Deckard, 2004; Rowe, 2008).

Importantly, the quality and quantity of interactions between parents and children is directly related to child language development outcomes, particularly for children under the age of 5. These interactions are a primary way that parents provide information about the world to children through their use of child-centered teaching practices and child-directed speech. For children living in poverty, systematic differences have been noted in the quantity and quality of parent-child interactions across various settings in which daily routines occur, and have been found to affect child language development as early as 14 months of age.
**Parenting Beliefs and Goals.** Parenting behaviors are substantially affected by the beliefs that parents have about child rearing and the goals that parents set to achieve certain outcomes for their children. Parenting beliefs relate to a parent’s understanding of child development and how parents view themselves in shaping the development of their children (Hoff, Laursen, & Tardiff, 2002; Sigel & McGillicuddy-De Lisi, 2002). Parenting goals are specific objectives that parents set to purposefully dictate the outcomes of their child’s development (Hoff, Laursen, & Tardiff, 2002). Significant differences have been noted in the beliefs and goals of parents across SES levels. These differences are important to understand because parenting behaviors related to beliefs and goals explain a substantial portion of the variance in child development outcomes. For example, the use of goal-directed teaching behaviors and enriched language in the home by parents is directly related to children’s academic skills at school entry, and accounts for 25 to 60% of the differences seen in the achievement gap for children across SES groups (see Britto, Brooks-Gunn, & Griffin, 2006).

In general, parents in higher-SES homes tend to believe that children are able to master skills earlier in development, when compared to parents in lower-SES homes (Hoff, Tardif, & Laursen, 2002). Parents in higher-SES homes also regularly estimate that their children’s previously-acquired skills are more advanced than the estimates made by lower-SES parents about their children (Hoff, Laursen, & Tardif, 2002), though there are exceptions in the early language development literature (Bavin et al., 2008; Feldman et al., 2000; Fenson et al., 1994; Hammer & Weiss, 1999, 2000). As an example of differences in beliefs and goals across SES groups, Heath’s (1983) ethnography of two small towns, Roadville and Trackton, investigated several differences across SES groups in parenting beliefs and goals for child language development. Lower-SES African-American caregivers were more likely to view young children
as less capable of understanding adult language and parents were less likely to engage children in conversation or to teach language directly. Heath also found that higher-SES Caucasian caregivers were more likely to see their children as active communication partners early in development and would purposefully engage in enhancing the language development of their children through direct teaching of language and literacy behaviors.

It is important to note, however, that wide variations exist within and across SES levels related to parenting behaviors (e.g., Andrews, Kelly, & McKelvey, 2008; Pan, Rowe, Singer, & Snow, 2005). In fact, research such as Heath’s does not provide enough evidence to separate out variability in parenting beliefs and goals across SES level, when confounded by issues of race and ethnicity (Leyendecker, Harwood, Comparini, & Yalcinkaya, 2005). To address this, Hammer and Weiss (1999, 2000) investigated the differences in parents’ beliefs and goals related to language development across SES groups within a single racial community. In their study of low-SES and middle-SES African-American mothers, Hammer and Weiss found that both groups of parents viewed the timing of early language development fairly similarly. However, low-income African-American mothers with less than a high school education were more likely to believe that their toddlers were less capable language comprehenders and users, and reported that their children were less likely to engage in conversation. By contrast, low-SES mothers with more education and higher-SES mothers in the study viewed their toddlers as more open to conversation and actively pursued language-based teaching agendas through daily routines, play, and shared book reading. Hammer and Weiss found similar results during observations of parent-child interactions during play, where low-SES mothers with less than a high school education incorporated fewer language goals into play interactions with their children. However, all mothers demonstrated several teaching strategies during play that were similar across education
and income levels (i.e., use of a variety of play episodes, frequently allowing the child to lead play interactions, consistent parent involvement in playing with the child).

In a similar study that included both African-American and Caucasian dyads, Farran and Haskins (1980) investigated the interaction behaviors of mothers and children when provided the opportunity to interact with both child and adult stimuli in a play observation. Dyads were provided both toys and magazines and mothers were instructed that the researchers were interested in seeing how the children played with toys and with the mothers. Though there was no difference in the number of play episodes across SES groups, low-income mothers interacted with their children in play only half as long as higher-SES parents. While in play, there were no differences in the rate of showing and giving toys between the two groups. Farran and Haskins suggested that the similarity of play interactions for mothers across SES groups shows that there is no difference in the mothers’ willingness or ability to engage in these activities. Instead, the length of time parents engage in play with children differs, which the authors suggest could be related to the value that the low-income parents place on play. They proffered that these differences may be due to differences in the knowledge parents have about the benefit of play in early learning, either from a lack of parenting information or a lack of role models in their community.

Finally, a study by Britto, Brookes-Gunn, and Griffin (2006) highlights differences in teaching behaviors and agendas in a low-income African-American sample of mothers and their preschool-aged children. Parents were observed engaging in shared reading and puzzle play with their children for 3 sessions that spanned 40 months of development. Parents who were more engaged in elaborations of stories were more likely to provide support to their child with the puzzle and have a more active teaching agenda during both activities. Parents who were less
engaged in story telling were less likely to be supportive of their child during the puzzle activity and were less likely to actively engage in teaching their child. These profiles of parenting behaviors were directly related to children’s receptive and expressive language development during the study. Children who had more supportive parents with more active teaching agendas evidence greater gains in language development, even when controlling for maternal education level.

**Self-Efficacy.** Researchers have found that a parent’s sense of control of their own environment and the environment of their child is an important feature of parenting beliefs and goals (Hoff, Laursen, & Tardiff, 2002; Sigel & McGillicuddy-De Lisi, 2002). This sense of parenting control, deemed parenting self-efficacy, is described as the feeling of power parents have about their ability to accomplish the goals they set for themselves. Parents who have greater feelings of control over their lives feel that the demands of parenting are less burdensome. By contrast, parents with diminished feelings of control over their lives tend to feel more overwhelmed with parenting (Coleman & Karraker, 2003). For parents living in poverty, there is a greater chance that they will have increased feelings of powerlessness for both child-rearing practices and general aspects of control in their life experiences (Coleman & Karraker, 1997; 2003). This translates into reduced feelings of competence in parenting for many low-income parents and in reduced feelings of success in their overall life experiences. In a large-scale study of low-income, inner city African-American and European-American families, Elder et al. (1995) demonstrated that a parent’s feeling of self-efficacy was directly tied to the financial strain parents endured and, subsequently, to the types of parenting behaviors upon which parents relied. Parents with higher family incomes, across race and ethnicity, were more likely to demonstrate greater feelings of self-efficacy. In turn, parents with greater feelings of self-
efficacy were more likely to provide greater learning opportunities for their children in their home and community (e.g., greater use of encouragements, joint activities and child supervision, access to community programs, and proactive prevention of failure).

The feelings of powerlessness and lack of competence for low-SES parents have also been found to be related to the quality of the interactions that occur between the parent and child. Thompson and Williams (2006) found that the language used at home by low-income parents of preschoolers differed substantially in terms of maternal self-efficacy levels. Mothers who demonstrated a greater feeling of powerlessness in domain-general life experiences were less likely to produce cognitively-demanding language in the home. Similarly, in a sample of middle-SES mothers, Coleman and Karraker (2003) found that a parent’s sense of parenting self-efficacy was a mediating factor between parent-child interactions in structured play and children’s cognitive development. Parents with higher parenting self-efficacy had more positive interactions with their children, who were then more likely to demonstrate better performance on the Mental Scale of the Bayley Scales of Infant Development (BSID).

**Parent Emotional Health and Knowledge of Child Development.** Interestingly, some researchers have suggested that parents’ feelings of control and competence can be traced back to parental knowledge of child development and parent emotional health, particularly when parents deal with issues related to child development and temperament (Coleman & Karraker, 2003; Machida, Taylor, & Kim, 2002; Powell, 2004; Raikes & Thompson, 2005). Several studies suggest that parents with greater feelings of self-efficacy may have more emotional resources to use when dealing with variations in both children’s development and in their temperament (Coleman & Karraker, 2003; also see Coleman & Karraker, 1998; Guimond, Wilcox, & Lamorey, 2008; Machida, Taylor, & Kim, 2002). For instance, Machida, Taylor, and Kim, in a
study of Mexican-American and European-American mothers, found that self-efficacy mediated the relationship between family factors, such as parent stress, parent education level, and child temperament, and the parent’s support of learning in the home environment. In another study with low-SES families, Freeland and Nair (1985) found that a parent’s knowledge of development affects the manner in which caregivers engage with their children. Parents who have less knowledge of development had less engaging parent-child interactions and were more likely to view their infant’s temperament as being fussy or difficult. Freeland and Nair reported that these parents demonstrated low self-efficacy, where they regarded themselves as powerless in the care of their children.

Rowe (2008) investigated the role of parent knowledge of child development in the relationship between a parent’s use of child-directed speech and family SES level for children 28 to 42 months of age. Consistent with other studies of variation in parent verbal input across SES groups, Rowe found that parents in low-SES homes provided less verbal input to their children than higher-SES parents. This difference was also related to children’s receptive language scores at 42 months of age. However, Rowe found that SES level was not a significant predictor of children’s receptive vocabulary at 42 months of age, once child receptive language and parent input at 28 months were used as controls. Instead, Rowe found that the relationship between child-directed speech and SES was strongly mediated by parent knowledge of child development, when parent knowledge was included in regression analyses. Similarly, Dichtelmiller et al. (1992) investigated the role of parent knowledge in child cognitive and motor development with families across SES levels. Parent knowledge of development predicted child performance on the BSID even when SES levels were taken into account. Parents with more knowledge of child development raised children with higher scores in cognitive and motor tasks.
Therefore, for parenting beliefs and goals, low-income status exerts pressure on how parents understand child development and create learning environments for their children. Low-income parents evidence lower levels of self-efficacy that affects the manner in which they are able to deal with and plan for various child development issues. Additionally, parents in low-income homes evidence reduced knowledge of child development, which appears to add additional strain on a parent’s ability to cope with the developmental and temperamental needs of young children. This, in turn, creates a situation where the skill development of low-income children occurs at a much slower rate compared to their wealthier peers.

**Parenting Styles and Practices.** By far the most researched areas in the parenting literature, parenting styles and practices are familiar territory for SLPs in the discussion of parent-child interactions and early language development. Parenting styles refer to the manner in which parents interact with their children, including the attitudes and emotions conveyed from parent to child (Hoff, Laursen, & Tardif, 2002). Highly related to parenting styles, parenting practices refers to the role that parents play in managing the lives of their children (Hoff, Tardif, & Laursen, 2002). Parenting practices encompass the ways in which parents shape the learning environment of their children, including the quality and quantity of communicative events and the contexts in which parents engage in interactions with their children. Two complementary views of language development address features of parenting styles and practices—the social-pragmatic and the data-providing views of input.

**Social-Pragmatic View of Input.** The social-pragmatic view of input suggests that various aspects of parent-child interactions, including mutual, positive engagement in activities, provide children with the necessary opportunities for word learning (Hoff & Naigles, 2002). In particular, the use of verbally responsive statements and questions to children’s actions and
vocalizations directly relate to toddlers’ word comprehension and productive vocabularies (Tamis-LeMonda et al., 1996; Tomasello & Todd, 1983; Harris, Jones, Brookes, & Grant, 1986; Carpenter, Nagell, & Tomasello, 1998; as cited in Hoff & Naigles, 2002). These findings are consistent across familiar and unfamiliar routines (Hoff & Naigles, 2002), suggesting that aspects of how parents structure communicative events with their children are related not only to the settings in which interactions occur (Hoff-Ginsberg, 1991), but are also related to the manner in which parents provide input to their children.

There are two major classifications of parenting styles frequently discussed in the poverty literature that highlight differences in parent-child engagement—the authoritarian and authoritative styles of parenting (Baumrind, 1967; as cited in Hoff, Tardif, & Laursen, 2002). Authoritarian parenting refers to a style of parent interaction that is more demanding and less responsive to children’s needs, while authoritative parenting is regarded as a style of parenting that is less demanding and more responsive to children. Parents in low-income households are more likely to rely on authoritarian parenting, through greater use of directives (e.g., “go get the cup”) and prohibitives (e.g., “don’t do that”) in their talk to children (Hart & Risley, 1995). By contrast, higher-SES parents demonstrate a more authoritative parenting style, where parents are less demanding in their language use to children and more responsive to child communicative attempts (Hoff, 2003). These verbal social pragmatic differences across SES level are highlighted in a study by Hoff-Ginsberg (1991), who found that during structured play and daily activities, low-income parents were less likely to rely on verbal social pragmatic acts, such as topic-continuing replies to child utterances, and more likely to produce behavioral directives, when compared to higher-SES parents. However, it is important to note that there have been
some studies that have found no differences in some verbal social pragmatic behaviors across SES groups (e.g., Farran and Haskins, 1980).

**Data-Providing View of Input.** In contrast to the social-pragmatic view of input, the data-providing view of input suggests that conversation between parent and child provides a stream of non-linguistic and linguistic data necessary for children to acquire language (Hoff & Naigles, 2002). In this account, language development occurs when ample amounts of data are provided to children related to all aspects of language development, including phonological, morphological, and syntactic structures, as well as pragmatic acts and word meaning and relationships. Several lines of research support the notion of ample data as being necessary for various aspects of language learning, including evidence to support the origins of early word segmentation, the use of familiar syntactic frames for word learning, and the relationships established between word type and token and subsequent child language outcomes (Hart & Risley, 1995; Hoff & Naigles, 2002; Johnson & Jusczyk, 2001; Mintz, 2006). Thus, taken together, these accounts of language development suggest that parenting styles and practices that support responsiveness to child actions and vocalizations in familiar and unfamiliar routines, while providing ample linguistic input, are necessary for promoting child language development.

For parents living in poverty, there are systematic differences in the “data-providing” communication and language input that parents employ with their children, when compared to higher SES parents. Early in the prelinguistic period of development, parents in low-SES homes have been found to produce a less diverse set of gestures than higher-SES parents when communicating with their children (Rowe & Goldin-Meadow, 2009). Moreover, Rowe and Goldin-Meadow noted that the diversity of gestural input provided by parents across SES levels remains stable as children develop, until at least 42 months of age. Given that gestural input
provides rich cues to a speaker’s meaning and communicative intent, these findings suggest that children in higher-income homes are provided a slight advantage in early communication and language learning. With the use of additional contextual cues for a wider variety of meanings and intents, children from higher-SES homes are provided more evidence to support the new words and language structures that they are learning.

Verbal input has also been found to vary across SES levels and is amazingly stable within families over time. Parents in low-income homes are noted to produce substantially fewer types of words and fewer tokens of words. For instance, Rowe, Pan, and Ayoub (2005) found that maternal talk to children from 14 to 26 months of age in low-SES homes was less lexically diverse than maternal talk used in higher-SES homes. Hart and Risley (1995) also noted that there are consistencies within families for verbal input to children from 9 months to 3 years of age. In their study, low-SES families were highly represented in what they referred to as a “low input” group. On average, low-input caregivers produced 20 million fewer words to their children by the time the children were 36 months of age. Additionally, the vocabulary that low-input parents used was substantially less diverse compared to higher-input parents. More recent studies of language input using a substantially larger corpus of parent language use in low- and higher-income homes (e.g., Warren, 2007) have by and large supported the presence of differences in the amount and type of language input available for children across SES groups.

Finally, other studies have noted that the temporal stability of verbal input is very high within families. Huttenlocher, Vasilyeva, Cymerman, and Levine (2002) found that the quantity of caregiver speech provided to children from 14 to 30 months of age is extremely stable, and varies as a function of maternal education levels. Mothers in this study with less education (i.e., low-SES) typically used fewer word tokens, utterances, and sentences in their talk to their
children. Additionally, as expected, all parents increased the complexity of the language they used with their children as the children matured across development. However, the rate of change in the parent’s language complexity varied as a function of maternal education levels. Mothers with less education had smaller growth over time for the number of words and noun phrases per sentence, as well as the proportion of complex sentences produced.

Thus, for parenting styles and behaviors, parents in low-income homes have been found to rely more frequently on authoritarian practices when engaging with their children in parent-child interactions. This provides a less responsive environment for children in low-income homes to learn language, when compared to children in higher-SES homes. Also, low-income parents have also been found to provide a less rich language learning environment, in terms of the amount of talk available and the diversity of gestures, words, and syntactic structures used. All of the parenting behaviors reviewed in this section, including parenting beliefs and goals, have been linked to slower language development for children living in poverty. Language-related developmental differences related to SES level are evident as early as 14 months of age and are found to remain stable as children enter school (Britto, Brookes-Gunn, & Griffin, 2006; Farkas & Beron, 2003; Rowe & Goldin-Meadow, 2009). The consequence of slower language development is an increased academic pressure on low-SES children as they enter formal education, where the effects of lagging school readiness skills interact with strong academic demands in areas such as literacy. For some areas of language, little to no effect of poverty is noted in child performance. For other areas of language, the effects of poverty are substantial and can remain over a lifetime.
**Language Development and Outcomes for Children Living in Poverty**

Although much research has been devoted to understanding the complex nature of oral language development for children under the age of 5, most of this research has focused on the language behaviors of Caucasian, middle- and upper-class children. Many researchers have also attempted to account for the significant amount of variability in early language development (e.g., Fenson et al., 1994), investigating a multitude of potentially causative factors, such as children’s gender and birth order. Some of this research has looked for systematic differences in child performance that lead to later difficulties or deficits in learning, such as studies focused on late talkers or children with specific language impairments (e.g., Bates, Thal, Fenson, Whitesell, & Oakes, 1989). However, most of the research literature has neglected factors that are related to family SES level as a major contributor to the high degree of variability across children. Fortunately, the past decade has seen a small upsurge in interest in understanding the role of poverty in language development, particularly for semantic development. This research has begun to shed light on some of the critical individual differences seen between children in low-SES and higher-SES homes, which can be tied directly to the language stimulation that parents and other caregivers provide for young children (Hoff, 2003).

**Language Sufficiency versus Language Enrichment.** In order to begin the discussion about language skills of children living in poverty, it is important to operationalize the difference between language acquisition for basic communication within a culture or society and the development of an enriched set of language and literacy behaviors that are necessary for long-term social and economic success. This is particularly important given that most children living in poverty gain sufficient language skills to be effective communicators in their homes, schools, and communities, but often lack a more enriched set of language and literacy skills that are
necessary for success in today’s global economy (National Research Council and Institute of Medicine, 2000).

It is well-known that language acquisition occurs naturally in many different contexts and cultures, and is a complex interaction between biological and environmental influences (Gilger, Ho, Whipple, & Spitz; Hoff, 2001). Language input has been shown to vary greatly across contexts and cultures, but it has been repeatedly demonstrated that child language acquisition is still robust enough to be acquired fully in children from vastly different backgrounds (Hoff, 2006). Although there are consistent differences across cultures in rates of acquisition of skills, all typically-developing children do learn to communicate effectively without the need for specialized interventions. But “sufficient” language acquisition for communicating with others is only part of the picture when considering the long-term outcomes for a particular child within a particular culture or society. Each society establishes what skills are necessary to be a competent and contributing member, and this standardization is often assumed by dominant cultures within a given population (Mages & Pan, 2008). Thus, it is important to understand that what is deemed sufficient for a basic level of language and literacy acquisition may not be consistent with what is expected of one within a given society (NICHHD Early Child Care Research Network, 2005).

In the United States, community standards about what constitutes as “enrichment” versus “sufficient” are driven primarily by the ever-increasing demands for a higher-skilled workforce, beginning with higher developmental and achievement expectations placed on children entering school. As developmental science has discovered new and important information about how and what children learn early in development, middle- and upper-class society has quickly adopted theories of development into their child-rearing practices (Bronfenbrenner, 1958; as cited in Hoff, Laursen, and Tardif, 2002). Since the early work of Bronfenbrenner, more recent
practitioners and researchers have also suggested that low-SES families have not had access to the same types of information as their more affluent peers (Rowe, 2008; Tough, 2008). This separation in parenting practices is analogous to a parenting Matthew Effect, in that a parent’s access to knowledge about child development, like a child’s access to rich forms of literature, helps the rich literally continue to get richer, while the rest rapidly fall behind (such as suggested in Bakermans-Kranenburg, Van IJzendoorn, & Bradley, 2005; see also see Stanovich, 1986, for information on the Matthew Effect). Stanovich’s model proffers a “rich get richer”, bootstrapping style of development, where children who are provided richer earlier experiences have a developmental advantage compared to children who are provided less optimal learning environments. In order for low-SES children to be more competitive in our current society, it is necessary to find ways to address the differences that are seen in parenting practices related to language and literacy skills. Thus, discrepancies in achievement across SES levels might not be established before children enter school, and could lessen the chance that differences would continue to exist as children move into adulthood.

**Poverty and Prelinguistic Communication Skills.** The first two years of life are characterized by the rapid growth in children’s ability to relate to others in their environment, segment information from the speech stream, and create a sophisticated system of communication with those around them. This prelinguistic stage of communication is important for subsequent language development and is characterized by a rapid shift from early vocalizations, through the use of non-symbolic and symbolic gestures, and finally to verbalizations that distinguish a child’s move into formal oral language use. Research has only begun to emerge about the prelinguistic period of development for children living in poverty. The studies that have been conducted all suggest that infants and toddlers who
are low-income produce fewer communicative bids than their wealthier peers, though there is no
difference in their capacity to produce early sounds (e.g., Oller, Eilers, Basinger, Steffens, &
Urbano, 1995; Hammer & Weiss, 1999; 2000; Dollaghan et al., 1999). Some have found that
differences in caregiver use of child-directed gestures (e.g., Rowe & Goldin-Meadow, 2009) and
child-directed speech (e.g., Hart & Risley, 1995) are related to differences in child gestural and
verbal communication skills.

In one of the earliest studies of prelinguistic communication differences of children
across SES groups, Oller et al. (1995) longitudinally investigated the early vocalizations of very-
low-SES, low-SES, and middle-SES infants at 4, 10, and 16 months of age. Oller et al. found
that there were no differences in the onset of canonical babbling or in the ratio of vowels and
quasivowels to consonants for infants across SES groups. However, differences emerged in the
volubility of speech (using the mean number of utterances per minute) across age and SES
group. All groups produced a statistically similar number of utterances at 4 months of age;
however, the MSES infants produced significantly more utterances per minute at ages 10 and 16
months, compared to both lower SES groups. Thus, early in development, children from low-
income homes demonstrate no differences in the emergence of canonical babbling, but vary in
the frequency of communication events attempted as children age as a function of SES level.

Differences in the rate of communication attempts by children across SES groups
continue to be noted as children move through the prelinguistic communication stage. For
example, Hammer and Weiss (1999) found that during free play sessions with their mothers, 13-
to 18-month-old infants who were low-SES demonstrated half as many vocalizations as middle-
SES infants. Similarly, Peralta de Mendoza (1995) noted differences in the number of child
verbalizations across low-SES and middle-SES groups for children ages 12 to 24 months.
Children from low-SES homes were significantly less verbally communicative during shared book reading sessions, either spontaneously or upon request by a parent, than children in middle-SES homes. These studies hint at the notion that early babbling behaviors seem immutable by differences in parent behaviors across SES. However, differences in rate of child vocalizations are seen as intentional communication skills begin to emerge by 10 months of age.

Finally, more recent research has found some differences in gesture lexicons of children across SES levels. Rowe and Goldin-Meadow (2009) found that children from lower SES backgrounds demonstrated smaller gesture lexicons at 14 months, which was related to the amount of gesture production by caregivers. Also reported in this study and in Rowe, Özçalışkan, and Goldin-Meadow (2008), smaller gesture lexicons of low-SES children at 14 months of age were related to smaller receptive vocabularies at 42 and 54 months of age.

Thus, some prelinguistic behaviors, such as early use of sounds, appear immutable by the effects of poverty. Other prelinguistic behaviors, such as gesturing, vocalizations, and early verbalizations, appear more affected by the reduced gestural and verbal input provided by low-SES parents. When taken with the information presented about data-providing input for language development, it may be possible that children living in poverty hear a sufficient amount of phonological information from even limited amounts of verbal input to allow a natural emergence of canonical babbling and vowel usage to occur. By contrast, semantic information and nonverbal social pragmatic acts are more complex behaviors that rely, to at least some degree, on aspects of joint attention and intentionality when children are learning language. Thus, children may be provided significantly fewer exemplars of these skills during early development, which creates significant differences in the developmental outcomes for early phonological, semantic, and sociopragmatic skills.
Poverty and Linguistic Communication. As young children enter into linguistic communication around the age of 2, they begin to acquire greater ability to understand and produce the language of their home and community. A large amount of research has demonstrated that the development of language skills from the toddler stage of development until school entry occurs quite rapidly (e.g., Fenson et al., 1994). Some areas of language develop more adult-like sophistication across this age range, such as phonological or morphosyntactic skills, whereas other areas of language, such as semantic skills, continue to develop over a lifetime.

By contrast, research into the linguistic development of children living in poverty has been limited or nonexistent in some areas (such as pragmatics and narrative skills) and more robust in others. Findings from the available research suggest that for some areas of language, there is no difference in the acquisition of skills across SES levels. For instance, Dollaghan et al. (1999) found that there were no differences in early phonological development, when comparing the phonetic accuracy of 3-year-old children across SES level. Other areas, such as morphosyntactic skills, show some degree of difference across SES during the preschool years of development (e.g., Vasilyeva, Waterfall, and Huttenlocher, 2008). Finally, the development of semantic language appears most affected by children’s exposure to poverty, with large differences in skill development noted before children enter school.

Morphosyntax. Research in the morphosyntactic development of children across SES groups points to a slower developmental trend for early morphosyntactic skills, with differences resolving, in at least most aspects of morphosyntax, by school entry. Vasilyeva, Waterfall, and Huttenlocher (2008) examined the emergence of syntactic skills of children, ages 22 to 42 months, across SES levels using language sample analysis. These researchers found no
differences in the onset of basic forms of syntax, where children displayed similar production of simple sentences across SES level. However, differences were noted in the children’s productions of complex sentences, where low-SES children began producing complex sentences later than higher-SES children. Also, low-SES children used fewer complex sentences, in proportion to the total number of sentences produced across the development, from 22 to 42 months of age and used a less diverse repertoire of complex sentences compared to higher-SES children. However, the researchers noted that although there were differences in frequency and complexity of syntactic output, there were no differences across SES level in the proportion of complex sentences produced that were grammatically complete (i.e., dropping a critical grammatical element in the sentence, such as a pronoun or the subject of the sentence).

In another study of morphosyntactic development across SES levels, Huttenlocher, Vasilyeva, Cymerman, and Levine (2002) examined the syntactic development of 4-year-old children (ages 54 to 60 months) in informal assessments of syntactic comprehension and production. Huttenlocher et al. found that low-SES 4-years-olds demonstrated reduced comprehension of complex sentences when compared to higher-SES children. Also, the researchers found that children from low-SES homes produced a smaller proportion of multi-clause sentences at home and at school. Using a similar measure of comprehension skills, Noble, Norman, and Farah (2005) investigated the receptive grammatical development of 5-year-old children across SES levels using the Test of Reception of Grammar (TROG). The researchers found no differences in sentence comprehension abilities across SES groups for children’s raw scores on this measure. Thus, a developmental trend appears to emerge from the handful of studies of morphosyntactic development of children living in poverty, where low-SES children develop most morphosyntactic skills at as a slower rate than children who come from higher-SES
homes, but begin to match the same comprehension of morphosyntactic skills of higher-SES children as they enter school. These trends suggest a resolution of delays for children from low-SES homes; however, further research is needed to determine the full extent of effects of poverty on morphosyntactic development across early and middle childhood.

**Semantics.** Semantic development has been the most frequently studied area of language development for children living in poverty, though findings in this area are still somewhat limited. Several researchers have noted that the rate and quality of child semantic development is much slower for children living in poverty than children living in higher-SES homes. Other studies suggest that children in low-income homes show similar potential for word learning when compared to their wealthier peers (Horton-Ikard & Ellis Weismer, 2007), which provides evidence of no significant biological issues that would preclude children living in poverty from learning similar amounts of semantic knowledge as middle-SES children.

