

Language Environments in Toddler Classrooms: The Contribution of Setting, Teacher,
and Child Variables

A DISSERTATION
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

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June, 2010

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Acknowledgements

I would like to acknowledge the many people who have helped me achieve this milestone. First of all, many thanks are due to my advisor Dr. Jim Ysseldyke, for his invaluable support, guidance, encouragement, and feedback throughout my graduate career. I would also like to thank Dr. Tony Pellegrini, Dr. Kyla Wahlstrom, and Dr. Ted Christ for serving on my dissertation committee and for their comments and suggestions that helped to improve this study. A special thank you is owed to Dr. Wahlstrom for providing me with a job at CAREI for four years and to Dr. Pellegrini for supporting me through research opportunities and mentorship.

Terry Paul, Dr. Jill Gilkerson, and the entire LENA Foundation are owed a special thank you for their technical support and guidance on using the LENA system as I completed this study. Without the donation of the LENA device by Mr. Paul, this study would not have been possible. I am extremely grateful.

Many thanks also go to the teachers and children who participated in this study for allowing me into their lives and classrooms for many months. And to my cohort who provided me with support, encouragement, and laughter for the previous six years, especially Christina Boice-Mallach and Isadora Szadokierski without whom, and our weekly visits to Dunn Brothers, my dissertation may never have been completed.

A final thank you goes to my family and friends for their love and support and helping me to believe that this huge task could be accomplished.

Abstract

This study sought to ascertain the relative contribution of setting, teacher, and child variables to the prediction of the amount of language teachers used in their toddler classrooms as well as the amount of engaged conversations they had with children. The Language ENvironment Analysis (LENA) system, Early Childhood Environment Rating Scale (ECERS) and Teacher Beliefs Scale (TBS) were used. Child variables included age, gender, and disability, English language learner, and poverty (tuition subsidy) status. Results indicated that classroom quality, teacher education and experience, teacher pedagogy, and the percentage of tuition subsidy students in the classroom predicted adult word rates; however, they were not significant independent predictors. No significant relationships were found for conversational turns. Study limitations and implications for policy and practice are discussed.

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CHAPTER 1

INTRODUCTION

Overview

Language is one of the most fundamental skills possessed by human beings. It allows individuals to express their thoughts and influence others, enables the transmission of ideas, and communicates symbols and cultures from one individual to another. Oral language skills, both expressive and receptive, also play a critical role in children's ability to understand the meaning of print and learn to read (Kirkland & Patterson, 2005, Scarborough, 1998, Walker, Greenwood, Hart & Carta, 1994), as well as interact appropriately with peers (Hart, Olsen, Robinson, & Mandelco, 1997).

Children learn language and conversational rules through observation and interaction with adults who are more proficient speakers of the language (Dickenson & Tabors, 2001; Gest, Holland-Coviello, Welsh, Eicher-Catt, & Gill, 2006; Massey, 2004). Specifically, adults help children learn to make associations between adult produced words and objects, actions, and external events (Girolametto, Hoaken, Weitzman, & van Lieshout, 2000). Adults facilitate these linkages in a variety of ways including modifying their language so that it is slower and less complex (i.e., "motherese"), reducing confusion, and providing repetition of salient words and phrases. According to the National Institute of Child Health (2000, p. 961), "...there is no question in the language literature that language experiences play an important role in children's acquisition of vocabulary and grammar."

The home is typically the first setting in which language is encountered. As the majority of children spend their early years in the care of their mother or father and learn the majority of their words from him or her, the primary care giver plays one of the most significant roles in young children's language development (Hoff, 2003). The home environment also has the power to influence later child outcomes as children who grow up in stimulating language environments typically enter school with a substantial understanding of the concepts that will eventually help them learn to read (Burchinal, Roberts, Nabors, & Bryant, 1996).

While the home environment has been the primary focus of researchers, other environments too have also been shown to have a significant impact on children's language development as over 60% of young children under the age of five are cared for in some type of regular child care arrangement outside of the home (Johnson, 2005). Child care environments have been found to account for approximately 11% of the variance in children's receptive language skills and 15% of the variance in children's expressive language skills (Weigel, Martin, & Bennett, 2005). The amount of teacher talk in the classroom has also been shown to be an indicator of the level of environmental stimulation and is related to children's learning and development (Kontos, 1999).

For children growing up in poverty, the child care environment may even play a more crucial role as these children are generally exposed to significantly fewer words and have fewer language interactions with caregivers in their home environment (Hart

& Risley, 1995, Hoff, 2003; Rowe, 2008). The interactions that these children have in the home environment also tend to consist of fewer complex words and ideas, and place greater emphasis on directives instead of conversation facilitating questions or statements. Language input from the child care setting may therefore make up a larger proportion of overall language input (Gest, Holland-Coviello, Welsh, Eicher-Catt, & Gill, 2006), making it critically important to study child care experiences for young children, especially those growing up in poverty.

One method for studying language exposure in child care environments is through application of the Language ENvironment Analysis (LENA), a recording device equipped with speech recognition software, that when placed on a child, captures the utterances between adults and children. The speech recognition technology quantifies and analyzes these conversations throughout the day in order to determine how much and when adults are conversing with children. This unobtrusive measure eliminates the human error and time often involved in the analysis of conversation and provides researchers, teachers, and parents with a tool to monitor a child's language environment. By having instant access to this information, parents and caregivers are then able to modify their language use patterns and thus, enhance outcomes for their children.

Statement of the Problem

While a vast body of research exists on adult language input to young children, much of this work has been conducted either in infancy or during the preschool

period, neglecting the important period of the toddler years where the greatest amount of language development takes place (Bloom, 1991). Additionally, much of the work on language environments and adult language input in early childhood settings is conducted within Head Start classrooms. This is problematic as the quality, curriculum, staff development, and parental involvement surely varies from federally managed Head Start program to other types of settings.

Purpose of the Study

The purpose of this study is to examine the mediating effects of classroom, teacher, and child variables on the amount of adult words and conversational turns used in the toddler classroom. This study will also seek to identify characteristics of toddler classrooms and teacher qualifications that maximize children's language exposure. Additionally, I will examine how child characteristics impact teachers' language use. This may provide useful information for early intervention programs targeting teacher-child interactions by identifying alterable factors such as group size, teacher education, and classroom quality that may facilitate teacher language usage and thus, improve outcomes for young children.

Research Questions:

1. What setting, teacher, and child variables predict teachers' language usage in the toddler classroom?

- a. Do specific setting variables (i.e., length of program day, adult to child ratio, quality) significantly predict the quantity of adult words used or the amount of conversational turns between teachers and children?
 - i. If more than one variable significantly predicts an outcome what is the relative effect of each variable?
 - b. Do specific teacher variables (i.e., education level, years of experience, pedagogical orientations) significantly predict the amount of adult words used or the amount of conversational turns between teachers and children?
 - i. If more than one variable significantly predicts an outcome what is the relative effect of each variable?
 - c. Do specific child variables (i.e., gender, ethnicity, ELL status, disability status, poverty status) significantly predict the amount of adult words used or the amount of conversational turns between teachers and children?
 - i. If more than one variable significantly predicts an outcome what is the relative effect of each variable?
2. What is the interaction between classroom, teacher, and child variables in predicting the number of adult words and conversational turns in a classroom?
- a. Do setting factors predict adult word use and conversational turns controlling for child and teacher factors?

- b. Do teacher factors predict adult word use and conversational turns controlling for setting and child factors?
 - c. Do child factors predict adult word use and conversational turns controlling for setting and teacher factors?
3. To what extent are there differences between rates of teacher talk and conversational turns between boys and girls, children of different ethnic backgrounds, children living in poverty versus those who do not, children with disabilities and those without, and children who speak English as a first language and those who do not?

Delimitations, Limitations, and Assumptions

Delimitations. Child participants in this study consisted of 28 toddlers (13 boys) ranging in age from 16 to 35 months and their 12 female teachers. The children were enrolled in four classrooms at three child care centers affiliated with a large Midwestern University. Children in the sample were 71.4% European American, 7.1% Asian/Asian American, 7.1% Hispanic/Hispanic American, 3.6% African/African American, and 11% Multiple Ethnic backgrounds. Eighteen percent of children primarily spoke a language other than English at home and 10.7% of children spoke English as well as another language at home. Over 28% of children received a tuition subsidy to attend school. All teachers were female and ranged in age from 25 to 44. Nine described themselves as European American, two were Asian/Asian American, and one was Hispanic/Hispanic American. Because the sample is based on

convenience, generalizations will be limited to the sample in question and may or may not generalize to other classrooms in the same center and other classrooms of the similar type.

Limitations. The major limitation of the study is that settings were not randomly selected from the population of toddler care settings and children who participated were not randomly selected from the population of children served in the setting. Because of this, I am not able to determine if the observed differences are due in total to the specific teacher or to the specific teacher-child relationships that are used in the study.

It is also possible that parents of children who elicit more talk from teachers were more likely to agree to have their child participate in the study, leading to an inflated number of child-caregiver interactions. As centers did not release demographic information for non-participants, it was not possible to determine if there were systemic differences between participants and non-participants in terms of age, gender, ethnicity, or disability, language or socioeconomic status. Furthermore, teachers may have spoken to children who they knew were participating in the study, more than they would have under normal conditions, thus artificially inflating the results. However, as children in the classroom who were not participating in the study were also wearing LENA clothing on all recording days, this limitation may have been minimized.

Furthermore, the Teacher Beliefs Scale (TBS) measures the extent to which beliefs about early childhood education concur with those proposed by the National Association for the Education of Young Children (NAEYC) and thus may not value non-mainstream beliefs that may draw from the various cultural or ethnic differences of caregivers. For example, several of the teachers who participated in the study were members of racial or ethnic minority groups and were not originally from the United States. These teachers may have used practices that were reflective of their own cultural backgrounds, and while appropriate, may not have been accounted for by the TBS.

Also several teachers reported that the TBS did not fit their work with toddlers, as it was designed for preschool age students. This may have impacted how they responded to questions as some practices that may be appropriate for preschool aged children may not be appropriate for toddlers. This limitation was hopefully addressed through the factor analysis conducted on this sample in order to derive factors instead of using the factors developed by the TBS authors.

Assumptions. A major assumption of the study is that the Language Environment Analysis (LENA) recording device operated as intended; moreover, that it recorded the conversations of students and teachers clearly and was able to function in a noisy and sometimes chaotic environment. It is also assumed that the device did not function differently between recordings or participants and that there was no systemic error in tallying adult words or conversational turns.

Definitions of Key Terms

Adult Word. A word, spoken by an adult near a child as measured by the LENA recording device (Xu, Yapanel, & Gray, 2009).

Classroom Quality. Components of care, both structural and procedural, delivered to children in child care classrooms. Where *Structural Quality* refers to the features of classrooms that can be regulated such as teacher education, ratios, and group size and *Procedural Quality* refers to dynamic aspects of classrooms such as teacher-child interactions, curriculum implementation, and relationships (Thomason & La Paro, 2009).

Conversational Turn. An engaged interaction that occurs when an adult talks to a child and the child responds, or vice versa (Hart and Risley, 1995).

Developmentally Appropriate Practice. A practice, such as developing a positive, personal relationship with each child and each child's family, that promotes young children's optimal learning and development (NAEYC, 2009). A developmentally appropriate practice takes into account research on child development and learning as well as the knowledge base on effective practices in early care in education. These practices consider young children's stages of development both relative to their age and to their individual developmental level and family and cultural backgrounds (Charlesworth, Hart, Burts, Mosley, & Fleege, 1993).

Early Childhood Curriculum. The content that children are expected to learn, the processes through which children achieve the identified curricular goals, what

teachers do to help children achieve these goals, and the context in which teaching and learning occurs (Bredekamp & Rosegrant, 1996).

Teacher Belief. Teacher's philosophies about how children learn and develop, what kinds of experiences ought to be provided, and how teachers facilitate children's learning and development through curriculum (Wang, 2000). These beliefs highlight what teachers' deem to be important or not important and influence how they make classroom decisions.

Summary

Chapter 1 provides an overview of the research study including delimitations, limitations, and assumptions. Delimitations included the use of a convenience sample and the potential problem of limited generalizability. Limitations included the lack of random selection. Some assumptions included technology issues and possible response bias.

Organization. Subsequent chapters are laid out in the following form. Chapter 2 is a *Literature Review* on topics surrounding early childhood settings as well as language environments. Chapter 3 consists of *Methods*, describing the sample, procedure, and data collection tools. Chapter 4 contains the *Results* section highlighting the data analytic procedures and findings. Chapter 5 is a *Discussion* of the results and their implications for the field. Appendices include copies of data collection tools used, and consent forms.

CHAPTER TWO

LITERATURE REVIEW

Language is one of the most fundamental skills possessed by human beings. It allows individuals to express their thoughts and influence others, enables the transmission of ideas, and communicates symbols and cultures from one individual to another. Language is also special because of its universality; almost all children learn language early and fluently. All typically developing children who grow up in typical households, surrounded by conversation, will learn the language that is being used around them (Birner, 2009). Nevertheless, there is also a great deal of variation in children's eventual mastery of the complex rules of grammar and syntax as well as variation in the total number of words and phrases children are able to use and understand.

