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CONTEXTUAL FACTORS IN RECEPTIVE VOCABULARY DEVELOPMENT OF THREE-YEAR-OLD CHILDREN IN HOMOGENEOUS AND HETEROGENEOUS DAY CARE

By

Louise Marie Mackley Snyder

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ABSTRACT

CONTEXTUAL FACTORS IN RECEPTIVE VOCABULARY DEVELOPMENT
OF THREE-YEAR-OLD CHILDREN
IN HOMOGENEOUS AND HETEROGENEOUS DAY CARE

By

Louise Marie Mackley Snyder

The purpose of this study was to look at microsystem contextual factors that contribute to the vocabulary development of three-year-old children in day care. Receptive vocabulary development was studied in the contexts of age in heterogeneous and homogeneous day care and the home environment.

The subjects for this study came from eight day care centers in two metropolitan cities in Michigan. Five centers grouped children heterogeneously, while three centers grouped their children homogeneously. The data for the study were compiled from June, 1991 through October, 1991.

The study was conducted in a series of procedures utilizing three assessment instruments. The Early Childhood Environment Rating Scale (ECERS) was used to assess the quality and sameness of eight day care centers in procedure 1. The Peabody Picture Vocabulary Test-Revised (PPVT-R) was administered to all subjects and to best friends of high and low scoring subjects to determine levels of vocabulary ability in procedures 2 and 3. Finally, the Home Observation for Measurement of the Environment-Revised (HOME) was used to measure the quality of the home environment for high and low scoring subjects in procedure 4.

The Mann-Whitney U was the statistic used to analyze the data collected during the center comparisons and the home evaluations. A two-factor ANOVA and t-tests were

used to analyze the vocabulary scores. All statistical analyses were computed at an alpha level of .05.

The day care centers did not differ significantly on the qualities assessed by the ECERS. The study determined that three-year-old boys and girls in homogeneous and heterogeneous day care showed no significant differences in vocabulary ability.

Vocabulary scores differed significantly between high scoring and low scoring subjects and between low scoring subjects and best friends. Learning stimulation and father's education were found to be significant factors that were associated with vocabulary development in the home environments in this study.

This study investigated only one aspect of language development in just two settings of the microsystem. Future research would benefit from a more in depth look at other contextual factors that affect vocabulary development as well.

To my parents, who always supported my efforts to learn.

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The achievement of the doctoral degree has been an eight year process for me. It has required the support and understanding of many people whom I wish to acknowledge at this time.

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I gratefully thank the directors of the day care centers for their time and efforts to make my study successful. I also thank the families who allowed their children to be a part of the study, and who allowed me to come into their homes. The home visits made the data collection enjoyable.

My coworkers must be acknowledged for their tolerance of my behavior on both "good days" and "bad days". They listened to me talk of my successes and failures as if they were truly interested, even though I know there were days when their own needs

were more important.

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Finally, though they will never know, I thank my dogs for their hugs and kisses when I needed them most. I regret the walks that were missed, the squirrels that never got chased, the moments we could not spend together because I needed to work at the computer, and the outbursts of temper only they had to endure. Now that my goal is accomplished, the squirrels had better beware!

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CHAPTER I

INTRODUCTION

Statement of the Problem

The traditional view of mother as "teacher" of children prior to the start of school has spawned numerous studies of mother-child interaction and its effects on language development. However, Belsky, Steinberg, and Walker (1982) state:

> Anyone familiar with the changing demographic profile of the American family is well aware that the 'traditional' American family--two-parent, nuclear, nonworking mother--is no longer the 'typical' American family. Indeed, if we hold to this definition of the traditional family, we find that the vast majority of families in America have broken with tradition. (p. 71)

Current research must increasingly look at nontraditional families and the variety of environments in which children find themselves growing up and "learning to talk." Those families whose structure is nontraditional--single-parent families and those with working mothers--are most likely to use some form of day care. Belsky et al., (1982) projected that the population of 0-5 year olds in 1990 would reach 23.3 million. Approximately 50 percent of the mothers of these preschoolers would return to work before the children turned 6 years of age. Therefore, millions of children in these critical ages would acquire much of their skill in language development outside their own home through interactions with adult caregivers and other children.

Phillips (1987), in her preface, estimated that by 1995 two-thirds of all children younger than age 6 and three-quarters of school age children would have working mothers. For many children, childrearing is no longer the responsibility of the parents alone. Growing numbers of children are spending larger portions of their young lives in non-parental child care.

Caldwell and Hilliard (1985) defined professional child care as a comprehensive service to children and families that supplements the care children receive from their families" (p. 4). As a supplement, they do not believe that child care is meant to replace parents or compete with parents' methods of raising their children. Caldwell and Hilliard view child care as a version of the extended family, since almost all children are raised by their own families but are often in the care of others for periods of time.

Supplemental child care programs vary immensely in structure and experiences. The three most common types of child care include: in-home care, family day care, and center day care. Results of the Chicago Study done by Clarke-Stewart (1987) indicated that each of these forms of child care was used by about one-third of the working mothers of preschool children.

Major factors influencing all aspects of the development of a child in day care include: 1) licensing of the day care, 2) professional training, 3) adult-child ratio, 4) group size and age make-up, 5) experiences with peers, and 6) variety of formal learning experiences. Depending on the size of the day care facility, children may not be afforded these facilitative conditions that will enhance their language development. A factor uniquely related to size of the day care facility is child grouping arrangements. Small day care facilities having few children have little choice but to group together children of varying ages. Large centers with large populations of children often choose to group children with same age peers in separate classrooms.

Conceptual Framework

Children develop language through the modeling that occurs when they interact with people in their environment. A critical period for language development falls within the first five years of life. Past research has focused on language development

primarily in the home environment. Increasing rates of single parenthood and maternal employment over the past decades, however, have necessitated an increase in the need for and utilization of alternative care arrangements for children. It is no longer feasible to assume that a child's home is the primary environment for the development of language. For many children, the home is only one of many environments in which exposure to language interaction and modeling occurs. It is necessary to view childrens' other environments and their impact upon one another in order to obtain a total picture of language development in a child. Bronfenbrenner's (1989) ecology of human development provides a framework to view language development from other perspectives.

Bronfenbrenner believes that the ecology of human development is comprised of five levels of the environment, each imbedded within the next. These may be conceptualized as a series of concentric circles, similar to those surrounding the bull's eye of an archery target (see Figure 1). The bull's eye represents the individual child, with the five levels progressing out from the center.

The first and smallest circle represents the MICROSYSTEM. Bronfenbrenner states that the microsystem is " a pattern of activities, roles, and interpersonal relations experienced by developing person in a given face-to-face setting with particular physical and material features, and containing other persons with distinctive characteristics of temperament, personality, and systems of belief " (Bronfenbrenner, 1989, p. 227). Both the day care center and the people present, as well as the child's own home and the family members present, represent settings that are part of the microsystem in this study.

The MESOSYSTEM constitutes the second circle outward from the bull's eye and comprises "the linkages and processes taking place between two or more settings

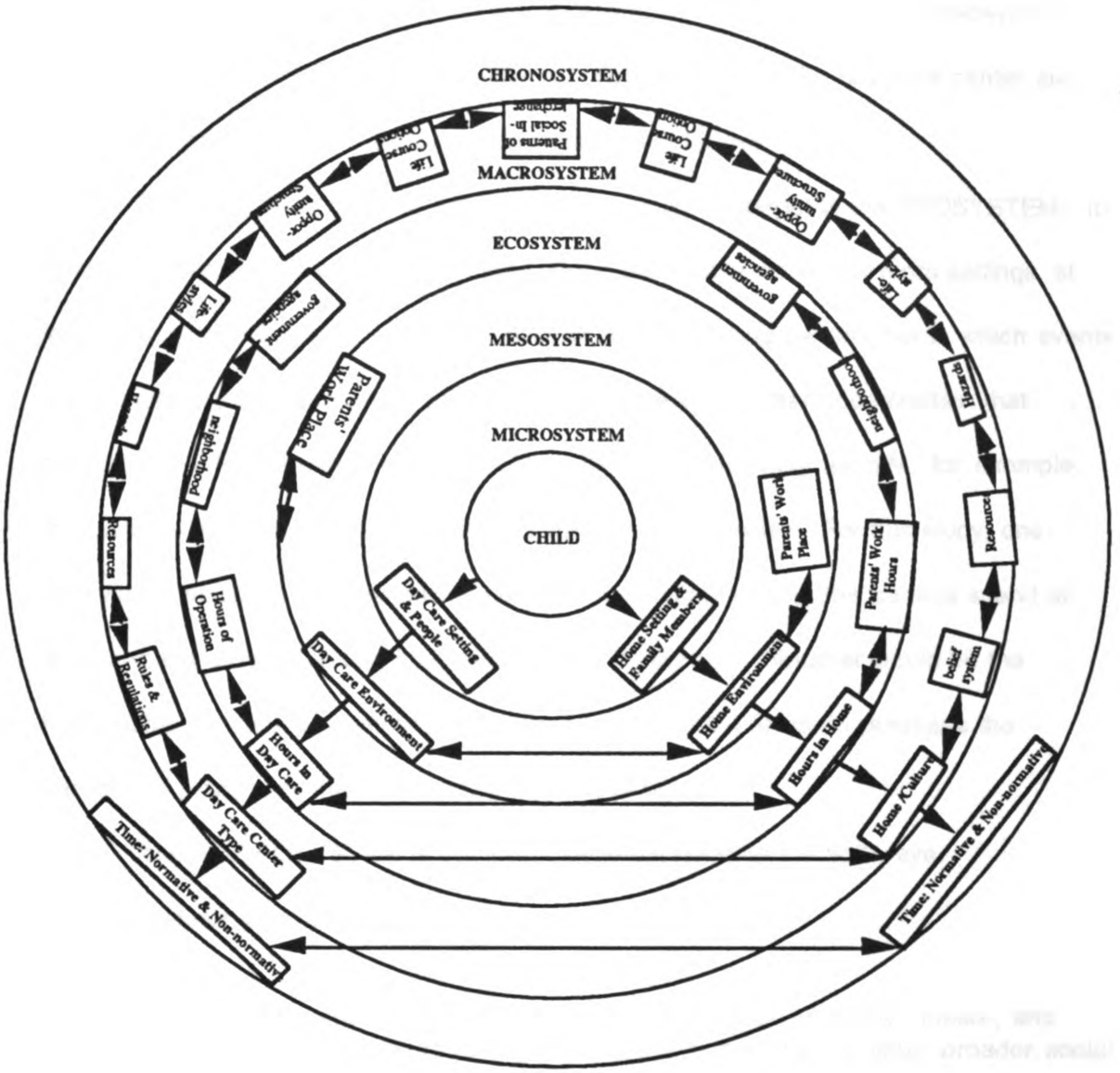

Figure 1.
Conceptualization of environmental levels for a child in day care based on the ecology of human development (adapted from Bronfenbrenner, 1989).

containing a developing person" (Bronfenbrenner, 1989, p. 227). The mesosystem characterizes the interface of microsystems. The influence of the day care center and the home upon each other comprise the mesosystem for this study.

The third circle outward from the bull's eye on the target is the EXOSYSTEM. It "encompasses the linkage and processes taking place between two or more settings, at least one of which does not ordinarily contain the developing person, but in which events occur that influence processes within the immediate setting that does contain that person" (Bronfenbrenner, 1989, p. 227). The exosystem may include, for example, the parent's work, the neighborhood, and government agencies. For this study, one exosystem would be the relationship between the amount of time the parents spend at work and the amount of time their child spends in day care. Another would be the relationship between the amount of money earned and the ability to purchase the services of a day care that best meet the needs of the child.

The MACROSYSTEM is the fourth circle surrounding the bull's eye. Bronfenbrenner states:

> The macrosystem consists of the overarching pattern of micro-, meso-, and exosystems characteristic of a given culture, subculture, or other broader social context, with particular reference to the developmentally instigative belief system, resources, hazards, life styles, opportunity structures, life course options, and patterns of social interchange that are embedded in each of these systems. (Bronfenbrenner, 1989, p. 228)

The macrosystem may be formal laws or informal customs and practices. For this study, governmental regulations from without and center-made regulations from within define the particular day care that a child attends. These rules and regulations interface with the rules and values instilled in a child through parents and culture. This interface has an impact on the quality and quantity of interactions a child may

experience in the day care setting. These interactions, in turn, impact on vocabulary development.

The fifth and largest circle is the CHRONOSYSTEM. Bronfenbrenner (1986) believes that the chronosystem represents transitions which occur at all levels throughout the life span and may result in developmental change. Transitions may be normative (such as puberty, marriage, retirement) or non-normative (such as severe illness, divorce, death). In this study, the child's relationship with the environment at all levels and the development of vocabulary vary over time.

Need for the Study

It has become increasingly necessary for both parents to work outside the home in order to finance the necessities of life. Millions of Americans are faced with the dilemma of placing their children, in particular their preschool children, in the care of someone else. The preschool years are the most critical years for the development of skills that children will utilize for the remainder of their lives. Therefore, it is not uncommon for parents to wrestle with the selection of an appropriate caregiver for their children.

Many parents choose to place their children in day care, including day care centers. But how do they determine which center will best meet their needs and provide an environment that stimulates the growth and development of their child? Are all centers of equal quality? Is one type of center, homogeneous or heterogeneous in age grouping, more advantageous than the other for specific areas of development such as vocabulary development? More research in these areas is needed to assure parents that their choice of caregiver and day care placement will best meet the developmental needs of their children.

Purpose of the Study

The home environment is the primary source of language development for most children. Clarke-Stewart (1973) stated that a mother's verbal stimulation and mediation of stimulation from the environment enhance cognitive development and language ability in young children. Children of mothers who provide a variety of play materials and activities tend to excel cognitively. In reviewing studies involving the home environment, Gottfried (1984) concluded that mothers of high intelligence, as measured by vocabulary, provide a more stimulating environment for their children.

Although research indicates that a stimulating home environment enhances language development of young children, millions of preschool children are in the care of others outside their home for part of the work day. Therefore, the responsibility for the language development of these children rests with caregivers in addition to parents.

Many of these children attend day care centers that vary in quality and in other factors as well. Parents have the responsibility of choosing a day care center of high quality that best meets their needs and most closely resembles the methods and values of childrearing they practice in their own homes.

Although many studies have been conducted in recent years on what constitutes quality in day care, little research has been done to determine which form of child grouping arrangements in day care is most beneficial for language development. Katz, Evangelou, and Hartman (1990), in their review of available research on multi-age grouping, suggest that "multi-age grouping in early childhood settings may benefit participants by providing contexts for interaction in which a variety of models of behavior and levels of social, intellectual, and academic competences are available" (p. 49). Freedman (1982) indicated from her review of the literature that the greatest benefit of heterogeneous grouping in preschool years was in the area of language

development. Bates (1975) and McCartney (1984), however, stated that adult interaction was much more beneficial than peer interaction for language development.

Since preschool children are spending increased amounts of time outside their homes and more time in day care, including day care centers, it is imperative to determine which factors in these environments enhance language development, and, specifically for this study, vocabulary development. Therefore, the purpose of this study was to look at microsystem contextual factors that contribute to the vocabulary development of three-year-old children in day care.

Objectives

The primary purpose of this study was to view vocabulary development of three-year-old boys and girls in two contextual settings to determine what factors impacted on vocabulary development. The specific objectives of the study were:

1. To determine if three-year-olds in heterogeneous day care would score higher on a test of vocabulary development than three-year-olds in homogeneous day care.
2. To determine if the vocabulary scores of three-year-old girls would exceed the vocabulary scores of three-year-old boys in both homogeneous and heterogeneous day care.
3. To determine if three-year-olds in homogeneous and heterogeneous day care would interact primarily with children of equal vocabulary ability.
4. To determine if factors in the home environments of three-year-olds had an effect on vocabulary development.

Hypotheses

This study was conducted using four separate procedures. Hypotheses were developed for each procedure. Major hypotheses and alternatives for each are stated.

Procedure 1 Hypotheses

Procedure 1 involved the administration of the Early Childhood Environment Rating Scale (ECERS) to eight centers for a comparison of levels of quality.

