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**Kayler, Claudette Taylor**

THE LANGUAGE USE AND LANGUAGE DEVELOPMENT OF BLIND AND  
SIGHTED PRESCHOOL CHILDREN

*The University of North Carolina at Greensboro*

PH.D. 1983

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THE LANGUAGE USE AND LANGUAGE DEVELOPMENT OF  
BLIND AND SIGHTED PRESCHOOL CHILDREN

by

Claudette Taylor Kayler

A Dissertation submitted to  
the Faculty of the Graduate School at  
The University of North Carolina at Greensboro  
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Approved by

  
Dissertation Adviser

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

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The purposes of this study were to investigate the language use and language development of blind and sighted preschool children who were in the same daily environment by means of naturalistic, observational research and to field test the methodology for the investigation.

The sample consisted of 12 children who were attending the Infant Care Center at the University of North Carolina at Greensboro. During each year of the study, 1980 and 1981, the vocalizations of two blind children were compared to those of the sighted boy and girl closest to them in age.

The data were collected by observing each of the six (per year) subjects for 15 randomly selected minutes on 15 days. All vocalizations spoken by the subjects were recorded on observation sheets and classified by function. The percentage of each child's vocalizations in each category--spontaneous, response, imitated, and initiated--was computed and compared within each age group.

The overall results showed that blind and sighted children were similar in their use of the functional categories of language: they were primarily initiators, mildly responsive, and somewhat imitative and spontaneous. Nevertheless, there were differences within the overall pattern of language use. The blind children were less responsive, more

spontaneous, more imitative, and used more vocalizations, more total words, and more different words than the sighted children.

A developmental trend was noted in the use of vocalizations and the parts of speech by the preschool children in the study. The total number of words used and the number of different words used increased with age.

The findings of very strong similarities across visual conditions in the use of vocalizations and across both age and visual conditions in the use of words lend support to a view of language as socioculturally determined. An interactionist theory of language was supported. Mainstreaming and the principle of normalization were among the factors accounting for the similarity of the use of language by blind and sighted children in the face of expected differences due to the heterogeneity of the children's backgrounds. The findings that the blind subjects uttered more vocalizations, spoke more words, and used more different words than the sighted children were new findings not documented previously in the research literature.



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Each of my children is owed a special thanks for their help in getting me to this point. Claude encouraged me in

the times of my deepest despair to go all the way and reach for the highest. Dayton never complained when I missed his ballgames or when he had to care for himself. Jacqueline has been my housekeeper and special assistant in innumerable ways and has given up years of her mother's attention and care for the sake of this project.

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## CHAPTER I

### INTRODUCTION

Blindness is frequently considered the worst possible handicap, an affliction equivalent to death, as if vision were synonymous with life, love, and understanding (Freeman, 1975). The attitude of society toward the blind has been markedly ambivalent. On the one hand loss of vision historically has been recognized as a serious handicap with some of the earliest welfare laws dealing with the problem. On the other hand, persons like Helen Keller, Tom Sullivan, and Stevie Wonder have become symbols of what blind persons can achieve and have blunted our sensitivity to the handicapping effects of visual impairment.

Warren (1977) provided a thorough, complete, and comprehensive review of the available knowledge about the effects of visual impairment on child development, encompassing most of the areas ordinarily considered in the structure of knowledge about child development. He revealed that "much of the work on 'blind children' has been done with adolescents" (p. 59) and added that almost no research is available on the age range between infancy and 5 or 6 years. Thus, there is a significant lack of knowledge about young blind children.

The present study concerned the language development of preschool blind children. The importance of language in

growth and development has long been accepted by educators. Language is considered one of the attributes that makes us human and sets us apart from other living creatures (Morrison, 1976). Piaget (1967) also emphasized the role of language in the construction of social-arbitrary knowledge. The importance of language, verbal communication, and verbal facility for the blind can hardly be overestimated (Cutsforth, 1951; Warren, 1977). Verbal ability may well be the key to cognitive development (Cutsforth, 1951; Warren, 1977) for the blind. The reliance of instruction on verbal behavior becomes progressively greater in the higher grades. It is imperative that the language skills of the blind be as superior as possible in order for them to serve as a substitute for visual skills, facilitate cognitive development, and aid in the overall functioning of the blind child.

According to Montessori (1967) learning language is the first basic test of intelligence. Children literally learn language by themselves in a manner and style all their own. Piaget and Inhelder (1969) believe that the acquisition of language profoundly affects intellectual life by enabling the child to internalize behavior through representation. The appearance of language marks the child's movement from the sensori-motor stage of development into the preoperational period. Previously, during the sensori-motor stage, movement produced knowledge; in the preoperational stage, with the emergence of language, knowledge occurs through

thinking which is more rapid and has greater range since it is not dependent upon movement. Piaget (1967) contends that cognitive development (intelligence) precedes language and that language is neither a necessary nor sufficient condition to ensure the development of logical thought though it clearly acts as a facilitator.

The development of language is believed to be based on the prior development of sensori-motor operations. Yet Piaget and Inhelder (1969) found that blind children with normal verbal development often have delays of up to four years on the development of some cognitive tasks. They concluded that this is evidence that language development is not sufficient for intellectual development. The development of sensori-motor schemata is seen as the prerequisite to language development.

Normal language development has been described by Earle (1976a, 1976b) and by Templin (1957). It was found that although speech develops in a very systematic, predictable, and orderly way, environment plays a crucial role. Although authorities differ about the exact time frame, there is generally agreement that the preschool years are critical to language development. Noel (1953) stated that by the time children arrive at school age, they have already learned to speak with whatever sound system, grammar, and vocabulary were heard most often at home or in the neighborhood. Strickland (1962) confirmed that language patterns of children are



largely set by the time they enter school. Bloom (1964) found that 50% of intelligence measured at age 17 was developed by age 4. The preschool years are crucial for the development of language and intelligence.

Two studies of the development of preschool blind children have been done previously in the United States. However, little attention was given to the development of language in blind children. Studies were conducted at the University of Chicago from 1949-1954 (Norris, Spaulding, & Brodie, 1957) and the University of Michigan (Fraiberg, 1977) in the 60's. There is a need for study of the preschool blind child and of his language. While little is usually gained from just another descriptive study, the dearth of literature relating to preschool blind children prohibits the generation of testable hypotheses.

The present study was investigatory in nature, heuristic in scope, and practical in its application to the preparation of blind children for mainstreaming in the public schools. It is important that the blind child be freed from assumptions unsubstantiated by research and that teachers be enabled to develop procedures and techniques for teaching based on greater knowledge of the characteristics of the blind.

## CHAPTER II

### REVIEW OF THE LITERATURE

The importance of language in growth and development has long been accepted by educators. Language is considered one of the attributes that makes us human and sets us apart from other living creatures. What are the characteristics of the language development of the blind? A recent handbook for parents (Scott, Jan, & Freeman, 1977) assured parents that blind or partially sighted children can proceed at the normal rate in their language development; however, Bernstein (1978) found blind children significantly delayed in language development.

Three aspects of language development have been identified (Ausubel, Sullivan, & Ives, 1980): phonology, syntax, and semantics. Phonological language development is concerned with the production of speech sounds and includes tone, rate, articulation patterns, phonemics, and phonetics. Syntactic development involves the learning of grammar, the way words are put together to form phrases, clauses, and sentences, and includes learning the rules of the language such as how to make statements, commands, or questions. Semantic development involves language comprehension, or meanings of words. Semantic studies investigate the relationship between the word and the world, between words and wishes,

the nature of misunderstandings, ambiguity, double meanings, and other issues such as the relationship of knowledge and language. The use or function of language is to communicate thoughts, feelings, wants, needs, and desires to others and to respond to and interact with others. Jakobson (Gardner, 1978) outlined six major functions of language which included vocalizations or expressive language to achieve certain ends.

#### Phonological Language Development

A comprehensive review of the early literature on the phonetic language development of the blind was made by Rowe (1958). Early studies characteristically found a high percentage of the blind with speech problems and conclusions were that visual stimuli may be more important to the acquisition of language than was formerly believed. For example, Cutsforth (1951) reported a 1928 study by Stinchfield at the Pennsylvania School for the Blind and at the Perkins Institution for the Blind which found 49% of 400 blind children had some form of speech defect. The 1933 White House Conference Report stated that the blind have "additional physical defects, peculiar mannerisms, general physical debility, nervous instability and speech defects" (p. 50). It was concluded that without vision and visual observations, certain sounds could never be produced correctly (Rowe, 1958). For years it was expected that the blind would have speech problems as the natural result of their blindness.

According to Rowe (1958) all these early studies were incomplete, lacked controls, used small samples, were conducted in restricted environments (mostly institutions for the blind), and included only school-aged subjects. There was no accounting for the social status of the home, background, language differences, or even foreign birth of the child or his parents. Rowe also reported a study by Brieland which compared 84 subjects in schools for the blind with control subjects matched for age, sex, socioeconomic status, and rural or urban residence. No significant differences were found; that is, by listening to tapes the judges could not differentiate the blind and sighted subjects.

Eisenstadt (1954) charged that the earlier reports ascribing a considerable incidence of speech defect to the blind were based on subjective recollection rather than objective measurement. In his study, 70 blind subjects were paired with controls. Both groups were tested for reading aloud, extemporaneous and impromptu speech-making, and conversation. Interviews were recorded on film and tape. Each speech situation was graded on voice, diction, language, self-projection, and general effectiveness by four speech specialists unaware of the visual status of the subject. The sighted group exceeded the blind group by only a small margin. In the categories of diction and language the blind were most like controls; on voice, self-projection, and general factors, they were most dissimilar. When grouped

by IQ, the upper IQ level scored higher in all audible speech factors. Judges were unable to determine the visual status of subjects on the basis of vocal clues. No significant performance differences were found except on voice. Eisenstadt (1954) concluded that the blind are as educable and potentially capable of development, improvement, and skill as the sighted and that there is no distinct personality typology of the blind revealed in speech pattern.

The University of Chicago supported a 5-year study of 66 preschool blind children in the Chicago area from 1949-1954 (Norris, Spaulding, & Brodie, 1957). The descriptive study focused on the functioning of the children in relation to their total environment. Speech development was measured by the following items from the Catell and Gesell scales:

Talks and imitates sounds at ten months; says two or more words between one year and 18 months; indicates needs and desires through language or gestures from 18-24 months; talks in short sentences at 22-24 months. (p. 29)

Data were supplied by the psychologist and social worker from their observations of the children. Findings indicated that most of the blind children observed passed the items within the expected age ranges. The researchers concluded that

in cases of retarded speech development as measured by these or the more advanced items on the Catell or Gesell scales, there were identifiable factors related to the parents' unrealistic expectations for the child and their handling of him sufficient to account for the retardation. In no case did problems in the area of speech appear to be a direct result of blindness. (Norris et al., 1957, p. 36)

Rowe (1958) studied 148 school-aged blind children in Northern California. She recorded their voices and then had two speech therapists independently evaluate them for speech defects. Results indicated that the percentage of speech defects was low when compared with most public school surveys of speech problems in school-aged children.