While parents and caregivers do not directly teach their children language, they play an important role in its development by talking with their children. Language development requires social exchange; children who are never spoken to or only hear language on TV or on the radio, will not learn to talk (Birner, 2009). According to Kulh (2004), the presence of a human being interacting with a child has a strong influence on both speech production and speech perception. Moreover, the quality and quantity of language input experienced by young children serves as an important source of difference in vocabulary and syntactic development (Pullen & Justice, 2003).

This chapter first reviews the literature on the importance of language and its linkage to the development of literacy and prosocial skills, as well as the relationship between limited language skills and conduct problems. Next, it reviews how language develops and the contribution that parents and caregivers play to the development of strong language skills in young children. Third, it highlights characteristics of children themselves such as gender and disability status that may impact the amount of language input they receive from their environment. Finally, it highlights limitations of previous research on language input in order to provide a context for the current study.

Why is Language Skill Important?

Researchers have consistently demonstrated a strong connection between children's language abilities and both their future literacy skills and academic achievement as well as their ability to interact with others, making the growth of language one of the most essential tasks of human development. Without strong oral language skills, children are at greater risk of school failure and behavioral problems as these children often lack the ability to access curriculum and understand social norms and conventions. The following section will describe in greater detail how oral language skill relates to these important tasks of learning to read and learning to interact appropriately with others.

Language and Literacy

While there are many early literacy skills, such as phonological and print awareness, that facilitate the development of learning to read, none is as significant as oral language. In fact, the development of oral language is crucial to a child's literacy development (Kirkland & Patterson, 2005). Oral language is defined as the ability to express oneself verbally (Ediger, Willcutt, & Bohn, 2005) but also includes the skills of word knowledge, expressive and receptive vocabulary, knowledge of syntax, and conceptual knowledge (Wasik, Bond & Hindman, 2006).

Numerous studies have documented a longitudinal relation between children's oral language and later reading, writing, and spelling proficiency within typically developing, reading-delayed, and language-delayed children (e.g., Butler, Marsh, Sheppard, & Sheppard, 1985; Scarborough, 1989; Share, Jorm, Maclean, & Matthews, 1984; van Kleeck, 1990). Specifically, there are significant correlations between mean length of utterance and language production measured before the third year of life and phonological awareness at 4 ½ years (Crian-Thoreson & Dale, 1992), spelling and reading achievement in early elementary school (Walker, Greenwood, Hart & Carta, 1994), and reading comprehension after fourth grade (Mills & Jackson, 1990). Measured later in development, prekindergarten and kindergarten children's performance on vocabulary and grammar tasks accounts for a significant amount of variance in later elementary school reading ability (Scarborough, 1998). Looking retrospectively, Scarborough (1990) also found that second graders with reading

problems made a greater number of grammatical errors at two years of age and had poorer receptive and expressive vocabulary at four years.

Children with stronger language skills may have more opportunity to learn during both content and comprehension activities in school (Connor, Morrison, & Slominski, 2006). Often, when children lack language skill, they are unable to access curriculum as they lack the knowledge of vocabulary used in instruction (van Kleeck, 1990). For example, if a child is unable to understand words such as *print*, *number*, or *letter*, he or she is unlikely to succeed in learning to read not because of his or her lack of conceptual knowledge but rather because of deficits in basic vocabulary. Taken together, these results indicate the incredible importance of language for eventually teaching children to read.

In their comprehensive overview of language and literacy, Whitehurst & Lonigan (1998) identified several ways in which language skills can influence reading acquisition. They proposed that two interdependent sets of skills and processes, *outside-in* and *inside-out*, that contribute to children's reading development. *Outside-in* units "...represent children's understanding of the context in which the writing they are trying to read occurs" (e.g., language) (pp. 854). *Inside-out* units "...represent children's knowledge of the rules for translating the particular writing they are trying to read into sounds" (e.g., phonological awareness, phoneme-grapheme correspondence) (pp. 854). They state that there is stability from the preschool to the early school years in children's *outside-in* skills (e.g., expressive and receptive

language. This indicates that children who do not have these skills early continue to lag behind during the school years, thus making reading acquisition much more difficult.

Language and Social Competence

Social competence, defined as behaviors exhibited within specific situations that predict a child's standing on important social outcomes (Gresham & Elliott, 1987; Vallance & Wintre, 1997), has been shown to be related to language skill (Hart, Olsen, Robinson, & Mandleco, 1997). Because social competence is highly related to children's ability to enter play groups (Putallaz, 1983), resolve conflicts with peers (Hartup, Laursen, Stewart & Eastonson, 1998), and to maintain play (Gottman, 1983), its development is an important task for all children. Consequently, poor social competence places children at risk for the development of behavioral and emotional adjustment problems (Irwin, Carter & Briggs-Gowan, 2002).

A major task of developing social competence is the ability to understand the meaning of and following along with conversation. Empirical research and clinical and educational observation indicate that many children with deficits in communication skills have difficulties in social interaction (Farmer, 2000). By 18 months of age, children with expressive language delays display deficits in social functioning as they are rated as having poor attention, being noncompliant, and score low in overall social competence (Horwitz et al., 2003). Preschoolers with language delays also engage in fewer positive social interactions and conversations with peers, and are less successful in social bids, such as asking another child to play or gaining control of a resource

(Guralnick, Connor, Hammond, Gottman, & Kinnish, 1996). Therefore, it appears that poor language skill has a very early linkage to the underdevelopment of social and behavioral competencies because children with deficits in language skills do not effectively use language to interact with adults and peers.

These results have also been found to continue into the school years. Specifically, Vallance and Wintre (1997) found a significant difference in teacher rated social competence between children with and without a language learning disability between the ages of eight and 12. It also appears that these difficulties are maintained over time, in that children identified with a specific language impairment at age seven were still experiencing problems with social competence at 11 years of age (Conti-Ramsden & Botting, 2004).

Children diagnosed with receptive language difficulties are also at risk of persisting deficits in social functioning. In a study done with 19 young adults (21-28 years) diagnosed with a receptive language disorder in childhood, only 45% had adequate or above adequate interpersonal relationships and 31.6% reported no particular friends with whom they shared activities (Howlin, Mawhood, & Rutter, 2000). Thus, it seems that both receptive and expressive language delays in childhood can have lasting effects on social competence.

Language and Conduct Problems.

When children are unable to interact positively with others or have limited social competence, they often resort to other means, such as physical aggression, in

order to express their wishes and get their needs met. Specifically, lower language skills are a predictor of disruptive behavior across age ranges in both typically developing children (e.g., Adams, Snowling, Hennesy, & Kind, 1999; Estrem, 2005) and in children with identified language delays (e.g., Brownlie, Beitchman, Escobar, Young, Atkinson, Johnson, et al., 2004; Prizant & Meyer, 1993). In fact, as many as 59% to 80% of preschoolers and school-age children identified as exhibiting language delays also exhibit disruptive behaviors (Beitchman et al., 1996; Brinton & Fujiki, 1993; Stevenson, Richman & Graham, 1985).

It seems that deficits in both expressive and receptive language can make a child more vulnerable to behavioral difficulties (Carson, Klee, Perry, Muskina, & Donaghy, 1998; Dionne, Tremblay, Boivin, Laplante, & Perusse, 2003; Estrem, 2005), as language impairment interferes with the ability to understand others' feelings and perspectives. It has been hypothesized that expressive language reduces physical aggression because as language skills develop, children may be more inclined to use language instead of resorting to physically aggressive strategies to help get their needs met (Dionne et al., 2003). Receptive language skills can also impact children's use of physical aggression as they may use physical aggression when they are unable to understand the language requests of others (Guralnick et al., 1996).

Silva and colleagues (1987) followed over 1,000 children from age three to age eleven and found that children with delayed verbal comprehension and those with general language delay had significantly more behavior problems than controls at ages

seven, nine, and eleven. These authors found that children with a general language delay were consistently the most disadvantaged in terms of later intelligence, reading and behavior, indicating the incredible importance of strong early language skill.

Examining the impact of early language skills into young adulthood, Brownlie, et al (2004) followed a community sample of boys identified with language impairment at age five until the age of 19. These authors found that boys with language impairments scored higher than controls on parent-rated rates of delinquent behavior controlling for verbal IQ, demographic and family variables, and school performance. These boys also reported higher rates of arrests and convictions than controls. Taken together, these studies highlight that children with delayed language abilities and language impairments are much more vulnerable to experiencing future behavioral problems as well as adjudication

How do Children Acquire Language?

Because of its importance, researchers have become interested in what factors, both environmental and genetic that may contribute to successful language development. Some researchers have attested that language acquisition is entirely environmental; children hear language in their environment and receive reinforcement for approximating that language. Others theorists suppose that language acquisition is innate; children are born with the ability to learn language and variation in skill is due to environmental factors including characteristics of the child's native language, their culture's attitude toward oral language, as well as the child's developmental growth,

and their exposure to language in their environment (Ediger et al., 2005). Others too, propose that language development occurs within the context of general cognitive development that both environmental and genetic factors play a role.

There are several main theoretical approaches that account for child language acquisition, although none have been able to fully explain the phenomenon. First, *Cognitive Theory*, attributed to Jean Piaget, asserted that language acquisition occurs within the context of a child's intellectual development. Piaget believed that children first become aware of concepts and then later acquire the words and patterns that convey those concepts. He also attested that children express simple ideas earlier than more complex ones even if the simple ideas are more grammatically complicated (Piaget, 1923). The second viewpoint, *Behaviorist Theory*, attributed to scholars such as B. F. Skinner, believes that children learn language through imitating and repeating what they hear. This theory asserted that children receive positive reinforcement for their successive approximations of adult language (Skinner, 1957).

In contrast, Noam Chomsky argued that children are born with an innate capacity for learning human language. The *Nativist Theory* states that children are born with innate knowledge of aspects of grammar that are consistent across all the world's languages. This "Universal Grammar" allows children to recognize which of the possible types of grammar their native language uses and thus enables them to learn it quickly despite its complexity (Chomsky, 1959). Chomsky (1988, p. 24) asserted:

The speed and precision of vocabulary acquisition leaves no real alternative to the conclusion that the child somehow has the concepts available before experience with language and is basically learning labels for concepts that are already a part of his or her conceptual apparatus.

A great deal of evidence has emerged over the last several decades in support of the *Nativist Theory*. First and foremost, human infants seem acutely attuned with human language. In utero, fetuses begin to respond to sound at 22 to 24 weeks (Hepper & Shahidullah, 1994). By the time they are born, human infants are able to discern the voice of their mother and seem to be familiar with the rhythmic properties of their native language (Behme & Deacon, 2008). Across cultures, children tend to develop spoken language at similar rates and all, even deaf children, babble and will invent grammatical speech even in the absence of a language with consistent rules (Pinker, 1994). Moreover, there are patterns in all human languages that children cannot learn simply by observation as children only hear speakers using sentences that are “right”, and not those that are “wrong” (Pullum & Scholz, 2002). In order to receive enough information on what is not grammatical; children would need to hear “wrong” sentences, use them themselves, and then receive corrective feedback. This pattern simply does not occur in human development.

However, we also know that children will not acquire language without interaction with a speaker and caregiver speech appears to be a driving force in syntactic development (Huttenlocher, Vasilyeva, Waterfall, Vevea, & Hedges, 2007).

Additionally, empirical evidence suggests that there are substantial variations in language input and these are related to differences in children's language development (Huttenlocher, et al, 2007). Thus, while children appear to be born with an innate capacity to acquire language skill, adult speakers are vital in facilitating this process through interacting with children, modifying their language, and expanding the language attempts of their young children.

Features of Adult Language Input

As previous stated, children learn language and conversational rules through observing and interacting with adults who are more proficient speakers of the language, (Dickenson & Tabors, 2001; Massey, 2004) through both formal and informal interactions. Specifically, adults help children learn to link adult produced words with objects, actions, and external events (Girolametto et al., 2000) through child-directed speech. When adults use child-directed speech, they modify it so that it is slower and less complex; they provide repetition and emphasis of salient words and phrases; and they support attempts at communication through adapting to the needs of their young language learner (Behme & Deacon, 2008). This "baby talk" or "motherese" that adults naturally use with infants and toddlers has a simpler vocabulary and sentence structure than adult language, uses exaggerated intonation and sounds, and provides many repetitions and questions (Birner, 2009). These features aid children's ability to sort out the meaning of sounds.

In addition to use of motherese, there are a number of strategies that adults use to facilitate positive outcomes for children including labeling, recasting, and expanding. Most simply, adults label objects within the child's environment in order to help the child make connections between objects and words (Behme & Deacon, 2008). When children begin talking, adults begin to expand and recast children's talk. Here, adults restate, in a linguistically correct form, what the child has said. For example, when a child says "milk", his mother may say, "Yes, there is milk in your cup. Would you like some more milk?"

When children's language development becomes more advanced, adults can also use more sophisticated tools to enhance language development. First, asking open-ended questions has been shown to be beneficial as it allows for conversation and typically requires the child to use more varied vocabulary and complex grammar (Gest, Holland-Coviello, Welsh, Eicher-Catt, & Gill, 2006, Tarawick-Smith, 1994). Conversely, using directives, or an utterance designed to direct the child's behavior, do not lend themselves to extended discourse.