H1: There will be no significant difference in the dimensions of quality of the ECERS between homogeneous and heterogeneous day care centers.

H1.1: There will be a significant difference in the dimensions of quality of the ECERS between homogeneous and heterogeneous day care centers.

Procedure 2 Hypotheses

Procedure 2 involved the administration of the Peabody Picture Vocabulary Test-Revised (PPVT-R) to 22 three-year-old subjects in homogeneous day care and 22 three-year-old subjects in heterogeneous day care.

H2: There will be no significant difference in the vocabulary scores of three-year-old children in homogeneous and heterogeneous day care.

H2.1: Three-year-olds in heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-olds in homogeneous day care.

H2.2: Three-year-old girls in homogeneous and heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-old boys in homogeneous and heterogeneous day care.

H2.3: Three-year-old girls in heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-old girls in homogeneous day care.

H2.4: Three-year-old boys in heterogeneous day care will score significantly

higher on a test of vocabulary development than three-year-old boys in homogeneous day care.

Procedure 3 Hypotheses

Procedure 3 involved the administration of the PPVT-R to children identified as best friend by the 21 subjects who had achieved the highest and lowest scores on the PPVT-R in Procedure 2.

H3: There will be no significant difference in the vocabulary scores of high scoring three-year-olds (in homogeneous and heterogeneous day care) and low scoring three-year-olds (in homogeneous and heterogeneous day care).

H3.1: High scoring three-year-olds (in homogeneous and heterogeneous day care) will score significantly higher on a test of vocabulary development than low scoring three-year-olds (in homogeneous and heterogeneous day care).

H3.2: There will be a significant difference in the vocabulary scores of high scoring three-year-olds in homogeneous and heterogeneous day care and their self-identified best friend.

H3.3: There will be a significant difference in the vocabulary scores of low scoring three-year-olds in homogeneous and heterogeneous day care and their self-identified best friend.

Procedure 4 Hypotheses

Procedure 4 involved the administration of the Home Observation for Measurement of the Environment (HOME) to the families of sixteen high scoring and low scoring subjects. Eight of the families represented children in homogeneous day care and eight families represented children in heterogeneous day care.

H4: There will be no significant difference in the HOME scores of three-year-olds in homogeneous and heterogeneous day care.

H4.1: There will be a significant difference in the HOME scores of three-year-olds in homogeneous and heterogeneous day care.

H4.2: There will be a significant difference in the HOME scores of high scoring three-year-olds (in homogeneous and heterogeneous day care) and low scoring three-year-olds (in homogeneous and heterogeneous day care).

Assumptions

The assumptions upon which this study was based are:

1. Children learn most of the skills necessary for language development within the first five years of their lives.
2. Vocabulary development is one aspect of language development.
3. Girls develop language skills earlier than boys.
4. Children develop language through interaction with and modeling of others within their environment.
5. Home stimulation is a major factor in language development.
6. Most children are exposed to a variety of environments outside the home that promote language development.
7. Children in day care will be exposed to many language models, both adult and peer.
8. Children in homogeneous day care are with same-age peers one hundred percent of the time.

Conceptual Definitions

The following concepts were relevant throughout this study:

Child Care--A comprehensive service to children and families that supplements the care children receive from their families. As a supplement to family care, professional child care is in no way a substitute for such care nor a competitor for the role of parents in the upbringing of their children (Caldwell and Hilliard, 1985, p.4).

Environment--The immediate settings of a developing person, the interconnections between such settings, and the external influences on these settings that emanate from the larger surroundings (Bronfenbrenner, 1979, p.22).

Heterogeneous (mixed-age grouping)--The practice of placing children who are at least a year apart in age into the same classroom groups (Katz et al., 1990, p. 1).

Homogeneous (same-age grouping)--The practice of placing children of the same age into the same classroom groups (Katz et al., 1990, p. viii).

Interaction--A two-directional relationship that is characterized by reciprocity (Bronfenbrenner, 1979, p. 22).

Language--A complex system of mutually agreed-upon symbols used to express and understand ideas and feelings. Speech is the vocal component of language, which includes expressive and receptive functions (Snow, 1989, p. 214). Receptive Language is word comprehension (Snow, 1989, p. 215) and the process used by both children and adults to understand both spoken and written language (Morris, 1988, p. 11).

Quality--The formal externalized descriptors through which a profession chooses to identify itself to its clients and to the general public (Caldwell and Hilliard, 1985, p. 6). A High Quality Environment for Children is one in which they are safe, healthy and well-nourished with adequate space, materials and equipment for learning through staff who are knowledgeable of child development and teaching methods and are able to plan and organize effective programs with parental input (Caldwell and Hilliard, 1985, p. 19).

Setting--A place where people can readily engage in face-to-face interaction (Bronfenbrenner, 1979, p. 22).

Stimulating Environment--In one sense, effective mother-infant interactions are part of a stimulating environment, but there is also stimulation provided by the

nonsocial environment that involves things to look at, hear, and manipulate (Horowitz, 1982, p. 26).

Vocabulary--One of the semantic features of language. It includes the acquisition of words, their meanings, and the relationships among words (Snow, 1989, p. 215).

Operational Definitions

In order to conduct the research for this study, the following terms were defined to meet the specific needs of this study:

Child Care-- Homogeneous and heterogeneous day care centers provided the child care in this study.

Environment-- This study viewed environments at the microsystem level. These included the day care facility and the home.

Heterogeneous--The maximum age difference of children in a heterogeneous classroom in this study ranged from 30 to 42 months.

Homogeneous--The maximum age difference of children in a homogeneous classroom in this study ranged from 10 to 12 months.

Interaction--Reciprocal relationships occurred within centers, within homes, and between centers and homes.

Language--The primary area of language in this study was receptive language.

Quality--Each day care center was assessed for quality using the Early Childhood Environment Rating Scale (ECERS).

Setting--The settings for this study were the day care centers and the homes.

Stimulating Environment--The homes of subjects in Procedure 4 were measured for quality of stimulation using the Home Observation for Measurement of the Environment (HOME).

Vocabulary--In this study, vocabulary was the area of receptive language that was measured. Specifically, receptive vocabulary was measured utilizing the Peabody Picture Vocabulary Test-Revised (PPVT-R), Form L.

Overview

Chapter II contains a review of literature related to speech and language development in general, gender differences in language development, home stimulation/interaction and implications for language development, and aspects of language development in day care. Methodology is discussed in Chapter III, including research design, sample, instrumentation, data collection procedures, limitations, hypotheses and data analysis. Chapter IV pertains to the specific analysis of results for each procedure of the study. The final chapter, Chapter V, includes a summary, discussion, and conclusion of findings, as well as implications for further research and practical use.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The research literature relevant to the various aspects of this study is reviewed under the following headings: Overview of Language Development, Variations in Language by Gender, Home Stimulation/Interaction and Implications, and Language Development in Day Care.

Overview of Speech and Language Development

> Language is learned not because we want to talk about language, but because we want to talk about the world. (Cazden, 1981, p. 14)

> Biophysically, humans are endowed from birth with the physical equipment that enables us to employ verbal and nonverbal behaviors for purposes of communication. We are capable of considerable variation in the sounds we can produce. These variations of sounds are mentally categorized and combined to form units of meaning. We can also control the pattern of inhalation and exhalation to provide power for speech, while simultaneously meeting our need to obtain oxygen. The combination of brain, neural system, and vocal tract physically sets the human being apart from other animals. We can remember what we said in the past and can verbalize what we will do in the future. We can teach our children by using the written word as well as the spoken word. Early speech development is highly dependent on the quality of the caretaker-infant relationship and is mediated by the child's cognitive development. (Ashburn, Schuster, Grimm, and Goff, 1986, p. 257)

Infants begin to make vocal sounds at birth. At first, their vocalizations are undifferentiated; however, they quickly develop a variety of cries. By 6 weeks of age, infants are also making a variety of cooing sounds. At approximately 3 to 4 months of age, infants begin to add consonant sounds to their vocalizations and soon begin combining consonants with vowels to produce babbling. It is usually not until they are 10 to 13 months that infants produce their first meaningful words (see Table 1).

The first words produced by infants are mostly nouns and are words that refer to things that move, things that can be acted upon, or objects of special interest. Verbs, adjectives, adverbs and prepositions are acquired later, generally in that order. Horowitz (1982) states that by 24 months of age, a child can string 2 words together and may use as many as 50 words (p. 17).

Mastery of the semantic features of language includes vocabulary development and understanding word meanings and relations among words and sentences. Initially, children may identify only the very general meaning of a language code but will learn more precise or specific meanings later on. Between ages 2 and 7, the child will advance from using only concrete objects that are present in the immediate environment to an ability to bring to mind a representation of an absent object or an event. Table 2 summarizes the semantic growth over the 5-year period.

Children acquire the rules of grammar over the course of the preschool years. However, Zigler and Finn-Stevenson (1987) state that even in young children who use only one- or two-word sentences, the understanding of the basic grammatical rules of language is evident (p. 369). Once a rule is learned, its use is generalized to other words, even words that are unfamiliar.

Language utilizes a system of codes understood by two or more people. Figure 2 presents a schematic representation of the verbal communication process. In viewing this model, it can be seen that the speaker must first encode the message. Encoding is the mode through which the brain organizes and forms the message for the listener. Ashburn et al. (1986) state that the transmission process begins by emitting air and then modulating and transforming the airstream into predetermined patterns of sound codes that represent the language (p. 258-259).

Table 1.–Milestones in Language Development-0 to 24 Months (Snow, 1989, p. 197).

AGE	PHONOLOGY	MORPHOLOGY AND SEMANTICS	SYNTAX	PRAGMATICS
Birth	Crying			
1 Month	Attends and responds to speaking voice			
2 Months	Cooing, Distinguishes phoneme features			
3 Months	Vocalizes to social stimulus			
4 Months	Chuckles			Pointing and gestures
6 Months	Babbling			
9 Months	Echolalia	Understands a few words		Understands gestures: responds to "bye bye"
12 Months	Repeated syllables, Jabbers expressively	First word		Waves "bye bye"
18 Months		Comprehends simple questions, points to nose, eyes, and hair, Vocabulary of 22 words	Two-word utterances, Telegraphic speech	Uses words to make wants known
24 Months		Vocabulary of 272 words	Uses pronouns and prepositions; uses simple sentences and phrases	Conversational turn-taking

Table 2.--Summary of Language Development-2 Years to 7 Years (Gard, Gilman, and Gorman, 1980).

AGE	PHONOLOGY	SEMANTICS	MEAN LENGTH OF UTTERANCE
2-1	70% intelligible	uses 200 words comprehends 500 words	3.1 words
2-7	80% intelligible	uses 500 words comprehends 900 words	3.4 words
3-1	p,b,m,w,h, mastered	uses 800 words comprehends 1200 words	4.3 words
3-7	becoming very intelligible in connected speech	uses 1000 to 1500 words comprehends 1500 to 2000 words	4.4 words
4-1	t,d,k,g,n,ng,y mastered		4.6 words
4-7	most consonants used accurately	uses 1500 to 2000 words comprehends 2500 to 2800 words	5.7 words
5-1	f mastered	comprehends 13,000 words by age 6	6.6 words
6-1	v,th,l,ch,sh (6.5 yr) z,s,th,r,hw (7.5 yr)	comprehends 20,000 to 26,000 words	7.3 words

The auditory feedback loop is used to monitor the transmitter in terms of what the encoder intended. If the transmitter is found to be faulty, the error is detected immediately after the utterance is produced. In effective communication, both the listener and the speaker are active participants, because the coded messages that have been transmitted by the speaker must be received and decoded by the listener. The receiving process for verbal language is accomplished by the ear and the

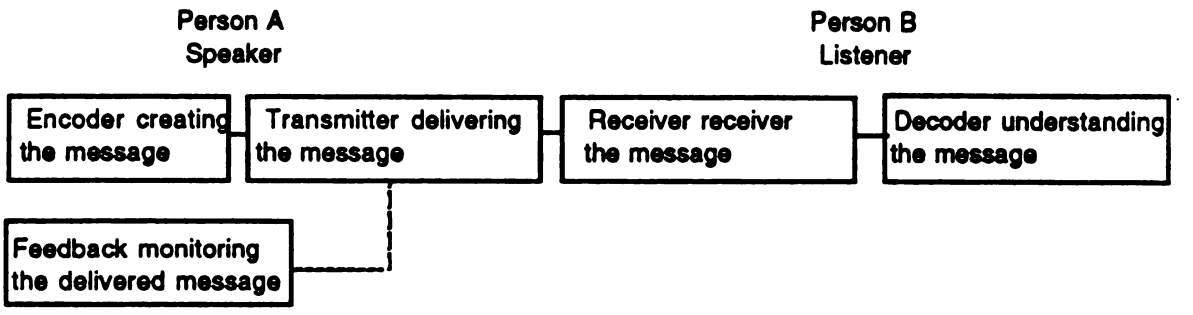

Figure 2. Communication model demonstrating the ability of humans to exchange information between parts of the system as well as between the system and its physical and social environments. (Ashburn et al., 1986, p. 258)

neural pathways to the brain. The listener receives the signals and combines them with knowledge of the rules of language and personal language experiences to predict missing parts of a communication.

Ashburn et al. (1986) state:

> A child does not acquire language in a vacuum. The child must be provided with a rich, responsive linguistic environment. Although the urge to communicate may be present from infancy, the child requires the stimulus of, and interaction with, loving persons who respond to and motivate the child at each stage of development to acquire the skills and the rules necessary for achieving communication competence. (p. 272)

Variations in Language by Gender

Researchers disagree on whether there actually are gender differences in language development. Many researchers who feel there are definite differences cannot agree as to which aspects of language are significantly different. Nor can they agree as to the significance the role of age plays in gender differences.

McCarthy (1953) stated that considerable evidence in the literature determined

boys to be slightly later than girls in practically all aspects of language development. She found the differences seldom to be statistically significant. "However, although the developmental differences between the sexes are small in magnitude, they seem to be of considerable importance for the later acquisition of the more complex and secondary language forms for the effect seems to be cumulative" (p. 155).

Ervin-Tripp (1966), in a review of child development research, stated that "formal differences in men's and women's languages in English are relatively small; topical and functional variations may be greater" (p. 89). Studies of verbal behavior indicate that girls' development is slightly faster than boys'. However, some well-designed American studies suggest that differences are very slight.

Garai and Scheinfeld (1968), in their review of literature, stated that females are reported to possess greater verbal fluency than males from infancy on. Studies reviewed by Garai and Scheinfeld found that girls' speech organs mature earlier than boys' and result in earlier age of speech onset for girls. In addition, studies found girls to exhibit greater verbal fluency from the age of 12 months on through high school and college. From the age of 18 months on, girls made fewer grammatical errors and produced longer and more complex sentences than boys. Garai and Scheinfeld reported that "in general, females perform better on tasks requiring verbal fluency and the mastery of the mechanics of language, while males excel in verbal comprehension and reasoning, with a slight edge over females in vocabulary" (p. 200).

In a review of literature, Reppucci (1971) documented the acceleration of girls over boys in physiological and physical development as well as intellectual development. Girls were found to be more advanced than boys in all aspects of language, such as age of onset, vocabulary size, and number of phoneme types.

Block (1976) reviewed earlier conclusions made by Maccoby and Jacklin

(1974) in their book, The Psychology of Sex Differences. On the basis of their review of over 2000 pieces of literature, Maccoby and Jacklin concluded that girls excel over boys in the area of verbal ability. Block stated that " although the authors found many sex differences to be unfounded in their book, verbal ability was one that was fairly well established" (p. 518).

Schachter, Shore, Hodapp, Chalfin, and Bundy (1978) contend that the discrepancy in opinions on gender differences for language acquisition may be the result of differing methodological approaches to research in this area. Schachter et al. found that older studies used mean length of utterance (MLU) as a method for measuring differences in language acquisition between boys and girls. More recent studies have not used this method.