Interest in the phonological language development of the blind seems to have ceased in the 1950's. It is difficult to believe that the matter has been settled so quickly on the basis of two descriptive studies and two matched studies with small samples. However, Warren (1976) in a recent review of blindness and early development concluded that there is no evidence that the blind child without other handicaps is developmentally different from sighted children in the production and refinement of sounds. While listing the need for research in other areas of language development, he considered the matter of phonological language development of the blind unworthy of further study.

#### Semantic Language Development

Semantic language development consists of language comprehension, understanding meanings of words, responding correctly to instructions, carrying out directions, understanding concepts, and developmental issues such as the relationship of knowledge and language.

### Verbalism

One of the longest raging controversies over the language development of the blind began in 1932 when Cutsforth, a blind clinical psychologist, indicted blind education by charging that it predisposed the blind toward the unwarranted use of meaningless visual terms. This problem he named "verbalism": the use of abstract concepts without appropriate foundation in concrete experience. Words, according to Cutsforth (1951), are shorthand signs for experience. He believed their significance for communication depended on the assumption that they represent essentially the same experiences for all who use them. Therefore, he found the blind person's use of words he could not experience (visual descriptions, colors, etc.) not only objectionable but "a very serious general condition."

According to Cutsforth (1951) the purpose of verbalism is to gain social approval. He believed that socially and educationally the blind are expected to appreciate things not as they themselves experience them but as they are taught how others experience them. For example, he quoted a passage written by Helen Keller which was full of visual imagery and verbalisms. He believed this was hypocrisy--her own experience and world were neglected and she was taught to write for those who both see and hear. Cutsforth (1951) cautioned that "too rapidly thrusting the blind child into a world of unreality produces loose and uncritical habits of thinking" (p. 61).

Cutsforth (1932) investigated the tendency toward "verbal mindedness." He presented 26 congenitally, totally blind children a list of 40 nouns with the instructions, "there are lots of things you can say about everything. A man is tall or short, fat or slim, kind or mean. What would you say about (a word from the list presented orally by the examiner)." Results were that 48% of the responses were visual qualities. In a later discussion of the research and the concept of verbalism, Cutsforth (1951) concluded that the dearth of responses in sensory modalities familiar to their experience indicated an undervaluing of their own experience by the blind. He believed the results indicated a predisposition toward unreality in which valid relationships are utterly disregarded.

The inevitable result is that nothing but incoherent and loose thinking is possible. Intellectually the child is organized without reference either to himself or to his own experiential world. The seeing world with its visual concepts and values becomes the flimsy gossamer web out of which his intellectual fabric must be woven. (Cutsforth, 1951, p. 69)

Dokecki (1966) pointed out that the stimuli words used by Cutsforth--moon, snow, sky, violet, night, gold, ink, lamp--could not help eliciting visual responses. He also believed that Cutsforth's results were partially due to the particular instructions used. He asserted that it is reasonable that cultural language expectancies for qualities would tend to be visual in nature and that blind children would be expected to use groups of associations similar to their



cultural experience. He pointed out that words do not have to stand for concrete experiences; they may have meaning according to their relationship to other words. Dokecki (1966) found verbalism a natural phenomenon representing cultural language expectancy which influences everyone's production of language. He could not see any cause for concern.

Burlingham (1965) found the ability of the blind to use visual words correctly a formidable intellectual feat accounted for by the child's remarkable ability to remember internal associations and his own desire to understand and communicate. Burlingham (1961) pointed out that rather than being meaningless to the child, such words may simply have a different meaning to the blind. It should be pointed out, also, that the wide range of variability in the percentage of visual responses given by Cutsforth's children (12½% to 95%) suggests that there is something besides blindness affecting the results.

Nolan (1960) replicated Cutsforth's study using a free association technique in addition to the controlled association method of Cutsforth. In the free association technique instructions were: "There are lots of things you can say about everything. Now when I say a word to you, I want you to say the first thing that pops into your mind." Two experimenters independently judged, with 90% agreement, the number of visual responses to each stimulus word. Significantly

fewer visual responses were made by the blind children in both the controlled association group and the free association group when compared with Cutsforth's children. The free association group made fewer visual responses than the controlled group, but Nolan (1960) found this difference not significant. Nolan also compared the responses of his children, Cutsforth's children, and 1,000 sighted children on four of the words--milk, moon, butter, and lamp. Cutsforth's subjects were quite different from the other groups, while Nolan's blind subjects and the sighted subjects closely resembled each other. Nolan (1960) concluded that "verbal unreality" was not a significant problem for the groups he studied.

Harley (1963) investigated Cutsforth's claim that verbalism leads to personality maladjustment and academic problems. He sought to relate chronological age, IQ, experience, and adjustment with verbalism--a child's inability to identify an object for which he could give an acceptable definition--and visually oriented verbalism--using visual words in defining an object (corresponding to Cutsforth's [1932] verbalism) in a sample of 40 blind children randomly selected from Perkins School and North Carolina School for the Blind. None of the variables were significantly correlated with visually oriented verbalism (Cutsforth's verbalism). Harley (1963) stated that only a small amount of visually oriented verbalism was found. He did find verbalism,

as he defined it--the inability of a child to identify an object for which he could give an acceptable definition--among the younger, duller, less experienced children.

Dokecki (1966) pointed out that Harley's verbalism is really a measure of tactual discrimination and is not related to the concept of verbalism studied by Cutsforth (1932) and Nolan (1960). Dokecki (1966) stated that Harley's (1963) finding "only a small amount of visually oriented verbalism" added weight against Cutsforth's (1932) findings, supported Nolan's (1960) findings, and pointed up the spuriousness of Cutsforth's (1932) findings as Nolan (1960) had suggested.

Nolan's (1960) failure to replicate Cutsforth's findings and Harley's (1963) failure to find verbalism in North Carolina and Massachusetts, along with Dokecki's (1966) cogent criticisms of Cutsforth's methods and underlying conceptualization of language, seem to be weighty evidence against a verbalism problem for the blind. Warren (1977) believed the matter of verbalism has been clarified. He stated that available evidence supports the idea that blind children should not be shielded from words or concepts that are normally based on visual experience. The goal should be to bring the blind child to the maximal use of the language of his culture so that language can aid in meaningful and useful social interaction, in behavioral self-direction, and in progress within the educational system.

### The Acquisition of Meaning

Bernstein (1978) studied the semantic development of nine congenitally blind children between 2½ and 4 years of age. Matched normal and congenitally blind children were compared on their comprehension of dimensional adjectives (big-little, long-short, thick-thin), relational terms (same-different), and locatives (front-back-side-in-on-under). On all tasks measured, the blind children's performances were significantly delayed compared to those of normal children. Bernstein (1978) concluded that the significant differences found between the blind and sighted subjects were attributable to the more basic cognitive deficits of the blind.

Bernstein's (1978) finding and her conclusions need closer examination. The children were not matched for socioeconomic status and IQ which could account for the discrepancies. The methodology used was described as an experiment in which certain tasks were presented to the children. When the tasks were performed correctly, their understanding of the test word was indicated. For example, to test for comprehension of "big-little," objects (toy cars) which differed only in the dimension under study were presented to the children; they were asked to show the examiner "the one which is big," or "the one which is little," in a counterbalanced design. The tactile discrimination required for the blind child to perform these tasks could be confounding the

results. Also, the use of an experimental or testing format with very young children is likely to produce unreliable results.

Ausubel et al. (1980) pointed out the following handicaps of a testing or experimental situation with children: the limitation of the child's testing ability, difficulties in following directions, unwillingness to cooperate, distractability, limited attention span, and tendency of the child to respond to undesigned stimuli. In addition there is a tendency for children to say what adults wish to hear in an examining situation. Cutsforth (1951) pointed out the blind person's detection of the subverbal meanings of the persons around them and Elonen and Zwarenstejn (1964) explained how responsive the blind are to the attitudes of the adults in their environment; therefore, Bernstein's results may be a measure of the experimenter's expectations rather than the blind child's ability. Bronfenbrenner (1974) pointed out the dangers of experimental work with children and the spuriousness of such findings.

#### Syntactical Development

Maxfield (1936) studied the language production of eight totally blind children from 3 to 6 years of age. The blind children she studied, compared to earlier normative studies of sighted children, produced fewer statements and negatives, an equal number of commands, and more questions. Their production of complex and compound sentences and the

length of their sentences did not differ from sighted norms. In his comprehensive review of the early childhood development of blind children, Warren (1977) reported no other studies of sentence characteristics. He concluded that the notion of a general developmental lag was not supported.

### Functional Language Development

Warren (1977) pointed out that the concern of research on the language development of blind children should be a concern with the function language performs. The goal of language is communication (Ausubel et al., 1980). The study of the functional effectiveness of language includes examining the relationship between language, thoughts, and abilities, i.e., how individuals communicate. Functional language development is defined, for purposes of this review, as growth in the ability to communicate one's thoughts, feelings, wants, needs, and desires to others, the use made of language to achieve certain ends.

### Use of Words

Burlingham (1961) described the functional language development of the blind children she observed in England. She reported that the blind child's first babbling took the course of a normal infant's, but mouth pleasure was prolonged for blind children. For example, they would wipe their mouths with the spoon when they began feeding themselves as their mothers had done. The blind infant used words as

playthings and speaking as an activity for its own sake (Burlingham, 1961). She found that between 16 and 18 months blind children were not using words as much as before due to (a) anticipation by their mothers and no need to verbalize, (b) the mothers' depression and withdrawal from their children, and (c) the children's restricted and inhibited motor development. She reported rapid language development from 18 months to 3 years so that by the time blind children entered nursery school they had a large vocabulary and spoke fluently. She reported that parroting--meaningless repetition of words--was common, probably to please the mother. Burlingham (1965) pointed out what a formidable intellectual feat learning language is for blind children and indicated that the ingenuity these children expend is often overlooked. While they accomplish this difficult task on their own with neither acknowledgment nor praise, we concentrate on how they fail to accomplish tasks we think are important (Burlingham, 1965).

Elonen and her associates worked with blind children who had previously been misdiagnosed as mentally retarded, cerebral palsy victims, or autistic. Elonen and Cain (1964) found that close analysis of the disturbances of speech in these children revealed a fixation or prolongation of the normal stages of speech development rather than special problems. The developmental stages were stretched out for the blind so that their speech appeared odd and distorted for what is

typical for the 2-year-old persisted in the speech of 7- or 8-year-old blind children.