Secondly, adults can support language development through their use of cognitively challenging, decontextualized, or pretend. Cognitively challenging talk encourages children to think and talk about past and future events (Dickenson & Tabors, 2001) and encourages the use of complex grammatical rules. Decontextualized talk, or referring to objects and events that are not physically present, is thought to be beneficial because it forces children to convey meaning

through language instead of through objects or individuals that are physically present (Gest et al., 2006). Similarly, pretend talk, or talk that enhances children's imaginative free play activities has been thought to be a tool to facilitate and extend children's pretend play (Kontos, 1999). For example, Katz (2001) found that mothers' use of pretend talk when children were three years old was positively related to children's definitional skill, receptive vocabulary, emergent literacy, and ability to create a narrative when children were in kindergarten. Furthermore, higher rates of mothers' pretend talk correlated positively and strongly with higher rates of pretend talk from their children at the same point in time.

Using rare words, defined as words that typical preschool children would not be expected to know, and a more varied vocabulary can also lead to greater vocabulary growth. (Dickinson & Tabors, 2001, Pan, Rowe, Singer, & Snow, 2005). This seems to be due to the fact that children are most likely to learn the new word when the more skilled speaker uses it within the context of the child's ongoing activity (Snow, 1983). Specifically, one study found that children who heard more rare words during the preschool period had higher receptive vocabulary in kindergarten (Tabors, Beals, & Weizman, 2001). This finding led the authors of that study to assert that children's rare word exposure during the preschool years is a strong predictor of their later vocabulary.

Home Influence on Language Development

A growing body of literature over the past several decades has documented the importance of children's home environments on their subsequent language skill. Characteristics of the family such as, parental literacy habits and activities, socioeconomic status, and parental beliefs and interaction styles have all been shown to impact children's future language skills. These characteristics are important as children who grow up in rich, stimulating language environments typically enter school with substantial understanding of the concepts that will eventually help them learn to read (Dickenson & Tabors, 2001). In fact, expressive language development in toddlers has been shown to be largely influenced by environmental, rather than genetic factors (Van Hulle, Goldsmith & Lemery, 2004). According to Hart and Risley (1995), "With few exceptions, the more parents talk to their children, the faster the children's vocabularies grow and the higher the children's IQ test scores were at age three and later."

Parental Literacy Habits & Activities

Parents' literacy habits, or their personal enjoyment in reading, the amount of time they spend reading, and the amount of time their children see them writing has been linked to children's language abilities. Specifically, parents who have strong literacy habits have children with higher expressive and receptive language scores (Weigel, Martin, & Bennett, 2006). This relationship is thought to occur because parents with stronger literacy habits may engage their children in more language and

literacy activities (DeTemple, 2001) and place a greater emphasis on the importance of these activities.

Language and literacy activities such as shared book reading seem to have an impact on children's oral language skills (Samuelsson, et al., 2005). Wells (1985) found that the frequency of listening to stories between 1 and 3 years of age was significantly associated with teacher ratings of oral language skill at 5 years of age and with reading comprehension at 7 years of age. During shared book reading parents facilitate language development by gradually increasing their demands in the questions they ask and the comments they make during the book-reading routine (van Kleeck, 1990).

Additionally, dialogic reading, where the adult assumes the role of an active listener, asks questions, adds information, and prompts the child to increase the sophistication of his or her descriptions of the material in the book, has been shown to enhance language development (Whitehurst, Falco, et al., 1988). For example, low-income children who participated in dialogic reading daily for six weeks gained approximately double the number of words between pretest and posttest as children in a control condition with effects lasting six or more months (Whitehurst, Arnold, Epstein, Angell, Smith, & Fischel, 1994). Parents, therefore, have the ability to enhance their child language development by placing an emphasis on language development and participating with their child in language focused activities.

Family Demographics

There is a great deal of suggestive evidence that there are individual differences in the speech of caregivers related to demographic factors (i.e., SES) that, in turn, are related to the language development of their children (e.g., Elardo, Bradley, & Caldwell, 1977; Hart & Risley, 1992; Price & Hatano, 1991). Particularly, children from low-socio-economic status (SES) homes typically have underdeveloped language skills (Hart & Risley, 1995) and do not have age appropriate letter knowledge and phonological sensitivity (Lonigan, Burgess, Anthony & Barker, 1998). On average, by three years old, children from low income homes, begin to lag behind their middle class peers in vocabulary production (Pan, et al., 2005). This trend continues into the school years as children living in lower-SES families continue to have lower performance on language and reading-related achievement across the elementary grades (Walker et al., 1994).

Betty Hart and Todd Risley's (1995) landmark study of differential rates of language exposure experienced by children of different socioeconomic classes shed a great deal of light on potential reasons why children from lower- SES home have more difficulty learning to read. They found that professional parents (i.e., middle to upper SES) use more words, a greater variety of words, more multiclausal sentences, more past and future verb tenses, more declaratives, and more types of questions. These parents not only used a greater number of words, but there was greater richness of words used. Extrapolating their results, Hart and Risley estimated that by age 3,

children in professional families would have heard more than 30 million words, children in working class families 20 million, and children in families receiving welfare, 10 million.

Expanding on Hart and Risley's work, Hoff and colleagues (2002, 2003) examined high- and mid-SES mother/child pairs, and found that SES was a significant predictor of vocabulary growth for young children. Specifically, high SES mothers produced more utterances, more word tokens, and more word types, had higher mean length of utterances (MLUs), and produced more topic-continuing replies to their children than lower- SES mothers. These factors were, in turn, all positively related to vocabulary growth. The total frequency of utterances, however, had no relationship to vocabulary development indicating that there are specific features of mother's speech, above and beyond the number of words she spoke, that facilitate language development in children.

Parental Beliefs & Interaction Styles

Ethnographic and cross-cultural studies have demonstrated that there are differences in the beliefs held about and the ways that adults from different social strata and cultural groups use language with their children and thus, shape their children's language development (Zhang, Jin, Shen, Zhang, & Hoff, 2008). Empirical evidence suggests that differences in these beliefs and interaction styles may account for the different amounts of language stimulation children from various SES groups receive as different cultural groups hold different beliefs about the appropriateness of

talking to prelinguistic children (Zhang, et al, 2008). Additionally, because of the confound between SES status and race, the differences in rates of language usage amongst high and low income parents may actually be accounted for by race and not SES status.

For example, Gusii mothers of Kenya rarely make eye contact with their children and only respond to child vocalizations when their children are in distress (Richman, Miller, & LeVine, 1992). This is also true of the Kaluli of Papua New Guinea who believe that young children have no understanding and thus, do not engage in dyadic communication until the child is able to talk (Ochs & Schieffelin, 1984). Even within Western cultures, beliefs have been found to influence adults' language use with their children. For example, Heath's (1983) study of neighboring Black and White working-class communities found that Black parents did not perceive their infants vocalizations as meaningful and therefore did not respond. Meanwhile, White families felt that children must be taught to talk and therefore, engaged in baby-talk in order to shape their infants vocalizations into words. Thus, it is reasonable to believe that children in these cultures may have language skills lagging behind children who receive frequent verbal input and dyadic conversations with their parents (e.g., Hoff, 2006).

In order to reduce the confound between race and SES status, Pungello and colleagues conducted a study of parental language stimulation of four groups: African American middle-income, African American low-income, European American middle-income and European American low-income families. In comparing these families,

they found that race is associated with receptive language skills and both SES and race are independently related to the growth of expressive language skill. They hypothesized that the reason European American children scored higher than African American children on measure of language skill was due to cultural differences in parenting style. Thus, it appears that different beliefs parents hold about their children's ability to understand and communicate may play a large role in the frequency and complexity of child directed talk in the home environment.

Childcare Influence on Language Development.

In the current economic and social environment, the majority of children in the United States are now regularly cared for by someone other than a parent. Specifically, 60 percent of children, or 12.2 million infants, toddlers and preschoolers under the age of six are receiving some type of care or education on a weekly basis from persons other than their parents (Mulligan, Brimhall, West & Chapman, 2005). Children are spending, on average, over 30 hours per week in non-parental care, with children of employed mothers spending almost 40 hours per week in some type of care arrangement (Johnson, 2005). Consequently, the child care setting is an important developmental environment, as it can play a significant role in facilitating children's language development through providing children with opportunities to interact with a variety of peers, teachers, and other adults.

Day-care and preschool environments can have positive effects on children's emergent literacy (Connor et al., 2006; Whitehurst & Lonigan, 1998) and language

development (Howes, 1997; McCartney, 1984, Weigel, Martin, & Bennett, 2005) emphasizing the importance of highly stimulating language environments in early childhood settings. On the other hand, children's cognitive and communication skills may be jeopardized by their experiences in poor childcare environments (Burchinal et al, 1996). In fact, aspects of the child care settings such as teacher demographics, activities, and beliefs can account for 11% of the variance in children's receptive language skills and 15% of the variance in children's expressive language skills (Weigel et al. 2005).

Because of the critical importance of immersing young children in language-rich environments, teachers should strive to provide an environment where language is valued. This, in turn, ought to increase children's word knowledge and vocabulary. In fact, rates of teacher talk have been shown to be an indicator of the level of environmental stimulation and have been shown to be related to children's learning and development (Kontos, 1999). Teacher's oral language proficiency has also been linked to end-of-kindergarten outcomes such as letter name identification and phonological awareness, regardless of the initial ability of the child (Cirino, Pollard-Durodola, Foorman, Carlson, & Francis, 2007).

Especially for low-income children, language input from the child care setting may make up a larger proportion of children's overall language input (Gest, et al., 2006) indicating the importance of positive childcare experiences for these young children. Furthermore, because the adult language young children are expected to

understand within a preschool or daycare setting may be different than that which they are expected to understand at home (Marinac, Ozanne & Woodyatt, 2000) having a high quality childcare experience can provide diversity in children's language input. However, many children growing up in poverty do not have access to high quality care experiences. For example, Raikes, Waikes, and Wilcox (2005) found that the when the number of lower-SES children in a child care setting increased, the level of a provider's education, training and sensitivity as well as the overall quality of the setting decreased. Furthermore, preschool classrooms serving a high percentage of at-risk students, compared to those serving fewer at-risk student, often have poorer language and literacy environments (Dickinson & Tabors, 2001).

McCartney (1984) examined whether the quality of the day care environment affected children's language development in a sample of low income children in Bermuda. She demonstrated that the total number of teacher utterances was a significant positive predictor of children's scores in adaptive language and an experimental communication task, controlling for family background. Also, Wasik, Bond and Hindman (2006) found that after training Head Start teachers to use specific language procedures, children in the intervention condition had significantly higher expressive vocabularies and better receptive language skills. Thus, "Enriching children's language experience should have beneficial effects on the vocabulary development of lower SES children, even when other SES-related differences in children's environments remain unaddressed" (Hoff, 2003, p. 1375-1376).

Unfortunately, Dickinson and Tabors (2001) found that children and teachers spend only 17% time engaged in conversations, thus limiting children's opportunities to talk and receive feedback thus limiting language development.

Based on these findings, it appears that teacher practices can make an impact on the development of children's language abilities. For example, teachers can facilitate language development through shared book reading (Dickenson & Smith, 1994), reading and writing centers, singing songs and telling stories, playing listening and group games, and providing opportunities for dramatic play (Weigel, Lowman, & Martin, 2007). Specifically, Whitehurst and colleagues (1994) found that when children were exposed to more language activities in their classrooms, they made statistically significant gains in language, print, and writing skills. Also, Weigel et al. (2005) found that children's language skills are greater when teachers actively engage students in language activities in the classroom through reading experiences, when they buy books for the classroom, and when they believe in the power of sharing books with children. These activities are thought to promote language growth by providing children with opportunities to hear and interact with speech, improve their vocabularies, and practice their language skills in an interactive setting.

While the previous studies have indicated the importance of teacher led language and literacy activities, other researchers have found a teacher's presence to be detrimental to children's language development. Pellegrini (1983, 1984) found that adults can inhibit aspects of children's symbolic play, language use, vocabulary

development, and print knowledge (Pellegrini & Galda, 1993). He hypothesized that adults can suppress children's exhibition of language during symbolic play because when children and adults interact, adults do most of the work. On the other hand, Dickenson and Tabors (2001) found that, children, especially children under the age of four, tend to pretend more, have longer play sequences, and engage in more diverse and complex play when they engage in pretend play with adult caregivers than when they pretend alone. Furthermore, Connor and colleagues (2006) theorized that the positive association between the amount of time children spent in symbolic play and vocabulary growth was due to more frequent interactions with more able peers and the teacher, thus giving children access to more diverse vocabulary not available to them through home language experiences.