In a study of the play and speech behavior of a group of 2-year-olds and their mothers, Lewis and Cherry (1977) found that maternal behavior varied as a function of gender of child and was not related to the child's linguistic behavior. In most cases, there were no gender differences in the children's language performance. According to the findings cited by Lewis and Cherry, girls are asked more questions, whereas boys receive more directives. Maternal utterances and MLUs show greater amounts directed toward girls than boys.

Craig (1991) determined many ways in which males and females talk differently from each other. Girls and women speak in longer sentences and produce successive sentences so that their conversational turns are longer. They use adjectives and other modifiers that are stronger and more emotional. Females ask more questions and do not usually express their ideas in statement form. Boys and men usually speak in shorter sentences with conversational turns of only one or two sentences in length. Sentences contain few modifiers which are generally neutral when they are present. Males tend to

present their ideas as comments and statements, while requests are often made using commands.

Home Stimulation/Interaction and Implications

Parental practices in child-rearing have long term effects on all aspects of the development of a child. The manner in which a parent and child interact during the early years, as well as other factors in the home environment, can be critical to the level and quality of cognitive skills that a child ultimately develops.

Freeburg and Payne (1967) stated:

> As a result of recent studies, there is reason to believe that patterns of verbal communication between parent and child, and the way in which language is utilized, affect not only the child's verbal development but also the ability to utilize higher-order concepts in problem solving.....Still other aspects of the home environment, including "social climate" and physical facilities, have been found to be associated with the child's academic and intellectual performance, as have parental personality characteristics and the mother's teaching "style." (p. 245)

Recent work in child language has established that parents and other caretakers use a special register called "Motherese" when speaking to young children. Wells (1982) stated that features of motherese include a reduction in the length and syntactic complexity of utterances, an emphasis on content related to ongoing activity or to features of the immediate perceptible environment, a high degree of repetitiveness, a tendency towards exaggerated intonation contours and a high proportion of utterances pitched at the higher end of the range.

Gelman and Shatz (1977) have found motherese to consist of well-formed utterances that are short and simple in syntax. It is slower and higher in pitch which makes it more intelligible than adult-directed speech. The lexical terms are fewer and

more concrete than those found in adult speech. Gelman and Shatz report that both mothers and four-year-olds adjust their speech for beginning language learners. Whether they have younger siblings or not, four-year-olds tend to produce shorter and syntactically simpler utterances when talking to very young children than to peers or adults.

Olsen-Fulero (1982) reported that mothers who utilize the features of motherese when speaking to their children are more likely to have children who develop language skills rapidly. However, some motherese characteristics (such as the use of imperatives) have been found to inhibit a child's development of language.

Clarke-Stewart (1973) found that frequent verbal stimulation from mother through reading or talking has resulted in more frequent vocalization and greater language ability in young children. Mother is both a source of stimulation herself, as well as a mediator of stimulation from the environment. She stated that "children of mothers who provide a greater number and variety of play materials and activities tend to be cognitively advanced. Moreover, mediation of materials by the mother is more closely related to the infant's skill with objects than is mere exposure to a stimulating physical environment" (p. 3).

Bricker and Carlson (1981), in a review of mother-child interaction, found that mother-infant conversations are important for shaping early reference. Mothers accomplish this through gestural and vocal procedures to get their babies to attend to objects and events. The research, although scant in comparison to that of mother-child interaction, indicates that father-child interaction represents a much smaller percentage of a child's communication stimulation in the home. Friedlander, Jacobs, Davis, and Wetstone (1972) conducted a time-sampling analysis of the natural language environments of two infants in their homes. They found that of all the conversational

segments directed toward baby "a", 65 percent came from the mother, 30 percent from the father, and 5 percent from guests. For baby "b", 59 percent came from the mother, 37 percent came from the father, and 4 percent came from guests. They concluded that the largest percentage of language stimulation in an ordinary American nuclear family comes from the mother.

Studies of birth order and language development are relevant to the results of the study conducted by this researcher. Clausen (1966) cited studies related to birth order and position of an individual among siblings. It was noted that first-born children tend to speak earlier and more precisely. In most instances, they will be learning to speak before a second child is born and will receive more verbal stimulation from their parents than later-born children who must compete for parental attention. It was also determined that the development of the first-born and the effects of sibling position are not confined to just the first few years. The first-born is likely to continue to be the child to whom the parents direct their level of conversation.

Clausen (1966) also cited studies relative to intelligence and birth order. Such studies found a tendency for first-born children to score slightly higher in tests of verbal intelligence, while later-born children tended to score slightly higher in tests of ability to make perceptual discriminations.

Research conducted by Dunn (1983) found a high frequency of imitation of older by younger siblings suggesting that an older sibling might play an important role in an infant's mastery of the object environment. Dunn also determined that children addressing their younger siblings adjust their speech in a manner somewhat similar to mothers addressing language-learning children.

The amount of parental verbal interaction with children is another important factor in the study of language development. Numerous environmental studies have been

conducted utilizing the Home Observation for Measurement of the Environment (HOME). The HOME was developed by Caldwell and Bradley in 1966 and revised in 1984. It has become a widely used instrument for the assessment of environmental quality in the home. Areas of quality that are measured include learning stimulation, language stimulation, physical environment, warmth and affection, academic stimulation, modeling, variety in experience, and acceptance. These subscale scores and total score indicate the level of quality that exists in a particular home environment.

In a meta-analysis of home environments and early cognitive development, Gottfried (1984) summarized conclusions pertinent to the study conducted by this researcher. He found that children from relatively higher SES families receive an intellectually more advantageous home environment. Mothers of higher intelligence, as measured by vocabulary, provide a more enriched environment for their children. During infancy and preschool years, the environments of firstborn children as opposed to later-born children are more conducive to enhancing intellectual skills. Gottfried found that in studies that used the HOME, no single factor (or scale) correlated with cognitive development across all of the studies. However, maternal involvement, play materials, and variety subscales tended to be most highly and consistently related to cognitive development between one and five years.

Language Development in Day Care

> High quality child care comes from high quality people. (Caldwell and Hilliard, 1985, p. 22)

Cazden (1981) stated that one of the responsibilities of a day care center is to extend children's verbal abilities. Children attending day care will increase their repertoire of words and meanings which they will use in communicating effectively in

their expanding world.

Quality in day care is an important element in providing an environment that will stimulate growth and development, especially in the area of language development. Caldwell and Hilliard (1985) suggested that child care professionals must provide high quality services that meet the needs of parents who have chosen that service for their children. A high quality environment is one in which children are safe, healthy and well-nourished with adequate space, materials and equipment for learning through staff who are knowledgeable of child development and teaching methods and are able to plan and organize effective programs with parental input.

The measure of quality in day care used in this study was the Early Childhood Environment Rating Scale (ECERS) developed by Harms and Clifford (1980). The seven dimensions of quality that were evaluated were personal care, creative activities, language/reasoning activities, furnishings/display, fine/gross motor activities, social development, and adult facilities/opportunities.

The National Day Care Study (Ruopp, Travers, Glantz, and Coelen, 1979) identified group size and specialized caregiver training as important elements of child care quality in center-based programs for preschoolers and added staff-child ratios to these elements for infant and toddler care. Ruopp et al. found that "the association between these variables and children's development in child care is largely a function of their facilitating effect on caregiver's efforts to interact in positive, stimulating ways with children in their care" (p. 77).

Phillips and Howes (1987) indicated that the National Day Care Study was able to determine the importance of children's interactions with their caregivers, rather than with materials and other children, on cognitive outcomes. They report that research conducted since the National Day Care Study has reached the following

conclusions:

1. Adult-child ratio affects the amount of adult-child interaction, children's verbal interaction, children's play, and nurturant caregiver behavior that is present in day care.

2. Smaller groups appear to enhance positive caregiver behavior and developmental outcomes for children.

3. Caregiver training is associated with more interaction with children. College educated caregivers with a child-related major showed more indirect guidance, less restriction, and more encouragement of children's self-initiations and verbal expression.

4. Consistent presence of an adult caregiver is positively related to an infants' development in child care.

A study of language in day care conducted by Tennant, McNaughton and Glynn (1988) found that caregiver training in language interaction skills improves the quality and quantity of language interactions with young children. A high ratio of conversations between child and caregiver results in increased rates of child language acquisition. An enriched environment consisting of toys and materials is not sufficient alone to improve language interactions that facilitate language acquisition.

Studies conducted by McCartney (1984) and Howes and Rubenstein (1985) found similar results. McCartney found that children from centers with high levels of caregiver speech performed better on tests of language development than children from centers with high levels of peer speech. Howes and Rubenstein found that children at home and in day care settings with more adults per child had higher talk and play scores than children in day care settings with fewer adults per child.

McCartney (1984) investigated the effects of adult and peer interaction on

language development. She found that the greater the number of conversations initiated with a peer in a center, the lower the language scores of children. She concluded that peer talk was less effective than caregiver talk in enhancing language development.

In comparing adult-child speech with child-child speech, Bates (1975) concluded that children who spend time with peers are at a disadvantage when compared with children who spend most of their time with adults. Speech from children to adults is longer and uses both a broader vocabulary and more complex syntax structure than speech between children. During play, children often display task-centered monologues that provide very little useful experience in language comprehension.

A final aspect of day care that is recently under study is heterogeneous grouping (mixed-age grouping). In general, heterogeneous grouping is defined as placing children who are at least a year apart in age into the same classroom groups. It is based on the assumption that the greater diversity of children present in heterogeneous grouping, compared to that in homogeneous grouping, will provide a variety of models from whom each child can learn.

Katz et al. (1990) favor heterogeneous grouping because it " resembles family and neighborhood groupings, which throughout history have informally provided much of children's socialization and education" (p. v). They state that heterogeneous grouping enhances social development, academic development, and leadership qualities.

Katz et al. (1990) believe that homogeneous grouping of children may have detrimental effects since "homogeneous treatments yield homogeneous results only if the population to be treated is homogeneous in all relevant aspects" (p. 2). Homogeneous grouping is based on the assumption that children of the same age learn at the same rate and in the same manner.

Katz et al. provide little information relative to advantages in the area of

language development from the use of heterogeneous grouping. Research studies that are available in this area are contradictory. Freedman (1982) found that children learn vocabulary from each other in settings with a variety of age groups. She stated:

> While children imitate adults more in terms of complexity and sentence length, they learn vocabulary more rapidly and easily from other children, even when the vocabulary is completely foreign. It is possible that adult language is too complex for a child to absorb all the nuances, while the language of the next oldest group of children may be just right. (p. 198)

Freedman also reported that as children become older, they imitate adults more and peers less. Therefore, the greatest benefit of heterogeneous grouping occurs in the very early years of rapid language expansion. In addition, "the processes important for verbal exchanges develop by three and one-half years of age, and thereafter there is no significant difference in effective communication between older and younger children" (p. 198).

Studies by Bates (1975) and McCartney (1984) cited previously in this researcher's review of peer interaction dispute the findings reported by Freedman and indicate that peer interaction is much less effective for language development than adult-child interaction. Therefore, although heterogeneous grouping of children in day care provides older models who may enhance the social and academic skill development of younger children, the research is unclear as to the benefits of older peer interaction for the enhancement of language development of younger children.

Summary

The research indicates that language development of young children is facilitated by mother-child interactions that occur in a stimulating home environment. Similarly, language development in day care is facilitated by adult-child interactions

that occur in a high quality day care environment. The research is more ambivalent relative to gender differences in language development and the advantages of heterogeneous day care over homogeneous day care.

CHAPTER III

METHODOLOGY

Introduction

Chapter III will present the methodological procedures utilized in this study. The areas presented are Research Design, Sample, Instrumentation, Data Collection Procedures, Data Analysis, Limitations, and Summary.

Research Design

The purpose of this study was to look at microsystem contextual factors that contribute to the vocabulary development of three-year-old children in day care. Figure 3 presents a sequential model of the research design. In procedure 1, day care centers were compared for their level of quality, and only high quality centers, as assessed on the Early Childhood Environment Rating Scale, were included in the study. Following this comparison, procedure 2 was begun. In procedure 2, the Peabody Picture Vocabulary Test-Revised was administered to three-year-old children in homogeneous and heterogeneous day care and vocabulary scores were compared. A total of 21 subjects from both groups in procedure 2 became a part of procedure 3. In procedure 3, the vocabulary scores of the 21 high and low scoring subjects from procedure 2 were compared with those of their self-identified best friend. In procedure 4, a home evaluation using the Home Observation for Measurement of the Environment was conducted for the high scoring and low scoring subjects from procedure 3. Therefore, the contextual factors studied for their contribution to the vocabulary performance of the subjects were factors in the day care setting, including interaction

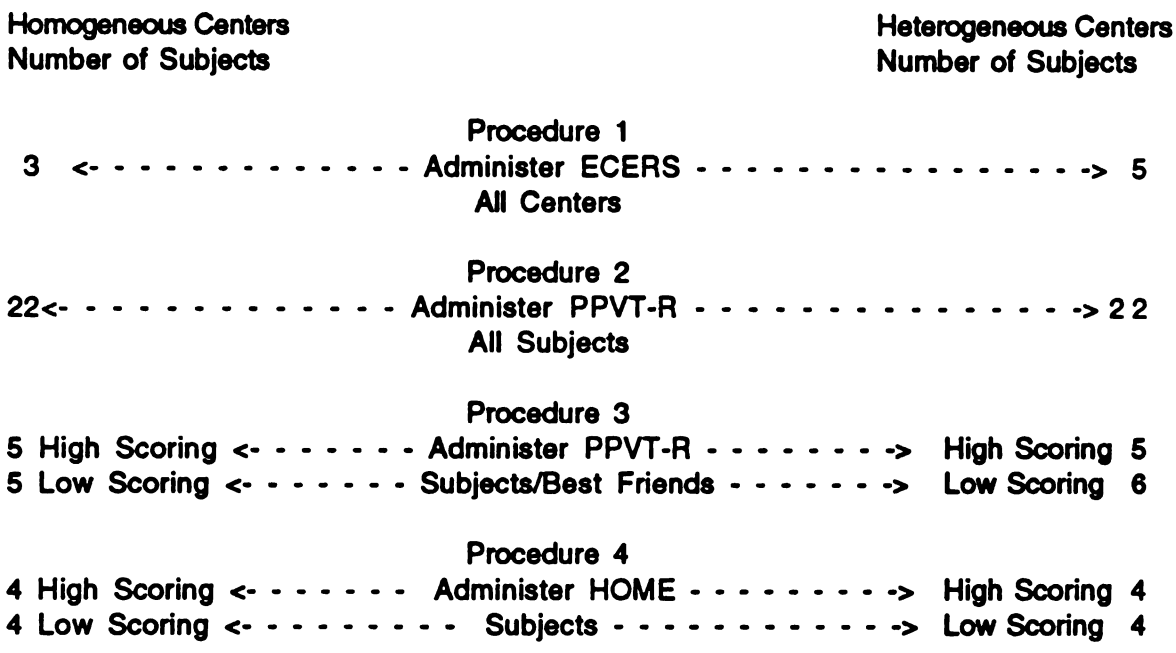

Figure 3. Sequential model of the research design

with best friend, and factors in the home environment.

Sample

The subjects for this study came from eight day care centers in two metropolitan cities in Michigan. The study was conducted from June, 1991 through October, 1991. Three day care centers provided the subjects for the homogeneous component, while five day care centers provided the subjects for the heterogeneous component. There were 22 subjects in the homogeneous group and 22 subjects in the heterogeneous group.

All subjects met the criteria for inclusion in the study. The criteria were: 1) children between the ages of 3 years 0 months and 3 years 11 months, 2) two parents in the home, 3) participation in day care 5 full days per week for a minimum

of 6 months, 4) average or higher family income ($30,000 to $35,000 or above) and 5) English as a first language.

Two children who became a part of the study attended 4 days per week. Their centers of attendance did not require participation 5 days per week. University day care is often conducted on a 4-day basis, and since the study was attempting to secure a valid number of subjects, it was presumed that there would not be significant differences in 4 and 5 day attendance and that inclusion of these two subjects in the study would not alter the validity of this study.