From the end of the prelinguistic stage of communication until school entry, a number of studies have demonstrated that caregiver input is implicated in less robust semantic development for children living in poverty. Hart and Risley (1995) noted that infants and toddlers raised in “low-input” homes (a designation that overlapped to a large degree with low-income status) had smaller receptive and expressive vocabulary sizes when tested at 36 months of age. In fact, the average expressive vocabulary size of children in this study from low-input households was approximately half of the size of children from high-input homes (approximately 500 versus 1000 words). Similarly, Pan, Rowe, Singer, and Snow (2005) found that for children in low-SES homes, the number of different words (NDW) produced by children between the ages of 14 and 36 months was directly related to the lexical diversity of maternal input versus the quantity of
maternal input. Children from low-SES who heard less diverse verbal input in the environment used a smaller number of different words than children from higher-SES homes.

Though a sizeable discrepancy in early semantic development has been noted for children across SES groups, this difference does not appear to be due to differences in underlying abilities in word learning. Horton-Ikard and Ellis Weismer (2007), in a study of low-SES and middle-SES African-American children from 30 to 40 months of age, found that low-SES children had consistently lower scores on receptive vocabulary on the Peabody Picture Vocabulary Test—Third Edition (PPVT-III) and on expressive vocabulary on the Expressive Vocabulary Test (EVT). The researchers also found that children from low-SES homes displayed a less diverse verbal lexicon than children from middle-SES homes in the study. However, when children were assessed on a fast-mapping task, where children were exposed to novel words and later tested on their comprehension and production of these words, there were no differences in word learning abilities across SES levels. Thus, it appears that the quality of caregiver input is a key factor in the quality of child semantic comprehension and output; however, there are no indications that children living in poverty have any fundamental differences from children in higher-SES homes for their potential to learn new words.

As children move through the remainder of early childhood and into middle childhood, low socioeconomic status continues to negatively affect the pattern of development for children’s semantic skills. For example, Farkas and Beron (2004) investigated the receptive language development of children ages 3 to 13, using the Children of the National Longitudinal Survey, Year 1979 (Children of NLSY79). These developmental data were collected biennially on approximately 4,900 to 7,400 children ages birth to 18, from the years 1986 to 2000 (depending on the number of children per birth year across the study), who were the offspring of participants
in the National Longitudinal Survey in 1979 (Bureau of Labor Statistics, 2005). Children were assessed cross-sectionally on the PPVT-III to examine the developmental trends in receptive vocabulary skills across this population of youth. Data were then pooled for each year of development (i.e., ages 3 to 13) and analyzed using hierarchical linear modeling. Results showed that children across race/ethnicity and SES level already showed significant differences at age 3 in receptive vocabulary sizes. Caucasian children demonstrated higher PPVT-III scores than African-American children, and high-SES children performed better than low-SES children on the assessment. Also, these differences remained stable in the growth curve estimates across the preschool and school-age periods of development. Additionally, several interactions between race/ethnicity and SES levels emerged from the data. Low-SES Caucasian children performed poorer than higher-SES Caucasian children at age 3, and these differences remained stable in the growth curve estimates through age 13. By contrast, low-SES African-American children comprehended fewer vocabulary words than higher-SES African-American children at age 3, and the gap between these two social groups widens until ages 5 to 6, at school entry. At that point, the gap between low-and higher-SES African American children ceases to widen, and remains stable until age 13. Thus, the semantic development of children appears to be highly negatively affected by low-socioeconomic status and minority status. Children that are noted as being low-income and children who are of minority status are more likely to understand fewer words at age 3 and demonstrate a less robust developmental trend in their comprehension of vocabulary into their adolescent years.

These findings about semantic development, in and of themselves, do not constitute a crisis in child development for children living in poverty. However, semantic skills, a blend of linguistic and conceptual knowledge, are key features in, among other things, the acquisition and
development of the “meaning-based” aspects of literacy skills (e.g., Lonigan, 2002; Lonigan, Burgess, Anthony, & Barker, 1998; Scarborough, 2001; Whitehurst and Lonigan, 1998). The study by Farkas and Beron again highlights the phenomenon called the Matthew Effect (Stanovich, 1986), a framework reminiscent of Sameroff’s transactional model of development. In Farkas and Beron’s study, this bootstrapping style of development contributed to significant growth curve differences in semantic skills across SES group and race/ethnicity from the preschool years until early adolescence. If these data are added to the findings from the prelinguistic period by Rowe and Goldin-Meadow (2009) and the early linguistic period by Pan et al. (2005), differences in the mental representations of words and concepts begin as early as 14 months of age for children living in poverty. It is possible to trace the root of these differences back to the quality of gestural and verbal input provided by caregivers in the proximal environment.

**Overview of Current Dissertation Study**

As discussed in this chapter, caregivers have the primary responsibility for creating and sustaining a rich language learning environment for young children. This is carried out through the material and developmental supports provided by caregivers, which are significantly influenced by the resources available to parents. As such, parents living in poverty have less knowledge of child development, have more parenting stress, and have less ability to plan and execute teaching goals related to child language skills and other areas of child development. And as a result, children living in poverty demonstrate a slower rate of language development compared to their wealthier peers, particularly for semantic skills. This creates less favorable learning conditions for children as they transition into formal academic training, and increases the risk for negative long-term developmental outcomes.
The next chapter will present the methods for a study that will investigate the early feasibility of a preventative language-based intervention on modifying features of caregiving that are known to affect child language outcomes. The intervention program, called the Caregiver-Child Language Apprenticeship Program (CcLAP), was created to increase a caregiver’s knowledge of child language development and skills related to support of language in the proximal environment.

The proposed intervention regards parents as unique agents in shaping the development of their children (Bandura, 2001), as the quality of a child’s language-learning environment is significantly influenced by the caregiver’s knowledge about child development and their use of responsive language behaviors. Specifically, some researchers have suggested that children’s language and literacy behaviors develop through an apprenticeship-like relationship between adults and children (Britto, Brooks-Gunn, & Griffin, 2006; Teale & Sulzby, 1986). In this conceptualization, apprenticeships promote learning within the natural environment over time, where the behaviors of interest, such as language use, regularly take place. Caregivers are viewed as knowledgeable guides to their children, using their own skills and knowledge to shape the learning opportunities of their lesser-skilled language “protégés.” It is through this lens that this program was created.

**Research Questions and Hypotheses**

The purpose of this study is to determine the early feasibility of a home-based preventative language intervention for caregivers and children living in poverty. This study addresses two types of research questions related to the early implementation of a novel language stimulation program. These research questions investigate (1) possible changes in parent
behavior as a result of the proposed intervention and (2) the feasibility of the intervention program and research study, as designed.

**Parent Language Stimulation Intervention**

First, this study attempts to modify specific caregiver-related factors that are affected by poverty, which would be expected to, in turn, affect early language outcomes. The CcLAP language stimulation intervention was designed to directly address the human capital parents have available for parenting, and the caregiver’s role in nurturing child language development, as seen in Appendix D. This is accomplished through increasing the caregiver’s knowledge of child semantic development and child temperament and the parent’s use of three parenting practices known to affect language development—language stimulation behaviors, responsive parenting practices, and promotion of child language development in the home environment.

**Knowledge of Development.** As noted previously in this chapter, the knowledge that parents have about development and child behavior affects the stimulation they provide to children. This intervention directly addresses the caregiver’s knowledge of development by providing information about several areas of research in language development. The intervention addresses the relationship between caregiver linguistic input and child language development (e.g., Hart and Risley, 1995) and presents basic elements of Bronfenbrenner’s (1979) model of ecological systems of development. Activities in all four sessions focused on helping parents improve their knowledge of child development. Additionally, information about how child temperament affects parent-child interactions was also included in this study, to help caregivers understand that children bring their own unique ways of processing information to the language-learning task.
Thus, several discussions and activities were devised to include the following parent behavior outcomes. After receiving training, parents will:

1. Understand what language development is and how it is supported in the daily environment (Session 1);
2. Understand basic sociocultural influences on child language development (Session 1); and,
3. Understand the basic areas related to child temperament and how parents can modify interactions with their child to adapt to the child’s temperamental and behavioral needs (Session 2).

Several additional outcomes related to knowledge of child language development are also addressed in the remaining three target areas below, as they are highly connected to the other specific parent behaviors being targeted by the intervention.

**Language Stimulation.** Research on the lexical diversity differences across SES groups suggest that parents who produce more diverse lexicons (versus purely talkativeness) raise children who have more diverse receptive and expressive lexicons (e.g., Hart & Risley, 1995; Pan et al., 2005). Connectionist models of language development (e.g., MacWhinney & Li, 2008) become relevant in this discussion, as lexical items within semantic maps, which are activated more frequently, are more easily accessed by a communicator. This is due to a shift in the distribution of neural weightings between words that occurs through language experience, in an effort to streamline processing of information (e.g., Merriman, 1999). Thus, this type of selective brain activation can be accelerated, or decelerated, by the amount of lexical input that is provided in the child’s environment. Several discussions and activities that address differences in lexical diversity across environments were developed. These activities provided parents with
information on basic principles of connectionist models, in lay person’s terms, and gave parents an opportunity to experience issues of lexical diversity firsthand.

These discussions and activities included the following outcomes. After receiving training, parents will:

1. Understand and experience firsthand the differences between high levels of input and low levels of input (Session 1);
2. Understand how semantic representations and relationships are developed and cultivated through experience (Sessions 1-4); and,
3. Experience firsthand the feeling not knowing a label or function for an object (as a child might experience), how one can go about learning that information as an adult, and how parents can support children’s development of word learning by being sensitive to child interests and child needs (Session 2).

**Responsive Communication.** Research on parenting practices has revealed that certain responsive techniques are effective at promoting caregiver language stimulation behaviors. These techniques have emerged from a variety of language stimulation interventions for children with language delays and disorders, and children with at-risk language development status related to poverty (e.g., Arnold et al., 1994; Fey, 1986; Girolametto, Pearce, & Weitzman, 1994; Yoder & Warren, 2001). Several techniques were incorporated into the intervention, which provide parents with specific skills that promote parent-child interactions and are indicative of authoritative, versus authoritarian, parenting behaviors (Kaiser & Delaney, 1996). To teach these techniques, several activities were developed that allow parents to be educated on general issues of responsive language and to practice role playing responsive communication scenarios.
These discussions and activities included the following outcomes. After receiving training, parents will:

1. Understand a basic communication model, as it applies to responsive parent-child interactions and child communication attempts (model adapted from Pence & Justice, 2007) (Session 2);

2. Follow and respond to the child’s communication attempts (verbal and/or nonverbal) to facilitate the child’s linguistic mapping (Yoder & Warren, 2001) (Session 1, 2, and 3);

3. Use expansion techniques to increase the linguistic information available to the child within the communicative event (Yoder & Warren, 2001) (Session 2);

4. Develop a focus for daily support of semantic development, through an understanding of the varieties of words that can be targeted in a parent-child communication event (Girolametto, Pearce, & Weitzman, 1994) (Session 2);

5. Use dialogic reading principles during shared storybook interactions. (Arnold et al., 1994; Whitehurst et al., 1988) (Session 3);

**Promotion of Child Development in the Home Setting.** Finally, previous studies have shown that parents’ promotion of language development has a strong influence on children’s language outcomes (e.g., Britto, Brooks-Gunn, & Griffin, 2006; Burchinal et al., 2000). This intervention incorporates aspects of this research by providing caregivers opportunities to explore the use of routine-based daily language stimulation during play time, shared book reading, and activities of daily living.

In this study, activities were developed that allow parents to role play scenarios that focus on supporting language in everyday activities and brainstorm ways in which language can be
supported on a daily basis. These discussions and activities included the following outcomes.

After receiving training, parents will:

1. Use age-appropriate low-cost toys or materials to support child language development during play and daily living activities (Sessions 1-4);

2. Support language development during shared storybook reading times throughout the day (Session 3);

3. Develop an understanding of the material and developmental supports that parents provide to children, which support language development directly and indirectly (Session 4);

4. Develop an understanding that language development occurs during both exciting, preplanned activities and more routine-oriented, quotidian events (Session 4).

**Indirect Treatment Effects.** In addition to the direct effects of the proposed intervention discussed above, several indirect effects were also considered. Social causation theory suggests that there is a relationship between parent resources, parent stress and self-efficacy, and parenting behaviors. As part of this investigation, indirect effects of the intervention were assessed for parent stress levels and a parent’s sense of self-efficacy. This will help determine if there are additional benefits to parents from this intervention for these variables, beyond those behaviors that are directly trained.

**Cumulative Risk Status.** Social causation and social risk theories (Sameroff et al., 1993) suggest that larger amounts of economic and social risk affect child outcomes more than fewer risks to development. As a means of assessing the viability of incorporating a cumulative risk model within this particular line of intervention research, a collection of social and family risks, called a family’s cumulative risk status, were investigated for this study and reported in the demographics section of the results section.
Intervention Outcomes

Given the above teaching goals of this invention, the research questions for this portion of the study are as follows:

1. Do caregivers produce increased levels of language stimulation in the home environment?
2. Do caregivers demonstrate increased responsiveness to child language needs?
3. Do caregivers demonstrate increased knowledge of child development?
4. Do caregivers demonstrate increased promotion of child development in the home?
5. Do caregivers demonstrate greater feelings of parent self-efficacy?
6. Do caregivers have reduced levels of parenting stress?

**Intervention Outcomes Hypotheses.** As a result of parents receiving the proposed intervention, several direct and indirect changes were hypothesized to occur in caregiver behaviors, based on the ecological and social causation frameworks provided earlier in this chapter. First, it was hypothesized that the proposed intervention would have a positive direct effect on parents’ human capital related to child rearing and on the amount of language-based investments parents make in their children’s development. Next, it was hypothesized that the proposed intervention would have a positive *indirect* effect on parent stress levels and a parent’s sense of self-efficacy. In social causation theory, parent stress levels and parent self-efficacy are theorized to directly affect changes in child outcomes via parent nurturance practices. However, it is possible that changes in the bidirectional nature of caregiver-child interactions (Sameroff & Chandler, 1975) in this intervention could induce positive outcomes for these parenting-related behaviors. Finally, given that previous research has found that positive outcomes are greater for those with more risk to child development (e.g., Brooks-Gunn, Gross, Kraemer, Spiker, &
Shapiro, 1992), it was hypothesized that families with more risk to child development will produce more robust results in this study.

**Assessment of Early Feasibility of Intervention**

Finally, as this study was exploratory in nature, it was important to develop some understanding of the feasibility of various aspects of the intervention and research design, in an effort to streamline future research with the CcLAP intervention and other related variables of interest. Thus, the research question for this portion of the study was as follows:

Can a parent training program (designed to target the caregiver’s knowledge of child development, promotion of child language development in the home environment, use of responsive language stimulation techniques, and use of language stimulation behaviors) be successfully implemented with low-income caregivers and their children?
CHAPTER III

Methods

The previous chapters have provided a basis for understanding key issues related to child development in the context of poverty. Chapter 1 introduced the effects of poverty on environmental input and child outcomes, as well as the need for SLPs to engage in the discussion surrounding poverty-related interventions. Chapter 2 provided the theoretical framework underlying current developmental research in the area of poverty and how it relates to language development for children living in poverty. This framework suggests that 1) there are multiple factors that comprise SES, including reduced knowledge of development, increased levels of parent stress, and reduced levels of parenting self-efficacy; 2) these variables affect the language stimulation caregivers provide to their children through various parenting behaviors; and 3) the language development of children living in poverty is not as robust as the language development of their wealthier peers. This framework established the foundation on which the current investigation was created. In this chapter, proposed methods will be reviewed for an early feasibility study of the CcLAP intervention.

Research Design

In the original research proposal, this experiment was designed to incorporate the use of a single-subject multiple baseline design, with an embedded pretest-posttest feature for the main research experiment. Prior to this experiment, a pilot study was to be conducted, which was designed as an abbreviated version of the multiple baseline design for the main study. Due to significant issues with recruitment of participants, the main multiple baseline experiment was not conducted. Instead, the pilot study design served as the main experiment that will be reviewed in the remainder of this document. The original research design for the multiple baseline main study as proposed is included for reference in Appendix E (for the written text) and Appendices
F and G (for visuals of the design). These items were included to allow readers the opportunity to understand the reasoning behind the choice of the main design and how it relates to the design choice for the pilot feasibility experiment that was conducted for this study. The completed pilot study design will be presented below.

Pilot Study Design

A pilot study was conducted to determine whether the planned assessments and activities proposed for the main experiment could be successfully implemented with one caregiver-child dyad. This pilot study used an abbreviated version of a single-subject, multiple baseline design, with an embedded pretest-posttest design. A table that provides a visual summary of the entire pilot study research design is provided in Appendix H.

Data were collected for the single-subject design across a single baseline and four training sessions. This portion of the pilot study design allowed for repeated measurement of two variables before and after the intervention—parent lexical diversity and parent responsivity to child communication attempts. These two variables correspond to Intervention Outcomes research questions 1 and 2.

In addition to the pilot for the multiple baseline design, a pilot study of the one-group pretest-posttest design from the main experiment was also conducted. This design was used to explore several of the constructs that could not be appropriately accommodated in the pilot of the multiple baseline design, as these data could not be collected repeatedly across sessions. For this portion of the study, parent knowledge of development, parent self-efficacy, parent stress, and parent stimulation of development in the home setting were assessed to investigate both direct and indirect effects of the proposed intervention. These variables correspond with Intervention Outcomes research questions 3-6.
Finally, feasibility of the study was assessed from both the vantage point of the lead researcher and the vantage point of the caregiver participant in the study. This qualitative aspect of the research study was included to allow for reflection by the lead researcher and adult participant on various portions of the study for future research with the proposed intervention. This portion of the study corresponds with the Assessing Early Feasibility of Intervention research question 1.

This type of pilot study design is considered a pre-experimental design, akin to a case study (Yin, 2009). This design is inherently weak for use in confirmatory studies, as it does not adequately control threats to internal validity, such as the effects of history, testing, and maturation (Creswell, 2008). This is due to the lack of a control group, multiple participants in the treatment group, or randomized assignment of participants across groups. However, as this study was conducted as an early feasibility study with a single participant dyad, any results from this study will be interpreted as exploratory in nature only, and not confirmatory of individual outcomes.

**Participants**

One parent-child dyad participated in this study. The child participant was a 23-month-old female. She was a monolingual speaker of English, Caucasian, and had no history of speech-language-hearing disorders or treatment. The adult participant was the child’s biological mother. She was a monolingual speaker of English, Caucasian, and evidenced low-income status per the requirements below.

A second parent-child dyad completed recruitment for the study, but dropped out due to maternal health issues. Six other parent-child dyads expressed interest in the program, but
dropped out of recruitment due to family issues (e.g., moving to a homeless shelter) or lack of follow-up contact.

**Participant Recruitment**

Participants were recruited from the Southeastern Michigan and Northwest Ohio region. Parent educators, social workers, and program coordinators from local early childhood community programming and social service agencies were asked to provide information about the study to potential participants in their programs. Interested parents were provided written information about the study and the consent form. Written information about the study included time expectations for the participants, details about monetary incentives for participation, and basic information about the study design (i.e., the study involves assessments, will take place at the family’s home, scheduling to take place at the convenience of the family and researcher). If parents were interested in participating in the study, they were asked to contact their program coordinator or directly contact the lead researcher for the study. The program coordinator provided contact information for those interested parties to the lead researcher, and direct contact was then made by the lead researcher.

If any additional questions or concerns arose about the study during the recruitment phase, caregivers were provided contact information for the lead researcher on the consent form, so that parents could directly speak with the principal investigator if there are additional questions or concerns. Potential participants were also instructed on the consent form that they may withdraw from the study at any time and that any concerns about their rights as a participant may be directed to the chair of the Human Subjects Review Board at the university.
Eligibility Instrumentation

Demographics Questionnaire

A demographics questionnaire was constructed for this study, and can be found in Appendix I. This questionnaire includes several questions related to the family’s SES level (consistent with the Hollingshead Four-Factor Index of Social Status), as well as questions related to child age, race/ethnicity, languages spoken in the home, and history of child language development. The questionnaire also includes additional items related to cumulative risk status for the determination of cumulative risk status, which will be explained in detail later in the chapter.

Hollingshead Four-Factor Index of Social Status

The Hollingshead Four-Factor Index of Social Status (Hollingshead, 1975) is a composite measure of family SES, which is comprised of four factors deemed important for social and economic status within a community—marital status, sex, education, and occupational prestige of the caregiver(s). These factors are combined and scaled to provide a composite measure of social status (Ensminger & Fothergill, 2003). This index has been frequently used in studies of child development, including research on early language development (e.g., Senechal & Cornell, 1993).

Demographic data were collected from parents on the four socioeconomic factors outlined in Hollingshead (1975). The first factor involves the determination of marital status of the caregiver. For caregivers married and living with a spouse, but only one spouse is gainfully employed, the social status of the family is based on that head of household. If both spouses are employed, then the education and occupation of each spouse is used to form an estimate of the family’s social status. The Sex Factor is evidenced by the person’s gender (i.e., male or female).
The Education Factor is based on the level of school completed and is scored using a categorical scale (1—less than 7th grade; 2—9th grade; 3—10th or 11th grade; 4—high school graduate; 5—partial college, at least 1 year, or specialized training; 6—college graduation; 7—graduate degree). And finally, the Occupational Factor is rated on a 9-point occupational prestige categorical scale developed by Hollingshead, with occupational titles provided corresponding to the 1970 Census code list for occupations, as seen in Table 1 below. Occupational status is used by Hollingshead because one’s occupation is indicative of not only the income associated with one’s employment, but of the additional social rewards that are associated with such positions. For instance, physicians are seen as having more social rewards than childcare workers even if in a rare case a physician might make less income than the childcare worker.

Table 1

*Hollingshead Occupational Factor Scale*

<table>
<thead>
<tr>
<th>Occupational Factor Score</th>
<th>Occupation Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Scientist, dentist, lawyer, physician, college professor</td>
</tr>
<tr>
<td>8</td>
<td>Accountant, school administrator, airplane pilot, librarian</td>
</tr>
<tr>
<td>7</td>
<td>Actor, artist, reporter, social worker, elementary school teacher</td>
</tr>
<tr>
<td>6</td>
<td>Dietician, forester, construction inspector, retail sales manager</td>
</tr>
<tr>
<td>5</td>
<td>Bank teller, bookkeeper, library attendant, therapy assistant</td>
</tr>
<tr>
<td>4</td>
<td>Airline attendant, brick mason, carpet installer, firefighter</td>
</tr>
<tr>
<td>3</td>
<td>Hairdresser, health aide, punch/stamping press operator</td>
</tr>
<tr>
<td>2</td>
<td>Busboy, childcare worker, waiter, freight handler</td>
</tr>
<tr>
<td>1</td>
<td>Stock handler, janitor, farm laborer, welfare dependent</td>
</tr>
</tbody>
</table>

Validation information about the Hollingshead Index is somewhat limited. Hollingshead (1975) stated that correlations between education status scores and occupational prestige scores
were high, and generally the same for males \((r = .835, p < .00001)\) and females \((r = .849, p < .00001)\). Correlations between median income (in dollars) and occupational prestige score were also high for males \((r = .781, p < .00001)\) and females \((r = .672, p < .00001)\). Subsequent research by Bornstein et al. (2003) found that the Hollingshead Index was highly correlated with other SES measures frequently used with infants and their families, including the Duncan Socioeconomic Index for Occupations \((r = .79, p < .001)\) and the Siegel Prestige Scale \((r = .73, p < .001)\).

**Language Development Survey**

The Language Development Survey (LDS) is a screening measure of language development for toddlers that was originally designed for use in pediatric clinics. The LDS is a simple one-page screening tool that allows for collection of information on children’s spontaneous production of words through parent report, using a 310-word checklist with 14 semantic categories. Information on whether children are combining words into phrases and a parent-reported sample of children’s three “best” sentences are also collected. This information is then used to determine if the child is at risk for an expressive language delay. This is defined in Rescorla (1989) as a Delay 3 cutoff, where children produce fewer than 50 words or have no word combinations (e.g., Rescorla & Achenbach, 2002; Klee et al., 1998).

The LDS was originally normed on a fairly diverse sample of 22- to 26-month-old children, related to race/ethnicity and SES (Rescorla, 1989). The LDS has been shown to have excellent test-retest reliability and very good concurrent validity with other available formal language measures. Test-retest reliability was established in Rescorla (1989), with extremely stable 1-week reliability for productive vocabulary scores (Cronbach’s \(\alpha = .99\)), as well as for a 23-day reliability test for productive vocabulary scores (Cronbach’s \(\alpha = .97\)), and a 23-day
reliability test for mean length of phrases reported by parents (Cronbach’s α = .87). The LDS also has very good concurrent validity with other naming tests and parent report measures. Children’s performance on the LDS is highly correlated with object/picture naming items from the Bayley Mental Development Scale and the Reynell Expressive Language Scale (combined $r = .87$), as well as with a combination of naming items from the Bayley and the PLS (combined $r = .79$).

**Eligibility Procedures**

For the purposes of determining a dyad’s initial eligibility for this study, interested parents completed the demographics questionnaire and the LDS during the initial consent-signing meeting, after consent was gained from the family. Any questions by the parents about the measures were answered to their satisfaction. The demographics questionnaire and LDS were reviewed after completion by the parent, to determine the family’s eligibility for the study. If a family was eligible for participation in the study, all procedures for the study were again reviewed, including information on incentives for participation ($15 paid to families for each completed session, with $100 paid to families if all sessions were completed). Completion of the study was not contingent on child behavior or willingness to participate.

**Scoring of Hollingshead Four-Factor Scale**

A family’s total score, called the Social Status score, is determined by weighting the factor score for occupational prestige by a multiplier of 5, the factor score for education by a multiplier of 3, and then dividing by 2 (if based on a 2-caregiver household). Scaled scores range from 8 to 66 and are divided into 5 social strata (Level 5—66-55; Level 4—54-40; Level 3—39-30; Level 2—29-20; Level 1—19-8). For the purposes of this study, LSES was defined as scoring as a Level 1 or 2 on the 5-level Social Status scale, consistent with prior shared book
reading and semantic development interventions (e.g., Senechal & Cornell, 1993). Families who have a Social Status score at a Level 3 or higher were excluded from the study.

The mother who participated in this study was not regularly employed and only noted a yearly income of $75 on her income taxes. She received a bachelor’s degree and was a single mother of 4 children. Her occupational status scaled score was a 1, and her educational status scaled score was a 6. The family’s total score using the occupational and educational status weights was 23. This score corresponds with Level 2 on the Hollingshead, which matched the qualifications for SES level for the study.

**Scoring of LDS**

Information collected on the LDS about vocabulary size and mean length of phrase were used to determine whether a child passed the language screening measure, which is consistent with Delay 3 criteria from Rescorla (1989). This measure was hand-scored by the lead researcher during the eligibility determination session, while the parent completes other written measures. Children who were reported to produce fewer than 50 words or have no word combinations were to be excluded from the study. The results of this screener indicated that the child participant in this study verbally produced 249 total words and 2- to 4-word utterances, thus qualifying for participation.

**Demographic Information: Cumulative Risk to Development**

Additional data were collected on several demographic variables that were used to detail the amount of poverty-related risk to which the child is exposed. Sameroff, Seifer, and Barocas (1987) originally devised the cumulative risk method to account for the effects of various known risks to child development in a more dynamic systems approach (Lerner, 2003; Lerner, Rothbaum, Boulous, & Castellino, 2002). Sameroff and colleagues theorized that children who are
exposed to more risks would have significantly poorer developmental outcomes. To test this theory, 10 common risk factors for child development were used in their original model, with each risk factor scored to represent either low risk or high risk. The researchers found that a combination of risk factors, and not single risk factors alone, accounted for significant differences in child development, such as verbal IQ scores. Other researchers have modified this list to more fully explain variation in specific areas of child development. In particular, cumulative risk models have been developed for explaining the specific risks to development that are associated with child rearing in poverty (Burchinal et al., 2000; Candelaria, O’Connell, & Teti, 2006; Evans & English, 2002; Evans, Kim, Ting, Tesher, & Shannis, 2007; Gassman-Pines & Yoshikawa, 2006; Hooper, Burchinal, Roberts, Zeisel, & Neebe, 1998; Liaw & Brooks-Gunn, 1994).