Overall, these series of experimental investigations indicate that training teachers to define vocabulary words and provide opportunities for the children to use vocabulary from books, as well as providing children with opportunities to talk and be heard, has been shown to increase their expressive and receptive vocabulary skills (Wasik & Bond, 2001). Additionally, child-directed talk during free play that is cognitively challenging and extends the child's own talk can facilitate children's language growth (Dickenson, 2001b). In many childcare settings, however, a great deal of teachers' vocalizations center around controlling behavior, giving instructions, and helping children to obtain items (Kontos, 1999) instead of using cognitively

challenging and decontextualized talk that can serve to facilitate children's language and literacy development.

Teacher Variables and Language Exposure

Since numerous studies have documented a link between teachers' use of language in their classrooms and children's language and literacy development, researchers have begun to examine teacher factors that, like parental factors, may be related to an increased use of language. These factors include teacher background such as education and experience, teacher beliefs and pedagogical orientations, and setting factors such as group size and ratios. Each may play a significant role in the language environment of a classroom, and therefore, significantly impact children's development.

Education. Teachers who attend more formalized schooling have a greater opportunity to learn about children's development and factors that can improve child outcomes. Particularly, caregivers with more formal education typically have more specialized training pertaining to children and hold typically less authoritarian child-rearing beliefs (NICHD, 1996). Therefore, it seems likely that teachers with more formalized education would use more language in their classrooms.

Smith and Dickinson (1994) found that teachers' reported levels of education was strongly positively correlated with the amount of cognitively challenging talk they provided during free play. Additionally, teacher education had a significant positive effect on one-word vocabulary growth in children enrolled in Head Start (Landry,

Swank, Smith, Assel, Gunnewig, 2006) and infants in classrooms with better educated teachers had higher levels of expressive language (Burchinal, et al., 1996).

Additionally, Honig and Hirallal (1998) found that teachers with more early childhood education and child development coursework made stronger contributions to children's language skills.

Years of Experience/Teacher Status. As teachers gain more experience working with children, it seems likely that they would become better caregivers and thus implement more practices that facilitate child growth and development as teachers with more experience also tend to provide more high-quality care (Smith, 2001). However, empirical research indicates that language usage does not increase with years of experience (e.g., Burchinal et al., 2002). Several studies have found no relation between teachers' reported years of experience and the amount of child directed verbalizations (Bryant et al., 1994; Kontos, 1999; Smith & Dickinson, 1994). This indicates that teachers may continue to use the same language patterns, no matter how long they have been working in an early childhood setting. On the other hand in one study, Weigel et al., (2005) found that children tend to make better language gains when they were with more experienced teachers; however, the teachers in this study also had stronger language skills and regularly modeled those skills.

It also seems likely that differential rates of language usage would be found for lead versus assistant teachers as lead teachers typically have more education and/or

experience. This too, does not appear to be the case as many of the same studies looking at years of experience have examined lead versus assistant teacher status and have found no differences between the two groups (Gest et al., 2006; Kontos, 1999). Therefore, it is possible that other factors of classrooms, such as the pedagogical orientation of the classroom or type of setting, may play a more important role in language environments than teacher status.

Pedagogical Orientations. A teacher's pedagogy, or their particular principles and methods of instruction, as well as what they think about their teaching and their understanding of how children learn, can also significantly affect their use of language in the classroom (McMullen, et al., 2006). In fact, teachers' pedagogical beliefs and teachers' instructional practices cannot be considered independent of each other (Smith, 2001). According to McMullen and colleagues (2006), teachers who base their teaching practice on NAEYC guidelines and developmentally-appropriate practice value child choice-making and play, engage children in problem-based learning, encourage critical thinking activities in curriculum and use small group activities rather than whole group instruction. On the other hand, more traditional teachers, typically rely on teacher-directed activities, are rule-bound, teach isolated content units of curriculum and use whole-group instruction as their primary method of teaching.

Thus, the amount of language teachers use in their classrooms may be related to their particular pedagogy. For example, traditional teachers who use a direct instruction approach may inhibit conversations through rigid adherence to rules and

structured language, with little consideration for children's feelings and ideas. In contrast, a developmental teacher may encourage conversations through engaging in friendly and affectionate open-ended discussions and play (DeVries et al, 1991). Developmental teachers also use more emergent literacy and language development activities than more traditional teachers (McMullen, et al., 2006) These developmental teachers also tend to use more cognitively challenging talk during small group times (Smith & Dickinson, 1994). Therefore, it appears that when teachers attest to using "developmentally appropriate practice," they also tend to use more language in their classrooms.

Setting Variables and Language Exposure

Features of the childcare environment both structural (e.g., ratios, group size) and process (e.g., teacher-child interactions) have been linked to language and literacy development in young children in both naturalistic and experimental contexts. Furthermore, overall classroom quality has been shown to be linked to numerous positive childhood outcomes both during the preschool period and into the school years. These setting variables are very important to examine as they are often the most amenable to change. If we can determine setting variables that are associated with increased teacher language use, we can promote these qualities in order to provide more children with essential language stimulation.

Classroom Quality (See Chapter 1 for definition). The benefits of high quality early childhood experiences are well documented (see Karoly, Kilburn, & Cannon, 2005

and Reynolds, Wang, & Walberg, 2003 for a complete review). Substantial research exists supporting the short-term effects of early childhood programs on improving the IQ, school readiness skills, academic achievement, and social development of its participants. One comprehensive study considering child care quality over time is the NICHD Study of Early Child Care (SECC), which has been conducted at ten research sites in the United States. Children were followed from birth, and at three-years-old, cumulative quality during the first three years was related to children's school readiness ($d = .39$), expressive language, ($d = .44$), and receptive language ($d = .28$) (Vandell & Pierce, 2003).

The Cost, Quality, and Outcomes of Child Care Study (CQO; Peisner-Feinberg et al., 1999) also examined the relationship between quality of early childhood experiences and outcomes through the first few years of formalized schooling. In this study, early childhood classroom quality was positively related to receptive language during the preschool period ($d = .60$ and $.51$ for the two years preceding school entry) and during kindergarten ($d = .30$). Additionally, children who were enrolled in higher quality child care classrooms had better math skills prior to school entry, in kindergarten, and in second grade with effect sizes ranging from $.20$ to $.29$ across the years. The effect was stronger for children whose mothers had less education.

Because children with less educated mothers and those who live in poverty face increased risk for problems once they enter school, researchers have also become interested in determining if early childhood programs for these students can better

prepare them for formalized schooling. Specifically, in a comprehensive review of 20 early intervention programs including the Abecedarian Project, the Early Training Project, and the Chicago Child-Parent Centers, Karoly and colleagues (2005) reported short-term positive effects for all 20 programs and long-term positive effects for five. This review found that early intervention programs can produce moderate IQ gains ($d = 0.28$), reduced special education placement ($d = -0.46$) and problem behavior ($d = -0.14$), and increased employment and earnings ($d = 0.37$). Gorey (2001) also reviewed early intervention programs and reported significant positive effects for IQ ($d = 0.56$) and scholastic achievement ($d = 0.56$).

In studying Head Start programs, Bryant and colleagues (1994) found that children in higher quality Head Start classrooms performed better on measures of achievement and preacademic skills, regardless of the quality of their home environment. These findings, taken together, provide significant evidence for the role of quality early childhood experiences on increasing the school readiness skills, such as a large vocabulary, of young children.

Group Size. The adult to child ratio in the classroom may inhibit or facilitate teachers' use of language. One concern related to the amount of children in a group is that when there is more than one child in a setting, adults spend less time with any given child, thereby reducing the amount of language stimulation that child receives (NICHD, 2000). Group size effects have been reported in the literature for both the quantity and quality of language directed towards children in the childcare setting

(Pellegrino, & Scopesi, 1990). The direction of these effects differs based on the results of different investigations.

McCartney (1984) found that teachers used more representative talk (i.e., giving and requesting information) when children were in groups and used more controlling talk (i.e., limiting behaviors) when speaking to individual students. Additionally, Marinac, Ozanne & Woodyatt (2004) found that while teachers used equal numbers of directives, requests, and statements regardless of the number of children they were speaking to, they had more grammatical complexity and increased the total number of words used when speaking to groups rather than individual children

On the other hand, Schaffer and Liddell (1984) found that while the overall rate of adult talk was greater in groups of children (4 children to 1 adult), the amount of talk directed specifically to each child was dramatically reduced. It also appears that teachers are more likely to use language stimulation techniques (LSTs), or linguistic structures that are helpful for children's language development, when groups were relatively small (1-5 children) as compared to larger (Turnbull, Anthony, Justice, & Bowles, 2009). Pellegrino and Scopesi (1990) also reported that in groups of seven, individual children "...receive a rather poor and monotonous input" (pg. 112). Furthermore, when in larger groups (i.e., seven children) compared to small groups (i.e., 2-3 children) and dyadic situations, teachers used fewer words, fewer compound and complex situations, and had less conversational talk with children with a primary

focus of talk in larger groups being directed towards controlling behavior. Thus, the relationship between the ratio of adults to children in the child care environment and the amount of language stimulation children receive remains unclear.

Child Variables and Language Exposure

In addition to teacher and setting variables, attributes of children themselves may also contribute to the amount of language stimulation they receive. For example, both child age and gender have been shown to impact the amount and type of language children hear in their natural environments (e.g., Leaper, Anderson & Sanders, 1998). Therefore, it is important to consider these relationships in any study of adult language use, especially in classroom environments.

Gender. Several studies have documented a link between child gender and the amount of language input they receive; specifically, girls tend to receive more child-directed talk from their primary caregivers than do boys (Gilkerson & Richards, 2006; Leaper, et al., 1998). This difference may be due in part to the fact that girls typically acquire a vocabulary faster than do boys, especially in the early stages, and therefore, elicit more talk from their caregivers (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991, Normand, Parris, & Cohen, 2008, Zhang, et al, 2008). Additionally, gender differences in the amount of language input children receive may be due to social factors such as gender-stereotypic attitudes and socialization (Cho, Holditch-Davis, & Belyea, 2007). Parents are more likely to encourage verbal performance in girls,

whereas motor development is preferred in boys (Galliano, 2003). Thus, girls are given more opportunities to practice social and language skills (Honig, 1998).

Age. Authors have previously indicated that there may be age-related changes in adult language input to young children, especially within the mother/child dyad. This seems to be a result of adults modifying their language based on their perceptions of the child's language abilities (Marinac, et al., 2000). For example, Pellegrino and Scopesi (1990) reported that teachers reduced the speed and complexity of their language when speaking to one-year-old children as compared to addressing two-and-a-half-year olds. On the other hand, Marinac and colleagues (2000) found no differences in either the linguistic or social components of adult language as addressed to two-year-old versus three-year-old groups of children. Additionally, Huttenlocher and colleagues (2007) found that adults used more complex talk and diverse words as children became older, the quantity of speech they used remained constant. Thus, it is unclear if the age of an individual child impacts teachers' language usage in the classroom, especially amongst homogenously aged children.

Disability Status. Disability status, as well as the nature of a child's disability, may also influence the amount of talk children elicit from their caregivers, especially within an inclusive program. In inclusion programs, where children with disabilities are educated with typically developing children, there are favorable outcomes in language and cognitive development for the children with disabilities (Burchinal, Roberts, Nabors & Bryant, 1996; Buysse & Bailey, 1993). This may be due in part to the fact

that teachers sometimes interact more frequently with children with disabilities than with typically developing children (Brophy & Hancock, 1985; Stipek & Sanborn, 1985) and thus provide them with greater amounts of language stimulation. Girolametto and colleagues (2000), on the other hand, found that teachers used significantly more directives with children with language delays than typically developing children and significantly fewer language-modeling utterances designed to encourage conversation. Thus, the type of disability a child has, the number of children with disabilities versus those without in the classroom, as well as the visibility of a child's disability may all influence the amount of language input children with disabilities receive in their classroom.

Socioeconomic Status & Ethnicity. Numerous studies have documented the negative association between low family socioeconomic status and ethnic minority status on children's language development. Additionally, in Western societies, SES and race are often confounded making it difficult to examine the unique effect of either variable. For example, a lack of resources and opportunities for low income families may affect children's outcomes, so too may discrimination and racism.

Vast amounts of evidence exists to indicate that children growing up in low-SES environments tend to acquire language slower than their high-SES counterparts and hear fewer and less complex words from their primary caregivers. Lawrence (1997) found that middle-class and European American preschool children had longer mean lengths of utterance than African American and working-class children. Thus, because

minority and low-SES children do not talk as much as White and upper-SES children, they may elicit less talk from caregivers in childcare and therefore receive less language stimulation in the environment as well.

Limitations of Past Research

Much of the work conducted on adult language input to children has been conducted either in infancy (birth to age two) or during the preschool period (ages three to five), neglecting the period between the ages of two and three. This is surprising because researchers have indicated that the period between the ages of two and three may be the stage when the greatest amount of language development takes place (Bloom, 1991). Also, this period may provide a critical window of opportunity to develop sophisticated oral language skills (Pullen & Justice, 2003). Between the ages of two and three, children's vocabulary typically grows from around 300 to 1000 words and three-year-old children are generally able to understand up to 3000 spoken words. Additionally, children also begin being able to use function words, such as articles, prepositions, pronouns, and conjunctions to speak, thus increasing their both their language use and sophistication (Ediger et al., 2005). Thus, if children are receiving complex, diverse vocabulary and language usage in their environment during the ages of two to three, there may be a significant impact on children's later language abilities as well as their ability to learn to read.