#### Use of Language: Vocalizations

Fraiberg (1977) conducted a longitudinal study of 10 congenitally blind children. She made no claims that her results were generalizable since the subjects were selected for normality in all areas except blindness and their development was facilitated by a home-based education and guidance program that was part of the study. However, the families involved represented a wide range of socioeconomic levels. During observations in the natural setting, narrative records were made of the mothers' information. Continuous notes, some tape recordings, and film samplings were made of the entire home visit. Team meetings were instituted to analyze the previously collected data by the following items of the Bayley Scales: listens selectively to familiar words, responds to verbal requests, jabbars excessively, imitates words, says two words, uses words to make wants known, sentence of two words. The median ages and age ranges at which Fraiberg's blind subjects passed the items were compared to Bayley's norms. Results were that blind infants could not be differentiated from the sighted norms of the Bayley Scales.

However, in the absence of quantitative data for the blind children or for sighted children, Fraiberg (1977) offered the impression that spontaneous vocalizations,



vocalizations for self-entertainment, and vocalizations to greet were infrequent; initiation of dialogue was rarely observed; response vocalizations were common. Fraiberg concluded that neurophysiological maturation and performance are not impeded by blindness for those blind children who are neurologically intact and intact in other systems, and that delays in language acquisition for such children may reflect experiential poverty.

#### Special Function of Language for the Blind

Based on her observations of and clinical work with blind children in England, Burlingham (1961, 1964, 1965) pointed out the following uses made of language by blind children that the seeing do not require: for orientation; to collect information and characteristics for differentiating persons and things; to fulfill their drives to know and to understand; to test continually the correctness of what they have learned or assumed from vague clues; to talk about their own blindness.

Cutsforth (1951) also emphasized the function of language for the blind. He stated that

the value that the human voice and speech have for the blind can hardly be overestimated. . . . The major part of what the congenitally blind ever know about their world comes to them through the medium of the human voice. (p. 103)

To the blind a person is what his voice is. Extremely egocentric individuals rarely perceive more than the bare words, but the blind whose personalities are more objectively

organized employ their interpretation of the voice as a social device to keep themselves more carefully in tune with their surroundings (Cutsforth, 1951).

#### Summary of Research

Only two developmental studies of preschool blind children have previously been done in this country, one at the University of Chicago from 1949-1954 concerned with retrolental fibroplasia children (Norris et al., 1957), i.e., children blinded by too much oxygen while incubated, and one at the University of Michigan (Fraiberg, 1977) in the 60's. The university studies focused on other aspects of the blind child's development and only incidentally collected data regarding language. In addition, Maxfield (1936) and Bernstein (1978) studied specific aspects of the language development of preschool blind children. The literature that exists concludes that the language development of blind children is normal. But this literature is based on little empirical data. Burlingham (1961, 1964, 1965) based her conclusions on her impressions from psychoanalytic work with blind children in nursery schools in England. Her data were neither quantified nor scientifically collected. Norris et al. (1957) based their conclusions on responses to two or three language items on the Catell scale and one language item on the Gesell scale. Fraiberg, as an afterthought, compared the tape recordings and film samplings she had already collected to the language-item norms of the Bayley Scales.

There has been no intentional collection of data relating to the language development of blind children.

While Maxfield (1936) studied syntactical development and Bernstein (1978) studied semantic development, Warren (1977) pointed out that the concern with the language of the blind should be a concern with the function language performs for the child. He stated that the goal of language development is to bring children to the maximal use of the language of their culture so that language can aid in meaningful and useful social interaction, in behavioral self-direction, and in progress within the educational system.

Presently there is a need for further research to collect empirical data on the language development of blind children. There is a need for research which takes into account the functions language is performing, the context, children in the 80's, and a method of comparison more appropriate than mixing idiographic and nomothetic data. When norms are constructed, the performance of an individual is obfuscated. Means, variances, and norms represent the group performance and are not meaningful in determining the degree to which one individual is performing. It has become unacceptable in the public schools to compare a child to nationally constructed norms only. Local norms, currently computed, are being used more and more frequently to compare children. To compare blind children to previously constructed national norms is to confound doubly the meaning of their

behaviors. There is a need to develop a method of examining individual cases of blindness and comparing these individuals with sighted children--not sighted norms.

### Theoretical Framework

One of the most important issues in psychology is the relationship between language and thought. According to the Whorf-Sapir hypothesis (Whorf, 1956), thinking reflects the structure and conceptual possibilities of the language while language influences perceptions and reasoning powers and, in effect, determines thought. To date, little research has supported this hypothesis (Gardner, 1978).

### Language and Cognitive Development

Piaget and Inhelder (1969) used research on the handicapped to substantiate their position that thought (intelligence) develops independently of language while language development alone will not ensure the development of logical thought. They believed that research on deaf mutes which found normal (although delayed) cognitive development without any language development showed that cognitive development is independent of language development and that language development is not necessary for the development of logical thought. Piaget and Inhelder (1969) used research by Hatwell which found that blind children with normal verbal development have delays of up to four years on the development of some cognitive tasks to conclude that language development is not sufficient for intellectual development.

Bernstein (1978) reported Hatwell's work in detail, but these studies are not available for direct reinterpretation since they were published by the University of France and have not been translated.

Hatwell (reported in Bernstein, 1978) studied the performance of 6- to 18-year-old congenitally blind subjects on Piagetian tasks measuring conservation, classification, symbolic imagery, and formal operations. Three assumptions underlie Piaget and Inhelder's conclusion that these studies of handicapped children demonstrate the independence of language and thought. (1) The assumption was made that the deaf had no language; therefore, to demonstrate that they had logical thought proved that cognitive development proceeds independently of language. But the deaf mutes must have had language in the sense of communication. They had a receptive language in order to understand to do the tasks in the first place, and they had a responsive language by which they were able to communicate although they were without verbal speech production. The assumption that deaf-mutes have no language is false. (2) Piaget and Inhelder stated that the blind subjects in Hatwell's studies had "normal" speech development but no elaboration of that statement was given. The criteria used to label the blind children's speech normal were not revealed. This assumption of normal speech development is questionable. (3) The assumption was made that the task required of the children was the

same for the blind and sighted subjects and that performance of the task demonstrated possession of the same skill for each type of subject.

The Piagetian task termed "the Rotation of Squares around an Axis" was administered by Hatwell to congenitally blind and sighted subjects to measure their level of cognitive development (reported in Bernstein, 1978). The use of this task was begging the question of how the blind think while testing them on a task that requires normal visual imagery to perform correctly. Congenitally blind children cannot have normal visual imagery. They were doomed to fail this task and then were labeled cognitively deficient. Hatwell found that blindfolded sighted children could perform the task tactually, but that is no reason to expect congenitally blind children to be able to do so. The sighted children already had internalized visual imagery which could be called upon when they were blindfolded. Performing the task tactually for them was not equivalent to what was involved for congenitally blind children to perform it. Thus, the research used by Piaget and Inhelder (1969) to support their position of the separate, independent development of language and thought was based upon several equivocal assumptions.

Other developmentalists (Burlingham, 1965; Montessori, 1967) point to the learning of language and its correct usage as a sign of intelligence. Piaget has been interpreted as

saying that language development depends on or is the result of cognitive development (Gardner, 1978; Sinclair, 1975). Sinclair (1975) interpreted Piaget as considering language to be one of the manifestations of the human capacity for representation of things and events in their absence. Pointing to research that he had done on children from 10 months to 3 years of age, Sinclair (1975) asserted that language does not appear before object permanency is attained, and its development depends upon leaving the sensori-motor stage and entering the second stage of cognitive development. Thus, for this Piagetian, evidence of language is evidence of cognitive development. The position adopted by most psychologists today (Bernstein, 1978; Pines, 1981) is that the development of language is tied to and/or emerges from cognitive development.

Therefore, it would seem more appropriate to conclude, if blind children have normal language development as found by Burlingham (1961), Norris et al. (1957), and Fraiberg (1977) but repeatedly show delayed cognitive development as measured by Piagetian tasks (Bernstein, 1978; Warren, 1977), one of the following conditions prevails: (a) that the Piagetian tasks are not valid measures of the intelligence of the blind; (b) that a type of intelligence, not required for language development, is required for correct performance of Piagetian tasks; or (c) that Piagetian tasks require visual information, experience, and/or imagery which the blind

cannot or do not ordinarily develop. Fraiberg (1977) concluded that when differences occur between sighted children and children who are blind but normal in all other respects, the differences must lie in the task, not in the children.

### Language and Innate Abilities

Another position on the relationship of language and thought is represented by Chomsky (1975). He believes that fundamental language ability is innate, unrelated to intelligence, and in a sense wired into the brain. The high incidence of impaired language ability accompanying impaired intellectual ability is evidence against this position. Ausubel et al. (1980) offered both argument and evidence against Chomsky's position. Another piece of evidence against Chomsky's view has come from the study of Genie, the California child who was isolated and not even spoken to from 10 months of age until she was 13½ years old (Pines, 1981). When discovered, Genie was unable to speak; nine years later, after years of intensive training by psycholinguists and others at the University of California at Los Angeles, she had failed to learn the kind of grammatical principles that Chomsky said were innate (Pines, 1981).

### Conclusions

The relationship between language and thought remains an important issue in psychology. The position that language determines thought (Whorf, 1956) has not been supported by



research (Gardner, 1978). Chomsky's (1975) theory that fundamental language ability is innate has not been supported by recent evidence (Pines, 1981). Although Piaget and Inhelder (1969) held that cognitive development and language development are independent, the predominant position adopted by most psychologists today (Bernstein, 1978; Pines, 1981) is that the development of language is tied to and/or emerges from cognitive development. Therefore, language development is taken as a sign of or indication of intellectual development. Furthermore, language then acts as a facilitator of cognitive development by providing a means of representing and internalizing experiences and learning.

Blind children have been found (without "hard" empirical data) to have normal language development. Language development is tied to and/or emerges from cognitive development. Therefore, blind children with normal language development must have normal cognitive development. But on Piagetian tests of cognitive development the blind show delays of up to four years. A paradox exists. New, additional data are needed. Theory may then be supported or revised.

Implications for Further Research:  
Justification for the Present Study

Six implications for further research were drawn from the review of the literature. These implications support the need for the present study.

1. Previous studies of the language development of preschool blind children have not been based on scientifically collected empirical data but have been impressions from clinical case notes (Burlingham, 1961, 1964, 1965) or incidentally collected case data compared to previous normative studies (Fraiberg, 1977; Norris et al., 1957). Therefore, there is a need for scientifically collected empirical data on the language development of blind children.