Three-year-olds were chosen as subjects because by the age of three, many children have mastered much of the grammar of their language. In addition, they can use and understand many of the words in their language. Ames and Ilg (1976) stated that at no other time will words mean as much as they do at three years of age. Attending skills improve as well and three-year-olds will attend to some tasks for as long as 20 minutes. Therefore, assessment instruments, such as the Peabody Picture Vocabulary Test-Revised, become more reliable when administered to three-year-olds than to a younger age child.

Instrumentation

Three instruments were utilized in this study to assess the quality and sameness of the day care centers, the receptive vocabulary of the subjects, and the quality and demographics of the home environment. These instruments were the Early Childhood Environment Rating Scale (ECERS), the Peabody Picture Vocabulary Test-Revised (PPVT-R), and the Home Observation for Measurement of the Environment-Revised (HOME), respectively (see APPENDIX A).

The Early Childhood Environment Rating Scale (ECERS)

The ECERS was developed by Harms and Clifford in 1980. It has been used in several studies as an index of the quality of day care centers. The instrument consists of 37 items that are scored on 7-point scales, which are accompanied by definitions of each point. The seven dimensions of quality include: personal care, furnishings/display, language/reasoning, fine/gross motor, creative activities, social development, and adult facilities/opportunities.

To test the validity of the scale, nationally recognized experts in the day care and early childhood fields were asked to rate each item on the scale in terms of its importance to early childhood programs. Seventy-eight percent of the ratings indicated high importance. The scale was also tested by comparing its ability to distinguish between classrooms of varying quality as determined by trainers who had been working with the staff in those classrooms. A rank order correlation of .737 was obtained when comparing the ratings of expert observers and trainers. A correlation of .697 was obtained when comparing less well trained observers and trainers.

Harms and Clifford (1980) stated that interrater reliability was rated by classroom and by item on three and two independent tests, respectively. Rank correlations for classroom were .899, .790, and .884. Rank order correlations for item were .937 and .932. Internal consistency, as measured by Cronbach's Alpha and Standardized Alpha, indicated low correlations for some of the subscales but high correlations of .830 and .863 for the scale as a whole.

The Peabody Picture Vocabulary Test-Revised (PPVT-R)

The PPVT was developed by Dunn and Dunn in 1959 and revised in 1981. It is administered individually and is a norm-referenced test of hearing vocabulary designed

for persons 2 1/2 through 40 years of age. It was standardized nationally on a sample of 5,028 persons--4,200 children and adolescents, and 828 adults. It produces a raw score that can be converted into age-referenced norms.

The manual of the PPVT-R (Dunn and Dunn, 1981) states that approximately 100 published studies have reported reliability data on the original PPVT, while 68 studies have reported data for the PPVT-R. Immediate retest reliability coefficients for raw scores and IQs, respectively, were .72 and .84 when the time interval between tests was less than 2 weeks. For short-term stability, defined as 1 year or less, the median correlation for IQs was .72; for long-term stability, defined as more than 1 year, the median correlation for IQs was .59. The median correlation based on raw scores for short-term stability was .75.

The PPVT-R has been correlated with other vocabulary tests and with vocabulary subtests of individual intelligence and psycholinguistics tests. The overall median value was .71, based on 55 correlations.

The Home Observation for Measurement of the Environment-Revised (HOME)

The HOME, developed by Caldwell, Heider and Kaplan in 1966, was revised by Caldwell and Bradley in 1984. It is an observationally based inventory which provides an index of the quality and quantity of social, emotional, and cognitive support available to a child within the home setting. Three forms are available to be administered to families of infants and toddlers (0-3), preschoolers (3-6), and elementary children.

The HOME (3-6) was utilized for this study. It contains 55 items representing eight types of environmental forces that make up the eight subscales. These include: learning stimulation, language stimulation, physical environment, warmth and affection, academic stimulation, modeling, variety in experience, and

acceptance.

The HOME manual (Caldwell and Bradley, 1984) states that standardization data for preschool age children was collected on 232 families in central Arkansas. The Kuder-Richardson 20 formula was used to determine internal consistency. Coefficients range from .53 to .83 for the HOME subscales and .93 for the total scale.

The HOME manual also indicates that HOME scores for 33 families were correlated with five socioeconomic-status indices including maternal education, maternal occupation, paternal education, paternal occupation, and the amount of crowding in the home. The correlations between mother's occupation and father's occupation and the home environment were negligible. Moderate correlations were recorded between the remaining three SES factors and several HOME subscales. The HOME has been found to correlate with measures of achievement at .51 to .58 for total score. The three-year HOME has been found to correlate with measures of cognitive development at .23 to .47 for subscales and .55 for total score.

Data Collection Procedures

The proposal for the study was submitted to the University Committee on Research Involving Human Subjects (UCRIHS). Approval was granted before the study was initiated.

A list of day care centers for two metropolitan areas in Michigan was secured from the Child Care Directory provided by the Office of Young Children. The list was reviewed by the researcher to determine possible centers for inclusion based on subject criteria. Centers were contacted by telephone to confirm their ability to meet the criteria and their willingness to participate. Many centers declined to participate including franchised centers found in many large cities in Michigan. Centers willing to

participate were then contacted by letter (see APPENDIX B) and permission to become a part of the study was secured from the director of the center and/or the board of directors for the center. Once permission was obtained, procedure 1 was initiated. In procedure 1, each of the centers was administered the Early Childhood Environment Rating Scale (ECERS) to determine if the centers were of high quality and comparable to one another. All the centers that agreed to be a part of the study were found to be of high quality based on the ECERS. All center evaluations were conducted by the researcher to insure reliability in administration of the ECERS.

A list of guidelines for inclusion in the study was provided to the directors of the centers, and they were asked to provide a list of students whom they felt would meet the guidelines. Introductory letters and permission forms (see APPENDIX B) were sent to the families of these children. Once the permission slips were returned, Procedure 2, which consisted of the vocabulary testing of the subjects, was begun.

The subjects were individually administered the Peabody Picture Vocabulary Test Revised-Form L (PPVT-R). Before the assessment session was completed, each subject was asked to respond orally to a Best Friend Questionnaire (see APPENDIX A). At that point in time, it could not be determined which subjects would become a part of procedure 3, so all subjects completed the questionnaire. The questionnaire was felt to be an appropriate manner of determining a child's preferred peer at the day care center. Gallagher (1991) stated that through such a nomination method, children can determine their peer preferences. Any number of questions can be proposed, and any limit can be set to the number of answers the children are asked to provide. Adaptability and versatility are advantages of the nomination method. The questionnaire for this study consisted of the following items:

1) "When you play inside, who do you like to play with the best?"

2) "When you play outside, who is the best person to play with?"
3) "Who do you think likes to play with you the most?"
4) "Who do you like to sit by when you eat?"
5) "Here at the center, who is your best friend?"

The final item, "Here at the center, who is your best friend?" was the primary item used for determining a child's best friend. This item was specifically placed last in order to allow the children to have given some thought, by answering the other items first, to which child was truly their best friend.

As a verification of the reliability of the child's responses, the teacher was given the questionnaire in advance. If the child's responses were different from that of the teacher, the researcher discussed with the teacher which response was most appropriate. In some cases, it was necessary to choose a name given in response to a different item because the child listed as a best friend was unavailable for testing. Several of the centers started their summer session in late June and some children no longer attended or attended less time during the summer session. When a "best friend" could not be available for testing, the name that appeared most often on the questionnaire was chosen as the best friend. Such decisions were discussed with the teacher for her consensus.

When all subjects for procedure 2 had been given the PPVT-R, the scores were rank ordered to determine which five students in each day care group had achieved the highest scores and which five students had achieved the lowest scores. Explanation letters and permission slips (see APPENDIX B) were sent to the homes requesting that these students become a part of procedures 3 (testing of best friends) and 4 (home assessments). In addition, explanation letters and permission slips (see APPENDIX B) were sent to the homes of children who were determined to be the best friends of the subjects for procedure 3.

There were ten scores for the homogeneous best friend group and eleven scores for the heterogeneous best friend group. The heterogeneous group exceeded the homogeneous group by one since two children had the same score on the rank order of scores from procedure 2. Therefore, both children, as well as their best friends became a part of procedure 3.

Nine children determined to be the best friend of a subject were already subjects in the study. Therefore, these children were not tested again; their original scores were reported in the best friend column. When testing of best friends was completed, procedure 4 was begun.

In procedure 4, home visits were made and the HOME was administered to the families who agreed to be a part of the procedure. Sixteen families of the 21 families eligible agreed to participate. There were eight subjects from homogeneous centers and eight subjects from heterogeneous centers. Demographic information was also obtained during the home visits.

All data were collected over a five month span of time. The researcher collected all data herself in order to maintain reliability in the administration of the assessment measures since conditions for testing varied among centers and homes.

Data Analysis

The Mann-Whitney U test at an alpha level of .05 was the statistical test used to analyze the data obtained from the administration of the ECERS and the HOME. The Mann-Whitney U test is a nonparametric test done on the rank orders of the variables within groups. It is equivalent to the parametric test for the independent pairs t-test where the null hypothesis is about the group means (Brent,1988).

The Mann-Whitney U test evaluates the null hypothesis that the

distributions of two independent samples are the same. It may be thought of as the ordinal equivalent of the t-test and is usually equal to or greater in power than the t-test (Brent, 1988). The small number of day care centers and the small number of subjects in Procedure 4 necessitated the use of the Mann-Whitney U test.

The Mann-Whitney U test compared the dimensions of quality for the eight centers by type of center; that is, homogeneous centers were compared with heterogeneous centers. It was also utilized for a comparison of centers for age range of students.

The centers were compared on several other demographic issues using nonparametric statistical analyses. These issues included accreditation, availability of an infant program, availability of a drop-in program, percentage of time each day that the children were grouped with children of other ages, class size and attendance, teacher-student ratio, and daily routine.

A two-factor ANOVA at an alpha level of .05 was used to compute means and F values for the PPVT-R scores that were obtained in procedure 2. The ANOVA was used to test hypotheses that compared the scores by group and gender. T-tests were used to compute means and t values for the remaining hypotheses in procedures 2 and 3.

Limitations

The following factors were seen as limitations in this study:

1. Number of Subjects. This is viewed as a major limitation of this study. Every attempt was made to secure at least 30 subjects for each type of day care, homogeneous and heterogeneous, for procedure 2. Contacts were made to all eligible centers in two major cities in Michigan. Many centers chose not to be a part of the study

for various reasons. Since the number of available centers was small, the number of available subjects was small as well.

An additional restriction to the number of subjects was the specific list of requirements for inclusion in the study. In an effort to limit the number of variables that might taint the results of the study, the following requirements were imposed:

a. The children had to be between the ages of 3 years 0 months and 3 years 11 months.

b. The children had to come from a two-parent home.

c. The children had to participate in day care five full days per week.

d. The children had to have attended the day care for at least six months.

e. The children had to speak English as a primary language.

f. The children had to come from homes of average or higher family income.

Many of the children fell within the necessary age range but did not meet the other requirements for inclusion in the study. There were at least three more students in each group that were eligible for procedure 2. However, no permission could be secured for their inclusion.

Procedures 3 and 4 had a small number of subjects by design. This was not viewed as a limitation of this study, but larger numbers in future research would provide much more data than were obtained with the number of subjects utilized for procedures 3 and 4.

2. Depth of the Study. This study investigated receptive language only and did not explore expressive language. Specifically, it investigated receptive vocabulary as one aspect of receptive language. It viewed the subjects' understanding of words rather than their use of words. Future research which explored the expressive vocabulary

component in conjunction with the receptive component would provide a wealth of additional information about language development.

This study viewed vocabulary development at the microsystem level only. Children were viewed in the contexts of their day care center and their home. The study, by design, did not view the child at other levels of ecological development or at other settings at the microsystem level. Future research could expand the study to other settings that contain the child at the microsystem level and to aspects of interaction of settings at the mesosystem level.

3. Reliability. Each day care center that became a part of the study had its own set of rules and regulations that the researcher was asked to follow. In addition, each day care director had a busy schedule with limited time and space to accommodate a researcher collecting data. It was virtually impossible to create the same conditions for data collection in each center. The one aspect of reliability that was consistent was the use of just one researcher for data collection. Every effort was made to administer all tests in a consistent manner to all subjects.

4. Definition of Terms. Concern is expressed in the literature relative to the limitations and benefits of homogeneous and heterogeneous day care. These types of programs are generally defined by the ages of children grouped together. It is a common assumption that children in homogeneous day care are always with other children who vary in age by not more than one year. This study was based on that assumption. However, it was determined from daily schedules (see APPENDIX C) and director input that, in actuality, children in homogeneous centers who arrived very early or stayed very late were grouped heterogeneously for a period of time due to small numbers of

students. Future research comparing homogeneous and heterogeneous day care should take this important factor into account.

Summary

Microsystem contextual factors that contribute to vocabulary development of three-year-old children in day care were researched in this study. The study was conducted in a series of procedures. Homogeneous and heterogeneous day care centers were compared for quality, while subjects were compared for performance on a test of vocabulary ability. Subjects who became a part of the third and fourth procedures were compared with a best friend for vocabulary scores and interviewed in a home assessment.

The Early Childhood Environment Rating Scale, the Peabody Picture Vocabulary Test-Revised, and the Home Observation for Measurement of the Environment-Revised were the measures used for the assessments. The researcher conducted all evaluations herself to ensure reliability in data collection due to the variability in testing sites and conditions.

The Mann-Whitney U, a two-factor ANOVA, and t-tests were computed at an alpha level of .05 on the data obtained from the assessments. Limitations to the study were discussed relative to their impact on this study and future research.

CHAPTER IV

ANALYSIS

Introduction

The results of the data analysis will be presented for each procedure initiated in the study and for the hypotheses that relate to each procedure. All statistical analyses were computed at an alpha level of .05. Day care centers were compared using the Early Childhood Environment Rating Scale (ECERS). Vocabulary scores of subjects in homogeneous and heterogeneous day care centers were assessed using the Peabody Picture Vocabulary Test-Revised (PPVT-R), and this measure was also utilized for the assessment of best friends of high scoring and low scoring subjects. The Home Observation for Measurement of the Environment-Revised (HOME) was used for the evaluation of the home context.

Procedure 1: Comparison of Day Care Centers on ECERS

The major hypothesis for procedure 1 is presented. One alterative hypothesis is presented as well.

H1: There will be no significant difference in the dimensions of quality of the ECERS between homogeneous and heterogeneous day care centers.

H1.1: There will be a significant difference in the dimensions of quality of the ECERS between homogeneous and heterogeneous day care centers.

Table 3 presents a summary of the scores that were obtained when each center was evaluated with the ECERS. A total of eight centers, three homogeneous and five heterogeneous, were evaluated. The total possible score that could be achieved is

presented for the seven subscales and total score. Results for each center are displayed, along with the weighted means. Weighted means were used since the subscales do not represent equal values.

Table 3

Summary of Scores for all Centers on ECERS

Subscale	Personal Care Routines	Furnish-ings/ Display	Language Reason-ing Experi-ences	Fine/ Gross Motor Activi-ties	Creative Activities	Social Devel-opment	Adult Needs	Total Score	Weighted Means
Total Possible	(35)	(35)	(28)	(42)	(49)	(42)	(28)	(259)	(38.41)
Homo-	30	32	24	40	42	36	19	223	33.29
geneous	34	33	28	42	48	40	26	251	37.27
Centers	32	32	26	41	44	39	24	238	35.35
Hetero-	34	31	28	41	47	39	28	248	36.70
geneous	33	34	28	42	49	41	28	255	37.84
Centers	33	31	28	41	47	41	28	249	36.89
	34	33	26	40	46	40	25	244	36.24
	28	29	28	41	45	36	25	232	34.43

n = 3 homogeneous centers
n = 5 heterogeneous centers

The Mann-Whitney U was the statistic used to compare the scores between the homogeneous and heterogeneous centers. Table 4 presents the results of the computation of the Mann-Whitney U. Both the U values and the P values showed no significant differences between homogeneous and heterogeneous centers on all subscales and total score on the ECERS. Therefore, H1 was accepted and H1.1 was rejected since no significant differences were found.