An additional limitation of past work on language environments in early childhood settings is the focus on Head Start (e.g., Bryant et al, 1994; Gest et al., 2006;

Kontos, 1999; Landry et al., 2006; Smith, 2001; Whitehurst et al, 1994). Because of this focus, we know much less about other early childhood settings, such as community child care centers, child care homes, etc. in which children, especially low income children, are served. Perhaps there is something distinct about Head Start (e.g., teacher pedagogy, classroom environments, family orientation) that makes these settings distinct from other early childhood settings. Without research examining other types of environments, we are unable to draw more general conclusions about the impact language environments have on young children.

A final limitation is that when factors related to adult language use are examined (e.g., setting variables and teacher and child factors), they are typically looked at in isolation. This makes mediating or moderating roles difficult to ascertain. Examining all of these factors simultaneously provides a more comprehensive picture of what contributes to teachers using language in their classroom.

CHAPTER 3

METHOD

Participants

Participants included 28 toddlers (ages 16 months to 35 months; $M = 26.5$ months, $SD = 5.19$ months; 13 boys) enrolled in 4 separate classrooms in 3 childcare centers. Children in the sample were mostly European American (71.4%); but others were described by their parents as Asian/Asian American (7.1%), Hispanic/Hispanic American (7.1%), or African/African American (3.6%). Almost 11% of children in the sample were described as being from multiple ethnic backgrounds. Many children (17.9%) primarily spoke a language other than English at home and 10.7% of children spoke English and another language at home. Additionally, 28.6% of children received a tuition subsidy to attend school. Only one child in the sample was described as having a disability (Autism Spectrum Disorder). The consent rate for the two classrooms at Center 1 was 38.5%, 66.7% for the classroom at Center 2, and 75% for the classroom at Center 3.

Twelve teachers also participated in the study, 3 in each classroom. Four teachers were described as Lead Teachers or Area Coordinators and eight teachers were described as Teachers or Assistant Teachers. All teachers were female and their ages ranged from 25 to 44 years. Nine teachers were European American, two were Asian American, and one was Latina. All teachers had a high school diploma, one teacher had an Associates degree, eight had Bachelors degrees, and two had Masters

degrees. All teachers who returned demographic information also indicated that they had coursework in child development and early childhood education and several had coursework in special education, family studies, social work, and/or elementary education. Of the nine teachers who returned demographic information, the average number of years in their current position was 6.5 (Range >1 year to 20 years) and the average number of years in early childhood education was 11.6 years (Range 5 to 20 years).

Measures

Three types of variables were used in the study. First, the Language Environment Analysis (LENA) system was used to capture utterances that occurred between children and their adult caregivers. Second, teacher variables were collected. These included teacher demographics as well as the Teacher Beliefs Scale (TBS), a measure of teacher pedagogy. Third, setting variables, including the Early Childhood Environment Rating Scale (ECERS), a measure of classroom quality, as well as adult to child ratio and group size were gathered. Finally, child demographics were collected.

Language ENvironment Analysis (LENA).

LENA is a recording device, equipped with speech recognition software that, when placed on a child, captures utterances between adults and children. LENA is placed in the front pocket of a child's clothing and at the end of the day the data are downloaded onto a computer. The LENA software uses child vocalization and speech recognition technology to quantify and analyze conversations between adults and the

child (See Figure 1). The LENA software segments the audio file into adult and child sounds and selectively eliminates noise, distant and unclear speech, overlapping speech, and electronic sounds. The software then employs a language-dependent statistical model to estimate the number of words spoken in each adult segment. Finally, the software uses a statistical analysis on the child sound segments to detect vocalizations and filter out laughing, crying, and vegetative (e.g., gurgle) sounds (Yapanel, Gray, & Xu, 2007).

To estimate the reliability of the LENA system, adult word counts measured by the LENA system were compared to those measured by human transcribers. The analysis was conducted on 70 hours of audio data selected based on the age of the child and mother's socioeconomic status. Two children were selected in each age group (2 months – 36 months), one from a relatively higher SES bracket and one from a comparatively lower SES bracket. Pearson's Product Moment correlations found a 92% linear relationship between LENA-based (machine detected) Adult Word Count and human transcribed indicating that the LENA mean word count is approximately 7% lower than the word count reported by human transcribers (Yapanel, Gray & Xu, 2007). There is no systematic over or under prediction of adult words or conversational turns (Gilkerson & Richards, 2007). Reliability estimates are highest in indoor environments free from background noise.

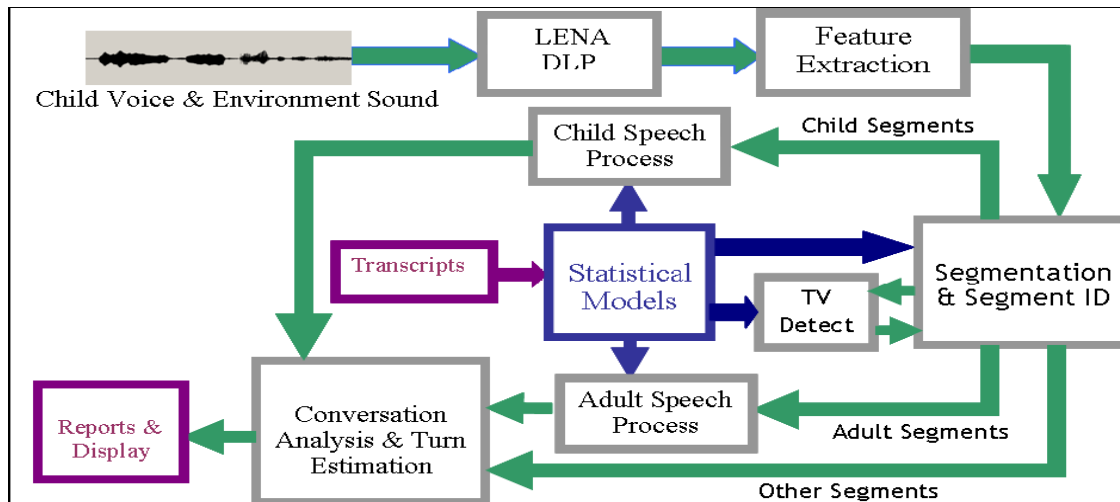


Figure 1. LENA Language Environmental Analysis Audio Processing System (Gray, Baer, Xu, & Yapanel, 2007)

Adult Words Count. Adult Words Count is an estimate of the number of adult words spoken near a target child per hour or per day. The total number of words recorded over the course of the day was then divided by the length of the recording, in hours, in order to compare children whose recordings were of different lengths. Additionally, a composite score for each hour of the day (e.g., 8 am, 12 pm, 3 pm) in each classroom was calculated by adding the number of words each child heard at a particular time of day divided by the number of children recorded to determine how much language teachers use at different times of day.

Conversational Turn Count. Conversational Turn Count is an estimate of the number of engaged interactions that occur when an adult talks to a child and the child responds, or vice versa. Each back and forth exchange is recorded as an individual conversational turn. For example, in an adult/child conversation with a child talking,

then a teacher, then the child, then the teacher, two conversational turns would be recorded. The total number of conversational turns recorded over the course of the day was then divided by the length of the recording, in hours, in order to compare different length recordings.

Teacher Variables

Teacher Beliefs Scale. To address pedagogical orientations, the Teacher Beliefs Scale (TBS; Charlesworth, Hart, Burts, Mosley, & Fleege, 1993, see Appendix A) was used. The TBS consists of 36 items and measures teachers use of developmentally appropriate versus developmentally inappropriate practices in several areas of early childhood instruction. The TBS was based on the original 1987 guidelines for developmentally appropriate practices of the National Association for Young Children (NAEYC) and covers aspects of early childhood education such as curriculum goals, teaching strategies, guidance of social-emotional development, language development and literacy, cognitive development, physical development, aesthetic development, motivation, and assessment.

Each item contains a belief statement (e.g., “It is ____ for children to work silently and alone on seatwork”) and teachers rank items on a 5-point Likert-type scale ranging from 1 (*not important at all*) to 5 (*extremely important*). Six factors can be derived from the TBS: 1) inappropriate activities and materials, 2) appropriate social, 3) appropriate individualization, 4) appropriate literacy activities, 5) appropriate integrated curriculum beliefs, and 6) inappropriate structures. Internal consistency

reliabilities ranged from .58 to .84 (Charlesworth, et al., 1993). For the purposes of this study, five factors were used 1) inappropriate curriculum (8 items; $\alpha = .7087$), 2) appropriate curriculum (5 items; $\alpha = .7085$), 3) appropriate literacy activities (2 items; $\alpha = .8951$), 4) appropriate social (5 items; $\alpha = .5857$), and 5) individualization (6 items; $\alpha = .7426$).

Caregiver Background. Teachers also completed a form (see Appendix B) providing their demographic information as well as information on their education, training experiences and coursework, and experience as a child care provider both in their current and previous positions. Education was quantified as 1 if the provider had a high school degree only; 2 if she had an Associates Degree; 3 if she had a Bachelors Degree; 4 if she had a Masters Degree; and 5 if she had a Ph.D. or other professional degree.

Setting Variables

Early Childhood Environment Rating Scale - Revised. The Early Childhood Environment Rating Scale - Revised (ECERS-R; Harms, Clifford, & Cryer, 1998) was used to measure the overall or global quality of the child care setting. It is designed to assess the day-to-day quality of care and education provided to children in early childhood classes and provides an assessment of the curriculum, environment, teacher-child interaction, and teaching practices. The ECERS-R consists of 43 items in 7 subscales: Space and Furnishings, Personal Care Routines, Language-Reasoning, Activities, Interactions, Program Structure, and Parents and Staff.

For the purposes of this study, a trained observer conducted a 3- to 4- hour observation in each classroom. Each item on the ECERS-R was scored on scale of 1 to 7, with 1 representing an inadequate situation, 3 is minimal, 5 is good, and 7 is excellent. The subscale scores and the total score were then converted into mean ratings between 1 and 7. Reported internal consistencies ranged from .25 on the Program Structure subscale to .93 on the Space and Furnishings subscale with a total scale internal consistency reliability of .97. There were no significant differences in internal consistencies on any of the subscales between classrooms.

Group size and ratio. At the beginning of each recording day, teachers recorded the number of adults and children in the classroom. They also made note of changes in the number of children and adults. For this study, the group size was recorded as the maximum number of children present during any part of the day and the number of adults present was recorded as the maximum number of adults that were present at any part of the day. Ratios were computed as the number of children divided by the number of adults.

Child Variables

For each child that participated in the study, centers released demographic variables including the child's birthdate in order to determine the child's age as well as the child's racial or ethnic group, their disability status, and their home language to determine their status as an English language learner.

Procedures

For this study, potential participating center directors were contacted by the primary investigator. Childcare centers were selected based upon their previous relationships with a large, Midwestern university and their enrolling children of varying ethnic, cultural, linguistic, and socioeconomic backgrounds. If the center director indicated an interest in participating in the project, the primary investigator met with the director and provided an overview of the study. Families and teachers were then approached to participate in the project by the center director. The primary investigator provided each center director with consent forms (see Appendix C) which were distributed to potential child and teacher participants.

After receiving center director consent, the primary investigator conducted the ECERS-R rating scale in each classroom as the teachers and children were still unfamiliar to the researcher. Once teacher consent was received, the primary investigator distributed the Teacher Background and Teacher Beliefs Scale to each participant. Teachers received a \$10 Target gift card for their participation. Teacher information was received from all participants at Centers 1 and 3 and from one teacher at Center 2. Numerous attempts were made to obtain the remaining teacher information, but this was unsuccessful.

Upon receiving parental consent for child participants, recording with the LENA device began. The primary investigator came to the classroom each morning and the teacher would select the children that were going to participate each day. Children

were told that they were going to get to wear a “special shirt” and were allowed to select from the various clothing options that were available. The recording device was then turned on and placed in the child’s recorder pocket. Children who did not have consent to participate in the study were given an opportunity to wear a “special shirt,” without the recording device, if they desired. On all recording days, children other than the focal child were wearing a “special shirt” and often multiple children in the classroom were wearing LENA clothing. The researcher remained in the classroom until recordings began. When a child was picked up from the child care center, the teachers powered down the LENA device. The researcher returned at the end of each day to download data for each participant. Across the three centers, two children who received parental consent did not participate in the study as they refused to wear the recording device. These children are not included in the overall sample size. There was no attrition.

CHAPTER 4

RESULTS

This study sought to address a number of research questions in order to ascertain the contribution of setting, teacher, and child variables in the prediction of the rates of adult words and conversational turns used by teachers in toddler classrooms. Table 1 highlights descriptive statistics for study outcome variables, adult word and conversational turn rates.

Research Questions:

1. What setting, teacher, and child variables predict teachers' language usage in the toddler classroom?
2. What is the interaction between setting, teacher, and child variables in predicting the rates of adult words and conversational turns in the toddler classroom?
3. To what extent are there differences between rates of adult words and conversational turns between groups of children?