2. Bernstein's (1978) semantic study, the most recent study of the language development of the blind, was done in an experimental setting and required tactile discrimination which may have influenced the results. She examined the comprehension of dimensional adjectives (big-little, long-short, thick-thin), relational terms (same-different), and locatives (front-back-side-in-on-under) by having the blind subjects perform certain tasks and comparing their performances to the performances of sighted subjects. Research in experimental settings with preschool children is unreliable (Ausubel et al., 1980; Bronfenbrenner, 1974). Therefore, there is a need for research in the natural setting to assess the language development of preschool blind children.

3. Previous researchers (Fraiberg, 1977; Maxfield, 1936; Norris et al., 1957) compared the blind children they studied to earlier normative studies of sighted children. This method of comparison is currently being challenged by developmentalists. Comparison of single case or multicase studies

of blind children to national large-scale norms of sighted children do not take into account the differences in background, experience, stimulation, or environment. Therefore, there is a need for more appropriate comparison of blind and sighted children.

4. Bernstein (1978) sought to deal with the problem of comparison of blind and sighted subjects by comparing matched blind and sighted subjects on a one-to-one basis. However, the children were not matched for socioeconomic status which means they had very different environments. Environment is generally recognized as one of the factors influencing language development (Ausubel et al., 1980). Therefore, there is a need for comparison of blind and sighted children in the same or very similar environments.

5. None of the studies of the language development of preschool blind children have focused on the function of language for the children. Fraiberg (1977), in the absence of quantitative data, offered the impression that spontaneous vocalizations and vocalizations to greet were infrequent, while initiation of dialogue was rare and response vocalizations were frequent. Ausubel et al. (1980) insisted that function is the key to analyzing language. Warren (1977) pointed out that the importance of language lies in its functional effectiveness. Therefore, there is a need for a study to investigate the function of language for both blind and sighted preschool children.

6. Findings from the needed empirical study should have implications for Language Theory.

### CHAPTER III

#### METHODS OF PROCEDURE

The most appropriate and most significant method of investigating the language development of preschool blind children would be to conduct a large-scale study of at least 100-200 blind and sighted preschool children and to examine all the variables which might be affecting their speech. Then, through multiple regression analyses, the variables accounting for the variance in the speech of the children could be determined. Such a study would include observational data from both structured and natural situations, social and psychological information, family interviews, laboratory examinations, and peer and teacher ratings gathered over a period of time.

The review of the literature in the previous chapter revealed that a large scale multivariant study of preschool language development is not possible at this time because empirical data have not been collected previously in a systematic, scientific manner. Before a large-scale multivariant study can be conducted, a methodology for study of the language of preschool children must be developed. In accord with the emphases on the use of language suggested by Ausubel et al. (1980) and Warren (1977), a major focus of this study was the development of a methodology for the

investigation of the uses made of language by preschool children. Additionally, the study was a field testing of the methodology in order to be able, in the future, to conduct a large-scale study for statistically significant results.

Additional purposes of this study were to collect data in a natural setting on the language development of preschool blind children, to compare the language development of preschool blind and sighted children, to analyze their language by its functions, and to relate the empirical findings to language theory.

#### Research Design

The purposes of the study dictated the design. In contrast to previous exploratory studies (Fraiberg, 1977; Norris et al., 1957) the present study was descriptive (Black & Champion, 1976) because it directed attention to a particular aspect or dimension (language) of the research target (the blind). The heuristic value of a descriptive study must be recognized as a possible major contribution to the field of social research (Black & Champion, 1976).

Research design in general is the logical manner in which individuals are compared and analyzed. Case study design is a depiction of some selected datum so that it can be compared and analyzed. (Black & Champion, 1976, p. 89)

Thus, case study design was selected for the purpose of describing, depicting, comparing, and analyzing preschool language usage of blind and sighted children.

### Observational Method

The observational method was used because of the problems with testing and experimental work with very young children. Bronfenbrenner (1974) charged that much of what is known about child development amounts to knowing about the behavior of children in strange situations with strangers due to the overuse of the experimental method. Yarrow (1963) advocated the direct observational approach for the study of child development. Bell (1964) pointed out that naturally occurring situations are nearer to the real thing, and Osofsky (1971) indicated that generalizations from naturally occurring situations have fewer limitations. Bronfenbrenner (1974) indicted nonobservational, nonnaturalistic research as ecologically invalid. Ausubel et al. (1980) pointed out that the method used must be appropriate to the age group studied and the most appropriate method for infants and young children is direct observation.

### Instrumentation

All vocalizations uttered by the subjects during the observation periods were recorded and classified by function on observation sheets. The observation sheets had been developed and pretested by the Director of the Mainstreaming Project (see Appendix).

"Vocalizations" were defined as "whatever the child gave voice to, uttered, or said" (cf. Webster's, 1980). The vocalizations were recorded verbatim as sentences, phrases,

or groups of words spoken together. The sentence, phrase, or group of words spoken together was the unit classified by function or use. The functional classifications of the uses of the vocalizations were based on the director's knowledge of child development literature, her experience in collecting observations of children, and her knowledge of and experience with preschool children's use of language. The selected categories were discriminated in observing the children's day in the center and they appeared to include all language uses for the observed children. Definitions of the categories of language use were as follows:

spontaneous--unsolicited, without external stimulation, not suggested by anything in the ecological context;

imitated--following a pattern, model, or example observed by the child within the present observation period;

initiated--directed toward someone or something in the environment, purposeful;

response--in answer to an external stimulus, resulting from an external stimulus.

### Selection of Subjects

Randomization is the best way to assure the representativeness of the sample, but with special populations such as the blind it is frequently impossible to locate a large enough population pool from which to draw a random sample. While arrangements (locating, traveling to, obtaining



permissions, etc.) are being made to obtain a random sample, the available subjects may age out of childhood or the need for the anticipated research may end. Warren (1977) stated that due to the within-group variability even randomization does not ensure a representative sample of the blind. He suggested that the only alternative is to carefully describe subjects and specify status variables so that one piece of research may be meaningfully related to another.

Subjects used in this study were three blind children enrolled in the Mainstreaming Project at the Infant Care Center of the University of North Carolina at Greensboro and the boy and the girl closest in age to each blind subject. Although there are many arguments against using populations for research just because they are available, Goldberg (1969) pointed out that the probability of gathering data on available populations should not be traded for the possibility of obtaining a random sample when blindness is being studied. The subjects used in the study each year and their characteristics are shown in Table 1. The names of the children have been changed in order to provide a degree of anonymity.

In 1980, six children were used in the study. The use of language by each of the two blind children (2-year-old Victor and 4-year-old Karen) was compared to that of a sighted boy and a sighted girl (2-year-old Tom and Tessie and 4-year-old Sandra and Ted) who were closest in age to each blind subject (see Table 1).

Table 1  
Subjects and Their Characteristics

1980						
Visual Status	Name	Sex	Birthdate	Age	IQ	Father's Occupation (SES)
<b>Two-Year-Olds</b>						
Blind	Victor	Male	1-26-78	2 years 1 month	average	Broom Maker
Sighted	Tom	Male	12-2-77	2 years 2 months	high	Accountant
Sighted	Tessie	Female	1-13-78	2 years 1 month	average	Teacher
<b>Four-Year-Olds</b>						
Blind	Karen	Female	9-24-75	4 years 6 months	average	Loading Coordinator (freight)
Sighted	Sandra	Female	11-6-75	4 years 4 months	average	Federal Employee--management
Sighted	Ted	Male	10-30-75	4 years 4 months	high	College Professor
1981						
<b>Three-Year-Olds</b>						
Blind	Victor	Male	1-26-78	3 years 1 month	low	Broom Maker
Sighted	Tessie	Female	1-13-78	3 years 1 month	average	Teacher
Sighted	Fred	Male	3-5-78	3 years 0 months	average	Sales Representative
<b>Four-Year-Olds</b>						
Blind	Rufus	Male	6-23-76	4 years 9 months	average	Factory Worker
Sighted	Jean	Female	12-29-76	4 years 3 months	average	Engineer
Sighted	Adam	Male	1-15-77	4 years 2 months	average	Physician

In 1981, the study was repeated using the blind children enrolled in the Infant Care Center at the University of North Carolina at Greensboro, 3-year-old Victor and 4-year-old Rufus. Karen, along with the sighted children compared to her in the first year of the study, had left the program. Table 1 shows the six children used in the second year of the study. Three-year-old blind Victor was compared with 3-year-old Tessie and Fred, the boy and girl in his classroom closest to him in age. The language use of 4-year-old blind Rufus was compared to that of 4-year-old Jean and Adam, the boy and girl closest to him in age.

#### Description of Subjects

A composite picture of the characteristics of the subjects in the study is shown in Table 1. The blind children were sponsored in the Mainstreaming Program by the North Carolina Commission for the Blind. Only Victor was in his biological two-parent family. Karen was placed with foster parents at age 6 months. They later adopted her. Rufus' father separated from his mother shortly after his birth. He and his mother lived with his maternal grandparents for several years. His mother remarried shortly before Rufus entered the program, and he was adopted by his stepfather.

Except for Tom, the sighted children were in their biological two-parent families. Tom's parents were divorced. He and his mother lived alone but moved three times after the parents' separation. At the time of the study they were in their own home.

None of the parents of the blind children had attended college. Except for Adam, all the parents of the sighted children were college graduates. Adam's mother, a registered nurse, was presently working on a college degree.

Each group of children was closely matched in age (Table 1). Both a male and a female were compared to each blind child. The fathers of the blind children were in semi-skilled occupations. The fathers of the sighted children were in professions which required a great deal of education. Each set of children will be described below.

1. 1980 study

a. Two year olds

Victor (Blind)

Victor was a small, frail child with curly blond hair. He had breathing problems, a broken collar bone, and eye and skull abnormalities at birth. His visual condition at the time of the study was reported to be "colobomas, decreased vision, and microphthalmia in right eye." He had some residual vision, but how much was not really known. Coloboma is any congenital defect of the eye; microphthalmia is abnormally small eyeballs. He was diagnosed as having the "failure to thrive" syndrome at 7 months of age due to his not growing. Victor's mother was totally blind due to retrolental fibroplasia; his father had bilateral colobomas. Victor's mother was unemployed; his father was a broommaker at The Industries for the Blind. At the local Developmental Evaluation Clinic,

during the first year of the study, Victor was found to be developing within normal limits.

Tom (Sighted)

Tom was a tall, well developed boy with dark hair, skin, and eyes. Independent observations of him found in his center records substantiated his extensive vocabulary, well developed, expressive language skills, aggression, and "every indication of high intelligence." Tom's father was a successful accountant; his mother was a real estate salesperson. The parents were divorced and Tom and his mother lived alone.