Table 4

Results of Mann-Whitney U for ECERS

Subscale		U Value	Corrected for Ties 2-tailed P
I.	Personal Care	6.0	.6447
II.	Furnishings/Display	5.5	.5437
III.	Language/Reasoning	3.5	.1685
IV.	Fine/Gross Motor	7.5	1.0000
V.	Creative Activities	4.0	.2938
VI.	Social Development	4.5	.3594
VII.	Adult Needs	2.0	.0909
	Total	5.0	.4561

U and 2-tailed P showed no significant differences between homogeneous and heterogeneous centers on the qualities mentioned above and the total score.

n = 3 homogeneous centers
n = 5 heterogeneous centers

Procedure 2: Comparison of PPVT-R Scores for Homogeneous and Heterogeneous Subjects

In procedure 2, 22 subjects in homogeneous day care centers and 22 subjects in heterogeneous day care centers were administered the PPVT-R. All subjects met the following criteria for inclusion in the study: 1) children between the ages of 3 years 0 months and 3 years 11 months, 2) two parents in the home, 3) participation in day care five full days per week for a minimum of six months, 4) average or higher family income ($30,000 to $35,000 or above--based on census figures for 1990), and 5) English as a first language.

PPVT-R scores and demographic information for the subjects in homogeneous day care centers are presented in Table 5. The PPVT-R scores and demographic information for subjects in heterogeneous day care centers are presented in Table 6.

Table 5

PPVT Scores and Demographic Information for Subjects in Homogeneous Centers

ID Number Attending	Score	Age	Sex	Years/Day Care	Days
100	67	3-6	F	3	5
101	56	3-5	M	2	4
102	51	3-8	M	2	5
103	51	3-11	M	1	5
104	50	3-0	F	2+	5
105	48	3-2	F	1+	5
106	48	3-6	F	3	5
107	47	3-8	M	3	5
108	47	3-4	M	2+	5
109	46	3-8	F	1	5
110	45	3-8	F	3	5
111	45	3-9	M	1	5
112	44	3-4	M	2	5
113	43	3-9	M	2+	5
114	42	3-4	M	3	5
115	41	3-8	F	3+	5
116	38	3-0	M	2	5
117	37	3-10	M	1+	5
118	36	3-2	F	3	5
119	31	3-0	F	2+	5
120	30	3-9	M	1	5
121	29	3-0	M	1	5

n = 22
females = 9
males = 13

+ represents additional months but less than another full year

Table 6

PPVT Scores and Demographic Information for Subjects in Heterogeneous Centers

ID Number Attending	Score	Age	Sex	Years/Day Care	Days
200	56	3-4	F	3	5
201	55	3-9	M	1	5
202	54	3-9	M	3+	5
203	52	3-7	M	1	5
204	52	3-5	F	2	5
205	51	3-11	M	3	5
206	50	3-11	M	1	5
207	49	3-11	M	2	5
208	49	3-0	M	3	5
209	48	3-9	F	3+	5
210	47	3-11	M	1	5
211	47	3-2	M	3	5
212	45	3-5	M	1+	4
213	45	3-4	M	1-	5
214	45	3-8	F	1+	5
215	42	3-4	F	2	5
216	41	3-9	F	2+	5
217	41	3-7	M	1-	5
218	40	3-11	F	2+	5
219	33	3-3	M	1	5
220	32	3-1	F	3	5
221	28	3-0	F	1	5

n = 22
females = 9
males = 13

+ represents additional months but less than another full year
- represents less than one year

The major hypothesis for procedure 2 is presented. Four alternative hypotheses are presented as well.

H2: There will be no significant difference in the vocabulary scores of three-year-old children in homogeneous and heterogeneous day care.

H2.1: Three-year-olds in heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-olds in homogeneos day care.

H2.2: Three-year-old girls in homogeneous and heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-old boys in homogeneous and heterogeneous day care.

H2.3: Three-year-old girls in heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-old girls in homogeneous day care.

H2.4: Three-year-old boys in heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-old boys in homogeneous day care.

A Two-Factor ANOVA was computed for the mean scores on the PPVT-R by group and by gender. The Two-Factor ANOVA was used to assess the effects of the two variables simultaneously and reduce the probability of error. Table 7 presents the means and standard deviations for the comparison by group. Table 8 presents the means and standard deviations for the comparison by gender.

A comparison by group resulted in an F value of .312 and a p value of .580 (see Table 9). These values were not significant; therefore, H2.1 was rejected.

A comparison by gender resulted in an F value of .191 and a p value of .664 (see Table 9). These values were not significant. Therefore, H2.2 was rejected. Since both H2.1 and H2.2 were rejected, H2.3 and H2.4 were also rejected. The null hypothesis was retained.

Table 7

Means for a Comparison of PPVT Scores by Group

Homogeneous		Heterogeneous	
ID Number	Score	ID Number	Score
100	67	200	56
101	56	201	55
102	51	202	54
103	51	203	52
104	50	204	52
105	48	205	51
106	48	206	50
107	47	207	49
108	47	208	49
109	46	209	48
110	45	210	47
111	45	211	47
112	44	212	45
113	43	213	45
114	42	214	45
115	41	215	42
116	38	216	41
117	37	217	41
118	36	218	40
119	31	219	33
120	30	220	32
121	29	221	28
mean	44.18		45.55
standard deviation	8.77		7.47

$F = .312$ $p = .580$

n = 22 homogeneous
n = 22 heterogeneous

Table 8

Means for a Comparison of PPVT Scores by Gender

Homogeneous & Heterogeneous Female Scores	Homogeneous & Heterogeneous Male Scores
67	56
56	55
52	54
50	52
48	51
48	51
48	51
46	50
45	49
45	49
42	47
41	47
41	47
40	47
36	45
32	45
31	45
28	44
	43
	42
	41
	38
	37
	33
	30
	29
mean 44.22	45.31
standard deviation 9.38	7.20

F = .191 p = .664

n = 18 females
n = 26 males

Table 9

Summary Table for Two-Factor ANOVA
for PPVT Scores as a Function of
Gender and Group

Source of Variation	df	ss	MS	F	p
Main Effects	2	32.99	16.49	.252	.779
Group	1	20.46	20.46	.312	.580
Gender	1	12.53	12.53	.191	.664
Group x Gender	1	152.49	152.49	2.327	.135
Explained	3	185.47	61.82	.943	.429
Residual	40	2621.71	65.54		
Total	43	2807.18	65.28		

Procedure 3: Comparison of PPVT-R Scores
for High Scoring and Low Scoring Subjects and Best Friends

In procedure 3, 21 children with the highest and lowest PPVT-R scores from procedure 2 completed an oral questionnaire to determine their self-identified best friend at the center (see APPENDIX A).

The subjects for procedure 3 were five high scoring homogeneous children and their best friends, five low scoring homogeneous children and their best friends, five high scoring heterogeneous children and their best friends, and six low scoring heterogeneous children and their best friends. There were six children in the low scoring heterogeneous group because two of the low scoring children achieved the same score when tested with the PPVT-R. All best friends were administered the PPVT-R if they had not already been given it as part of procedure 2.

High scoring and low scoring subject scores and best friend scores as well as demographic information for the homogeneous centers are displayed in Table 10. High scoring and low scoring subject scores and best friend scores as well as demographic information for the heterogeneous centers are displayed in Table 11.

Table 10

High Scoring and Low Scoring Subject Scores/Best Friend Scores and Demographics for Homogeneous Centers

ID Number	Score	Age	Sex	Center Number	Years Day Care	Days Attend	BF ID Number	Score	Age	Sex	Years Day Care	Days Attend
High												
100	67	3-6	F	3	3	5	110	45	3-8	F	3	5
101	56	3-5	M	3	2	4	106	48	3-6	F	3	5
102	51	3-8	M	4	2	5	140	47	4-2	M	2	5
103	51	3-11	M	4	1	5	141	46	4-1	F	1-	5
104	50	3-0	F	3	2+	5	110	45	3-8	F	3	5
Low												
117	37	3-10	M	4	1+	5	102	51	3-8	M	2	5
118	36	3-2	F	5	3	5	108	47	3-4	M	2+	5
119	31	3-0	F	3	2+	5	104	50	3-0	F	2+	5
120	30	3-9	M	3	1	5	110	45	3-8	F	3	5
121	29	3-0	M	5	1	5	142	27	2-9	M	1	5
mean (yr)		3.43							3.55			

n = 5 high scoring
n = 5 low scoring

+ represents additional months but less than another full year
- represents less than one year

Table 11

High Scoring and Low Scoring Subject Scores/Best Friend Scores and Demographics for Heterogeneous Centers

ID Number	Score	Age	Sex	Center Number	Years Day Care	Days Attend	BF ID Number	Score	Age	Sex	Years Day Care	Days Attend
High												
200	56	3-4	F	1	3	5	240	42	4-1	F	1-	5
201	55	3-9	M	7	1	5	241	48	4-10	M	1	3
202	54	3-9	M	1	3+	5	242	66	4-8	F	2	4
203	52	3-7	M	2	1	5	243	66	4-2	F	1+	5
204	52	3-5	F	2	2	5	244	35	4-1	F	1	3
Low												
216	41	3-9	F	1	2+	5	245	73	4-2	F	1+	5
217	41	3-7	M	1	1-	5	246	63	4-2	M	1	4
218	40	3-11	F	7	2+	5	215	42	3-4	F	2	5
219	33	3-3	M	8	1	5	206	50	3-11	M	1	5
220	32	3-1	F	6	3	5	208	49	3-0	M	3	5
221	28	3-0	F	1	1	5	216	41	3-9	F	2+	5
mean (yr)		3.49							4.02			

n = 5 high scoring
n = 6 low scoring

+ represents additional months but less than another full year
- represents less than one year

The major hypothesis for procedure 3 is presented. Three alternative hypotheses are presented as well.

H3: There will be no significant difference in the vocabulary scores of high scoring three-year-olds (in homogeneous and heterogeneous day care) and low scoring three-year-olds (in homogeneous and heterogeneous day care).

H3.1: High scoring three-year-olds (in homogeneous and heterogeneous day care) will score significantly higher on a test of vocabulary development than low scoring three-year-olds (in homogeneous and heterogeneous day care).

H3.2: There will be a significant difference in the vocabulary scores of high scoring three-year-olds in homogeneous and heterogeneous day care and their self-identified best friend.

H3.3: There will be a significant difference in the vocabulary scores of low scoring three-year-olds in homogeneous and heterogeneous day care and their self-identified best friend.

A comparison of the PPVT-R scores of high scoring and low scoring subjects was made to determine if the scores differed significantly. Means and t-test values were computed; the results of the comparison are displayed in Table 12.

The mean value for the high scoring subjects was 54.4, while the mean value for the low scoring subjects was 34.4. The t value was -9.37 with a p value of .001. The test was significant; therefore, H3.1 was retained.

A comparison of PPVT-R scores of high scoring subjects and best friends was made to determine if they differed significantly. Means and t values were computed; the results of the comparison are displayed in Table 13.

The mean value for the high scoring subjects was 54.4, while the mean value for the best friends was 48.8. The t value was 1.61 and the p value was .131. The test was not significant; therefore, H3.2 was rejected.

A comparison of PPVT-R scores of low scoring subjects and best friends was

made to determine if they differed significantly. Means and t values were computed; the results of the comparison are displayed in Table 14.

Table 12

Means and t-Test Values for a Comparison of PPVT Scores
for High Scoring and Low Scoring Subjects

Homogeneous and Heterogeneous High Scoring		Homogeneous and Heterogeneous Low Scoring	
ID Number	Score	ID Number	Score
100	67	117	37
101	56	118	36
102	51	119	31
103	51	120	30
104	50	121	29
200	56	216	41
201	55	217	41
202	54	218	40
203	52	219	33
204	52	220	32
		221	28
mean	54.4		34.4
standard deviation	4.93		4.86

t = -9.37 p = .001

n = 10 high scoring
n = 11 low scoring

The mean value for the low scoring subjects was 34.4, while the mean value for their best friends was 48.9. The t value was -3.78 with a p value of .002. The test was significant; therefore, H3.3 was retained.

Since two of the alternative hypotheses were retained for procedure 3, the null hypothesis could not be retained. Therefore, H3 was rejected.

Table 13

Means and t-Test Values for a Comparison of PPVT Scores for High Scoring Subjects and Best Friends

Homogeneous Scores		Heterogeneous Scores	
Subject	Best Friend	Subject	Best Friend
67	45	56	42
56	48	55	48
51	47	54	66
51	46	52	66
50	45	52	35

mean = 54.4 for high scoring subjects
mean = 48.8 for best friends

t = 1.61 p = .131

n = 5 homogeneous high scoring subjects and 5 best friends
n = 5 heterogeneous high scoring subjects and 5 best friends

Procedure 4: Comparison of HOME Scores for High Scoring and Low Scoring Subjects

In procedure 4, home visits were made on the high scoring and low scoring subjects. During the home visit, the Home Observation for Measurement of the Environment-Revised (HOME) was used to measure the quality of the home environment. Home visits were made at the convenience of the family being visited. The visits

occurred primarily on weeknights or on weekends during the day. Every attempt was made to meet with both parents during the visit, but this was not always possible. The subject was always present during the visit.

Table 14

Means and t-Test Values for a Comparison of PPVT Scores for Low Scoring Subjects and Best Friends

Homogeneous Scores		Heterogeneous Scores	
Subject	Best Friend	Subject	Best Friend
37	51	41	73
36	47	41	63
31	50	40	42
30	45	33	50
29	27	32	49
		28	41

mean = 34.4 for low scoring subjects
mean = 48.9 for best friends

t = -3.78 p = .002

n = 5 homogeneous low scoring subjects and 5 best friends
n = 6 heterogeneous low scoring subjects and 6 best friends

The major hypothesis for procedure 4 is presented. Two alternative hypotheses are presented as well.

H4: There will be no significant difference in the HOME scores of three-year-olds in homogeneous and heterogeneous day care.

H4.1: There will be a significant difference in the HOME scores of three-year-olds in homogenous and heterogeneous day care.

H4.2: There will be a significant difference in the HOME scores of high scoring three-year-olds (in homogeneous and heterogeneous day care) and low scoring three-year-olds (in homogeneous and heterogeneous day care).

HOME scores for high scoring and low scoring subjects in the homogeneous centers are presented in Table 15, while those for subjects in heterogeneous centers are in Table 17. Visits were made with the families of eight high scoring subjects and eight low scoring subjects. The remaining families declined the home visit.

Table 16 presents the demographic information compiled for the homogeneous subjects in conjunction with the administration of the HOME, while Table 18 presents the demographic information for the heterogeneous subjects. The families were asked to complete a brief questionnaire concerning their income during 1990 (See APPENDIX A).

Table 19 presents a summary of the scores that were obtained on the HOME during the home visits. Subjects are identified by type of center and whether they are part of the high scoring group or low scoring group. Subscales are listed, and the total possible score for each subscale and total score are indicated. Scores for each subject are listed under each subscale and under the total score obtained. Items number 8 (At least 10 books are visible in the apartment) and number 37 (Child is encouraged to learn to read a few words) were deleted from the HOME with the permission of the author, Bettye Caldwell (personal communication, June 9, 1992). For item number 8, it was not possible to see a room where books were kept in all the homes visited. For item number 37, many parents viewed this as an inappropriate question since their children were only three years of age. Since the inventory was for children aged three to six, it was determined that a question about reading was more appropriate for six-year-olds than for three-year-olds.

The Mann-Whitney U was the statistic used to compare the scores obtained in procedure 4. The small number of subjects in procedure 4 would not represent a normal distribution and would therefore necessitate the use of the Mann-Whitney U.