Table 1. *Descriptive Statistics of Adult Words and Conversational Turn Rates*

| | N | Minimum | Maximum | Mean | Standard Deviation |
|----------------------|----|---------|---------|-------|--------------------|
| Adult Words | 28 | 2.71 | 28.79 | 10.47 | 6.03 |
| Conversational Turns | 28 | 0.05 | 0.67 | 0.32 | 0.18 |

Research Question 1

Several levels of analyses were conducted in order to address the first study objective, focusing on what setting, teacher, and child variables predicted teachers' language usage in the toddler classroom. First, a series of correlational analyses were conducted to ascertain the extent to which there was a relationship between any study variables (setting, teacher, child) and adult words and conversational turns. Next, a series of linear regression analyses were conducted within setting, teacher, and child variables to ascertain the relative contribution of each independent variable in the prediction of adult words and conversational turns. Only predictor variables that were significantly correlated with outcome variables were used in the regression analysis. Because no predictor variables were significantly correlated with conversational turns, regression analyses were not conducted on this outcome variable.

Setting Variables (see Tables 2 & 3)

ECERS. Correlations between adult words and the ECERS subscales revealed a significant positive relationship between overall classroom quality and adult words ($p < .01$). There were also significant positive relationships between adult words and all ECERS subscales aside from Interaction and Program Structure. No significant relationships were found between ECERS ratings and conversational turns.

In a regression analysis, overall classroom quality, as measured by the ECERS, significantly predicted adult words ($\beta = 0.504, p < .01$). Overall classroom quality also explained a significant proportion of variance in adult words ($R^2 = .254, p < .01$).

Group size and ratio. No significant relationships were found between rates of adult words or conversational turns and group size or ratio. Because there were no significant correlations, regression analyses were not conducted on group size and ratio.

Table 2. Descriptive Statistics for Setting Variables

| | N | Minimum | Maximum | Mean | Standard Deviation |
|----------------------|----|---------|---------|-------|--------------------|
| <u>ECERS Ratings</u> | | | | | |
| Space & Furnishings | 4 | 3.88 | 6.50 | 5.31 | 1.39 |
| Personal Care | 4 | 4.00 | 6.17 | 5.46 | 0.99 |
| Language | 4 | 3.25 | 6.75 | 5.69 | 1.64 |
| Activities | 4 | 3.89 | 5.22 | 4.78 | 0.63 |
| Interaction | 4 | 3.80 | 6.60 | 5.80 | 1.34 |
| Program Structure | 4 | 4.33 | 5.67 | 5.34 | 0.67 |
| Parents | 4 | 4.17 | 6.00 | 5.33 | 0.87 |
| Overall Quality | 4 | 3.90 | 6.07 | 5.30 | 1.01 |
| Ratio | 28 | 1:2.0 | 1:4.5 | 1:3.6 | 0.79 |
| Group Size | 28 | 2 | 13 | 10.14 | 2.85 |

Table 3. Correlations between setting variables and adult words and conversational turn rates.

| | Adult Words | Conversational Turns |
|----------------------|-------------|----------------------|
| <u>ECERS Ratings</u> | | |
| Space & Furnishings | .62** | .33 |
| Personal Care | .42* | .07 |
| Language | .38* | .04 |
| Activities | .48** | .14 |
| Interaction | .34 | .00 |
| Program Structure | .33 | -.01 |
| Parents | .53** | .20 |
| Overall Quality | .50** | .16 |
| Ratio | .07 | .16 |
| Group Size | .16 | .23 |

** $p < .01$ * $p < .05$

Teacher Variables (See Tables 4 & 5)

Teacher Beliefs Scale. Correlations between teacher variables and adult words revealed a significant positive relationship between adult words and teachers' reported appropriate literacy activities ($p < .05$) and a negative relationship between adult words and teacher reported inappropriate curriculum ($p < .01$). No significant relationships were found between any of the TBS subscales and conversational turns.

Due to the significant correlation, both appropriate literacy and inappropriate curriculum were entered into a multiple regression equation to determine the relative contribution of each in predicting adult words. Only inappropriate curriculum was a significant predictor ($\beta = -.533, p < .05$) and accounted for variance in adult words ($R^2 = .312, p < .05$). The addition of appropriate literacy activities did not add to the model in predicting adult words.

Teacher Demographics. Significant positive relationships between all teacher variables and adult words were found; however, there was a great deal of colinearity between the variables. No significant relationships were found between any teacher demographic variable and conversational turns.

To determine which of the significantly correlated teacher demographic variables predicted adult words, teacher education level, teacher years in position, teacher years in early childhood education, and teacher age were entered into a regression model. Teacher age and teacher years in position were removed due to tolerance limits being reached. The overall model accounted for a significant amount of variance in adult words ($R^2 = .314, p < .01$). Both teacher years in early childhood education ($\beta = .393, p < .05$), and teacher education ($\beta = .353, p < .05$) were significant predictors of adult words.

Table 4. *Descriptive Statistics for Teacher Variables*

| | N | Minimum | Maximum | Mean | Standard Deviation |
|-------------------------------|---|---------|---------|-------|--------------------|
| <u>TBS Ratings</u> | | | | | |
| Appropriate Curriculum | 9 | 3.00 | 5.00 | 3.81 | 0.80 |
| Appropriate Literacy | 9 | 3.80 | 5.00 | 4.38 | 0.44 |
| Appropriate Social | 9 | 3.00 | 4.50 | 3.93 | 0.43 |
| Appropriate Individualization | 9 | 1.50 | 2.63 | 1.95 | 0.44 |
| Inappropriate Curriculum | 9 | 3.20 | 5.00 | 4.36 | 0.55 |
| <u>Teacher Demographics</u> | | | | | |
| Years in Position | 9 | 1 | 20 | 5.60 | 5.76 |
| Years in ECE | 9 | 5 | 20 | 11.57 | 6.29 |
| Education Level | 9 | 2 | 4 | 3.08 | 0.52 |
| Age | 9 | 25 | 44 | 31.45 | 5.75 |

Table 5. Correlations between teacher variables and adult word and conversational turn rates.

| | Adult Words | Conversational Turns |
|-------------------------------|-------------|----------------------|
| <u>TBS Ratings</u> | | |
| Appropriate Curriculum | .17 | .35 |
| Appropriate Literacy | .43* | .16 |
| Appropriate Social | .06 | -.13 |
| Appropriate Individualization | -.10 | .19 |
| Inappropriate Curriculum | -.56** | -.23 |
| <u>Teacher Demographics</u> | | |
| Years in Position | .43* | .18 |
| Years in ECE | .40* | .18 |
| Education Level | .44* | .12 |

** $p < .01$ * $p < .05$

Child Variables (See Tables 6 & 7)

Results of correlational analyses revealed that the percentage of English language learners and the percentage of minority children in the classroom were significantly negatively correlated with adult words in that the greater percentage of ELL or tuition subsidy children in the classroom, the fewer adult words were spoken. The percentage of tuition subsidy children was also significantly negatively correlated with conversational turns. Finally, the percentage of male children in the classroom

was significantly positively correlated with adult words and conversational turns in that the greater the percentage of male children, the higher the rate of adult words and conversational turns.

To determine which of the significantly correlated child variables predicted rates of adult words, percentage of ELL, percentage of male, and percentage of tuition subsidy children were entered into a regression model. Percentage of male children was removed due to tolerance limits being reached indicating that this variable was highly correlated with the other variables. The overall model accounted for a significant amount of variance ($R^2 = .406, p < .01$) but only percentage of tuition subsidy children was a significant predictor ($\beta = -.519, p < .01$),

Table 6. Descriptive Statistics for Child Variables

| | Minimum | Maximum | Mean | Standard Deviation |
|---------------------|---------|---------|-------|--------------------|
| % Male | 12.5 | 63.6 | 46.43 | 22.12 |
| % Minority | 12.5 | 44.4 | 28.57 | 12.68 |
| % ELL | 9.1 | 33.3 | 17.85 | 10.92 |
| % Tuition Subsidy | 0.0 | 62.5 | 28.56 | 26.10 |
| Child Age in Months | 17 | 35 | 26.82 | 5.12 |

Table 7. Correlations between the percentage of children in a classroom and adult word and conversational turn rates.

| | Adult Words | Conversational Turns |
|-------------------------------------|-------------|-------------------------|
| Percentage Minority Children | -.02 | .23 |
| Percentage of ELL Children | -.39* | -.05 |
| Percentage Tuition Subsidy Children | -.59** | -.46* |
| Percentage of Male Children | .43** | .45** |
| Child Age in Months | .25 | .24 |

** $p < .01$ * $p < .05$

Summary of Results for Research Question 1

Application of correlational analyses showed that several of the study variables were related to adult word rate. Overall classroom quality, teachers' reported use of appropriate literacy activities, teacher education levels and years of experience, and the percentage of males in a classroom were all positively correlated with adult words rates. Teachers' reported use of inappropriate curricula, and the percentage of ELL and tuition subsidy children were all negatively correlated with adult word rate.

Results of regression analyses indicated that overall classroom quality and teacher experience and education significantly predicted the adult word rate. When classroom quality, teacher experience, and teacher education increased the adult word rate in the classroom increased. Teachers' reported use of inappropriate

curriculum and the percentage of tuition subsidy children were also significant predictors in that when the percentage of tuition subsidy children was higher and when teachers reported using more inappropriate curricula, the adult word rate in a classroom decreased.

Research Question 2

The second research question focused on relative contribution of setting, teacher, and child variables, controlling for the influence of the other factors. In order to answer this question, variables that were significant predictors of adult word rate were entered into a regression equation in order to predict the adult word rate in a classroom. Overall quality and teacher experience were removed due to tolerance limits being reached. The overall model, including percentage of tuition subsidy children, teacher education level, and teacher reported inappropriate curriculum, accounted for a significant proportion of variance in adult word rate ($R^2 = .407$, $p < .05$). However, none of the predictors were significant.

Research Question 3

Research question three sought to determine the extent to which there were significant differences between adult word and conversational turn rates spoken to children in various groups. Results of a correlational analysis revealed that there was no significant relationship between rates of adult words or conversational turns and child age. Furthermore, results of a t-test indicated that there was no significant difference in the rate of adult words or conversational turns heard by girls and boys.

Results of additional t-tests revealed that although none of the differences were significant, white children heard more adult words than non-white children; non-ELL children heard more words than ELL children; and children who did not receive childcare subsidy heard more adult words than children who did receive childcare subsidy. There were no group differences between rates of conversational turns between any of the groups. (see Table 4).

Table 4. Mean differences between groups

| | Adult Words | Conversational Turns |
|-------------------------------|-------------|----------------------|
| <u>Gender</u> | | |
| Male | 10.08 | .31 |
| Female | 10.81 | .33 |
| <u>Minority Status</u> | | |
| Non-Minority | 11.10 | .34 |
| Minority | 8.88 | .27 |
| <u>ELL Status</u> | | |
| Non-ELL | 10.52 | .32 |
| ELL | 7.80 | .23 |
| <u>Tuition Subsidy Status</u> | | |
| No Tuition Subsidy | 11.34 | .36 |
| Tuition Subsidy | 8.28 | .23 |

CHAPTER 5

DISCUSSION

The purpose of this study was to ascertain the relative contribution of setting, teacher, and child variables to the prediction of the amount of language teachers used in their toddler classrooms as well as the amount of engaged conversations they had with children. The study also was conducted to explore the role of these factors in combination with each other. The study hypotheses were based on the assumption that a language rich experience in early childhood has an important impact on children's emerging language abilities and therefore it is important to determine what environmental factors support a language-rich environment for young children.

Findings revealed that a number of factors could be used to predict adult word rates in the child care environment; however, there were no significant predictors of conversational turn rates. Overall rates of conversational turns in classrooms were relatively low, averaging only a little over 19 conversational turns per hour with a median value of 16.8 turns/hour. There was also a somewhat limited range, from one student having an average of three conversational turns per hour up to an average of about 40 conversational turns per hour. Due to this limited variability, it was difficult to find a significant linear relationship between any of the predictor variables and conversational turns.

In the LENA norming sample, parents at the 50th percentile had 39.5 conversational turns per hour and parents at the 10th percentile had 18.75

conversational turns per hour (Gilkerson & Richards, 2008). Based on this information, classrooms in this study fell below the 10th percentile in terms of the rate of conversational turns. It is likely that the limited amount of conversational turns seen is due to the fact that children in this study were enrolled in child care centers, with about 15 children in the classroom. As opposed to the norming sample, which examined engaged interactions between one adult and one child, having approximately three children to every one adult may have limited opportunities for children to have engaged, back and forth conversations with caregivers.

Contribution of Setting, Teacher, & Child Factors

Setting Variables. This study sought to determine the extent to which features of the child care environment, such as adult to child ratio and overall classroom quality, were linked to higher rates of adult talk and conversational turns in the classroom. These setting variables were investigated because they are highly amenable to change, can be used to alter program structures, and thus, enhance the amount language stimulation children receive.