Measures

Demographics Questionnaire. As previously discussed, a demographics questionnaire was constructed for use in this study to collect information related to participant eligibility and cumulative risk status. Information collected on the instrument that is specific to cumulative risk includes the caregiver’s marital status, education level, household size, and income level. This questionnaire can be found in Appendix I.

Parenting Stress. The Parent Stress Index—Long Form (PSI) was used as a measure of stress related to parenting. Discussion of the measure, including reliability and validity information, can be found in the description of measures in the pretest-posttest portion of the study below.
HOME Inventory for Infants/Toddlers. The Home Observation for Measurement of The Environment (HOME) Inventory for Infants/Toddlers (Caldwell & Bradley, 2001) was used as a measure of parent stimulation of child development. Discussion of the measure, including reliability and validity information, can be found in the description of measures in the pretest-posttest portion of the study below.

Cumulative Risk Procedure

For this study, risk factor information was collected on seven of the factors used in the cumulative risk study of poverty by Burchinal et al. (2000), as seen in Table 2. Most of the data used in the cumulative risk factor score for the current study were collected from the demographics questionnaire. However, additional data from the pretest administration of the PSI and HOME Inventory were also collected for use in calculating the risk factor score. The caregiver completed each of the assessments during either the consent signing session or the first baseline session of the study.

Table 2

Social and Family Risk Factors to Development

<table>
<thead>
<tr>
<th>Social and Family Characteristics</th>
<th>Proposed Assessment</th>
<th>Risk Factor Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital Status</td>
<td>Demographics Questionnaire</td>
<td>Single</td>
</tr>
<tr>
<td>Maternal Education</td>
<td>Demographics Questionnaire</td>
<td>&lt; 12 years</td>
</tr>
<tr>
<td>Household Size</td>
<td>Demographics Questionnaire</td>
<td>≥ 4 nonparents</td>
</tr>
<tr>
<td>Stressful Life Events</td>
<td>Parent Stress Index</td>
<td>≥ 20 events in past year</td>
</tr>
<tr>
<td>Poverty Status</td>
<td>Demographics Questionnaire</td>
<td>&lt; Federal poverty guidelines</td>
</tr>
<tr>
<td>Depression Status</td>
<td>Parent Stress Index</td>
<td>&gt; 90th percentile</td>
</tr>
<tr>
<td>Parent Stimulation Cumulative Risk Score</td>
<td>HOME Inventory for Infants/Toddlers</td>
<td>Total score &lt; 30</td>
</tr>
</tbody>
</table>

Note. HOME = Home Observation for Measurement of the Environment.
<table>
<thead>
<tr>
<th>Social and Family Characteristics</th>
<th>Assessment</th>
<th>Risk Factor Status</th>
<th>Risk Factors Present in Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital Status</td>
<td>Demographics Questionnaire</td>
<td>Single</td>
<td>1</td>
</tr>
<tr>
<td>Maternal Education</td>
<td>Demographics Questionnaire</td>
<td>&lt; 12 years</td>
<td>0</td>
</tr>
<tr>
<td>Household Size</td>
<td>Demographics Questionnaire</td>
<td>≥ 4 nonparents</td>
<td>1</td>
</tr>
<tr>
<td>Stressful Life Events</td>
<td>Parent Stress Index</td>
<td>≥ 20 points for past year</td>
<td>0</td>
</tr>
<tr>
<td>Poverty Status</td>
<td>Demographics Questionnaire</td>
<td>&lt; Federal poverty guidelines</td>
<td>1</td>
</tr>
<tr>
<td>Depression Status</td>
<td>Parent Stress Index</td>
<td>&gt; 90th percentile</td>
<td>0</td>
</tr>
<tr>
<td>Parent Stimulation</td>
<td>HOME Inventory for Infants/Toddlers</td>
<td>Total score &lt; 30</td>
<td>0</td>
</tr>
</tbody>
</table>

### Scoring and Analysis

Information for each of the variables collected on the demographics questionnaire were analyzed to determine if the family fell above or below the cut-off scores establish in Burchinal et al. (2000) (as seen in Table 2). For determining the presence of domain general stressful life events, the number of stressful life events were hand tallied from parent responses on the PSI for the Life Stress subtest. To determine the risk associated with parent stimulation in the home setting, parent-child behaviors and answers to parent interview questions from the HOME Inventory were used to calculate a total score. The total score on the HOME Inventory was derived by hand scoring behaviors during parent-child interactions and responses in the parent interview, consistent with scoring directions in the manual. Finally, a total cumulative risk factor score was calculated for the family, by tallying the number of social
and family characteristics that fall below the risk factor status established by Burchinal et al. A higher score indicates more risk to child development.

A cumulative risk score was computed for the family participating in this study, as seen in Table 3 above. This score indicated that the home environment did present some risk to child development, with 3 of 7 of the risk items present.

Demographics Information: Child Temperament

Measures

**Carey Toddler Temperament Scale.** The Carey Toddler Temperament Scale (CTTS) (Carey, 2000) is a measure used to determine the temperament and behavior style of a child-based parent report of observable child behaviors. Temperament has been shown to be a significant factor in the manner in which parents interact with their children and in children’s language development outcomes in low-income samples (e.g., Noel, Peterson, & Jesso, 2007; Vernon-Feagans et al., 2008). In particular, child temperament is seen as a within-child influence that uniquely contributes to the parent-child interaction process in an ecological systems model (Vernon-Feagans et al., 2008). For this study, the CTTS was used as an indicator of a parent’s perception of their child’s temperament and behavioral qualities, in an effort to individualize training modules to meet the specific needs of parents during parent-child interactions.

The CTTS is an assessment that is used to determine the temperamental style of toddlers, ages 1 to 3 years. There are nine areas of temperament and behavior assessed with the CTTS, including activity level, rhythmicity, approach-withdrawal, adaptability, intensity, mood, attention span and persistence, distractibility, and sensory threshold (Administration for Children and Families, 2003). The CTTS was specifically designed to provide information to caregivers on the unique behavioral profile of their child, as it relates to temperamental characteristics. In
particular, this tool is recommended for use by clinicians as a way to increase parent knowledge about child temperament and behavioral style during interventions (Administration for Children and Families, 2003). Parents respond to a series of items, where child temperament and behavior characteristics are rated on a 6-point Likert scale (almost never to almost always). These responses are used to calculate children’s temperamental and behavioral tendencies for the 9 areas mentioned above.

Reliability on the CTTS ranges from .53 to .86 on each of the 9 scales (Administration for Children and Families, 2003). No detailed information on validity is currently available for the CTTS, though there is clinical evidence validating the use of the CTTS for professional practice with caregivers (Carey & McDevitt, 1995, as cited in Administration for Children and Families, 2003; Levine, Carey, & Crocker, 1992, as cited in Administration for Children and Families, 2003). Additionally, some caution has been raised about the validity of use for clinical purposes, such as diagnosis, with diverse groups, including low-SES families (Newman, 2001). However, for the purposes of this study, findings from this assessment were not used for clinical diagnostic purposes. Instead, information from the assessment was used to inform the lead researcher of patterns of behavior and temperament that parents note in their responses, with that information used to guide suggestions in the training phase of the study.

Procedure

**Administration.** The CTTS was administered to the parent during the first baseline session of the multiple-baseline design (described below). Administration was consistent with procedures outlined in the assessment manual. All questions about the assessment were answered to the satisfaction of the participant.
Scoring of Carey Toddler Temperament Scale. Prior to the intervention sessions, the lead researcher completed hand-scoring of the CTTS, consistent with scoring procedures outlined in the assessment manual. The results of the CTTS can be found below in Table 5.

Table 4

Quantitative and Qualitative Findings from CTTS

<table>
<thead>
<tr>
<th>Category</th>
<th>Category Score</th>
<th>Parent Rating of Behavior</th>
<th>Parent General Impressions of Toddler Temperament</th>
<th>Mismatch in Parent Impressions and Child Behavior Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>2.92</td>
<td>Inactive</td>
<td>High Activity</td>
<td>Perceives child as very active, but rates as low activity</td>
</tr>
<tr>
<td>Rhythmicity</td>
<td>2.19</td>
<td>Rhythm</td>
<td>Very Rhythmic</td>
<td>Perceives child as very rhythmic, but rates as somewhat irregular rhythm</td>
</tr>
<tr>
<td>Approach</td>
<td>2.66</td>
<td>Moderately Hesitant</td>
<td>Somewhat Hesitant</td>
<td>Very Quick to Adapt</td>
</tr>
<tr>
<td>Adaptability</td>
<td>1.89</td>
<td>Adaptable</td>
<td>Adapt</td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>2.9</td>
<td>Mild Intensity</td>
<td>Somewhat Intensity</td>
<td></td>
</tr>
<tr>
<td>Mood</td>
<td>2.23</td>
<td>Pleasant Mood</td>
<td>Very Pleasant</td>
<td></td>
</tr>
<tr>
<td>Persistence</td>
<td>1.64</td>
<td>Persistent</td>
<td>Persistent</td>
<td></td>
</tr>
<tr>
<td>Distractibility</td>
<td>3.45</td>
<td>Seldom Distracted</td>
<td>Seldom Distracted</td>
<td></td>
</tr>
<tr>
<td>Threshold</td>
<td>5.25</td>
<td>Sensitive to Stimuli</td>
<td>Sensitive to Stimuli</td>
<td></td>
</tr>
</tbody>
</table>

Manageability

Very Easy
The findings from the CTTS were not directly reviewed with the family. Instead, information from this scale was used to tailor instruction for the parent during the training phase of the study. For instance, the mother in this study perceives that her daughter has an overall pleasant mood and is seldom distracted. Thus, in the intervention stage, the researcher added statements into the training such as “given that you perceive that your daughter is frequently in a pleasant mood and is rarely distracted, this provides you with a great opportunity to incorporate parent-child activities throughout your day without considerable opposition from your daughter.” Thus, various aspects of child temperament were layered into the discussion so that the caregiver understood how her daughter’s temperament could affect dyadic communication patterns.

Pilot Study for Multiple-Baseline Design

Measures

Measure D and vocd. Measure D (McKee, Malvern, & Richards, 2000) was used in this study as an index of the lexical diversity present in the verbal output of caregivers during activities with their children. Measure D is a recently developed computational instrument for calculating lexical diversity of oral or written texts (Jarvis, 2002). The measure was specifically designed to be a more effective estimation of lexical diversity than other more common measures used in language research (McKee, Malvern, & Richards, 2000). Measures of lexical diversity have long been fraught with issues related to interactions between length of text, volubility, and variations in mean length of utterance (MLU) that occur within and across speakers (Duran, Malvern, Richards, & Chipere, 2004). In particular, standard lexical diversity measurements, such as number of different words (NDW) or type-token ratio (TTR), do not take into account differences in the quantity of words used within a given sample (McKee, Malvern, and Richards, 2000). By not gaining sufficient control for differences in token counts, researchers have the
potential for inflating the estimation of lexical diversity in smaller samples and deflating the estimation in larger samples. To combat this problem, McKee, Malvern, and Richards created the measure D and the vocd software program to analyze lexical diversity, while simultaneously controlling for the length of the sample and number of word tokens.

In vocd, small amounts of data from the transcript, ranging from 35 to 50 words, are sampled without replacement to calculate the TTR for that portion of the data. This process occurs over a number of subsamples, which are then averaged to form a curvilinear relationship between TTR and word tokens. The sample’s curve is then matched to the theoretical curves available within a probabilistic mathematical model established for TTR versus word tokens, which provides the output D (McCarthy & Jarvis, 2007; also see Duran et al., 2004 for a good visual of the theoretical curves). Values for D represent the height of the curve for TTR plotted against tokens, where a higher curve (D value) represent greater lexical diversity, regardless of length of the entire sample (Jarvis, 2002).

This measure has been used across many fields of research including language development (e.g., DeThorne et al., 2008), language disorders (e.g., Klee, Stokes, Wong, Fletcher, & Gavin, 2004; Owen & Leonard, 2002), second language acquisition (e.g., Jarvis, 2002), and caregiver-child interactions in poverty and language development research (e.g., Rowe, 2008), among others. The measure D has been used to estimate the diversity of vocabulary used in oral and written language for both children and adults, and has been determined to be most effective using whole texts versus content words (Jarvis, 2002). In particular, Jarvis, dubious of the use of measure D with longer adult samples, demonstrated superior goodness of fit for measure D for adult written samples of native and second language learners of English (98.19% fit for all samples, using the least squares $\chi^2$ procedure), compared
to other measures of lexical diversity (range of 5.43% to 97.83% for goodness of fit). Duran et al. (2004) also report that measure D has been effective at calculating lexical diversity of small samples of data, from a minimum of 50 words to hundreds of words, using language transcripts from Wells (1985) study of children ages 15 to 42 months. Thus, for the purposes of this study, it is anticipated that parent utterances produced during play will provide a sufficient number of words to analyze parent lexical diversity using vocd.

**Parent Verbal Social-Pragmatic Acts.** Parent verbal social-pragmatic acts were coded in this study as a measure of parent interaction behaviors with their children during structured activities. Social-pragmatic theory suggests that various aspects of parent-child interactions provide children with opportunities for word learning (Hoff & Naigles, 2002). In particular, the use of verbally responsive statements and questions to children’s actions and vocalizations during familiar and unfamiliar routines have been found to be directly related to toddler’s comprehension and productive vocabularies (Tamis-LeMonda et al., 1996; Tomasello & Todd, 1983; Harris, Jones, Brookes, & Grant, 1986; Carpenter, Nagell, & Tomasello, 1998; as cited in Hoff & Naigles, 2002). As reviewed in chapter 2, several verbal social pragmatic acts are known to be affected by poverty, including an increased use of directives and prohibitives in conversation (Hart & Risley, 1995), as well as more limited use of responsive acts to children’s communicative bids, including the use of topic-continuing replies. For the purposes of this study, topic-continuing replies were measured as an indicator of changes in parent style of interaction. This interaction behavior was originally used in research by Hoff and Naigles (2002) and Andrews and Kelly (2008), to examine the interaction behaviors of middle-SES European-American and low-SES African-American mothers and their children, respectively.
Multiple Baseline Pilot Study Procedure

Data were collected on caregiver language and verbal social pragmatic behaviors across one baseline session and four training sessions. Each of these sessions took place in the home environment of the family, during a time convenient for both caregiver and child to meet. Each session was videotaped to allow for later analysis of the data. The five sessions occurred over a 3-week period after the initial consent-signing session. After eligibility procedures were completed with the family, a baseline session was conducted. Four training sessions were then conducted on four additional days across three weeks. No consistent interval of time between sessions was required for scheduling sessions with the family for this study.

Baseline. Baseline measurements were collected for parent lexical diversity and topic-continuing replies. Both dependent variables in this portion of the study were elicited using a modified version of the Three Bags Task.

The Three Bags Task was originally designed for evaluation of parent-child interactions in the Early Head Start program (Administration for Children and Families, 2000) or in a modified version called the Two-Bag Task in the Early Childhood Longitudinal Study—Birth Cohort (United States Department of Education, 2007). During the Three Bags Task, parents are provided with three separate child-centered activities with which they can interact with their child. These activities include two play sets and one storybook, placed in three separate bags. After a period of warm-up interaction between parent and child, the parent is invited to open the bags, one at a time, and play with the child as they normally would. The task is estimated to allow for at least 10 to 15 minutes of conversation between parent and child.

Given that the Three Bags Task was originally designed for single-use, and not repeated, administration, some modifications of materials were required for this study’s design. First, a
series of playsets were created for this study which emulate the structure of the set used in Early Head Start studies (i.e., use of two themed toy sets and one storybook). Thus, a collection of 5 3-bag sets were developed for use in the pilot study, which draw on commercially available toy sets for toddlers (e.g., Playmobil, Little People) and age-appropriate storybooks. Toy sets were chosen if they incorporated a limited number of parts and were safe for use by 2-year-old children. Themes do not repeat within and across sessions for the toy sets, limiting the chance of increased familiarity with sets across sessions. Finally, storybooks were chosen that included smaller amounts of text (e.g., more than 50 words, but less than 500), evidenced some story grammar, and did not repeat themes across texts. Items were counterbalanced across the bags, so that the same type of item (e.g., storybook) will not be presented in a predictable order session after session. The items used in this assessment can be found in the intervention manual available in Appendix J.

**Intervention Phase.** The intervention portion of this study was provided to the primary caregiver and child for 4 sessions over 3 weeks, with approximately 1-hour sessions each week. Each session provided the parents with basic information about child semantic development and child temperament, and provide the parent with opportunities to practice and role-play responsive communication techniques and evidence-based language stimulation techniques (i.e., several of those associated with Dialogic Reading and focused-stimulation interventions). Additionally, the parent was also provided opportunities to plan simple ways to promote language throughout the family’s daily routine.
## TABLE 5
Completion of Proposed Intervention Activities in the Pilot Study

<table>
<thead>
<tr>
<th>Intervention Session</th>
<th>Intervention Activity</th>
<th>Completion of Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td><em>What is Language and How is It Supported?</em> Handout and Discussion</td>
<td>Completed</td>
</tr>
<tr>
<td></td>
<td><em>Influences on Child Development: Parents are Key</em> Handout and Discussion</td>
<td>Completed</td>
</tr>
<tr>
<td></td>
<td><em>Building Your Child’s Language Skills: It’s All About Quantity and Quality</em> Activity and Discussion</td>
<td>Completed</td>
</tr>
<tr>
<td>Session 2</td>
<td><em>Who, What, When, Where, and Why?: Developing Rich Language to Think and Say Whatever You Want</em> Activity and Discussion</td>
<td>Completed</td>
</tr>
<tr>
<td></td>
<td><em>How Children Influence Their Learning Environment</em> Handout and Discussion</td>
<td>Completed</td>
</tr>
<tr>
<td></td>
<td><em>Responsive Communication with Your Child: Play Ball!</em> Activity and Discussion</td>
<td>Partially Completed</td>
</tr>
<tr>
<td>Session 3</td>
<td><em>Variety is The Spice of Life: Making the Move Beyond Basic Object Names</em> Activity and Discussion</td>
<td>Completed</td>
</tr>
<tr>
<td></td>
<td><em>“Oliver Finds His Way”</em> Book Activity</td>
<td>Completed</td>
</tr>
<tr>
<td></td>
<td><em>Shared Book Reading: Bringing the World to Your Child One Book at a Time</em> Handout and Discussion</td>
<td>Completed</td>
</tr>
<tr>
<td>Session 4</td>
<td>*Supporting the Development of Strong Word Relationships: Help Me, Help You Activity and Discussion</td>
<td>Completed</td>
</tr>
<tr>
<td></td>
<td><em>Everywhere...All of the Time!: Finding Ways to Promote Children’s Language Development Daily</em> Activity and Discussion</td>
<td>Partially Completed</td>
</tr>
<tr>
<td></td>
<td><em>STAR: Finding Ways to Respond to Child Interests and Entice Child Conversation</em> Handout and Discussion</td>
<td>Partially Completed</td>
</tr>
</tbody>
</table>

Data were collected for child-directed speech and parent child interactions using the Three Bags Task at the end of each session. The manual for the intervention conducted for this study, in Appendix J, is provided to the reader as it was originally designed. For this study, small
portions of activities were not conducted because of issues with time during the session (i.e., some activities took longer to complete than was expected, as there were interruptions during session that complicated completion of task). A summary of the activities and completion of each are reported above in Table 4.

**Multiple Baseline Data Analysis Procedures**

**Transcription of Parent-Child Interaction Samples.** Parent-child interactions during the Three Bags Task were videotaped and all parent and child utterances were transcribed by trained transcribers. The transcriber was required to be a native speaker of English and have some prior experience with children or with language transcription. All transcribers for this project were trained by the lead researcher on CHAT transcription conventions (MacWhinney, 2000a), which includes conventions on unintelligible utterances, partially-uttered words, and transcription formatting for analysis in the CLAN software program (MacWhinney, 2000b).

Fidelity of transcription was established on a parent-child communication sample of a 23-month-old Caucasian child and her mother. The mother in this sample was a certified speech-language pathologist trained in early child communication skills. She transcribed the entire language sample for the project and a 3-minute sample was used for the fidelity sample. Before transcribers were allowed to participate in the study, they were required to achieve an initial transcription reliability of 90% or greater on both parent and child utterances (when compared to the standard sample provided by the mother). Only three transcribers (one paid professional transcriptionist, one trained graduate assistant and the lead researcher) met the initial transcription reliability requirements (Transcriber 1: 92%; Transcriber 2: 91%; Transcriber 3: 95%). Four transcribers (3 undergraduate research assistants and 1 graduate research assistant) were unable to achieve fidelity for this study.
Once eligibility for transcription was established with Transcriber 1, she was allowed to independently transcribe the video samples collected each session using the Three Bags Task. All outside transcribers were blind to the study design and target population, as well as the intent and content of the intervention. All videos were labeled in random order, to reduce the possibility of any perceived treatment effects over the course of the sessions by outside transcribers.

**Reliability of Language Sample Transcription.** A random selection of 10% of the videos collected was transcribed for reliability purposes by Transcriber 2. Video and textual data transfer between transcribers occurred using a secure online data transfer site (i.e., Dropbox). Interrater reliability for this study was determined on a word-by-word basis across the transcripts and expressed as a percentage agreement (number of agreements/number of agreements + number of disagreements x 100) (e.g., Hall, Yamashita, & Aram, 1993). Agreement between Transcriber 1 and Transcriber 2 fell below the 90% agreement cutoff across the first 2 transcripts (Transcript 1: 76%; Transcript 2: 82%) and interrater reliability for these two transcribers was stopped. A review by the lead researcher of Transcript 1 (with the video of the session) found that Transcriber 1 was missing sizeable portions of the utterances in her transcript. Thus, Transcriber 2 was then asked to transcribe all of the videos again for the main transcription of the video data. Another random selection of 10% of the videos was again determined and the lead researcher (Transcriber 3) completed the interrater reliability transcription for the transcripts. As the entire transcript for Transcript 1 was reviewed with the video by the lead researcher for determining the extent of errors, a random sample of 2 parts of Transcript 5 were chosen as replacement for the reliability portion of Transcript 1. Reliability between Transcriber 2 and Transcriber 3 exceeded 90% for all transcripts individually (Transcript 2: 95%; Transcript 3:
94%; Transcript 4: 92%; Transcript 5a: 90%; Transcript 5b: 94%), with a combined reliability of 93%.

**Transcription Cleaning and Coding for vocd.** Transcriptions of the 5 videotapes completed by Transcriber 2 were then reviewed by the lead researcher for cleaning and coding items for preparation for analyses in CLAN using vocd. Additional CHAT conventions were then marked on each transcript. These additional conventions included coding onomatopoeic language (e.g., marking *woof woof* as one onomatopoeia: *woof_woof@o*) and conventionalizing words to CHAT transcription suggestions across transcripts (e.g., remarking a vocalized agreement written as *uhuh* to *uhuh* across all transcripts, as suggested in the CHAT transcription conventions). Finally, all transcripts were reviewed and edited by the lead researcher to ensure proper use of tabs, capitalization, and punctuation, as required by CHAT transcription conventions.

**Morpheme Coding.** In order for the vocd program to properly analyze the lexical diversity of the language samples, the transcripts required further coding of inflectional morphemes to isolate root morphemes across morphosyntactic forms. For this study, SALT transcription conventions were used for coding of inflectional morphemes (Miller & Chapman, 1986-2000). This allowed the CLAN program to analyze root morphemes for frequency counts (using the freq program in CLAN, which forms the basis of vocd analyses) and for vocd.

Prior to coding of the transcripts, two undergraduate research assistants (Coders 1 and 2) and one graduate research assistant (Coder 3) were trained by the lead researcher in coding of transcripts using SALT conventions, as well as the unique morpheme coding system required by CLAN (i.e., use of a dash at the end of the root morpheme, to remove the inflectional morpheme or a contraction from a root morpheme). Additionally, all apostrophes were removed from the
transcriptions, as these punctuation marks are not able to be used in CLAN analyses (on the Main Line of the CHAT transcript). Once the coding was completed for a transcript, the lead researcher input the file into the CLAN program and conducted a CHECK program review of the file. This feature in the CLAN software suite allows researchers to determine if there are any errors in the transcript, which would render the sample unable to be analyzed within the language sample analysis programs in CLAN. Any additional errors found with spacing, tabbing, or punctuation were cleaned during this time. After each transcript was determined by the CHECK program to be clean for the purposes of a CLAN analysis, a frequency count of root words was conducted (using the *freq* program in CLAN) and results were sent to the research assistants for a final review of the words in the text. If any errors were noted during the frequency count review, the research assistants were advised to make changes before coding reliability was initiated.

*Reliability of Morpheme Coding.* A random selection of 10% of the transcripts was recoded for morphemes by the lead researcher. Textual data transfer between coders occurred using a secure online data transfer site (i.e., Dropbox). Interrater reliability of morpheme coding was determined on a coded word-by-word basis across the transcripts and expressed as a percentage agreement (number of coding agreements/number of coding agreements + number of coding disagreements x 100). Agreement between Coder 1 and the lead researcher for Transcript 1 fell below the 90% agreement cutoff (75%) and Coder 2 was asked to recode the transcript again. After Coder 2 recoded the transcript, interrater reliability exceeded 90% for all transcripts individually (Transcript 1: 100%; Transcript 2: 100%; Transcript 3: 95%; Transcript 4: 94%; Transcript 5: 100%), with a combined interrater reliability of morpheme coding of 98%.

*Maternal Responsivity Coding for Topic Continuing Replies.* Following transcription of the videos, coding of maternal responsivity to child communication attempts was conducted.
A graduate student (Transcriber 2 from above) served as the main coder for the transcripts. Training was conducted for the graduate student on a one-on-one basis, to orient the student to the research literature on maternal responsivity and coding conventions for topic-continuing replies, which were planned for use in the study. Two additional undergraduate students were also trained to code topic-continuing replies; however, the students indicated that they would not feel comfortable coding the transcripts (and doubted their accuracy rate for coding) as there were frequent situations in the transcripts where child utterances had reduced or nonexistent intelligibility.

After an independent review of the first transcript, the graduate student and the lead researcher conducted several meetings to determine the most accurate and efficient coding scheme for the transcripts, given the number of semi- or unintelligible child utterances, and the lack of clarity and guidance in the literature about coding communication attempts by early language users. Colleagues on staff at the university familiar with early language development were also consulted for suggestions on coding procedures. Coding conventions were created that relied upon previous work by Hoff and Naigles (2002) for coding adult-child social-pragmatic acts (p. 425). For the purposes of this study, the parent utterance was considered topic-continuing if it:

1. Immediately followed the child’s utterance;
2. Continued the topic of the child’s utterance;
3. Referred to any entity or event mentioned in the child’s utterance;
4. Was an answer to a question;
5. Continued some patterned speech, such as reciting the alphabet or a nursery rhyme;
6. Commented on objects or events referred to in the prior utterance; or,
7. Was a paraphrase of the prior utterance.

Additional conventions were added beyond those from Hoff and Naigles that stated that maternal utterances would be considered topic continuing if:

1. The utterance is a question to the child that refers to any entity or event mentioned in the child’s utterance (linguistically or paralinguistically);
2. The utterance was a request for repetition of information (e.g., What did you say?; Huh?");
3. The utterance continued some patterned speech using a series of like statements (e.g., This is a dog. This is a cat. This is a…).

Finally two new conventions, which addressed the unique challenges of parent-child interaction with toddlers, were also included in this study. These conventions were established to address unintelligible utterances produced by the child, which are common with children in this age group:

1. If the child’s utterances were unintelligible, but the intent of the child’s utterance was understood by the coder through additional paralinguistic functions (e.g., gesturing; prosodic elements; joint attention), the utterance should be counted as comprehensible for the purposes of coding.
2. If the child’s utterance was not intelligible and no additional information was available to decode the child’s intent with the utterance, then the utterance would be removed from analyses.