Tessie (Sighted)

Tessie was a black child with dainty features, brown hair, and light brown skin. Both parents were school teachers. Examination at 2 years of age found Tessie above average on the Bayley Mental Scale, at age level on the Physical Scale, and within her chronological age on the Denver Developmental Screening Test.

b. Four year olds

Karen (Blind)

Karen was reportedly blinded by child abuse at 4 months of age. She was a large, well developed, friendly, and outgoing 4-year-old at the time of the study. She learned easily and was very inquisitive. Psychological evaluation at age 2 found her within the average range. Karen had been in the same foster home since she was 6 months old. She

was adopted by the foster parents after enrollment in the Mainstreaming Program. When Karen entered the program at age 2, she had behavior problems and was considered hyperactive. After firm guidance and discipline, she was taken off the Ritalin and behaved within acceptable limits in the Center. Karen's adoptive mother did not work outside the home. The adoptive father was a loading coordinator for a warehouse. Karen was totally blind.

Sandra (Sighted)

Sandra was a dark-haired 4-year-old of medium size. Her mother was a school librarian and her father a manager in a large federal agency. Independent observations found in her record noted that she was a popular, socially well developed child.

Ted (Sighted)

Ted was a well developed blond boy who was generally happy and energetic. Both parents were college professors. Previous observations reported that he had no communication problems, spoke well, and had a good vocabulary.

2. 1981 Study

a. Three year olds

Victor (Blind)

Victor was previously described in the 1980 study.

(See above.)

Tessie (Sighted)

Tessie was described in the 1980 study. (See above.)

Fred (Sighted)

Fred was a tall, well developed three-year-old with dark hair. He tended to be on the quiet side but was obviously alert and inquisitive. Both parents were college graduates. His mother worked as a secretary-receptionist in a dentist's office and his father was a sales representative.

## b. Four year olds

Rufus (Blind)

Rufus was a well developed blond who seemed to handle his blindness well. Rufus' father had deserted him at birth, and he and his mother lived with her parents for several years. Rufus' mother remarried when he was 3 years old. He was adopted by his stepfather during the study. Rufus was considered by his caseworker, doctor, parents, and teachers normal except for Norrie's disease, a rare form of sex-linked hereditary blindness. Rufus' mother was a skilled technician who worked in data processing. His stepfather worked at a sawmill when Rufus first entered the program but later was a factory employee.

Jean (Sighted)

Jean was an energetic redhead. She was the only child in the study whose records did not contain other observations and reports. Jean was considered by her teachers to be an average to above average child with a friendly, likable personality. Her mother was a personnel technician at the

University and her father was an engineer with a local textile firm.

Adam (Sighted)

Adam had been studied numerous times since he was enrolled as an infant in the Center. He was always found to be exactly on age-level. He was a physically well developed 4-year-old. He was generally pleasant, cooperative, and happy. His father was a physician and his mother, a nurse, was presently pursuing a college degree.

Control of Extraneous Variables:  
Internal Validity

One of the first steps of a researcher is, generally, to control all factors except  $x$  which could affect  $y$ . Then, it is believed, the affect of  $x$  on  $y$  is demonstrated. Campbell and Stanley (1966) asserted that when full experimental control is impossible, the research may still be valuable but the researcher must be thoroughly aware of the specific variables left uncontrolled which might affect  $y$ .

An interactionist view of language development was adopted for this study. This view recognizes that language development depends upon the complex interaction of maturation and learning, parents or caretakers and the child, genetically determined capacities, neurophysiological growth, incidental experience, environmental stimulation, motivational factors, and deliberate training measures (Ausubel et al., 1980). In addition, status variables--sex, age (CA),



socioeconomic status (SES), intelligence (IQ), and visual status are believed to affect language development (Warren, 1977).

The research strategy employed in the present study was to control the environment of the children studied by using as subjects children who spent at least 40 hours per week in the same environment. There are 168 hours in a week. Children aged 2 to 4 spend 70-84 hours per week sleeping. The subjects in the study spent almost half of the remaining 84-98 hours in the same environment, the Infant Care Center.

Environment is generally believed to be a factor in language development (Ausubel et al., 1980; Earle, 1976; Fraiberg, 1977; Gardner, 1978; Norris et al., 1957; Templin, 1957). By holding the environment constant, the following factors considered by interactionists to be important in language development were at least partially controlled: opportunities for learning, caretakers, incidental experience, environmental stimulation, and deliberate training measures. Having the children in the same daily environment controlled these factors as much as they could be controlled unless an experimental situation is used. Maturation and CA were controlled by comparing children of the same age. Sex was controlled by comparing both a boy and a girl to the blind subjects. The status variables--SES, IQ, and visual status--and parental influence and genetic capacities have not been controlled by the design. These factors are most appropriately controlled by statistical procedures employed in

the analysis of the data (analysis of covariance). If statistical procedures are not used, the researcher must evaluate the effect of these variables on the results of the study. Warren (1977) pointed out that if no differences are found in the dependent variable when heterogeneous groups were studied, the status variables can be said to have had no effect. This is one reason in favor of heterogeneous subjects rather than homogeneous or matched ones. If the status variables have no effect, more is known than would be known from a matched sample of homogeneous subjects.

#### External Validity

The most prominent disadvantage of case studies is their limited generalizability. The problem is the representativeness of cases. However, findings from case studies may lend support to or provide refutation of theories (Black & Champion, 1976).

The lack of a random sample will limit the generalizability of the present study. Instead of being able to establish broad generalizations from a widely representative randomly selected sample, this study sought to build knowledge in another way--by contributing one piece of scientific evidence from a selected small sample. This is necessary for much research dealing with handicapped populations.

### Procedure

During each year of the study each of the six subjects was observed on 15 days for 15 minutes at randomly selected times. In the first year of the study, the same observer conducted all observations. During the second year, one observer was employed and trained to observe the 3-year-olds and another trained observer was employed for observation of the 4-year-olds. Each observer was trained until she was able to record and classify the vocalizations adequately and accurately. An agreement of 90% was reached with the original observer during the training period for the second-year observers. All vocalizations uttered by subjects during the observation periods were recorded and classified by functional type on observation sheets. The vocalizations of the more talkative 4-year-olds were tape recorded and transcribed immediately following the observation period by the observer.

### Analyses

Research in the tradition of Fisher emphasizes large-N and statistical analyses based on probability theory. One position taken by critics of large-N between-group research is that individual performance is obfuscated and new methods of analyses must be used to preserve the affect of the individual (Kazdin, 1976). Some researchers are attempting to develop appropriate statistical analyses for single-case studies (Hersen & Barlow, 1976).

After statistical consultation, it was decided that no statistical tests were appropriate to the analyses of the data collected in this study. Statistical techniques are based on probability theory and determine whether any particular finding could have occurred by chance. Since this was a descriptive study, considerations of chance occurrence are inappropriate.

Content analysis is a research technique for the objective, systematic, and quantitative description of the manifest content of communication (Bailey, 1978). Content analysis is the appropriate method for describing patterns of communication and may be used to examine the content of observations (Bailey, 1978), such as recorded observations of verbal behavior (Borg & Gall, 1976). The content of the communications may be examined by categories and enumerated by frequencies (Bailey, 1978).

Content analysis was deemed the appropriate technique for examining and analyzing the language uses of preschool children. The first step in content analysis is to obtain the documents to be analyzed. These were the recorded observations of the vocalizations of the subjects in the study. Categories reflecting the purposes of the research (the uses of language by preschool children) were developed and employed to classify the observations.

The vocalizations of the blind and sighted children, classified by function, were counted to determine each

child's total number of vocalizations. The percentage of each child's vocalizations in each category--spontaneous, response, imitated, and initiated--was computed. Using the blind child's vocalizations as the baseline, the total vocalizations were compared within each age group. Each child's number of vocalizations per minute and per observation period was calculated.

Individual words used in all observation periods were classified by part of speech and counted for each child to determine vocabulary size, number of uses of each part of speech at each age level, number of different words of each type used, and total number of words. Using the blind child's words as the baseline, the total number of words used and the number of different words used were compared within each age group. The number of words spoken per minute and per observation period was also determined and compared.

The most used words within each part of speech were determined for each child. These were compared across visual categories and age groups.

## CHAPTER IV

## RESULTS OF THE STUDY

The results of the study of the language uses and language development of preschool blind and sighted children are presented in Tables 2-8. There are no accepted criteria for interpretation of data which are not obtained through statistical procedures. There are no "rules of thumb" or confidence intervals appropriate to the data. In general in the present study, obtained results were considered "different" when they were five percentage points more or less than other data; results were considered "similar" when they were within the 5% range. The results of this study were discussed and interpreted in relation to Child Development principles, previous research on the blind, the field testing of the methodology, and language theory.

The children in the four groups were primarily initiators, mildly responsive, and showed little imitation and spontaneity. (see Table 3). Within this overall pattern of language use, the blind subjects were less responsive, more spontaneous, and more imitative than the sighted subjects. (see Table 3). The blind child in each age group had the largest number of vocalizations, exceeding those of the sighted children by 22-33% (see Table 2). A developmental trend was noted in the use of vocalizations by the preschool children in the study: the subjects became less spontaneous,

Table 2  
Vocalizations of Blind and Sighted Children  
By Function and Age of Child

Child	Spontaneous	Response	Imitated	Initiated	Total	Percent of Blind Child's Total	Per Min.	Per Observation
Year 1-1980								
Two-Year-Olds								
(Blind) Victor	124 (30%) <sup>a</sup>	28 (7%) <sup>a</sup>	60 (14%) <sup>a</sup>	204 (49%) <sup>a</sup>	416 (100%)	100% <sup>b</sup>	1.85	27.73
(Sighted) Tom	22 (4%)	95 (16%)	62 (11%)	409 (69%)	588 (100%)	141%	2.61	39.20
(Sighted) Tessie	59 (19%)	56 (18%)	41 (13%)	158 (50%)	314 (100%)	75%	1.40	20.93
Four-Year-Olds								
(Blind) Karen	27 (4%)	178 (25%)	61 (8%)	461 (63%)	727 (100%)	100%	3.23	48.47
(Sighted) Sandra	19 (3%)	144 (26%)	15 (3%)	374 (68%)	552 (100%)	75%	2.45	36.80
(Sighted) Ted	28 (5%)	162 (28%)	27 (5%)	353 (62%)	570 (100%)	78%	2.53	38.00
Year 2-1981								
Three-Year-Olds								
(Blind) Victor	26 (7%)	54 (14%)	69 (17%)	244 (62%)	393 (100%)	100%	1.75	26.2
(Sighted) Tessie	11 (4%)	76 (26%)	19 (6%)	187 (64%)	293 (100%)	75%	1.30	19.53
(Sighted) Fred	21 (8%)	54 (19%)	37 (13%)	166 (60%)	278 (100%)	71%	1.23	18.53
Four-Year-Olds								
(Blind) Rufus	41 (11%)	55 (15%)	13 (4%)	257 (70%)	366 (100%)	100%	1.62	24.4
(Sighted) Jean	8 (3%)	47 (19%)	9 (4%)	180 (74%)	244 (100%)	67%	1.08	16.27
(Sighted) Adam	0 (0%)	50 (18%)	37 (13%)	189 (69%)	276 (100%)	75%	1.22	18.4

<sup>a</sup>Parentheses in this column represent percent of child's total vocalizations.