Table 15

HOME Scores for High Scoring and Low Scoring Subjects in Heterogeneous Centers

Sub-scale	Learning Stimulation	Language Stimulation	Physical Environment	Warmth and Acceptance	Academic Stimulation	Modeling	Variety in Experience	Acceptance	Total Score	Weighted Means
Total Possible	(10)	(7)	(7)	(7)	(4)	(5)	(9)	(4)	(53)	(7.26)
ID Number										
High										
100	10	7	7	7	4	5	8	4	52	7.09
101	10	7	7	7	4	5	9	4	53	7.26
103	10	7	7	7	4	5	9	4	53	7.26
104	10	7	7	7	4	5	7	4	51	6.92
Low										
117	9	7	6	7	4	5	9	4	51	6.92
118	8	7	7	7	4	5	9	4	52	7.09
119	8	7	7	7	4	5	8	4	50	6.72
120	9	6	4	7	3	5	8	3	45	6.23

Note: Items 8 and 37 were deleted from the HOME, since they could not be observed for all subjects.

n = 4 high scoring
n = 4 low scoring

Two subjects were not available for HOME interviews.

Table 16

HOME Demographics for High Scoring and Low Scoring Subjects
in Homogeneous Centers

ID Number	Family Income	Siblings	Father's Education	Mother's Education
High				
100	$50,000+	0	Ph.D.	Ph.D.
101	$50,000+	2+P	J.D.	M.A.+
103	$50,000+	1-	M.A.	M.A.
104	$50,000+	1+P	M.S.	B.A.
Low				
117	$50,000+	0	H.S.+	B.S.+
118	$50,000+	O	B.S.	H.S.+
119	$50,000+	0	H.S.+	B.A.
120	$50,000+	1-	B.S.	B.S.

n = 4 high scoring
n = 4 low scoring

Two subjects were not available for HOME interviews.

Siblings: + represents older sibling
- represents younger sibling
P represents sibling only part-time in the home

Education: Ph.D. represents Doctor of Philosophy Degree
J.D. represents Doctor of Law Degree
M.A. represents Master of Arts Degree
M.S. represents Master of Science Degree
B.A. represents Bachelor of Arts Degree
B.S. represents Bachelor of Science Degree
H.S. represents High School Diploma
+ represents hours/credits beyond a level

Table 17

HOME Scores for High Scoring and Low Scoring Subjects in Heterogeneous Centers

Subscale	Learning Stimulation	Language Stimulation	Physical Environment	Warmth and Acceptance	Academic Stimulation	Modeling	Variety in Experience	Acceptance	Total Score	Weighted Means
Total Possible	(10)	(7)	(7)	(7)	(4)	(5)	(9)	(4)	(53)	(7.26)
ID Number										
High										
200	10	7	7	7	4	5	9	4	53	7.26
202	9	7	7	6	4	5	9	4	51	6.94
203	10	7	7	6	4	4	8	4	50	7.01
204	6	5	4	7	0	4	8	4	38	6.04
Low										
216	9	7	7	7	4	5	9	4	52	7.08
219	8	7	7	6	4	4	7	4	47	6.32
220	6	7	3	5	3	5	9	4	42	5.64
221	9	7	6	7	4	4	9	4	50	6.84

Note: Items 8 and 37 were deleted from the HOME, since they could not be observed for all subjects.

n = 4 high scoring
n = 4 low scoring

Three subjects were not available for HOME interviews.

Table 18

HOME Demographics for High Scoring and Low Scoring Subjects
in Heterogeneous Centers

ID Number	Family Income	Siblings	Father's Education	Mother's Education
High				
200	$50,000+	0	J.D.	M.A.
202	$50,000+	1+	M.A.	B.S.
203	$50,000+	0	B.S.+	B.S.
204	$40,000 to $44,999	1+	H.S.	M.A.+
Low				
216	$50,000+	1+	B.S.	M.A.
219	$45,000 to $49,999	1+	H.S.	A.D.
220	$45,000 to $49,999	1-	H.S.+	A.D.
221	$50,000+	1+	Ph.D.	M.S.

n = 4 high scoring
n = 4 low scoring

Three subjects were not available for HOME interviews.

Siblings: + represents older sibling
- represents younger sibling
P represents sibling only part-time in the home

Education: Ph.D. represents Doctor of Philosophy Degree
J.D. represents Doctor of Law Degree
M.A. represents Master of Arts Degree
M.S. represents Master of Science Degree
B.A. represents Bachelor of Arts Degree
B.S. represents Bachelor of Science Degree
A.D. represents Associate Degree
H.S. represents High School Diploma
+ represents hours/credits beyond a level

Table 19

Summary of HOME Scores for All Subjects

Subscale	Learning Stimulation	Language Stimulation	Physical Environment	Warmth and Acceptance	Academic Stimulation	Modeling	Variety in Experiences	Acceptance	Total Score
Total Possible	(10)	(7)	(7)	(7)	(4)	(5)	(9)	(4)	(53)
ID Number									
High Homogeneous									
100	10	7	7	7	4	5	8	4	52
101	10	7	7	7	4	5	9	4	53
103	10	7	7	7	4	5	9	4	53
104	10	7	7	7	4	5	7	4	51
High Heterogeneous									
200	10	7	7	7	4	5	9	4	53
202	9	7	7	6	4	5	9	4	51
203	10	7	7	6	4	4	8	4	50
204	6	5	4	7	0	4	8	4	38
Low Homogeneous									
117	9	7	6	7	4	5	9	4	51
118	9	7	7	7	4	5	9	4	52
119	8	7	7	7	4	5	8	4	50
120	9	6	4	7	3	5	8	3	45
Low Heterogeneous									
216	9	7	7	7	4	5	9	4	52
219	8	7	7	6	4	4	7	4	47
220	6	7	3	5	3	5	9	4	42
221	9	7	6	7	4	4	9	4	50

Note: Items 8 and 37 were deleted from the HOME, since they could not be observed for all subjects.

n = 8 high scoring subjects
n = 8 low scoring subjects

Table 20 presents the results of the Mann-Whitney U for the HOME scores compared by center type. Two subscales were found to be significant. They were Warmth and Affection with a U of 16.0 and a p of .0265, and Modeling with a U of 16.0 and a p of .0253. The remaining subscales and total score were not significant. Since two subscales were significant, H4.1 was retained.

Table 20

Results of Mann-Whitney U for Comparison of HOME Scores for Subjects Grouped by Center Type

Subscale		U value	Corrected for Ties 2-tailed P
I.	Learning Stimulation	20.0	.1826
II.	Language Stimulation	31.5	.9373
III.	Physical Environment	27.0	.5223
IV.	Warmth and Affection*	16.0	.0265
V.	Academic Stimulation	27.5	.4875
VI.	Modeling*	16.0	.0253
VII.	Variety in Experience	28.5	.6797
VIII.	Acceptance	28.0	.3173
	Total	19.0	.1671
Demographic Data			
Father's Education		26.0	.5221
Mother's Education		29.0	.7452

* significant at the .05 level of confidence

n = 8 homogeneous subjects
n = 8 heterogeneous subjects

Table 21 presents the results of the Mann-Whitney U for the HOME scores compared by high scoring and low scoring subjects. Only one subscale, Learning Stimulation, was found to be significant. A U value of 10.0 and a p value of .0145 were computed for Learning Stimulation. Since Learning Stimulation was found to be

significant, H4.2 was retained. Since both H4.1 and H4.2 were retained, H4 was rejected.

Table 21

Results of Mann-Whitney U for Comparison of HOME Scores for Subjects Grouped by High Scoring and Low Scoring

Subscale		U value	Corrected for Ties 2-tailed P
I.	Learning Stimulation*	10.0	.0145
II.	Language Stimulation	31.5	.9273
III.	Physical Environment	20.5	.1411
IV.	Warmth and Affection	31.0	.8897
V.	Academic Stimulation	29.0	.6434
VI.	Modeling	32.0	1.0000
VII.	Variety in Experience	28.5	.6797
VIII.	Acceptance	28.0	.3173
	Total	18.0	.1368
Demographic Data			
Father's Education*		13.5	.0484
Mother's Education		15.0	.0655

* significant at the .05 level of confidence

n = 8 high scoring subjects
n = 8 low scoring subjects

Summary

In this section, the hypotheses for each procedure of this study will be restated. The decision rule for each hypothesis will be given. All tests were performed at an alpha level of .05.

Hypothesis Tested		Decision Rule
H1:	There will be no significant difference in the dimensions of quality of the ECERS between homogeneous and heterogeneous day care centers.	Null retained

H1.1: There will be a significant difference in the dimensions of quality of the ECERS between homogeneous and heterogeneous day care centers. — Alternative rejected

H2: There will be no significant difference in the vocabulary scores of three-year-old children in homogeneous and heterogeneous day care. — Null retained

H2.1: Three-year-olds in heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-olds in homogeneous day care. — Alternative rejected

H2.2: Three-year-old girls in homogeneous and heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-old boys in homogeneous and heterogeneous day care. — Alternative rejected

H2.3: Three-year-old girls in heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-old girls in homogeneous day care. — Alternative rejected

H2.4: Three-year-old boys in heterogeneous day care will score significantly higher on a test of vocabulary development than three-year-old boys in homogeneous day care. — Alternative rejected

H3: There will be no significant difference in the vocabulary scores of high scoring three-year-olds (in homogeneous and heterogeneous day care) and low scoring three-year-olds (in homogeneous and heterogeneous day care). — Null rejected

H3.1: High scoring three-year-olds (in homogeneous and heterogeneous day care) will score significantly higher on a test of vocabulary development than low scoring three-year-olds (in homogeneous and heterogeneous day care). — Alternative retained

H3.2: There will be a significant difference in the vocabulary scores of high scoring three-year-olds in homogeneous and heterogeneous day care and their self-identified best friend. — Alternative rejected

H3.3: There will be a significant difference in the vocabulary scores of low scoring three-year-

olds in homogeneous and heterogeneous day care and their self-identified best friend. — Alternative retained

H4: There will be no significant difference in the HOME scores of three-year-olds in homogeneous and heterogeneous day care. — Null rejected

H4.1: There will be a significant difference in the HOME scores of three-year-olds in homogeneous and heterogeneous day care. — Alternative retained

H4.2: There will be a significant difference in the HOME scores of high scoring three-year-olds (in homogeneous and heterogeneous day care) and low scoring three-year-olds (in homogeneous and heterogeneous day care). — Alternative retained

Chapter V will discuss these findings and their implications for further research. Implications for practical use will be discussed as well.

CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

The purpose of this study was to look at microsystem contextual factors that contribute to the vocabulary development of three-year-old children in day care. The study was conducted in a series of procedures (see Figure 3) with children in homogeneous and heterogeneous day care centers. The first procedure involved the administration of the Early Childhood Environment Rating Scale (ECERS) to the eight day care centers that became a part of the study. The second procedure involved the testing of 44 three-year-old subjects attending the centers with the Peabody Picture Vocabulary Test-Revised (PPVT-R). In procedure 3, 21 subjects with the five highest and lowest scores on the PPVT-R were asked to identify a best friend at the center. The self-identified best friend was also administered the PPVT-R. Procedure 4 involved the administration of the Home Observation for Measurement of the Environment-Revised (HOME) to 16 families of high scoring and low scoring subjects during a home visit.

Discussion of the Findings

Procedure 1-ECERS

The administration of the ECERS in procedure 1 found no significant differences on the dimensions of quality between homogeneous and heterogeneous centers. Of particular importance to this study was the fact that no significant differences were found on the subscale for Language/Reasoning Experiences (see APPENDIX A). The

statistics would indicate that the children in both center types were receiving language stimulation experiences of similar quality.

A typical daily schedule was developed (see APPENDIX C) based on a composite of the daily schedules of all the centers in the study. The sequence of daily activities was basically the same for all centers, although the times varied slightly among the centers. Therefore, there was no difference in the microsystem contextual factor of center type with respect to activities conducted within the center. Both homogeneous and heterogeneous centers engaged in similar types of activities throughout the day.

Procedure 2-PPVT-R

In procedure 2, the PPVT-R was administered to 22 homogeneous subjects and 22 heterogeneous subjects. It was assumed a priori that three-year-olds in heterogeneous day care would achieve higher scores in vocabulary by benefit of exposure to older language models in their classroom at the center. However, statistical analyses showed no significant differences in the vocabulary scores of the three-year-olds by center type.

In viewing the Day Care Center Demographics (see APPENDIX C), it can be seen that, in actuality, homogeneous centers were not totally homogeneous. The directors of the centers reported that very early in the morning as children arrived, a staff person grouped all the children together in one room until enough staff and children had arrived to send the children to their appropriate classrooms. Similarly, as children departed in the evening and the numbers of children per classroom became smaller, remaining children were again grouped together in one room with a staff person. The directors of the homogeneous centers were asked to estimate what per cent of the time the three-year-olds were mixed with other ages. The percent varied from 10 percent to 20

percent. Therefore, periodically during the day, there was no difference in the micro-system contextual factor of center type with respect to exposure to older language models.

Classroom size and teacher/student ratio (see Day Care Center Demographics, APPENDIX C) tended to favor the children in the homogeneous centers. Two of the homogeneous centers had the smallest classroom size and best teacher/student ratio of all eight centers in the study. This resulted in only four children in one center and six children in another competing for adult attention and interaction as opposed to seven, eight, and ten children seeking interaction with one adult. Some studies have shown that adult-child interaction in day care centers is more important for language development than child-child interaction (Bates, 1975; Ruopp et al., 1979; McCartney, 1984; Howes and Rubenstein, 1985). Therefore, there was a difference in the microsystem contextual factor of center type with respect to the facilitation of language development through adult-child interaction.

This study did not investigate the number and variety of microsystem contextual settings that the 44 subjects in procedure 2 were exposed to outside the day care center. These other settings may provide opportunities for exposure to language experiences that would enhance vocabulary development. Although in procedure 4 home visits were made on a portion of the subjects, the number of subjects would not present a normal distribution and could not be said to be representative of all the children in procedure 2. Future research could utilize an ecomap to determine other environmental settings that influence language development. These settings could be evaluated for their importance in the development of vocabulary.

The vocabulary scores of boys in day care were compared with the vocabulary scores of girls in day care. It was assumed a priori that girls' scores would exceed boys'

scores because past research has indicated that girls develop language skills earlier than boys (McCarthy, 1953; Ervin-Tripp, 1966; Garai and Scheinfeld, 1968; Reppucci, 1971; Maccoby and Jacklin, 1974). However, statistical analyses found no significant differences in the vocabulary scores of the boys and girls in this study. Nor did statistical analyses find significant differences between girls by center type and boys by center type.

McCarthy (1953) found that differences between boys and girls in language development were seldom statistically significant. Ervin-Tripp (1966) reported that studies done in America with well-designed samples found very slight differences between boys and girls. Garai and Scheinfeld (1968) reviewed studies that indicated greater verbal fluency for females from the age of twelve months through preschool, elementary school, high school and college. Verbal fluency included correct language usage, sentence complexity, grammatical structure, spelling, and articulation. All of these are aspects of expressive language rather than receptive language.

In this study, the Peabody Picture Vocabulary Test-Revised (PPVT-R) was administered to all subjects. The PPVT-R is a test of receptive vocabulary development and not a test of verbal ability. Garai and Scheinfeld (1968) stated that although some studies reported girls exceeding in all areas of language development, especially verbal ability, the majority of studies they reviewed found boys superior to girls in vocabulary development from the age of three to five years and beyond. Although Fitzgerald, Strommen, and McKinney (1982) also reported studies finding girls surpassing boys in nearly all aspects of language development, they did indicate that knowledge is lacking as to long term stability of differences. For example, they reported that at ages two and three girls have larger vocabularies than boys, but the difference disappears by age four.

Vocabulary development, an aspect of receptive language development, was the only area of language that was assessed in this study. No measure of expressive language or verbal fluency was investigated. In future studies, assessment of both receptive and expressive language would provide a more complete picture of language development.

Procedure 3-PPVT-R with Best Friend

Children from both center types with the top five and bottom five scores on the PPVT-R became the subjects for procedures 3 and 4. There were ten subjects in the homogeneous centers and eleven subjects in the heterogeneous centers (two children had identical scores). Through a best friend oral questionnaire consisting of five questions, these children identified their best friend at the center. Best friends were then tested with the PPVT-R to determine their level of vocabulary development.