After these codes were established, the graduate student coded all of the transcripts independently.
Reliability of Maternal Responsivity Coding. A random selection of 10% of the transcripts was recoded for maternal responsivity by the lead researcher. Textual data transfer between coders occurred using a secure online data transfer site (i.e., Dropbox). Interrater reliability of responsivity coding was determined on a coded utterance-by-utterance basis across the transcripts and expressed as a percentage agreement for the presence of codable child utterances (i.e., intelligible via verbal or nonverbal means) and for parent responsivity to child utterances (number of coding agreements/number of coding agreements + number of coding disagreements x 100). Interrater reliability exceeded 90% for all transcripts individually (Transcript 1: number of codable child utterances 100%, parent responsivity 100%; Transcript 2: child utterances 100%, parent responsivity 100%; Transcript 3: child utterances 100%, parent responsivity 90%; Transcript 4: child utterances 100%, parent responsivity 100%; Transcript 5: child utterances 100%, parent responsivity 92%), with a combined interrater reliability of 100% for determining codable child utterances and 96% for parent responsivity to child utterances.

Pilot Study for Pretest-Posttest Design

Measures

For the pretest-posttest portion of the mixed method design, several additional constructs were examined to provide a more comprehensive view of caregiver-related factors that could be directly and indirectly affected by the proposed intervention. Four pretest-posttest measures were administered to caregivers to assess changes in parent behaviors that have been previously found to be affected by low socioeconomic status. These behaviors include parent knowledge of child development, parent self-efficacy, parent stress, and parent stimulation of child development.

Parent Knowledge of Child Development. The Knowledge of Infant Development Inventory (KIDI) was used as a measure of parent knowledge of development in this study. The
KIDI (MacPhee, 1981) is a 75-item questionnaire that assesses a caregiver’s knowledge of parenting practices, child development, and infant-toddler developmental milestones. The KIDI was originally designed to be used by persons across racial, cultural, and SES groups, although it was normed on a sample of primarily highly-educated students, parents, and faculty members from North Carolina. Items are scores in a 3-item forced choice format (right, wrong, or not sure). Items are tallied to obtain a total score.

Reliability information available on the KIDI (National Resource Center for Community-Based Child Abuse Prevention, 2005) suggests that there are acceptable to good levels of internal consistency across several adult populations (i.e., college students, parents, and professionals) (Cronbach’s $\alpha$s = .55 to .82). There is also a high level of test-retest reliability for parents’ total scores over a 2-week period of time ($r = .92$). No further information is currently available on the validity of this measure.

**Parent Self-Efficacy.** The Self-Efficacy for Parenting Tasks Index—Toddler Scale (SEPTI-TS) (Coleman & Karraker, 2003) was used as a measure of a parent’s sense of self-efficacy related to parenting skills. The SEPTI-TS includes 53 items that are divided into seven categories that highlight various aspects self-efficacy related to the parent-child relationship, including (1) emotional availability; (2) nurturance, valuing the child, and emotional responsiveness; (3) bodily protection of the child; (4) discipline and setting limits for the child; (5) play with the child; (6) teaching behaviors; and, (7) care of the child and establishment of structure and routines (Coleman & Karraker, 2003, p. 131). All items are on a 6-point Likert scale (from 6—strongly agree to 1—strongly disagree) and total scores are derived by tallying responses on all questions. Higher scores indicate greater feelings of parenting self-efficacy. Coleman and Karraker reported that the magnitude of internal consistency across the 7 subscales
varied widely (Cronbach’s $\alpha = .46$ to .81). However, the internal consistency for the full scale was excellent (Cronbach’s $\alpha = .91$). No reliable information on forms of validity of the instrument are known at this time, though Coleman and Karraker offer some limited evidence of discriminant validity using the Parent Stress Index.

**Parenting Stress.** The Parenting Stress Index—Third Edition, Long Form (PSI) (Abidin, 1995) was used in this study as a global measure of parenting stress. The PSI is a 120-item questionnaire that provides a profile of a caregiver’s perceptions of stress related to parenting. Caregivers are asked to rate their responses to the questions on a 5-point Likert scale (strongly disagree to strongly agree). This assessment takes about 20 to 30 minutes to complete.

Findings from this assessment create a 4-domain profile of parenting stress, including a child domain of stress, a parent domain of stress, life-related stress, and a total stress composite score. The child domain of stress includes questions about the parent’s perception of the child’s temperament and behavior traits. The parent domain includes questions about the parent’s feeling of competence, parental isolation, parent-child attachment, parent health, parent feeling of role restriction, depression, and support from their spouse. The life stress domain assesses the parent’s perceptions of stressors that are not in the control of the parent. The total stress level is a combination of the child and parent domains of stress.

Reliability information on the PSI suggests that there are acceptable to good levels of internal consistency (Cronbach’s $\alpha = .70$ to .83 across subtests) and moderate levels of test-retest reliability across time periods from 3 weeks to 1 year ($r = .55$ to .82) (Administration for Children and Families, 2003). Previous work by Raikes and Thompson (2005) found that test-retest reliability during 3 administrations of the PSI for an Early Head Start program evaluation
were high \((r = .82)\). There is also moderate concurrent validity with other measures of family stress levels \((r \geq .32)\) (Administration for Children and Families, 2003).

**Caregiver Stimulation of Child Development in the Home.** The Home Observation for Measurement of the Environment Inventory—Third Edition, Infant/Toddler Version (HOME) (Caldwell & Bradley, 2001) was used in this study as a measure of the amount of caregiver stimulation of child development in the home setting. The HOME is a commonly used measure of parent stimulation in the home environment. Originally developed to be a more sensitive measure of SES level than other available SES indices, the HOME has been found to be significantly related to child cognitive development and assesses various parenting behaviors in the home environment related to socioeconomic status (Administration for Children and Families, 2003).

The Infant/Toddler Version of the HOME is a 45-item, 6-subscale assessment used for children under the age of 3. This assessment includes observation and parent report of parent-child interaction behaviors. The six subscales include (1) Parental Responsivity; (2) Acceptance of Child; (3) Organization of the Environment; (4) Learning Materials; (5) Parental Involvement; and, (6) Variety in Experience. Items are scored in a binary forced-choice (yes/no) format, and all “yes” answers are tallied together to form subtest and total scores.

Reliability information available on the HOME suggests that there are acceptable to good levels of internal consistency (Cronbach’s \(\alpha\)s = .44 to .89 for the 6 subscales; .89 for the total score) and test-retest reliability \((r \geq .65)\) (Administration for Children and Families, 2003). There is also moderate concurrent and predictive validity for the HOME reported \((rs \geq .50)\) (Administration for Children and Families, 2003). No further reliability and validity information related specifically to the toddler form is known at this time.
Pretest-Posttest Procedure

Data were collected on all dependent variables in the first baseline session and at the end of the last intervention session. The caregiver was provided with pencil and paper forms for the KIDI, SEPTI-TS, and PSI assessments. All questions of the caregiver were answered as they were received.

The HOME Inventory was conducted in a parent-child observation and interview format in the first baseline session and at the end of the last intervention session. The caregiver was asked a series of pre-specified questions by the lead researcher that corresponded to child development and child rearing practices for toddlers. For the play observation of the assessment, the parent was allowed a period of warm-up play with her daughter before the play observation was administered. The Administration of the HOME lasted approximately 40 minutes during each administration.

Assessing Early Feasibility of Intervention

As the CcLAP intervention is at the early development stages, it was important to determine if any aspects of the intervention as designed suggest long-term potential as a viable preventative or therapeutic option for clinicians. As various fields of study, such as medicine, psychology, and speech-language pathology, demand more efficacious and effective treatments, different phases of clinical research for evidence-based care have emerged (Robey, 2004; Rogers, n.d.). The five-phase model of clinical outcome research (Robey, 2004) suggests that clinical research should follow a systematic 5-step process that moves from development of informed hypotheses from the research literature and a basic intervention framework, through efficacy testing of the intervention, and finally into testing effectiveness of the treatment in real-
world settings. The five phases of clinical research from Robey (2004) and Rogers (n.d.) are highlighted below in Table 6.

Table 6

**Phases of Clinical Outcomes Research**

<table>
<thead>
<tr>
<th>Phase of Research</th>
<th>Type of Study</th>
<th>N Size</th>
<th>Purpose of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I</td>
<td>Pretrial” studies: observational studies, correlational studies</td>
<td>Small $n$</td>
<td>Hypothesis generation, Intervention development, Participant selection criteria established, Creation of treatment protocol, Creation of outcomes measures</td>
</tr>
<tr>
<td>Phase II</td>
<td>Feasibility studies: exploratory studies, case studies, single-subject designs, small group studies</td>
<td>Small $n$</td>
<td>Establish possibility of presence of efficacy of treatment, Refine population definition, Refine intervention, Develop intervention manual</td>
</tr>
<tr>
<td>Phase III</td>
<td>Early efficacy studies: quasi-experimental designs, experimental studies</td>
<td>Sufficient $n$ for group designs</td>
<td>Test efficacy of treatment with more controlled research designs</td>
</tr>
<tr>
<td>Phase IV</td>
<td>Later efficacy studies: Experimental designs</td>
<td>Sufficient $n$ for group designs</td>
<td>Test efficacy of treatment to establish causality</td>
</tr>
<tr>
<td>Phase V</td>
<td>Effectiveness research: field research</td>
<td>Sufficient $n$ for group designs</td>
<td>Test effectiveness of treatment in everyday settings</td>
</tr>
</tbody>
</table>

This research study falls within Phase I of this clinical research model. This “pretrial” study (Rogers, n.d.) focuses on the development of viable hypotheses related to the population and constructs of interest, the development of an intervention program and treatment protocol, determination of the types of participants who might benefit from this type of program, and the examination of various measures for outcomes from the study. As part of this design, some aspects of Phase II research were planned in the original design but not completed (e.g., multiple
baseline design to investigate the possibility of a treatment effect), while others aspects of Phase II research were attempted within the confines of a Phase I research study (e.g., developmental of an intervention manual).

**Feasibility Procedures**

As part of the feasibility review for this study, data were collected to detail the perceptions of the lead researcher and the adult participant about the research study and intervention program. Several areas were targeted for review of feasibility for this study, including recruitment procedures, participant selection criteria (e.g., cumulative risk status, race/ethnicity, attrition of potential participants), intervention protocol (procedures, intervention materials, setting, and mode of information dissemination), and outcomes measures.

Detailed notes in a researcher journal were taken throughout the study by the lead researcher about feasibility of each part of the research design as was proposed. Additionally, feedback from the parent was solicited verbally at the end of the last session to determine if changes should be considered for any of the measures or intervention methods completed during the study. Questions utilized for this portion of the study can be found in the intervention manual in Appendix J, in the assessments section at the end of the intervention manual.
CHAPTER IV

RESULTS

Intervention Outcome Research Question 1: Analyzing Lexical Diversity of Child-Directed Speech Using vocd

To answer research question 1 (Do caregivers produce increased levels of language stimulation in the home environment?), the lexical diversity of parent utterances during the Three Bags Task were analyzed for measure D using vocd. Prior to conducting analyses in vocd, storybook text was removed from each transcript by the lead researcher. This was done to ensure that the lexical diversity of utterances produced by the parent were not inflated by the lexical richness of the storybook text. Language sample data were entered into the vocd program using the software program CLAN (MacWhinney, 2000b) to determine D scores for each transcript. For this analysis, syntax was input into CLAN that excluded any morphemes outside of root morphemes, excluded all child utterances, and exclude any recursive wording on the part of the parent (vocd +t*PAR +s"*-%%" +r6 filename.cha). D values for parent lexical diversity were plotted on a graph as seen in Figure 2 below.

Figure 2

D Values for Lexical Diversity of Parent Utterances
Results indicate that no positive trends above baseline were detectable in the data, with a drop in lexical diversity at the onset of the intervention program and a return to pre-intervention levels at the end of the study.

**Intervention Outcome Research Question 2: Analyzing Parent Responsivity Behaviors using Verbal Social Pragmatic Act Coding**

To answer research question 2 (Do caregivers demonstrate increased responsiveness to child language needs?), topic-continuing replies were analyzed in terms of the number and percentage of productions of the behavior by the parent during each session. One graduate student was trained to recognize the presence of topic-continuing replies in parent-child interactions for this portion of the study and trained on coding conventions.

Results for maternal use of topic-continuing replies can be found in Table 7 and Figure 3 below. Results indicate that no discernable positive trend can be noted in the data, with variability observed across treatment sessions. The only positive increase in the data occurred on training session 2, which corresponds to an activity and discussion related to maternal responsivity.

Table 7

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Training 1</th>
<th>Training 2</th>
<th>Training 3</th>
<th>Training 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Topic-Continuing Replies</td>
<td>95</td>
<td>59</td>
<td>97</td>
<td>67</td>
<td>54</td>
</tr>
<tr>
<td>Child Utterances</td>
<td>130</td>
<td>90</td>
<td>120</td>
<td>89</td>
<td>90</td>
</tr>
</tbody>
</table>
Intervention Outcome Research Question 3: Parent Knowledge of Development

For research question 3 (Do caregivers demonstrate increased knowledge of child development?) data were collected using the Knowledge of Infant Development Inventory (KIDI). Parent responses were reviewed for completeness and handscored following procedures outlined in the KIDI manual. Results for pretest and posttest administration of the KIDI are in Table 8 below. Percent Attempted Items are the percentage of items that the participant answered using a direct response (i.e., didn’t chose “Not for Sure” for an answer) to the question posed (Right + Wrong/Right + Wrong + Not Sure). Percent Accurate for Attempted Items are the percentage of items correct that were attempted with a direct response to the question (Right/Right + Wrong). Percent Correct for All Items is the percentage of items that were correct out of all responses (Right/Right + Wrong + Not Sure).

These results indicate that parent knowledge of child development trended in a positive direction after the intervention phase of the study. For the posttest, the participant attempted more items than in the pretest administration of the KIDI, had a higher accuracy rate in the
posttest for the items to which the participant attempted a direct response to the question, and had a higher percentage of items in the posttest that were answered correctly.

Table 8

Pretest and Posttest Results for KIDI

<table>
<thead>
<tr>
<th></th>
<th>Pretest Summary Score</th>
<th>Posttest Summary Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Attempted Items</td>
<td>94.7%</td>
<td>97.3%</td>
</tr>
<tr>
<td>Percent Accurate for Attempted Items</td>
<td>83.1%</td>
<td>91.8%</td>
</tr>
<tr>
<td>Percent Correct for All Items</td>
<td>78.7%</td>
<td>89.3%</td>
</tr>
</tbody>
</table>

Intervention Outcome Research Question 4: Parent Promotion of Child Development in the Home

For research question 4 (After the CcLAP intervention, do caregivers demonstrate increased promotion of child development in the home?), data were collected using the HOME Inventory for Infants and Toddlers. Parent responses were summed for each response category and a total score was obtained for the pretest and posttest administrations of the measure. Results for pretest and posttest administration of the HOME are in Table 9 below.

Results from pretest to posttest administration were fairly stable. Two subtests did demonstrate some change in parenting behaviors—Responsivity and Involvement. For the Responsivity subtest, the parent responded positively to praise of the child offered by the lead researcher on the posttest administration. For the Involvement subtest, the parent demonstrated that she now consciously encouraged the child’s developmental advance. In fact, the parent verbally indicated on posttest administration of the Involvement subtest that she was “more aware of language development now after the intervention,” which also indicated some perceived benefit of the intervention on parenting skills covered with the HOME Inventory.
Table 9

**HOME Inventory Scores for Pretest and Posttest Administration**

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Pretest HOME Scores</th>
<th>Posttest HOME Scores</th>
<th>HOME Median Scores</th>
<th>HOME Ceiling Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsivity</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Acceptance</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Organization</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Learning Materials</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Involvement</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Variety</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total Score</strong></td>
<td><strong>35</strong></td>
<td><strong>37</strong></td>
<td><strong>32</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

**Intervention Outcome Research Question 5: Parent Self-Efficacy**

For research question 5 (After the CcLAP intervention, do caregivers demonstrate greater feelings of parent self-efficacy?), data were collected using SEPTI-TS. Parent responses were reviewed for completeness and hand-scored using the conventions outlined in Coleman and Karraker (2003) for both the pretest and posttest administrations of the measure. Items were scored on a 1 to 6 scale (1 indicating low levels of self-efficacy and 6 indicating high levels, per question) and all responses were summed for a total score. Results from pretest and posttest administration of the SEPTI-TS indicate no change across administrations. Out of a total of 318 points on the SEPTI-TS, the participant scored 308 on the pretest and a 306 on the posttest. Higher scores are related to greater feelings of self-efficacy, which indicates that the mother had very high feelings of self-efficacy at both the beginning and end of the study.

**Intervention Outcome Research Question 6: Parenting Stress**

For research question 6 (Do caregivers have reduced levels of parenting stress?), data were collected from the Parent Stress Index—Long Form (PSI). Parent responses on the PSI were scored using the handscoring system provided on the scoring form and described in the
manual. Parent responses were reviewed for completeness and several questions were noted as being skipped in this assessment. These questions all referred to a spouse or partner, which is not applicable to the mother in this study, as she is a single parent.

The manual for the PSI states that percentiles between the 15th and 85th percentile are considered within average limits. Scores below the 15th percentile are not considered a cause of concern for the purposes of this assessment. However, percentile scores that are at or above the 85th percentile are considered high indicators of stress (Abidin, 1995). High stress scores in the Child Domain are often indicative of parenting situations where parents are raising children who may not meet their parenting expectations. High stress scores in the Parent Domain suggest that parent functioning could be a source of stress on the parent-child relationship. High stress scores for the Composite Scores indicate generalized parenting stress issues (Total Stress score), stress that stems from circumstances outside of the control of the family (Life Stress score), or the parent is responding defensively to the assessment (Defensive Responding score). Defensive responding occurs in this assessment if raw score totals are less than 24.

Results for parent responses to Child Domain Questions can be found below in Table 10. Results indicate that for all Child Domains for pretest and posttest administration, the parent did not view the child as a source of parenting stress. In fact, on pretest administration, the parent reported that the child was below average limits for all child domains (i.e., a particularly easy-going child to parent). Some increases in percentiles were noted on posttest scores for all areas, except the Acceptability domain score. However, all scores on posttest administration for child domain questions remained below average limits or were borderline low scores.
Table 10

*Child Domain Scores on PSI for Pretest and Posttest Administration*

<table>
<thead>
<tr>
<th>Domain</th>
<th>Pretest Scores</th>
<th>Posttest Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raw Score</td>
<td>Raw Score</td>
</tr>
<tr>
<td>Distractibility/Hyperactivity</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Adaptability</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Reinforces Parent</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Demandingness</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Mood</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Acceptability</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Total Child Domain</td>
<td>56</td>
<td>67</td>
</tr>
</tbody>
</table>

Results for parent responses to the Parent Domain Questions can be found in Table 11. Results indicate that several Parent Domain subscale scores for pretest administration were within average limits. However, the percentile scores for Attachment and Role Restriction were at the high end of average limits, and the Health subscale percentile score was above average limits. On posttest administration, increases in parent stress were noted for the Isolation and Depression subscales, while the Health subscale percentile remained above average limits.

Composite scores for the PSI can be found in Table 12. Results indicate that the parent did not evidence defensive responding during this assessment; thus, findings from this assessment appear valid in terms of parent responsiveness to the assessment. The parent also reported life stress levels that were within average limits. The Total Stress subtest score could not be determined with the parent, as this subtest relied on answers about a spouse or partner and the mother is currently single.
Table 11

*Parent Domain Scores on PSI for Pretest and Posttest Administration*

<table>
<thead>
<tr>
<th>Parent Domain</th>
<th>Pretest Scores</th>
<th></th>
<th>Posttest Scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raw Score</td>
<td>Percentile</td>
<td>Raw Score</td>
<td>Percentile</td>
</tr>
<tr>
<td>Competence</td>
<td>18</td>
<td>5</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>Isolation</td>
<td>11</td>
<td>35</td>
<td>17</td>
<td>85**</td>
</tr>
<tr>
<td>Attachment</td>
<td>14</td>
<td>75</td>
<td>13</td>
<td>65</td>
</tr>
<tr>
<td>Health</td>
<td>17</td>
<td>90**</td>
<td>13</td>
<td>90**</td>
</tr>
<tr>
<td>Role Restriction</td>
<td>22</td>
<td>75</td>
<td>21</td>
<td>70</td>
</tr>
<tr>
<td>Depression</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td>30</td>
</tr>
<tr>
<td>Spouse</td>
<td>N/A*</td>
<td>N/A*</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
<tr>
<td>Total Parent Domain</td>
<td>N/A*</td>
<td>N/A*</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
</tbody>
</table>

*Note.* *Participant not able to answer questions about spouse; thus, no values could be calculated for these variables; ** = indicates clinically high levels of stress.

Table 12

*Composite Scores for PSI in Pretest and Posttest Administration*

<table>
<thead>
<tr>
<th></th>
<th>Pretest Scores</th>
<th></th>
<th>Posttest Scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raw Score</td>
<td>Percentile</td>
<td>Raw Score</td>
<td>Percentile</td>
</tr>
<tr>
<td>Defensive Responding*</td>
<td>31</td>
<td>---</td>
<td>35</td>
<td>---</td>
</tr>
<tr>
<td>Life Stress</td>
<td>8</td>
<td>60</td>
<td>8</td>
<td>60</td>
</tr>
<tr>
<td>Total Stress</td>
<td>N/A**</td>
<td>N/A**</td>
<td>N/A**</td>
<td>N/A**</td>
</tr>
</tbody>
</table>

*Note.* * = Scores below 24 indicate defensive responding; ** = Participant not able to answer questions about spouse; thus, no values could be calculated for these variables.

**Assessing Feasibility of Intervention Study Research Question 1**

For research question 1 (Can a parent training program [designed to target the caregiver’s knowledge of child development, promotion of child language development in the home environment, use of responsive language stimulation techniques, and use of language stimulation...
behaviors] be successfully implemented with low-income caregivers and their children?), written and verbal data were collected by the lead researcher. Information was documented textually to detail the perceptions of the study feasibility by the lead researcher. Information was also documented about the perceptions of the adult participant in the research study through a verbal parent questionnaire.

**Lead Researcher Perception of Feasibility.** Information related to the intervention, either mentioned by the parent or encountered by the lead researcher, were documented. Several areas were targeted for review of feasibility for this study, including recruitment procedures, participant selection criteria, instrumentation, the intervention procedures related to research setting, and data coding and analysis procedures in the lab.

**Recruitment Procedures.** Recruitment for this study spanned an 8-month period of time. During that time period, 212 facilities were contacted to determine if the facility served the given population of interest and if there was interest by facility managers or staff to recruit for the study. For this study, sites were recruited in the southeast Michigan and northwest Ohio regions. These areas spanning several suburban and rural regions outside of metropolitan Detroit and the urban/suburban/rural regions around the Toledo area. Various types of facilities were contacted for this study, which were believed to have lasting and meaningful contact with low-income caregivers and their toddlers. These sites included daycares, social service agencies, food pantries, homeless shelters, early intervention centers (at-risk programming only), churches, parent work support programs, school districts with early childhood programming, parent-child playgroups, early education facilities (e.g., preschools for 2-year-olds), low-income housing projects (with social service agencies attached), community mental health and treatment centers, teen parent health centers, and teen parent educational programs. Initial responses from agencies
related to the potential of recruitment were mixed. Some agencies were very willing to recruit (i.e., pass out consent form packets to families) and those agencies were sent for approval to the Human Subjects Review Board, including a consortium program that included 47 agencies whom have contact with children in the birth-to-three range of development (although a majority of the programs in the consortium were not interested or willing to recruit for the study). Other agencies canvassed did not voice interest in the program, due to lack of return contact from the facility manager. There were no indications as to why these programs were not interested or willing to recruit for the study. Finally, some agencies voiced considerable interest, but later discontinued contact with the lead researcher.

**Participant Selection Criteria.** The initial recruitment procedures that were approved by the Human Subjects Review Board were revised and reapproved by the board after early indications that the range of ages chosen for the study would not be sufficient for recruitment. The child participant age range was widened from 24- to 30-months of age, to 18- to 36-months of age. This age range was chosen for two reasons. First, the widened target population still fell within the spirit of the target population of children/families for the project (i.e., children under age 3 and their families). Second, the language development screener used for the study, the LDS, would still be sufficient and appropriate for the widened age range. This reduced the need to modify the screening protocol for the study to include an additional screener for older or younger children. One additional screening tool, a fast mapping task created by Horton Ikard and Ellis Weismer (2007), was also planned for the study. However, this task was dropped from the procedures as it was not previous tested with children down to the 18-month age cutoffs for the study.
One persistent issue in the study was related to the recruitment of participants based on racial and ethnic features. Various agencies that were contacted for recruitment had a large concentration of clients who were members of racial or ethnic minority communities. As the study focused on one racial group (i.e., Caucasian families), to limit the potential confounding issues of race and ethnicity, this removed several viable (i.e., highly interested) sites from the potential recruitment pool. Of these sites, one agency served exclusively Arab-American families, four served African-American families, and one served Hispanic migrant workers and their families. Other agencies also voiced disappointment in the narrow range of participants for the study based on race and ethnicity as well, as they also provided services to a large, but not exclusive, population of underserved minorities.

One final issue with participant selection criteria was noted. Many of the sites contacted during the study assumed that since the study was being conducted by a speech-language pathologist, the services would be targeting children with language-disorders and their families. All sites canvassed for recruitment were provided education on the range of services that could be provided by a speech-language pathologist, including prevention services to at-risk populations. Throughout recruitment of participants, several sites consistently mentioned that they had numerous clients with whom the intervention would be very appropriate; however, these potential child participants had previously diagnosed language disabilities and were receiving services through the early intervention system. Additionally, one program coordinator voiced opposition to the spirit of the project, citing that families would believe that the coordinator was indirectly referring the families to speech-language pathology services for treatment, given that speech-language pathologists work closely with their population of clients in other treatment capacities.
**Intervention Procedures: Research Setting.** The intervention as designed included 4 training sessions that were one hour long each. Early in the development of the project, it was decided that an intervention program conducted in the family’s home would be the most feasible for parents to manage. This was particularly important for a multiple baseline design, which required consistent, long-term contact between the researcher and study participant. One of the major issues being addressed with home-based services was that of transportation issues for many families who are low-income. It was believed that a lack of transportation may have precluded the participation of many families in the project.

The mother in the study stated during initial recruitment that the home-based services were particularly important to her. She stated that she would not have been able to participate in the study if it had not been for the home visiting aspect of the design. This is because the family relied on public transportation for all movement around town, due to a lack of a working vehicle. The city in which the family resides offers local busing services; however, the mother noted that it is very time consuming and less feasible to transport two young children on the bus across town. To illustrate the importance of the home-based services to the mother, she described a trip to the doctor’s office prior to the third training session. The mother stated that the two younger children had a wellness check-up at the pediatrician’s office across town (less than seven miles from the family’s home). The entire trip, excluding the doctor’s appointment and wait time for the physician, took over three and a half hours for travel. In particular, the public bus was late on arrival at the family’s local pick-up site and was late for departure from the pediatrician’s office. The mother also stated that it is very difficult to transport two young children (ages 23 months and 3 years) on the bus because of a lack of seat restraints for car seats on the public bus.
system. The mother noted that the children are more apt to stand up and walk around on the bus, particularly when other riders enter and exit the vehicle.

For the entire research study (including eligibility procedures), the lead researcher conducted the study in the family’s home. The home setting was a small 2-bedroom townhouse (approximately 1000 square feet) that housed 5 people. The townhouse was categorized as HUD subsidized housing, in a low-income housing cooperative. The living quarters appeared quite organized for some items (e.g., all of the toys and books had containers that were stored in certain places), while other spaces were visibly chaotic (e.g., the small eat-in kitchen was exceptionally unkempt, including a dining table that was broken from its base and clothing strewn across the chairs and dismantled tabletop). The space where the study was conducted was in the main living room of the house, a tightly packed room that allowed approximately a 6’ x 6’ area of floor space to conduct data collection. All parent-researcher interactions took place on the family’s couch, which was a focal point of the entire household. The couch faced a sliding glass door, which looked upon an often busy common area for the complex. No air conditioning was used in the apartment, although temperatures exceeded 90 degrees on some days of the study. A box fan circulated air around the family room from the screen in the sliding glass door. The family room also housed an upright studio piano, a medium-sized television and DVD player, a home computer system, an assortment of children’s toys and books, an assortment of adult novels, and personal mementos placed across nearly all available horizontal surfaces (e.g., family photos; funeral memorials for family members).