<sup>b</sup>Numbers in this column represent percentage this child's total vocalizations are of blind child's total vocalizations.

Table 3  
 Percentages of All Children's Vocalizations  
 By Functional Category, Year of Study,  
 And Visual Condition

	Initiated	Response	Spontaneous	Imitated
	1980			
All Children	62%	21%	9%	8%
All Sighted	64%	23%	6%	4%
All Blind	58%*	18%*	13%*	11%*
	1981			
All Children	66%	18%	6%	10%
All Sighted	66%	21%	4%	9%
All Blind	66%	14%*	9%*	11%

\* Indicates that the percentage for all blind children differs  $\pm$  5% from that of all sighted children.



more responsive, less imitative, and initiated a higher percentage of their vocalizations (see Table 4). The older subjects verbalized more per minute and per observation period (see Table 2).

More words were spoken by the blind subjects in three out of the four groups (see Table 5). A developmental trend was found in the use of the parts of speech: the use of pronouns, verbs, adverbs, and adjectives increased with age; use of nouns increased; use of interjections decreased; use of articles, prepositions, and conjunctions greatly increased with age (see Table 5). No differences were noted between the blind and sighted children in the uses of the different parts of speech (see Table 5). Three of the four blind children had vocabularies as large or larger than their age-mates (see Table 6). There were many similarities across age groups and visual conditions in children's most frequently used words. Similar words were used by all children in 7 out of the 11 word categories (see Tables 7 and 8).

#### Vocalizations by Function

The overall results showed that blind and sighted children were similar in their use of the functional categories of language: they were primarily initiators, mildly responsive, and less imitative and spontaneous. Nevertheless, within this pattern there were differences in the use of language. The blind children were less responsive, more

Table 4  
 Percentages of All Children's Vocalizations  
 By Functional Category and Age

	Initiated	Response	Spontaneous	Imitated
Two-Year-Olds	58%	14%	16%	12%
Three-Year-Olds	62%	19%	6%	13%
Four-Year-Olds				
1980	64%	26%	4%	6%
1981	71%	17%	5%	7%

Table 5  
Number of Uses of Words  
By Part of Speech and Age of Child

Child	Pronouns	Verbs	Adverbs	Nouns	Adjectives	Inter- jections	Con- tractions	Articles	Prepo- sitions	Conjunc- tions	Proper Nouns	Total Words	Words per Min.	Words per Obser- vation
Year 1-1980														
Two-Year-Olds														
(Blind) Victor	30	85	31	290	22	212	8	4	0	0	22	704 (100%) <sup>a</sup>	3.13	46.93
(Sighted) Tom	413	397	170	252	142	123	105	83	62	6	43	1794 (255%)	7.97	119.6
(Sighted) Tessie	94	126	85	87	16	320	9	7	19	2	27	792 (113%)	3.52	52.8
Four-Year-Olds														
(Blind) Karen	585	748	357	367	235	48	155	145	186	64	61	2951 (100%)	13.12	195.73
(Sighted) Sandra	513	592	206	291	142	19	170	134	197	37	92	2393 (81%)	10.64	159.53
(Sighted) Ted	458	522	227	240	137	184	115	99	136	33	83	2234 (76%)	9.93	148.93
Year 2-1981														
Three-Year-Olds														
(Blind) Victor	142	174	83	162	38	183	34	48	26	1	27	918 (100%)	4.08	61.06
(Sighted) Tessie	180	189	122	88	37	98	70	26	27	18	5	858 (93%)	3.81	57.2
(Sighted) Fred	162	145	87	124	51	81	57	20	49	3	21	798 (87%)	3.55	53.2
Four-Year-Olds														
(Blind) Rufus	215	265	91	164	40	186	80	64	64	37	34	1230 (100%)	5.32	79.33
(Sighted) Jean	174	221	46	86	59	105	55	33	50	12	35	876 (71%)	3.97	59.67
(Sighted) Adam	216	216	97	172	52	107	100	33	54	24	22	1093 (89%)	4.86	72.87

<sup>a</sup>Percentages in this column indicate percentage this child's total words are of blind child's total words.

Table 6

## Number of Different Words

By Part of Speech and Age of Child

Child	Pronouns	Verbs	Adverbs	Nouns	Adjectives	Interjections	Conjunctions	Articles	Prepositions	Conjunctions	Proper Nouns	Total Number of Different Words
Year 1-1980												
Two-Year-Olds												
(Blind) Victor	6	30	8	70	11	37	4	1	0	0	9	176 (100%) <sup>a</sup>
(Sighted) Tom	20	75	26	103	31	24	11	2	7	1	11	311 (177%)
(Sighted) Tessie	15	29	19	40	8	34	3	1	3	1	7	160 (91%)
Four-Year-Olds												
(Blind) Karen	21	85	49	136	50	13	12	3	8	4	23	404 (100%)
(Sighted) Sandra	19	109	35	132	42	9	12	3	18	2	27	408 (101%)
(Sighted) Ted	21	96	35	128	41	28	6	2	12	6	19	394 (98%)
Year 2-1981												
Three-Year-Olds												
(Blind) Victor	13	49	27	85	17	23	12	2	8	1	8	245 (100%)
(Sighted) Tessie	19	47	27	44	19	23	15	2	7	3	3	206 (82%)
(Sighted) Fred	16	51	23	59	25	19	15	2	10	1	10	227 (93%)
Four-Year-Olds												
(Blind) Rufus	21	65	30	82	27	38	29	2	8	6	14	311 (100%)
(Sighted) Jean	13	49	20	52	38	29	16	2	9	4	14	236 (83%)
(Sighted) Adam	16	59	30	78	31	23	20	3	11	5	9	285 (92%)

<sup>a</sup>Percentages in this column indicate percentage this child's total words are of blind child's total words.

Table 7  
 Most Used Words of Blind and Sighted Children  
 Year 1-1980

Child	Pronouns	Verbs	Adverbs	Nouns	Adjectives	Inter- jections	Con- tractions	Articles	Prepo- sitions	Conjunc- tions	Proper Nouns
<b>Two-Year-Olds</b>											
(Blind) Victor	I (16) <sup>a</sup>	see (13)	yes (10)	bubble (62)	pretty (8)	yah (24)	I'm (3)	a (4)	0	0	Scott (6)
(Sighted) Tom	I (173)	want (46)	no (26)	cookie (13)	some (32)	um (13)	that's (21) didn't (21)	a (47)	to (32)	and (6)	Scott (12)
(Sighted) Tessie	I (42)	row (27)	no (26)	socks (9)	more (4)	ha (105)	let's (4)	the (7)	to (12)	0	Lexis (11)
<b>Four-Year-Olds</b>											
(Blind) Karen	I (157) me,my (128)	forms of to be (98)	here (30)	hands (16)	one (37)	yeah (15)	I'm (63)	a (89)	to (66)	and (44)	Easter (11)
(Sighted) Sandra	I (166)	go (53)	not (24)	mother (15)	one (19)	hello (5)	let's (38)	the (83)	to (84)	and (29)	Abigail (16)
(Sighted) Ted	I (119)	forms of to be (59)	there (27)	apples (13)	one (17)	ha (48)	I'm (51)	a (57)	to (48)	and (18)	Gill (30)

<sup>a</sup>Numbers in parentheses indicate the frequency of the word for that child.

Table 8  
Most Used Words of Blind and Sighted Children  
Year 2-1981

Child	Pronouns	Verbs	Adverbs	Nouns	Adjectives	Inter- jections	Con- tractions	Articles	Prepo- sitions	Conjunc- tions	Proper Nouns
<b>Three-Year-Olds</b>											
(Blind) Victor	I (91) <sup>a</sup>	get (15)	here (13)	door (11)	some (7)	sha (31)	it's (7)	a (31)	on (9)	and (1)	Mary (11)
(Sighted) Tessie	I (44)	have (19)	no (61)	milk (6)	some (6)	ha (16) beep (16)	don't (13)	the (16)	to (13)	but (16)	Mrs. Adams (3)
(Sighted) Fred	I (92)	to be (15) get (14)	there (12)	baby (15)	some (5)	ha (20)	don't (11)	a (12)	on (18)	and (1)	Scott (5)
<b>Four-Year-Olds</b>											
(Blind) Rufus	I (59)	to be (25) go (25)	too (9) up (8)	crab (12)	happy (4)	yeh (30) arf (31)	don't (16)	a (32) the (32)	to (30)	and (14) but (14)	Fred (11)
(Sighted) Jean	I 63)	to be (28) go (26)	up (8)	dress (5) tobacco (5)	two (7)	wah (12)	don't (16)	a (17) the (16)	to (18)	and (4)	Mayhand (13)
(Sighted) Adam	I (62)	do (21)	yes (15)	one (20) two (19) three (19)	what (5)	goo (26)	don't (37)	a (16) the (16)	to (26)	and (11)	Annie (8)

<sup>a</sup>Numbers in parentheses indicate the frequency of the word for that child.

imitative, and used more vocalizations than the sighted children (see Tables 2 and 3).

### Initiated

The majority of all children's vocalizations were initiated. Blind Victor at 2 initiated the smallest percentage (49%) of all subjects. Sighted Tessie at 2 initiated only 50% of her vocalizations. The other blind and sighted subjects were similar in the percentage of their vocalizations which were initiated (62-74%).

### Response

Most children were only mildly responsive. Sighted Ted was the most responsive (28%) and blind Victor at age 2 was the least responsive. The blind child in each age group was the least responsive.

### Imitated

All children exhibited little imitation in their speech (from 3-17% of their total vocalizations). Blind Victor at age 3 had the most imitation (17%). Sighted Sandra, age 4, was the least imitative (3%). Sighted Jean at age 4 used 4% of her vocalizations to imitate. Blind 4-year-old Rufus also imitated with 4% of his vocalizations.

### Spontaneous

Only a small percentage of the vocalizations of all children were spontaneous. Blind Victor at age 2 was the

most spontaneous child (30%). Blind Rufus also had more spontaneous vocalizations than the sighted children in his group (11%). Sighted Adam had the least spontaneous expressions (0%). The other children used fewer spontaneous expressions than other uses of language.

### Total Vocalizations

The total vocalizations of the subjects are shown in Table 2. Four-year-old blind Karen had the greatest number of vocalizations during the observation periods, followed by 2-year-old sighted Tom. The large volume of Tom's speech showed that at age 2 he compared with the 4-year-olds in speech development. Except for Tom's exceeding blind Victor, the blind child in each age group was the most verbal, exceeding the sighted children by 22-33%.