Except for one outlying high score of 67 for the homogeneous group, the range of scores was almost identical for the two center types (see Tables 5 and 6). Statistical analyses of the scores of the high scoring and low scoring subjects (see Table 12) found a significant difference between the high and low scores. A significant difference was assumed a priori since the scores were, by definition, highest and lowest.

The range of scores for homogeneous best friends was slightly smaller than for homogeneous subjects (see Table 10). However, the range of scores for heterogeneous best friends was much greater than for that of heterogeneous subjects (see Table 11). This was to be expected since the heterogeneous subjects were restricted by the age requirements of the study but had older children available to choose as best friends.

Statistical analyses indicated that high scoring three-year-olds chose best friends who had similar ability in vocabulary development (see Table 13), while 10 out of the 11 low scoring three-year-olds chose best friends with higher vocabulary

ability (see Table 14). Although the researcher asked the children to identify their best friend, she did not ask the children "why" they chose that person as a best friend. In many cases, the person named as best friend was not the person named for the other four questions on the questionnaire. Therefore, the researcher can only speculate as to why high scoring subjects sought best friends of similar ability, while low scoring subjects sought best friends of higher ability.

Oden (1982) reviewed research on peer relationships and how they develop in childhood. A number of correlational studies indicated that children like to play with or be friends with other children who are similar to them in characteristics such as age, sex, race, and cultural background. Similarly, Kostelnik, Stein, Whiren, and Soderman (1988) indicated that a child's selection of a friend may be the result of name, physical appearance, race, gender, age, ability and attitude.

In viewing Tables 10 and 11 for ages and sex of subjects and best friends, it can be seen that two thirds of the children chose a best friend of the same sex. Seventy-one percent of the children chose a best friend who was older, while 24 percent chose a best friend who was younger. Only one child chose a best friend who was exactly the same age.

A comparison of the ages of high and low scoring subjects and their best friend was made to determine if the ages of subjects and best friends differed significantly. Means and t-test values were computed; the results of the comparison are displayed in Table 22 for high scoring subjects and in Table 23 for low scoring subjects.

Table 22

Means and t-Test Values for a Comparison of Ages in Months for Best Friends of High Scoring Subjects

	Homogeneous Ages		Heterogeneous Ages	
	Subject	Best Friend	Subject	Best Friend
	42	44	40	49
	41	42	45	58
	44	50	45	56
	47	49	43	50
	36	44	41	49
mean age	42.0	45.8	42.8	52.4

mean age of subjects (grouped) = 42.4
mean age of best friends (grouped) = 49.1
t = 2.67 p = .028

n = 10 high scoring subjects (grouped)
n = 10 best friends (grouped)

The mean age in months for high scoring subjects grouped together was 42.4, while the mean age for best friends was 49.1. The t value was 2.67 and the p value was .028.

The mean age in months for low scoring subjects grouped together was 40.7, while the mean age for best friends was 42.03. The t value was 1.64 and the p value was .136.

The statistical analyses determined a significant difference in the ages of high scoring subjects and best friends. There was no significant difference in the ages of low scoring subjects and best friends. High scoring subjects chose best friends of similar vocabulary ability but who were significantly older. Low scoring subjects chose best friends with significantly higher vocabulary ability but who were similar in age.

Table 23

Means and t-Test Values for a Comparison of Ages in Months
for Best Friends of Low Scoring Subjects

Homogeneous Ages		Heterogeneous Ages	
Subject	Best Friend	Subject	Best Friend
46	44	45	50
38	40	43	50
36	36	47	40
45	44	39	47
36	33	37	36
		36	45
mean age 40.2	39.4	41.2	44.7

mean age of subjects (grouped) = 40.7
mean age of best friends (grouped) = 42.03
t = 1.64 p = .136

n = 11 low scoring subjects (grouped)
n = 11 best friends (grouped)

In this study, the low scoring subjects' choice of best friend appears to support the findings of Oden, 1982, and Kostelnik et al., 1988. Even though the best friend had significantly higher vocabulary ability, the friendship may have developed because of similarity in age with no relationship to the context of vocabulary ability.

High scoring subjects chose best friends with similar vocabulary ability but who were significantly older. Pepler, Corter and Abramovitch (1982) reported that older children tend to direct the interactions of younger children. It may be that the high scoring subjects were not the "chooser" but rather the one "chosen" by an older best friend who could direct them. As was the case with the low scoring subjects, the choice of best friend may have been unrelated to the context of vocabulary ability.

It is difficult to determine, based on one measure of vocabulary ability, the scope of the relationship between subjects and best friends. This study compared children on their knowledge of vocabulary but did not address their use of it for communication with one another. No attempt was made to measure expressive language skills used during interaction with a best friend. Nor was an attempt made to determine if choice of best friend was based on a child's ability as communication partner or his ability as playmate. Although the subjects were viewed at the microsystem level in the day care setting, they were not viewed in their "pattern of activities, roles, and interpersonal relations in a given face-to-face setting..." (Bronfenbrenner, 1989, p. 227). Future research comparing the language skills of children and their best friend would benefit from an assessment of both receptive and expressive language ability along with observation of interaction to determine the relationship of play behavior and verbal communication.

Procedure 4- HOME

In procedure 4, home visits were made on the high scoring and low scoring subjects of procedure 3. Sixteen families were available for home visits. During the home visits, the Home Observation for Measurement of the Environment-Revised (HOME) was administered.

Tables 15 and 17 present the values for the subscales and total score for the HOME for homogeneous and heterogeneous subjects, respectively. It should be noted that the term "Warmth and Affection" was used by the authors in the summary of the HOME, but the term "Warmth and Acceptance" was used in the actual inventory. The researcher assumed that the authors used the terms interchangeably. Statistical analyses determined that there was a significant difference between the homogeneous and

heterogeneous subjects on the subscale of Warmth and Affection and the subscale of Modeling (see Table 20). Warmth and Affection involved the incorporation of verbal interaction, physical contact, and aspects of self-esteem, while Modeling involved the incorporation of values and appropriate behaviors (see APPENDIX A). All subjects in homogeneous centers received the total possible score for these subscales. Fifty percent of the heterogeneous subjects received less than the total possible score for both of these subscales. Although the sample size is small, these results would indicate that in this study the homes of some of the heterogeneous subjects may have provided lower quantities and/or quality of verbal interaction, physical contact and affection, development of self esteem, incorporation of values, and modeling of appropriate behaviors. However, these factors apparently do not affect vocabulary development, since the children's vocabulary scores did not differ significantly by center type.

Statistical analyses determined that there was a significant difference in Learning Stimulation between high scoring and low scoring subjects (see Table 21). Learning stimulation involved the incorporation of toys, puzzles, records, games, books, papers and magazines as items to promote learning in the home (see APPENDIX A). The scores for the low scoring subjects were significantly lower than the scores for the high scoring subjects. Although the sample size is small, these results can be interpreted to indicate that the subjects in the low scoring group received less exposure to a stimulating learning environment in their homes. Since a significant difference was found in the vocabulary scores of high scoring and low scoring subjects, learning stimulation in the home may play a major role in vocabulary development.

In reviewing the demographic data presented in Tables 16 and 18, it can be seen that some subjects in the low scoring group had lower family income levels than most

subjects in the high scoring group. While these subjects' families had definite income levels of $45,000 to $49,000, subjects with income levels listed as $50,000 and more could actually have incomes substantially higher than $50,000. Therefore, more money was available in the homes of high scoring subjects to purchase items that stimulate learning and possibly promote vocabulary development.

Tables 16 and 18 also indicate that five of the high scoring children were the only child in the family most, if not all, of the time. Five of the low scoring children, however, had another sibling in the home. Studies of birth order and language development (Clausen, 1966; Dunn, 1983) indicate that a first-born child and an only child tend to speak earlier and more precisely. They tend to receive more verbal interaction from their parents than any later born child, who must compete for the shared attention of the parents. In addition, parents continue to pitch their conversation at the level of the first-born. In this study, the subject with the highest vocabulary score was an only child with highly educated parents. The subject interacted much of the time with her parents and with her parents' friends.

Certainly parents' education can be interpreted as a major factor in the discrepancy in learning stimulation and vocabulary development between high scoring and low scoring subjects. Ninety-four percent of the parents of the high scoring subjects had college degrees consisting of a bachelor's degree or higher, while only 56 percent of the parents of low scoring subjects had college degrees at the bachelor's level or higher. Thirty-one percent of the parents of the low scoring subjects had only a high school diploma, while only six percent of the parents of the high scoring subjects had only a high school diploma.

Note that father's education differed significantly between high scoring and low scoring subjects (see Table 21). Eighty-eight percent of the fathers of high

scoring subjects had college degrees, while only 50 percent of the fathers of low scoring subjects had college degrees. Lynn (1974) suggested that well-educated men, as opposed to less-educated men, are able to promote educational achievement in their children. Lynn stated:

> When the father's occupational level is high and when the parents are well educated they are more apt to have both the interest and the means to provide for the child's intellectual needs by reading to him, taking him to interesting places, providing him with a separate play area and a library for his books, setting high educational standards, and making financial preparations to send him to college. (p. 78)

In a meta-analysis of home environments, Gottfried (1984) concluded that children from relatively higher socioeconomic status families receive an intellectually more advantageous home environment. Consistent with the relationship between SES and home environment was the finding that mothers of higher intelligence, as determined by a test of vocabulary, were able to provide their children with an environment that was more enriched.

Caldwell and Bradley (1984), the authors of the HOME, found moderate correlations between maternal and paternal education and several HOME subscales. They found that toys, games and materials, including reading materials, that were incorporated into learning stimulation showed the highest overall correlation with SES measures. The correlation between parental education and learning stimulation was highly significant.

Though the number of subjects was small, this study supports the findings of Gottfried (1984) and Caldwell and Bradley (1984). Father's education and learning stimulation, based on the HOME assessment, were significant factors associated with language development. Mother's education was not found to be significant in this study,

possibly due to the small number of subjects.

During the home visits with the families of the high scoring and low scoring subjects, the researcher found that the HOME did not look at family dynamics of the home in terms of interpersonal relations between the parents. The researcher observed that in some of the homes that were visited, the relationship between the parents seemed to be strained for various reasons. Such a disruption in the relationship of the parents could have detrimental effects on their ability to interact with their child. The HOME was not sensitive to this aspect of family dynamics. In conducting future research, an instrument that is capable of assessing family dynamics that impact upon the HOME should be utilized along with the HOME. In this study, the researcher incidentally learned of a recent, serious family crisis in one of the homes of a lower scoring subject. Even though the child scored well on the HOME, she was a low scoring subject on the PPVT-R. The interview, rather than the HOME, was able to determine that the change in the status of the home environment might be affecting the vocabulary score.

The use of the HOME determines the presence or absence of the factors stated in the inventory. It does not, in itself, ascertain the depth of these factors or how they impact upon one another. In viewing the home environment at the microsystem level, it is equally important, if not more so, to determine how items such as books are used, rather than that they are visible. An instrument that can measure the depth of experiences at the microsystem level can provide much needed additional information in a study of the home environment.

It should be reiterated that this study investigated vocabulary development which is only one aspect of receptive language development. The judgment of a child's language ability should not be based solely on one aspect, nor should it be based solely on one assessment instrument. To view a child's language development completely, both

receptive and expressive abilities should be determined through a variety of measures.

Summary of the Findings

The findings of the study are presented in this section. Results should be interpreted with caution due to the small number of subjects.

1. Three-year-old children in heterogeneous day care displayed similar vocabulary scores to three-year-old children in homogeneous day care.

2. Three-year-old girls in homogeneous and heterogeneous day care displayed similar vocabulary scores to three-year-old boys in homogeneous and heterogeneous day care.

3. The PPVT-R was sensitive enough to distinguish a significant difference in the vocabulary scores of high scoring three-year-olds and low scoring three-year-olds.

4. High scoring three-year-olds identified best friends of similar language ability based on a test of vocabulary development.

5. Low scoring three-year-olds identified best friends of higher language ability based on a test of vocabulary development.

6. Learning stimulation and father's education were significant factors in the home environment that were associated with vocabulary development.

Conclusions

The purpose of this study was to look at microsystem contextual factors that contribute to the vocabulary development of three-year-old children in day care. All of the day care centers in this study were of equal quality (as assessed on the ECERS) and of high quality as defined by Hilliard (Caldwell and Hilliard, 1985).

In this study, receptive vocabulary was assessed by the PPVT-R. Vocabulary

ability of three-year-olds was viewed in the context of day care type, interaction with a best friend, and the home environment.

The vocabulary scores of the initial 44 subjects did not differ significantly by center type or by gender. In this study, the children received similar language experiences in both homogeneous and heterogeneous centers. They undoubtedly benefitted from the numerous other environments they were exposed to outside the center, but environments other than the homes of the high scoring and low scoring subjects were not explored as part of this study.

Much additional information was gained by studying the 21 children who achieved the highest and lowest scores on the PPVT-R. Children with the highest vocabulary scores identified best friends with similar vocabulary ability who were significantly older. The children with the lowest scores, however, identified a best friend with higher vocabulary ability of similar age. It could not be determined from this study whether choice of best friend was based on vocabulary ability or other factors.

The use of the HOME on assessments of the home environments of 16 subjects provided information relative to factors in the home environment that may affect vocabulary development. Learning stimulation and father's education were significant factors associated with vocabulary development.

Implications for Further Research

This study was able to answer questions relative to effects of the day care environment and the home environment on vocabulary development. It did not, however, explore the number and types of other environments to which the subjects of the study were exposed. Future research would benefit from a more in-depth look at other contextual factors that affect vocabulary development as well. An ecomap would

provide a method of determining other environmental settings within the microsystem that may enhance vocabulary development.

The only aspect of language development that was assessed was receptive vocabulary. This presents only a partial picture of a child's language ability. Both receptive and expressive language skills need to be assessed to develop a complete picture of a child's level of language ability.

The best friend questionnaire was able to determine whom a subject identified as best friend. It was unable to determine why the best friend was identified. Observation of interaction between a subject and best friend may be able to provide insight into the reasons behind the friendship. Such friendships may be based on language ability or numerous other factors.

This study suggests a possible relationship between children's vocabulary development and parental intelligence and education, income, and available resources such as toys, books, and other stimulating materials. It appears that parents of higher intelligence and education level are able to secure ample income to provide material resources that stimulate vocabulary development and, subsequently, language development. However, this study did not determine which of these factors is most important in the development of receptive vocabulary. Future research should attempt to delineate the importance of each factor.

The HOME was not sensitive to aspects of the interpersonal relationships of the parents or the family dynamics during the home visits. Nor was the HOME able to determine the depth of materials and experiences; rather, it simply determined the presence or absence of materials and experiences. These would appear to be important variables that impact on vocabulary development but were not explored in this study. Future research may need to include instruments in addition to, or as an alternative to,

the HOME that would delve into these types of factors more thoroughly.

Finally, only the subjects were administered the PPVT-R. However, Gottfried (1984) noted that mothers of relatively higher intelligence, as measured by vocabulary, were able to provide a more enriched environment for their children. In this study, father's education was a significant factor in achieving a high score on the PPVT-R. Although this study assumed intelligence based on level of education, future research may want to corroborate these findings by administration of a test of general intelligence along with the PPVT-R to the mother and father in addition to the subject.

Implications for Practical Use

The results of this study indicate that homogeneous and heterogeneous day care centers of equally high quality provide similar experiences that enhance receptive vocabulary development in three-year-old children. High quality centers are those in which children are well nourished, healthy, and safe with adequate space, materials and equipment to provide stimulation for learning. Centers that have a small adult-child ratio provide more opportunites for children to interact with adults and model their language.

Children develop proficient vocabulary skills in a home environment that provides high levels of learning stimulation through toys that teach color, size, shape, and number; through access to children's music; and through access to information available in books, magazines, and newspapers. However, parental education has a positive relationship to learning stimulation as well. Parents who are able to interact with their children while providing opportunities and materials that stimulate learning will enhance the development of their children's language. Materials and opportunites cannot enhance language development in and of themeselves; they are simply the

resources around which human communication and language learning take place.