Outside of physical environment of the home, management of children in the house was also an important feature of consideration for the study. The four children in the home and other residents in the community entered and exited the house continuously during the study. This
occurred frequently although provisions for childcare were established at the beginning of the study and the mother instructed several community friends to not stop by during the sessions. Babysitting services offered by a friend of the mother did not occur as planned. Consequently, the mother chose to use the older siblings as a form of babysitting for the two younger children, though the older children frequently stopped watching the younger children after a short period of time each session. The three older children were frequently observed during the study turning on various media in the living room or playing on the piano at will during the study, regardless of parent bids to engage in other activities outside or upstairs in the townhome.

**Instrumentation.** The instrumentation used for this study included both repeated measures and pretest-posttest measures. The repeated measurement of parent behaviors in this study included measurement of parent lexical diversity and parent use of topic-continuing replies. The Three Bags Task was used to elicit parent-child interactions that could be construed as being typical of interactions within the child’s daily environment. The choice of materials for this portion of the study involved finding sets of toys and books that would be age-appropriate and perceived as interesting to a toddler. In particular, two play sets and one storybook were used for the Three Bags Tasks, consistent with the types of materials employed for the Early Head Start program evaluation protocol, from which this task originates. Materials were purchased from local and online retailers of children’s toys and books. Three large canvas bags were labeled with numbers (i.e., 1, 2, 3) with a Sharpie marker, to provide a visual cue to the parent for the language sampling task.

The Three Bags Task required the parent to play with the sets of toys provided, moving from Bag 1, to Bag 2, to Bag 3. Several times during data collection, the parent seemed to be driven to follow the directions provided to her and would redirect the child away from other
preferred activities or items back to the toy bags. The child also would try to open bags out of order, which prompted the mother to again redirect the child to the “correctly ordered” bag for the study. During three data collection sessions, the child clearly refused the storybook activity or a particular toy set. The mother was observed redirecting the child to the toys or storybook repeatedly, even when the child clearly refused the toys or books. When this occurred with a storybook, the mother decided to read the book independently, in a straight reading format, often adding in enticements to the child (e.g., “I bet <brother> would really like to hear this book.”). When this occurred with a toy, the child would eventually enter into the interaction after the mother modeled playing with the toys or bids or enticements to join her in play.

For the pretest-posttest measures, no specific issues were noted with the administration of the tasks. The parent indicated that the assessments took much longer than she had anticipated. However, when probed to talk further about that, she indicated that they were actually fun to do, but just took much longer than she thought they would.

Other items were also used to collect demographic information for the study, including information to establish socioeconomic status and cumulative risk status. The Hollingshead Four-Factor Scale was very quick and easy to administer during the eligibility and consent signing session. The demographics questionnaire was also quick and easy to complete. Portions of the cumulative risk model were tightly connected to the pretest-posttest assessments, which made data collection for this assessment run without complications.

*Data Analysis Procedures in the Lab.* After data were collected in the field, data transcription, cleaning, coding, and analysis were completed. Several issues were noted in this process that made the data analysis phase consume greater amounts of time and energy than what was planned and expected. First, video transcription was hampered by a lack of transcription
reliability on the part of an off-site paid transcriber. After an initial fidelity check that proved highly faithful to the original transcript, the transcriber was allowed to begin transcription. Her turn-around times were rapid (i.e., 5 transcripts completed in 3 days). However, the level of detail paid to the transcription process by the transcriber was far less than what was expected and required for data analysis. Thus, the transcripts were discarded and several undergraduate and graduate students were asked to train and provide a fidelity sample. Out of that group of students, only one graduate student surfaced as being exceptionally talented at video transcription.

After the videos were retranscribed, the transcripts were cleaned to conform to basic CHAT conventions. The CLAN program was very simple to use, although some aspects of the process were not as transparent as was needed by a novice user (e.g., what to do with apostrophes in the main line of data). The CHECK program was a particularly helpful feature of the CLAN program that helped in cleaning the transcripts to the appropriate level required by the program.

Morpheme coding for the lexical diversity measure and parent responsivity coding were completed with little issue, once coding conventions were established for each measure. Undergraduate and graduate students participated in the morpheme coding, as training and implementation of coding behaviors by research assistants confronted only limited issues. The biggest issue in coding behaviors occurred with the parent responsivity coding. Only one graduate student (the student who completed the transcription) was interested and willing to attempt the coding. Other students withdrew their interest in coding behaviors after training was completed, citing potential difficulties with completing the coding as indicated due to lack of skill.
<table>
<thead>
<tr>
<th>Question</th>
<th>Caregiver Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the most memorable thing for you from the language development training that we did together?</td>
<td>Neuron maps.</td>
</tr>
<tr>
<td>Why is that memorable to you?</td>
<td>It's a connection that I really got.</td>
</tr>
<tr>
<td>What was the most helpful or useful thing for you for interaction with &lt;child&gt; that was covered in the training?</td>
<td>Seeing how much language, how you talk and connect, helps her connect.</td>
</tr>
<tr>
<td>Is there anything that we covered in the training that was not very useful for you?</td>
<td>No. If there were things that I knew, it was presented slightly different.</td>
</tr>
<tr>
<td>What would you change in the training, if you could change anything?</td>
<td>More of it. Something later on.</td>
</tr>
<tr>
<td>What would you tell other parents that you learned from this program, now that you've completed this training?</td>
<td>I would tell them that I learned useful education scientific parenting education material. I never would have thought that was with the language mapping system. Kind of makes you think. It's weird and it's cool. It wasn't what I expected and it was really neat. It wasn't what I thought it would be...like videotaping, playing, etc. [mild negative tone of voice used for emphasis on “videotaping, playing, etc.”]</td>
</tr>
<tr>
<td>Do you have anything else that you'd like for me to know about your experiences with this program?</td>
<td></td>
</tr>
<tr>
<td>Do you have any recommendations for me as I move ahead with this program?</td>
<td>Continue it! I hope that everyone could understand it.</td>
</tr>
<tr>
<td>Do you have any recommendations for other parents that might participate in this program in the future?</td>
<td>&quot;Stay with it.&quot; [quotations added gesturally]</td>
</tr>
</tbody>
</table>

**Parent Perception of Feasibility.** Finally, feedback from the parent was solicited verbally from the adult participant to determine if changes should be considered for any of the
measures or intervention methods proposed for the main design. Results of the questionnaire can be found above in Table 13.

Results indicate that the parent expressed positive feelings and perceptions about the program as it was designed. The only potentially negative aspect of the study was expressed by the caregiver was a slightly negative tone of voice when talking about videotaping and playing with her daughter for the final data collection period each session, although that procedure was detailed in full in writing and verbally during the consent signing and eligibility meeting.
CHAPTER V

Discussion

In the current study, a novel language stimulation program for low-income caregivers was developed to examine the potential intervention outcomes and feasibility of the study with a single case participant. Guiding the development of this intervention program was a sound theoretical basis supporting interrelated systems of development (Bronfenbrenner, 1979) and the theorized linear relationship between social and economic risk factors, parent behaviors and inputs to child development, and child developmental outcomes (Conger & Donnellan, 2007). Additionally, this program was developed based on a strong research literature supporting the presence of risk to language development in low-income homes. These risks associated with low-income status include less diverse parental verbal input to children (e.g., Hart & Risley, 1995; Pan et al., 2005), less responsive parenting practices (Hart & Risley, 1995; Kaiser & Delaney, 1996), reduced knowledge of child development (e.g., Rowe, 2008), reduced levels of material and developmental support in the home setting for child development (e.g., Bradley & Caldwell, 1984; Garrett, Ng’andu, & Ferron, 1994), reduced feelings of self-efficacy, which affect parent use of stimulating language (e.g., Thompson & Williams, 2006), and increased levels of parenting stress (e.g., Deater-Deckard, 2004).

Given the above theoretical models and behavioral findings, the Caregiver-child Language Apprenticeship Program (CcLAP) intervention was developed, to address the unique needs of low-income caregivers and their young children. This program focused on increasing parent language stimulation and responsivity in the home setting, parent knowledge of development, and a parent’s material and development support of child maturation in the home. The program relied upon both theoretical models of child language acquisition (e.g.,
connectionism, transactional model of risk) and techniques that have been shown to be effective in previous research with children with language disorders and at-risk language development (e.g., expansion techniques, parent responsive communication acts, dialogic reading principles).

The intervention focused on providing information to parents through both didactic and hands-on, experiential learning opportunities. By targeting these skills in the intervention program, it was hypothesized that positive changes in parent self-efficacy and parenting stress would be realized. Six research questions related to intervention outcomes guided this portion of the study:

1. Do caregivers produce increased levels of language stimulation in the home environment?
2. Do caregivers demonstrate increased responsiveness to child communication attempts?
3. Do caregivers demonstrate increased knowledge of child development?
4. Do caregivers demonstrate increased promotion of child development in the home?
5. Do caregivers demonstrate greater feelings of parent self-efficacy?
6. Do caregivers have reduced levels of parenting stress?

As this study was a Phase I “pretrial” or early feasibility study of the intervention program, it was important to document any positive or negative issues that emerged throughout the study, from the vantage point of the researcher and the research participant. One research question guided this portion of the study:

Can a parent training program (designed to target the caregiver’s knowledge of child development, promotion of child language development in the home environment, use of responsive language stimulation techniques, and use of language stimulation behaviors) be successfully implemented with low-income caregivers and their children?
This discussion is divided into four main sections. In the first main section, results are discussed as they relate to the findings to the research questions for this study (Intervention Outcomes and Early Feasibility of Intervention Outcomes). In the second section, the results are compared to previous intervention studies with children and caregivers from low-income backgrounds. In the third section, limitations of the study will be discussed. In the last section, directions for future research are presented.

Findings of Current Study

Discussion of Intervention Outcomes

Research Question One. Question one focused on whether the intervention program as implemented increased levels of language stimulation in the home environment. To examine this question, parent-child interaction and language samples were collected, transcribed, and coded and data were input into vocd in CLAN to analyze the lexical diversity of parent input to the child. Analysis of the data indicated that parent lexical diversity did not increase as a result of the intervention and remained within a 10% range of the initial baseline measurement, indicating only limited change from session to session (Kazdin, 1982).

These results indicate that, although a significant portion of the intervention that was implemented focused on increasing parent lexical diversity, the intervention had no positive effect on this parent behavior. This could be due to a number of reasons. First, the manner in which the intervention was implemented may have had no appreciable effect on parent behavior due to the adult-to-adult contact that pervaded the intervention. Direct intervention on parent-child interaction may be warranted for future studies, including the use of video feedback (e.g., Girolametto & Weitzman, 2006) to support parent awareness of their own lexical diversity over time.
Second, the prior use of vocd for analyzing the lexical diversity of parent utterances within an intervention program appears nonexistent. A review of the literature found no intervention programs that have used this measure for analyzing changes in lexical diversity over time through repeated measurement. Studies in speech-language pathology and related fields that have utilized D as a measure of lexical diversity have focused on group differences between child or adult participants and not on differences within participants over time (e.g., Owen & Leonard, 2002; Price, van Kleeck, & Huberty, 2009; Rowe, 2008; Silverman & Ratner, 2002).

Next, the material used for this portion of the study may have had a significant impact on the quality of lexical input that the parent was providing from session to session. It is unclear the extent to which the diversity of basic object labels for play items or the diversity of storybook text may have contributed to the variability from session to session on D values for parent input. Further research on the effects of stimuli selection on parent lexical behavior appear warranted at this time.

Finally, it is important to note that there are no established cut-off scores for “good” versus “inadequate” lexical diversity as with other parenting behaviors like maternal responsivity (e.g., as discussed in Yoder & Warren, 2001). It is feasible that the mother in this study is using an acceptably (or a typically) diverse lexicon when communicating with her toddler during play and storybook reading, and is hitting a potential internalized ceiling effect (i.e., “this is what is expected for communicating with children this age.”). Previous research with low-income caregivers has noted quite a large within-group range of lexical diversity (e.g., Andrews, Kelly, & McKelvey, 2008; Pan, Rowe, Spier, & Tamis-LeMonda, 2004; Pan, Rowe, Singer, & Snow, 2005), and it is unknown where on this continuum of low to high lexical diversity this mother was positioned. Given the results of this study where the mother indicated extremely high levels
of parent self-efficacy, this seems like a potentially plausible explanation for the lack of a treatment effect with parent lexical diversity.

**Research Question Two.** Question two focused on whether the intervention program as implemented increased levels of parent responsiveness to child communication attempts. To examine this question, parent-child interaction and language samples were collected, transcribed, and coded for maternal topic-continuing replies to comprehensible child communication attempts. Analysis of the data indicated that parent responsivity did not increase above baseline as a result of the intervention. Parent responsivity to child communication attempts during the Three Bags Task ranged from 60 to 81 percent of comprehensible child utterances. These results indicate that discussions and activities in the intervention program directly related to parent responsive communication practices were not effective in creating a lasting change in the manner in which the parent interacted with her child across the five sessions.

One of the important features of this program focused on the increase in parent responsiveness to child communication attempts, as this behavior could occur in the daily context and has been shown to directly support child communication development. When these data are viewed next to other portions of the study that collected data on actual parent responsiveness (i.e. HOME Inventory: Pretest and Posttest scores were near ceiling levels for responsivity) and the participant’s perceived parent responsiveness (e.g., SEPTI-TS includes questions on parent responsiveness to child needs, which were at ceiling levels as well) the results are, at first, confusing.

However, review of these responsive behaviors across assessments shows that each measure focused on different smaller aspects of the larger construct of parent responsivity. Previous researchers have defined responsivity as a part of the parent-child relationship that
includes “such caregiver characteristics as warmth, nurturance, stability, predictability, and contingent responsiveness” (Spiker et al., 2002; in Warren & Brady, 2007, p. 330). Warren and Brady further explain that these general characteristics manifest in four overlapping parenting behaviors that include “contingent responding, emotional-affective support, joint attention with the child, and language input that is matched to the child receptive language level” (p. 330). The authors also note that these behaviors fall on a continuum of responsivity, from the “molar level” of responding to a child’s physical health needs, to a less molar level of providing affective responsiveness to the child (e.g., being warm to the child), and at a molecular level, responding contingently to child interests and child communication attempts (p. 330-331). Thus, in this study, parent responsiveness for research question 2 focused on the most molecular level of responsivity, while the HOME and SEPTI-TS targeted more molar forms of parent responsivity. This suggests that although the parent exhibited and reported high levels of parent responsiveness for more molar aspects of parent responsivity at both pretest and posttest, the more molecular aspects of responsivity appear either immutable for this participant, given the intervention as it is currently structured, or they are, in fact, at ceiling levels as well for parent responsiveness to child communication attempts.

Interestingly, a study by Rowe (2008) also investigated similar aspects of parent communication responsivity (targeting topic-eliciting statements/questions to children, versus topic-continuing replies to child utterances). Rowe’s study found no effect of parent SES level on topic-eliciting statements. Thus, there appears to be some need to investigate further relationships between more molecular aspects of parent responsivity, SES level, and child communication outcomes, to provide a clearer explanation of the relationship between these complex variables. Additionally, it would be important to determine what level of parent
responsivity appears sufficient for parent-child interactions across SES groups (e.g., Yoder & Warren, 2001).

**Research Question Three.** Question three focused on whether the intervention program as implemented increased caregiver knowledge of child development. To examine this question, the Knowledge of Infant Development Inventory (KIDI) was administered prior to, and at the end of, the intervention program. Analysis of the data indicated that parent knowledge of development did show a substantial positive change from pretest to posttest administration for the single participant, despite rather high pretest scores.

Previous research by Rowe (2008) found that parent knowledge of development mediates the relationship between child-directed speech and child language outcomes. In particular, Rowe found that regardless of parent education level and parent language skills, the knowledge that parents had about development had a significant influence on the varieties of speech the parents used with their children. In a larger study by Vernon-Feagans et al. (2008), maternal knowledge of development was also a mediator between SES level and the linguistic output and complexity of statements by the mothers to their infants. However, Vernon-Feagans and colleagues also found that the temperament of the child actually predicted the maternal language output and complexity level. Thus, features of the child and the parent appear to affect the language that the parents were using.

In the current study, the parent rated the child on the CTTS consistently as an “easy going” child. Combined with the parent knowledge of development findings from this study, this would suggest that the parent in this study would be more likely to produce more diverse lexical items when communicating with her child. This may indicate once again that the lack of change in parent lexical diversity from the beginning to the end of the intervention may be related to
already ceiling-like effects that the parent may have internalized for communication with a
toddler. This also suggests that the use of parent knowledge of development as part of the criteria
for eligibility determination for interventions with this population of parents appears warranted.

**Research Question Four.** Question four focused on whether the intervention program as
implemented increased promotion of child development in the home. The Home Observation for
Measurement of the Environment (HOME) Inventory for Infants/Toddlers was used as a measure
of parent stimulation and promotion of child development in the home setting. Data were
collected at the beginning of the first session and at the end of the last session. Results indicated
that most subtest scores were stable from pretest to posttest administration, though there was
some slight improvement in scores for the Responsivity and Involvement subtests. Moreover, the
mother verbally indicated during the assessment that she felt that she was more aware of
language development after the intervention.

This particular portion of the intervention findings is difficult to parse out on first glance.
The findings would indicate that the participant had created an exceptionally warm, inviting
environment that is well-designed to support child development, even prior to initiation of the
study (based on pretest scores for the HOME Inventory). For instance, the parent entered the
intervention already scoring at or near the published median scores for the HOME assessment, as
seen in Table 9 above, and was near ceiling levels for some of the subtests. However, the general
impressions of the researcher were that this perception of a well-designed home environment
was not the case. In fact, the home environment presented as quite chaotic in terms of routines,
available space, unexpected and frequent entry and exit of family members and neighborhood
friends, and significant behavioral challenges of children in the family. Given that the mother
voiced several times during the assessment that her older children were having troubles in school
academically and behaviorally, and the fact that the family had been recently monitored by child protective services, it is possible that there are some aspects of the home care environment to which the HOME Inventory was not particularly sensitive.

As this study focused on improving both interactional “microenvironmental” support of language development (e.g., parent responsivity and parent lexical diversity) and the implementation of these behaviors in the home environment (e.g., promotion of language development in the home) (for a discussion on microenvironmental supports, see Matheny, Wachs, Ludwig, and Phillips, 1995), differences in HOME Inventory outcomes and researcher impressions may indicate issues with the physical home environment (Evans & English, 2002; Evans & Kim, 2007) outside of what the HOME Inventory was measuring. The physical environment of the home and level of stability that is provided to children over time are potentially just as important as the actual developmental supports that parents can demonstrate that they provide in a one-on-one basis with an examiner. In fact, the physical environment is considered “the stage or setting on which occur caregiver-child transactions” (Matheny et al., 1995, p. 430). Even if the parent in the current study demonstrated many aspects of a supportive and developmentally-rich home environment, which appears likely given the results on the HOME Inventory, the physical environment may potentially impede the mother from carrying out the intended behaviors on a day-to-day basis.

Prior research suggests that issues in the physical and parent social environment may produce a more chaotic home environment, which has been known to affect child development by reducing the potential behaviors that parents are able to demonstrate. For example, household crowding is considered a physical environment issue that has been found to negatively affect child development in samples of low-income families. Evans, Ricciuti, Hope, Schoon, Bradley,
Corwyn, and Hazan (2010) investigated the effects of household crowding in the household on parent responsivity and child cognitive outcomes. Crowding was found to negatively impact child cognitive outcomes at 36 months of age, and maternal responsivity was determined as a mediator between the two constructs. In particular, crowding was noted as having the potential unintended effect of social withdrawal of the parents due to constant social contact with individuals in the home environment (Evans et al., 2010).

Importantly, this was a significant concern regularly mentioned by the mother during the study. In the current study, the adult participant was raising four children as a single mother and lived in a small 2-bedroom apartment in a low-income cooperative housing unit. The children in the household ranged from 23 months of age to 16 years of age. Moreover, the residents in the community were often stopping through during the study, as the doors and windows were left open for summer ventilation. During the study, the mother also verbally indicated that she was rarely ever alone, often sending her older children out of the home “for peace and quiet’s sake.” She also indicated that there was never enough space to put out all of the toys and books that she’d like to have available for her child. Thus, issues of crowding may be a potential stressor that could depress the mother’s ability to regularly engage with the daughter (as the HOME Inventory would suggest occurs with the assessment of parent behaviors) or even find space in her home to set aside a wider range of developmentally-appropriate toys. Therefore, it is feasible that assessment such as the HOME Inventory may not be sensitive to additional contextual or social stressors in the home environment that could affect the implementation of child-development-promoting behaviors and activities by the parent. As the use of goal-directed teaching behaviors and enriched language in the home by parents has been found to account for
25 to 60% of the differences seen across SES groups (Britto, Brooks-Gunn, & Griffin, 2006), this appears an important area for further investigation.

Some assessments have been created that address issues of the physical environment and the effects of chaotic homes in the development of children outside of those targeted on the HOME Inventory. These types of assessments may be warranted for use in future intervention studies for caregivers parenting in low-income homes, which may provide more sensitivity to additional contextual factors not noted on assessments used in the current study. For instance, the Confusion, Hubbub, and Order Scale (CHAOS) was developed to assess the degree to which the home environment promotes the development of “environmental confusion”, though increased noise levels, household crowding, and excessive traffic in the home (Macheny et al., 1995 p. 429). Prior research reviewed by Macheny et al. suggests that child development is impeded across a range of skills areas due to environmental confusion, where noise may inhibit a caregiver’s ability or willingness to engage with their children. Other researchers investigating the relationship between poverty and children’s health have also investigated the use of cumulative risk models that focus on three psychosocial stressors (family turmoil, child’s separation from parents, and exposure to violence) and three physical stressors (crowding, noise, and substandard housing) (Evans & English, 2002; Evans & Kim, 2007). Thus, the use of these types of assessments for understanding issues of parenting effectiveness in the home environment may be warranted. These assessments could provide additional information of stressors on the parent-child relationship, areas to target within the intervention, or specific cumulative risk factors that may indicate which participants may benefit most from the intervention that is provided.
Research Question Five. Question five focused on whether the intervention program as implemented increased the caregiver’s feelings of parent self-efficacy. The Self-Efficacy in Parenting Task Index—Toddler Scale (SEPTI-TS) was administered at the first session and at the end of the last session. Results from pretest and posttest administration of the SEPTI-TS indicate no change across administrations. On this measure the participant scored 308 on the pretest and a 306 on the posttest, out of a possible 318 points. These scores indicate that the mother had exceptionally high levels of parenting self-efficacy.

These results could be interpreted in three different ways. First, the mother in the study could have inflated her responses to the self-efficacy measure, indicating that she was, in fact, in control of her child’s behavior and aware of her own decisions in the parenting process. On both the pretest and posttest of the SEPTI-TS, the mother consistently ranked herself as strongly in control of her parenting skills (e.g., marking Strongly Agree for “Even when I have had an unusually distressing day, I think my child knows I am available to meet his or her emotional needs.”). These types of responses indicate that they mother felt she was highly responsive to her child’s needs, highly engaged in her child’s life, and very much in control of her child. However, there were no overt indications in this study that the mother was inflating her responses on the self-efficacy scale.

Next, these results could have also been related to a child-specific or age-specific response to parenting efficacy, and not her general feelings of parenting efficacy with her four children. For this study, the mother consistently reported that her daughter was, by far, the easiest child to parent out of the four children. This was indicated both through her responses on assessments during the study, and through her self-reported statements about the differences in parenting her four children. The mother frequently mentioned during the study that she felt
exasperated by the behavior of the three older children, stating that all of the children were easy
to parent when they were little (much like the child participant in the study), but that by age 3,
they all developed what she termed “serious conduct disorders.” Thus, the mother may feel much
more comfortable with parenting children under the age of three, and her feelings of parent
efficacy for engaging with children of that age appear high.

Finally, the mother in this study could have truly felt that she could appropriately address
the social, emotional, and educational needs of her child, and indicated that she felt strongly
about her abilities as such on the SEPTI-TS. This extremely high feeling of self-efficacy could
be considered a buffering effect for many of the risk factors that are present in the home setting.
These resilient feelings of self-efficacy are evidenced in many aspects of her life—she was
involved with a number of different parent-child education programs in the area, had a strong
interest in literacy (both personally and with her children), and reported that she loved being
home with her children versus working outside of the home. Her daughter’s communication
skills were noted as being well within average limits on the LDS screener for this study, with a
significant number of words in her expressive lexicon (269 words) and emerging morphosyntax
(e.g., 2- to 4-word utterances). Thus, these strong feelings of parent self-efficacy could be
interpreted as a form of parenting resiliency.

Previous research has demonstrated just this discussion in the role of high levels of
maternal self-efficacy in parenting infants and toddlers. Raver and Leadbeater (1999) found that
mothers raising toddlers in low-income homes with high levels of stress consistently reported
“good enough” to “very good” parenting skills, which were similar to the self-efficacy ratings of
wealthier, nondepressed mothers who had low levels of risk to development in the home setting
(p. 530). This would seem paradoxical given that some researchers suggest that risk in the home
setting has a depressive effect on maternal self-efficacy (Coleman & Karraker, 1997) and that higher levels of self-efficacy help to minimize risk to child development (Elder, Eccles, Ardelt, & Lord, 1995). However, some studies with middle-SES families have shown that high levels of parent-self efficacy (considered moderate illusory control, or a healthy view of the control one has over a scenario with an infant/toddler), paired with high levels of parent knowledge of development create parents who are much more sensitive and responsive to their children’s needs (e.g., Donovan, Taylor, & Leavitt, 2007). In this study, the mother actually sought out opportunities to participate in research studies at a local university related to parenting behaviors, and also accessed parent education opportunities in her community through social service agencies and local parenting groups. The mother reported that these types of activities were enjoyable to her, where the activities “got her out of the house” where she could communicate with other parents about raising children. Moreover, the mother had earned a bachelor’s degree and was an avid book reader. Thus, it would appear that high levels of self-efficacy and knowledge of development in this study, couple with an intense interest in learning, may provide the mother with a buffer to the moderate level of risk present in the home environment.

**Research Question Six.** Question six focused on whether the intervention program as implemented reduced the caregiver’s feelings of parenting stress. Data were collected using the Parenting Stress Index—Long Form (PSI) at the beginning of the first session and the end of the last session in the study. No indication of a reduction in parenting stress was noted in this study, and in some cases in the parent responses on the Parent Domain questions, there was an increase in parent stress. Of particular note was the consistently high score for the Health Domain for the Parent Domain scores.
Abidin (1995) noted that parent health can be indicative of parent difficulties that stem from the parent-child system or could be an independent parent stressor in its own right (p. 11). Abidin also states that previous research found that low-SES families with greater parenting stress may seek medical services more frequently than low-SES families without high parenting stress levels or higher SES families. It is important to note that during the intervention portion of the assessment, the mother suffered a physical injury (reported to the lead researcher as a fall, which included several stitches to her face and damage to her left leg and hip) that caused an unexpected hospitalization during the study. The parent also reported significant long-term health issues (several significant autoimmune disorders; physical difficulties secondary to significant weight issues), which were also reported to debilitate her daily routines to a great degree at times. Thus, the consistently high scores for the Health Domain across the study are warranted.

Other patterns of responses by the parent in this study indicate higher levels of parent stress in the home environment as well. The participant’s posttest score of Role Restriction in the Parent Domain increased to borderline high scores over pretest administration, and the Isolation Domain increased from high average to clinically high levels of stress across the study. Abidin (1995) stated that high scores for the Role Restriction and Isolation Domains are suggestive of significant parent stress in the home environment. High scores in these two areas combine to create potential issues of neglect of childcare duties or more severe patterns of child neglect. Additionally, Abidin stated that parents with high scores on these two domains may feel distant from a partner or emotional support system, which also increases risk to child development.

In this study, the parent participant did not have a partner who helped raise her children and had an extremely limited social and emotional support system. The mother reported during
the study that she had been referred to child protective services the previous spring because of suspected neglect by neighbors in her housing complex. During the study, the parent reported that the foster care worker assigned to her family closed the case, citing that the mother had completed all of her obligations with the court system. Though this could have been perceived by many as a positive accomplishment, the mother reported feeling deep sadness that the social worker assigned to her family was not going to be visiting on a regular basis. The mother further reported that the social worker was one of the few people that understood her situation and was helpful to her and her children.