### Comparison of Blind and Sighted Children

Comparing blind and sighted children, blind Victor at age 2 was the most spontaneous, least responsive, most imitative, and least initiating of all subjects. Blind Rufus, age 4, was the most spontaneous in his age group. The blind child was the least responsive in each age group. Blind Victor at both ages 2 and 4 and blind Karen at age 4 were the most imitative in their age groups.

Spontaneous. The blind subjects were more spontaneous or as spontaneous as their sighted age-mates. Blind Victor at 2 was the most spontaneous of all the children, and blind



Rufus at 4 was more spontaneous than the other 3- and 4-year-olds. Blind Karen's spontaneous vocalizations of 4% were comparable to the percentage of spontaneous vocalizations of the other 4-year-olds. Victor's spontaneous vocalizations at age 3 were 7% of his total vocalizations. This was a higher percentage than 3-year-old Tessie (4%) had and only one percentage point less than Fred (8%) had. These results did not agree with Fraiberg's (1977) finding that spontaneous vocalizations were rare among the blind.

Response. The blind subjects were the least responsive in their age groups. Victor was 9-11% less responsive than the other children in his 2-year-old age group. Karen was only 1-2% less responsive, but at 3 years Victor was 12-15% less responsive. At 4, Rufus was only 3-4% less responsive. The small percentages of difference for Karen and Rufus are not large enough to indicate that blind children are characteristically less responsive because they are missing visual clues. The results indicate that the particular child, Victor, is considerably less responsive than his age-mates and less responsive than other blind children compared to their age-mates. This finding may indicate a lack of social interaction for Victor. He may lack social skills or be having communication problems. His teachers need to be aware that Victor needs special help in interacting and responding. A hearing examination may be in order. The fact that all the blind children were less responsive than

the sighted children in the study revealed that vision is necessary to know when to respond and that vision aids communication and social interaction. The blind children Karen and Rufus were able to compensate for their visual loss and be responsive almost as much as sighted children in their age groups.

The finding that the blind subjects were the least responsive in their age groups differed from Fraiberg's (1977) conclusion that response vocalizations were frequent among her blind subjects. Fraiberg's conclusion was an impression offered in the absence of quantitative data. The findings in the present study were based on quantitative empirical data and a comparison of blind and sighted children in the same setting.

Imitated. Three of the four blind children were the most imitative in their age group. Burlingham (1961) pointed out how the blind imitate the words of their mothers and use words as playthings. This learning mechanism seemed to be operating with these children.

Initiated. The percentages of total vocalizations which were initiated by the blind subjects were closely comparable to the percentages of initiated vocalizations made by the sighted children (see Table 2). The sighted children initiated from 50-74% of their vocalizations; the blind children initiated from 49-70% of theirs. Victor initiated dialogue 49% of the times he spoke when he was 2 and 62% of the times

when he was 3. Blind Karen used language to initiate vocalizations 63% of the time and blind Rufus initiated 70% of his vocalizations. Such initiation rates cannot be described as "rarely observed" as Fraiberg (1977) concluded.

Total vocalizations. The relatively high use of vocalizations by the blind subjects (22-33% more than the sighted subjects) supported earlier findings of the importance of language and its special functions for the blind (Burlingham, 1961, 1964, 1965; Cutsforth, 1951). Burlingham asserted that a blind child's drive to know and to understand depend upon language in a way that a sighted child's does not and that talking is the way a blind child tests the correctness of vague, nonvisual clues. The findings of the present study added support to the folk wisdom that the blind use language more than sighted persons and provided data to support impressions reported by Burlingham from her case notes. The present study provided quantitative empirical data to support the conclusions that the blind talk more, depend more upon language, and use language to compensate for their lack of vision.

#### Developmental Results

Certain results obtained in this study appeared to be a function of age and may thus be classified as developmental.

#### Use of Vocalizations

A developmental trend was noted in the use of vocalizations by the preschool children in the study: the subjects

became less spontaneous, more responsive, and less imitative as they grew older (see Table 4). The older subjects verbalized more per minute and per observation period (see Table 2).

It is generally believed that children progress from carefree, spontaneous, creative creatures to socialized, inhibited, restrained 7-year-olds. The decrease in spontaneity with age in this study supported this expected developmental trend. In accord with a lessening in egocentricity as children grow older, the children in this study became more responsive to others. They became less imitative with age. This was in agreement with the usual progression to independence and self-direction.

#### Uses of Words: Parts of Speech

A developmental trend was evident in Table 5 in the use of the different parts of speech. The use of interjections decreased with age. The use of pronouns, verbs, adverbs, and adjectives increased with age. The use of nouns increased, but a large number of nouns were used at every age. The use of articles, prepositions, contractions, and conjunctions showed the greatest increase with age. As the children grew older they were less spontaneous and, therefore, used fewer interjections. The increases in number of vocalizations and number of words used were reflected in increased use of the other parts of speech. The large

increase with age in articles, prepositions, and conjunctions reflected the use of more complex sentences by the older children.

#### Uses of Words: Total Words and Different Words

The total number of words used (Table 5) and the number of different words used (Table 6) increased with the children's ages. This was in accord with an expected developmental sequence and agreed with earlier vocabulary studies (Ausubel et al., 1980; Earle, 1976a, 1976b; Templin, 1957).

#### Uses of Words

The total number of words used by each child and the number of uses of each part of speech are shown in Table 5. The blind children used the most words in their age group except for 2-year-old Victor. Sighted Tom, whose speech development at 2 seemed characteristic of the 4-year-olds, spoke the most words of the 2-year-olds. Two-year-old sighted Tessie also used more words than blind Victor. Four-year-old blind Karen, blind Victor at 3, and 4-year-old blind Rufus spoke more than the sighted children in their age groups. No differences were found in the use of the parts of speech by blind and sighted subjects.

#### Use of Different Words: Vocabulary Size

The sizes of the vocabularies of the children in the study are shown in Table 6. Four-year-old blind Karen used

the most words (2951) of any subject in the study. Karen used 404 different words while sighted Sandra used 408 different words, 1% more than Karen. Blind Victor used more different words than Tessie, but both Tessie and Tom had higher total words than Victor (see Table 5.) At age 3 Victor had an 18% larger vocabulary than Tessie and a 7% larger one than Fred. Four-year-old blind Rufus used 311 different words. This was 8% more than sighted Adam and 17% more than sighted Jean. Victor at 3 and Rufus at 4 had the largest vocabularies in their age groups.

The findings that three of the four blind children used the largest number of words in their age groups and used as many or more different words (had vocabularies as large or larger) than their age-mates emphasized again the importance of language to the blind children. Words for the blind children filled some of the gaps caused by their lack of vision. The blind subjects in this study talked more (said more words) than the sighted subjects.

#### Most Used Words

There were many similarities across age groups and visual conditions in children's most frequently used words (see Tables 7 and 8). Similar words were used by all children in 7 out of the 11 word categories. The most used pronoun for all children in all age groups was "I." "One" was the favorite adjective for all the 4-year-olds in 1980. "Some" was the most used adjective for the 1981 3-year-olds.

The 1980 2-year-olds and the 1981 4-year-olds were varied in their adjectival preference. Verbs and nouns were marked by their variety, Victor's adverbial preference was for consent (yes) at age 2 and locative (here) at age 3. Karen's was for the same locative at age 4 while 4-year-old blind Rufus preferred a degree (too). Four of the sighted children preferred dissentive adverbs (no, not), while two used the locative "there," one used "up" and one used "yes" most frequently.

"I'm" was the most used contraction for the two blind children and 4-year-old sighted Ted in 1980. Five of the six children in the 1981 study used the contraction "don't" most frequently. Tessie at 2 and 3 years and 4-year-old Sandra preferred "the." The blind children in the study each year, along with Tom, Ted, Fred, and Jean, preferred "a." "A" and "the" were equally preferred by Rufus and Adam. The preferred preposition for all children in the 1980 study was "to." In 1981 "to" was preferred by four out of the six children. The favorite conjunction was "and" for all children except 3-year-old Tessie. The proper nouns were varied in use and number.

Although three of the four blind children had vocabularies as large or larger than their age-mates, the important finding about vocabulary was the strong similarities across age groups and visual conditions in most used words (see Tables 7 and 8). This finding supported a view of

language as socioculturally determined (Dokecki, 1966). These children in the same environment tended to use the same words regardless of individual sensory-motor experiences or status variables. Cultural language expectancies appeared to be operating strongly enough to overcome the vast discrepancies in the children's backgrounds and bring about similar choices of words for all children. In view of the highly heterogeneous family backgrounds of the blind and sighted subjects, the strength of this particular environment was shown.

The strong use of "I" (see Tables 7 and 8) by all children in different age groups and both visual conditions was a finding contrary to Fraiberg (1977). She found that blind children displayed an extraordinary incapacity to represent the self as "I" and to acquire stable "I-you" concepts. This difficulty was not apparent in this study. The blind subjects used personal pronouns as frequently and as correctly as the sighted subjects.

#### Interpretation of Findings

Blind and sighted children were found to be similar in their uses of language in the preschool. They were primarily initiators, mildly responsive, and somewhat imitative and spontaneous. Within the overall pattern of language use, the blind subjects were more spontaneous, more imitative, and less responsive. The blind children uttered more vocalizations, more total words, and more different words. There



were many similarities across age groups and visual conditions in children's most frequently used words..

The status variables--age, sex, socioeconomic status (SES), intelligence (IQ), and visual status--are believed to affect language development (Warren, 1977). In the present study age was shown to be a factor influencing language in the developmental results reported above. The subjects were heterogeneous with regard to sex, SES, IQ, and visual status (Table 1). Yet similarities were found in the uses of vocalizations and choices of words for all children in the study. The blind children were socially, culturally, and economically below the sighted children and their parents were financially, educationally, and vocationally limited. Yet the uses of vocalizations and their most used words were similar for blind and sighted children in the same day care center for full-time day care. Thus the status variables--sex, SES, IQ, and visual status--can be said to have had no effect in this study.

A great many current preschool programs and practices are based on the belief that home environments, specifically the socioeconomic status and cultural interests of the parents, are important factors influencing language development (Honig, 1982). Previous research has established the effects of sex, SES, IQ, and visual status on language (Ausubel et al., 1980; Gardner, 1978; Honig, 1982; Warren, 1977). Therefore, there must be factors operating in this study to

overcome the vast discrepancies in the children's backgrounds and bring about similar uses of language and choices of words for all subjects.

One explanation of the findings is that there were cultural and environmental language expectancies (Dokecki, Polodoro, & Cromwell, 1965) operating within the day care center which overcame the discrepant backgrounds and visual conditions. The children spoke as they were spoken to, as they were expected to speak, and as they heard others speak.