Like the work of Kontos (1999), results of this study indicated that environmental quality was a significant positive predictor of rates of teacher talk; the higher quality the environment was deemed to be, the more teachers talked to their children. It is not surprising that teachers who prepared environments rich with environmental print and literacy experiences also used higher rates of adult talk. Teachers in high quality environments use a variety of techniques that increase their

rates of talk such as participating in book reading, providing a wide variety of play and learning activities, encouraging children to communicate, and using language to develop reasoning skills. Due to the previously mentioned activities, higher ratings on the space and furnishings, activities, and language subscales of the ECERS were also significantly positively associated with rates of teacher talk.

This study did not find any relationship between the number of children in the classroom and rates of teacher talk or conversational turns. However, there was not a great deal of variation in adult to child ratios between any of the classrooms or between any recording days. Previous work on this topic has been systematically conducted with groups of various sizes (e.g., one adult to two children versus one adult to seven children) (Schaffer & Linddell, 1984, Pelligrino & Scopesi, 1990, Turnbull, et al., 2009). Because the ratio of children to adults was never more than about 4:1, it is likely that the lack of a significant finding in this area is attributable to the fact that all groups in the study were small.

Teacher Variables. Due to the amount of empirical evidence suggesting that specific teacher factors are related to an increased use of language in their classrooms, this study examined the relative contribution of teacher education, years of experience, and pedagogical orientations to the prediction of adult word usage. Teacher preparedness is also very amenable in that centers can require potential teachers to have had more coursework or student teaching experiences prior to their hiring. Based on empirical evidence on practices that enhance outcomes for young

children, teacher education programs can emphasize certain practices and pedagogies. Additionally, as evidence suggests that more highly educated teachers put into place practices that help young children be more prepared for formalized schooling (e.g., Honig & Hirallal, 1998), licensing and accreditation boards can make recommendations for the level of education necessary to provide care for babies, toddlers and preschoolers.

Like a great deal of previous work (e.g., Smith & Dickinson, 1994; Landry et al., 2006), this study found that teachers' reported levels of education was a significant positive predictor of adult word use; when teachers attended more formalized schooling they talked more to their children. This may indicate that when teachers receive more training on child development and the importance of early language experiences, they are able to transfer that knowledge into practice in their classrooms.

Additionally, years of experience were a significant positive predictor of rates of teacher talk. This finding was divergent from the majority of research in the field (i.e., Bryant et al., 1994; Kontos, 1999; Smith & Dickinson, 1994) which has found that there was no relation between teachers' reported years of experience and the amount of their child directed verbalizations. In this study, teachers with more years of experience also had more education; however, both variables were significant independent, positive predictors of rates of teacher talk. It is possible that there was something unique with the teachers in this study or that due to the limited sample size this finding was the result of statistical error.

This study also found that teachers' pedagogy, or their principles and methods of instruction, what they think about teaching, and their understanding of how children learn, was significantly positively related to rates of teacher talk. Specifically, teachers who reported believing in "developmentally appropriate" literacy activities such as providing environmental and functional print and opportunities for (pre)writing activities also tended to talk more to the children in their classrooms. Additionally, teachers who reported using more "developmentally inappropriate" practices such as using working alone on seatwork, forming letters correctly, and using worksheets and flashcards, tended to talk less to the children in their classrooms. Like the work of authors such as DeVries et al (1991), McMullen et al., (2006), and Smith & Dickinson (1994), this study provides further evidence that belief in "developmentally appropriate practice" in the area of early care and education has the potential to enhance outcomes for young children.

Child Variables. Few investigators have examined the role of child variables in the prediction of rates of teacher talk. When the role of child variables has been studied, researchers have examined the influence of child gender, age, and disability status, but have neglected the contribution of child socioeconomic status and ethnicity. This is surprising as a great deal of evidence suggests that low income and minority children tend to receive less language stimulation in the home environment than middle and upper income and Caucasian children and therefore have shorter mean length of utterances (Lawrence, 1997), more limited vocabulary (Pan, et al.,

2005), and underdeveloped language skills (Hart & Risley, 1995). Because of these risk factors, it seems likely that children from these backgrounds would elicit less talk from their caregivers and thus, hear fewer words. The contribution of many child factors including age, gender, disability status as well as socioeconomic status and ethnicity to the prediction of rates of teacher talk in toddler classrooms was examined.

Interestingly, in this study, there was a higher rate of teacher talk in classrooms where there were more boys than girls. Previous work has suggested that when there is a difference between the amounts of words heard by boys versus girls, girls hear more words (e.g., Gilkerson & Richards, 2006; Leaper, et al., 1998). This is likely because girls typically acquire vocabulary faster, especially in toddlerhood, and therefore elicit more talk from their caregivers (Huttenlocher, et al., 1991). Cho and colleagues (2007) asserted that gender differences in the amount of language input children receive may be due to gender-stereotypic attitudes and socialization beliefs of parents. Because this study was conducted with teachers, it appears that teachers, as opposed to parents, may not hold these beliefs. On the other hand, because the type of language used was not analyzed in this study it is possible that in classrooms with more boys, teachers used more controlling language and directives intended to influence behavior.

In examining the influence of child age on the amount of talk a child heard in their classroom, like the work of Huttenlocher and colleagues (2007), this study did not find any relationship between child age and rates of teacher talk or conversational

turns in the classroom. It appears, therefore, that while features of adult talk such as speed and complexity may change as children get older, overall rate of talk does not significantly change over time. Marinac and colleagues (2000) hypothesized that adults modify their language based on their perceptions of the children's language ability. Because children in this study were in classrooms rather than individual homes and parent/child dyads, it is also possible that teachers used language aimed at the "middle" of the group or that due to the limited age differences between children, there were not enough differences in their language abilities to warrant modification.

There were also no relationships between the percentages of ethnic minority children enrolled in the classroom and rates of teacher talk or conversational turns. This is most likely because other variables that impact a child's language ability such as their English language learner (ELL) status and poverty status better accounted for differences than ethnic minority status; there was a significant negative relationship between both percentage of ELL children and the percentage of tuition subsidy children and adult word rates. It seems very plausible that because ELL children have had limited exposure to the English language prior to their entry into child care where they heard primarily English, they possess far fewer expressive language skills in English than non-ELL children. Thus, due to their limited English vocabulary these children may be less likely to elicit talk from their caregivers and therefore, they hear fewer adult words.

The significant negative relationship between high percentages of students receiving tuition subsidy and low rates of teacher talk confirms work by Dickenson & Tabors (2001) who found that preschool classrooms serving high percentages of at-risk children have poorer language environments. This discovery is impactful in a variety of ways. First, substantial empirical evidence exists to suggest that children who grow up in poverty are exposed to less language stimulation in the home (e.g., Hart & Risley, 1995, Hoff, 2003). If these children are then exposed to lower levels of language stimulation in the child care environment as well their risk status is multiplied. Second, because at-risk children tend to be enrolled in the same childcare setting, and having more at-risk children in a center together decreases the likelihood of having a rich language environment in the setting, center directors and licensing and accreditation boards need to be especially mindful to hire educated and trained teachers for these classrooms to improve the language environment .

Interaction of Setting, Teacher & Child Factors

Much of the previous work studying teacher language usage has been conducted examining setting, teacher, or child factors in isolation. Because all of these factors may be simultaneously influencing the amount of language a teacher uses in her classroom, studying these factors in isolation may, in fact, lead to spurious correlations. Thus, this study sought to determine the interaction between setting, teacher, and child variables in predicting the rate of teacher talk and conversational turns in a classroom.

While several of the predictor variables were significant predictors when considered in isolation, none of the variables (percentage of tuition subsidy children, teacher education level, and teacher reported inappropriate curriculum) were significant independent predictors when the other variables were controlled for. Most likely, this was due to the fact that all of these variables were significantly correlated with one another. In this study, teacher education level was significantly negatively correlated with percentage of tuition subsidy children and reported inappropriate curriculum indicating that more educated teachers taught fewer “at-risk” children and also tended to use more “developmentally appropriate” teaching practices. Thus, it appears that while teacher education and pedagogy as well as the make-up of a classroom can be important in the prediction of adult words, it is the total environment, rather than specific features of it, that are the most impactful.

Differences Between Groups.

Unlike the work conducted by authors such as Gilkerson & Richards (2006) and Leaper and colleagues (1998), this study did not find a significant difference between the amounts of child-directed talk heard by boys versus girls. This finding is likely due to the fact that this study was conducted in classrooms where much of the talk was directed towards groups, rather than individual children.

There were also no significant differences between English language learners and non-English language learners, children from minority groups and children from majority groups, or children receiving tuition subsidy and those who did not. There

were, however, noticeable mean differences between the groups. It is possible that had the sample size been larger, these differences may have become statistically significant.

Limitations & Future Directions

A number of limitations in the present investigation should be considered in implementing future research on the topic of teacher language usage, especially those that use the LENA recording device. One of the major limitations of the study is its small sample size. This limited the power for determining statistical significance in computed analyses. Future studies should use a larger sample in order to eliminate the potential for statistical error. This may have also led to statistically significant differences between groups when trends emerged (e.g., statistically significant difference between adult words heard by ELL and non-ELL children).

Additionally, the sample was relatively homogenous in terms of teacher background, program type, and student demographics. Where there was diversity, it tended to cluster within a particular center making it possible that observed trends were due more strongly to the particular characteristics of a center or a classroom than to those of the teacher or children in it. Upcoming research should attempt to include centers with diverse populations of teachers and children in them or include enough participants to conduct statistical analyses within, rather than between, centers in order to eliminate this potential confound. Furthermore, because in this study highly qualified teachers were less likely to have “at-risk” children in their

classroom, in future work, it will be important to study highly qualified teachers in high risk classrooms.

Another major limitation is that this investigation also failed to include a measure of the child's language abilities or their rate of word production. It was hypothesized that the significant negative relationships between adult word rate and percentages of tuition subsidy children and ELL children in a classroom were due to the limited language abilities of the children and the amount of language they elicited from their caregivers. Measures of children's language skill would have allowed for this hypothesis to be tested. Future studies on similar topics should include both formal, standardized measures of children's language abilities such as expressive vocabulary tests as well as measures of child word production rates in order to systematically test these hypotheses.

In future studies using the LENA device, researchers should be aware of the potential that children will refuse to wear the "special shirt". While this was not a significant problem in the current study, several children did refuse, and they were all children diagnosed with a disability. When research is being conducted on this population, researchers should make every possible attempt to over-represent these groups in recruitment of participants to ensure there are enough data points for analysis. Furthermore, in the present study, teachers in one center turned off the recording device for periods of the day. Researchers using LENA should be aware of this possibility and take measures to eliminate the probability of this happening.

Future studies of a similar nature should also explore alternative measures of teacher pedagogy. Several teachers reported that the TBS did not fit their work with toddlers, as it was designed for preschool age students. This may have impacted how they responded to questions as some practices that may be appropriate for preschool aged children may not be appropriate for toddlers. This limitation was hopefully addressed through the factor analysis conducted on this sample in order to derive factors instead of using the factors developed by the TBS authors. Additionally, in this study the ECERS was conducted only by the primary investigator; therefore, there was no inter-rater reliability. This limitation was addressed through comparing internal consistencies between centers, where there were no significant differences. Future work, however, should attempt to involve multiple raters in order to increase the reliability of the instrument.

Implications for Research & Practice

Results of this study highlight a variety of practices that may be helpful in increasing the amount of language children are exposed to in their childcare environment. The first, and most important, is the recruitment and retention of highly educated, highly qualified early educators. This study stressed how these individuals tend to stay in the field longer, prepare higher quality environments for children to learn in, and use more curriculum that is advantageous for early learning. Second, because teachers tended to use less language in classrooms with higher percentages of ELL and tuition subsidy children, it may be important to attempt to integrate

children who are learning English and children growing up in poverty into classrooms with non-English language learners and middle class children to every extent possible.