Therefore, it is conceivable that parent stress levels from a number of different sources contributed to the lack of gains noted in several parent behaviors in this study. Given that the parent demonstrates borderline high scores for Isolation and Role Restriction, and clinically high stress levels for the Health Domain, it suggests that the cumulative risk model used in the study may not be as robust a measure for identifying risk in the home setting when compared to the findings from the PSI (as the cumulative risk status score demonstrated a fairly moderate level of parent risk in the home environment). This may be due to the fact that many of the risk factors used in the cumulative risk model rely upon composite scores from various assessments. Additionally, the cumulative risk model may not provide a realistic view of the day-to-day stressors that could significantly impact the parent-child relationship, and thus, parent support of child communication and language development.

**Discussion of Early Feasibility of Intervention Outcomes**

Question one for the feasibility portion of the study focused on whether the intervention as designed could be successfully implemented with low-income caregivers and their children. Data were collected using detailed notes in a researcher journal, to document the lead
researcher’s perceptions of the intervention feasibility, and a parent questionnaire, to document
the participant’s perceptions of feasibility.

**Lead Researcher Perception of Feasibility.** Several areas of the study were examined, to assess the viability of various decisions for the research study. These areas included (1) recruitment of participants and participant selection criteria; (2) intervention procedures: research setting, (3) instrumentation, and (4) data coding and analysis procedures in the lab.

**Recruitment of Participants and Participant Selection Criteria.** Recruitment for the current study was conducted over an 8-month period, which was nearly four times the amount of time that was slotted for recruitment in the research design. Recruitment was generally hampered by a lack of interest or willingness on the part of the program coordinators to participate with recruitment. Additionally, recruitment was hindered by the narrow range of participant features that were required for the study. Still other sites had program managers who simply did not understand that speech-language pathologists provide preventative intervention services to families. These situations suggest several venues for exploration.

First, expanding the recruitment of participants to include families from racial and ethnic minorities on future studies could increase access to a larger participant pool. In particular, several sites indicated willingness to participate, but the agency provided services exclusively to African-American, Hispanic, or Arab-American families. In order to expand recruitment into these populations, it would be important to consult with cultural and linguistic experts of each of these populations to ensure a high level of sensitivity to cultural differences related to parenting factors in the CcLAP intervention program.

Next, expanding the intervention to include low-income parents of children with communication disorders could be feasible. Given that the program as designed includes many
aspects of parent-child interaction theories or strategies that have been demonstrated to be effective with families of children with language disorders, this seems like a promising avenue of exploration. In particular, families of children with communication disorders are highly motivated to find ways to improve their child’s communication skills, and this may provide the motivation necessary to promote uptake and retention from participant families. Additionally, speech-language pathologists are traditionally viewed as interventionists who work with children with disabilities. Incorporating these families into the intervention design could easily ease recruitment burdens. In this study, many of the program coordinators were perplexed by the inquiries of a speech-language pathologist recruiting parents of children with at-risk, versus disordered, language skills. Also, one program coordinator simply refused to recruit, based solely on the fact that a speech-language pathologist was providing a preventative intervention program to at-risk families. Therefore, working with low-income parents of children with communication disorders may alleviate this fairly pervasive dissonance with service providers of low-income families.

Although the above recruitment issues are of great importance to future studies, of considerable interest to the lead researcher was the recruitment situation where sites appeared interested and willing to recruit at first, but abruptly (and sometimes with no contact to the lead researcher about any perceived issues with the study) became unreachable by the lead researcher. There were approximately 15 agencies that were contacted that fit into this category of potentially viable recruitment sites. In each case, several pre-recruitment interactions were completed and the program coordinators appeared eager and ready to recruit for the study. However, all of those agencies ceased contact with the lead researcher, sometimes even after setting up a final meeting to discuss how forms were to be passed out to potential participants.
and sign documentation to be sent to the Human Subjects Review Board about the facility manager’s willingness to allow recruitment at the site.

This pattern of behavior was at first perceived by the lead researcher as an anomaly, given the number of sites that were contacted for the study. However, once several sites had mysteriously backed out of recruitment at the last minute, after extremely favorable interactions with each of the program coordinators, a pattern of behavior started to emerge. Some researchers have investigated this type of recruitment behavior on the part of program coordinators or facility managers, called clinical gatekeeping of clients for clinical research studies (Sharkey, Savulescu, Aranda, & Schofield, 2010). Clinical gatekeeping is defined as “the process whereby healthcare providers prevent access to patients for research recruitment” (p. 363). Sharkey et al. discussed clinical gatekeeping as a significant hindrance to research with various subpopulations of participants in clinical research programs. In particular, they suggest three generally held ethical principles that are violated with clinical gatekeeper behaviors.

First, clinical gatekeeping does not respect individuals and their ability and right to make decisions for themselves. This suggests that persons of clinical authority over the potential participant weigh the benefits and drawbacks of research for the individual, versus allowing the individual to make that decision on their own. In particular, the fact that a speech-language pathologist was involved with this study may have led some program coordinators to question the intent or the merit of the program as it was designed. As speech-language pathologists regularly service people with disabilities, it may have been perceived by these program coordinators that a low-income parent may be overly burdened with additional issues related to that type of contact. Conversely, program coordinators could have simply felt that the potential participants were already confronting too many significant issues related to low-income status,
and that any additional stressor added to the system from a research study on a previously untested program would be considered unduly burdensome.

Next, clinical gatekeeping erodes the concept of beneficence of research, or the “favourable balance of possible benefits versus potential harms” (p. 364). Sharkey et al. suggest that this scenario falsely passes judgment on the merit of the research before it has been conducted. Although closely tied with the first principle of an individual’s right to self-determination, this scenario suggests that the gatekeeper has determined that the research study potentially provides a great deal of risk to the client and not enough reward. Sharkey et al. suggest that this scenario leads to selection bias and smaller overall recruitment rates for clinical research studies.

Finally, clinical gatekeeping reduces the “distribution of the benefits and burdens of research” that should be afforded to all potential participants for clinical research (p. 363). Given that much of the behavioral and clinical research in speech-language pathology has targeted middle and upper class families, this establishes a further gap in the fair distribution of research outcomes to the low-income population. For this study, only one participant was successfully recruited and maintained over the course of the study. This greatly limited the scope of inferences that could be drawn from the study, which could be extended to low-income families, and hinders investigation of any potential benefits of this program.

**Intervention Procedures: Research Setting.** Although the use of the home setting was incredibly important to the parent’s ability to participate in this study, the decision to use the home environment for the main dissemination of information to families proved exceptionally challenging. The living room space, in particular, provided a number of unintended tests to the research design. First, the space in which the study was held was very cramped. Recording
parent-child interactions was quite difficult, as there was little space to set up video equipment so that it wouldn’t encroach on the small amount of floor space for data collection. Additionally, the presence of various media items in the room proved tempting for the children in the home. As the living room was a main source of relaxation and entertainment for the family, the presence of a research study in this space was fairly unwelcomed by all of the children.

Next, the childcare arrangements for the children, which were established by the mother and lead researcher, were well-intentioned, but were not effective for most of the research study. Unfortunately, the babysitter (a friend of the mother) who was asked to watch the younger children during the study never showed up to watch the children on the first session. At that point, the older siblings were asked to watch the younger children while conducting the study. This was effective for portions of two sessions, but the older siblings consistently dropped the younger children back off into the house without reason and promptly left the housing complex. An additional outside babysitter was also offered to the parent (i.e., a student from the university), but the parent refused the additional person, citing that they would be strangers to the younger children that may upset them. Although management of the two younger children was a significant concern during the study, the management of the two older children was much more challenging to the research design. This was the most unexpected consequence of conducting research in the home environment. For instance, several times during the study, the mother was observed verbally fighting with the two older siblings, in an effort to manage their behavior. One engagement between the mother and older children lasted over a half of an hour, unfortunately during the middle of a training session, though more abbreviated engagements peppered the entire study. These interactions created an environment of hostility and anger in the home, that more than likely had a significant effect on the data collection procedures. In fact, during the
heated exchanges between the mother and older children, the child participant ran to the lead researcher and hid her face in the couch, clearly emotionally affected by the incident.

The findings for the feasibility portion of the study related to the home environment mirror some of the discussion of the HOME Inventory for the intervention outcomes above. Household crowding and noise levels, coupled with periods of high hostility between the parent and the older children and serious health issues of the mother, created an environment in which responsivity to child communication attempts and rich language input were most certainly not as important to the parent as they could be in a different environment. Thus, the results from the HOME Inventory and the cumulative risk status seem particularly at odds with the qualitative findings from the feasibility portion of the study, but provide no clear-cut solutions to the dissonance that this creates methodologically. Although intervention in the home setting was a primary goal of this intervention program, it may be warranted to investigate the feasibility of center-based training programs, with or without a home-based component. Conversely, the development of additional training components that directly address chaos in the home may provide an avenue for improving parent outcomes with this particular intervention program.

**Instrumentation.** Most of the measures used for the study appeared sufficient for the needs of the design. They were all quick and easy to administer, and cleaning/analyzing for most assessments was not a particularly significant demand during the study. However, for some of the measures used in the study, scoring issues related to methodology appeared to be of some concern. First, ceiling effects were possible with the SEPTI-TS, given the mother’s responses to the assessment. This may be an artifact of the mother inflating responses to these questions, the manner in which the questions were asked, the types of questions that were asked, or a combination of these issues. Next, the HOME Inventory scores appeared inflated given the
overall quality of the home environment observed throughout the study. This may be due to the types of probes that were used for indicators of quality for the assessment, which were clearly present in the home environment, but did not appear to catch the true spirit of the setting. Finally, the findings from the cumulative risk status score did not appear to match the degree of risk to development that was observed by the lead researcher in the home. More investigation of assessments or scales which address these concerns is warranted.

The only additional issue noted with the instrumentation used during the study was the informal assessment of parent-child interactions using the Three Bags Task. The format that was used for the data collection procedures was verbatim from the Early Head Start program evaluation procedures. However, it was clearly observed that the mother appeared driven to follow the instructions for the assessment over implementation of the skills that were taught during the intervention. Thus it is possible that the mother was most interested in compliance to the rules that were provided for data collection by the researcher, to the detriment of parent responsivity to child communication attempts. This may be an artifact of the instructions that were provided to the parent or it may indicate that the parent was not yet ready to implement the skills as trained.

**Data Coding and Analysis Procedures in the Lab.** For this portion of the study, data were collected in the field, then data were transcribed, cleaned, coded, and analyzed by several research assistants and the lead researcher. Several issues were noted in this process, which were directly tied to transcription reliability. The entire process to achieve reliability of transcription, and the cleaning and coding of transcripts, took nearly five months of time, owing to initial transcription errors by the paid transcriber and issues with the use of undergraduate and graduate student who were less familiar with language sample transcription procedures for research.
purposes. The undergraduate and graduate students were from the university’s communication sciences and disorders program, which includes a number of very skilled, knowledgeable, and highly motivated students. Unfortunately, several of the students trained for language transcription and coding for this project had significant difficulties achieving the 90% reliability cutoff scores for transcription and coding. The only student who successfully completed language sample transcription was a non-traditional graduate student, who is raising several children of her own. It is believed that the life experience and maturity of the student provided her with much more skill for processing the hard-to-transcribe child utterances of the toddler in this study. The same student was also especially adept at coding maternal responsivity, which may be indicative of her skills acquired from various life experiences.

**Participant Perception of Feasibility.** To provide parent perspective to feasibility research question 1, feedback from the parent was solicited verbally to determine how the program was received and if changes should be considered for the intervention or research study as designed. The participant expressed many positive feelings about the study, indicating that the intervention program was perceived by the parent as beneficial.

One interesting area of feedback was related to changing the length of training provided, where the parent indicated that more sessions, with additional follow-up sessions, would be beneficial. This suggests that the parent considered the program to be of use to her and that increasing the amount of contact time would be important. As this study was designed to provide approximately 4 hours of training to the parent, this suggests two possible reasons for this statement. First the amount of contact time may have been perceived as insufficient to meet the needs of the parent. Or conversely, the parent felt strongly about the social and development support that the researcher provided (similar to the support provided by the parent’s previous
court-appointed social worker), and that the perceived benefits of the program to the parent may be tangential to the actual goals of the research study.

One additional theme that arose from the comments made by the mother was the apparent interest in the connectionist modeling that was provided. The mother indicated that the “neuron maps” were very tangible to process and that “scientific parenting education material” is of great value to her. This suggests that the lack of parent knowledge of development for some low-income families may be a matter of access to the information versus actual interest level, as suggest in Raviv, Kessenich, and Morrison (2004), Bronfenbrenner (1958; as cited in Hoff, Laursen, and Tardif, 2002), and Tough (2008).

Findings Related to Previous Intervention Research with Low-Income Families

As mentioned in chapters 1 and 2, there have been few studies in speech-language pathology and related fields that address the creation of small-scale language stimulation interventions that target the unique needs of low-income caregivers and their young children. A major purpose of this study was to create a dialogue as to ways in which researchers can close this gap in the literature.

One program that was recently conducted by Oetting, Pruitt, and colleagues (Oetting, Pruitt, & Farho, 2010; Oetting, Pruitt, & Roy, 2006) investigated the efficacy of an intervention program for low-income caregivers called Tips About Talk. This parent education program was designed to train caregivers during four 1-hour sessions over a 4-week period in a group setting at a local community center. Areas targeted included parent knowledge of language development and disorders (e.g., basic terminology for the field, developmental milestones), parent language stimulation behaviors (e.g., self-talk, repetition, expansion techniques), the use of the parent language stimulation behaviors during storybook reading and during daily activities, and finding
ways to reduce parent-child conflicts that could limit parent-child interactions. The first study of this program (Oetting, Pruitt, & Roy, 2006) found that parent knowledge of development was positively changed after the intervention, but parent behaviors were not changed from pretest to posttest. There are evident similarities between the general focus of training targets and the research findings from the Tips About Talk pilot research and the current research study. This is despite the differences in specific methods, setting, and target group of children (roughly ages two to six in Tips About Talk). In the discussion of findings from their pilot research, Oetting, Pruitt, and Roy lament some of the same issues that the current study has uncovered:

Although caregiver training as a service is far from novel for the field of speech language pathology, we would argue that our field's participation in this type of service is extremely underdeveloped in at least two ways. First, we lack a research base within the field of speech language pathology that focuses on caregiver training methodology. As one can see from our pilot data, our workshops led to positive changes in the caregivers’ self-perceptions of their knowledge and skills, but they were less useful for helping caregivers’ change their behaviors when they interacted with their children” (p. 20).

Oetting, Pruitt, and Roy state that although positive findings were noted in their study, that the gains that were seen were more limited than what was expected. This is particularly notable as the research team had worked for many years on developing and refining this program for low-income families. However, the authors suggest that issues related to manner of presentation of material may be critical to the effectiveness of the intervention and that specific caregiver training methodologies should be sought to improve the extent of changes in caregiver outcomes.

One program outside of our field that has been successful with improving language outcomes of children under the age of three who are low-income is the Dialogic Reading program, developed by researchers in the field of education (Valdez-Menchaca & Whitehurst, 1992; main study with middle-SES toddlers in Whitehurst et al., 1988). This program was designed to train caregivers during two sessions (30 minutes each) over a two-week period in
dialogic reading principles (e.g., expansion techniques, using open-ended questions) during shared storybook readings. This program uses didactic teaching, instructor modeling, and role playing with feedback (Whitehurst et al., 1988). Findings from these studies suggest that parents who were trained in dialogic reading principles, whether middle- or low-SES, had children who evidenced greater gains in expressive vocabulary skills when compared to controls. Changes in parent language stimulation behaviors during shared storybook readings were measured in these studies and were found to increase across sessions.

As the current study incorporated dialogic reading principles in session 3, along with the same general programmatic teaching methods, this disagreement in findings is curious. One issue may be that the way in which the need for uptake of the material by the parents was presented to families in each study. From the descriptions in Whitehurst et al. (1988) and Arnold et al. (1994) the Dialogical Reading program relies much more on *telling* parents what they should be doing and how they should be doing it, versus embedding the intervention targets within experiential learning tasks. Whitehurst et al. (1988) stated that parents were directly instructed to increase their behaviors in the target areas (akin to the single-subject research study conducted by Morgan and Goldstein, 2004, on the use of decontextualized language during shared book reading with low-income parents). In the current study of the CcLAP intervention, no direct demands for increasing behaviors were used. Instead the caregiver was provided information about certain target behaviors beneficial to child language development and given experiential tasks that required the use of these target behaviors (e.g., a discussion about responsive communication behaviors and an activity that helped the caregiver practice these behaviors). This suggests that with parent behaviors in caregiver training programs, the use of explicit training practices (e.g., Do \(<x>\) more frequently) versus implicit training practices (e.g., \(<x>\) is important to child
language development; then modeling/role playing <x> in an activity) may, in fact, positively improve parent behaviors in the short-term and long-term (as evidenced in the short- and long-term gains noted with the Dialogic Reading program) (similar to findings from Katz, Rusnak, Burroughs, Hawke, Maag, Wetli, et al., 2009, with graduate student clinicians conducting a literacy intervention with at-risk kindergarteners). However, differences in findings may also be due to the differing contextual targets of the study as well. Dialogic Reading focuses on improving behaviors within one context, concentrating parents’ focus onto a single set of behaviors. By contrast, CcLAP seeks to change parent behavior within and across microsystemic contexts.

Therefore, the focus solely on microsystemic contexts using the CcLAP intervention, as currently design, may not have be able to provide parents with the broad array of contextual supports that would be needed to combat the effects of poverty. By far the greatest concern that arose during the current research project was the true feasibility of providing a prepackaged program in a home environment where there are large amounts of risk related to low-income status (a macrosystemic issue). While conducting the study, the risks outside of those related directly to language development worked against the intent of the CcLAP intervention program, as highlighted in the home environment discussion above. It appeared as though the family unit and community environment were actively in opposition to what the participant and the lead researcher were trying to cultivate in the study.

Given that macrosystemic differences in ecological models of human development are an amalgamation of subsystem differences, it would suggest that attempts to change a single system (the microsystem, or parent-child interactions) may in fact be a much more daunting task than first conceptualized. Systems theory suggests that any system, such as the parent-child dyad, is
not a single entity unto itself, but is actually functioning within a broader set of interconnected contexts (Heylighen & Joslyn, 1992), much akin to the connectionist modeling examples used for this study. Thus, if large amounts of risk in the broader context of child rearing are placing great burdens on a parent, it may be warranted to investigate ways in which these other contextual variables can be modified to support child language developmental outcomes.

One study by McGowan et al. (2008) from the field of social work indicates some promise in this multilevel approach to modifying parenting behaviors to support language development. McGowan et al. targeted various parenting behaviors with teen parents, in an effort to improve infant communication development outcomes. The project focused on a wide range of parent-related skills through both prepackaged intervention programs and social networking principles. This study offered parents three separate intervention programs over an eight-month period. The prepackaged programs used included an infant massage training, child development education training using the My Baby U program (Brown et al., 2000; in McGowan et al., 2008), and language stimulation training using Hanen’s *You Make the Difference* program (Manolson et al., 1995). These interventions offered parents training on ways to increase parent-child attachment and bonding, knowledge of child development, and parent stimulation of communication development in everyday contexts. Social networking principles included the use of mentors for the teen parents and the use of center-based teen parent group meetings. These social networking features provided the teen parents with guidance from a knowledgeable individual invested in the parent’s learning and a social outlet with individuals living the same experience as the parent.

As systems theory suggests that systems are both dynamic and self-regulating (Heylighen & Joslyn, 1992), this type of broad-based intervention program may provide families not only
with relevant developmental information, but it may also provide families with the individual and group feedback from social supports to make lasting changes in parent behavior. Although the program specifically targets the improvement of microsystem parent behaviors (i.e., attachment, parent knowledge of development, and parent language stimulation behaviors), the addition of the parent mentor and the group training model may have provided support that cuts into mesosystemic and exosystemic factors. In other words, the social dimension of the program may provide a feeling of community to the teen parents, as well as a sense of accountability to those around them.

For the participant in the current study, there was an increase in feelings of social isolation as the study progressed. The mother voiced strong feelings about the completion of social work supports in the home environment provided by child protective services. These features of the parenting situation in the home environment suggest further exploration into how social supports can buffer risk to child development (such as work by Raikes & Thompson, 2005), particularly as they could apply to intervention programs with low-income caregivers and their children.

Therefore, for the CcLAP program, it would seem that the narrow focus on microsystemic factors may not have provided the parent with the necessary mesosystemic and exosystemic supports that could work in concert with, versus in opposition to, support of child development in the home setting. The field of speech-language pathology has long worked with families who have significant emotional and financial stressors due to child delays and disabilities, and many of these child development risk factors overlap with those seen with low-income caregivers. For instance, parents with children who have language disorders are more likely to be less responsive and provide more directives (e.g., Warren, 2004) when compared to
parent with typically-developing children. These parents also evidence greater amounts of parenting stress (Connor, 2008) and are at greater risk for fewer positive feelings of parenting self efficacy due to increased depression and stress in the home environment (Guimond, Wilcox, & Lamorey, 2008). Parents of children with disabilities are also at greater risk for social isolation, which could lead to child maltreatment (Office of Child Abuse and Neglect, 2003). Thus, many of the challenges that are central to parenting in low-income environments are also of concern for parents of children with disabilities.

For working with families of children with disabilities, early intervention researchers and speech-language pathologists have devised many effective ways for helping families improve child development outcomes. First, researchers have created a number of prepackaged evidence-based interventions which directly address microsystemic issues in parent-child interactions (e.g., Responsivity Education/Prelinguistic Milieu Teaching, Yoder & Warren, 2001). Research on these interventions document significant shifts in the ways parent interact with their children, which ultimately improves child language outcomes. Second, the type of work that early intervention speech-language pathologists do within the home environment addresses many critical mesosystemic and exosystemic issues that these prepackaged communication and language stimulation programs do not. Speech-language pathologists by trade provide a number of different flexible and emergent supports to parents through an understanding of parent needs and resources. These supports include parent counseling and emotional support, referrals to resources in the community, connections to parent support groups, and carryover of skills across multiple environments, just to name a few. Thus, speech-language pathologists may help reduce risk in the home environment not only with the evidence-based interventions that we provide, but in the emergent and sensitive manner in which we guide and support the family unit over time.
Therefore, with future research on the CcLAP intervention, further investigation of intervention procedures to support the reduction of risk factors in the home environment is warranted. In particular, it would be important to find ways to emulate the type of flexible, parent-driven support that speech-language pathologists already provide to parents of children with disabilities. One possible option could be the embedding of a speech-language pathologist into a community agency already serving families who are low-income. In this authentic community-based model, many different aspects of the poverty-child development connection could be addressed. First, coordination of services with other professionals interested in issues of poverty, such as social workers, could be readily accomplished. Social workers are uniquely attuned to issues of social and mental health and these two aspects of parenting are important elements in addressing child communication development. Next, parent-to-parent group services could also be offered as an exosystemic support, much like in McGowan et al. (2008). This type of service could allow prepackaged language stimulation programs such as CcLAP to be offered to families. Thus, providing information about child development and language stimulation behaviors to parents, along with a social support system, may be promising for a multisystem intervention approach.

Another possible model could include center-based training modules with a home-based carryover component. The center-based option could include administration of the CcLAP intervention (or similar program) in a group format, allowing parents to talk with a knowledgeable trainer (i.e., an SLP) about child language development and develop a sense of community with other group members. Then home-based services could focus on carryover of skills into the home environment, working directly with the entire family unit on reduction of risk factors in the home setting. Either option above would provide not only programmatic
support for changes to parent-child interaction, but would also provide a more flexible model for addressing other family needs that may be barriers to lasting changes in the home.

Limitations of Current Study

Although several limitations related to specific research questions were inherent to the discussion above related to feasibility of the research study, some additional limitations are worth noting. First, and most notably, this research study was conducted as a pilot study with one participant dyad for the research design. This design did not provide sufficient controls for a number of threats to validity, such as history effects and maturation related to child development (and any potential changes that could occur in parent behavior as a result). As mentioned previously, although intervention outcomes were discussed in terms of trends in behavior, no findings from this study can be suggestive of confirmatory results. Rather, the results from this study are purely exploratory in nature and will help determine potential avenues of exploration with future research with this program.

One final limitation of the study was the potential skill level and prior training of the mother who participated in this program. During the course of the research study, the mother revealed that she had participated in three activities that could have affected outcomes. First, the mother had been a participant in numerous research studies at a local university, all of which targeted changes in a variety of parenting behaviors. Next, the parent indicated that she had also recently participated in a parent education program at a local faith-based social service agency that targeted healthy parent-child relationships for at-risk families. She indicated that she was referred to the program because of her involvement with the court system.

Finally, the mother indicated that she was regularly involved with a local parent-child playgroup and parent training program. The mother stated that she meets at least once per week
with a parent educator in a playgroup setting that is structured to allow parents to learn about child development and practice parent-child interactions. This is accomplished through group activities led by the parent educator and periods of free play in a developmentally-appropriate community play space provided by the play group program. This program also provides families with one-on-one parent support from a parent educator several times a year using the Parents as Teachers program (e.g., Parents as Teachers National Center, 2008) and includes regular developmental screenings using the Ages and Stages Questionnaires (Squires, Twombly, Bricker, & Potter, 1995-2009). Additionally, this program is tightly coordinated with the early intervention programming for children with disabilities, where speech-language pathologists, occupational therapists, and physical therapists regularly attend to parents with developmental questions. Thus, this mother has received a great deal of prior parent education training that could have limited the extent to which changes in parent behavior could have been realized in the current program. Additionally, it is feasible that the mother was already at ceiling levels for the behaviors targeted during this study and may not have been an ideal candidate for this research project as designed.

**Directions for Future Research**

The current study created many avenues of exploration for future research in language stimulation programs for parents who are caring for young children in low-income households. These areas of future research stem from questions that arose from issues surrounding the knowledge base for parent behaviors and methodological issues in the intervention itself.

First, and most importantly, additional information about parent and child behaviors for low-income parents is desperately needed to form a more solid basis on which this intervention is constructed. It would be important to develop a deeper knowledge base of the possible range
of skills present in the broader population (both low-SES and middle-SES) for the variables covered in this study, particularly as they combine to relate to child language development outcomes. Previous studies have indicated an effect of each of these variables on child outcomes (e.g., parent knowledge of development mediating the relationship between child directed speech and child language outcomes; parent stress depresses a parent’s ability to provide enriched language to the child), but no systematic understanding of how the constructs targeted with this study collectively contribute to child outcomes in a single model is known at this time.

Second, more information is needed about the specific indicators for risk to language development over time. For instance, the cumulative risk model suggests that more risk factors present in the home setting indicates more risk to development, but there are no known studies that demonstrate a threshold at which risk is so great that it tips the balance to depress child development, particularly language skills. Additionally, assessments such as the HOME Inventory and cumulative risk status score, did not appear sufficient for the purposes of this study, in terms of indicating the degree of risk in the home setting that was clearly evident observationally. Given that the current study investigated the feasibility of a new preventative language stimulation program for low-income parents, more information to signal when this type of program would provide the most benefit to families would be warranted.

Next, future research on this parent language stimulation intervention will need to incorporate a broader range of participants to achieve sufficient n sizes, to provide some indication if the findings from this study were anomalies or population trends. For the current study, the target population was monolingual Caucasian families that included a typically-developing 18- to 36-month-old toddler. This suggests that research with different race/ethnicity categories, different age ranges, or children with disabilities should be targeted. Given the access
that speech-language pathologists have to children with disabilities, it would seem most feasible to provide this type of programming to that parent-child population. The fact that children from low-income homes have diagnosed language disabilities does not preclude the need for these types of parent language stimulation programs. Indeed, it would suggest that these types of programs could be exceptionally beneficial to families who are low-income and have the additional stress of a child’s disability present in the home setting. Additionally, speech-language pathologists are viewed by many as service providers for families who have children with disabilities, and the uptake for low-income families seeking services for their child, and support for their family, may be much greater.