APPENDICES

APPENDIX A

TEST INSTRUMENTS

APPENDIX A

EARLY CHILDHOOD ENVIRONMENT RATING SCALE (ECERS)

THELMA HARMS & RICHARD M. CLIFFORD

SUMMARY OF ITEMS FOR EACH SUBSCALE

Personal Care

Greeting/departing
Meals/snacks
Nap/rest
Diapering/toileting
Personal grooming

Furnishings/Display

Furnishings (routine)
Furnishings (learning)
Furnishings (relaxation)
Room arrangement
Child related display

Language/Reasoning

Understanding language
Using language
Reasoning
Informal language

Fine/Gross Motor

Fine motor
Supervision (Fine motor)
Gross motor space
Gross motor equipment
Gross motor time
Supervision (Gross motor)

Creative Activities

Art
Music/movement
Blocks
Sand/water
Dramatic play
Schedule (creative)
Supervision (creative)

Social Development

Space (alone)
Free play
Group time
Cultural awareness
Tone
Exceptional Provisions

Adult Needs

Adult personal area
Adult opportunities
Adult meeting area
Parent provisions

APPENDIX A

PEABODY PICTURE VOCABULARY TEST-REVISED (FORM-L)

LLOYD M. DUNN & LEOTA M. DUNN

SUMMARY OF TEST ITEMS

1	bus	40	parachute	79	cooperation
2	hand	41	furry	80	scalp
3	bed	42	vegetable	81	twig
4	tractor	43	shoulder	82	weasel
5	closet	44	dripping	83	demolishing
6	snake	45	claw	84	balcony
7	boat	46	decorated	85	locket
8	tire	47	frame	86	amazed
9	cow	48	forest	87	tubular
10	lamp	49	faucet	88	tusk
11	drum	50	group	89	bolt
12	knee	51	stem	90	communication
13	helicopter	52	vase	91	carpenter
14	elbow	53	pedal	92	isolation
15	bandage	54	capsule	93	inflated
16	feather	55	surprised	94	coast
17	empty	56	bark	95	adjustable
18	fence	57	mechanic	96	fragile
19	accident	58	tambourine	97	assaulting
20	net	59	disappointment	98	appliance
21	tearing	60	awarding	99	pyramid
22	sail	61	pitcher	100	blazing
23	measuring	62	reel	101	hoisting
24	peeling	63	signal	102	arch
25	cage	64	trunk	103	lecturing
26	tool	65	human	104	dilapidated
27	square	66	nostril	105	contemplating
28	stretching	67	disagreement	106	canister
29	arrow	68	exhausted	107	dissecting
30	tying	69	vine	108	link
31	nest	70	ceremony	109	solemn
32	envelope	71	casserole	110	archery
33	hook	72	vehicle	111	transparent
34	pasting	73	globe	112	husk
35	patting	74	filing	113	utensil
36	penguin	75	clamp	114	citrus
37	dewing	76	reptile	115	pedestrian
38	delivering	77	island	116	parallelogram
39	diving	78	spatula	117	slumbering

118 peninsula
119 upholstery
120 barricade
121 quartet
122 tranquil
123 abrasive
124 fatigued
125 spherical
126 syringe
127 feline
128 arid
129 exterior
130 constellation
131 cornea
132 mercantile
133 ascending
134 filtration
135 consuming
136 cascade
137 perpendicular
138 replenishing
139 emission
140 talon
141 wrath
142 incandescent
143 arrogant
144 confiding
145 rhombus
146 nautical
147 tangent
148 inclement
149 trajectory
150 fettered
151 waif
152 jubilant
153 pilfering
154 repose
155 carrion
156 indigent
157 convex
158 emaciated
159 divergence
160 dromedary
161 embellishing
162 entomologist
163 constrain
164 infirm
165 anthropoid
166 specter
167 incertitude
168 vitreous
169 obelisk
170 embossed
171 ambulation
172 calyx
173 osculation
174 cupola
175 homunculus

APPENDIX A

BEST FRIEND QUESTIONNAIRE

Name_____ Center_____

Date _____ Respondent: ( ) Child ( ) Teacher

"I am going to ask you about some of the things you do here at the center":

1) "When you play inside, who do you like to play with the best?"_____

2) "When you play outside, who is the best person to play with?"_____

3) "Who do you think likes to play with you the most?" _____

4) "Who do you like to sit by when you eat?" _____

5) "Here at the center, who is your best friend?" _____

(Note: If the child gives more than one name, the examiner will ask the child to name just one person and repeat the question.)

Teachers: Please complete this form on the above named child, based on your observations of his/her behavior over the past year.

APPENDIX A

HOME INVENTORY FOR FAMILIES OF PRESCHOOLERS (THREE TO SIX)
BETTYE M. CALDWELL & ROBERT H. BRADLEY

Family Name_____Date_____Visitor_____

Child's Name_____Birthdate_____Age_____Sex_____

Caregiver for visit_____Relationship to child_____

Family composition_____
(Persons living in household, including sex and age of children)

Family Ethnicity_____ Language Spoken_____ Maternal Education_____ Paternal Education___

Is Mother employed?_____ Type of work when employed_____ Is Father employed?_____ Type of Work when employed___

Address_____Phone_____

Current child care arrangements_____

Summarize past year's arrangements_____

Caregiver for visit_____ Other persons present_____

Summary

Subscale	Score	Percentile Range: Lowest Fourth	Middle Half	Upper Fourth
I. LEARNING STIMULATION		0-2	3-9	10-11
II. LANGUAGE STIMULATION		0-4	5-6	7
III. PHYSICAL ENVIRONMENT		0-3	4-6	7
IV. WARMTH AND AFFECTION		0-3	4-5	6-7
V. ACADEMIC STIMULATION		0-2	3-4	5
VI. MODELING		0-1	2-3	4-5
VII. VARIETY IN EXPERIENCE		0-4	5-7	8-9
VIII. ACCEPTANCE		0-2	3	4
TOTAL SCORE		0-29	30-45	46-55

HOME Inventory (Preschool)

Place a plus (+) or minus (-) in the box alongside each item if the behavior is observed during the visit or if the parent reports that the conditions or events are characteristic of the home environment. Enter the subtotals and the total on the front side of the Record Sheet.

I. LEARNING STIMULATION

1. Child has toys which teach color, size, shape.
2. Child has three or more puzzles.
3. Child has record player and at least five children's records.
4. Child has toys permitting free expression.
5. Child has toys or games requiring refined movements.
6. Child has toys or games which help teach numbers.
7. Child has at least 10 children's books.
8. At least 10 books are visible in the apartment.
9. Family buys and reads a daily newspaper.
10. Family subscribes to at least one magazine.
11. Child is encouraged to learn shapes.

Subtotal

II. LANGUAGE STIMULATION

12. Child has toys that help teach the names of animals.
13. Child is encouraged to learn the alphabet.
14. Parent teaches child simple verbal manners (please, thank you).
15. Mother uses correct grammar and pronunciation.
16. Parent encourages child to talk and takes time to listen.
17. Parent's voice conveys positive feeling to child.
18. Child is permitted choice in breakfast or lunch menu.

Subtotal

III. PHYSICAL ENVIRONMENT

19. Building appears safe.
20. Outside play environment appears safe.
21. Interior of apartment not dark or perceptually monotonous.
22. Neighborhood is esthetically pleasing.
23. House has 100 square feet of living space per person.
24. Rooms are not overcrowded with furniture.
25. House is reasonably clean and minimally cluttered.

Subtotal

IV. WARMTH AND AFFECTION

26. Parent holds child close 10-15 minutes per day.
27. Parent converses with child at least twice during visit.
28. Parent answers child's questions or requests verbally.
29. Parent usually responds verbally to child's speech.
30. Parent praises child's qualities twice during visit.
31. Parent caresses, kisses, or cuddles child during visit.
32. Parent helps child demonstrate some achievement during visit.

Subtotal

V. ACADEMIC STIMULATION

33. Child is encouraged to learn colors.
34. Child is encouraged to learn patterened speech (songs, etc.).

35. Child is encouraged to learn spatial relationships.

36. Child is encouraged to learn numbers.

37. Child is encouraged to learn to read a few words.

Subtotal

VI. MODELING

38. Some delay of food gratification is expected.

39. TV is used judiciously.

40. Parent introduces visitor to child.

41. Child can express negative feelings without reprisal.

42. Child can hit parent without harsh reprisal.

Subtotal

VII. VARIETY IN EXPERIENCE

43. Child has real or toy musical instrument.

44. Child is taken on outing byfamily member at least every other week.

45. Child has been on trip more than fifty miles during last year.

46. Child has been taken to a museum during past year.

47. Parent encourages child to put away toys without help.

48. Parent uses complex sentence structure and vocabulary.

49. Child's art work is displayed some place in house.

50. Child eats at least one meal per day with mother and father.

51. Parent lets child choose some foods or brands at grocery store.

Subtotal

VIII. ACCEPTANCE

52. Parent does not scold or derogate child more than once.

53. Parent does not use physical restraint during visit.

54. Parent neither slaps nor spanks child during visit.

55. No more than one instance of physical punishment during past week.

Subtotal

APPENDIX B

INTRODUCTORY MATERIALS

APPENDIX B

LETTER TO DAY CARE PROVIDERS

March 28, 1991

Dear Day Care Providers,

I am a Certified Speech and Language Pathologist and a doctoral student at Michigan State University proposing to do a study of three-year-olds in day care. I wish to determine how language development is affected by exposure to same-age children versus exposure to older and younger child language models.

Participants in the study need to be from homes containing two parents who appear to be of average or higher family income ($30,000 to $35,000 or above). In addition, the children need to be between three years zero months and three years eleven months of age and have been in your day care for five days per week for a minimum of six months. The study will be conducted through June, July and August, 1991.

Your participation as a day care provider will involve an initial contact to determine if your center will be able to provide subjects who meet the criteria of the study. If subjects can be provided and you are willing to participate, your further involvement will include a brief interview as well as provision of a quiet area to test those children whose families are interested in participating. Ten families from the same-age group and ten families from the mixed-age group who become a part of the interaction study will be interviewed briefly in their homes at their convenience.

Your interview, to be conducted in your center, will be done at your convenience. It will take no more than one hour. Brief language testing of the children will be conducted in the morning to insure optimal performance.

In conducting this study, I will take all necessary precautions to insure your privacy and the privacy of the participating families. For example, all records will be kept in strictest confidence, and no information identifying your center and staff, or the children and their families, will appear with the results.

I will be contacting you within the next few days to determine if you will be able to participate in my study, or you may contact me if you are interested in participating. I may be reached at 338 E. Garfield Rd., Coldwater, Michigan 49036. My phone number is 517-279-7410.

Sincerely,

Louise M. Snyder, M.A., C.C.C.

APPENDIX B

PARENT LETTER I

Louise M. Snyder, C.C.C.
Speech Pathologist
338 E. Garfield Rd.
Coldwater, Michigan 49036
517-279-7410

June 5, 1991

Dear Parents,

I am a doctoral student in the Department of Family and Child Ecology at Michigan State University. You have been referred to me by the day care provider who cares for your child as a possible participant in a research study which I am currently conducting.

In this study, I wish to compare language development of children who are grouped in day care. The findings from this study may have implications for parents when choosing the appropriate day care to meet the needs of their child.

Your child's participation in this study would involve a brief test of vocabulary development. The vocabulary test simply requires your child to point to the one picture out of four possible on each page that represents the word given by the examiner. The test would be conducted during the morning at your child's day care center and would be administered during the weeks of July 14 and 21,1991.

Your participation in this study is voluntary and you may discontinue your involvement at any time. In conducting this study, I will take all necessary precautions to insure your privacy and that of your child. For example, all records will be kept in strictest confidence, and no names will ever appear with results.

Attached to this letter, you will find a Parent's Consent Form. If you would be willing to have your child participate in the study, please complete this form and return it with your child to his day care **as soon as possible.**

Sincerely,

Louise M. Snyder, M.A.

APPENDIX B

PARENT CONSENT FORM I

Parent's Consent Form

We hereby freely agree to have our child _____ participate in the study described to us by Louise Snyder. We understand that the study will take place in June and July, 1991, and involve the administration of a brief vocabulary test to our child while at the day care center. We realize that we may withdraw from the study without penalty at any time, and that neither our names nor that of our child will appear with the results of the study.

_____
Parent's Signature

_____
Date

We would be interested in receiving a summary of the results of this study.

Yes _____

No _____

Please return this form with your child to the day care center as soon as possible.

APPENDIX B

PARENT LETTER II

Louise M. Snyder, C.C.C.
Speech Pathologist
338 E. Garfield Rd.
Coldwater, Michigan 49036
517-279-7410

July 15, 1991

Dear Parents,

Thank you for allowing me to test your child's vocabulary development for the purposes of my language study. I enjoyed working with your child very much, and I appreciate your cooperation with my research.

Additional information concerning your child's language development will enhance the value of my study and may be gained through a brief home interview arranged at your convenience. The home interview should take no more than one hour and can be arranged to best meet your needs, including late afternoons, evenings, or weekends.

Your involvement in this last part of the study would be greatly appreciated. Your participation is voluntary and you may discontinue your involvement at any time. In conducting this study, I will take all necessary precautions to insure your privacy and that of your child. All records will be kept in strictest confidence, and no names will ever appear with results.

Attached to this letter, you will find a Parent's Consent Form. If you would be willing to participate in this second part of the study, please complete this form and return it with your child to his day care center **as soon as possible.** If you will include your phone number, I will call you to schedule a convenient time for the home interview.

Sincerely,

Louise M. Snyder, M.A.

APPENDIX B

PARENT CONSENT FORM II

Parent's Consent Form

We hereby freely agree to become a part of the home interview phase of the study being conducted by Louise Snyder. We understand that the interview should require no more than one hour of our time. We understand that the interview will be arranged at a time that is convenient with our schedule. We understand that the interview will be conducted in August or September, 1991. We realize that we may withdraw from the study without penalty at any time, and that neither our names nor that of our child will appear with the results of the study.

_____ _____

Child's Name Parent's Signature

_____ _____

Phone Number Date

_____Yes, We would like to participate.

_____No, We would not like to participate.

Please return this form marked "Yes" or "No" as soon as possible. That way I will know if you and your child will be participating, or if you choose not to participate. I have enclosed a stamped envelope for your convenience.

APPENDIX C

DAY CARE CENTER INFORMATION

APPENDIX C

DAY CARE CENTER DEMOGRAPHICS

	Class Size	Attend-ance F/V	Teacher-Student Ratio	% of time Mixed Ages	Accred-itation* Y/N	Age Range/ Class-(months)	Infant Program Y/N	Toddler Program Y/N	Drop-in Program Y/N
Homo-geneous Centers	20	V	1/10	10%	N	36-48	Y	Y	N
	12	F	1/6	10%	Y	36-48	Y	Y	N
	12	F	1/4	20%	N	28-38 39-50	Y	Y	N
Hetero-geneous Centers	15	V	1/7	100%	Y	30-60	Y	Y	N
	22	V	1/7	100%	Y	30-60	N	Y	N
	22	V	1/7	100%	N	30-60	N	Y	N
	20	V	1/8	100%	Y	30-66	Y	Y	N
	30	V	1/10	100%	N	30-72	N	N	Y

Homogeneous Centers n = 3
Heterogeneous Centers n = 5

Attendance: v = varying schedules allowed
F = full time attendance/5 days per week

*Accreditation is with the National Association for the Education of Young Children (NAEYC)

APPENDIX C

TYPICAL DAILY SCHEDULE FOR DAY CARE CENTERS*

7:00 - 9:00	Arrival and Free Play
9:00 - 9:30	Breakfast
9:30 - 11:00	Group Time (large, small, art, motor)
11:00 - 12:00	Outdoor Play
12:00 - 12:30	Lunch
12:30 - 2:30	Rest/Quiet Activities
2:30 - 3:00	Group Time
3:00 - 3:30	Snack
3:30 - 5:00	Outdoor Play/Free Play
5:00 -5:30	Story/Group
5:30-6:00	Departure and Free Play

* This schedule represents a composite of the daily schedules for all centers involved in this study. The times may vary slightly by center, but the sequence of activities is basically the same.

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