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Appendix A

TEACHER BELIEFS SCALE

Please respond to the following items by circling the number that most nearly represents YOUR PERSONAL BELIEFS about the importance of that item in a childcare program.

| 1 Not Important At All | 2 Not Very Important | 3 Fairly Important | 4 Very Important | 5 Extremely Important | | | | | |
|------------------------------|---|--------------------------|------------------------|-----------------------------|---|---|---|---|---|
| 1. | As an evaluation technique in the childcare program, standardized group tests are _____. | | | | 1 | 2 | 3 | 4 | 5 |
| 2. | As an evaluation technique in the childcare program, teacher observation is _____. | | | | 1 | 2 | 3 | 4 | 5 |
| 3. | As an evaluation technique in the childcare program, performance on worksheets and workbooks is _____. | | | | 1 | 2 | 3 | 4 | 5 |
| 4. | It is _____ for childcare activities to be responsive to individual differences in interest. | | | | 1 | 2 | 3 | 4 | 5 |
| 5. | It is _____ for childcare activities to be responsive to individual differences in development. | | | | 1 | 2 | 3 | 4 | 5 |
| 6. | It is _____ for each curriculum area to be taught as separate subjects at separate times. | | | | 1 | 2 | 3 | 4 | 5 |
| 7. | It is _____ for teacher-child interactions in childcare to help develop children's self-esteem and positive feelings toward learning. | | | | 1 | 2 | 3 | 4 | 5 |
| 8. | It is _____ for children to be allowed to select many of their own activities from a variety of learning areas that the teacher has prepared (blocks, science center, etc.) | | | | 1 | 2 | 3 | 4 | 5 |
| 9. | It is _____ for children to be allowed to cut their own shapes, to perform this own steps in an experiment, and plan their own creative drama, art, and writing activities. | | | | 1 | 2 | 3 | 4 | 5 |
| 10. | It is _____ for children to work silently and alone on seatwork. | | | | 1 | 2 | 3 | 4 | 5 |
| 11. | It is _____ for children to learn through active exploration. | | | | 1 | 2 | 3 | 4 | 5 |
| 12. | It is _____ for children to learn through interaction with other children. | | | | 1 | 2 | 3 | 4 | 5 |
| 13. | Workbooks and/or ditto sheets are _____ to the childcare program. | | | | 1 | 2 | 3 | 4 | 5 |
| 14. | Routine group practice (on shapes, numbers, letters, months and/or words, etc.) using materials such as flashcards and charts is _____ to the childcare program for instructional purposes. | | | | 1 | 2 | 3 | 4 | 5 |
| 15. | A structured reading or pre-reading program is _____ to the childcare program. | | | | 1 | 2 | 3 | 4 | 5 |
| 16. | In terms of effectiveness, it is _____ for the teacher to talk to the whole group and make sure everyone participates in the same activity. | | | | 1 | 2 | 3 | 4 | 5 |

| 1 Not Important At All | 2 Not Very Important | 3 Fairly Important | 4 Very Important | 5 Extremely Important | | | |
|------------------------------|---|--------------------------|------------------------|-----------------------------|---|---|---|
| 17. | In terms of effectiveness, it is _____ for the teacher to move among groups and individuals, offering suggestions, asking questions, and facilitating children's involvement with materials and activities. | | 1 | 2 | 3 | 4 | 5 |
| 18. | It is _____ for teachers to use their authority through treats, stickers, and/or starts to encourage appropriate behavior. | | 1 | 2 | 3 | 4 | 5 |
| 19. | It is _____ for teachers to use their authority through punishment and/or reprimands to encourage appropriate behavior. | | 1 | 2 | 3 | 4 | 5 |
| 20. | It is _____ for children to be involved in establishing rules for the classroom. | | 1 | 2 | 3 | 4 | 5 |
| 21. | It is _____ for children to be instructed in recognizing the single letters of the alphabet, isolated from words. | | 1 | 2 | 3 | 4 | 5 |
| 22. | It is _____ for children in childcare to color within predefined lines. | | 1 | 2 | 3 | 4 | 5 |
| 23. | It is _____ for children in childcare to form letters correctly on a printed line. | | 1 | 2 | 3 | 4 | 5 |
| 24. | It is _____ for children to have stories read to them individually and/or on a group basis. | | 1 | 2 | 3 | 4 | 5 |
| 25. | It is _____ for children to dictate stories to the teacher. | | 1 | 2 | 3 | 4 | 5 |
| 26. | It is _____ for children to see and use functional print (telephone books, magazine, etc.) and environmental print (cereal boxes, potato chip bags, etc.) in the childcare classroom. | | 1 | 2 | 3 | 4 | 5 |
| 27. | It is _____ for children to participate in dramatic play. | | 1 | 2 | 3 | 4 | 5 |
| 28. | It is _____ for children to talk informally with adults. | | 1 | 2 | 3 | 4 | 5 |
| 29. | It is _____ for children to experiment with writing by inventing their own spelling. | | 1 | 2 | 3 | 4 | 5 |
| 30. | It is _____ to provide many opportunities to develop social skills with peers in the classroom. | | 1 | 2 | 3 | 4 | 5 |
| 31. | It is _____ for children in childcare to learn to read. | | 1 | 2 | 3 | 4 | 5 |
| 32. | In the childcare program, it is _____ that math be integrated with all other curriculum areas. | | 1 | 2 | 3 | 4 | 5 |
| 33. | In teaching health and safety, it is _____ to include a variety of activities throughout the school year. | | 1 | 2 | 3 | 4 | 5 |
| 34. | In the classroom setting, it is _____ for the child to be exposed to multicultural and nonsexist activities. | | 1 | 2 | 3 | 4 | 5 |
| 35. | It is _____ that outdoor times have planned activities. | | 1 | 2 | 3 | 4 | 5 |
| 36. | Input from parents is _____. | | 1 | 2 | 3 | 4 | 5 |

Appendix B

TEACHER BACKGROUND SURVEY

1. Please check all degrees, diplomas, or certificates that you have earned or, if you are currently a student working toward a specific degree:

High school diploma CDA AA
 B.S./B.A. M.S./M.A. Ph.D./Ed.D.

2. Please indicate if you have done course work and/or specialized professional training in the following:

child development family studies social work
 early childhood education special education
 elementary education psychology or counseling
 physical, speech, or occupational therapy

3. Your current position _____

4. Number of years in current position _____

5. Number of years in Early Childhood Ed _____

6. Number of children enrolled in your classroom _____

7. Age range of children in your classroom: _____ months to _____ months

8. Your current age (optional) _____

9. Your ethnic background (optional):

American Indian/Alaskan Native Asian/Pacific Islander
 Black Latino(a)
 White Multiple ethnic backgrounds

Appendix C

CONSENT FORMS

Center Consent Form

Project: Language Environments in Early Childhood Care Settings Project

Primary Investigator: Meghan C. Hickey, M.A.
360 Education Sciences Building
56 East River Road
Minneapolis, MN 55404
612.207.6645
hick0146@umn.edu

Advisor: James E. Ysseldyke, Ph.D.
250 Education Sciences Building
56 East River Road
Minneapolis, MN 55404
612.624.0414
jim@umn.edu

The purpose of this research project and the nature of my center's involvement have been explained to my satisfaction. I have read about and understood each component of the project. I understand that:

- I am being asked to give consent for my center to participate and that I will be asked to distribute introductory letters and consent forms to each teacher employed by me;
- All information will be held strictly confidential;
- Participation on the part of my center is voluntary;
- My center is free to discontinue participation at any time without consequence.

If you have any questions about this research project now or in the future, **you are encouraged** to contact the primary investigator, Meghan Hickey (612.207.6645). You may also contact the primary investigator's advisor Jim Ysseldyke (612.624.0414).

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the University of Minnesota Research Subjects' Advocate Line (612.625.1650), D528 May, 420 Delaware St. SE, Minneapolis, MN 55455.

You will be given a copy of this information to keep for your records.

Name of center director (Please print)

Signature of center director

Date

Name of center (Please print)

Phone number of center

Teacher Consent Letter & Form

Dear _____

You are invited to participate in a research study of language environments in early childhood care settings. The study is being conducted by Meghan Hickey and advised by Jim Ysseldyke at the University of Minnesota. You were selected as a potential participant because of your teaching a 2-year-old classroom. The results of this study may help us understand language environments in your classroom and may serve to promote effective teaching. We would very much appreciate your help with this effort.

Participating children in your classroom will be asked to wear specially equipped overalls with a recording device for one program day. We will ask that you complete a short survey regarding your beliefs about teaching in early childhood as well as your background information. We will also ask for your assistance in equipping your students with the overalls. Finally, you will be asked allow an observer(s) in your classroom during the data collection phase which will take approximately two weeks.

This study has minimal risks. You may experience inconvenience by having to assist children in wearing the overalls. Additionally, you may feel mild anxiety having an observer in your classroom as well as having your language use analyzed.

As a thank you, you will receive a \$10.00 Target gift card. This is our way of letting you know that we appreciate your time and participation. We understand how valuable your time is, and we will make every effort to make participation in this project convenient.

The records of this study will be kept private. In any sort of report we may publish, we will not include any information that will make it possible to identify a participant. Research records will be stored securely and only researchers will have access to the records. Recordings will not contain voice data so they will be non-identifiable. The information gathered will be used to generally describe language environments in early childhood settings.

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or with your childcare center. If you decide to participate, you are free to not answer any question or withdraw at any time with out affecting those relationships.

If you have any questions about this research project now or in the future, **you are encouraged** to contact the primary investigator, Meghan Hickey (612.207.6645). You may also contact the primary investigator's advisor Jim Ysseldyke (612.624.0414).

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the University of Minnesota Research Subjects' Advocate Line (612.625.1650), D528 May, 420 Delaware St. SE, Minneapolis, MN 55455.

If you are willing to participate in this project, please sign the attached consent form and return it to your center director. We will contact you to begin data collection.

Sincerely,

Meghan C. Hickey, M.A.
School Psychology Doctoral Candidate
University of Minnesota

James E. Ysseldyke, Ph.D.
Advisor
University of Minnesota

Project: Language Environments in Early Childhood Care Settings Project

Primary Investigator: Meghan C. Hickey, M.A.
 360 Education Sciences Building
 56 East River Road
 Minneapolis, MN 55404
 612.207.6645
 hick0146@umn.edu

Advisor: James E. Ysseldyke, Ph.D.
 250 Education Sciences Building
 56 East River Road
 Minneapolis, MN 55404
 612.624.0414
 jim@umn.edu

The purpose of this research project and the nature of my involvement have been explained to my satisfaction. I have read about and understood each component of the project. I understand that:

- All information will be held strictly confidential;
- Participation is voluntary;
- I am free to discontinue participation at any time without consequence, by simply telling the researcher that I wish to withdraw.

I agree to assist researchers with equipping children with recording devices, completing the teacher survey, and allowing an observer in my classroom.

If you have any questions about this research project now or in the future, **you are encouraged** to contact the primary investigator, Meghan Hickey (612.207.6645). You may also contact the primary investigator's advisor Jim Ysseldyke (612. 624.0414).

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the University of Minnesota Research Subjects' Advocate Line (612.625.1650), D528 May, 420 Delaware St. SE, Minneapolis, MN 55455.

Please keep the introduction letter for your records.

 Name of teacher (Please print)

 Signature of teacher

 Date

 Name of center (Please print)

 Phone number of teacher

Parent Consent Letter & Form

Dear Parent/Guardian:

Your child is invited to participate in a research study of language environments in early childhood care settings. The study is being conducted by Meghan Hickey and advised by Jim Ysseldyke at the University of Minnesota. Your child was selected as a potential participant because of his or her enrollment in a 2-year-old classroom. The results of this study may help us understand language environments in your child's classroom and may serve to promote effective teaching. We would very much appreciate your help with this effort.

Your child will be asked to wear specially equipped overalls with a recording device for one program day. The overalls will be placed over your child's normal clothing. He or she will be able to go about their normal daily activities and should be able to function completely normally. We will also ask that you allow your child's center to release demographic information about your child including their birthday, gender, ethnicity, disability status, and whether or not they receive tuition subsidy. If you center does not have this information, we would appreciate you providing us with the information through a follow-up phone call.

This study has minimal risks. Your child may experience mild anxiety by being asked to wear special clothing.

The records of this study will be kept private. In any sort of report we may publish, we will not include any information that will make it possible to identify your child. Research records will be stored securely and only researchers will have access to the records. Recordings will not contain voice data so they will be non-identifiable. The information gathered will be used to generally describe language environments in early childhood settings.

Your and your child's participation in this project is entirely voluntary. Your decision whether or not to allow your child to participate will not affect your current or future relations with the University of Minnesota or with your childcare center. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships. Your child may also ask to have the overalls removed at any point and participation terminated without consequence.

If you have any questions about this research project now or in the future, **you are encouraged** to contact the primary investigator, Meghan Hickey (612.207.6645). You may also contact the primary investigator's advisor, Jim Ysseldyke (612.624.0414).

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Research Subjects' Advocate Line (612.625.1650), D528 Mayo, 420 Delaware St. SE, Minneapolis, MN 55455.

If you are willing to allow your child to participate in this project, please sign the attached consent form and return it to your child's teacher.

Sincerely,

Meghan C. Hickey, M.A.
School Psychology Doctoral Candidate
University of Minnesota

James E. Ysseldyke, Ph.D.
Advisor
University of Minnesota

Project: Language Environments in Early Childhood Care Settings Project

Primary Investigator: Meghan C. Hickey, M.A.
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56 East River Road
Minneapolis, MN 55404
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jim@umn.edu

The purpose of this research project and the nature of my involvement have been explained to my satisfaction. I have read about and understood each component of the project. I understand that:

- All information will be held strictly confidential;
- Participation is voluntary;
- I am free to discontinue my child's participation at any time without consequence, by simply telling my child's teacher that I wish to withdraw my child.

I agree to allow my child's center to release demographic information about my child including my child's birthday (age), gender, race, disability status, and whether or not my child receives tuition subsidy. If my child's center does not have demographic information about my child, I agree to be contacted by researchers to obtain the information.

If you have any questions about this research project now or in the future, **you are encouraged** to contact the primary investigator, Meghan Hickey (612.207.6645). You may also contact the primary investigator's advisor Jim Ysseldyke (612.).

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the University of Minnesota Research Subjects' Advocate Line (612.625.1650), D528 May, 420 Delaware St. SE, Minneapolis, MN 55455.

Please keep the cover letter for your records.

Name of child (Please print)

Signature of parent/guardian Date

Name of center (Please print)

Phone number of parent/guardian