Finally, the current research study as designed had only limited effects on changing parent behaviors that have been shown to influence child language development. As previously mentioned, the Tips About Talk program had similar outcomes with low-income families, but programs like Dialogic Reading have shown positive gains in parent and child behaviors, even with contact time that was 25 percent of what the current study and Tips About Talk program employed, and with similar coverage of shared book reading principles in all three programs. This indicates that further investigation of the intervention methodology and teaching strategies for the study is warranted. Additionally, it would be important to investigate the use of multilevel/multisystem approaches to intervention with low-income families and their children. This type of programming should focus not only on parent-child interactions, but on other ways to reduce risk factors to development within the child’s language learning environment.

**Conclusion**

Previous research in poverty and child development has forged a pathway to understanding mechanisms of risk to development, including early communication and language
skills. Parents are a strong mediating variable in this pathway. They either create a conduit between poverty and child development, or a protective buffer to a variety of risks. Speech-language pathologists are uniquely suited to provide assistance to families to help them more effectively manage this risk, but more research is needed to determine which intervention methods are most efficacious. The CcLAP intervention program was designed to engage in this discussion. This type of pre-trial, or early feasibility work, is a necessary step in the clinical outcomes research process. The current study used a type of emergent field-based design—a sort of “get your hands dirty and see what comes of it” approach. The hope is that future research projects will also engage in this exploratory work, to help more quickly solidify the main components of an intervention that shows real potential for meeting the needs of low-income caregivers and their families. The fruits of this labor will certainly lead to more promising Phase II and Phase III efficacy studies in the years to come.
References


cognitive outcomes of low birth weight, premature infants: For whom is the intervention most effective? *Pediatrics, 89*, 1209-1215.


Coleman, P. K., & Karraker, K. H. (2003). Maternal self-efficacy beliefs, competence in


development, sensory sensitivity, and maternal response during interaction.

*Developmental Psychology, 43, 865-876.*


Evans, G. W., & Kim, P. (2007). Childhood poverty and health: Cumulative risk exposure and


Freeland, C. A. B., & Nair, P. (1985, April). *The role of parent knowledge and support in the


CCLAP Parent Language Stimulation Program

rationale and model for early interventionists who work with low-income families. *Zero to Three, 27*, 13–22.


preschool to adolescence: The influence of social and family risk factors. *Child Development, 64,* 80-97.


Storch, S. A., & Whitehurst, G. J. (2001). The role of family and home in the literacy
development of children from low-income backgrounds. *New Directions for Child and Adolescent Development, 92, 53-71.*


through picture book reading: A systematic extension to Mexican day care.

Developmental Psychology, 28, 1106-1114.


0,,contentMDK:22569498~pagePK:148956~piPK:216618~theSitePK:336992,00.html


Appendix A

*Bronfenbrenner’s Ecological Systems Model of Development*
Appendix B

*Family Investment Model from Conger & Donnellan (2007)*
Appendix C

*Family Stress Model from Conger & Donnellan (2007)*
Appendix D

*Model of Hypotheses for Current Study*

Knowledge of Child Development and Temperament (Human Capital)

Low-Income Status/Established Cumulative Risk (Family Economic Pressure)

Parent Stress & Parent Self-Efficacy

Parenting Practices: Stimulation and Involvement

Child Behaviors and Outcomes

Language Stimulation Behaviors

Parent Responsivity in Interactions

Promotion of Language and Goal Setting
Appendix E

*Original Proposed Methods for Main Experiment*

For the main experiment of this study, a single-subject multiple baseline design, with an embedded pretest-posttest feature will be employed. This mixed method approach was chosen to allow for consistent, repeated measures of some target behaviors, while allowing for the investigation of additional behaviors that cannot be repeatedly measured at the frequency required for a pure single-subject design. In particular, a multistrand concurrent mixed model design will be employed (Tashakkori & Teddlie, 2003), as seen in Appendix F. This model allows for the construction of independent sets of questions, data collection, and data analysis for the multiple baseline and pretest-posttest strands of the design. “Mixing” in this study will manifest in participant selection, administration of the intervention, and a meta-inference stage. Thus for this study, the integration of findings from both strands of the model have the potential to provide additional insights into changes in the proximal environment that occurred as a result of the proposed intervention. These insights could form the basis of future intervention research in this area. In fact, many of the parent-related factors included in the study design have been traditionally held outside of the scope of research in speech-language pathology. Drawing inferences from multiple sources of data related to parent stimulation in the child’s proximal environment will provide additional avenues to explore in parent-child interaction and language development research.

**Single-Subject Design**

A concurrent multiple baseline design across participants, with two replications, will be employed for the single-subject portion of the design (Barlow, Nock, & Hersen, 2009; Cooper, Heron, & Heward, 1987). Multiple baseline designs are considered a mainstay of research
conducted in applied behavior analysis, as well as other types of educational and developmental research. A concurrent multiple baseline design was chosen for this study because of several important features inherent to this form of single-subject design. First, single-subject designs in and of themselves are extremely useful as an exploratory experimental research design because they allow for inference of treatment effects within single participants through sufficient controls on various threats to validity (Barlow, Nock, & Hersen, 2009; Cooper, Heron, & Heward, 1987). This is accomplished by collecting data at consistent intervals across three separate phases of the design—baseline, training, and withdrawal. During the baseline phase, data are collected on the target behavior until a stable baseline is noted. Then, the independent variable is presented to the participant and the effects of the treatment, if any, are noted. At that point, the training is withdrawn, and if the behavior returns to baseline levels of measurement, then a causal inference can be made between the independent and dependent variables.

However, for this study, the withdrawal of treatment used in a traditional single-subject design is neither possible nor preferable given the nature of the proposed intervention with families (Cooper, Heron, & Heward, 1987). If parents are provided information about ways that are deemed important in interactions with their child, parents may be unwilling to stop doing those behaviors for the sake of researcher interest, particularly given that this research is being conducted with young children and their families. Additionally, if parents are told to withdraw certain behaviors that were just recently trained, they may become used to the “return to normalcy”, requiring additional costly training to reinstitute the previously established behaviors. Given that issues of parent stress and self-efficacy are a portion of the research design, this seems an untenable design feature to accommodate.
Fortunately, multiple baseline designs do not require the use of withdrawal to establish causal inference of behavior. Instead, these designs rely on the behavioral changes across more than one participant (or behavior, or setting) to provide additional evidence of the effect of the independent variable (Barlow, Nock, & Hersen, 2009). Each participant can serve as their own “tier” in the design and stable baselines are achieved within and across participants. Once stable baseline are established within participants, training is administered to one tier at a time, while subsequent tiers are held at baseline. Once a treatment effect is established with the first participant, new participants can be moved into the training phase of the study. This delay of treatment allows for an independence of behavioral changes across phases to be established, and thus causal inference, as the participant receiving the training demonstrates changes in the target behavior while the other participant(s) remain stable at pre-training levels. Additionally, this design allows for data collection during a post-training maintenance phase (e.g., Miguel, Petursdottir, Carr, & Michael, 2008), where measurement of target behaviors is allowed to continue without the need for any additional training or the implementation of formal withdrawal procedures.

To provide strength to the findings of a multiple baseline design across participants, it is desirable to replicate the experiment with at least 3 to 5 different baselines (Barlow, Nock, & Hersen, 2009; Cooper, Heron, & Heward, 1987). This form of replication is most often done contemporaneously for all participants. However, one consequence of this design feature is the presence of prolonged baselines for participants who have not yet been exposed to the independent variable (Miguel, n.d.; C. Miguel, personal communication, September 2, 2009). In fact, this type of delay of treatment may increase the chances for additional threats to validity,
including participant attrition from the study, child or adult maturation, or changes in parent behavior due to repeated testing in the baseline condition (Miguel, n.d.). Therefore, a multiple baseline design across two participants or tiers, with at least one subsequent replication can be used as a solution to the problem of prolonged baselines (Miguel).

The use of a 2-tier multiple baseline is viewed as “complete design”, in that it is a credible means by which a functional relationship can be established between the independent and dependent variables (Cooper, Heron, & Heward, 1987, p. 199). By replicating with additional 2-tier multiple baselines, the strength of the design is increased for determining causal relationships, without the need for several additional tiers of participants within a single design to be held in baseline for significant periods of time. Thus, a 2-tier multiple baseline design with 2 replications will be used for the main experiment in this study. Two separate dependent variables, parent lexical diversity and parent responsivity to child during structured activities, will be the focus of this portion of the experiment. A table is provided in Appendix G for the main experiment that provides a visual summary of the entire research design.

Pretest-Posttest Design

In addition to the multiple baseline design, a one-group pretest-posttest design will be incorporated in the main feasibility study. This design will be used to explore several of the constructs that cannot be appropriately accommodated in the design previously reviewed. For this portion of the study, parent knowledge of development, parent self-efficacy, and parent stress will be assessed to investigate additional direct and indirect effects of the proposed intervention.

One-group pretest-posttest designs are inherently weak for use in confirmatory studies, as they are pre-experimental designs that do not adequately control threats to internal validity,
such as the effects of history, testing, and maturation (Creswell, 2008). This is due to the lack of a control group or randomized assignment of participants. However, as this is a feasibility study with a limited number of participants, any results from the pretest-posttest portion of the study will be interpreted as exploratory in nature only, and not confirmatory of individual or group outcomes.

**Participants**

Six parent-child dyads will participate in this study. Child participants will be 24 to 30 months of age, monolingual speakers of English, Caucasian, and have no history of speech-language-hearing disorders or treatment. Families will be required to be low-income and only one caregiver per family will be solicited for this study. Caregivers can be either male or female, but are required to be a long-term primary caregiver of the child (e.g., parent, long-term guardian).
Appendix F

Proposed Mixed Method Design for Main Experiment

**Mixed Research Question**
Does participant performance in the above areas vary as a function of the family’s risk status?

**Multiple Baseline Research Questions**
Do caregivers produce increased levels of stimulation in the home environment for child language skills?
Do caregivers demonstrate increased parental sensitivity to child language behaviors?

**Pretest-Posttest Research Questions**
Do caregivers demonstrate increased knowledge of child development?
Do caregivers demonstrate greater feelings of parent self efficacy?
Do caregivers have reduced levels of parent stress?

**Purposive sampling of 6 parent-child dyads via eligibility screening**
- Monolingual speakers of English, typically-developing 24-month-olds, low-SES, Caucasian

**Pretest-Posttest Data Collection**
Administer for eligibility and cumulative risk information:
- Demographics Questionnaire, Hollingshead 4-Factor Status, LDS, HOME, PSI

**Multiple Baseline Data Collection**
Collect parent-child interaction sample in baseline (minimum of 3), training (4), and follow-up sessions (3) using Three Bag Task

**Administer CcLAP Training Program (Training Sessions 1-4)**

**Data Coding and Analysis RQ 1**
- Parent utterances transcribed
- Calculate D using VOCD
- Analyze individual participant trends

**Data Analysis RQ 2**
- Parent-child interactions coded for topic continuing replies
- Analyze individual participant trends

**Data Analysis RQ 3-5**
- Calculate standard scores for measures
- Run descriptive statistics for means, range
- Analyze mean trends
- Analyze individual participant trends

**Meta-Inference**
Connections to literature on poverty and language development
Connections to parenting literature
Note any trends in parenting behaviors related to a family’s cumulative risk
**Main Experiment Procedures: Multiple Baseline with Embedded Pretest-Posttest Design**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Pre-Study</th>
<th>Baseline Phase (Continue until baseline established)</th>
<th>Training Phase</th>
<th>Follow-Up Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligibility</td>
<td>Demographics Questionnaire LDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demographics and Cumulative Risk</td>
<td>Demographics Questionnaire HOME PSI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>CTTS</td>
<td>Module 1</td>
<td>Module 2</td>
<td>Module 3</td>
</tr>
<tr>
<td>Multiple Baseline Design Assessments</td>
<td>Three Bags Task</td>
<td>Three Bags Task</td>
<td>Three Bags Task</td>
<td>Three Bags Task</td>
</tr>
<tr>
<td>Pretest-Posttest Design Assessments</td>
<td>PSI KIDI SEPTI-TS HOME</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PSI KIDI SEPTI-TS HOME</td>
<td>PSI KIDI SEPTI-TS HOME</td>
</tr>
</tbody>
</table>

*Note. LDS = Language Development Survey; FM Task = Fast Mapping Task; HOME = Home Observation for Measurement of the Environment Inventory for Infants/Toddlers; PSI = Parenting Stress Index; CTTS = Carey Toddler Temperament Scale; KIDI = Knowledge of Infant Development Inventory; SEPTI-TS = Self-Efficacy for Parenting Tasks Index—Toddler Scale.*
Pilot Study Procedures

<table>
<thead>
<tr>
<th>Activity</th>
<th>Day of Study</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Study</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Baseline</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day of Study</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Day 5</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Eligibility</strong></td>
<td>Demographics Questionnaire LDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Demographics and Cumulative Risk Status</strong></td>
<td>Demographics Questionnaire HOME PSI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td>CTTS</td>
<td>Module 1</td>
<td>Module 2</td>
<td>Module 3</td>
<td>Module 4</td>
<td></td>
</tr>
<tr>
<td><strong>Single-Subject Design Assessments</strong></td>
<td>Three Bags Task</td>
<td>Three Bags Task</td>
<td>Three Bags Task</td>
<td>Three Bags Task</td>
<td>Three Bags Task</td>
<td></td>
</tr>
<tr>
<td><strong>Pretest-Posttest Design Assessments</strong></td>
<td>PSI KIDI SEPTI-TS HOME</td>
<td>PSI KIDI SEPTI-TS HOME</td>
<td>PSI KIDI SEPTI-TS HOME</td>
<td>PSI KIDI SEPTI-TS HOME</td>
<td>PSI KIDI SEPTI-TS HOME</td>
<td></td>
</tr>
</tbody>
</table>

Note. LDS = Language Development Survey; HOME = Home Observation for Measurement of the Environment Inventory for Infants/Toddlers; PSI = Parenting Stress Index; CTTS = Carey Toddler Temperament Scale; KIDI = Knowledge of Infant Development Inventory; SEPTI-TS = Self-Efficacy for Parenting Tasks Index—Toddler Scale.
Appendix I

Demographics Questionnaire

Parent Questionnaire

1. Do you have an 18- to 36-month old child?  Yes  No

2. What is his/her date of birth?  ______________________

3. Do you speak any languages other than English in the home?  Yes  No

4. Do you have any concerns about your child’s speech/language abilities?  Yes  No

5. Do you have any concerns about your child’s hearing abilities?  Yes  No

6. Has your child ever had any treatment for speech and/or language issues in the past?  
   Yes  No

7. How many children are you currently raising? _________
   a. Do all of these children live with you?  Yes  No

8. Are you raising these children with the help of a partner, such as a wife/husband?  
   Yes  No
   a. Does this person currently live with you?  Yes  No

9. Is there anyone besides you and your toddler living in your home?  Yes  No
   a. Who are they (e.g., children; your parents; boyfriend, girlfriend, wife, husband, partner)?
      ___________________________________________________________________________
   b. Do they help raise your children? Yes  No

10. How many people are in your immediate family? ____________
11. What type of job do you do? _________________________________
   
a. Do you work full-time? Yes  No

12. If you have a husband/wife/partner living with you, what do they do?
   ____________________________________________________
   
a. Do they work full-time? Yes  No

13. Have you been previously married? Yes  No

14. If you were previously married, do you receiving any support payments from your previous spouse (as part of the divorce settlement or if your husband/wife is deceased)?
   Yes  No
   
a. If you circled YES to #13, what was your previous spouse’s last completed year of schooling? (circle one)
   
   Less than 7th grade  8th or 9th grade
   10th or 11th grade  High school graduate
   Partial college (at least 1 year)  Technical school/Specialized Training
   4-year college graduate  Graduate professional training/graduate school
   
b. If you circled YES to #13, what is/was your previous spouse’s job?
   ____________________________________________________

15. What is your family’s gross annual income level in dollars? __________________

16. What was your last completed year of schooling? (circle one)
   
   Less than 7th grade  8th or 9th grade
   10th or 11th grade  High school graduate
   Partial college (at least 1 year)  Technical school/Specialized Training
   4-year college graduate  Graduate professional training/graduate school
17. If you currently have a husband/wife/partner, what was their last **completed** year of schooling? (circle one)

- Less than 7th grade
- 10th or 11th grade
- Partial college (at least 1 year)
- 4-year college graduate

- 8th or 9th grade
- High school graduate
- Technical school/Specialized Training
- Graduate professional training/graduate school

18. What is your race? (circle one)

- American Indian or Alaska Native
- Black or African American
- Caucasian/White

- Asian
- Native Hawaiian/Other Pacific Islander

19. What is your ethnicity? (circle one)

- Hispanic or Latino
- Not Hispanic or Latino

**Note:** Eligibility will be determined by the child’s age, race/ethnicity, monolingual speaker status, absence of diagnosed child language disorder, and answers to the questions related to education level, marital status, and occupation. The remaining questions will be used to determine the family’s cumulative risk status.
Appendix J

CcLAP Intervention Manual

The Caregiver-child Language Apprenticeship Program
Materials for Session:

- Consent Documents Packet
  - Pilot or Main Study Consent Form
- Eligibility Packet
  - Language Development Survey (LDS)
  - Demographics Questionnaire
- Child Independent Play Pack
  - Set #1

Plan:

1. Introduce self to family.
2. Review consent documents with the family, including reading the entire consent form to the parent.
3. Describe the study, including eligibility requirements, the intervention, and the videotaping for each session (at the end of each session) for data collection purposes.
4. Explain how compensation will be administered.
5. If family signs consent, provide a copy of the consent on baseline session visit.
6. Review the LDS and demographics questionnaires with the caregiver. Ask them if they have any questions filling it out and clear up any confusion that may arise.
7. While the caregiver complete the forms, provide the child with the Child Independent Play Pack, Set #1.
8. Review the data from the LDS while the parent and child wait. Children pass the LDS screener if they produce 50 words in Section A or have evidence of word combinations in Section B of the screener.
9. After the screeners have been scored, inform the parents of the results. If a child does not pass either screener, provide information for Early On (Michigan) or Help Me Grow (Ohio) evaluation services from the school district or local service agency.
10. If a child passes both screeners, then inform the family that they are eligible to participate in the full study and explain the study design and compensation procedures to the family.
11. Complete compensation forms for this session and thank the parent for their participation.
12. Clean up materials and determine the schedule for the next visit with the family. Tell the family that a reminder call about the session will be provided to them about 24 hours before the next session.
Materials for Session:

- Video equipment
- Copy of signed consent document
- Pre-Test Assessment Packet
  - Knowledge of Infant Development (KIDI) Form
  - SEPTI-TS form
  - Parent Stress Index form
  - Carey Temperament Scales—Toddler form (Carey)
  - Clipboard
  - 2 ink pens
- Home Observation for Measurement of the Environment—Infant/Toddler Version (HOME)
  - HOME Infant/Toddler form
- Child Independent Play Pack
  - Set #1
- Three Bags Task Assessment Pack
- Compensation Packet

Plan:

1. Set up video equipment and explain to parent the purpose of today’s session (i.e., collecting data to help us understand parent interests and concerns about development, how the child is processing information, and how the parent and child interact during play activities)
2. Review LDS with the caregiver. Ask them if they had any questions filling it out and clear up any confusion that has arisen.
3. Provide the parent with a packet of assessments to be completed. This packet includes forms for the KIDI, PMS, PSI, and Carey. Provide the parent written and verbal instructions on how to complete the forms and address any questions that arise. If the child should have difficulty with the parent completing the tasks during the session, offer for the parent the option to complete the forms prior to the next session.
4. Administer the HOME Inventory per the manual requirements.
5. Finally, administer the Three Bags Task assessment with the parent and child dyad. Provide the parent with 3 bags of toys and follow the procedures outlined for the modified Three Bags Task (provided in this manual).
6. Administer compensation for the session to the family. Have the parent sign the compensation form.
7. Clean up materials and determine the schedule for the next visit with the family. Tell the family that a reminder call about the session will be provided to them about 24 hours before the next session.
Intervention Sessions
Intervention Session 1
Module 1 Lesson Plan

Materials for Entire Session:
- Video equipment
- 1 Child Independent Play Pack
- Compensation Packet

Materials for Intervention:
- Binder
- *What is Language and How is It Supported?* Handout
- *Influences on Child Development: Parents are Key* Handout
- *Building Your Child’s Language Skills: It’s All About Quantity and Quality* Activity Forms
  - 2 input bingo cards
  - Low- and high-stimulation language scripts
- *How Children Learn and Use Words* Handout
- Hands-on Word Stimulation Activity
  - Pretend bath items and doll
  - Blank paper (for binder)

Materials for Data Collection:
- Three Bags Task Assessment Pack

Plan:

**Part 1: Review of Goals of the Intervention**

2. Review with the parent:
   a. The general focus of the intervention
      - Input is an important way to help children learn language, which helps them communicate effectively and understand more of the world around them.
      - Caregivers have a critical role in shaping the language development of their children. We will be working together to find creative ways to help the parent stimulate child language learning daily in the home environment.
   b. Length of the intervention itself, plus remaining data collection sessions
   c. Format of each intervention session
      - Set up and provide the child with an independent play pack that can be used while the parent and clinician work
ii. Discussion and activity about child language development
iii. Discussion about material and developmental supports/techniques to help foster language skills
   1. Direct intervention with parent and child on how to incorporate the techniques into an activity
   2. Plan situations for the next week
iv. Data collection
   1. Videotape parent-child interaction with language sampling material pack (i.e., 3-bag task)

Part 2: Child Language Development Discussion and Activity

1. Topic Discussion
   a. What is Language?
      i. Review *What is Language and How is It Supported* handout with the parent
   b. What Influences Language?
      i. Review *Influences on Child Development: Parents are Key* handout with parent
      ii. Discuss basics of Bronfenbrenner’s model on child development

2. Activity
   a. How Children Learn and Use Words
      i. Give parent the *Building Your Child’s Language Skills: It’s All About Quantity and Quality* input bingo cards
      ii. Explain that in this activity, the interventionist will read out loud what two different children hear in their home environment during 3 play sessions.
      iii. Read the High Input and Low Input scripts for this activity slowly out loud to the parent.
      iv. Ask the parent to describe what they experienced in the activity.
      v. Label the two bingo cards “High Input” and “Low Input”, respectively.
   b. Debrief
      i. Storage and Retrieval of Words
         1. Review the How Children Learn and Use Words handout with the parent.
         2. Tie the concepts on this handout to the experience that the parent had with the activity.
         3. Reference the idea that “Input Affects Word Learning” frequently throughout the debriefing.

3. Hands-On Activity
   a. Discuss with the parent that everyday materials throughout the home can be good places

4. Discuss material and developmental support

5. Things to do and use around the home

6. Discussion: Where and when does language learning occur during the day?
7. Targeting and creating “familiar and important routines”
8. Technique training

9. Parent planning of language support during daily activities
10. Brainstorming activity
11. Parent-child interaction practice with feedback
12. Have parent pick an everyday activity to focus on (i.e., something they do regularly in the schedule or something they like to do together)
13. Brainstorm what supports would work in that case
14. Observe the parent trying the technique
15. Provide feedback

**Part 3: Data Collection**

1. Follow language and interaction sampling procedures using the Modified Three Bags Task, outlined in the Assessment Procedures and Material List section of the manual.

**Part 4: Compensation and Schedule for Next Session**

1. Finalize payment with participant.
2. Schedule next session.
What is Language and How is It Supported?

1. Language is a rule-based system that we use to understand information and share information with others
   - Helps you represent your thoughts
   - Helps you conceptualize the world around you
   - Uses agreed-upon symbols (e.g., letters; sounds)
   - Follows agree-upon rules (e.g., grammar; sound order; politeness; loudness levels)

2. Language development comes about through an interaction between biological development (genetic traits) and environmental stimulation

3. Language is made up of 5 areas:
   - Vocabulary, word meaning, and word relationships (semantics)
   - Sound combination rules (phonology)
   - Word structure, such as word endings, and rules that govern parts of words (morphology)
   - Sentence structure and rules that govern words in sentences (syntax)
   - Rules for interacting and conversing with others (pragmatics)

4. Each of these areas develops across childhood (some even across the lifespan!)

5. Caregivers, such as parents, are critical in the development of children’s language capabilities. They control the quality and quantity of most of the stimulation their children receive. Their involvement in structuring the child’s daily language-learning experience is essential for optimal child language development.

6. Both caregiver and child factors influence the type of language stimulation that children receive.

7. Children who are raised in a “language-rich” and responsive home environment are more likely to do better in school and in life. They are:
   - more likely to have better literacy skills, such as reading and writing
   - more likely to do well in their academic studies
   - less likely to be in special education
   - more likely to graduate
   - more likely to have a solid career

8. The knowledge that caregivers have about child language development can act as a “buffer” to possible risks to development. The more that caregivers know about what children know and how they best learn language, the better the stimulation that they provide to their children.
Parents are one of the most important elements in child development. They influence nearly all of what a child sees and hears.
Input # 1 (High)—Using Pretend baby and food

Play session 1

Let’s get out all of your toys. Look at the baby…she looks very hungry. I wonder what she wants to eat for lunch? Do you have any food for her?

There she goes. You put her in her high chair. Make sure you buckle your little girl up so that she doesn’t fall out and get hurt. Remember when you fell down and scraped your knee? Let’s keep the baby safe.

What should the baby have for lunch? Good idea—milk and juice to drink. You like rice cereal and green apples! How about some cereal and apples, too? The baby says “that tastes great, Mommy/Daddy!”

Time for the baby to finish up and go take a nap. Let’s use the wipes and clean up the baby. Look, you wiped the baby’s mouth and nose and cheeks. Make sure you wash her fingers, too!

Play session 2

You want to play with your doll? Okay, let’s go see what the baby is doing. Do you have a name for the baby? Katy? Katy is a great name. That is your friend’s name from day care, isn’t it?

Where are all of Katy’s things? There they are, under the table. Come on Katy, let’s crawl over to your toys so that we can play. Look at all of the toys that are here—a sippy cup with orange juice, a pink plate, a fork and a spoon, and even a rag to wipe Katy’s dirty face. Which toys do you want to carry back to our play area in the family room?

Play session 3

Wow, I see you have your doll and her food. I have to start to cook dinner. Do you and the baby want to help me? Maybe you could cook some vegetables for the baby to eat. I’m going to make corn and green beans for supper, what do you want to make? Come over to the table and let’s cook something together.

Okay, here is a bowl and a wooden spoon. You can mix up some food for Katy in here. I can put some noodles for you in there to mix. Then you can put them in this big pot and cook them for your baby doll. Make sure you stir the pasta while it cooks!
Building Your Child’s Language Skills:
It’s All About Quantity and Quality

**Input #2 (Low Input)**

**Play session 1**

Go play with your baby. I’m busy right now. Go on.

That’s right, keep playing with it. You are being a very good girl/boy. Keep playing.

**Play session 2**

Go get your baby. Where is it? Go play with it. You can do it. You have lots of toys to play with.

Not right now. You can play with your baby. You know how. I’m cleaning right now.

**Play session 3**

Why don’t you go play with your toys. Get your baby toys out. You like your baby. I’m going to go cook dinner.