The number of hours spent per day with the same caretakers in the same environment (the university day care center) and the nature of the center itself (warm, loving caretakers, high adult-child ratios, enriched environment) must be recognized as factors which operated to bring about language similarities in the face of expected differences. Tizard, Cooperman, Joseph, and Tizard (1972) found that the level of child language in residential nurseries was related to the quality of the staff and the organization of the program itself. In this study the day care center had more influence than the home environment on the language development of the blind children enrolled.

Another factor operating to bring about similarities in the children's use of language was the effect of mainstreaming. The center in which the study took place cared for both blind and sighted children. In this mainstreamed day care center the principle of normalization operated. Every effort

was made to make the experience of the children as culturally normative as possible. The effect was that culturally normative characteristics were established and maintained for the blind children. All activities and experiences available to the sighted children were also available to the blind children. Mainstreaming and the principle of normalization were among the factors accounting for the similarity of the use of language by the blind and sighted children in the study.

The findings that the blind subjects uttered more vocalizations, spoke more words, and used more different words than the sighted children were new findings not documented previously in the research literature. This finding is accounted for by the empirical nature of the study and the comparison of blind children with sighted children in the same setting rather than comparison with sighted norms.

#### Field Testing the Methodology

A major focus of this study was field testing the methodology developed to collect the data on preschool language use and language development. The instrument, an observation schedule, may be found in the Appendix.

The first difficulty encountered in using the instrument was the impossibility of hand recording the lengthy vocalizations of the 4-year-olds. This problem was solved by tape recording the observation period and transcribing it immediately afterwards.

There was no difficulty among any of the observers in recognizing a "vocalization," i.e., the sentence, phrase, or group of words spoken together. There was difficulty in classifying the vocalizations. The categories covered all uses of language, but the definitions of the categories needed to be refined and elaborated. Examples should have been included in the instructions for the use of the observation form. Rules for distinguishing the categories needed to be developed and written in the instructions. This was done "informally" when the observers were trained during the second year of the study, but it should have been done explicitly and formally.

A problem was discovered when the data were analyzed. The 4-year-olds in 1981 spoke only 40-50% as much as the 1980 4-year-olds. In exploring this discrepancy it was determined that all the 1981 observations were made in the afternoons. Although they had not realized it previously, upon reflection the teachers realized that the children do talk less in the afternoons. It is speculated that the children are fresher, more lively, more energetic, and more talkative in the mornings. The afternoon observations were made after nap time when the children may still have been sleepy, sluggish, and tired from their day at the center. Also, the afternoon schedule differed a great deal from the morning schedule. In the afternoons, after nap, the children had a snack, then a group session, and then outdoor play. In the

mornings the children had a long period of free play while all were arriving. Then there was a snack, a group session, and outdoor play. The differences in the classroom routine and the children's physical-emotional condition accounted for the differences in the volume of the 4-year-olds' speech in 1980 and 1981.

A major limitation of the study was the failure to include a context variable in the observations. The context of each observation period should have been recorded. By context is meant the setting (classroom or outdoors), the activity (free play, snack time, group time, etc.), and persons present. Then findings such as fewer responses by the blind subjects could have been tied to the context in which they occurred. For example, it might be found that the blind children never responded during group time but the sighted children did frequently. Perhaps the blind children responded little during free play because they were frequently alone. Much valuable and meaningful data were lost due to the omission of a context variable in the recording of the data.

#### Relation to Language Theory

The findings of this research support an interactionist view of language. In this view language is the result of the complex interaction of maturation and learning, genetically determined capacities, neurophysiological growth, incidental experience, environmental stimulation, motivational factors, deliberate training measures, and the joint

interaction of the parents (or caregivers) and the child (Ausubel et al., 1980). In this study, children of very different background, family environment, and socioeconomic status used vocalizations and words similarly. They even had a remarkable similarity in their most frequently used words. The strength of the same daily environment was great enough to overcome vastly differing backgrounds. This finding supported a view of language as socioculturally determined (Dokecki, 1966) and suggested that the status variables--sex, IQ, SES--have less influence than the regular, daily environment on language development.

CHAPTER V  
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to investigate the language use and language development of preschool blind and sighted children who were in the same daily environment by means of naturalistic, observational research. An additional purpose was the field testing of the methodology for the investigation of the uses made of language by preschool children.

The sample consisted of 12 children. All children were attending the Infant Care Center at the University of North Carolina at Greensboro. The study was conducted during two years, 1980 and 1981. During each year two blind children were compared to the sighted boy and girl closest to them in age. This made a total of six children in the study each year.

The data were collected by observing each of the six (per year) subjects for 15 randomly selected minutes on 15 days. All vocalizations spoken by the subjects were recorded on observation sheets and classified by function (see Appendix). The vocalizations of the blind and sighted children, classified by function, were counted to determine each child's total number of vocalizations. The percentage

of each child's vocalizations in each category--spontaneous, response, imitated, and initiated--was computed. Using the blind child's vocalizations as the baseline, the total vocalizations were compared within each age group. Each child's number of vocalizations per minute and per observation period were calculated. Individual words used in all observation periods were classified by part of speech and counted for each child to determine vocabulary size, number of uses of each part of speech at each age level, number of different words of each type used, and total number of words. Using the blind child's words as the baseline, the total number of words used and the number of different words used were compared within each age group. The number of words spoken per minute and per observation period were also determined and compared. The most frequently used words within each part of speech were determined for each child. These were compared across visual categories and age groups.

Findings were the following:

1. Blind and sighted children were found to be similar in their uses of language in the preschool. All children in every age group and visual condition were primarily initiators, mildly responsive, and somewhat imitative and spontaneous. However, within the categories of language use there were differences.

2. Two of the four blind subjects were the most spontaneous in their age groups.



3. The blind subjects were the least responsive in their age groups.

4. Three of the four blind children were the most imitative in their age groups.

5. The blind child in each age group had the largest number of vocalizations, exceeding those of the sighted children by 22-33%.

6. A developmental trend was noted in the use of vocalizations by the preschool children in the study: the subjects became less spontaneous, more responsive, less imitative and initiated a higher percentage of their vocalizations as they grew older. The older subjects verbalized more per minute and per observation period.

7. Three of the four blind subjects spoke the most words in their age groups.

8. A developmental trend was found in the use of the parts of speech: the use of pronouns, verbs, adverbs, and adjectives increased with age; use of nouns increased; use of interjections decreased; use of articles, prepositions, and conjunctions greatly increased with age.

9. No differences were noted between the blind and sighted children in the uses of the different parts of speech.

10. Two of the four blind children had the largest vocabularies in their age groups.

11. There were many similarities across age groups and visual conditions in children's most frequently used words.

12. Similar words were used by all children in 7 out of the 11 word categories.

### Conclusions

The following conclusions were drawn from the findings:

1. The findings of very strong similarities across visual conditions in the use of vocalizations and across both age and visual conditions in the use of words lend support to a view of language as socioculturally determined (Dokecki, 1966).

2. Cultural and environmental language expectancies operate to overcome discrepancies in children's backgrounds and bring about similar uses of language and choices of words for all children when children are exposed to the same cultural environment on a daily basis.

3. This sample of blind children was less responsive, more spontaneous, more imitative, and used more vocalizations than the sighted children.

4. Vision is necessary to know when to respond.

5. Vision aids communication and social interaction.

6. Some especially capable blind children are able to compensate for their visual loss and be almost as responsive as sighted children in their age groups.

7. Blind children use imitation as a learning mechanism.

8. Support was not given to Fraiberg's (1977) findings that blind children are rarely spontaneous, initiate conversation rarely, and respond frequently.

9. Blind children use language to compensate for their lack of vision.

10. In general, children become less spontaneous, less egocentric, more responsive, less imitative, and more independent and self-directed as they grow older.

11. There is a developmental trend in the use of the parts of speech.

12. Visual status does not affect the use of the parts of speech.

13. Children in the same environment tend to have the same most used words, regardless of individual sensory-motor experiences or status variables. This supports the position of Dokecki, Polidoro, and Cromwell (1965) that there are cultural commonalities and cultural language expectancies that operate regardless of mental or psychological states.

14. A group experience such as a day care center similar to the Infant Care Center of the University of North Carolina aids in the language development of preschool blind children through the effect of mainstreaming and the principle of normalization.

15. The methodology developed to collect data on preschool language use and language development was effective, with modifications.

16. An interactionist theory of language was supported.

### Recommendations

It is recommended that the limitations of this study be kept in mind when interpreting the results and accepting the conclusions. The study is limited by the lack of a random sample. This severely restricts the generalizability of the findings and the validity of the conclusions. However, the impossibility of obtaining a representative sample of the blind due to the heterogeneity of the sample should be noted.

Another limitation of the study is the data collection instrument. Its use is not precise enough due to the need for further definition and refinement of the categories of language use.

### Further Research

It is recommended that further research be conducted on the language use and language development of both blind and sighted preschool children using the methodology developed in this study. The categories of functional use of language found on the observation schedule should be more clearly defined and refined. Examples need to be included in the instructions and uniform rules and specific instructions for the use of the observation schedule should be developed. A context variable should be included for each observation period. Then findings can be tied to the context in which they occurred. Interrelationships between categories may be

apparent. Analysis by Markov Chains to see the process of the use of categories would then be possible.

### Applications

This study should be encouraging to teachers and mainstreaming proponents. The factor most influencing the language development of the blind children in this study seemed to be the daily cultural environment of the children. This environment was the university day care center, a mainstreamed preschool characterized by high adult-to-child ratios, warm and caring staff, and many enriching opportunities to learn.

Blind children may need assistance in responding appropriately and in interacting sufficiently with others in the classroom, but teachers should be able to capitalize on their willingness to imitate to increase their language skills. Language for the blind can be a compensation for the lack of vision and one way to fill in some of the voids blindness causes in experience. The blind children in this study developed language skills beyond the highest expectations. They developed mechanisms for learning and using language to cope with their visual deficiencies.

In view of the role played by the Infant Care Center in keeping the language skills of these blind children comparable with those of their age-mates, it is recommended that consideration be given to quality mainstreamed day care or some type of mainstreamed developmental enrichment program on a regular basis for blind children.

In consideration of the large volume of speech found in this study, the blind may need more opportunities to talk than many classrooms provide. Teachers of the blind need to remember to verbalize more of the classroom routine and activities and to substitute verbal or tactile activities for visual ones as much as possible.

Overall, the blind can be expected to use language much as other children do, to speak as fluently, to use as many words and parts of speech, to use words similar to those they hear daily, and to use language skills to compensate for their lack of vision when given the opportunity to exercise and increase their vocalizations.

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APPENDIX  
SAMPLE OF OBSERVATION SHEET

NAME \_\_\_\_\_

PAGE \_\_\_\_\_

VOCALIZATIONS			USES OF LANGUAGE				
DATE	TIME	WORD - WORDS	SPONTANEOUS	RESPONSE	IMITATED	INITIATED	RECORDER