Clean up those toys before you come eat! And don’t bring those toys in here.
Intervention Session 2
Module 2 Lesson Plan

Materials for Entire Session:

☐ Video equipment
☐ 1 Child Independent Play Pack
☐ Compensation Packet

Materials for Intervention:

☐ Binder
☐ *How Children Influence Their Learning Environment* Handout
☐ *Responsive Communication with your Child: Play Ball!* Handout (tennis balls cut up into game cards)
  ☐ Old MacDonald Had a Farm Game

Materials for Data Collection:

☐ Three Bags Task Assessment Pack

Lesson Plan:

**Part 1: Review of Last Session**

2. Review the basic topics from the last session and connect to today’s discussion.

**Part 2: Child Language Development Discussion and Activities**

1. Unknown & Known Object Activity and Discussion
   a. Show parent a rare object (e.g., chisel sharpener; see picture at end of lesson plan)
   b. Have parent fill out the first question for *Who, What, When, Where, and Why?: Developing Rich Language to Think and Say Whatever You Want* (Write down everything you know about the object.)
   c. Review what the parent wrote down, starting to categorize or describe what the parent wrote down (e.g., “It’s grey and black”—“those are excellent describer words for the object”)
   d. Ask the parent if they know what the object is called.
      i. Write down any answers
   e. Ask the parent if they know what the object does/what the objects is used for
i. Write down any answers.

f. Ask the parent how they could learn something about the object.
   i. Write down any answers.

g. Debriefing
   i. Tell parent what the object is and what it does.
   ii. Connect to personal experience of not knowing what the object was
   iii. Connect to the experience of the child when learning language
      1. Talk about elements of semantic maps and how all of these “clues” help us understand what an object is, how it functions, etc., even when we’ve never seen exactly that object.
      2. Use everyday object as an example of how much we know about a word.
         a. Perceptual information
         b. Conceptual information
         c. Linguistic information
   3. Talk about how it must feel to not be able to conceptualize an object or know the name of things.

h. Using page 2 of the handout, have the parent now write down everything they know about something they do know (e.g., play dog)
   i. Review the parent’s answers and categorize them into different functions of words
      1. Add in any additional functions
   ii. Ask the parent: How could child learn something about the objects.
      1. Connect to the child’s experience of learning words
      2. Review parent statements; add in any other places/ways in which a child could learn words (e.g., play, storybook reading, everyday activities)
      3. Model describing the object to a child

2. Child Temperament Handout and Discussion
   i. Review *How Children Influence Their Learning Environment* handout with parent
   ii. Describe the 9 basic areas of child temperament for parent
   iii. Connect each area to parent’s own child(ren)
   iv. Discuss with parent ways in which temperament could affect language development

3. Maternal Responsivity Activity and Discussion
   a. Use the *Responsive Communication with your Child: Play Ball!* Handouts
   b. Describe the communication model with the two tennis rackets and ball.
      i. Volley of communication back and forth between two people
      ii. Model verbal and nonverbal shared means and the volley (responsive communication) that can occur
      iii. Connect to language development for children
iv. Connect to the literature on directives/prohibitives vs. rich language stimulation (language rich information increase vocabulary knowledge for children; directives and prohibitives depress)

v. Discuss how responsivity connects with word learning/fast mapping
   1. Connect to Tomasello’s research on focus of attention for word learning

c. Hands-On Activity
   i. Using a game (e.g., Old MacDonald Had a Farm Matching Game by Milton Bradley) take one of the game pieces and model an exchange between a child and a parent
      1. The mock child says one word about the item
      2. The mock parent “volleys” back more information about the item (i.e., expansion)
      3. Visually model the size of the ball that gets sent back and forth (child’s ball is small with information, parent’s ball is larger/fuller)
         a. Write out the words that could be modeled to the child
   ii. Have the parent try it several times with another item and a paper ball from page 3 and 4 of the handout packet (i.e., balls with text that child could say/nonverbally exhibit to parent).
      1. Discuss verbal and nonverbal means of communication by child
      2. Discuss the parent’s responses and how their responsiveness helps the child learn words
         a. i.e., connect back to Tomasello’s research and topic of responsivity

Part 3: Data Collection

1. Follow language and interaction sampling procedures using the Modified Three Bags Task, outlined in the Assessment Procedures and Material List section of the manual.

Part 4: Compensation and Schedule for Next Session

1. Finalize payment with participant.

2. Schedule next session.
Who, What, When, Where, and Why?: Developing Rich Language to Think and Say Whatever You Want

Write down everything you know about this object:

How could you learn something about this object?

How could your child learn something about this object?

Object Name: ________________________________
Who, What, When, Where, and Why?: Developing Rich Language to Think and Say Whatever You Want

Write down everything you know about this object:

How could you learn something about this object?

How could your child learn something about this object?

Object Name: _________________________________
Children bring their own personalities and ways of engaging others into interactions. Below are some things to consider when talking and playing with your child.

- **How Active They Are**
- **What Their General Mood Is**
- **How Easily They Are Upset by Change**
- **How Quickly They Adjust**
- **Their Natural Reaction to New Experience, People, or Places**
- **How Easily They are Distracted**
- **How Driven They Are By Routines**
- **How Persistent They Are & How Long Their Attention Span Is**
- **How Strongly They React to Something**
- **How Sensitive They Are to Stimulation**

How Children Influence Their Learning Environment
Responsive Communication with Your Child:
Play Ball!
Pointing

Grunting

Crying

Making Animal Sounds
Avoiding the Activity

Laughing

Naming Items

Looking at You
Intervention Session 3
Module 3 Lesson Plan

Materials for Entire Session:

- Video equipment
- 1 Child Independent Play Pack
- Compensation Packet

Materials for Intervention:

- Binder
- *Variety is The Spice of Life: Making the Move Beyond Basic Object Names Activity*
  - Toy tricycle (e.g., Fisher Price version)
- *Shared Book Reading: Bringing the World to Your Child One Book at a Time Handouts*
- *Responsive Communication with your Child: Play Ball! Handout* (tennis balls cut up into game cards)
  - Old MacDonald Had a Farm Game

Materials for Data Collection:

- Three Bags Task Assessment Pack

Lesson Plan:

**Part 1: Review of Last Session**

4. Review the basic topics from the last two sessions and connect to today’s discussion.

**Part 2: Child Language Development Discussion and Activities**

4. *Variety is The Spice of Life: Making the Move Beyond Basic Object Names Activity*
   a. Show parent a known object (Fisher Price toy tricycle)
   b. Have parent write everything they can about the tricycle
   c. Review what the parent wrote down, circling/marking squares around words that are beyond the basic label for the item
      i. Talk about how words are used to describe a central concept
      ii. Take the words that the parent used and categorize them into hand drawn squares on page 2 of the activity packet, to show the different types of words that can be used to talk about an object (e.g., “color” words, “describer” words, parts of the whole, other nouns that are related by function, verbs/action words)
      iii. Talk about the more common words that the parent identifies, and introduce the idea of the use of more “rare” words
d. Talk with the parent about how interventionists use assessments that cover a variety of different types of words (e.g., MacArthur Bates CDI) and that parents can use this mental map to structure the types of verbal input that one can provide to the child.
e. Discuss the fact that the more diverse the lexicon the parent uses with the child, the larger the vocabulary size of the child.
   i. Discuss basic number of words children learn per day.
f. Connect vocabulary growth to the idea of repeated exposures to words over time, to strengthen the brain’s processing of the word (i.e., strengthen semantic representations of word)
   i. Thus, providing children with richer descriptions of words, even for a simple object like a tricycle, works to expose children to newer, more advanced words, and strengthens the child’s ability to access that word as she/he starts to talk.

5. Shared Book Reading Hands-on Activity and Discussion
   a. Introduce the parent to the topic of shared book reading
      i. Discuss the fact that reading books to children is a very rich language opportunity, due to the differences in the language naturally used in books (versus conversations)
   b. Introduce the parent to the book that we’ll use for this activity (Oliver finds his way)
      i. Show the parent the two sheets, saying that these are two different ways you could read a book to a child
      ii. Explain that the child’s previous exposure to words in the book are marked with circles
         1. The larger the circle, the more learning that has occurred, and consequently the more easily the child can use the word.
      iii. Model both methods to the parent
      iv. Circle the words that the parent supported in the text
         1. Model talking about the text
         2. Model connecting text to self
      v. Discuss the processes of straight reading versus enhanced reading.

6. Shared Book Reading/Dialogic Reading Handouts and Discussion
   a. Introduce the parent to the Shared Book Reading: Bringing the World to Your Child One Book at a Time handouts
      i. Review handouts with the parent, connecting the topics to the experience with the text in the previous activity and to the parent’s experience with the child.

   Part 3: Data Collection

1. Follow language and interaction sampling procedures using the Modified Three Bags Task, outlined in the Assessment Procedures and Material List section of the manual.

   Part 4: Compensation and Schedule for Next Session

1. Finalize payment with participant.

2. Schedule next session.
Variety is The Spice of Life:
Making the Move Beyond Basic Object Names

Object: _________________________________________________

Write down things you could tell your child about this object:
Variety is The Spice of Life: Making the Move Beyond Basic Object Names
While Mama hangs the wash out and Papa rakes the leaves,

Oliver chases a big yellow leaf

Down the hill

Around a clumpy bush

Under a twisty tree,

And all the way

To the edge of the woods.
While Mama hangs the wash out and Papa rakes the leaves,
Oliver chases a big yellow leaf
Down the hill
Around a clumpy bush
Under a twisty tree,
And all the way
To the edge of the woods.

Enhanced Reading of “Oliver Finds His Way” Story Book
**Strategies to Use for Enhancing Reading Time with Your Child**

1) **Ask questions.**
   
   What is Oliver doing?
   
   Where is the bush?
   
   Who is hanging the laundry up on the clothesline?

2) **Repeat and reinforce what your child says.**
   
   Yes, Oliver is running down the hill.
   
   That’s right! Papa is raking the leaves.

3) **Give your child help when it’s needed.**
   
   Who is hanging up the laundry? Oh, you pointed to Papa. Mama (pointing to Mama) is hanging up the laundry.
   
   Oh...this is the bush right here (points). Do you see the limbs on the bush (touches several of the limbs)? You try it now...can you show me the bush?

4) **Notice and reinforce what your child is interested in.**
   
   Wow! You are looking at the twisty tree. See the squirrel sitting on the twisty branch?
   
   Where is the bush?...(child is looking at Oliver). Oh! You are looking at Oliver, the bear. What do you think is happening here?

5) **Expand what your child says.**
   
   Child: Hahah! Ah-vuh!
   
   Caregiver: Yes, Oliver *is* funny, isn’t he?
**What else can I do to support language development during book reading?**

1) **Try to be a story teller.**
   - Use good voice inflection
   - Use smooth speech that is not too fast
   - Be comfortable with what you are reading. This may mean that you review the book before you read it to your child.

2) **Focus on the meaning of the story.**
   - Try to help your child make sense of what the story means
     - Enhanced reading strategies
     - “Thinking aloud”
     - Summarizing the text for the child
     - Clarify anything that is difficult for your child to understand

3) **Act like a teacher--introduce your child to many different kinds of new or more difficult words.**
   - Talk about the words you encounter in the book (e.g., “twisty”...that looks like this.)
   - Introduce new words that might not be part of the story itself (e.g., “clothesline”—See the clothesline right here? That is what Mama is hanging the laundry on)

4) **Read books over and over again.**
   - It strengthens the words that children already know and helps them learn new words
   - It also strengthens the relationship between words and concepts
Intervention Session 4
Module 4 Lesson Plan

Materials for Entire Session:

☐ Video equipment
☐ 1 Child Independent Play Pack
☐ Compensation Packet

Materials for Intervention:

☐ Binder
☐ *Supporting the Development of Strong Word Relationships: Help Me, Help You* Activity and Discussion
  ☐ Marker
☐ *Everywhere...All of the Time!*: Finding Ways to Promote Children’s Language Development Daily Activity and Discussion
☐ *STAR: Finding Ways to Respond to Child Interests and Entice Child Conversation* Handout and Discussion

Materials for Data Collection:

☐ Three Bags Task Assessment Pack
☐ Final Posttest Assessment Packet
☐ Final Interview Questionnaire

Lesson Plan:

**Part 1: Review of Last Session**

2. Review the basic topics from the last session and connect to today’s discussion.

**Part 2: Child Language Development Discussion and Activities**

1. *Supporting the Development of Strong Word Relationships: Help Me, Help You* Activity and Discussion
   a. Give parent the dinner web and the marker. Explain the activity to the parent.
   b. Read the dinner sentences to the parent, having them mark a line between the words that were mentioned in the same sentence.
   c. Review what the parent marked for the dinner web.
      i. Discuss relationships between words and the idea of neural maps.
   d. Give parent the cat web and the marker. Explain the activity to the parent.
   e. Read the cat sentences to the parent, having them mark a line between the words that were mentioned in the same sentence.
   f. Review what the parent marked for the dinner web.
i. Discuss relationships between words and the reinforce the concept of neural maps.

ii. Show the effect of many exposures to a word relationship over time by darkening the relationships on the page (like “roadways” between words)

**g. Debriefing**

i. Information can be added in over a lifetime

ii. Several examples from real life as an adult (e.g., dialect differences across regions)
   1. Black Squirrel
      a. Draw a “squirrel” neural map
      b. Talk about seeing a black squirrel for the first time and how even as an adult we add in new information all of the time (even to maps that are fairly stable and unchanged)
   2. Toboggan
      a. Toboggan is a hat down south and a sled up north

iii. All examples point to the fact that lived language experiences dictate the words that we learn

iv. The language experience that we have helps a neural network “light up” when we talk about a particular item (e.g., cat)
   1. Thus, every time we talk about cat, all of the words that have been shown to be related to cat in the child’s brain “light up” as well
   2. This allows us to think and reason quickly and efficiently
   3. Rich language experiences help children learn and strength word relationships
      a. E.g., talking to the child repeatedly over time across various contexts
   4. This language benefits children as they enter school because the “roadways” between words have been set up prior to tasks like reading
      a. Thus, children are working on reading tasks and not learning the language elements for the first time making the task of reading somewhat easier
      b. Explain outcomes for children from low stimulation homes versus high stimulation homes with reading tasks
         i. i.e., academic achievement gap
         ii. IQ isn’t very different at first across low and high stimulation homes, but the gap in achievement widens over time

2. *Everywhere...All of the Time!: Finding Ways to Promote Children’s Language Development Daily Activity and Discussion*
   a. Review the lead-in information on page 1 with the parent
   b. Developmental Supports
      a. Discuss the varieties of ways that parents can support language development through developmental supports (figure on the page)
         i. Everyday activities
1. Discuss the everyday support and the special activities that one can plan out for the child to learn language
   a. i.e., language support does not have to happen only during special times. Everyday activities work well, too.
2. Ask the parent to take a moment to think about the activities during the day in which they can support language development (i.e., everyday daily activities that are part of the routine)
3. Brainstorm with the parent ways that they can support communication and language skills during the activity
4. Brainstorm times when the activity occurs
   b. Special Activities
      i. Same procedure as above
   c. Material and Care Supports
      a. Review information regarding the support of materials and childcare
      b. Complete chart
         i. Discuss ways in which the parent already provides material and care support to enhance the child’s learning
         ii. Brainstorm ways that the parent could increase support
         iii. Brainstorm ways that the parent could get access to these supports (e.g., library program, early care program, WIC, Medicaid)
3. **STAR: Finding Ways to Respond to Child Interests and Entice Child Conversation** Handout and Discussion
   a. Review the STAR handout with the parent.
   b. Provide examples of each of the target areas.
      a. Draw upon the examples in the intervention and personal examples.
      b. Extend to examples with the parent’s child.

**Part 3: Data Collection**

1. Follow language and interaction sampling procedures using the Modified Three Bags Task, outlined in the Assessment Procedures and Material List section of the manual.
2. Administer the HOME Inventory, per the manual requirements.
3. Administer the final questionnaire to the parent (parent perception of study questions).
4. Provide the posttest assessment to the parent and offer to pick up the next day if the session goes for too long.

**Part 4: Compensation and Final Goodbyes**

1. Finalize payment with participant for session and entire study, if applicable.
2. Close the intervention with the family and thank them for their time.
Supporting the Development of Strong Word Relationships: Help Me, Help You

Dinner

- Chair
- Chicken
- Carrots
- Knife
- Peas
- Eat
- Table
- Fork
Supporting the Development of Strong Word Relationships: Help Me, Help You

Cat

- Black
- Kitty
- Milk
- Lick
- Purr
- Legs
- Tail
- Whisker
Input for Dinner: Chicken Carrots Knife Peas Fork Table Eat Chair
1. We are going to have chicken and carrots tonight.
2. Can you go put your fork on the table, please?
3. Time to eat dinner!
4. We’ll have peas and carrots today for our vegetables.
5. Dinner will be at the table tonight.
6. Push your chair under the table.
7. Are you ready to eat at the table?
8. Cut your carrots with your knife.
9. And make sure you use a fork for your chicken today. No hands!
10. Grab your knife and fork before you sit down.

Input for Cat: Black Kitty Milk Lick Purr Legs Tail Whisker
1. Your cat likes to purr a lot, doesn’t he?
2. Did you pet the kitty on the tail?
3. That cat is tickling you with his whiskers.
4. Watch the cat lick his milk.
5. That is a big black whisker.
6. Now he’ll lick his legs.
7. Uh oh…you spilled your milk right next to the kitty.
8. Look at that black cat!
9. Touch his tail and he will purr.
Everywhere…All of the Time!: Finding Ways to Promote Children’s Language Development Daily

Part I: Developmental Supports

Language and Communication development can occur at all points in the day. We all have opportunities to talk to or communicate with others regularly. Sometimes these are situations that are everyday events, like eating a meal or taking a bath, that sometimes seem small and unimportant to language development. Sometimes we create a special activity for children, such as a trip to the zoo, that seem big and essential for learning language.

In fact, both the small and the big are important to child language development. Each plays a role in providing children with rich experiences for learning. These activities can be used as a way to support development on a consistent basis.
Everyday Activities

*Everyday activities* are those things that we do in our daily routine. We get up out of bed, get ready for the day, eat our meals, and do a number of different activities that seem dull and uninteresting for teaching opportunities for children. In fact, these types of activities have been found to be great for providing children with incredible opportunities to learn about the world around them and learn the essentials of communicating with others. Most importantly, these activities are predictable to children. They provide children with a familiar structure that they can work from when learning new words or new ideas. They form a large percentage of the time children spend with family members, which makes them great teaching opportunities for caregivers.

In the space provided below, think of some everyday activities that you and your child experience together. Then write down some possible communication and language skills that can be learned during that activity and brainstorm times when you can do this activity.

<table>
<thead>
<tr>
<th>Everyday Activity</th>
<th>Communication/Language Skills You Can Support with Your Child</th>
<th>When Can You Do This Activity?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Everywhere…All of the Time!:
Finding Ways to Promote Children’s Language Development Daily

Special Activities

Special Activities are those things that we do that may or may not be part of our daily schedule. Sometimes they are easily planned activities, such as reading a new book to your child, playing a board game, or going for a bike ride in your community. Sometimes these events require much more planning, such as when we go visit family members, set up play activities with other friends’ children, or plan a trip to a special place, such as a museum, restaurant, or community event. Some of these special activities may happen frequently during the week, such as reading a book to a child. Others may happen only one a year, such as visiting friends in a far away city.

These special activities are important for children’s learning. They expose children to new places or new ideas, which are all great opportunities for learning new words.

In the space provided below, think of some special activities that you and your child can or do experience together. Then, write down some possible communication and language skills that can be learned during that activity and brainstorm times when you can do this activity.

<table>
<thead>
<tr>
<th>Special Activity</th>
<th>Communication/Language Skills You Can Support with Your Child</th>
<th>When Can You Do This Activity?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Everywhere…All of the Time!:
Finding Ways to Promote
Children’s Language Development Daily

Part II: Material and Care Supports

All of the above activities are considered developmental supports for children’s communication and language. In addition to developmental supports, caregivers are responsible for providing children with something called “material and care supports”. Material supports provide children with materials and care for learning or enhancing their health and wellness.
Everywhere…All of the Time!: Finding Ways to Promote Children’s Language Development Daily

In the space provided below, think of some material and care supports that you provide to your child to support their learning, health, and wellness. Then, brainstorm some additional supports that you can provide to your child and where you think you can get access to those supports.

<table>
<thead>
<tr>
<th>Materials and Care I Currently Provide to Enhance My Child’s Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Materials and Care I Could Provide My Child</strong></td>
</tr>
<tr>
<td><strong>Where I Can Get Access to These Materials and Care</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Everywhere…All of the Time!:
Finding Ways to Promote
Children’s Language Development Daily

<table>
<thead>
<tr>
<th>Health and Wellness Supports I Currently Provide My Child</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Health and Wellness Supports I Could Provide My Child</th>
<th>Where I Can Get Access to These Health and Wellness Supports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Start engaging.

- Entice your child to play with you, before and during an activity
- Choose an activity that is familiar to your child
- Choose an activity that would be interesting to your child
- Take your child’s style of learning into account
- Plan ways to include language in everyday activities, such as mealtime, bathtime, bedtime, or trips around town
- Plan an activity each week that is outside of your everyday routine
- Make an effort everyday to talk and play with your child

Talk. Talk. Talk.

- Talk to your child about things that you are doing or your child is doing
- Talk about things in the activity that may be interesting to your child
- Make an effort to use a variety of words with your child, including new words, each time you talk with them
- Remember to repeat new words you’ve used in future activities
- Relate new concepts to what the child already understands

Answer and add.

- Respond to your child’s attempts to communicate with you, when they use:
  - words, even if it isn’t close to how adults say the words
  - gestures or looks
  - sounds or grunts
- Add new things to what your child communicates, making what they say or show you more complex

Relate.

- Understand that they may have a hard time understanding something, even after hearing it many times
  - They only have a weak understanding of things at first
  - You may have to give them more clues and more chances before they learn
- Remember, children aren’t born knowing about the world around them.
  - Tell them things about everyday activities.
  - Show them and tell them about new things they may not know.
  - It takes many, many times of hearing something to learn something well
Assessment Procedures and Material Lists
This portion of the assessment will be conducted each session with the family. This is a modified version of the Three Bags Task that is used in Head Start evaluation research (Administration for Children and Families, 2000). The following protocol is adapted from the 24-Month Video Protocol provided by the Administration for Children and Families at http://www.acf.hhs.gov/programs/opre/ehs/ehs_resrch/instruments/videobooklet_2year/videotaped_booklet_2yrs.pdf.

Materials for Assessment:

□ Three Bags Task Assessment Pack

Assessment Procedures:

Help the parent clear the area of any unnecessary items for videotaping, especially other toys in the room. Place the 3 bags from the assessment pack in front of the child and the parent, with Bag #1 to the parent’s left, Bag #2 in the middle, and Bag #3 to the parent’s right.

Tell the parent before videotaping:

“Next, we are going to videotape you and your child interacting during several play activities. This is an activity lasts about 15 minutes and involves you and your child playing with items provided in 3 separate bags.

While I set up the video equipment and toys, you and (CHILD) can take a little break and you can take care of anything that you think could interrupt our taping. You can use this time to feed or change (CHILD), or to check on anything else in the (house/apartment). During the taping itself, I prefer that (CHILD) not use (his/her) pacifier or bottle.

Once we start, I’d like to complete this activity without interruptions. If the phone rings or someone comes to the door, we would appreciate if someone else took care of it; or, if you wouldn’t mind, I could answer it.

IF OTHER FAMILY MEMBERS ARE PRESENT, ADD:

Could you please let the other people in the (house/apartment) know that you’ll need some time now with (CHILD) without interruptions? If you wouldn’t mind, if any family members forget and come into this area while we are taping, I will ask them to leave to that you are not interrupted.”
AFTER SETTING UP THE EQUIPMENT, SAY TO THE PARENT: Now we are going to have you and (CHILD) play together with 3 bags of toys. Please start with Bag #1, move on to Bag #2, and finish with Bag #3. You can divide the 15 minutes as you like. At the end of the time we will ask you and (CHILD) to put away the toys, so you don’t have to worry about that while (CHILD) is playing. Do you have any questions?

Possible Procedural Questions from Parents and Answers (from Head Start Evaluation materials):

Q: How long should I spend on each toy?
A: You can divide the time as you like.

Q: Should I open Bag #1 first?
A: We would like you to give (CHILD) the bag with #1 on it first.

Q: Can I play with (CHILD) during this time?
A: That is completely up to you.

Q: Can (CHILD) and I play with all the toys in the bags?
A: Yes, if you’d like.

Once the family begins play, start the timer for 15 minutes. If the child does engages with one or more of the toys for less than 1 minute each, prompt the parent by saying:

“I’d like to give (CHILD) more time to play with the (TOY). Please play with the (TOY) for 2 more minutes.”

At the end of the 15 minutes, tell the parent they are finished with this activity and they are free to clean up the toys. Continue videotaping until all of the toys have been cleaned up.
Note: Material packs are presented to families only one time each. These packs will also be counterbalanced across families and sessions so that families will not interact with materials in the same order as other families. Items will also be counterbalanced within each session to further reduce ordering effects due to within-session presentation of materials.

Language Sampling Material Pack #1

- Little People Sarah Lynn & Her Camping Adventure
- Playmobil Playground
- *Big Red Barn* board book (by Margaret Wise Brown)

Language Sampling Material Pack #2

- Playskool Mr. Potato Head Spud Buds
- Little People Click ’n Fun Barnyard
- *The Little Train* board book (by Lois Lenski)

Language Sampling Material Pack #3

- Little People Spin ’n Sparkle Car Wash
- Little People Fairy Tree house
- *Come Along Daisy!* paperback book (by Jane Simmons)

Language Sampling Material Pack #4

- Thanksgiving Celebration
- Little People Peek ’n Discover Barnyard
- *Shhhhhh! Everybody’s Sleeping* hardcover book (written by Julie Markes and illustrated by David Parkins)

Language Sampling Material Pack #5

- Little People Play ’n Go Castle
- Playmobil Summer Meadow
- *Go Away Big Green Monster* hardcover book (by Ed Emberley)

Child Independent Play Pack Materials

Child Independent Play Pack # 1

☐ 1-to-5 Ring Counter
☐ First Jumbo-Knob Puzzle: First Shapes
☐ Pop-Up Toy

Child Independent Play Pack # 2

☐ Jumbo Lacing Beads Toy
☐ First Jumbo-Knob Puzzle: Pets
☐ Fun Time Tractor

Child Independent Play Pack # 3

☐ Jumbo Lacing Shapes Toy
☐ First Jumbo-Knob Puzzle: Fish Bowl
☐ Safari Tractor

Child Independent Play Pack # 4

☐ Snap Beads
☐ First Jumbo-Knob Puzzle: Stop Sign
☐ Press & Go Inchworm

Child Independent Play Pack # 5

☐ Kiddy Connects
☐ First Jumbo-Knob Puzzle: Barnyard Animals
☐ Little Auto

Child Independent Play Pack # 6

☐ String-a-Farm
☐ Geometric Puzzles: Circle Sorter
☐ Visual Tracking Ball Tower

All items available from Beyond Play: http://www.beyondplay.com/
Final Parent Interview:
Parent Experiences during the CcLAP Intervention Study

Materials for Session:

☐ Interview Questions
☐ Video equipment
☐ Paper and pen

As a final review of the CcLAP intervention, parents participating in the study will be asked the following questions:

1. What is the most memorable thing for you from the language development training that we did together?

2. Why is that memorable to you?

3. What was the most helpful or useful thing for you for interacting with <CHILD> that was covered in the training?

4. Is there anything that we covered in the training that was not very useful for you?

5. What would you change in the training, if you could change anything?

6. What would you tell other parents that you learned from this program, now that you’ve completed this training?

7. Do you have anything else that you’d like for me to know about your experiences with this program?

8. Do you have any recommendations for me as I move ahead with this program?

9. Do you have any recommendations for other parents that might participate in this program in the future?
Appendix J

Human Subjects Review Board Project Approval

March 28, 2011

TO: Emily Rusnak
CDIS

FROM: Hillary Harms, Ph.D.
HSRB Administrator

RE: HSRB Project No.: H10ID172GFB

TITLE: Addressing the Effects of Poverty on Early Language Development: A Feasibility Study of a Novel Parent Language Stimulation Program

You have met the conditions for approval for your project involving human subjects. As of February 18, 2010, your project has been granted final approval by the Human Subjects Review Board (HSRB). This approval expires on January 12, 2011. You may proceed with subject recruitment and data collection.

The final approved version of the consent document(s) is attached. Consistent with federal OHRP guidance to IRBs, the consent document(s) bearing the HSRB approval/expiration date stamp is the only valid version and you must use copies of the date-stamped document(s) in obtaining consent from research subjects.

You are responsible to conduct the study as approved by the HSRB and to use only approved forms. If you seek to make any changes in your project activities or procedures, send a request for modifications to the HSRB via this office. Those changes must be approved by the HSRB prior to their implementation.

You have been approved to enroll 14 participants. If you want to enroll additional participants you must seek approval from the HSRB.

Good luck with your work. Let me know if this office or the HSRB can be of assistance as your project proceeds.

Comments/ Modifications:
Stamped original consent documents are coming to you via campus mail.

c: Dr. Tim Brackenbury

Research Category: FULL BOARD REVIEW